

Environmental Flows Bulletin

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Director's Note

By Denise Fort



Transitions are underway at the Utton Center; I'm leaving the University (for the most part) to return to full time environmental advocacy, with a focus on climate and water. Marilyn O'Leary, a lawyer with a background in water and energy, and a former director of the Utton Center, will return on an interim basis as Director. Adrian Oglesby, a UNMSOL graduate with deep interests in water, will become a part-time staff member. I will remain involved with the Bulletin and in these endeavors.

As I'm writing this, it's the start of Memorial Day weekend and a friend is off in search of water to enjoy. Half the state is likely doing the same thing, and, unless someone has a secret spot, we know that it will be thin pickings. More importantly, cattle are starving, farms are dry, and, in the realm of this newsletter, streams and springs are dry.

I am struck by how desperately people want information and wisdom about water now. Underlying all of the questions is surely the ultimate question: will *I* run out of water? But people are also paying more attention to the distribution of water: Why is that golf course still green? How can people afford to keep their fruit trees alive? And, what is happening to all of the

species that depend on a trickle of water in the river, now that it is dry? Does it have to be like this, or is there something we could do?

Our mission with the *Environmental Flows Bulletin* is to keep the information flowing about natural systems and steps that people are taking to protect nature in this time. Laura Paskus is digging deeper into stories than print reporters can, and building up documentation about each of the state's rivers. This issue's story about the Middle Rio Grande is an example of what we have created in a century of water policy: an endangered fish is the fragile product of policies that dewatered a formerly great river; bureaucracies that cannot change the paradigm and move very, very slowly towards measures to protect the river; and a public that is unable to find a way to meaningfully demand its rights to the public trust in a living river.

I've been absorbed in a book that is different from my usual reading fare: *Earth-Honoring Faith: Religious Ethics in a New Key*, by Larry Rasmussen (Oxford 2013). It is a courageous book that calls upon us to recognize that a revolution is required in our relationship to the earth: the Great Turning, as it has been called, or in Rasmussen's words:

A perspectival transition....Altered perception includes a certain reenchantment that counters what Max Weber called the 'disenchantment' of the world, by which nature was rendered little more than a repository of resources for human use. Reenchantment restores nature to human consciousness and feeling, nature as a community of subjects, the bearer of mystery and spirit, the ethos of the cosmos, and the womb of all the life we will ever know.

It is not an exaggeration to say that this period of drought, which may not end, calls upon us to transform our management of water. It is not worthy of us as a species to let the Silvery Minnow go extinct, or allow a mighty river to go dry, simply because we have not used the available legal, economic, and social tools to make the necessary changes in water allocation. Extinction of a species and the death of this river are not inevitable. But far more is required of all of us to prevent them from occurring.

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Gila Plans Still Open to Debate

Earlier this year, State Sen. John Arthur Smith, D-Deming, proposed a capital bill to the New Mexico legislature—and highlighted tensions over water in the southern part of the state.

In his bill, Smith requested \$100 million to build a pipeline from the Gila-San Francisco River Basin to Doña Ana County. According to a February story in the Las Cruces *Sun-News*, Smith considered the proposal a “message bill.” That message was directed at Grant, Luna, Hidalgo, and Catron counties, which he says haven't planned quickly enough for how to use 14,000 acre feet of water that the state might purchase under the Arizona Water Settlements Act (AWSA). (For background on the act visit the December issue of EFB.)

Environmental activists opposed Smith's bill. So did many others, including Las Cruces Mayor Pro Tem Sharon Thomas, two Las Cruces city councilors, and two Doña Ana county commissioners. In their joint letter to the Senate Finance Committee, they point out that the \$100 million would only be a “down payment” on the pipeline. The project, they estimate, would cost at least estimate, would cost at least \$400 million. On top of that, users would still have to pay

for the water itself. Current cost estimates for anyone—cities or farmers—interested in buying that water range from \$72 to \$122 per acre foot. In the coming years, that price is expected to rise.



Whitewater Canyon in the Gila National Forest. Photo by USFS. More online: <http://www.flickr.com/photos/gilaforest/with/8644170034/>

The state does have a planning process for how it might use that water, or, alternatively, use a lesser amount of federal funding for nondiversionary water projects. Over the past two years, a panel has been evaluating project proposals—some of which are focused on development, others on conservation. Next spring, the panel should receive engineering, cost, and cost-benefit analyses, then make its preliminary decision in August 2014. The state’s final decision will come in November, just before the federal government’s December 31, 2014, deadline to procure between \$66 and \$128 million in funding.

Allyson Siwik, executive director of the Gila Resources Information Project, notes that although Smith’s bill failed to pass, it did indeed send a message. By raising the possibility of a water transfer, it heightened fears among city and local officials in the four counties that, if they don’t develop the water themselves, it will be shipped to a city like Las Cruces. “It did what he intended: it ended up scaring people,” she says. “A lot of people started saying, ‘Why should we, in southwestern New Mexico, bear the ill effects of rampant growth on the Rio Grande?’”

Under the provisions of the AWSA, the state doesn’t have to build dams, divert and develop the water; it can instead implement conservation projects. But many local officials are deaf to protecting the Gila, says Siwik. That’s due in part to rhetoric by state officials, who say development projects would only take “excess” water from the river. “But there’s no such thing as excess water,” says Siwik. “All the flood flows have a purpose; they’re all important to the river, and they all do different things.”

Note: In the next issue of EFB, we’ll be focusing on the Interstate Stream Commission and its role in the decision-making process.

For more information on the AWSA, visit:

The Interstate Stream Commission’s (ISC) website:
<http://nmawsa.org/>

The Gila Resources Information Project’s (GRIP) website:
<http://gilaresources.info/>

To view the U.S. Bureau of Reclamation’s recent technical support presentation to the ISC:
<http://nmawsa.org/meetings/reclamation-presentation-04-15-13>

Climate-driven Changes for Southwestern Fish “Almost Inevitable”

Earlier this year, when the U.S. Fish and Wildlife Service (FWS) proposed Endangered Species Act protection for a rare fish in western New Mexico, some feared that move might waylay a restoration project in the Cibola National Forest. According to a news story earlier this year from E&E’s April Reese:

If the species is listed, the Forest Service will have to consult with FWS on how thinning could affect the fish. The next phase of the project, which will target the Rio Puerco area, is scheduled to begin in 2015, which is about the same time FWS’s decision on whether to list the fish will be due.

That project, the Zuni Mountains Collaborative Forest Landscape Restoration Program, is designed to reduce fire danger in the area. If FWS lists the Zuni Bluehead Sucker for protection, it might add to the project’s bureaucratic tangle, but the project would likely benefit the fish. Given the sucker’s extremely limited habitat, a forest fire could destroy its entire wild population.

Although the Zuni Bluehead Sucker just hit the news this year, biologists have been studying the fish for decades. As David Propst notes in a 1999 technical paper for the New Mexico Department of Game and Fish, the fish was first collected from the Zuni River in 1873. A century later, its numbers were dwindling.



Zuni Bluehead Sucker. Photo by Angela James, USFWS.

In 1975, New Mexico listed the sucker for protection; a habitat survey was completed shortly thereafter. According to Propst, at that time, suckers were limited to the confluence of the rios Nutria and Pescado, the upper reaches of the Rio Nutria, and Agua Remora (formerly Radosovich Creek). Its range was fragmented, he writes, but the fish were “moderately common” in those areas. (Meanwhile, in Arizona, the fish’s range was reduced to Kin Li Chee Creek in Canyon de Chelly.)

By the mid- to late-1990s, the fish’s habitat had shrunk further to the Rio Nutria upstream of the mouth of the Nutria Box Canyon and the Agua Remora—together making up less than 10 percent of the fish’s historic range. Impacts to the fish’s habitat include historic timber harvesting and livestock overgrazing, both of which increased soil erosion in the watershed. In the 1960s, streams were also chemically treated (presumably to kill off the less desirable fish and make way for fisheries trout). Some suckers survived by moving upstream and populating the untreated upper reaches of the streams.

But in the future, that survival strategy may be of little use to the suckers—and many other western fish. As the southwestern United States continues to warm and precipitation patterns change, Propst writes in an email that fish are being pushed down from higher elevations and also pushed up from lower stretches. This sort of range constriction, along with increased sympatry, can harm fish populations.

(Sympatric species or populations share the same habitat and regularly encounter one another; sympatric speciation occurs when an interbreeding population splits into two or more distinct species that share a common range. Hybrid offspring may not be able to reproduce, which reduces the gene flow of the species.)

For decades, the New Mexico Department of Game and Fish, the Pueblo of Zuni, and The Nature Conservancy have been trying to protect the sucker. More recently the Albuquerque Wildlife Federation spearheaded a volunteer service project to build and repair fences on a set of natural ponds on the west rim of the Zuni Mountains that are important refugia for the fish. Such efforts trace back to the early 20th century. As Propst notes in his paper, in the 1920s, two young boys wished to have fish in a small headwater stream of the Rio Nutria. The boys took what they thought were minnows from the Rio Nutria and brought them by bucket to the Agua Remora—where the suckers still survive today.

While restoration and conservation efforts have helped the sucker survive this long, it's unclear what impact they may have in the long term, as water supplies continue to dwindle. In the past, for instance, the New Mexico Department of Game and Fish translocated suckers to what, at that time, was a perennial stream. Since then, that stream has dried.

Unfortunately, that's not an unusual problem.

In a 2010 U.S. Forest Service report about the impacts of climate change on fish populations in the Rocky Mountain West, fisheries scientists address three critical questions: What is changing, what are the implications for native fishes, and what can we do about it?

As laid out by the authors, the impacts to streams from climate change are vast and interrelated. Warmer temperatures have decreased winter snow accumulations by increasing rainfall, advancing spring snowmelt, and altering the pattern of stream flow recession. Smaller snowpacks are also tied to more extensive wildfire activity. In turn, each of those stresses causes changes in plant communities (by encouraging drought-tolerant plants, causing die-offs of established species, and making plant communities vulnerable to nonnative plants and outbreaks of pests like pine beetles). In addition, altered plant communities, in combination with wildfires, will change the sediment load and course of stream channels. (If there aren't any big trees to fall across streams, for example, consider how differently high mountain streams will appear and function). Temperatures also affect the timing of runoff and water temperature—both of which affect a fish's ability to spawn.

The authors encourage increased monitoring of fish species in the region, but note that because stream temperature and flow “represent fundamental constraints on physical and biological processes in aquatic systems”—in other words, because fish need water—“climate driven changes seem almost inevitable.”

For more information:

NMDGF Zuni Bluehead Sucker Recovery Plan

<http://www.wildlife.state.nm.us/conservation/documents/ZuniBlueheadSuckerRecoveryPlan.pdf>

Conservation Genetics of the Zuni Bluehead Sucker

<http://www.wildlife.state.nm.us/conservation/documents/ConservationGeneticsZuniBlueheadSucker.pdf>

Threatened and Endangered Fishes of New Mexico (1999)

http://wildlife.state.nm.us/publications/documents/threatened_endangered_fish.pdf

USFS Climate Change Aquatics Blog

http://www.fs.fed.us/rm/boise/AWAE/projects/stream_temp/stream_temperature_climate_aquatics_blog.html

Climate Change, Aquatic Ecosystems, and Fishes in the Rocky Mountain West: Implications and Alternatives for Management

http://www.fs.fed.us/rm/pubs/rmrs_gtr250.pdf

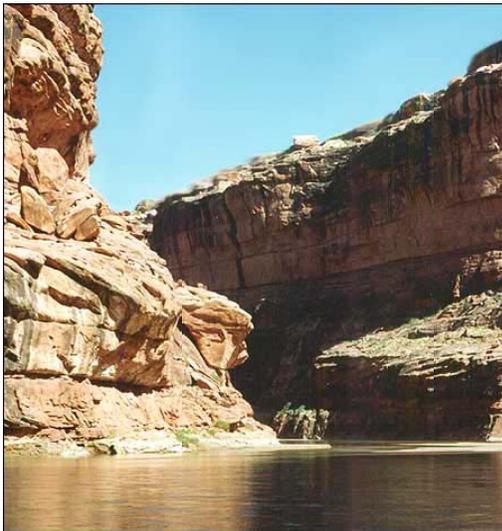
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The San Juan's Flexible Flows

The Upper Colorado River Basin's snowpack was below average—again—this year. And the spring is shaping up to be a tough one for the San Juan River. Peak flows above Navajo Reservoir occurred in mid-March—and were only 74 percent of average. And in mid-May, Navajo Reservoir was only about half-full.

“It's a bleak year for the system,” says the U.S. Fish and Wildlife Service's David Campbell, director of the San Juan River Recovery Implementation Program (RIP). “It won't run dry, but it's a year in which we're all watching how we're using our water.”

It's Campbell's job to work with scientists, water managers, tribes, and water users to ensure that there's enough water in the river for two rare fish, the Colorado pikeminnow and the razorback sucker.



San Juan River. Photo by USFWS.

More than 20 years ago, when the Animas-La Plata water project was being developed in southwestern Colorado, the RIP was hit upon as a way for the U.S. Bureau of Reclamation (“Reclamation”) to avoid an Endangered Species Act jeopardy opinion for the two endangered fish. Today, the program's participants can't do much to stop the drought, but they are trying to make sure the endangered fish recover in the San Juan River.

Under the RIP, Reclamation is required to keep between 500 and 1,000 cubic feet per second of water moving through the San Juan. This year, those flexible flow targets are being put to the test. Reclamation is operating flows at the lower end and hoping to conserve water in storage in

case next year is dry, too. As the program gets ready to revise those flow recommendations over the next two years, that flexibility will be maintained, says Campbell.

Reclamation also had to forgo spring releases for spawning. Typically, the agency releases about 35,000 acre feet of water from Navajo Reservoir into the fish's critical habitat between

Farmington and Lake Powell. That's typically done in late May or early June to help the two fish species spawn. Due to drought conditions, Reclamation couldn't release that water this year.

Campbell says the fish shouldn't be at risk. "We're getting really good larval returns from razorbacks and seeing a lot of adult razorbacks in the system," he says, adding that biologists should start seeing recruitment in the next year or two. Because the pike-minnow is a longer-lived species, biologists aren't yet seeing those same results, says Campbell: "They mature later than the razorbacks do and their spawning hasn't quite kicked up yet." But he's optimistic that biologists will start seeing those good returns among pike-minnow in the coming years.

He adds that the recent San Juan Navajo Water Rights Settlement, which grants the tribe about a million acre feet of water annually (in divisions and depletions), will not impact fish recovery or river flows. Those water depletions are already built into the baseline of the model the program uses to determine flows and river operations. One problem the program is facing, however, is funding. "Right now, we're trying to figure out how sequestration is going to affect our budget," he says, citing a \$250,000 budget cut. "That's a big chunk of change."

For more information, visit:

The San Juan Basin Recovery Implementation Program website:

<http://www.fws.gov/southwest/sjrip/>

U.S. Bureau of Reclamation's Navajo Reservoir storage websites:

<http://www.usbr.gov/uc/water/crsp/cs/nvd.html>

http://www.usbr.gov/uc/water/rsvrs/ops/crsp_40_nr.html

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Farmers, Fish, and Flows All Suffer on the Middle Rio Grande

If you've been on the Middle Rio Grande this spring—or even peered over one of Albuquerque's bridges—you've seen a lot of mud. With New Mexico in its third consecutive year of drought, storage in reservoirs is dwindling, and even the spring snowpack melt didn't significantly boost the river's flows. And now, at the very end of May, it's clear that the river through Albuquerque is about to dry.

The drought's effects are visible along the Rio Grande valley's ditches and canals, too. This year, the Middle Rio Grande Conservancy District (MRGCD) is not running water continuously through the majority of its canals and ditches. Rather, it's rotating water based on irrigators' needs. It also curtailed deliveries to its Water Bank users, about 275 people who have sold or transferred their water rights but still lease water from the district. Deliveries were halted in mid-April, resumed briefly due to a surge of water past the Otowi Gage, then halted again in mid-May. According to Tom Thorpe, MRGCD's public affairs officer, as of mid-May, there was still enough native water in the Rio Grande for regular irrigators. At that time, the district also had 20,000 acre feet of supplemental San Juan-Chama water in storage. The district, says Thorpe, may start tapping that supply in June.

Meanwhile, biologists are struggling to protect a rare fish, the Rio Grande Silvery Minnow. First protected under the Endangered Species Act (ESA) in 1994, the fish has seen its numbers rise

and fall along with the river's flows. Since 2001, a group of federal, state and local water managers and users have been meeting to determine how best to balance the needs of water users with those of the fish. But unless river conditions change—and soon—wild populations of the silvery minnow will likely disappear from the Middle Rio Grande.

Punting the BO

Under federal law, the U.S. Fish and Wildlife Service (FWS) must determine how proposed actions by a federal agency might affect rare species protected under the ESA. Based on input from the action agencies, as well as scientific studies of the species, FWS then develops what is called a Biological Opinion (BO).

The FWS had originally planned to release its 2013 BO for the silvery minnow last fall. Now, officials with the agency's Ecological Services Office say they will release a draft at the end of 2013. That means water management agencies are still bound to the 2003 plan, which requires that the U.S. Bureau of Reclamation ("Reclamation") keep water flowing through the Albuquerque stretch of the river and not allow drying south of the city until after June 15.

While FWS officials say they're still awaiting documents from Reclamation and the U.S. Army Corps of Engineers, both those agencies are also waiting for the Middle Rio Grande Endangered Species Act Collaborative Program to complete its transition to a Recovery Implementation Program (RIP). But after more than a decade of working together, tensions still remain between the federal and non-federal agencies in the program.

When asked to update the program's executive committee (EC) meeting in May, FWS's Assistant Regional Director, Michelle Shaughnessy, punted and said she didn't have an update on the draft BO, a "pre-decisional" document that the FWS will not release to the public. Her one-sentence reply to the committee elicited a flurry of responses from the Attorney General's Office, the Interstate Stream Commission (ISC), and the MRGCD; representatives from the three agencies pointed out problems with the draft BO and its schedule.

Assistant Attorney General Steve Farris called for a special meeting on the BO in June, which FWS suggested be closed to the public. "Years ago, I thought we were closer to resolving this than we are now," said Farris. "This is a big deal, and it has to be resolved."

The ISC and the Office of the State Engineer (OSE) are dissatisfied with what they've seen of the draft BO; they're also wary of the "Hydrologic Objectives" FWS may include within the RIP. In this document, FWS has developed a way to determine how water releases might support a wild silvery minnow population in the Middle Rio Grande.

According to ISC/OSE Public Information Officer, Lela Hunt, ISC and OSE have a number of concerns, including the achievability of those objectives, based on hydrological realities and the data FWS is using to tally the number of minnows present in the river. She adds that the hydrologic objectives have not been subjected to "scientific scrutiny" by the collaborative program or been independently peer-reviewed. The state's criticism is a long-standing one. For years the state agencies and MRGCD have disagreed with FWS's data—and have hired consulting scientists to supplement, and sometimes counter, the work of the federal biologists.

During the May EC meeting, ISC's Rio Grande Basin Manager, Rolf Schmidt-Peterson, repeatedly objected to the FWS's data collection methods. In an email, Hunt followed up with more details: "The non-federal members think management and recovery is impaired when one sampling technique is unilaterally imposed by one agency on a Program that is supposed to be

collaborative,” she writes. The current method—called “catch per unit effort,” or CPUE, and commonly used by fisheries biologists nationwide—produces “huge errors that make it difficult to accurately assess number and population trends.”

Swimming upstream

Meanwhile, on the same mid-May day that EC members again tussled over details and calculations—and officials with FWS’s Ecological Services Office remained mum on the BO—FWS’s biologists were out on the river.

New Mexico Fish and Wildlife Conservation Office biologist Thomas Archdeacon got the call around 6 a.m. A small surge of water downstream of Isleta was causing silvery minnows to spawn.

Before the Rio Grande was so drastically altered by dams and diversions, the fish’s buoyant eggs would float downstream a few hundred meters, or perhaps a kilometer. Now, they are often blown out of the system before they can develop—and biologists rush to collect them for use in hatcheries.

Currently, silvery minnows are raised at three different facilities: FWS’s Southwestern Native Aquatic Resources and Recovery Center in Dexter, N.M.; the City of Albuquerque’s BioPark; and the ISC’s Los Lunas Silvery Minnow Refugium. However, earlier this year, the Los Lunas fish manifested abnormal swim behavior described as “spinning.” Scientists conducted studies, classified the fish as “high risk,” and recommended against stocking them in the wild. As a result, in April, more than 5,000 silvery minnows had to be euthanized.

Without hatchery fish, the silvery minnow would likely be extinct in the Middle Rio Grande. Biologists have been monitoring the fish’s numbers at 20 sites since 1993. Last October, there were no minnows at any of the sites. “There are still wild fish out there, but they didn’t find any,” says Archdeacon. “That’s the first time that’s ever happened. What that tells you is they are really, really, really rare.”

Then, in November, the FWS stocked 276,000 hatchery minnows in the Isleta and San Acacia reaches of the river. Surveying the river in December, biologists found fish at 13 of the 20 sites—and almost all of them were marked as hatchery fish.

If this were a good water year—or if water managers kept the river wet until at least July—Archdeacon believes the fish might rebound from last year’s low numbers. However, 2013 is shaping up to be anything but a good water year. “There may be some that survive through the summer,” he says, noting that they’ll be few and far between. “They may not actually be extinct,” he says, “but functionally? They would be pretty close.”

Archdeacon adds that biologists anticipate the river will dry into the Albuquerque reach and begin drying before June 15—the date after which Reclamation can legally let the river dry under the 2003 BO. As that happens, biologists will head to the river, seepuddles and re-release silvery minnows into a stretch of the river still flowing. Extended river drying within the fish’s critical habitat will lead to new challenges, including, he says, figuring out where to release those salvaged fish.

Meanwhile, at just about the time Archdeacon and other FWS biologists were collecting eggs from the river, MRGCD’s hydrologist, David Gensler, was presenting the Minnow Action Team’s (MAT) recommendations to the program’s EC.

In addition to meeting regularly and awarding contracts and grants for everything from data collection to restoration projects, the committee also formed the ad hoc MAT to determine how water managers might meet the minnow's needs with limited water supplies. On the heels of two years of severe drought, 2013 is proving to be the worst year on record for the Middle Rio Grande's water supplies. This year, flows throughout the river have been 18 to 24 percent of average.

At the meeting, Gensler presented the team's seven recommendations, which range from trying to manage river drying within certain stretches and relocating salvaged fish to facilities such as the Albuquerque BioPark and the Los Lunas Silvery Minnow Refugium to engaging in a "flexible, interagency decision-making process."

"We're going to try to get them to survive this year, and maybe try and do something better next year," said Gensler at the meeting. He said if water managers continue trying to meet the 100 cubic feet per second flows—required by the 2003 BO for the Albuquerque reach of the river, Reclamation will exhaust its supplemental water supplies by mid-summer.

It's worth wondering if the team's efforts are worthwhile. The EC will consider them, but the FWS's Ecological Services Office may or may not incorporate them into the BO.



Even in March, the Middle Rio Grande was slow and low. Photo by Laura Paskus.

And while the FWS's New Mexico Fish and Wildlife Conservation Office is responsible for minnow operations—overseeing everything from egg collecting to salvage operations when the river dries—it is not currently involved in writing the agency's 2013 BO. Nor are any of its biologists participating in the Minnow Action Team.

Too little, too late

Citing the failure of water managers to implement the 2003 BO, WildEarth Guardians recently filed a 60 day Notice of Intent to sue Reclamation and the Army Corps for violations of the Endangered Species Act.

In particular, the group says agencies have violated flow requirements, neglected to remove or modify dams and bridges that fragment river habitat and harm the minnow, failed to implement adequate restoration activities, and failed to release enough water to spur springtime spawning. Although the notice names the two federal water management agencies, the environmental group also points to chronic problems within the collaborative program.

"I think there's definitely a place for collaboration, and everyone was hopeful the collaboration would result in decisions and solutions," says WildEarth Guardians Wild Rivers Program Director Jen Pelz. "But all it has served to do in the past ten years is insulate the status quo."

Pelz points out that Reclamation, for example, has spent about \$10 million in the past ten years acquiring supplemental water to release for the minnow. “And look where we are today,” she says. “They don’t have enough water or money after ten years, and the minnow isn’t doing better, but worse.”

Given the severity of the drought, Pelz acknowledges that this is a tough year. But agencies and the collaborative program have had more than a decade to implement the 2003 BO and pursue solutions. Instead, they have neglected to take steps like creating an agricultural leasing program or working with the pueblos to release unused irrigation water earlier in the year, rather than in November or December for the purpose of meeting New Mexico’s compact obligations to Texas.

“Everyone is very complacent in their roles and in their ability to find new sources of inspiration—to try to save the species but also save the river,” she says. “We would like to come out of this crisis better than we’ve gone into it, in terms of commitments from the parties and how we go about protecting the river—and make sure that, ten years from now, we aren’t doing this all again, but with no minnows in the river.”

San Juan-Chama’s no silver bullet

Over the past decade, water managers have been relying upon San Juan-Chama water—water that has been diverted from the San Juan River, a tributary of the Colorado River, and piped via tunnels into the Chama River, which drains into the Rio Grande—to meet the needs of cities, irrigators, and the fish. The project began operating in the early 1970s and was estimated to yield more than 96,000 acre feet each year.

Reliance on San Juan-Chama water has become especially important in recent years as the Rio Grande’s native flows have dwindled. (In May, the Albuquerque Bernalillo County Water Utility Authority voted to lease Reclamation another 40,000 acre feet of water—at a cost of \$4 million.)

But even San Juan-Chama water isn’t guaranteed to solve problems in the Middle Rio Grande. In 2007, the National Academy of Sciences released a report showing that extended drought is a reality for the Colorado River Basin; temperatures will continue to rise for the foreseeable future and urban demands for water will make it increasingly difficult for the region to deal with drought and water shortages.

Now, projections for San Juan deliveries to the Chama, via the Azotea Tunnel, show a steady decline in annual average flows. According to a study from Sandia National Laboratories and Reclamation, the problem will worsen. According to the study, “Climate Change Impacts on San Juan-Chama Project Reliability,” the project will likely see supply shortages through the 2020s and beyond.

According to the study’s simulations, the San Juan-Chama project experiences supply shortages in more than 10 percent of simulation years in the 2020s, more than 25 percent of simulation years in the 2050s, and more than 35 percent of simulation years in the 2090s.

San Juan-Chama water is stored in the Chama’s Heron Reservoir. According to the study, “In 2013, for the first time in the 42 years of operation of the San Juan-Chama project, Heron project supply was insufficient on January 1st to support a complete initial allocation.”

That’s a problem water managers will continue to face. As the report concludes:

What is worrisome however, are the trends in reduced SJC supply suggested by the [Upper Rio Grande Impact Assessment] simulations as climate change sets in. If these

trends are realized to any degree, Reclamation's current firm yield estimate for the San Juan-Chama project will need to be reconsidered. Contractors of San Juan-Chama will hope that these trends do not materialize, but will be well served to consider them as possibilities in water resources planning.

And a new analysis by Reclamation, announced at the end of May, shows that the Colorado River Basin could begin experiencing water shortages as soon as 2016.

Summertime blues

No one doubts this summer will be a tough one. The past 24 months have been the driest on record in New Mexico—and even the string of dams, diversions, and reservoirs can't defend against such a severe and long-running drought. Reclamation estimates it can only acquire 65,000 acre feet of supplemental water this year for irrigators and the endangered fish. As of mid-May, it has already released 15,000 acre feet of that.

According to Mike Hamman, manager of Reclamation's Albuquerque Area office, to meet the 2003 BO's flow targets—which would keep water flowing through the silvery minnow's critical habitat in the Middle Rio Grande—Reclamation would need 85,000 acre feet. And even that number, he says, assumes there would be “monsoon support.”

Managing the river this year is a challenge, and everyone is doing things a little differently, says Hamman. Considering climate change projections, he says structural changes are likely necessary. As precipitation patterns change—snowpack will move higher in elevation and further to the north—managers will have to look at how to more efficiently capture and store summertime runoff.

And while “climate change” isn't a phrase typically mentioned at collaborative program meetings, Reclamation is acknowledging that reality. As part of its 2011 SECURE Water Act report, the agency evaluated climate change impacts and projections for the Rio Grande Basin. According to the report, changes in the basin will include a 5 to 6 degree Fahrenheit temperature increase during the 21st century, a 2.3 to 2.5 percent decrease in annual precipitation by 2050, and a 7.3 to 14.4 percent decrease in mean annual runoff by 2050.

The agency has also identified potential impacts, including a decrease in the ability to meet irrigation demands, a decrease in groundwater recharge, increased stress on fish such as the silvery minnow, increased water demands for instream flows, and increased invasive species infestations.

Under the direction of Commissioner Michael Connor, Hamman says Reclamation is intent on knowing what's happening and trying to adapt to the changes. “Until we get our arms around it,” he says, “we're still in survival mode.”

Considering the year's poor water projections, “survival” is probably a good word. Last year, the minnow barely survived the river drying that occurred between mid-June and late October; on the worst day, 53 miles of the Middle Rio Grande dried south of Albuquerque. This year, it's anyone's guess how many miles will dry.

Important Links:

Monthly Drought Monitor Status Reports for New Mexico:
http://www.nmdrought.state.nm.us/dtf_workgroup.html

NOAA National Climatic Data Center U.S. Palmer Drought Indices:
<http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/palmer.html>

National Weather Service Climate Prediction Center's U.S. Seasonal Drought Outlook:
http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html
USGS Current Water Data for New Mexico, including stream flow and groundwater data:
<http://waterdata.usgs.gov/nm/nwis/rt>

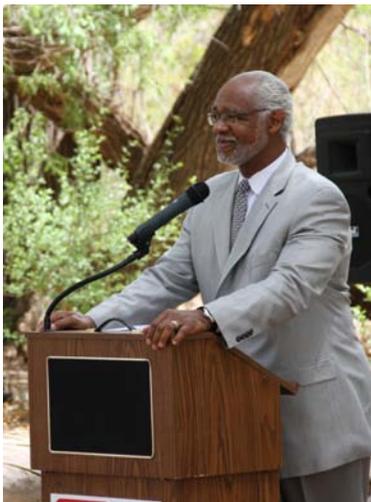
U.S. Bureau of Reclamation Rio Grande Schematic (with distribution and gage information):
<http://www.usbr.gov/pmts/rivers/awards/Nm2/rg/riog/schematic/SCHEMATICriogrande.html>

U.S. Bureau of Reclamation 24-hour Rainfall Map:
<http://www.usbr.gov/pmts/rivers/awards/Nm2/rg/riog/rgindexnt.html>

U.S. Bureau of Reclamation Reservoir Storage Data:
<http://www.usbr.gov/pmts/rivers/awards/Nm2/rg/riog/schematic/SCHEMATICmrgsjcopr.html>

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Striking a Balance: An Interview With FWS Regional Director Dr. Benjamin Tuggle



Dr. Tuggle, U.S. Fish and Wildlife Service Southwest Regional Director, recently accepted an Urban Waters Federal Partners designation recognition for the newly established urban refuge - Valle de Oro National Wildlife Refuge in Albuquerque. Photo courtesy of USFWS.

Dr. Benjamin Tuggle is the southwest regional director of the U.S. Fish and Wildlife Service. Having arrived here seven years ago from Washington, D.C., where he was special assistant to the director, in the Southwest he has faced some of the most controversial endangered species issues in the nation—from the Mexican Gray Wolf reintroduction program to the near-extirpation of the silvery minnow in the Middle Rio Grande.

EFB's Laura Paskus sat down with him at the end of April to talk minnows, water, and leadership. What follows are short excerpts from that interview.

EFB: By default of protecting endangered species, and specifically endangered fish, the Fish and Wildlife Service has become the agency responsible for keeping water in the Southwest's rivers. Is that a role that the agency should have? Is that a role you're comfortable with?

Tuggle: We are very comfortable with that role. We often get accused, on either side, of being more of the regulatory agency because of our endangered species responsibilities, but I would like to think that we're part of the solution. We're part of the dialogue that needs to take place among all users, and we're part of the picture that represents the species that can't speak for themselves.

[In the course of managing water, there are many major principles and objectives involved.] We're just one of them. We need to look out for the fish. We need to look out for [the Bosque

del Apache Refuge]. We need to look out for the riparian vegetation because of southwestern willow flycatchers. We need to look out for those species that depend on those wet meadows, like the New Mexico meadow jumping mice. But we're just one voice. Reclamation has the responsibility of doing that management, and the maintenance and distribution, and things like that. So, when we're talking to them, and we're talking to Interstate Stream Commission, and we're talking to MRGCD, our voice is one. And a lot of times, I think, unfairly, we get charged with being the one that's driving the process.

Yes, we can drive the process, because we have a Biological Opinion that says, "Here's what you should do," but we still have to be part of the solution. We still have to be part of the management strategy that allows for the appropriate management of water in [that] stretch of the river.

EFB: I've oftentimes been surprised by what feels like a lack of leadership from the Fish and Wildlife Service within the Middle Rio Grande Endangered Species Act Collaborative Program. It seems like, for example, Fish and Wildlife Service should be leading the meeting, or that people should be listening to what Fish and Wildlife says to do because it's an *Endangered Species Act* collaborative program....

Tuggle: But the key word is "collaborative." That's the key word; not "dictatorial." It's a collaborative. And so, there are a lot of people that have felt that way, that the Service should be leading this. And I've declined to do that, primarily because water management in this stretch of the river should not be about endangered species.

And if I was in charge, everybody would say, "Well, he's in charge because of endangered species." No. It's about how we manage the water, and that's why, when I tell you I'm one voice—a loud voice, sometimes—but I'm one voice. And it's a collaborative process.

If we're going to solve the problem of water in the Middle Rio Grande, it can't be one agency that does it. It has to be all of us. And it can't be one rule, like ESA, that dictates that. There has to be some give and take, because there's only so much water. And the demand is always going to be greater.

Now, if you're saying that you don't feel that the collaborative has leadership, that's a different thing. But I don't feel that the Service should be necessarily leading it, because of ESA.

We have to be involved in it. There's no question. I'm going to deviate just a minute. When I first got here, I went to a couple of collaborative meetings, and they kept talking about the endangered species. And I looked at them, and I said, "You know, this is more than endangered species. This is not about silvery minnow. Maybe you got the money, and you got the attention because of the calamity that might have happened because of the silvery minnow and the Biological Opinion, but that's not what that's about." The collaborative gives us enough time, and enough resources, and enough cooperation to solve the problem—it's not to make sure that we don't run afoul of the Endangered Species Act. It's much bigger than that.

If we only look at that through one lens, we're missing one heck of an opportunity. I don't have a problem stepping up when I should because everybody is very concerned about where we're going to be—now that we're writing a new Biological Opinion, and we have a Biological Opinion that we're operating under until we get that done, and the fact that we're going to be in one heck of a water year this year. And will we exceed the take? And that's a conversation that we're going to have to have with Reclamation and the Interstate Stream Commission and some

of the other major players in this river. We will. We haven't had it yet, but we will. And we're going to have to find some solutions.

EFB: When you say solutions, do you mean for those two species, the silvery minnow and the flycatcher, or do you mean for everybody to function together in the system? Because my understanding is, the silvery minnow right now is doing as bad as it's ever done.

Tuggle: Yes.

EFB: And most of the fish that are still alive are hatchery fish....

Tuggle: I would prefer [a solution for everybody] because it incorporates everybody's portion of pain or gain, as long as we are talking about the solution that will allow for silvery minnows to exist in the river, to spawn in the river, to be sustainable in the river.

It would be easy for me to take a very selfish view of that, but I think that if I did, it would be very short-sighted, and I'd make probably more enemies than I would make collaborators.

We have to keep water in the river for the fish, or we have to come up with a Plan B in terms of where we will keep the river wet to sustain fish.

Most of the angst comes when [the river dries] from San Acacia south. We have a vested interest in trying to keep water there because that's where most of the habitat is. And that also means that there's more water that we can get to Bosque del Apache as well.

So, we're looking at a lot of different options—in terms of if that has to happen if there's not enough water—where we would do other habitat benefits things in the river where it's wet for fish. And our folks are working on that. This is going to be a very difficult year, very difficult. I think people understand that. It's going to be one whale of a challenge for the people who have to make those decisions.

Everybody's not going to be happy, but I think that if we can get together and have the conversation about why we have made those management decisions and what it means to the future of all of those needs, then that's going to be the best position we can be in.

I don't have a crystal ball to tell you how that's going to work out. I know that we will represent our responsibilities under ESA. I also know that we won't get everything we want. And I'm very cautious, because I would like to have the opportunity to work that out locally, before somebody comes in with a legislative bomb and starts to dictate what the process is going to be, and it will be beyond the scope of the people who actually might have been able to work it out locally.

So, I don't mean that bomb literally, but just taking it out of our hands. I think that that would be a mistake at this point. I think there's enough good will among the agencies that are involved that we can talk frankly to one another and try to work this thing through. I may be wrong; don't get me wrong. But I think that we can start from a good place.

And the reason why I say that is because—look at the San Juan, the collaborative operation that they have there. That's what gives me faith that we can do it here. And the collaborative [program] is moving very much to a Recovery Implementation Program. And it's so difficult because just that switch, at a time when we have less water, is hard because it's based on

adaptive strategies. And now you're trying to come up with a recovery implementation plan when drought is taking you down. It would have been easier if we would have had a normal year, and then we would have been able to bracket what is normal.

We're going to have to do a lot of work, in terms of looking at where that baseline is, as we talk about a recovery implementation plan. I don't think the biology is going to change, but I think that there are things that we will have to look at, in terms of how we define that baseline of what the recovery goals actually are.

It's going to be some work; don't get me wrong. Our folks are pragmatists in that regard. They know that they don't have the full picture, but I'm still optimistic. I'm an optimistic kind of guy.

EFB: Does the Service have a long-term vision for what baseline is and how to even maintain baseline, never mind recovery?

Tuggle: That speaks to adaptive management as it relates to climate adaptation. If the baseline was X when you had lots of water in the '70s, the baseline can't be X when you don't have as much water in 2012.

We struggle with that because, is this climate change cyclical? Are we going to be able to come out of it, or is this the new normal? And so, it's the argument about where the baseline should be for the 2003 Biological Opinion, and we are arguing about that vehemently because you don't want to take a step back because the step back that you're going to take means extirpation for the species in the river.

I don't know if we could genuinely come up with an adaptive strategy at this time, during this time, for this stretch of the river. I think that we need to just try to survive right now.

We will develop those adaptive strategies when we figure out what a normal year might be, and we will continue to work in that direction. We know we have to get there. Boy, I tell you, we're not in the operating room. We're in the emergency room right now.

We are going to be more conservative because we don't have time to have an objective to manage to. We're just trying to keep them alive. We're trying to keep this population from being extirpated. So, it's a different conversation.

I would prefer the conversation under less demanding terms, but you've got the drought. You've got this potential of the new normal in terms of climate change. You have more people needing more water. And sooner or later this river is going to be adjudicated. It's going to be a dog fight, lots of blood.

And I think that the compacts with the other states will be resolved, but, boy, we can't wait on that. We have to do something in the next year to five years, to make sure that we just don't have nothing in the river in terms of populations.

EFB: The Fish and Wildlife Service has a unique mandate. It also has many passionate people who are committed to their work and who see moral value in ensuring species don't just disappear. What's it like to lead an agency full of people who may feel that way?

Tuggle: Well, I'm extremely proud to be able to lead a group of people like that. It is very challenging, because that passion can be one-dimensional at times, and at times people don't see

the complete picture. I don't have the luxury of wearing that passion on my sleeve, but it doesn't mean it's not there.

7. Supplemental Reading

There's no shortage of reading material on water and drought right now. Both John Fleck, with the *Albuquerque Journal*, and The Associated Press's Susan Montoya Bryan are regularly covering what's happening in the Middle and Lower Rio Grande. The Utton Center has also partnered with the brand new website, The New Mexico Mercury.
<http://www.newmexicomercury.com/>

If you're looking for summer reading material, two recently published books deserve attention: *Contested Waters: An Environmental History of the Colorado River* by April R. Summitt and *Assessment of Climate Change in the Southwest United States*.

The climate change assessment report comes from the National Climate Assessment, which is conducted every four years under federal law. The report includes chapters on everything from historic and current conditions to projected changes. It also includes information for decision-makers; details on impacts to cities, agriculture, human health, wildlife, and the transportation sector; and chapters on the special challenges border and tribal communities may face.

The report is available online at <http://swccar.org/sites/all/themes/files/SW-NCA-color-FINALweb.pdf>. Or, you can order a bound copy of the 500-page report from Island Press at <http://islandpress.org/ip/books/book/distributed/A/bo9199001.html>

While here in New Mexico it's going to be a struggle to keep water in the state's rivers for instream flows this year, other states are seeing progress. The **Ecological Limits of Hydrologic Alteration (ELOHA) website and newsletter is one good place to keep up with that news:**
<http://conserveonline.org/workspaces/eloha>

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