

# *swimming upstream*

## swimming upstream

San Juan River Basin Recovery Implementation Program  
Upper Colorado River Endangered Fish Recovery Program

Winter 15

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# swimming upstream

*Swimming Upstream* is a publication of the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program. These programs are national models of cost-effective, public and private partnerships. The programs are working to recover endangered fishes while water development continues in accordance with federal and state laws and interstate compacts, including fulfillment of federal trust responsibilities to American Indian tribes.

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Water Development Interests

## Program director's message

By **Tom Chart**, Director  
Upper Colorado River Endangered Fish Recovery Program



In recent years the Upper Colorado Program has been so focused on the nonnative fish threat that we can lose sight of how much science and coordination goes into evaluating and meeting our endangered fish flow targets. So, I thought I would touch on a couple of exciting flow-related success stories that exemplify what I think our programs are all about.

One of the many benefits of 20+ year-old recovery programs is our long-term monitoring. Long-term data sets, are particularly powerful for highly variable big river systems. Colorado State University researchers, Dr. Kevin Bestgen and Angela Hill, recently drafted a summary of larval and young-of-the-year (YOY) Colorado pikeminnow fall monitoring information collected from the Green River that dates back to 1979. In a nutshell, they report that fall YOY abundance was higher when summer (August–September) flows fell in a preferred range—1,700 and 3,000 cfs in the Middle Green River. The lower end of that preferred range was higher than what we thought could be beneficial when we approved Green River flow recommendations in 2000. Bestgen and Hill recommend that the preferred base flows are needed to assist in YOY survival, which plays a critical role in reversing an apparent decline in the adult pikeminnow population.

This past spring the United States Fish and Wildlife Service (USFWS) and the Bureau of Reclamation (USBOR) decided to experiment with the new preferred base flow range, which resulted in steady summer base flows in the Middle Green river that hovered around 2,000 cfs. The stage was set for a test of the preferred flows. On September 17, 2015, Utah Division of Wildlife Resources biologist Matt Breen sent an excited late night text that YOY numbers were looking strong in the Middle Green. A couple of days later, Chris Michaud and Julie Howard, Utah Division of Wildlife Resources (UDWR) biologists in Moab, Utah said the same was happening in the lower Green, signaling a system wide positive response! Although Bestgen and Hill's analysis did not include similar data from the lower Colorado River, YOY numbers in that reach turned out to be record breaking in 2015. Obviously, 2015 base flows in the Colorado River had fallen into a similar preferred range. To me these results demonstrate the power in long-term monitoring; how solid research can be applied to influence management (e.g., experimental dam operations); and the dedication and enthusiasm of our biologists.

I also wanted to recognize an example of our partner's commitment to fish recovery. After a series of winter and spring public meetings and many hours of negotiation, in late August the Colorado Water Conservation Board (CWCB) and the Ute Water Conservancy District (Ute Water) signed a temporary lease to use up to 12,000 ac-feet of Ute Water in Ruedi Reservoir to further augment base flows in the 15-Mile Reach of the Colorado River. This was the first time CWCB was able to exercise a new provision in water law that allows them to use Species Conservation Trust Funds to assist in meeting instream flows. Thanks to CWCB, Ute Water, and all our partners for all you do to recover our fish!

A handwritten signature in black ink that reads "Tom Chart". The signature is written in a cursive style.

Fish Illustration © Joseph R. Tomelleri

# Endangered razorback sucker in Lake Powell

By Travis Francis, Ben Schleicher, Darek Elverud, Dale Ryden, USFWS and Brian Hines, and Brandon Gerig, UDWR

Razorback sucker is one of four Colorado River endangered fishes that have been greatly reduced in numbers and range since the mid 1900s. Physical alterations of riverine habitats, water impoundments, introduction of non-native species, and contaminants have all contributed to the decline of these species. Recovery programs have been formed to direct management and conservation of these species and ultimately achieve recovery while water use and development continues in compliance with interstate compacts and applicable federal and state laws. The majority of the efforts of the Upper Colorado and San Juan recovery programs have been directed toward riverine recovery. These recovery programs have stocked hatchery-raised razorback sucker into riverine habitats since 1994; and as of 2014 over 517,000 have been reared, tagged with passive integrated transponders (PIT tags), and stocked back into the wild.

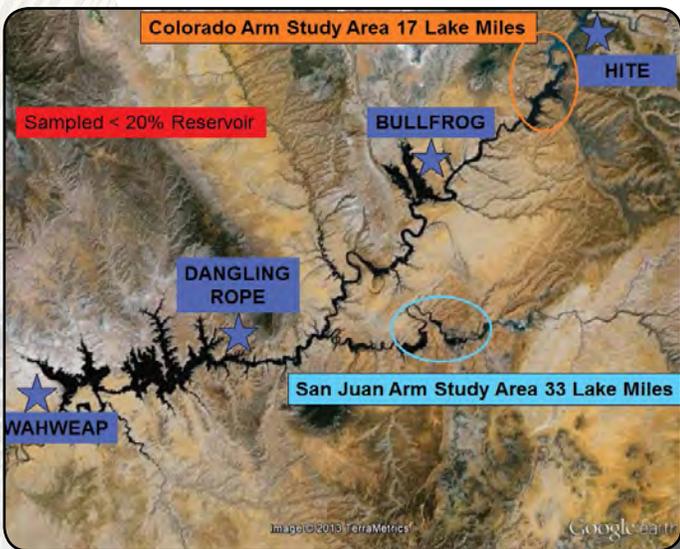
In 2011, the San Juan River Program funded a project, led by the U.S. Fish and Wildlife Service (USFWS) and Utah Division of Wildlife Resources (UDWR), to look into the status of all life stages of razorback sucker occupying the San Juan River arm of Lake Powell. Fish in the lake are isolated from the river population by a waterfall (since 2003) unless



PHOTO COURTESY OF MARK MCKINSTRY, USBOR

**A waterfall that separates the San Juan River from Lake Powell, 54 miles upstream from the Colorado River arm confluence.**

(these two areas account for ~24% available habitat in the San Juan River arm of Lake Powell). In addition, 36% of these fish had no PIT tag, suggesting potential wild recruitment. In 2011, larval sampling produced one wild larval razorback sucker, suggesting some level of lake spawning. These findings highlighted the need to expand our focus lake-wide particularly on the inflow area of the Colorado River arm of Lake Powell.



**A Google Earth image of Lake Powell, highlighting the four main marinas and two study areas.**

the lake elevation exceeds ~ 3,650 ft. In addition, 29 miles of razorback sucker critical habitat were rarely sampled. Field work performed in 2011 and again in 2012 found a relatively large population of adult fish that were not only occupying the lake, but were also actively spawning there (two spawning bars were identified). In 2012, razorback sucker abundance was estimated at 527 (95% CI: 239-1312) animals using spawning bars near Spencer's Camp and Neskahi Canyon



PHOTO COURTESY OF TRAVIS FRANCIS, USFWS

**Researchers (from left) are Laura Smith (UDWR), Krista Koehn (UDWR), Shawn Ryden (USFWS), Susan Wood (UDWR), and Kirk Groves (USFWS).**

In 2014 and 2015, the Bureau of Reclamation (USBOR) funded a similar project at the inflow of the Colorado River. Sampling was patterned after work done in the San Juan River arm. During spring, fish aggregate on large shallow beaches that are covered by small shards of shale, sandstone, or river cobble that are exposed to considerable wave action. Researchers believe this habitat is selected because razorback sucker eggs better adhere to the clean substrate and the wave action may keep the eggs from developing fungus and thus remain viable. The Colorado River arm had many of these habitats from Trachyte Canyon (the inflow area) downstream

18 miles to Good Hope Bay. In 2014, 241 individual adult razorback sucker were collected and three spawning bars were identified. In 2015, 277 individual adult razorback sucker were collected. During the last eighteen days of sampling two submersible PIT tag antenna were deployed which detected an additional 101 individuals. The 2014 and 2015 data are still being analyzed; however, if estimated razorback sucker capture probabilities are similar to the San Juan River arm,

had many wetlands (many more than present day) that would ephemeral connect to the river throughout the basin. Razorback sucker had to adapt and evolve to both riverine and lacustrine habitats. Since the inception of this project, researchers have learned that razorback sucker not only occupy Lake Powell, they complete much of their life cycle in this large man-made impoundment. Fish that had surgically-implanted sonic tags provided movement data that suggests some fish are moving around large expanses of the lake throughout the year, while others are moving very little, and others are moving to and from the rivers. While a lake-wide abundance estimate may be unattainable, it is very clear that the population of razorback sucker in Lake Powell is very large and that interactions between this group of fish and their riverine counterpart need to be better understood. This will provide managers better measure of species status and allow them to make informed decisions regarding recovery.

**For more information, contact Travis Francis, 970-628-7204, [travis\\_francis@fws.gov](mailto:travis_francis@fws.gov)**

PHOTO COURTESY OF MARK MCKINSTRY, USBOR



Larval fish light traps that were first deployed in Lake Powell in 2014. Researchers pictured (from left) are Travis Francis (USFWS) and Brian Hines (UDWR) collecting traps near Red Canyon on the Colorado River arm of Lake Powell.

PHOTO COURTESY OF MARK MCKINSTRY, USBOR



Researchers (from left) Travis Francis (USFWS) and Brian Hines (UDWR) recovering the first fully submersible PIT tag antenna deployed in the Colorado River arm of Lake Powell in 2015. This antenna was deployed near the razorback spawning site discovered near Castle Butte.



Researchers (from left) Chelsea Gibson (UDWR) and Mike Partlow (USFWS) display razorback sucker collected near Red Canyon in the Colorado River arm of Lake Powell in 2015.

PHOTO COURTESY OF TRAVIS FRANCIS, USFWS

abundance of adult razorback sucker in the sampled portions of the Colorado inflow could potentially exceed 3,000 individuals. Larval light trap sampling in 2014 produced 811 razorback sucker larvae at all developmental stages throughout the sampling period at all three spawning sites. In fact, razorback sucker was the second most abundant species present in our samples!

Fossil record and carbon dating suggest that these endemic native fishes of the Colorado River have been around for 3-5 million years. During the Cenozoic Era, the Colorado River basin was volcanically active and large natural reservoirs were created by lava flow dams. The basin historically



# Rivers are for natives: Good news about recovery

By **Tom Czapla**, Propagation and Life History Coordinator  
Upper Colorado River Endangered Fish Recovery Program

In the Upper Colorado River Basin, we hear happy complaints from scientists handling so many razorback sucker that it makes for longer days and longer trips! Captures of wild-produced larvae in the Green, Gunnison, Colorado and San Juan rivers document that stocked razorback sucker are spawning and researchers began finding wild-produced juvenile razorback sucker in 2013. Remote tag antenna systems are detecting fish that had been stocked every year since 2003. On the Green River, flow releases are increased from Flaming Gorge Dam when razorback sucker larvae are initially detected in the river to move larvae into the flood plains, such as Stewart Lake. For the past three years, larvae have moved into Stewart Lake under the increased flows and yearling fish were detected leaving the lake for the river in the fall. Another floodplain just recently modified for use by native fish is Johnson Bottom, which had larvae detected in it this year. On the Colorado River, all life stages of razorback sucker are being caught by biologists in the field. Researchers have confirmed that hundreds of razorback sucker are using transitional habitats at the inflows of both the Colorado and San Juan rivers in to Lake Powell and believe some of these fish are carrying out their entire life cycle there.

Lake Havasu annually. The U.S. Fish and Wildlife Service (USFWS) and state agencies believe they can manage razorback sucker by growing them in ponds located at the Imperial National Wildlife Refuge near Yuma, Arizona. They are then collected and released into the river.

With all this new information on razorback sucker gathered over the last several years, the Upper Colorado Program and its partners are funding a project to better understand the status of the razorback sucker, a process the U.S. Fish and Wildlife Service uses called a Species Status Assessment (SSA). The ultimate goal of the SSA is to provide decision makers with a clear characterization of viability, including risks to the species, and key uncertainties in the characterization. The SSA does not result in a decision to downlist or delist the species, but it is the scientific risk analysis portion of the decision process.

PHOTO COURTESY OF TILDON JONES, USFWS



**Johnson Bottom: Razorback sucker habitat.**

In the Lower Colorado River Basin, biologists are finding razorback sucker moving further into Grand Canyon, but still moving throughout Lake Mead as well. In Lake Mohave, larvae continue to be collected and brought into captivity to grow up and be re-stocked into the Lake. Scientists using remote tag antenna systems have seen more individual detections than the actual population estimate where fish are collected by more traditional fishing methods, such as nets and electro-fishing. In Lake Havasu, spawning aggregations of razorback sucker are seen near Laughlin, Nevada and Bullfrog, Arizona. The very first were seen near Needles, California. Larvae have been collected since 2013. Razorback sucker are stocked in



PHOTO COURTESY OF MELISSA TRAMMELL, USFWS

**This handful of pikeminnow were from a seine haul from the Middle Green reach.**

In September, researchers also reported some very encouraging news regarding Colorado pikeminnow reproduction in the Green and Colorado rivers. Every fall, the Utah Division of Wildlife Resources (UDWR) samples for young-of-year (YOY) Colorado pikeminnow in main channel backwaters (see related story on page 10) throughout two, 100+ mile reaches on the Green River and one similar sized reach in the lower Colorado River. The Colorado River reach, which extends from Cisco, Utah to the confluence with the Green River, yielded 1331 YOY, which is the highest catch recorded for this reach since this annual monitoring effort began in 1986. The UDWR-Vernal crew collected 276 YOY in the Middle Green River reach and the UDWR-Moab crew caught 486 in the lower Green River. Although, the Green River catches were not record-breaking, they represent some of the best numbers the Program has seen in the past 10 years.

# STReaMS: The species tagging, research and monitoring system

## A new state of the art way to manage endangered fish data

By **Kevin McAbee**, Nonnative Fish Coordinator  
Upper Colorado River Endangered Fish Recovery Program

Soon the Upper Colorado and San Juan recovery programs will have a state-of-the-art way to manage endangered fish data. Both recovery programs recently funded the Colorado Natural Heritage Program (CNHP) to create a web-accessible database that will store all of the data collected when biologists capture endangered fish or when antennas detect endangered fish swimming nearby. And most exciting, the database, called STReaMS (Species Tagging, Research, and Monitoring System), is already online.

Every endangered fish captured or stocked by the recovery programs receives a small device called a PIT tag implanted in its body cavity, providing each fish with a unique identifier, similar to a social security number. Therefore, researchers know exactly what individual fish is encountered, either through an active capture by biologists or through a passive detection at an antenna. Encounters carry valuable information on where the fish was at a certain time, and if handled by biologists, the size and condition of the fish. Researchers use these encounters to develop population estimates, demonstrate movement, calculate yearly survival estimates, and determine recruitment of new adults into the population.

STReaMS allows users to query and download specific encounter data, and allows researchers to upload any new data they have collected—all they need is an internet connection. CNHP has already launched the first version of the database at <https://streamsystem.org/>. This first version includes over a million records of stocked hatchery fish and wild fish captures, and thousands of detections at antennas from across the basin. The website currently allows users to query, view, and download data from this extensive data set. In addition, CNHP has designed appropriate user-levels and security to protect the valuable data from being corrupted.

Even more exciting are the additional features CNHP has planned for version two—including automatic, remote uploads of data from antennas; the capacity to upload large data files from a researcher’s home office (such as entire year classes of hatchery stocked fish); and more complex, individualized data searches.

Both the San Juan and Upper Colorado recovery programs are very excited about the potential uses of STReaMS and are impressed with the progress that CNHP has already made. Agency and other recovery programs’ personnel interested in using STReaMS should visit the website and register a username and password.

The screenshot shows the STReaMS web application interface. At the top, there is a navigation bar with links for Home, View & Edit Data, Batch Uploads, Downloads, Help & Documentation, and Contact Us. Below this is a search and filter section titled "Browse Encounters (filtered)". It displays "You are viewing 82 of 957,239 encounters. How would you like to filter results?". The filter section includes several dropdown menus and input fields: Species (Ptychocheil), Encounter Type (Detection), River (White River), River Mile Start, River Mile End, Basin (--All--), Sampling/Stocking Org (--All--), Parent Org (--All--), and Date Range (YYYY-MM-DD). Below the filters are buttons for "Filter Results", "Clear Filters", "Download", and "New Encounter". At the bottom, there is a table showing a list of encounters with columns for ID, Current Tag, Species, Encounter Type, Date, River, River Mile, Antenna, Notes, and Options. The table contains three rows of data for Ptychocheilus lucius encounters.

ID	Current Tag	Species	Encounter Type	Date	River	River Mile	Antenna	Notes	Options
722119	3D91C2C2D56C6	Ptychocheilus lucius	Detection	2013-06-28	White River	59.0			View Details Delete
722120	423E3D5B57	Ptychocheilus lucius	Detection	2013-06-28	White River	59.0			View Details Delete
722117	3D91C2D04E5F8	Ptychocheilus lucius	Detection	2013-06-27	White River	59.0			View Details Delete

## Dave Speas and Mark McKinstry presented outstanding achievement awards at the annual researchers meeting.



**Pictured (from left to right): Scott Durst, Sharon Whitmore, Mark McKinstry, Dave Campbell, Dave Speas, Tom Chart and Angela Kantola.**

**Dave Speas** was recognized as a dedicated force in the Upper Colorado Program, always looking for ways to contribute and never dodging a tough task. Dave is a fish biologist for the Bureau of Reclamation (USBOR) on the Biology Committee

and his work also extends to the Glen Canyon Dam Adaptive Management Program, Three Species Conservation Program, and San Juan River. A few of Dave's major contributions include: championing and coordinating remote PIT tag detection systems; promoting STReAMS, the soon-to-be-released interactive fish database; serving (twice) as Biology Committee chair; carefully reviewing innumerable reports with a consistent eye to establishing the strongest science possible; and regularly volunteering on field projects. Finally, Dave has led the reliable transfer of funding from the USBOR to Upper Colorado Program partners for over a decade. Although at times an agonizing lesson in bureaucracy, Dave always brings a 'problem solver' approach to this vitally important task.

**Mark McKinstry**, a biological scientist with the USBOR, was similarly recognized as a tireless champion for the recovery of endangered fish in the San Juan River Basin and to native fish conservation throughout the Colorado River system. The San Juan Program has benefited greatly from Mark's enthusiasm, dedication to sound science, innovative thinking, and on-the-ground participation, for over a decade. He is always looking for ways to contribute and takes on the tough tasks that no one else wants (e.g., funds management and contracting). A few of Mark's outstanding contributions to the San Juan Program include: leading the effort to deploy remote and floating PIT tag readers in the San Juan River Basin; insuring Navajo Nation's NAPI razorback sucker grow-out ponds and PNM fish passage are functional and productive; being an active member on the Biology Committee for a decade; kick-starting the first fish habitat restoration on the San Juan River; ensuring Lake Powell is surveyed for endangered fish; getting an innovative, low-maintenance fish weir installed at Hogback Diversion to prevent fish entrainment; and ensuring the San Juan Program has a strong science based foundation.

## Colorado Water Conservation Board to release Ruedi Reservoir water for endangered fish

By **Michelle Garrison**, Water Resource Specialist, CWCB

In 2015 the Colorado Water Conservation Board (CWCB) leased 6,000 acre-feet of water from Ruedi Reservoir to benefit Colorado River endangered fish. The lease is with the Ute Water Conservancy District (UWCD). This agreement can be renewed on a year-to-year basis and allows the CWCB to lease between 6,000 acre-feet and 12,000 acre-feet of water for instream flow in the 15-Mile Reach of the Colorado River.

"This is the first time that the Species Conservation Trust Fund has been used to purchase stored water for flows in critical habitat. We are excited to see this funding and our instream flow program used for this purpose," said Linda Bassi, Chief of the Stream and Lake Protection Section of the CWCB. Currently, the CWCB holds two instream flow water rights on the reach. Jana Mohrman, Hydrologist for the USFWS for the Upper Colorado Program, added "it's outstanding to see the initiative and cooperation on behalf of the endangered fish by UWCD Water and CWCB."

The water protects the natural environment at rates up to and exceeding the current instream flow rights to meet U.S. Fish and Wildlife Service (USFWS) flow targets. These 'win-win' agreements are a trademark of this recovery program.

The UWCD supplies domestic water to over 80,000 people in rural areas of the Grand Valley. The UWCD originally contracted with the Bureau of Reclamation in 2013, purchasing 12,000 acre-feet of water annually. This CWCB lease provides water on a short-term basis for the endangered fish, non-consumptive power generation, and additional late summer benefits to the local area.

"Colorado has always been on the leading edge of balancing development of water resources with recovery of endangered species, and this lease serves as the latest example of that," said Ted Kowalski, Chief of the CWCB's Interstate, Federal & Water Information Section.



# San Juan River Phase II channel restoration project

By **Robert Findling**, *The Nature Conservancy*

Construction of Phase II of secondary channel restoration projects on the San Juan River was completed in the spring of 2015. The project was managed by the New Mexico Field Office of The Nature Conservancy with engineering assistance from the Farmington office of Keller-Bliesner Engineering. Implementation of this phase of restoration projects, which was funded with both private and government grants, included the Ancestral Lands Program (ALP) of the SW Conservation Corps and the San Juan River Dineh Water Users Association. The ALP employs Navajo young adults in natural resource-related projects on the Navajo Nation. The San Juan River Dineh Water Users Association is the indigenous member-owned non-profit local irrigation district for Navajo farmers in the Shiprock reach of the San Juan River.

Invasive exotic tree removal work was performed by Navajo Nation staff of the ALP. The crew will be clearing historic secondary channels of exotic Russian olive trees which have clogged critical backwater habitat for both larval and juvenile fish. Exotic trees such as tamarisk and Russian olive choke many secondary channels causing them to fill with sediment and eliminating much of this essential habitat type from the San Juan River system.

Once channels were cleared of exotic invasive vegetation, the San Juan River Dineh Water Users used irrigation system maintenance equipment to remove sediment from the channels to allow a portion of the river's base flows to reconnect the channels and provide habitat for endangered Colorado pikeminnow and razorback sucker, as well as other native fish species. The participation of Navajo Nation partners is an important part of engaging and informing local people by providing employment and economic benefits. The project has been endorsed by the Shiprock Chapter and is fully coordinated with the San Juan Program, Fish and Wildlife Service, and the Navajo Nation Departments of Fish and Wildlife, Historic Preservation, and the Navajo Nation Environmental Protection Agency.

This phase of restoration projects resulted in clearing more than forty acres of exotic invasive trees and restored more than 4.7 miles of secondary channel. Crews also treated previously cleared Phase I areas of vegetation where re-sprouting has occurred and cleared sediment deposits which interfered with secondary channel flows.

Following completion of the restoration treatments, the restored sites will be monitored by the San Juan Recovery Program for three years to determine whether aquatic habitats in the newly restored channels persist over time at different flow levels, and to estimate the abundance of larval and young fish using the restored channels as nursery and rearing habitat. Also of interest is the response of the restored channels to flood events including environmental flow releases from

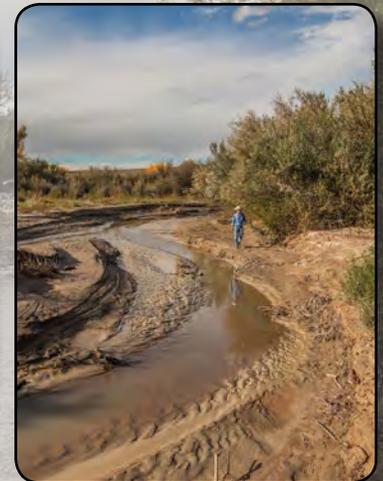
Navajo Dam. In theory, these high flows should scour our accumulated sediments and maintain aquatic habitats in the restored channels over time. Depending on precipitation patterns over the next three years, the results of the monitoring effort, which will be funded by Bureau of Reclamation, may shed light on this important question.



**Pictured are the Ancestral Lands Program staff and San Juan Dineh Water Users Assoc. members who performed the secondary channel clearing and earthwork operations on the Phase 2 Projects. Martin Duncan, the Executive Director of the SJDWUA, is in the white hard hat.**



**Robert Findling explains hydrologic and vegetative changes in the San Juan River to Ancestral Lands Program staff who were involved in exotic invasive tree removal.**



**San Juan River Phase II Channel Restoration Project: Before**



**San Juan River Phase II Channel Restoration Project: After**

PHOTO COURTESY OF BOB FINDLING, THE NATURE CONSERVANCY

# Native fishes of the San Juan River posters

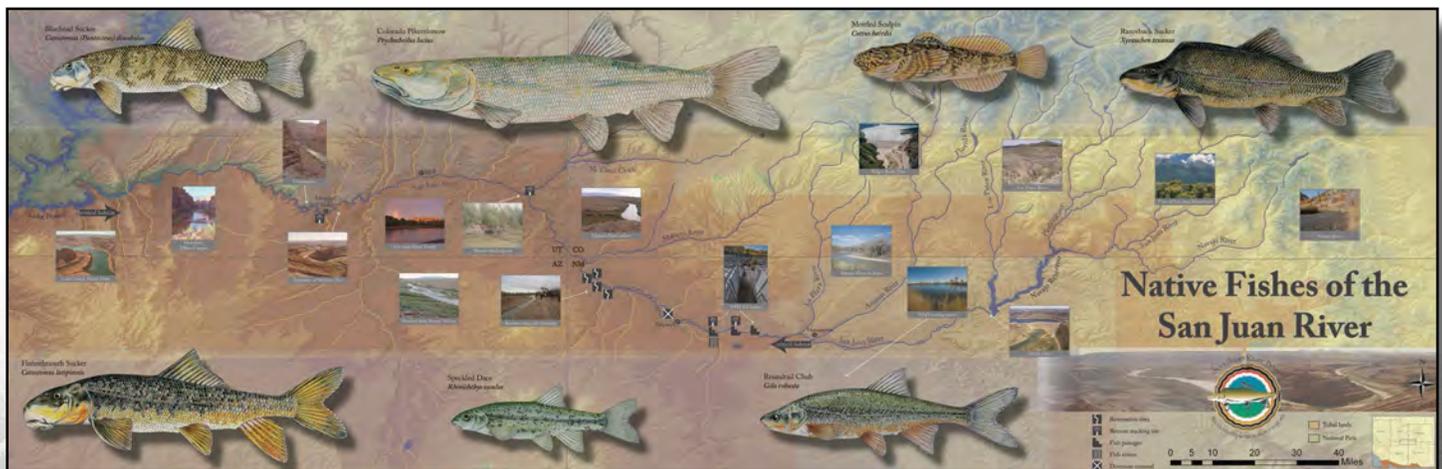
By **Steve Platania**, American Southwest Ichthyological Researchers, L.L.C.

Besides being home to two endangered fishes, the San Juan River is also a very active waterway for river runners. A rafting permit is required year-round to float any section of the San Juan River between Montezuma Creek and Clay Hills. The Bureau of Land Management (BLM) manages this permitted rafting on the San Juan River between and is the primary federal contact agency for most people who visit the San Juan River. They estimate that about 11,500 individuals raft the San Juan river annually. The seasonal peak in rafting on the San Juan River also coincides with the peak in recovery activities on the river for the two endangered fishes. During spring and summer, field biologists can often be found with their rafts anchored on the river's edge while they explain the San Juan Program and ecology of the river and fish to interested river-runners. Starting in 2015, biologists can not only share their expertise with interested river rafters, but will also be distributing a new outreach tool; an educational poster titled "Native Fishes of the San Juan River."

Howard Brandenburg and his wife Ayesha designed and produced the poster. The San Juan Program poster overall size is 39½" x 13". The colorful front side map of the San Juan River drainage is filled with fish illustrations and photographs of riverine habitats as well as structures built by the San Juan Program (i.e., PNM fish ladder, NAPI rearing ponds, RERI sites).

The reverse side of the poster, is a wealth of biological information on each of the seven native fish species as well as a brief narrative on the history of the San Juan Program and its efforts to recover the endangered fishes.

The BLM will provide electronic copies of the poster to all individuals who receive a permit to raft the San Juan River. In addition, they have hundreds of copies available at their San Island Boat Ramp office for distribution to day visitors. If you would like to receive a copy of this beautiful poster, please contact Joann Perea-Richmann at the San Juan Program office by emailing her at [joann\\_perea-richmann@fws.gov](mailto:joann_perea-richmann@fws.gov).



Hogback Diversion Dam located near Shiprock, NM.



Navajo Nation Department of Fish and Wildlife technician inspects net at the PNM Fish Ladder.

# Anglers reel in more than 2,000 nonnative smallmouth bass at Ridgway tournament

Colorado Parks and Wildlife

More than 200 Colorado anglers showed their skills at the recent smallmouth bass tournament at Ridgway State Park and removed 2,036 of this invasive species from the reservoir. Smallmouth bass were illegally stocked in Ridgway Reservoir. CPW and U.S. Fish and Wildlife Service officials are concerned that if the smallmouth bass escape the reservoir they will impact populations of native fish downstream in the Gunnison River. The native fish are unique to the Colorado River Basin and are found nowhere else in the world. Smallmouth bass are predator fish that can survive and proliferate in Colorado rivers and displace native species.

Eric Gardunio, aquatic biologist in the Montrose area, estimated that the reservoir held about 3,600 smallmouth bass more than 6 inches long. Of the fish caught during the tournament, 1,300 were more than 6 inches long. “Anglers made a significant dent in the population and we hope to have another tournament next summer,” Gardunio said. “But there are still a lot of smallmouth bass in the reservoir.”



Don Turk from Cedaredge, CO, shakes hands with Eric Gardunio of CPW as he accepts the Ridgway Bass Tournament Grand Prize.



Norwood anglers give a big thumbs up at the smallmouth bass they entered into the tournament competition.

## Seining for young-of-year fishes on the Green River

By Katherine Creighton, UDWR Moab Field Office

If the Discovery Channel were to combine its hit series Dirty Jobs with an episode of Deadliest Catch, the Utah Division of Wildlife Resources Moab Field Office might find itself on the brink of stardom. Let's be honest, torrential monsoon storms, neck deep mud, boat-flipping winds, and prehistoric-looking fish all make for really good television. Several times each year, biologists from UDWR-Moab head out on a four-day seining trip on the lower Green River looking for young-of-year razorback sucker and Colorado pikeminnow. Launching in the town of Green River, crews motor down the lowest 120 miles of the Green River through the most remote part of Canyonlands National Park to the confluence with the Colorado River. Along the way, biologists sample backwaters and other zero-velocity habitat with a 12' x 3' seine net dragged between two people. Fish are identified, counted, and measured and then released back into the river. With these data, we are able to assess spawning success, location and timing of spawning, recruitment success, growth, and distribution of these native fishes. This information helps inform management decisions and actions that will ultimately guide the recovery of these species. And don't worry, even if reality TV fame hits this troupe of Utah fish biologists, we won't be quitting our day jobs; those young-of-year Colorado pikeminnow and razorback sucker are just too dang cute.



Jonathan Dutrow and Katie Creighton carry a seining net on the Green River.



Nate Zabloski, Jonathan Dutrow and Katie Creighton prepare to seine in deep mud.

# A new era in reservoir fisheries: Desirable to anglers and compatible with endangered species recovery

By **Kevin McAbee**, Upper Colorado River Endangered Fish Recovery Program

Implementing actions to reduce the threat of nonnative fish is a priority for all Upper Colorado Program stakeholders. For the past decade, field crews have honed their skills at removing nonnative fish from upper basin rivers, primarily targeting northern pike, smallmouth bass, and walleye.

Unfortunately, population modeling demonstrates that in-river removal will not succeed if problematic fish escape from reservoirs and reproduce in the river. Therefore, Program stakeholders are now focusing additional efforts to reduce escapement from reservoirs.

Understandably, anglers are concerned that these projects will damage their fishing experience. However, Program stakeholders are committed to providing enjoyable replacement fishing experiences by focusing on the assortment of fish that are both desirable and compatible with recovery. Species such as black crappie, yellow perch, and largemouth bass are sought by many anglers; yet these species do not establish and reproduce when they escape from reservoirs. These species can be stocked in upper basin reservoirs with low risk to native fish downstream.

Other sought-after species, such as triploid walleye<sup>1</sup>, tiger muskie<sup>2</sup>, and wiper<sup>3</sup> are sterile and cannot reproduce. These fish can still consume native fish over their lifetime if they do escape from reservoirs; therefore, secondary escapement prevention is needed, such as a net or screen on reservoirs where these species are stocked.

The states of Utah and Colorado are shifting reservoir management to provide these desirable fishing opportunities that are compatible with endangered fish recovery. This October, Utah Division of Wildlife Resources (UDWR) successfully removed the illegally introduced walleye population at Red Fleet Reservoir. To provide a replacement fishing experience, UDWR asked the community which species they would like to have in the reservoir. UDWR and the community collaboratively selected wiper, triploid walleye, yellow perch, black crappie, and others for future stocking.

Similarly, Colorado Parks and Wildlife (CPW) is shifting the fishing experience at Rifle Gap and Elkhead reservoirs. The 2015 Rifle Gap Lake Management Plan (LMP) commits to diminishing the existing walleye and smallmouth bass populations through liberalized harvest regulations and agency removal. To replace these fishing opportunities, CPW has begun stocking triploid walleye. CPW also continues to operate a screen downstream of the dam, which has excluded fish as small as 20 millimeters (mm) and as large as 500mm.

At Elkhead Reservoir, Program stakeholders and the local community agreed upon a solution that includes a net installation over the spillway, liberalized harvest regulations for smallmouth bass, and a new LMP. Importantly, the community is supportive of this approach. Angler Burt Clements recently said at a CPW Commission meeting “this is the best way to keep going” and “as anglers, we appreciate [the collaboration] very much”.

By these and other projects, Program stakeholders continue to strive to provide anglers with community supported fishing opportunities that are also compatible with endangered species recovery.

<sup>1</sup> Sterility is induced in walleye in a hatchery setting by modifying the fish in the egg stage.

<sup>2</sup> A hybrid offspring of the true muskellunge (*Esox masquinongy*) and the northern pike (*Esox lucius*).

<sup>3</sup> A hybrid offspring of the striped bass (*Morone saxatilis*) and the white bass (*M. chrysops*).



**Sterile walleye are compatible sport fish in reservoirs.**

Fish Illustration © Joseph R. Tomelleri

# What is selenium and why is it a problem?

By **Justyn Liff**, -Public Affairs Specialist  
Bureau of Reclamation

Selenium is a trace metal that occurs naturally in the environment. Locally, selenium is found in sedimentary geological deposits (Mancos Shale) that originated in an ancient inland sea between 65-150 million years ago. Soils in many parts of the lower Gunnison basin are naturally high in selenium and salts. When water is applied and infiltrates into these soils, selenium is mobilized and begins to move through groundwater systems and eventually enters our streams and rivers. Selenium mobilization occurs as a result of lawn and agricultural irrigation, leaky canals and laterals, and seepage



**Mancos Adobes containing selenium and salt near Montrose, Colorado.**

from ponds, and septic leach fields. Selenium concentrations in the lower Gunnison and Colorado rivers and some of their tributaries currently exceed levels considered to be safe for aquatic life. These rivers serve as habitat to four endangered fish species: the Colorado pikeminnow, bonytail, razorback sucker, and humpback chub.

High selenium concentrations have been shown to cause reproductive failure and deformities in some sensitive aquatic birds and fish. Examples of reproductive failures include eggs failing to hatch, or if they do hatch, the fish or waterfowl may have deformities that reduce their chances of survival. The photo below shows how selenium can affect the reproductive success of endangered species. On the left side of the photo is a deformed larval razorback sucker resulting from maternal exposure to selenium. On the right is an unaffected normal, healthy larval razorback sucker.



These selenium-related impacts create potential conflict between existing and future water uses and the Endangered Species Act (ESA). However, stakeholders in the Gunnison River Basin believe that such conflict can be avoided through proactive programs that emphasize both protecting existing and future water uses and recovering endangered fish. Stakeholders formed the Selenium Management Program (SMP). The SMP, is a private and public partnership working together to identify and implement solutions to reduce selenium concentrations. The long-term goal of the SMP is to sufficiently improve water quality conditions to assist in the recovery of the endangered fish.

A key component of reducing selenium and salinity in the Gunnison Basin is piping and lining irrigation laterals or canals. Below is a picture of an Uncompahgre Valley Water Users Association construction crew installing the final section of pipe for the EF Lateral Piping Project. This type of water efficiency project reduces seepage and prevents selenium and salt from being mobilized and transported to the river system. Funding for this project was provided by the State of Colorado Non-Point Source Program and the Colorado River Basin Salinity Control Program.



If you live in the Gunnison Basin you can help reduce selenium and salt concentrations.

- Use only the amount of water needed for crops and lawns; over-watering leads to selenium and salt runoff.
- Do not irrigate previously non-irrigated soils that are high in selenium and salt content.
- Always line ponds in areas with high selenium and salt soils to avoid selenium and salt mobilization.

# Cha..cha...changes!

## San Juan River Basin Recovery Implementation Program, Albuquerque, NM



PICTURED: DR. NATE FRANSSSEN, SHARON WHITMORE, JOANN PEREA-RICHMANN AND SCOTT DURST

### Sharon Whitmore, San Juan Program Coordinator

Sharon was promoted from Assistant Coordinator to Coordinator. She replaces Dave Campbell who held that position since 2005.

### Dave Campbell, Branch Chief for the Large River Recovery and Restoration Programs in the NMESFO.

Dave Campbell is now the Branch Chief for the Large River Recovery and Restoration Programs in the New Mexico Ecological Services Field Office (NMESFO). His primary duties as Branch Chief are overseeing the San Juan Program and working with the Middle Rio Grande collaborative program to develop a recovery program for that river system.

### Tom Sinclair, Chair of the Coordination Committee

Tom Sinclair, USFWS's New Mexico Fish and Wildlife Conservation Office's Project Leader, was appointed by Dr. Benjamin Tuggle as the Chair of the Coordination Committee replacing Stewart Jacks, Assistant Regional Director for Fisheries.

### Scott Durst, Science Coordinator

Scott oversees all of the San Juan Program's science-related activities including data management, integration, and analyses; coordination with the Biology Committee and researchers; and assessing progress toward recovery.

### Dr. Nate Franssen, Biologist

In July, NMESFO welcomed Dr. Nate Franssen to its ranks as the new San Juan Program Biologist, the position previously held by Scott Durst. Nate has extensive experience working on the San Juan River and has been integrating and analyzing San Juan River data for the Program as a Postdoc since 2013.

## Colorado River Fishery Project (CRFP), Grand Junction, CO



### Brendan Crowley, Biological Science Technician

Brendan's main duty is Crew Leader for our river sampling crews. He's in charge of salvage efforts to rescue endangered and other native fish from local irrigation canals at the end of the season. He's responsible for setting, retrieving and downloading data from thermographs CRFP maintains along the Colorado and Gunnison rivers.

## Colorado River Fish Project, Vernal, UT



### Christian T. Smith, Biologist

Chris came to the Colorado River Fish project from Salt Lake City, UT and has worked as a seasonal for several years. He has also been a professional raft guide and brine shrimp boatman on the Great Salt Lake. He went to Utah State University and studied Watershed Science. Chris started working as an full time biologist in Jan. 2015.

## Utah Division of Wildlife-Moab, Moab UT



### Zach Ahrens, Native Aquatics Biologist

Zach is Principle Investigator on Cataract Canyon Humpback Chub Monitoring Project, Green River Canal Salvage and heads up UDWR-Moab's Outreach Program. In his off-time he is building a straw bale house in Moab.



### Jonathan Dutrow, Native Aquatics Lead Technician

Jonathan has worked for UDWR-Moab as a Wildlife Technician for six seasons and was promoted to Native Aquatics Lead Technician in March 2015. He is a co-investigator on numerous UDWR-Moab projects. In the off-season, Jonathan owns and operates a yurt company in Moab's La Sal Mountains.

## Upper Colorado River Endangered Fish Recovery Program, Lakewood, CO



### Ellen Szczesny, Budget Analyst

After 16 years, Ellen has moved from the Upper Colorado Program to Budget and Administration in the USFWS Mountain-Prairie Regional Office. She now handles reimbursable agreements for the entire region. We appreciate Ellen's expert handling of budgets, fund transfers, and Program web pages. Her work has been key to recovery efforts on behalf of the endangered fishes of the Colorado River Basin.



### Sandra Spivey, Administrative Officer

Sandi served as an Administrative Assistant for USFWS in Georgia Ecological Services since 2006. Sandi earned her B.B.A. in Business from Columbus State University in 2012 and M.B.A. in Sustainable Business from Marylhurst University in 2015. Sandra is a mother to three boys, Jacob, Carter, and Colten. Sandi's professional interests include grant writing and management for conservation initiatives. Sandi enjoys hiking, painting, and roller derby.



### Melanie Fischer, Information and Education Coordinator

Melanie Fischer is now a public affairs specialist providing full-time outreach support, graphic design and social media expertise.

# the fisheye:

## Angela Kantola, Beekeeper



Upper Colorado Program participants tend to think of longstanding Deputy Program Director, Angela Kantola, as the Program’s “glue” or “Scotty in the engine room,” but did you know she’s also a “beek”? (That’s a beekeeper to you and me.) In 2012 Angela, and her husband Don Wallace, began keeping bees at Skye Hill, their home in the foothills above Littleton, Colorado.

“My family has always loved honey,” says Angela. “My great-grandmother lived to almost 99 and my grandmother to almost 95. They both attributed much of their good health and longevity to eating honey. Back in those days, we didn’t think much about local honey, and our family favored clover honey from Colorado. We brought about a hundred pounds of Colorado honey home to Oklahoma from our annual visit to Manitou Springs every year.”

Don kept bees as a child, Angela is just plain crazy about honey, and they both wanted to promote pollinators, so beekeeping seemed a natural for them. Before they could install beehives though, they first had to build a “bee yard.” In Colorado’s foothills, this means

protecting the hives with a solar-and-battery-powered electric fence to deter bears. “Most people think bears are after honey,” says Angela. “While a bear will eat everything in the hive, it’s the protein-packed larval bees that they’re really after.” Fortunately, the electric fence has worked well and the Skye Hill bees have had no bear intrusions.

As extra insurance against cold foothill temperatures and to potentially reduce disease concerns, Angela and Don installed somewhat unique beehives known as “Warré” hives. These are slightly smaller than standard Langstroth hives and the bees build all of their own comb from scratch, attaching it to bars at the top of each box. This type of hive does have some challenges: as the bees expand their honey stores in the summer, you don’t actually “super” or add boxes above existing boxes on a Warré hive, but instead you “nadir” the additional boxes – placing them below the existing boxes to mimic the way bees build comb in a tree cavity. And, with comb built from top bars instead of on standard frames, the honey is extracted by a more labor-intensive crush-and-strain process instead of

being spun out of the frame in a honey extractor. “Honey extracted by this method tends to have more pollen in it, which we find delicious” says Angela.

This fall Angela received a very special gift of honey that reversed her long family history of bringing Colorado honey to Oklahoma. Sometime within the past few years, honeybees gained access to Angela’s mother’s home in Tulsa, Oklahoma, through an external faucet bibb. Although local beekeepers had been contacted to remove the hive, they had not yet responded when Angela’s mother’s unexpectedly passed away in September. Despite the difficult and busy time following her mother’s death, Angela had to have the beehive removed. Don and Angela didn’t have the necessary equipment or experience, but found two wonderful Tulsa beekeepers to remove the hive (which the bees had built in a plumbing cavity behind the guest bath cabinet), relocate the bees, and extract the honey. “In October, Don and I returned home to Colorado with two quarts of very special Oklahoma honey.”



# Endangered species updates



PHOTO COURTESY OF TYLER SEXTON, USFWS

Sam Hultberg, USFWS holding an adult Colorado pikeminnow.

## Colorado pikeminnow

The USFWS Grand Junction office completed the final year of the 2013-2015 Colorado River Colorado pikeminnow population estimate sampling period. Preliminary adult (> 450 mm total length) Colorado pikeminnow population estimates from 2013 and 2014 are 413 and 377 adult Colorado pikeminnow respectively. The preliminary adult population estimates from 2013 and 2014 indicate a decline of the adult populations from the 2005 estimate of 837 adult pikeminnow. Data collected during 2015 has not yet been utilized to calculate a population estimate. While the two most recent preliminary population estimates indicate a decline in the adult population, numbers of fish >250 mm total length have remained stable due to several age classes of recruiting Colorado pikeminnow.



PHOTO COURTESY SUSAN WOOD, UDWR

Chelsea Gibson with humpback chub captured in Desolation Canyon.

## Humpback chub

Three sampling passes were completed this fall on the Green River in Desolation and Gray Canyons. The crew encountered 95 humpback chub ranging in total length from 214 to 343 mm and seven juveniles ranging in total length from 66 to 80 mm; all juveniles were captured via hoop nets. Prior to the collection of these juveniles there has been little documentation in recent years of successful reproduction and potential recruitment within Desolation and Gray Canyons. There were 16 recaptures recorded using trammel and hoop nets; 20% of recaptures were collected in the hoop nets. Recaptures were recorded for all six of the sampling sites enabling the calculation of population estimates for all sites; in 2010 and 2014 population estimates were only calculated for five of the six sites.



PHOTO COURTESY CPW

Native Aquatic Species Restoration Facility technician, Dave Westerman stocking fish in Debeque Canyon.

## Bonytail

Colorado Parks and Wildlife (CPW) released approximately 2,700 bonytail in the Green River at Echo Park in mid-August followed by 2,250 bonytail released into the Colorado River in Debeque Canyon in September. These fish, reared at CPW's Native Aquatic Species Restoration Facility averaged 12 1/2" in length and also included a few whoppers coming in at over 18". In addition, 500 more bonytail are expected to be released in the Grand Valley in November. Submersible pit tag antennas will aid in the tracking fish dispersal following this release.



PHOTO COURTESY CPW

Tom Mix of the Native Aquatic Species Restoration Facility stocking bonytail at Echo Park.



PHOTO COURTESY USFWS

Erin Tracy, USFWS with a razorback sucker at a Yampa River spawning site, 2015.

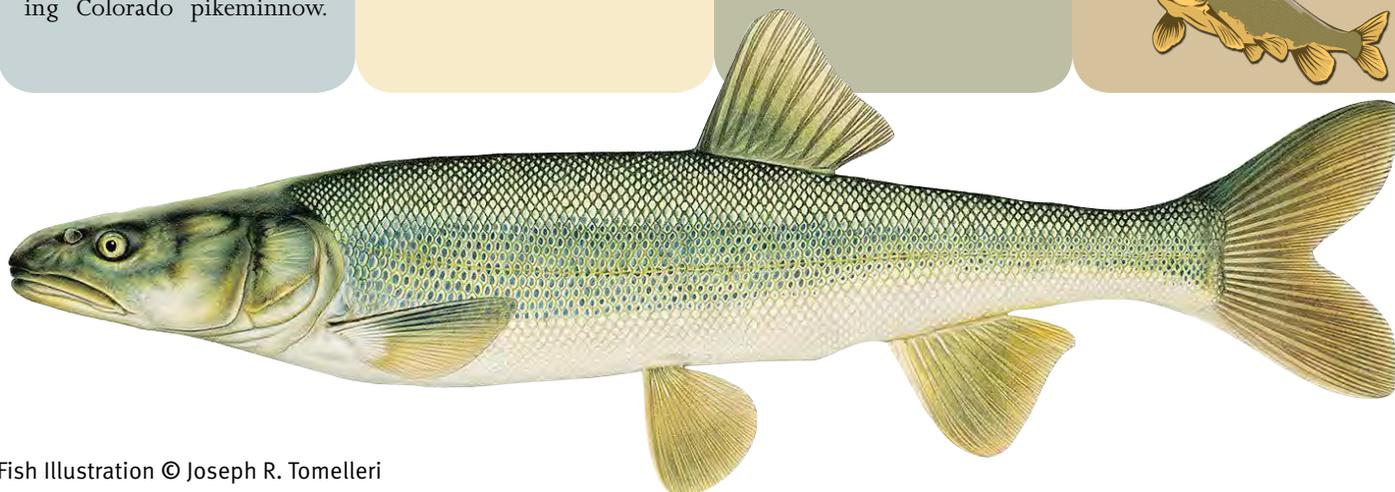
## Razorback sucker

Program partners successfully coordinated flow releases from Flaming Gorge dam to benefit razorback suckers this spring. These releases successfully moved larval fish into Johnson Bottom, a newly restored wetland on Ouray National Wildlife Refuge. In more good news for razorback suckers and other native fish, biologists saw drastic decreases in the catch rates of invasive smallmouth bass this year in both the Yampa and Green rivers of Dinosaur National Monument. They also encountered fewer wall-eye in the Green River.



PHOTO COURTESY BEN KIEFER, UDWR

Brent Leite with a razorback sucker on the middle Green River



**UCREFRP**  
**PO BOX 25486**  
**DENVER, CO 80225**

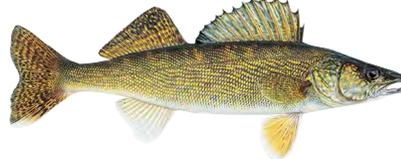
## HELP PREVENT THE SPREAD OF NONNATIVE SPECIES



**SMALLMOUTH BASS**



**NORTHERN PIKE**



**WALLEYE**

UTAH AND WYOMING HAVE  
**CATCH & KEEP**  
REGULATIONS. IT IS ILLEGAL TO  
RETURN THESE FISH TO THE RIVER.

One hundred years ago only 13 native species swam in the Upper Colorado River and its tributaries—today they have been joined by more than 50 nonnative species. Introduction and establishment of problematic nonnative predators affect native fishes, the Recovery Program, anglers, and local communities with high environmental and economic costs.

Removing illegally-introduced species is expensive and time-consuming. We must all join forces to prevent the spread of these problematic nonnative predators in order to preserve native fish in the river and desirable sport fisheries in the reservoirs.

Fish Illustrations © Joseph R. Tomelleri

Review your state fishing regulations. State regulations may vary based on river mile and are the LAW. Regulations on the river may be **very different** than in reservoirs. **Know the law.**

<http://cpw.state.co.us/Documents/RulesRegs/Brochure/fishing.pdf>

<http://wildlife.utah.gov/fishing-in-utah/guidebooks/51-rules/guidebooks/1530-2015-utah-fishing-guidebook.html>

[https://wgfd.wyo.gov/Regulations/Regulation-PDFs/WYFISHINGREGS\\_BROCHURE](https://wgfd.wyo.gov/Regulations/Regulation-PDFs/WYFISHINGREGS_BROCHURE)