

swimming upstream

Upper Colorado River Endangered Fish Recovery Program

Yampa River serves as outdoor lab for nonnative fish management efforts

—by Kim Giffin

Carpenter Ranch Outreach Intern
The Nature Conservancy in Colorado

“I want to catch this fish!” Dillon Monahan, 14, said enthusiastically, as he followed U.S. Fish and Wildlife Service Fishery Biologist Sam Finney to the shore of a Yampa River State Wildlife Area pond. Sam, along with a crew of six, spent six consecutive weeks in the spring of 2004 electrofishing 37 miles of the Yampa River from near Hayden to Craig in northwest Colorado. Their work is an integral part of the broader efforts of the Upper Colorado River Endangered Fish Recovery Program.

This is the second year that the Recovery Program has spearheaded concerted efforts to manage the numbers of northern pike and smallmouth bass in the Upper Colorado River Basin, including the Yampa River. On this stretch of river, the crew targeted northern pike — a nonnative, predatory sportfish. The northern pike is a threat to the endangered native fish



DILLON MONAHAN (LEFT) WAS EXCITED TO HELP U.S. FISH AND WILDLIFE SERVICE BIOLOGIST SAM FINNEY PLACE A LARGE NORTHERN PIKE TAKEN FROM THE YAMPA RIVER INTO A POND AT THE YAMPA STATE WILDLIFE AREA.

because it competes with them for food and habitat, and also preys upon the native fish populations on their own home turf — or home waters, as the case may be.

This spring, the U.S. Fish and Wildlife Service's team conducted six passes along the same stretch of river. On the first pass, they tagged, recorded and released the northern pike that were captured. On five subsequent passes, northern pike were tagged, recorded and relocated. Each pass was divided into two-mile segments. Two electrofishing boats traveled the length of the segment on either side of the river, netting the temporarily stunned northern pike in the low-velocity waters near the riverbanks, and particular-

ly in backwater areas. The captured northern pike were relocated to ponds at the Yampa River State Wildlife Area, where Dillon and other lucky angler families were able to fish for them.

“Northern pike are ambush predators,” Sam said. “They like to hide in the submerged vegetation and wait for their prey, then dart out and attack them. Northern pike can eat fish up to three-quarters of their own length, and may attempt to eat fish that are physically too big for them to consume. When that happens, the pike will spit its ‘prey’ out, but the ill-fated fish still generally dies.”

This six-pass system of marking and recapturing fish allowed the Recovery Program to estimate the size of the northern pike population. Recaptured fish also provide information about how quickly the fish grow and how far they have traveled.

—continued on page 4

Biologists review data from largest known nonnative fish management effort

Biologists hung up their waders and stored their boats this fall signaling the end of a second season of the largest known nonnative fish management research effort, which spanned 480 miles of rivers in two states. They are now compiling and reviewing data collected during weeks of blistering hot days and bone-chilling nights as they floated sections of the Colorado, Green and Yampa rivers in Colorado and Utah in search of smallmouth bass and northern pike targeted for removal.

By year's end, biologists hope to better understand what needs to be done to reduce the numbers of certain nonnative fish species to a level where they no longer threaten the survival of the endangered humpback chub, bonytail, Colorado pikeminnow and razorback sucker.

“This was the second year that we've made a concerted effort to tackle this difficult issue,” said Recovery Program Nonnative Fish Coordinator Pat Nelson. “Last year's data showed there are far greater numbers of certain nonnative fish species in the Colorado River system than we thought. We also learned that numbers of smallmouth bass are increasing in many river reaches inhabited by endangered fish.”

Last May, the Recovery Program launched a greatly expanded collaborative effort with the Colorado Division of Wildlife, the Utah Division of Wildlife Resources, the U.S. Fish and Wildlife Service and biologists from Colorado State University.

Biologists used a variety of techniques to determine if management efforts were effective in reducing the numbers of targeted nonnative fishes in sections where they were removed. Follow-up monitoring of endangered and other native fishes will determine if numbers of these species increased as a result.

“It's important for us to learn whether removing nonnative fish is an effective way to increase the number of native fish in the river system,” said Kevin Conway, director of the Utah Division of Wildlife Resources. “This year's nonnative fish removal projects are part of that evaluation.”

Scientific evidence demonstrates that northern pike, smallmouth bass and channel catfish are nonnative fish species that pose a significant threat to the survival of endangered fish because they prey upon them and compete for food and space. Declines in other native fish species have also been attributed to increasing nonnative fish abundance.

Although channel catfish were included in last year's research effort, capture methods proved inadequate for effective removal. With the exception of Yampa Canyon where effective removal has been demonstrated, channel catfish research has been postponed until sampling efficiency can be improved.

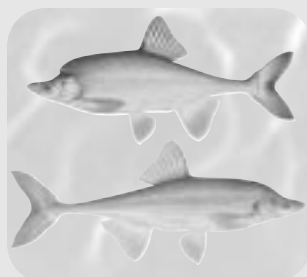
“Nonnative fish management is one of the Recovery Program's biggest challenges and one of the most important for the recovery of the endangered fishes,” said Recovery Program Director Bob Muth. “There's no easy solution because there are such large numbers of nonnative fishes occupying the same areas as the endangered fish. The Recovery Program is committed to using the best scientific information to determine future management actions needed to achieve our goal of recovery.”

For more information, contact Pat Nelson at 303-969-7322, ext. 226, pat_nelson@fws.gov.



THE AUTHOR, KIM GIFFIN, WAS AMAZED AT THE SIZE OF NORTHERN PIKE THAT BIOLOGISTS REMOVED FROM THE YAMPA RIVER.

In this issue



Fascinating ancient survivors, p. 2

Humpback chub and bonytail have a lot to teach us about the Colorado River.



Ute Tribe to support native fish recovery, p. 3

Ute Indian Tribe to develop native fish management plan and outreach program.



2004 outstanding researcher named, p. 3

Biologist Kevin Bestgen receives the Recovery Program's research award.



This help is for the birds — and the fishes, p. 5

Grand Valley Audubon Society helps restore river habitat for birds, fish and mammals.



Fish passage enhances 100-year-old dam, p. 6

Notch cut in crest of unique Roller Dam to give endangered fish access to critical habitat.

Of Humpbacks and Bonytails: fascinating ancient survivors

—by Rich Valdez, Ph.D., Aquatic Ecologist

Humpbacks and bonytails sound more like characters from the 1923 Lon Chaney movie featuring Quasimodo, the legendary resident of the clock tower at Notre Dame. Actually, these are common names of some unique and interesting fish found only in the Colorado River Basin. Aply named for their appearance, the humpback chub has a large fleshy hump behind the head and the bonytail has a long, elongated bony tail.

These fish are fascinating because they have been able to survive some two to three million years of life in one of the most arduous and demanding river systems in the world. The Colorado River has extreme variations in flow and water chemistry such that only about 35 species of fish are native, compared with 100 or more species in most other river basins of North America.

Humpback chub discovered in 1946

Biologists refer to the humpback chub as *Gila cypha*, the scientific name for the species meaning streamlined chub. It is one of the more recently described of the major fish species in North America. Most fish were discovered and described in the late 1800s

Desolation/Gray Canyon, Yampa Canyon and Black Rocks. River runners today know these areas well and relish their whitewater. But before 1946, few ventured into these treacherous regions — including fishery biologists.

Because humpback chub live in one of the most treacherous whitewater regions in the world, one would think of them as the swiftest of swimmers — like a salmon or a striped bass. On the contrary, humpback chub are relatively poor swimmers.

What humpbacks lack in speed, however, they make up in cunning. The hump that gives the fish its name acts as a stabilizer and a hydrodynamic foil that helps the fish maintain position. Its large, fan-like fins act as wings that enable the fish to “soar” among sheets of constantly surging water. Add a highly streamlined body, small slender head and small embedded scales, and you have the perfect hydrodynamic design and the envy of any boat engineer.

In addition to an elaborate body design, the humpback chub has a few other tricks. This fish is able to tolerate salinity levels that range from nearly pure water to the equivalence of slightly diluted seawater. It has small eyes that limit vision in the nearly dark turbid world of the Colorado River, but more than compensates with acute hearing and olfactory (smell) senses, and a highly developed lateral line system that enables it to detect changes in water currents and provides “distant touch.”

Humpback chub have a series of pimple-like nerve endings on the head that enables them to smell food and can pick up vibrations from a tiny struggling insect many feet away. In the midst of the muddiest flood where the river is “too thick to drink and too thin to plow,” one can witness the characteristic slap of the tail as a humpback rises to the surface to consume a delectable insect. The humpback chub has figured out that most of the time the Colorado River menu is bleak, but floods are the dinner bell that deliver a glut of food.

The humpback chub is a small fish by most standards — its maximum size is about 20 inches and 2.5 pounds. Most people are surprised to know that the humpback chub is a minnow. By minnow standards it is a big fish, though not like the giant of all minnows and its cousin — the Colorado pikeminnow at 100 pounds!

The fact that the humpback chub is uniquely shaped by its environment and highly specialized to live in the toughest place on the planet appears to be part of the reason that it is having trouble today. It is too specialized. Human changes to the river, especially modified flows and the introduction of nonnative fish, have affected its surroundings in a way never before experienced. The advantage of living in severe whitewater is that few other species dare enter. Now, flow modifications have reduced the severity of the

whitewater, and nonnative fish from other river basins have invaded. Unaccustomed to competition and predation, the humpback chub is having difficulty coping with its new neighbors.

The humpback chub was designated as an endangered species in 1968 and was included under protection of the Endangered Species Act (ESA) in 1973. The Upper Colorado River Endangered Fish Recovery Program has implemented aggressive efforts to reduce the numbers of nonnative fish in the system. Flow management programs are also in place throughout the Upper Colorado River Basin to maintain the natural features of the river.

There are currently five self-sustaining populations of humpback chub in the upper basin. About 3,000 adults occur in the Black Rocks and Westwater Canyon populations near the Colorado-Utah border. The Yampa Canyon and Cataract Canyon populations are small, each with a few hundred adults. The population in Desolation/Gray Canyons ranges from 1,000 to 2,000 adults. The Recovery Program continues to monitor these populations.

Bonytail has much to teach us

In the early 1900s, Chuck Mack of Craig, Colo., called them “broom-tails” because “...you could get a firm grip on their bony tail.” Chuck and other old-timers used to catch these fish in the Upper Colorado River Basin along with Colorado pikeminnow and suckers. Some people used them for food. Others, like Lyndon Grant of Palisade, Colo., found them too bony to eat. He called them “bush trout” because he tossed them into the bushes near the river.

Today, fish biologists call them “bonytail” because of their long slender tail trunk, and they classify them as *Gila elegans*, a fancy name that describes the fish as an elegant swimmer and member of the “chub” group of minnows. Like the humpback chub, bonytail are minnows, despite the fact that they can grow up to 22 inches long.

So why the big fuss about an overgrown minnow that is probably too bony to eat and typically got tossed into the bushes? The bonytail is like the canary in the coal mine — it is one of a number of indicators of the health of the Colorado River. It is also a unique species with extraordinary ability to survive one of the muddiest, saltiest and most violent rivers in North America. The bonytail, like the humpback chub, has uncanny senses to locate food in a dark, muddy river by detecting and honing in on the minute vibrations of a struggling insect.

Today, the bonytail is among North America’s most endangered fish species. Its distribution and numbers are so low that it is threatened with extinction. In 1980, the bonytail

became listed as “endangered” under the ESA.

The last significant numbers of bonytail caught in the upper basin were in the Green River shortly before and after the closure of Flaming Gorge Dam, including 67 from 1964 to 1966, and 36 from 1967 to 1973. Since 1982, only seven confirmed wild bonytail have been caught in the upper basin.

“If it were not for the stark example provided by the passenger pigeon, such rapid disappearance of a species once so abundant would be almost beyond belief,” observed Colorado State University Fishery Biologist Bob Behnke, an early expert on the endangered fishes.

Recognizing that fewer bonytail were being seen in the Colorado River and no young, biologists captured 34 adults from Lake Mohave from 1976 to 1988, and 16 from 1988 to 1989. These fish have been held in fish hatcheries.

Today, the young of these Lake Mohave fish, and the few remaining adults in hatcheries and in the wild, make up the entire known population of bonytail in the world. Thanks to new and innovative culture techniques and facilities, there are enough brood fish in hatcheries to produce young fish for release back to the wild.

The Recovery Program has been working for years to refine hatchery culture of the bonytail and to improve its habitat to return this unique, imperiled fish to its historic home. The principal brood stock is being held at the U.S. Fish and Wildlife Service’s Dexter National Fish Hatchery near Roswell, N.M. Young produced from Dexter are moved to several locations for rearing and release into the upper basin, including the Wahweap Fish Hatchery and the J. W. Mumma Native Aquatic Species Restoration Facility.

From 1996 to 2003, the Recovery Program released more than 280,000 bonytail into the Upper Colorado, Green and Yampa rivers. Biologists are finding increasing numbers of bonytail from these releases as a good sign that the fish are surviving and doing well in the wild.

Capturing these bonytail is doubly good news! First, these fish have been in the wild for up to five years and they provide valuable information to the Recovery Program regarding the best size and locations of release. Even better news is that most of these fish have reached the size of maturity. The next exciting news will be reports of young bonytail in the upper basin as the best sign that Recovery Program efforts are working to bring this most endangered — and unique — fish back from the brink of extinction. ➤

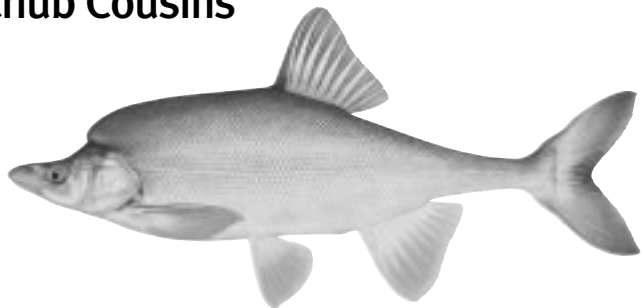
Editor’s note: Rich Valdez is a leading expert in the ecology of endangered fishes with more than 30 years of experience working with fishes of North America. He was named the Recovery Program’s Outstanding Researcher of the Year in 2002.



THE AUTHOR, RICH VALDEZ, AND CO-WORKER KARA HILWIG ELECTROFISH WITH A BACKPACK SHOCKER IN BACKWATERS AS THEY CONDUCT RESEARCH ON ENDANGERED FISHES.

SWCA ENVIRONMENTAL CONSULTANTS

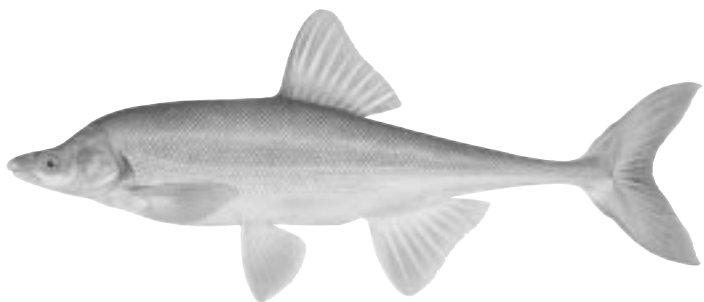
Chub Cousins



© COPYRIGHT JOSEPH R. TOMELLER

Humpback Chub (*Gila cypha*)

- A minnow that lives secluded in the deep, swift water of steep-walled canyons
- Distinguished by an abrupt hump behind the head and large fins
- May reach 20 inches in length and can live 30 years
- Eats insects, plankton and plant matter



Bonytail (*Gila elegans*)

- A minnow that is the rarest of the four endangered fish species in the Colorado River System
- Characterized by a streamlined body that becomes pencil-thin near its tail
- May reach 22 inches in length and can live up to 50 years
- Eats insects, plankton and plant matter

and early 1900s. It wasn’t until 1946 that Dr. Robert Rush Miller received specimens of what he called a “remarkable” new species from Grand Canyon.

Humpbacks had been with us all along, but were hidden by some serious whitewater in Grand Canyon, Cataract Canyon, Westwater Canyon,

Ute Tribe secures grant to support native fish recovery

Northeast Utah is home to the Ute Indian Tribe of the Uintah and Ouray Reservation which consists of almost four million acres that encompass numerous waterways including the Duchesne, Green and White rivers where Colorado pikeminnow and razorback sucker have swum for

millions of years. For the past five years, biologists with the Ute Indian Tribe Fish and Wildlife Department have helped the Upper Colorado River Endangered Fish Recovery Program conduct a variety of studies on tribal lands as part of efforts to recover these endangered fishes.

When the Tribe enters into a grant agreement with the U.S. Fish and Wildlife Service this fall, the Tribe will begin work to develop a native fish management plan and outreach program for further recovery of the endangered fishes and to protect another threatened native fish species — the Colorado River cutthroat trout.

The Ute Tribe project is among 23 tribal projects

nationwide to receive Tribal Landowners Incentive Program funds through the fiscal year 2003 Tribal wildlife grants program. The selection of the Ute program was announced in January. The Tribe will use \$40,000 of its own funds to garner \$120,000 in federal funds. The grant will help the Tribe further its goals to protect and enhance Tribal aquatic resources. It will also fulfill a Tribal admonition to honor and respect the Creator's cretures.

The Tribe's primary objectives are to establish a native fish management plan; supplement existing programs that provide for habitat protection and restoration; support recovery activities that benefit federally listed and proposed species and their habitat; and provide for Tribal and public awareness and support for native fish management activities.

"The native fish management plan will serve as a blueprint for activities and policies regarding Tribal management of all native fish species within Tribal jurisdiction," said Jay Groves, a fisheries biologist recently hired by the Tribe to coordinate this Tribal wildlife management effort. "We will also develop a Tribal policy statement regarding endangered fish for inclusion in the Tribal fishing proclamation."

Another important component of the Tribe's plans includes developing an education and outreach program for staff, Tribal members and the general public.

"Currently, support for the restoration of native fish among Tribal members is weak or nonexistent," said Everett Manning, director, Ute Tribe Fish and Wildlife Department. "The Tribe is committed to teaching its members the value and importance

of maintaining river habitat and healthy native fish populations."

On behalf of the Recovery Program, Utah Division of Wildlife Resources and U.S. Fish and Wildlife Service staff in Vernal, Utah, will continue to work closely with members of the Tribe to help them achieve their goals.

"We have enjoyed a good working relationship with the Tribe in the past and greatly appreciate their cooperation and assistance in recovering the endangered fishes," said Ralph Morgenweck, U.S. Fish and Wildlife Service regional director for the Mountain-Prairie Region and chairman of the Recovery Program's Implementation Committee. "Developing and implementing a native fish management plan on Tribal lands will add continuity to projects being conducted off reservation by the Recovery Program." ◀



FISHERY BIOLOGIST JAY GROVES (LEFT) WILL COORDINATE THE TRIBAL WILDLIFE MANAGEMENT GRANT WITH SUPPORT FROM DAVE IRVING, PROJECT LEADER, UTAH FISH AND WILDLIFE MANAGEMENT ASSISTANCE OFFICE.

Work group to implement Duchesne River flow recommendations

Colorado pikeminnow and razorback sucker in northeast Utah's lower Duchesne River are getting a helping hand from local water irrigation companies and state and federal agencies. Representatives are in the process of establishing a work group to implement flow recommendations approved this year by the U.S. Fish and Wildlife Service as required in a biological opinion the agency issued in 1998.

The recommendations call for summer base flows to sustain native fish populations. The group is working with the U.S. Geological Survey to install additional gauges to help identify current flows.

"It is important to our water users to work through the Recovery Program to recover the endangered fish," said Utah Department of Natural Resources Deputy Director Sherm Hoskins. "This can be accomplished through a cooperative work group of water users, Central Utah Water Project personnel, and state and federal agencies working together to find solutions."

Historically, the Duchesne River was one of the Green River's major

tributaries in terms of flow volume. Diversions occurred early in the development of the Uintah Basin. Following the establishment of the Ute Reservation in 1861, the U.S. Bureau of Reclamation promoted irrigation, and by 1899 at least 14 diversion canals had been constructed.

Homesteading began in the early 20th century and irrigation demands increased. Several irrigation companies secured water rights and began to divert water from the Duchesne River. Over a period of 50 years, numerous water diversion projects reduced flows and greatly altered the nature of the river.

"This group has demonstrated a willingness to work together to achieve the goal of implementing the recommended year-round flows within the next few years," said Larry Crist, assistant field supervisor for Utah endangered species at the U.S. Fish and Wildlife Service's office in Salt Lake City. "We appreciate their participation and willingness to consider a variety of options to make this happen."

For more information, contact Larry Crist, 801-975-3330, ext. 126, larry_crist@fws.gov. ◀

Colorado State University's Bestgen named outstanding researcher of the year

Colorado State University's Larval Fish Laboratory Director Kevin Bestgen is the Upper Colorado River Endangered Fish Recovery Program's Outstanding Researcher of the Year. Kevin is one of the foremost experts on native and endangered fish of the Southwest. For more than two decades, he has studied fish reproduction and ecology and the effects of regulated rivers and introduced species on native fish communities. His research has greatly increased biologists' understanding of habitat needs of the fish and contributed to development of flow recommendations.

"Kevin brings to the Recovery Program a tremendous background of integrity and experience," said last year's recipient, Doug Osmundson, U.S. Fish and Wildlife Service biologist, who presented the award. "Not only is Kevin an outstanding fish biologist and aquatic ecologist, but he has also become the biostatistician that many of us in the upper basin turn to for help.

"Kevin's colleagues are impressed with his level of professionalism, his hard work and perseverance at tackling questions, and his innovative way of looking at things differently and not accepting the standard answers."

Throughout his career, Kevin has worked to unravel the mysteries of what fish need to survive in desert rivers. His first work involved surveys of fish populations of the South Platte River and conservation of greenback cutthroat trout for the Colorado Division of Wildlife. Kevin also worked extensively in the American Southwest in the Gila,

Pecos, Rio Grande and San Juan rivers. His studies of endangered silvery minnow in the Rio Grande laid much of the foundation for today's understanding of that river system.

From 1986 to 1989, Kevin was associate curator of fishes for the Museum of Southwestern Biology and a research associate for the University of New Mexico. In 1989, he returned to the Larval Fish Lab where he has been director since 1997. He continues to conduct important research for the Recovery Program, including a recently completed study on the status of Colorado pikeminnow in the Green River Basin in Utah and Colorado.

Kevin has authored and co-authored over 50 technical reports and journal articles.

"Kevin's extensive knowledge of the Colorado River system and the endangered fishes has been crucial to helping us determine management actions that we hope will lead to their recovery," said Recovery Program Director Bob Muth. "He is a dedicated scientist who won't give up until he finds answers."



RESEARCHER OF THE YEAR KEVIN BESTGEN SORTS SMALL-BODIED, PREY-SIZED FISHES BY SPECIES IN THE YAMPA RIVER TO DETERMINE POPULATION RESPONSES TO THE RECOVERY PROGRAM'S NONNATIVE FISH MANAGEMENT ACTIONS.

Kevin was both surprised and humbled by his award.

"I have very much enjoyed working with the Recovery Program to conserve endangered fishes in the Upper Colorado River Basin," Kevin said. "Receiving the Researcher of the Year award was personally gratifying because it acknowledged that the Recovery Program and my peers considered the work of the Larval Fish Laboratory and myself as contributing to those conservation efforts." ◀

Editor's note: The Recovery Program presents this award each year to an individual who has demonstrated a longstanding commitment to the recovery of the endangered fishes and who has made significant contributions to understanding their biology and environmental needs.



GENE SHAWCROFT OF THE CENTRAL UTAH WATER CONSERVANCY DISTRICT (RIGHT) JOINED DUCHESNE RIVER COMMISSIONER JOHN SWASEY (CENTER) AND U.S. FISH AND WILDLIFE SERVICE CREW LEADER TIM MODDE TO INSPECT THE MYTON TOWNSITE DIVERSION ON THE DUCHESNE RIVER. HISTORICALLY, THIS DIVERSION HAS FUNCTIONED AS A DRY DAM WITH DOWNSTREAM WATER NEEDS BEING SUPPLIED BY RETURN FLOWS. TO SUPPLY FLOWS FOR ENDANGERED FISH RECOVERY PURPOSES, THE DIVERSION WILL BE MODIFIED SO THAT FLOWS PASSED DOWNSTREAM CAN BE MEASURED AND ACCOUNTED FOR.

Yampa River continued from page 1

Farther downstream in the Yampa River, Colorado State University and Colorado Division of Wildlife biologists conducted similar efforts between Craig, Colo., and Dinosaur National Monument. They transferred northern pike to Yampa State Wildlife Area and Loudy-Simpson ponds and to Rio Blanco Reservoir. Smallmouth bass were transferred to Elkhead Reservoir.

Data entered by these teams are compiled to give an overall picture of the northern pike and smallmouth bass populations, including scientific population estimates, which previously have not been available to the Recovery Program. This type of inter-agency cooperation has been critical to the program's increased success in recent years. Biologists also tag, record and release native fish to form population estimates for the native species as well as the nonnative, invasive species.

"The Yampa River is like an outdoor laboratory for us because we have come to know it so well through many years of research," Recovery Program Director Bob Muth said. "We can use what we learn in that river system about how endangered and other native fish are responding to our nonnative fish management efforts as guidance in other river systems."

Sam said he feels strongly that removing northern pike from the



MICK CALDWELL NETS A NORTHERN PIKE IN THE YAMPA RIVER WHILE CHRIS SMITH (LEFT) AND FRANK PFEIFER LOOK ON. THE BALL AT THE FRONT OF THE BOAT EMITS A SMALL ELECTRIC CHARGE THAT TEMPORARILY STUNS FISH SO THE U.S. FISH AND WILDLIFE SERVICE CREW CAN CATCH THEM AS PART OF A NONNATIVE FISH MANAGEMENT EFFORT.

Yampa River and relocating them to local fishing ponds produces positive results for both the river and the community. The native endangered fish are given a much better chance at survival which, in turn, will create a more natural river system.

At the same time, what Sam calls the "joy of catching and eating the northern pike" is also preserved for many local fishermen. Because private property limits public access to the river, more members of the community are able to fish for northern pike in the ponds at the Yampa River State Wildlife Area, which are open to the public. Fishing in ponds often appeals to families with children,

such as the Monahans, because it is safer than fishing on riverbanks.

"You're making his day!" Dillon's mother, Janis, tells Sam, as they watch him unload northern pike after northern pike from the oxygenated cooler in his truck into the ponds. What Dillon doesn't know is that his excitement has made Sam's day as well.

Editor's note: The Nature Conservancy's Carpenter Ranch is a historic, working ranch located adjacent to the Yampa River just east of Hayden, Colo. The ranch provides the Recovery Program with access to its lands and conducts public education about the importance of restoring the Yampa River to sustain native fish populations.

Recovery program partners develop landmark policy

In spring 2004, Recovery Program partners adopted a policy to identify and implement nonnative fish management actions needed to recover the endangered fish.

"This was a landmark event because it clearly demonstrates that these diverse organizations recognize that management of nonnative fish is essential to achieve and sustain recovery of the endangered fishes," said U.S. Fish and Wildlife Service Mountain-Prairie Regional Director Ralph Morgenweck, who also chairs the Recovery Program's Implementation Committee. "The policy also recognizes the dual responsibilities of state and federal fish and wildlife agencies to conserve listed and other native fish species while providing recreational sportfishing opportunities."

Utah's first annual Wildlife and River Festival fun for all

Colton Lee, 4, and his family learned about endangered fish from U.S. Fish and Wildlife Service Biologist Tim Modde at the first annual Utah Wildlife and River Festival in Vernal, Utah. The three-day event offered

many activities including birding and bighorn sheep tours, hiking and river running trips, displays of historic and modern river boats, Indian culture education, a duck derby and a Dutch oven cooking contest. Next year's festival will be held June 10-12, 2005.



Recovery Program news and updates



Fish barrier replaced at Highline Lake

A unique barrier net system designed to keep endangered and nonnative fish apart will be replaced by year's end at Highline Lake State Park in western Colorado. Originally installed in 1999, the net deteriorated from exposure to water and sun. The new net will be made of the same material — a high-molecular weight polyethylene used to make bulletproof vests and high-strength fishing line.

The net prevents sportfish stocked into the lake from escaping through the spillway into the Colorado River where they could threaten the survival of endangered fish.

The Recovery Program is funding the \$100,000 net replacement to ensure that sportfishing opportunities continue. This is a cooperative project with Colorado State Parks and the Colorado Division of Wildlife.



Yampa plan proposes Elkhead Reservoir expansion

The Recovery Program has agreed to fund a portion of a proposed 12,000 acre-foot enlargement of Elkhead Reservoir in northwest Colorado, as recommended in the recently completed *Management Plan for Endangered Fishes in the Yampa River Basin*. The expansion would make 7,000 acre-feet of water available to augment late-summer flows in the Yampa River for endangered fish and to sustain future growth in the Yampa Valley.

If the Recovery Program and the Colorado River Water Conservation District agree to proceed with the project, expansion is expected to begin next year and be completed in 2007.

For more information, contact Debbie Felker, 303-969-7322, ext. 227, debbie_felker@fws.gov.



Redlands fish screen contract awarded

The U.S. Bureau of Reclamation awarded a \$5 million contract this fall to Kissner G.C., Inc. of Cedaredge, Colo., to construct a fish screen in the Redlands Power Canal, below the Redlands Diversion Dam on the Gunnison River near Grand Junction, Colo. The screen will prevent endangered and other native fish from entering the canal where they could be injured or killed.

Construction of the V-type fish screen will begin this fall with major portions to be completed by April 1, 2005. Completion is scheduled by July 29, 2005. Construction will be limited to before and after the irrigation season to avoid impacting deliveries and to take advantage of low river flows. For more information, contact Justyn Hock, 970-248-0625, jhock@uc.usbr.gov.



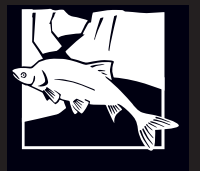
Razorback suckers swim near prehistoric bones and fossils

Razorback suckers are swimming in a new 150-gallon aquarium next to 150 million-year-old dinosaur bones and fossils in Dinosaur National Monument's visitor center. The historic fish add a new dimension to the interpretive messages the monument provides.

"The endangered fish are indicator species that tell us we could see extinctions of native species in the future," said Chief Interpreter David Whitman. The monument worked with the Recovery Program to establish the aquarium. The Ouray National Fish Hatchery provided the fish.

"It's important that people have an opportunity to see this rare fish," David said. "It is much more meaningful than just seeing a picture or a model."

swimming upstream



Upper Colorado River
Endangered Fish Recovery Program

Swimming Upstream is a publication of the Upper Colorado River Endangered Fish Recovery Program. The Recovery Program is a cooperative program involving federal and state agencies, environmental groups and water and power-user organizations in Colorado, Utah and Wyoming. Its purpose is to recover endangered fish while water development proceeds in accordance with federal and state laws and interstate compacts. The four endangered fish species are humpback chub, bonytail, Colorado pikeminnow and razorback sucker.

Robert T. Muth
Program Director

Debra B. Felker
Editor

Program Partners

Colorado River Energy Distributors Association
Colorado Water Congress
National Park Service
State of Colorado
State of Utah
State of Wyoming
The Nature Conservancy
U.S. Bureau of Reclamation
U.S. Fish and Wildlife Service
Utah Water Users Association
Western Area Power Administration
Western Resource Advocates
Wyoming Water Association

Upper Colorado River
Endangered Fish Recovery Program
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC
Lakewood, CO 80225
(303) 969-7322
(303) 969-7327 - Fax
ColoradoRiverRecovery.fws.gov



RAZORBACK SUCKER

© COPYRIGHT JOSEPH R. TOMELLER



Grand Valley Audubon Society helps restore river habitat

Program director's message

By Bob Muth

The Colorado River has been called the "Lifeline of the American Southwest." It begins in the Never Summer mountain range of Rocky Mountain National Park in Colorado and travels 1,400 miles to the Sea of Cortez in Mexico. Along its descent, the river swells with tributary runoff and is transformed from a cold, clear trout stream to a warm, sediment-rich, turbulent environment. The tremendous power of the Colorado River carves spectacular sandstone canyons, including the Grand Canyon in Arizona.

The river has unique communities of native plants and animals that are adapted to dramatic seasonal and annual differences in river flows. There are 35 remaining species of native fishes that share their home with about 70 species of introduced nonnative fishes. Millions of people in the West also rely on the Colorado River for drinking and irrigation water, recreation and electricity. In fact, the Colorado River now supplies more water for consumptive use than any other river in the United States. These basic vital statistics generally describe the river system and illustrate the challenges of recovering the endangered fishes.

I have had the privilege of working on recovery and conservation of endangered and other native fishes in the Upper Colorado River Basin in Utah, Colorado and Wyoming for over two decades. I can personally attest to the fact that it is a highly complex river system with vastly varying habitat. As a system driven largely by snowmelt runoff, river flows swing widely within and between years. The water is turbid and muddy which can make it difficult to work in, yet the river traverses some of the country's most scenic landscapes. In essence, the river is a truly magnificent and wondrous resource deserving of our best efforts to preserve and protect.

Over time, I have seen many changes but perhaps none have been as dramatic as those in recent years related to ongoing drought and the associated rise in numbers of certain nonnative fishes. We do not know what long-term effects these two combined factors may have on endangered fish populations. Preliminary data reported at the August 2004 workshop on population estimates for Colorado pikeminnow and humpback chub show recent downward trends in numbers of adult fish in some areas. Results are still being studied, but this is certainly a concern that we are paying close attention to. We are moving forward to better understand population dynamics and influencing factors, and to take appropriate management actions.

Although this was not the type of news we like to hear, we are confident in the knowledge that the Recovery Program partners will continue to work cooperatively and actively to find solutions to conserve and share limited water resources and to manage nonnative fish populations. The Recovery Program takes pride in its ability to develop and use new information to adjust overall management strategies and focus specific projects. You will read in this issue of *Swimming Upstream* about some of those types of projects undertaken in 2004.

Unfortunately, space does not allow us to provide details of all of the accomplishments that have occurred this past year. We would like to tell you about other efforts related to studying and improving river habitat, raising and stocking endangered fishes, and preparing environmental impact statements for operation of Utah's Flaming Gorge Dam on the Green River and Colorado's Aspinall Unit on the Gunnison River, as well as many other projects. There are literally hundreds of people involved with the Recovery Program who continue to work diligently to solve the puzzle of recovery.

Looking ahead to next year, we anticipate continued challenges brought about by the effects of Mother Nature and the complexity of the Upper Colorado River Basin. At the same time, we remain committed to using the best science available as we continue to work toward recovery of the endangered fishes.



COLORADO PIKEMINNOW

© COPYRIGHT JOSEPH R. TOMELLER

Birds, fish and mammals will reap the benefits of restored river habitat thanks to a cooperative effort between the Grand Valley Audubon Society and the Upper Colorado River Endangered Fish Recovery Program. The Audubon Society granted the Recovery Program an easement to 25.67 acres of the Audubon's Lucy Ferril Ela Wildlife Sanctuary along the Colorado River in Grand Junction, Colo.

The easement includes several interconnected ponds that, until now, were separated from the river by a levee built to keep the river from flooding. The levee disrupted the river's ability to flow through a natural floodplain wetland that historically provided important nursery habitat for razorback suckers.

In August, this problem was solved when U.S. Bureau of Reclamation work crews constructed a 50-foot notch in the levee that will allow a portion of the Colorado River to flow through the ponds nearly every year during spring runoff. Razorback sucker larvae float down the river during that time of year, and some are expected to drift into the ponds where they will have a chance to survive and grow until they are ready to return to the river to join the adult fish population.

"This easement is very important to the recovery of the endangered razorback sucker," said Recovery Program Habitat Coordinator Pat Nelson. "Without these types of habitats, razorback sucker larvae are not able to survive. The Ela Sanctuary ponds will provide larval nursery habitat that may help achieve and sustain recovery of the razorback sucker."

Endangered fish aren't the only beneficiaries of this project. The restored river habitat will improve sources of food and shelter for other species common to the area such as great blue herons, ducks, geese, migratory birds, river otters and raccoons.

"The Audubon Society is pleased to have this opportunity to work with the Recovery Program to further our mission of environmental education," said Grand Valley Audubon Society Nature Center Chairman Bob Wilson. "We hold classes for about 1,500 fifth-graders each year. This type of project teaches them the importance of restoring balance in nature and the value of working together to achieve mutual goals."

As noted in its mission statement, Grand Valley Audubon believes stewardship of the natural world begins with awareness, understanding and appreciation of birds and other wildlife species, their habitats and their connection to people.



AL PFISTER, U.S. FISH AND WILDLIFE SERVICE

GRAND VALLEY AUDUBON SOCIETY PRESIDENT STEVE WATSON (LEFT) MEETS WITH U.S. BUREAU OF RECLAMATION ENGINEERING EQUIPMENT OPERATOR RICK SWEAT (MIDDLE) AND AUDUBON NATURE CENTER CHAIR BOB WILSON TO REVIEW A BLUEPRINT SHOWING THE CONSTRUCTION SITE FOR A 50-FOOT NOTCH THAT WILL RECONNECT THE COLORADO RIVER WITH PONDS AT THE AUDUBON'S LUCY FERRIL ELA WILDLIFE SANCTUARY.

In memory

Ouray National Fish Hatchery Biological Technician Tom Hatch died Nov. 22, 2003, after a brief battle with cancer. Tom worked for the Colorado River Fishery Project in Vernal, Utah, from 1989-1997 and then transferred to the Ouray National Fish Hatchery. His contributions to recovery of the endangered Colorado River fishes were invaluable. In particular, researchers relied upon Tom's vast knowledge of the Yampa and Green river systems that he gained during years as a professional river guide for Hatch River Expeditions, his family's business. He was also an excellent boatman and he taught many of his coworkers how to maneuver boats and rafts in whitewater situations. Tom was a man with a big heart who is greatly missed.



U.S. FISH AND WILDLIFE SERVICE

Fish passage provides access to river habitat blocked for nearly a century

Nearly a century ago, one of the nation's largest irrigation projects was completed to provide water to cultivate 50,000 acres in the Grand Valley on Colorado's western slope. The unusual, concrete roller dam is 15 feet high and spans 546 feet across the Colorado River in Debeque Canyon about eight miles east of Palisade, Colo. The level of the river behind the Grand Valley Project Diversion Dam, also known as the Roller Dam, is controlled by raising or lowering large steel cylinders, called rollers.

Unique in design, the Roller Dam is modeled after an experimental German design. According to an article in the *Grand Valley Gazette**, the rollers were fabricated in Germany under the direction of engineers in that country familiar with the necessary specifications. The German vessel carrying those vital parts to the United States met an untimely fate at the hands of a British warship. The German ship — and the rollers for the dam — ended up on the bottom of the Atlantic Ocean. New rollers were fabricated in the U.S. and the dam was completed in 1916.

Until this year, the dam consisted of six roller gates, each 70 feet long by 10 feet in diameter, and one sluiceway



THE NEW FISH PASSAGE UNDER CONSTRUCTION IN MAY 2004.

that is 60 feet wide with a roller gate that is 15 feet high. Each gate operates independently with a massive cog and chain drive system to control the amount of water that passes over the dam.

This year, the roller located next to Interstate 70 was raised and a 12-foot-wide notch was cut in the dam's concrete crest to facilitate construction of a 373-foot-long concrete fish passage. It took nine months and 2,800 cubic yards of concrete (enough to fill 350 concrete trucks) to construct the passage, the largest of its type in the Colorado River Basin. The Upper Colorado River Endangered Fish

Recovery Program funded the \$4.5 million construction project.

The fish passage is a cooperative effort of the Grand Valley Water Users Association and the Recovery Program. The U.S. Bureau of Reclamation designed and oversaw construction. The U.S. Fish and Wildlife Service will operate the ladder.

The fish passage will become fully operational once a fish passage is completed at the Price-Stubb Diversion Dam five miles downstream. Construction is scheduled to begin in winter 2005 with completion in spring 2006.

At that time, endangered fish will regain access to 56 miles of critical habitat that has been blocked for nearly a century. This habitat is needed to help them establish self-sustaining populations.

"Floodplain and riparian habitat upstream of the roller dam is more natural. It hasn't been as affected by the growth and development that has occurred downstream," said Recovery Program Director Bob Muth. "This is evidenced by the apparently healthy populations of other native fish species that live above the dam."

Through research, biologists know that the endangered Colorado pikeminnow and razorback sucker

migrate from 50 to 200 miles a year. This natural migration likely led these species to swim downstream over the dam in search of food and spawning sites. Once this happened, they were trapped below the dam and could not return to their original home. That is when biologists found that the numbers of endangered fish above the dam had decreased dramatically.

"When this ladder becomes operational, we expect to see the endangered fish return to their natural migration pattern," Bob said. "They will be able to move up and down the river as they did in the past."

The Grand Valley Project Diversion Dam is part of the larger Grand Valley Project that was approved by President William Howard Taft in 1911 to serve water needs of a growing population. Construction began in 1912 and the first irrigation water was provided on June 29, 1915, at which time the entire project was less than 60 percent completed.

The Grand Valley Project is a unique water delivery system that provides irrigation water for the Grand Valley Water Users' Association and the Orchard Mesa, Mesa County and Palisade irrigation districts and a hydroelectric power plant. The project includes the dam which diverts irrigation water from the Colorado River, a power plant, two pumping plants, two canal systems totaling 91 miles, 166 miles of laterals and 113 miles of drains. Laterals deliver water from the main canals directly to the intended recipients. Drains return unused water back to the river.

"The vitality of the entire Grand Valley remains dependent on the continued successful operation of the Roller Dam and of the Grand Valley Project," said Dick Proctor, manager, Grand Valley Water Users' Association.

This year's fish passage construction is only one of several other water-related construction projects the Recovery Program has put in place during the past several years in cooperation with water users in the Grand Valley. One example was the installation of canal checks in the Grand Valley Project Government Highline Canal that helped reduce irrigation diversions from the Colorado River by 31,000 acre-feet of water in 2003.

"The seven new canal check structures that the Recovery Program put in place to benefit endangered fish have also helped the water users," Dick said. "The canal checks are a good example of where the water saved since they were installed has helped us all get through the past several years of extreme drought."

For more information, contact Justyn Hock, Bureau of Reclamation, 970-248-0625, jhock@uc.usbr.gov.

**Grand Valley Gazette—A Journal of Mesa County History*, Issue 3, November, December, January 1975-76.



THE GRAND VALLEY PROJECT DIVERSION DAM WAS COMPLETED IN 1916.



THE COLORADO RIVER AS IT WAS IN THE EARLY 1900S WHEN DAM CONSTRUCTION BEGAN.

swimming upstream



Upper Colorado River Endangered Fish Recovery Program

U.S. Fish and Wildlife Service
P.O. Box 25486, Denver Federal Center
Denver, Colorado 80225