COLORADO RIVER PROJECT

River REPORT

Summer 2011

A project of the Water Education Foundation

Conserving Species and Habitat: Five Years of the Multi-Species Conservation Program

By Gary Pitzer

Decades after it was first altered, the Colorado River floodplain is regaining traces of its former appearance in certain places.

In a comprehensive effort, the Lower Colorado River Multi-Species Conservation Program (MSCP) is creating habitat with the hope of sustaining and boosting the numbers of several species that were threatened with extinction.

Five years into the program, an impressive scale of contributions by federal, state and local agencies and water users is generating remarkable changes to reaches of the river that had been severely altered and degraded because of the flow changes caused by the introduction of dams. In a testament to nature's resiliency, officials are finding an ecosystem responding to even the slightest of manipulations.

"It's amazing to me how much has been completed in the last five years," said Laura Vecerina, deputy program manager for the MSCP, coordinated by the federal Bureau of Reclamation (Reclamation).

The MSCP aims to create more than 8,000 acres of new habitat (including 512 acres of marsh and 360 acres of backwaters) and introduce more than 1 million combined razorback sucker fish and bonytail along some 400 river miles from Lake Mead to the southerly border with Mexico. The program's entire cost of $626 million is split 50/50 between the federal government and Arizona, California and Nevada, with California picking up 50 percent of the three states' share.

In March, Vecerina and the engineers and scientists with Reclamation conducted a tour of what they are accomplishing along the river, showing off several restoration sites along more than 200 miles along the lower river.

"I was impressed," said tour participant Larry Purcell, water resources manager with the San Diego County Water Authority. "I think the Bureau is doing a great job of implementing the program."

Purcell, whose agency is contributing $7.5 million to the MSCP, said it was his first time seeing the Imperial Ponds Conservation Area, Yuma East Wetlands and the Hart Mine Marsh.

Habitat restoration projects existed prior to the MSCP, which began in

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Imperial Ponds Wildlife Conservation Area

Dear Readers

The federal Bureau of Reclamation (Reclamation) and the Lower Basin states launched the Lower Colorado River Multi-Species Conservation Program (MSCP) in 2005. Designed as a 50-year program, this habitat conservation plan aims to bring back native riparian habitat in the lower Colorado River and increase the numbers of endangered, native fish such as the razorback sucker and bonytail.

In just a few years, the MSCP already has transformed sections of the 100-year floodplain with new riparian habitat as Writer Gary Pitzer discovered on a March tour of several habitat restoration sites. The tour visited Yuma East Wetlands, Imperial Ponds Conservation Area, the Hart Mine Marsh and Beal Lake and in this of River Report, *Gary writes about how biologists and others are working to implement the MSCP.*

The MSCP has been criticized by some because it relies on growing cottonwoods and willows on former farmland and rearing captive endangered fish rather than actively restoring river flows and riverine habitat. But it still is exciting to see areas of the river begin to resemble the historic floodplain and imagine a future where these intentionally created habitats are reclaimed by nature and fish populations become stabilized, all while allowing society to continue to rely on the Colorado River's water to produce food and provide water to cities in Arizona, California and Nevada.

Rita Schmidt Sudman

River Report *is a project of the Water Education Foundation*

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2005, giving Reclamation a leg up as it charted its plans. The program is intended to create habitat for wildlife rather than achieve specific restoration numbers for birds; a reflection of the inherent difficulty in species-by-species management.

The restoration is proceeding in an area that bears little likeness to its legacy as a historical floodplain. "To do restoration on this scale you have to remember we are not dealing with a real floodplain that's connected to the river where we can manipulate the flood levels," Lesley Fitzpatrick, aquatic animal recovery coordinator with the U.S. Fish and Wildlife Service (USFWS) in Phoenix, told *River Report* in an interview. "We are really taking more of a farming aspect."

MSCP activities are "improving an extremely degraded baseline, but whether those improvements rise to the level of a restoration success is another question," said Kara Gillon, senior staff attorney with Defenders of Wildlife. "Just as the MSCP is not about [species] recovery, it is not about ecosystem restoration, because growing fish and farming trees on former ag lands will not yield habitats that are self-sustaining now or will be in the future, that contain characteristic assemblages of native species and that are resilient to threats to their health," Gillon said.

A prime function of the MSCP is to revive the populations of native Colorado River fish that thrived in the waterway before the construction of dams and the loss of habitat. A sometimes vexing proposition, fish restoration is challenging because of the array of variables that result in periodic setbacks, such as disease and predation by non-native species.

More than a decade in planning, the MSCP came about because the USFWS in 1994 designated the Colorado River Basin critical habitat for bonytail and razorback sucker, both species listed under the federal Endangered Species Act. Rather than a species-by-species approach, officials targeted their efforts to improve the habitat in the river valleys for aquatic, marsh and riparian species in a holistic approach. Fitzpatrick said the goal was to create habitat "that met that physical and biological characteristics that species needed," but that because of differing factors, there is not a requirement to operate the program with specific numbers of the species present.

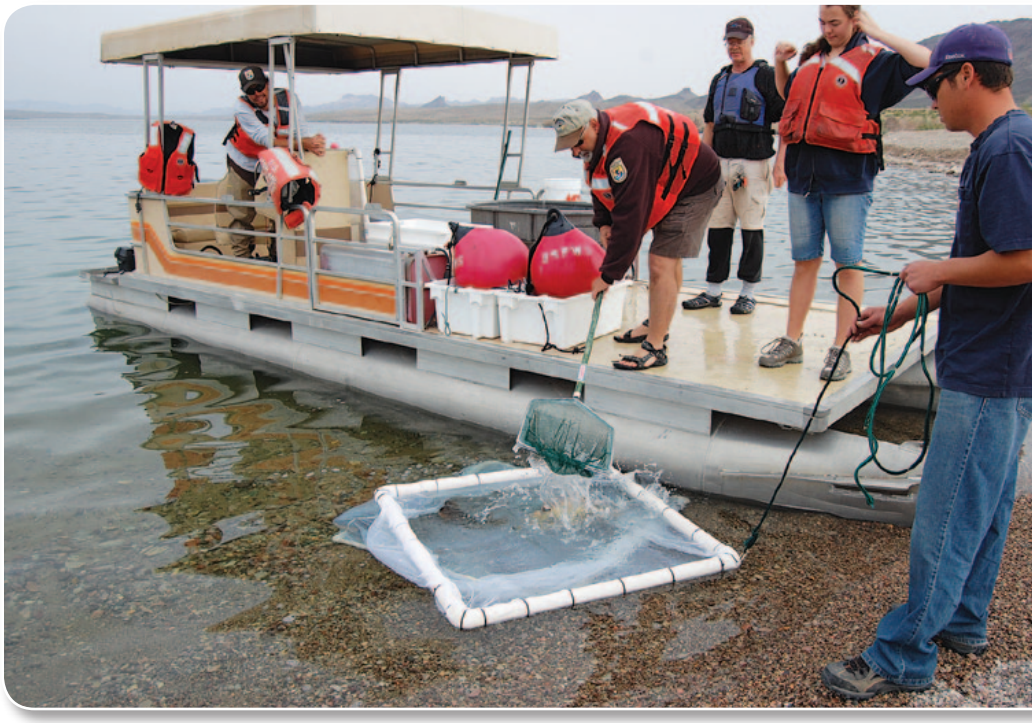
With migratory birds, "you don't know what's happened to them when they're not [at the conservation areas]," she said. While the MSCP may create "the best habitat in the world," expecting it to produce exact numbers of birds is unreasonable, she added.

In 1997 USFWS issued a biological opinion that laid the foundation for the MSCP – a process that encouraged the direct participation of Reclamation and non-federal stakeholders.

At the heart of the MSCP is the effort to provide habitat for vulnerable animal species within the historic 100-year floodplain so that overall population numbers can increase. This is being done within the context of current water diversions and power production and the ability to "optimize opportunities for future water and power development, to the extent consistent with law," according to Reclamation.

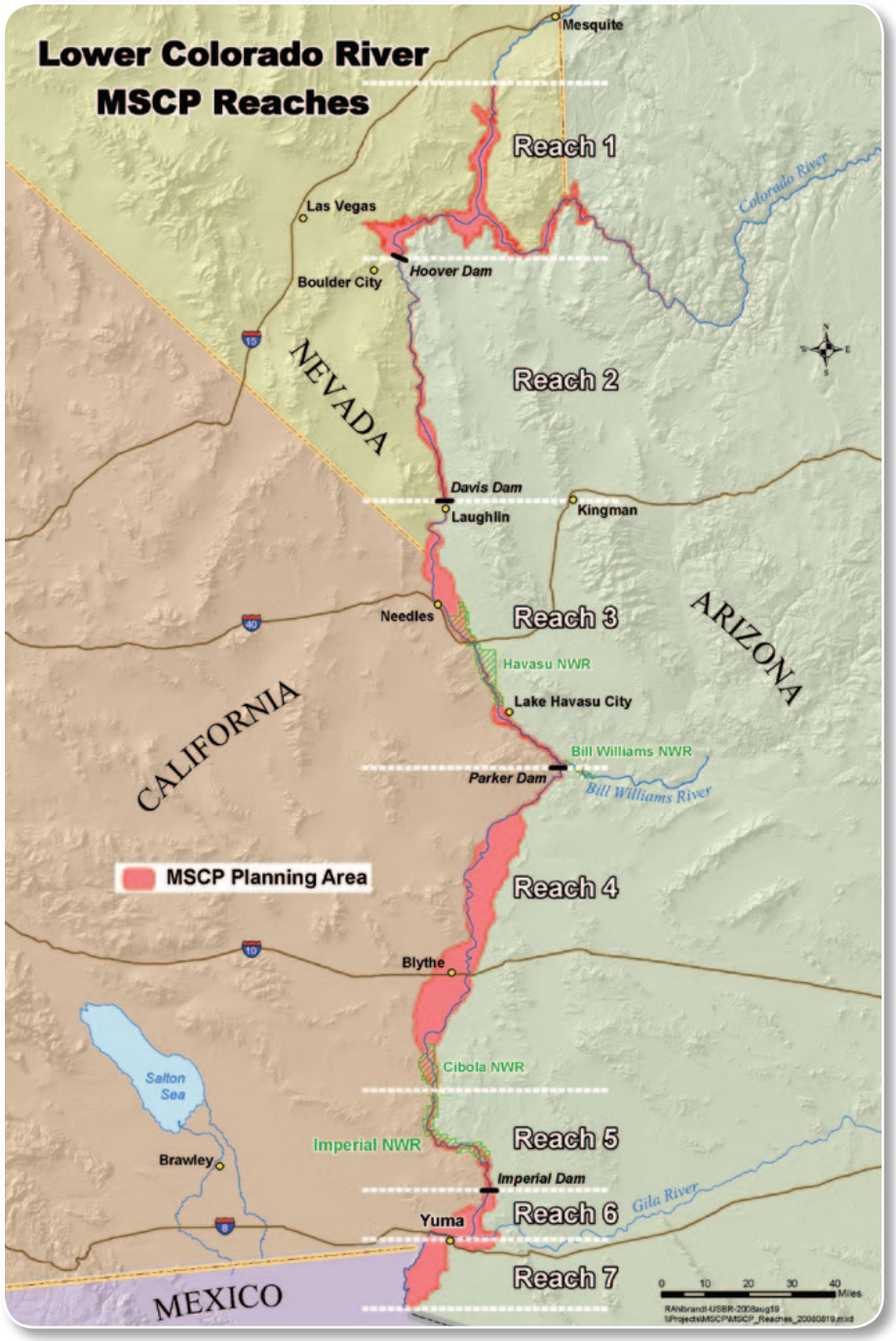
The MSCP has focused on securing partnerships with resource agencies to ensure adequate land and water resources are available to create habitat and provide for its long-term maintenance. Priority is placed on securing land with existing water rights. Under a water accounting agreement between Reclamation and key state water agencies, non-native vegetation may be removed and native vegetation planted in its place for MSCP purposes without accounting for the water used to create and maintain the habitat, provided there isn't an existing water right for the site where habitat is created. MSCP planners are determining criteria "whenever we identify a potential project that may need the water accounting agreement to make it practical to implement," said John Swett, MSCP program manager.

A prime function of the MSCP is to revive the populations of native Colorado River fish.



Scientists say the work associated with the MSCP is not merely an exercise of creating habitat for habitat's sake. "Our goal is not just to move the species to the restored area, our goal is to increase the species," wildlife biologist Beth Sabin said at the Palo Verde Ecological Reserve, one of several MSCP sites along the lower Colorado River.

After several years of development, the MSCP was launched with the support of 56 federal and non-federal participants. Its main goals are ensuring continued river diversions and operations by avoiding additional listings and addressing the needs of existing threatened and endangered wildlife. In March 2005, a 50-year biological opinion issued by USFWS charted a new course for a 1,100 square-mile area covering parts of Arizona, California and Nevada along the lower Colorado River.



The MSCP coincides with the Upper Colorado River Endangered Fish Recovery Program, which began in 1988 to bring back populations of humpback chub, bonytail, Colorado pikeminnow and razorback sucker. The bonytail and humpback chub are two of the six endangered species the MSCP concentrates on, the others being the southwestern willow flycatcher, Yuma clapper rail razorback sucker and the desert tortoise. The program also concentrates on 20 sensitive species and five "evaluation species."

Evaluation species are those that could become listed under the Endangered Species Act and that could be added to the MSCP covered species list "but for which sufficient information is not available at this time to determine their status in the … MSCP planning area, to assess the potential effects of covered activities, or to develop specific conservation measures," the MSCP Habitat Conservation Plan says.

Sensitive species describes those listed individually by California (which has its own ESA), Arizona, which has "wildlife of special concern," and Nevada, which has "at-risk" and "watch-list" species, Swett said.

Restoration efforts are geared toward establishing aquatic and marsh habitat and what is known as lower terrace cottonwood habitat and upper terrace mesquite. "Restoring a degraded ecosystem using native plant species will facilitate long-term objectives of creating a functioning riparian habitat that will not only provide habitat for a diverse group of species but will also be capable of regeneration over time," according to Reclamation.

Cottonwoods and willows – once found at low elevations in the floodplain – depend on groundwater and serve a multitude of functions, including regulating temperature fluctuation, stabilizing stream banks and improving water quality. Mesquite grows quickly, is

drought-resistant, increases soil nitrogen and supports a wide range of animals for food and shelter.

"The goal is clear – get a balance that's sustainable for the 25 million people that rely on the Colorado River," Reclamation says. Thus far, more than $66 million of the program's $626 million cost has been spent to get the MSCP up and running.

The results are visible – thriving forests of cottonwoods and willows on former agricultural fields and backwater habitat that rears native fish. The pace of progress has exceeded the expectations of many participants. "The successful implementation of this unique and important program since 2005 has been remarkable, with many success stories already observed," Swett wrote in the introduction of a brochure highlighting the first five years.

The MSCP's rate of habitat restoration is "exceeding expectations," and the program is well on its way toward creating the planned 8,132 acres of habitat, Purcell said. Challenges lie in meshing the federal ESA with the California ESA to "maximize what we do on the ground" and to spread initiation of MSCP projects into California, he said.

"We have been talking about an increased emphasis on siting [conservation areas] in California that meets both permit needs," Purcell said. "They [Reclamation] are open to that. The low-hanging fruit is gone; as we move forward, it's now a little harder to put the required habitat in the right locations."

"The low-hanging fruit is gone; as we move forward, it's now a little harder to put the required habitat in the right locations."

– Larry Purcell, San Diego County Water Authority

This issue of *River Report* looks at how the MSCP is striving to improve wildlife habitat along the Lower Colorado River.

Doubling Diversity and Density: Yuma East Wetlands

The success stories span the course of the lower river and encompass not just ecological benefits, but societal improvements as well. An example of that is readily apparent at the Yuma East Wetlands, a once-downtrodden no-man's land that has been the focus of intense rehabilitation efforts for more than a decade. At one time an important component of the riverine ecosystem, the area debilitated as flows were diverted elsewhere, gradually turning into a morass of more than 1,000 acres of non-native vegetation.

"The community was cut off from the river," said Charles Flynn, executive director of the Yuma Crossing Natural Heritage Area. "It was a dump."

Restoring the wetlands to a shred of its former visage has cost millions of dollars and countless hours as officials and members of the Quechan Indian Tribe aim to provide as much as 1,400 acres of wildlife habitat and recreational and cultural resources. Yuma East Wetlands began with an initial $300,000 grant from the U.S. Environmental Protection Agency and has continued on with contributions from Reclamation, the state of Arizona, the tribe and the city of Yuma.

"The acres of native trees and wetlands at the site now attract an abundance of birds and other wildlife in an area once overgrown with invasive plants such as salt cedar and phragmites [an invasive reed]," according to Reclamation. "The wetlands also provide opportunities for low impact recreation for residents and winter visitors alike."

More than $1 million has been spent to create more than a mile of backchannel. "It's been an extraordinary effort to get to this point because it was so degraded," Flynn said. Reclamation is directly involved with a 350-acre portion of the wetlands reforested with cottonwood and willow trees. The MSCP is exploring providing operation and maintenance funding for the project.

The work is paying off with documented sightings of the endangered Yuma clapper rail and an assortment of other birds, insects, mammals, reptiles and amphibians. "The last four years the density and diversity has doubled for birds," said Fred Phillips, a Flagstaff-based ecosystem restoration consultant. "By the end of this year, I think we probably will have a pretty big jump in diversity."

The revitalized wetlands provide native sources of materials used in the cultural practices of the Quechan Tribe, said Brian Golding, director of economic development. The wetlands provide an

Yuma East Wetlands

Troy Smith with Arizona Game and Fish Department at the Cibola Valley Conservation Area.

opportunity to create a "storehouse" of cultural material production and a "sustainable" ecotourism trade, he said.

Upriver from Yuma East Wetlands, the $25 million Laguna Project aims to establish approximately 1,200 acres of restored habitat by 2014, making it one of the largest riparian/marsh habitats along the lower Colorado River. During a three-phase, fall/spring cycle, crews will widen and deepen the former river channel and lay irrigation pipe with the aim of creating 168 acres of open water and marsh and more than 420 acres of cottonwoods and willows.

"Unlike other MSCP projects, the Laguna Project will return native vegetation to the river channel itself, mimicking natural river floodplain inundation and a certain degree of hydrologic dynamism to the river corridor," said Michael Cohen, senior research associate with the Pacific Institute.

The project will be laborious because of the "tremendous amount" of salt cedar at the site, said Bill Singleton, a civil engineer with the MSCP restoration group.

Also known as tamarisk, salt cedar is a non-native shrub that was introduced to stabilize stream banks. It tolerates saline and alkaline soils and has spread rapidly throughout the Southwest. Its heavy use of groundwater crowds out native species and in many sites salt cedar grows so thick it halts the growth of any other plants. Salts accumulate in the soil from the fallen leaves of salt cedar or from the excretion of salt from living leaves.

Because it will attract migratory birds and species listed under the ESA, the Laguna Project will exist as a "managed riverine system," Singleton said, adding "we will adjust and enhance management actions for the species." The project "will be done to minimize impacts on water deliveries," he said.

Water and Diversity: The Imperial Ponds Conservation Area

A "major focus area" of the MSCP is the Imperial Ponds Conservation Area east of the river in the Imperial National Wildlife Refuge. Six ponds provide 80 acres of habitat for razorback sucker and bonytail chub while a cottonwood/willow forest is set to be expanded in 2014 to provide refuge for endangered bird species and migratory wildfowl. The prospects of the site have Reclamation personnel highly optimistic about its future.

"Everything above the water will be pretty exciting," said Chris Dodge, MSCP monitoring coordinator. "This area already has the highest number of covered species … there is a lot of water and a lot of diversity."

The addition of cottonwood trees once soil conditions are right will heighten the attractiveness of the conservation area, Dodge said. "Once we get the trees in, I am very hopeful we will see more birds and bat activity," he said. "With the whole mosaic, I think we are looking at a really good site for a lot of our species."

Anticipation of cottonwood and willow restoration sometimes results in "tree fever," the desire to see plantings occur before the soil salinity is stabilized, said Terry Murphy, MSCP restoration program manager. Instead, the soil is being carefully cultivated with trees expected in 2013.

"By irrigating a cover crop on the 34 acres before restoration, it gives us time to reduce the salinity in the soil, gives us a visual indication of how well the soil will support tree planting, integrate the planting of Imperial with other conservation areas and should provide us with better cottonwood-willow survivorship when planted," Murphy said.

Success Story: The Cibola Valley Conservation Area

Trees dominate the MSCP's Cibola Valley Conservation Area in southwest

Cottonwood and willow trees stand on the site of former farmland.

Arizona, with groupings of cottonwood, willow and honey mesquite creating an "integrated mosaic" of habitats on land where they once thrived on the floodplain, according to Reclamation.

"We'd love to have this right in the river but practically speaking it's not going to happen if you don't bring the water to it," Murphy said.

The conservation area is refuge for a host of species covered under the MSCP, including migratory birds. "This is one of the more successful sites; it is fabulous here," said Theresa Olson, wildlife group manager with Reclamation. "We have had phenomenal success with yellow-billed cuckoo. Another great success is with bats." The majority of yellow-billed cuckoos on the mainstem Colorado River are found at the conservation area and the Palo Verde Ecological Reserve, Dodge said.

The 1,300-acre conservation area is owned by the Arizona Game and Fish Department and leased to Reclamation. The former farm fields use about 8 acre-feet of water per acre to maintain the cottonwoods and willows, an amount "that may increase or decrease" as more is known about the performance of the trees and response of the birds, Murphy said.

So far, 264 acres of the conservation area have been mass-planted with trees in varying densities to determine the "most suitable" mixture, according to Reclamation. Areas of standing water or moist soil (which are preferred by some birds during breeding season) will be incorporated into the conservation area "when feasible," Reclamation says.

"Some of the fields are very sandy and require more frequent irrigation than fields with silty or loamy conditions," Murphy said. "It's going to take a while for us to actually fine tune the watering requirements so we can maximize native plant establishment while providing for migratory bird species habitat needs. That will ultimately determine how much cottonwood-willow we can establish on the conservation area and how much water the stands will require."

A 'Win-Win' Partnership: Hart Mine Marsh

Besides species protection, the MSCP has fostered a greater working relationship between Reclamation and USFWS. An example is Hart Mine Marsh, a 255-acre site about 20 miles south of Blythe that is being returned to a shade of its original form after years of being managed with drainage water.

"With changes in the river system, including water operations and management, the dynamic processes that once maintained the marsh have been all but removed," according to Reclamation. "Until recently, the marsh had no outlet, resulting in poor water quality and highly saline areas dominated by invasive salt cedar."

Prior to restoration, the marsh was only about 20 acres of cattails and shallow open water. Most of the areas were completely dry and some were devoid of any vegetation. "It looked pretty dismal to begin with," said Gregg Garnett, project manager. "We knew we had a lot to do. It was a marsh that really didn't function as a marsh."

Through a long-term agreement, Reclamation and USFWS have teamed up to revitalize Hart Mine Marsh so it can host resident and migratory birds. Non-native vegetation has been removed and the marsh has been excavated and recontoured to make it suitable habitat for birds, including the Yuma clapper rail.

Hart Mine Marsh has been a "win-win" because it meets the MSCP's habitat requirements and USFWS' management goals, Garnett said. "Both sides wanted to do this; that's why it worked," he said. "The goals were congruent so it was easy to get things going."

Ashlee Rudolph with the Bureau of Reclamation at the Beal Lake Conservation Area.

With some overt and subtle changes, Hart Mine Marsh is well on its way to being vital habitat for species covered under the MSCP and the general bird population. "We now have a pretty good handle on management," Garnett said. "This place was a marsh and wanted to be a marsh."

The Importance of Proper Planning

Wherever attention is focused on replanting vegetation in the historical floodplain of the Colorado River, officials must proceed carefully to ensure their efforts are well-suited and prone to success. "It takes several years between design and actually putting trees in the ground," Murphy said. "We literally think well over two years ahead of time. If we don't do it that way we end up with poor survivorship. If you don't have a plan in advance you have an issue."

Proper tree planning is of utmost importance at the Palo Verde Ecological Reserve near Blythe, where hundreds of acres of land are being converted from agriculture to a mix of cottonwood, willow and honey mesquite. In 2004, more than 1,000 acres of farmed lands were identified as suitable for habitat restoration under the MSCP.

"Really what we are doing is agriculture but instead of producing a crop we are producing wildlife," said biologist Bill Wiesenborn with the MSCP.

Species monitoring is easy to do at Palo Verde because there are lots of small mammals that keep relatively close, said Dodge, who displayed a Colorado River cotton rat he had caught with a mixture of peanut butter, oats and vanilla. MSCP scientists create a "capture history" that is used to come up with population estimates. From that, modeling will be developed that can estimate the likelihood that a species like the cotton rat occupies a certain area.

"We want to create that optimal habitat," Dodge said. "That's what keeps this species going on the river."

Though the cotton rat is not a candidate for the ESA, protecting its habitat is proactive, Swett said.

Reclamation can work "for pennies on the dollar" at Palo Verde because of all the existing infrastructure and resources available through the Palo Verde Irrigation District, Murphy said. The district already services more than 100,000 acres "so in effect we become just another farmer working in the valley," he said.

Because the Palo Verde Ecological Reserve is teeming with birds, it is regularly monitored to gauge the type of bird on site and the frequency of their visits. Surveyors systematically walk through plots recording birds by sight and sound, taking the information to differentiate between those species that are using the area to forage and those establishing nests, Sabin said. The process is ongoing and inconclusive as yet.

"We may not have enough data right now, but we know we are getting covered species in restored areas," Sabin said. The next 10 to 20 years will reveal if populations are increasing in MSCP conservation areas, she said. The work being done at Palo Verde is to provide the habitat and not necessarily hard numbers of birds, said biologist Barbara Raulston, adding "there's no reason to think they won't use the site as we add acreage."

In other areas, adjustments have to be made to ensure the long-term health of restoration projects. At Beal Lake on the Havasu National Wildlife Refuge near Needles, Calif., Reclamation and others are determining the best way to establish trees using dredged soil. The process includes installing irrigation, regularly testing soil quality and demonstration plantings to evaluate progress. "We did a lot of testing to determine survivability," said Swett, noting that Beal Lake predated the MSCP and "shelters a lot of our covered species."

With more than 100 acres of cottonwood and willows, Beal Lake is providing Reclamation with valuable information about restoring long-degraded areas, including the degree to which soil amendments are needed. "Gathering data is a big part of what's happening here now," said Swett.

The Challenges of Fish Augmentation

Upriver in Nevada, the MSCP is concentrated at the Big Bend Conservation Area – 15 acres of uplands and 15 acres of backwater that serve as important habitat for razorback and flannelmouth sucker and bonytail chub. Big Bend is important because it is one of the few undeveloped backwaters on the river between Davis Dam and Parker Dam.

"This type of habitat was common along the lower river before the dams were built," said Jeff Lantow, fishery biologist with Reclamation. "It's kind of nice to have a natural backwater for these fish to use." The Big Bend reach of the river "is one of the better success stories" for fish augmentation, with numbers of razorback doubling since 2005, Lantow said.

Reclamation's involvement with Big Bend, which began in 2009 in partnership with the state of Nevada and the Southern Nevada Water Authority (SNWA), stemmed partly from a sense of urgency. "The real driver for us was that every one of these backwater areas was going to get built up," Swett said. "We had the opportunity with SNWA to protect one and make it part of the MSCP."

Building fish populations at the rates targeted by the MSCP (660,000 razorback suckers and 620,000 bonytail) is a considerable task. "This certainly has its challenges," Lantow said. "There hasn't been an aquaculture industry all that long [and] we need source fish."

Stocks of razorback and bonytail come from Lake Mohave and the Dexter National Fish Hatchery in New Mexico. Broods have to be of sufficient quality and quantity, with Lake Mohave providing the best genetic diversity of any group, Lantow said. Since 2005, 150,000 razorback suckers and 35,000 bonytail have been put back into the lake after being initially caught as larvae and reared by Reclamation.

"That's something we can be very proud of," Lantow said. "All these fish are targeted to get back into the MSCP area."

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Calendar

July

25-27 **Western Water Seminar**, sponsored by National Water Resources Association, Colorado Springs, CO • http://www.nwra.org/events/2011/7/western-water-seminar

August

11-12 **Arizona Water Law**, sponsored by CLE International, Phoenix, AZ • http://www.cle.com/product.php?proid=1270&src=Featured&page=Arizona_Water_Law

23-25 **Symposium on the Settlement of Indian Reserved Water Rights Claims**, sponsored by Western States Water Council & Native American Rights Fund, Billings, MT • http://www.westgov.org/wswc/2011indian%20wat%20rts%20symp.html

23-25 **Summer Conference**, sponsored by Colorado Water Congress, Steamboat Springs, CO • http://www.cowatercongress.org/SummerConference/index.aspx

September

18-20 **Arizona Hydrological Society Annual Symposium: Watersheds Near and Far**, Flagstaff, AZ • http://www.azhydrosoc.org/2011_symposium.html

18-21 **Joint Annual Conference**, sponsored by Rocky Mountain Section AWWA/Rocky Mountain Water Environment Association, Loveland, CO • http://www.rmsawwa.net

October

5-7 **WaterSmart Innovations 2011 Conference and Exposition**, Las Vegas, NV http://www.watersmartinnovations.com/index.php

November

7-10 **47th Annual Water Resources Conference**, sponsored by American Water Resources Association, Albuquerque, NM • http://www.awra.org/meetings/ABQ2011

15-18 **Meeting Irrigation Demands in a Water-Challenged Environment**, sponsored by the U.S. Society for Irrigation and Drainage Professionals, San Diego, CA http://www.uscid.org

December

8-9 **Water Marketing, sponsored by CLE International**, Denver, CO • http://www.cle.com/product.php?proid=1290&src=Featured&page=Water_Marketing

14-16 **Colorado River Water Users Association Conference**, sponsored by the Colorado River Water Users Association, Las Vegas, NV • http://www.crwua.org

Contact Sue McClurg with your calendar items from January 2012 through June 2012 for inclusion in the Winter issue of River Report, *smcclurg@watereducation.org or 717 K Street, Suite 317, Sacramento, CA 95814*

Shortage Criteria Triggers Boost In Lake Mead Inflow

Glen Canyon Dam

Thanks to a bountiful snow pack in the Upper Colorado River Basin, Lake Mead will see an additional 3.33 million acre-feet of water. The delivery, announced by the Bureau of Reclamation in April, means the total release from Lake Powell will be 11.56 million acre-feet, in keeping with the 2007 shortage criteria agreed to by the Department of the Interior and the seven Colorado River Basin states.

"Drought conditions over the past 11 years had raised the possibility of water shortages in the Lower Basin over the next year, but thanks to good precipitation, wise planning and strong collaboration among the states, we are able to release additional water and avert those shortages," Interior Secretary Ken Salazar said in an April 12 press release.

The inflow forecast for Lake Powell through July is 9.5 million acre-feet, 120 percent of average, and an increase of 300,000 acre-feet from the March 2011 inflow forecast.

Lake Mead receives 8.23 million acre-feet of water from Lake Powell in a typical year. In November 2010, drought conditions pushed Lake Mead to its lowest level since the completion of Hoover Dam in 1935, forcing marinas to be moved closer to the shoreline.

The boost to Lake Mead comes from the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead. The guidelines' "equalization operations" triggered the increase of inflow, which will be updated monthly through the end of September. The additional water will increase Lake Mead's level by more than 20 feet since October 2010, with a projected level of 1,105 feet above sea level by September.

The guidelines are "an important example of the ongoing collaborative partnership between the federal government and the seven states on Colorado River management issues," according to Reclamation.

Even with the added flow, Reclamation Commissioner Mike Connor said in a press release that the drought is not over and that "given the potential for extended dry years, and the effects of climate change on snowpack and runoff in the Colorado Basin, we must continue to work with the states, tribes and other stakeholders in the Basin to meet the water needs in the future."

Shortly after the announced increased flows to Lake Mead, Reclamation released a report highlighting the expected impacts of climate change on water supplies. The report shows "several increased risks," including a temperature increase of 5 to 7 degrees Fahrenheit, an overall precipitation decrease in the Southwest, a decrease for almost all of the April 1 snowpack and an 8 to 20 percent decrease in average annual stream flow in several river basins, including the Colorado.

"Impacts to water are on the leading edge of global climate change, and these changes pose a significant challenge and risk to adequate water supplies, which are critical for the health, economy, and ecology of the United States," Connor said about the report. •

– Gary Pitzer

Ten backwaters at Lake Mohave are used as "grow out" facilities for the fish augmentation program, providing as many as 1,000 small fish that are transferred when they are able to survive. There are still things to learn in restoring the native fish. "They are not trout, so there is still a lot to learn about how to raise razorback suckers and bonytail," said Lantow.

Five Years Down, 45 to Go

"I think [the MSCP's] been a tremendous success," said Jeff Kightlinger, general manager of the Metropolitan Water District of Southern California (MWD), who worked on the MSCP's development as MWD's general counsel. "It's been a fantastic program and it's really up and running now."

MWD pays 56 percent (more than $88 million) of California's total share of MSCP funding.

Tour participant Laura Simonek, MWD's program manager for environmental strategy, said the MSCP "demonstrates success on many levels," such as showing that "these kinds of plans can work" as well as the "great partnerships that can be put together." The MSCP also shows that sensitive species can benefit from all the restoration work done by Reclamation and its partners, Simonek said.

"It's not a 100 percent 'if you build it, they will come,' but it does produce opportunities for sensitive species," she said. "That's another fabulous success of the MSCP."

The MSCP has done "very well, particularly in the development of conservation areas," said USFWS' Fitzpatrick and that for the present, "really, the focus is on the lands they have acquired" instead of looking for potential new conservation areas. USFWS was very pleased that work on the MSCP's conservation areas began immediately, a testament to Reclamation and its partners sincerity in seeing the program work.

"They wanted to make people sure they were serious and that this wasn't gong to just drag on," she said. The scope of the MSCP process restoration may not change though the transformed areas will certainly change with the passage of time.

"This is a regulatory program. We can't lose sight of that legal basis for doing this. It shows it can be a success for the people who depend on water and power."

– Laura Simonek, MWD

"I think it will look different as the trees in the restoration area grow and go through normal cycles," Fitzpatrick said. "We will see a different kind of structure that will be naturally driven."

For the near-term, most MSCP cottonwood-willow restoration will be confined to former agricultural lands because it is the most practical way to proceed. "Is it feasible to say do not plant in square area plots and use farmland? Not really," Fitzpatrick said. "Farms tend to be the better lands. They are useable to begin with and they come with a water right."

While planting trees in rows on former farm fields "might be the easiest way to proceed and might generate the most trees for the dollar, it is not clear that it is the most ecologically productive way to proceed," Cohen said.

Struggles still exist such as perfecting the process of rearing native fish. The Imperial Ponds Conservation Area "could serve several purposes" for fish augmentation, be it a rearing and/or research facility or "just to establish a population that is allowed to recruit naturally until we get [the ponds] to function," Fitzpatrick said.

Adaptive management remains the "core of the program," along with experimentation to see what works best for each conservation area. Reclamation needs to find "effective ways" to build and maintain its conservation areas because unlike habitat conservation plans in other areas, it doesn't have the option of simply buying additional property, she said.

"Every place has its own little tweaks," she said. "We are still kind of learning."

The challenge can be somewhat daunting when the scale of restoration goals is considered, particularly in remote, severely degraded areas where Reclamation has to essentially start from scratch.

"When we work at remote sites such as Beal Lake there is no infrastructure, only limited resources available locally, no other farmers or conservation areas to help share the cost, and the existing ground conditions are typically salt cedar so they have to be cleared, leveled, and irrigation infrastructure installed before we even think about restoration," Murphy said. "Since there is no power at Beal Lake, we had to install a diesel pump just to deliver the water. To operate the irrigation cycle, we have to make sure fuel is on-site and pay for someone to actually drive to the remote location and operate the system and maintain the site. Since the project is only just over 100 acres, and the only one for many miles, the project can't share resources, which means we have to spend a considerable amount of time and money to maintain a relatively small site."

"We've got a lot more to do but we are still seeing great habitat creation," Simonek said. "Finally, this is a regulatory program. We can't lose sight of that legal basis for doing this. It shows it can be a success for the people who depend on water and power. There is some long-term reliability and stability and that also is an important demonstrated success of these kinds of plans."

Time is on the MSCP's side, a by-product of the fact that a river system so drastically altered cannot turn around on short notice. Reclamation and its MSCP partners realize the long trek and are heavily vested in its outcome.

"There is no way we could have done this without the MSCP," said Elaine Johnson, manager of the Imperial National Wildlife Refuge. "It has helped fill that role and has been a huge benefit to the refuge in improving wildlife habitat. It's been a great program and we are looking forward to the next 45 years." •

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