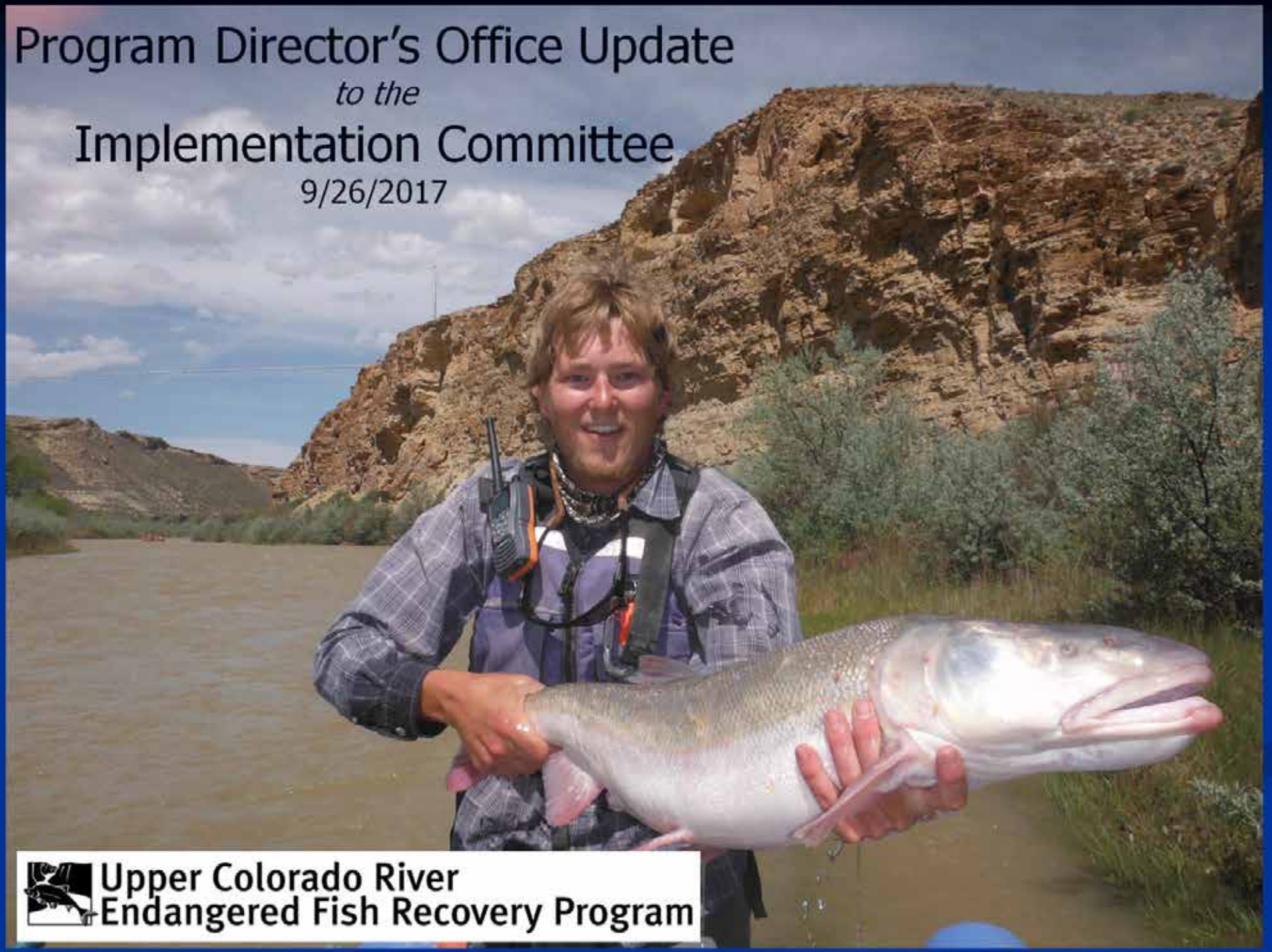
Program Director's Office Update

to the

Implementation Committee

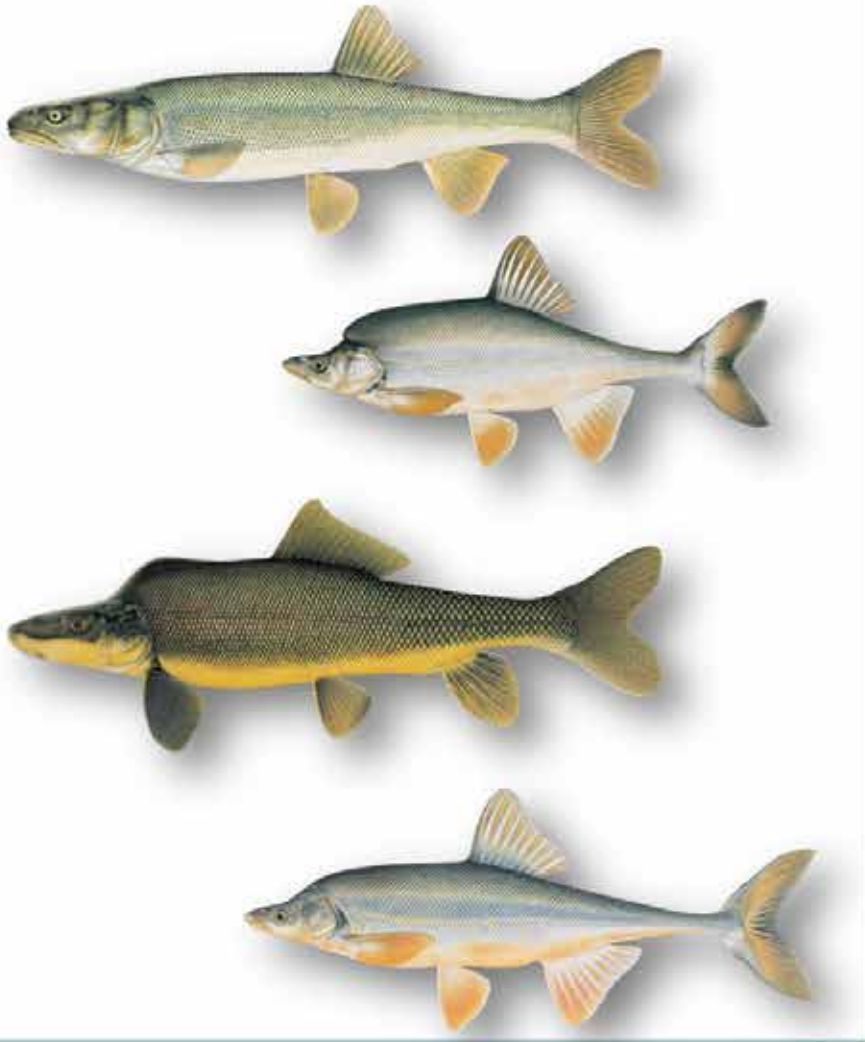
9/26/2017



Upper Colorado River
Endangered Fish Recovery Program

Upper Colorado River Endangered Fish Recovery Program

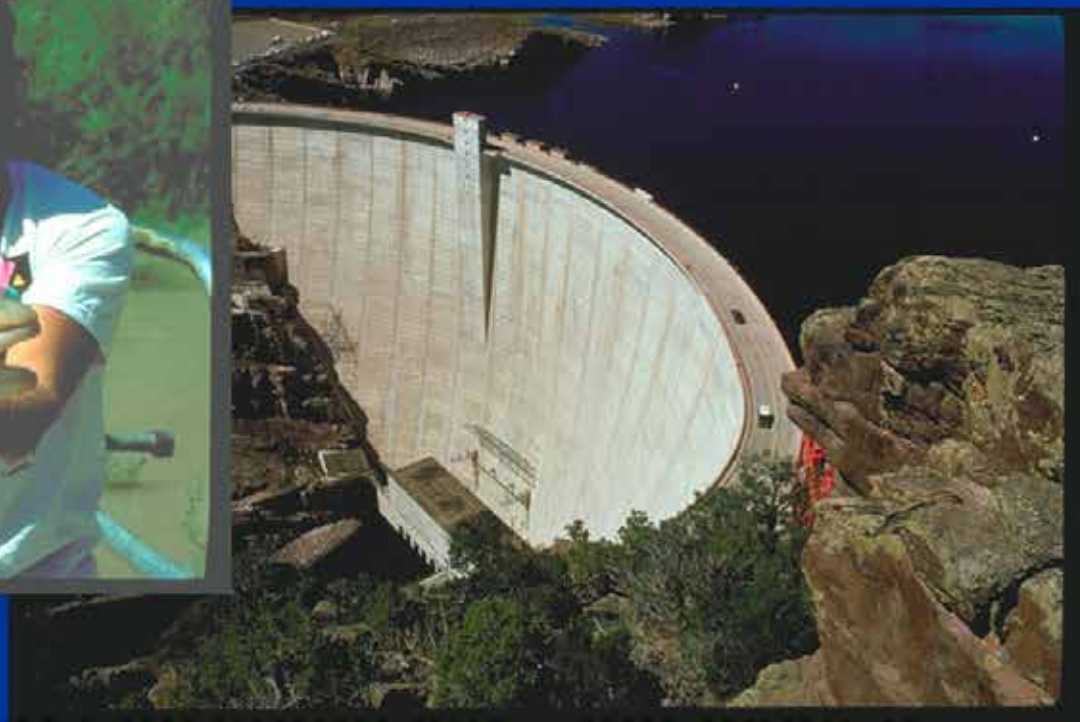
- Established in 1988
- Partners
  - State of Colorado
  - State of Utah
  - State of Wyoming
  - Bureau of Reclamation
  - Colorado River Energy Distributors Association
  - Colorado Water Congress
  - National Park Service
  - The Nature Conservancy
  - U.S. Fish and Wildlife Service
  - Utah Water Users Association
  - Western Area Power Administration
  - Western Resource Advocates
  - Wyoming Water Association



Fish Illustrations by Joe Tomelleri

Recovery Program Goal

Recover the endangered fish as water development proceeds in compliance with the Endangered Species Act, state water law, interstate compacts, and federal trust responsibilities to tribes.



Recovery Program Provides ESA compliance for Historic and New Water Depletion Projects

Summary of Endangered Species Act Section 7 Consultations (1/1988 through 12/31/2016)				
State	Number of Projects	Historic Depletions (Acre-Feet/Yr)	New Depletions (Acre-Feet/Yr)	Total Depletions (Acre-Feet/Yr)
Colorado	1224	1,915,682	207,195	2,122,877
Utah	250	517,898	97,622	615,520
Wyoming	410	83,498	36,013	119,511
Regional*	238	(regional)	(regional)	0
Total	**2,122**	2,517,078	340,830	**2,857,908**

* Amount included in individual state's new depletions

Upper Colorado Program Cash Funding

1988-2017

Partner	Total (millions)	Percent
Power Revenues Base Funding	**$96.3**	**31%**
Congressional Appropriations	**$130.9**	**41%**
States: Colorado, Wyoming, Utah	**$33.6**	**11%**
Water Users	**$36.7**	**12%**
Power Customers: Capital Funding	**$17.0**	**5%**
Total Partner Cash Contributions	**$314.5**	**100%**
Does not include non-cash costs/contributions by Reclamation/power customers: $65.0 M		

Program Actions

Recovery Elements

- Information and Education
- Habitat and Flow Management
- Habitat Restoration
- Nonnative Fish Management
- Database Management
- Propagation and Genetics
- Research and Monitoring

Upper Colorado River Endangered Fish Recovery Program

Public Involvement and Outreach Progress Report

San Juan River Basin Recovery Implementation Program

Upper Colorado River Endangered Fish Recovery Program

Education

San Juan River Basin Recovery Implementation Program

Kiss a Sucker Program in Colorado (CPW) and Utah (USFWS)

4th Grade Education Program in Northeastern Utah (UDWR)

Upper Colorado River Endangered Fish Recovery Program

Increase Public Awareness and Support

San Juan River Basin Recovery Implementation Program

U.S. Fish and Wildlife Service

News Release

Public Affairs Office
PO Box 1306
Albuquerque, NM 87103
505-248-6911
505-248-7401 (Fax)
505-248-7401 (Fax)

Southwest Region (Arizona • New Mexico • Oklahoma •Texas) www.fws.gov/southwest/

FOR IMMEDIATE RELEASE July 10, 2017

Contacts: Sharon Whitmore, San Juan River Recovery Program Coordinator, USFWS 505-761-4753

Eliza Gilbert, San Juan River Recovery Program Biologist, USFWS 505-761-4746

Caption: One of 23 yearling endangered Colorado Pikeminnow captured by New Mexico Department of Game and Fish biologists in the San Juan River in 2016. This is only the second time ever that yearling fish have been captured the San Juan River. Photo Credit: New Mexico Department Game and Fish

Endangered Colorado Pikeminnow Produce Young in Response to Increased San Juan River Flows

FARMINGTON, NM - In the spring of 2016, the San Juan River Recovery Implementation Program and Bureau of Reclamation released water from Navajo Dam to imitate spring snow melt. Endangered Colorado pikeminnow responded by producing young. Conditions in the river were so good for the young fish that they survived into the fall. Winters are hard for any animal but it appears those young fish also survived through winter 2017. This is the first time in 20 years that biologists have seen such a successful response to flows by Colorado pikeminnow.

Another release of water is occurring this spring and biologists hope Colorado pikeminnow will respond the same way they did in 2016.

We think of a minnow as being small, like the ones people use for bait when fishing. But the Colorado pikeminnow is big – growing up to six feet long historically -- and that is not a fisherman's tall tale. Humans used to eat this fish, calling it the "Salmon of the Southwest" and sold it as food during the mining years of the late 1800s.

This once common, long lived, and migratory species was the top native predator in the San Juan River. Today, few adults are captured and reproduction is rarely observed, much less survival of young.

In spring 2016, Navajo Reservoir, which feeds the San Juan River, had enough water to make a spring peak release possible. Released water met up with water from the Animas River. Downstream at Four Corners, the river experienced flows of 8,000 cubic feet per second for eight days. Typically, flows in the river hover closer 1,000 cfs at that spot.

Young-of-year Colorado pikeminnow captured on the San Juan River.

Press release from the San Juan office was picked up and an expanded article was published in the Farmington Daily Times.

In the Upper Basin, there have been several articles highlighting the problems of nonnative fish in the river system.

Upper Colorado River Endangered Fish Recovery Program

Increase Public Awareness and Support

San Juan River Basin Recovery Implementation Program

Public Outreach in Black Rocks on the Colorado River

Upper Colorado River Endangered Fish Recovery Program

Partners Working Together

San Juan River Basin Recovery Implementation Program

Bonytail Harvest at Wahweap Fish Hatchery

Utah Water Users Meeting

Upper Colorado River Endangered Fish Recovery Program

Partner Fishing Tournaments

San Juan River Basin Recovery Implementation Program

Colorado Parks and Wildlife's Ridgway Fishing Tournament removed over 2,000 smallmouth bass. The Elkhead Reservoir Fishing Classic had over 400 participants up from 57 the year before. Large cash prizes were given out and the tournament was deemed a success.

Wyoming Game and Fish sponsor two burbot tournaments at Flaming Gorge in January.

Upper Colorado River Endangered Fish Recovery Program

40 New Signs in the Field!

San Juan River Basin Recovery Implementation Program

Forty, 4' x 3' signs along the Green and Colorado Rivers in Utah

Upper Colorado River Endangered Fish Recovery Program

Information & Education Committee

San Juan River Basin Recovery Implementation Program

Your Water – Your Fish – Your Future

Your Water • Your Fish • Your Future

Grand Junction COLORADO

Upper Colorado River Endangered Fish Recovery Program

Water that supports your family also supports healthy rivers for plants, birds, and fish, including four endangered native fishes: bonytail, Colorado pikeminnow, humpback chub, and razorback sucker.

Colorado River

Razorback sucker

Colorado pikeminnow

Humpback chub

Bonytail

Found only in the Colorado River Basin, these four ancient species evolved over millions of years to live in a desert river system. These "dinosaurs of the river" are part of our western heritage and a critical part of the river ecology. Conserving these fish enhances the overall health of your rivers.

The City of Grand Junction has been an active partner in the Upper Colorado River Endangered Fish Recovery Program since its inception and supports this successful public and private partnership. The Recovery Program works together to bring these fish back from the brink of extinction and provides streamlined Endangered Species Act compliance so that water development can proceed as fish populations recover. Water development is important to Colorado's citizens, but it can change river flows and temperature, and block fish migration. The Recovery Program uses science and partnerships to manage those threats and support fish recovery in a way that minimizes impacts to water users. We and other Colorado River water users release water from reservoirs on the western slope to benefit Colorado River fish in times of low water, fish spawning, or other habitat needs. The biggest remaining obstacle to recovering the endangered fish is large numbers of predatory nonnative fish that now live in the river. The three most damaging nonnative species are smallmouth bass, northern pike, and walleye. These fish compete with and prey on the endangered fish. Colorado Parks and Wildlife (CPW) and the U.S. Fish and Wildlife Service manually remove these invasive, non-compatible fish from the river, but it's not enough. We also must halt illegal introduction of nonnative fish (people moving fish from reservoirs to the river or from reservoir to reservoir) and eliminate certain species from reservoirs to prevent them from spilling into the river. The Colorado River District led the Elkhead Reservoir Spillway Fish Barrier Net Project, completed in 2016. The Recovery Program and its partners have installed nets at other reservoir outlets on the western slope to prevent fish escapement. Nets are a temporary measure while CPW replaces non-compatible sport fisheries with compatible fish like trout, kokanee salmon, largemouth bass, wiper and tiger muskie (sterile hybrids), and triploid walleye (sterile fish). CPW also offers fishing tournaments at Elkhead Reservoir and Rideway Reservoir. Tournament anglers help remove non-compatible smallmouth bass, northern pike, and walleye.

Smallmouth bass with a native sucker in its mouth

The installation of the net at Elkhead Reservoir, 2016

You can help recover the endangered fish by taking home all the northern pike and smallmouth bass you catch, by participating in CPW's fishing tournaments, and by reporting illegal fish stocking. Your efforts to help native fish contribute to a healthy river system for the future. This means better water for all of us. For more information about the importance of the endangered fishes of the Colorado River, visit coloradoriverrecovery.org/Water-Users.html.

Fishing tournament participants, Elkhead Reservoir, 2017

To learn more about CPW's fishing regulations on the Colorado River, visit http://cpw.state.co.us/Documents/Rules/Regs/Brochure/fishing.pdf

keep

A message of conservation of Colorado River native fish and the obstacle of predatory nonnative fish in the upper Colorado River basin. The message is less program centric and more about actions needed to recover the fish and provide compatible sport fisheries. The water users have agreed to publish articles in a variety of formats. Aurora Water and the Colorado River District have been published. Grand Junction Water is due next with other water users to follow.

Upper Colorado River Endangered Fish Recovery Program

Public Events

San Juan River Basin Recovery Implementation Program

CRWUA Annual Meeting, December 2016

Colorado Water Congress Annual Meeting, January 2017

Utah Water Users Meeting, March 2017

Home and Garden Show, Vernal Utah, March 2017

Ute Water Festival, May 2017

Ouray National Fish Hatchery Open House, May, 2017

Endangered Species Day, Denver Aquarium, May 2017

State of the Yampa River, hosted by Friends of the Yampa, June 2017

Vernal 4th of July parade and Arts and Craft Show, July, 2017

Palisade Peach Festival, August 2017

Palisade Farmer's Market, August, 2017

Tour de' Vineyards, September, 2017

Upper Colorado River Endangered Fish Recovery Program

Live Exhibits of Endangered Fish

San Juan River Basin Recovery Implementation Program

Endangered Species Day

The Denver Aquarium has agreed to increase their signage to include conservation of native fish in the Colorado River. They are considering having classes for school age children on Colorado River native fish. We attend their Endangered Species Day activities and pass out educational materials to children.

Upper Colorado River Endangered Fish Recovery Program

Current & Future Exhibits of Endangered Fish

San Juan River Basin Recovery Implementation Program

Children's Nature Center,
Mesa Mall, Grand Junction, CO

Children's Nature Center is currently exhibiting 3 of the 4 endangered fish. They have several thousand visitors per month. We are providing I&E supplies, a Colorado pikeminnow cutout and fabric banners to hang from the ceiling to highlight the display.

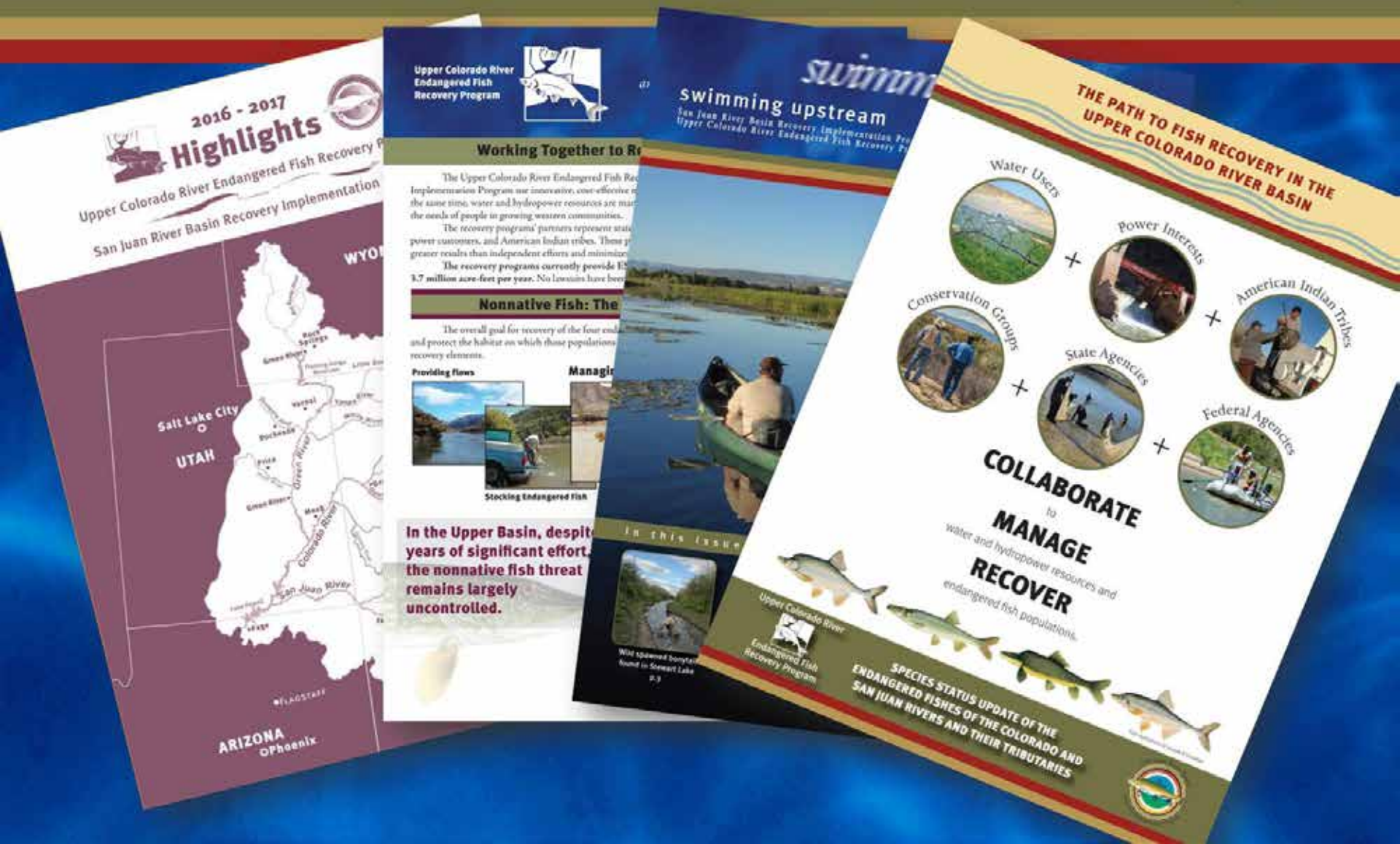
A future aquaculture facility at Palisade High School, Palisade, CO. is in the planning phase.

John McConnell Math and Science Center of Western Colorado will have a new facility at Colorado Mesa University. They will exhibit the Colorado River endangered fish. The facility is under construction.

Upper Colorado River Endangered Fish Recovery Program

Publications

San Juan River Basin Recovery Implementation Program



Upper Colorado River Endangered Fish Recovery Program

Educational Items

San Juan River Basin Recovery Implementation Program

Temporary Tattoos

Lapel Pins + Trading Cards

Paper Stickers

Ruler

Raft / Boat Beverage Holder

Vinyl Stickers

Recovery Elements

- Information and Education
- Habitat and Flow Management
- Habitat Restoration
- Nonnative Fish Management
- Database Management
- Propagation and Genetics
- Research and Monitoring

Hydrology and Instream Flow Updates

Upper Colorado River Endangered Fish Recovery Program

2017 Water Conditions

2017 was a year of feast and some famine, depending where in the basin you were …

Upper Green, Duschesne, and San Rafael Rivers had unusually high runoff

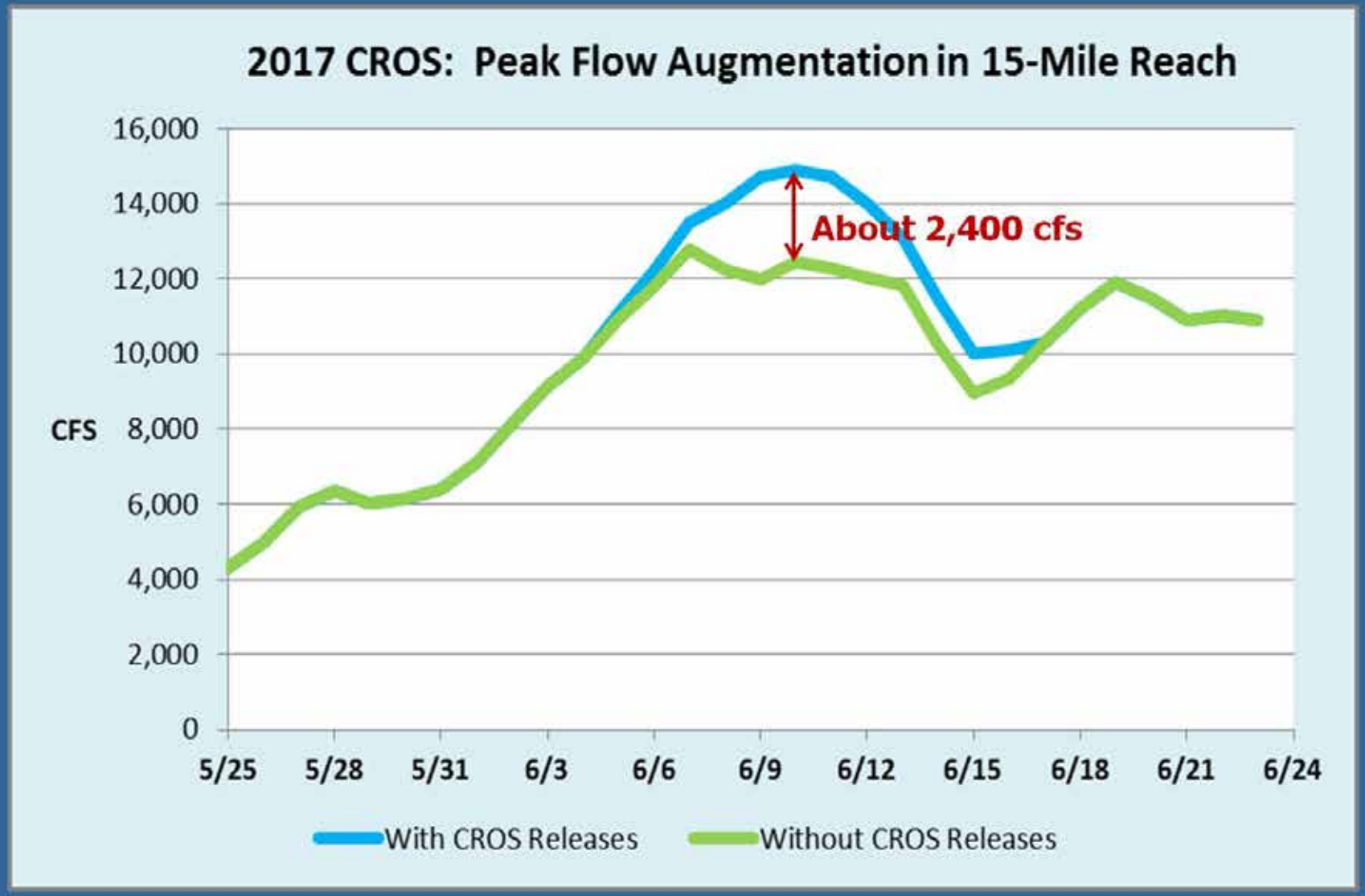
(Apr-Jul percent of 1981-2010 average)

Gunnison and Dolores Rivers had <u>above-average</u> runoff

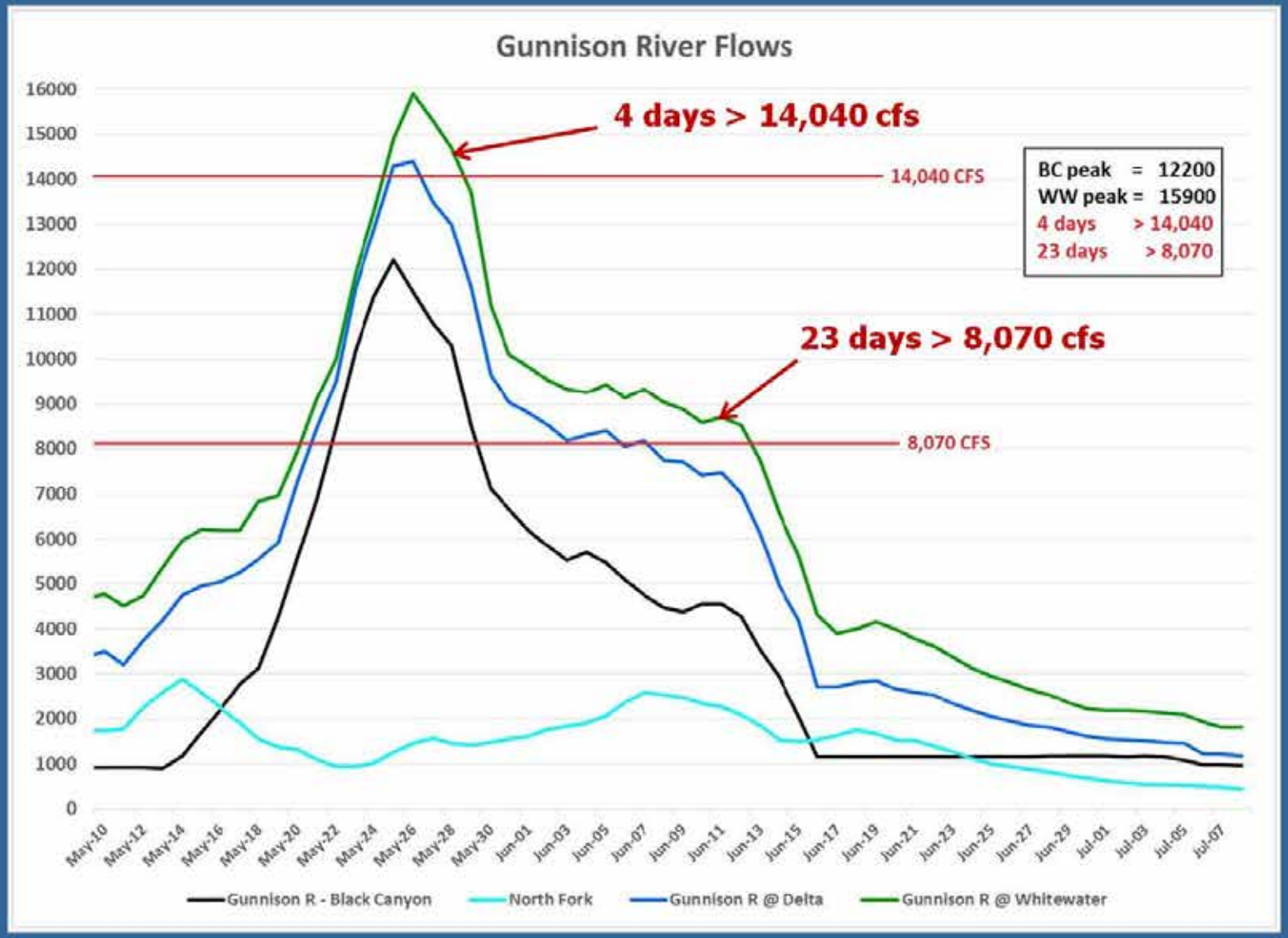
Yampa, White, and mainstem Colorado Rivers had below-average runoff

Some 2017 Accomplishments

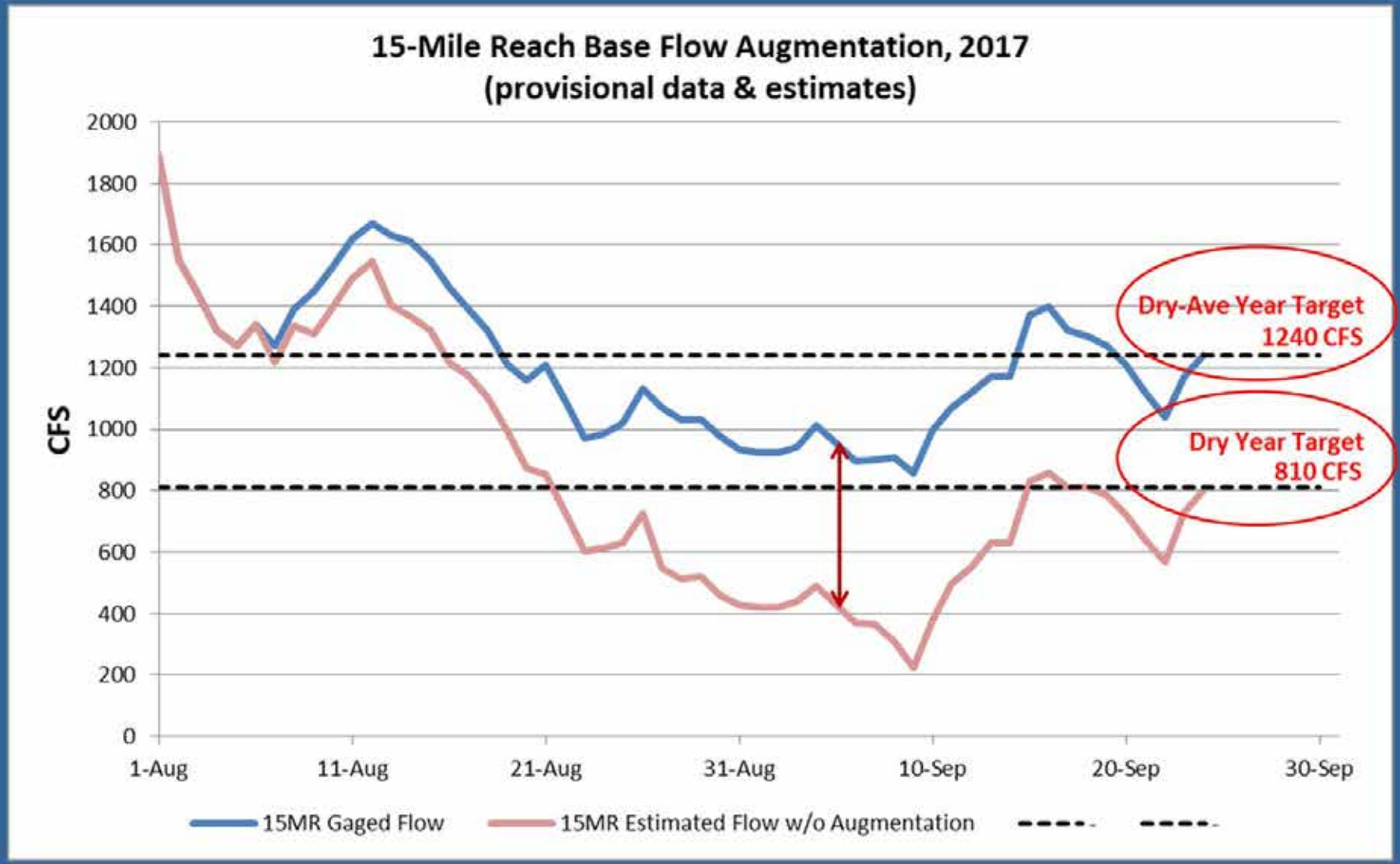
Peak flows in the 15-Mile Reach were successfully boosted for the third year in a row with CROS releases:



Also, peak flows in the lower Gunnison River were successfully boosted to meet & exceed peak flow targets, with Reclamation's well-timed flow augmentation from the Aspinall Unit:



Base flows are being substantially augmented to improve 15-Mile Reach flow conditions



Improved water management & irrigation efficiencies:

Mainstem Colorado River - **Orchard Mesa Irr Dist Reregulating Reservoir**

Program Capital Expenditure: $8.86 Million
Improvements will conserve up to 17,000 AF annually

(Photo Credit: ***Grand Junction Daily Sentinel***)

Improved water management & irrigation efficiencies:

Yampa River: **Maybell Irrigation District Diversion Controls**
Program Capital Contribution: $66,600 (32% of total cost)

Significant Challenges in the Coming Year

- Finalize the White River flow targets and Basin Management Plan
- Address coverage for projected new water development (new depletions) on the Green River, Utah, over the 'forseeable future'
- Coordinate with Yampa River Basin interests on long-term flow protection strategies, including re-visiting and possibly updating flow recommendations

Aspects that will Require Continued Management Beyond 2023

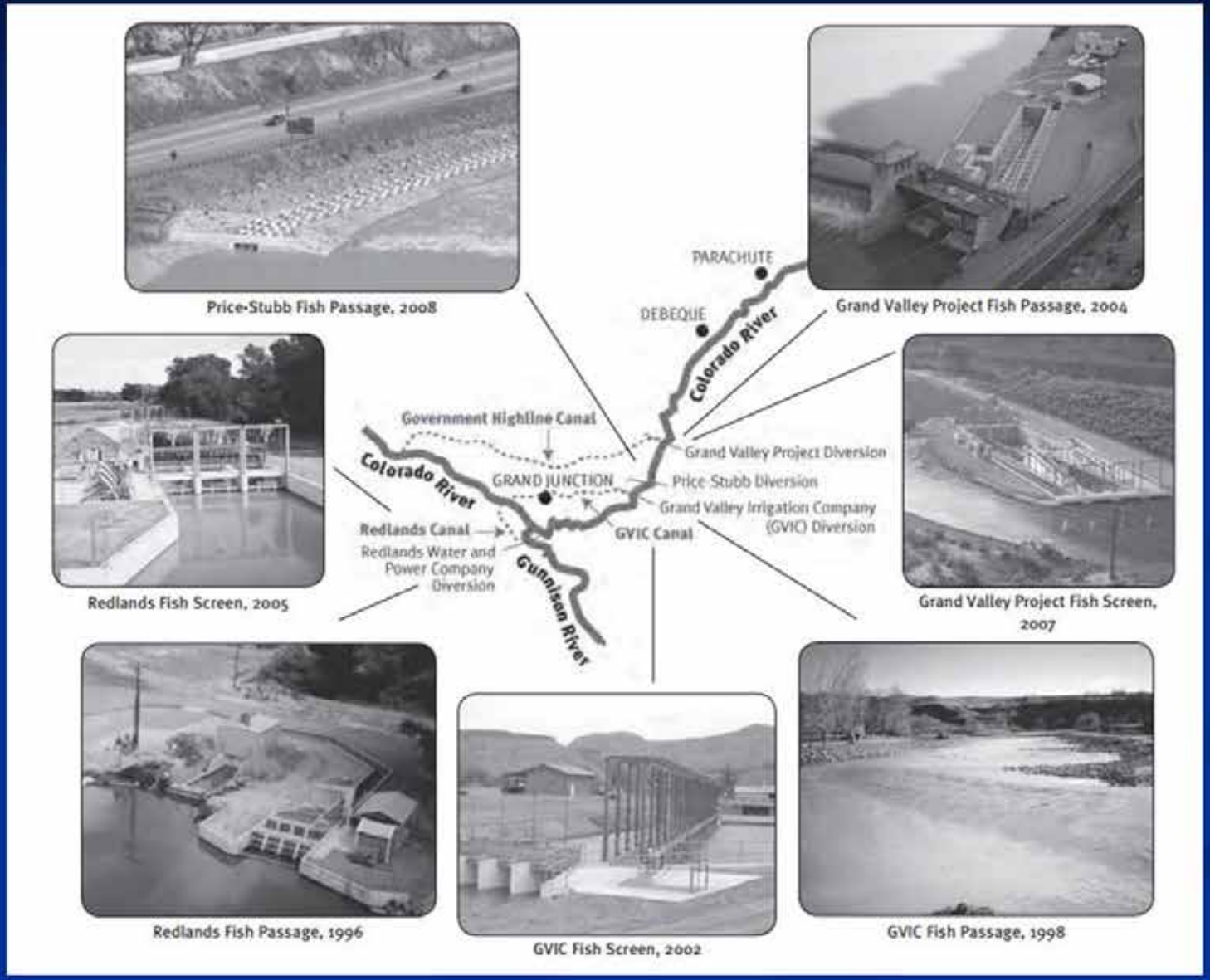
Long-term flow protection

- **This will likely involve a toolbox of various strategies, agreements, commitments and contracts, for example:**
  - **Additional in-stream flow rights(?)**
  - **Conservation agreements**
  - **New/renewed/extended/expanded water contracts or exchange agreements**
  - **Other creative solutions? (voluntary fallowing, deficit irrigation, temporary water leasing, water banking & exchange arrangements?)**

Recovery Elements

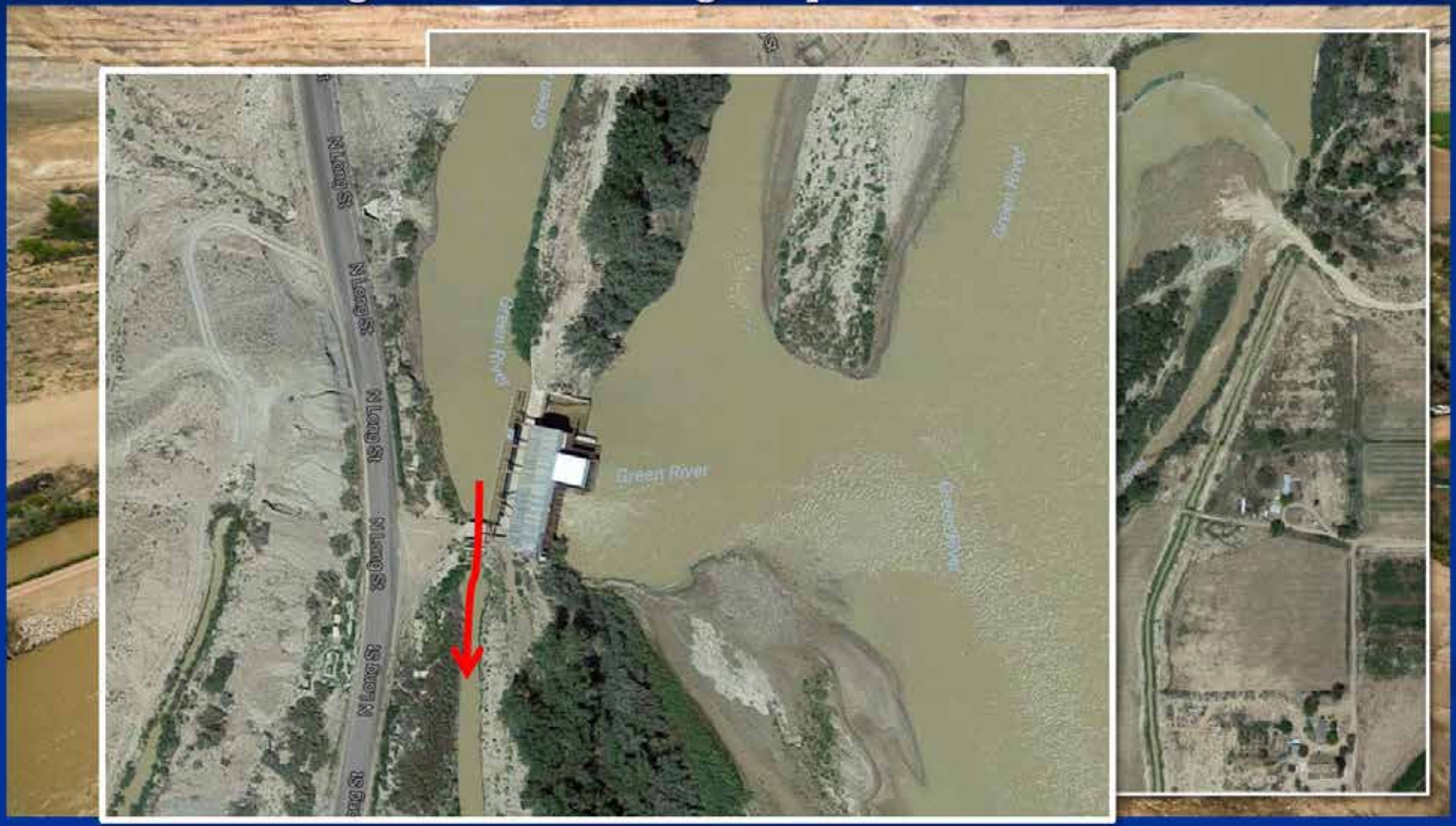
- Information and Education
- Habitat and Flow Management
- Habitat Restoration
- Nonnative Fish Management
- Database Management
- Propagation and Genetics
- Research and Monitoring

Habitat Restoration: Capital Projects to Reconnect Habitat and Reduce Entrainment



Tusher Diversion Rebuilt in 2016

Post 2018 Irrigation Season Program plans to address entrainment



Habitat Restoration: Floodplain Management

Proper Floodplain Management will entail:

- Water control gates on inlet channel
- Screens to exclude large bodied nonnative fish
- Ability to completely drain habitat at end of growing season
- Supplemental water to maintain summer water quality

Habitat Restoration: Post 2023

- **Irrig. Canal Screens** – current O&M (~$300K / yr) will likely need to continue in perpetuity
  - Screen replacement costs will be significant ($MM).
  - Funding sources for O&M and replacement unknown
  - End of season canal salvage - ??
- **Fish Ladders** – debris removal and mechanical repairs will be required. Current operation costs (~$150K / yr) could be reduced significantly if ladders operated non-selectively.
- **Managed Floodplains** – Intensive management of 5-6 wetlands could cost ~$250K / yr, but intensive management may not be needed long term.

Recovery Elements

- Information and Education
- Habitat and Flow Management
- Habitat Restoration
- Nonnative Fish Management
- Database Management
- Propagation and Genetics
- Research and Monitoring

Managing Predatory Nonnative Fish:

A Long Term Commitment for Endangered Species Recovery

Kevin McAbee

Nonnative Fish Coordinator

Upper Colorado River
Endangered Fish
Recovery Program

Three Focal Nonnative Fish

Northern pike *Esox lucius*

Smallmouth bass *Micropterus dolomieu*

Walleye *Sander vitreus*

These fish escaped from reservoir sources and established populations in river habitats.

Two-tiered Strategy

In-River

In-Reservoir


IN RIVER REMOVAL
SMALLMOUTH BASS
NORTHERN PIKE
WALLEYE
CHANNEL CATFISH
RESERVOIR SOURCES OF NONNATIVE FISH
CONTAINED
PARTIALLY CONTAINED
NOT CONTAINED
CANNOT BE CONTAINED
Big Sandy River
Flaming Gorge Reservoir
Little Snake River
Red Fleet Reservoir
Duchesne River
Vernal
Starvation Reservoir
Elkhead Reservoir
Craig
Yampa River
Lake Catamount
Stagecoach Reservoir
White River
Rangely
Colorado River
Price River
Green River
Rifle Gap Reservoir
Highline Lake
Rifle
Green River
Grand Junction
Gunnison River
Moab
Colorado River
Ridgway Reservoir
Aspinall Unit
McPhee Reservoir
Dolores River
Lake Powell
San Juan River
La Plata River
Animas River
Farmington
Navajo Reservoir

Two-tiered Strategy

Rivers: native fish recovery areas

- Large scale removal
- Disrupt spawning

Reservoirs: compatible angling opportunities

- Source eradication & containment
- Provide replacement fisheries for anglers

Major Accomplishments: 2017

River

- Implementing most effective & efficient actions
  - intensive disruption of northern pike and smallmouth bass spawning
  - walleye catch rates declining in response to increased effort

Kudos to our field crews – quality, dedication, & safety

Major Accomplishments: 2017

Reservoir

- Screening completed & management in place:
  - Highline Lake; Rifle Gap, Starvation*, & Elkhead Reservoirs
- Screening needed :
  - Red Fleet & Ridgway Reservoirs (Currently avoiding spills)
  - Lake Catamount & Stagecoach Reservoir (currently managing fisheries)

Significant Challenges: 2018

River

- Fertile adult Grass Carp & reproduction documented
  - Both Utah & Colorado prohibit fertile grass carp in our basin
- Need to implement smallmouth bass spike flow study plan
  - Regulatory and stakeholder hurdles exist

Landscape Scale Nonnative Fish Management Via Flow Manipulation

- Disrupt reproduction by disturbing bass nests with short-duration increased flows
  - Primarily in drier hydrology years
  - Multi-year benefits
  - Reduce year classes that persist
  - Enhance in-river removal

Significant Challenges: 2018

Reservoir

Starvation stilling basin

- Contain & reduce smallmouth bass in Ridgway Reservoir
  - Ridgway net should be utmost priority for the Program
- Install a permanent Starvation Reservoir screen (delayed)
- Stagecoach Reservoir collaboration

Reservoir Projects are Ongoing

Reservoir	Replacement Species (not exhaustive)	Escapement Solution	Year Complete
Highline Lake	Largemouth bass	Spillway net	1999
Rifle Gap Reservoir	Sterile Walleye	Downstream Screen	2015
Elkhead Reservoir	Largemouth Bass	Spillway net; outlet screens	2016
Starvation Reservoir	Black crappie, sterile walleye	Stilling basin screen	2017* 2018
Red Fleet Reservoir	Sterile Walleye (2015)	Rotenone treatment; downstream screen	2018* 2019?
Ridgway Reservoir	In-development	Spillway net	2019* 2019?
Stagecoach Reservoir and Lake Catamount	Trout	Spillway net; outlet screen (Catamount)	2020* 2020

Managing Predatory Nonnative Fish

A Long Term Commitment For Endangered Species Recovery

Long term (post 2023) actions

Rivers

- Consistent in-river removal
  - Hopefully lower than current levels
  - Must be flexible to environmental conditions
  - Coordinated crews

Long term (post 2023) actions

Reservoir

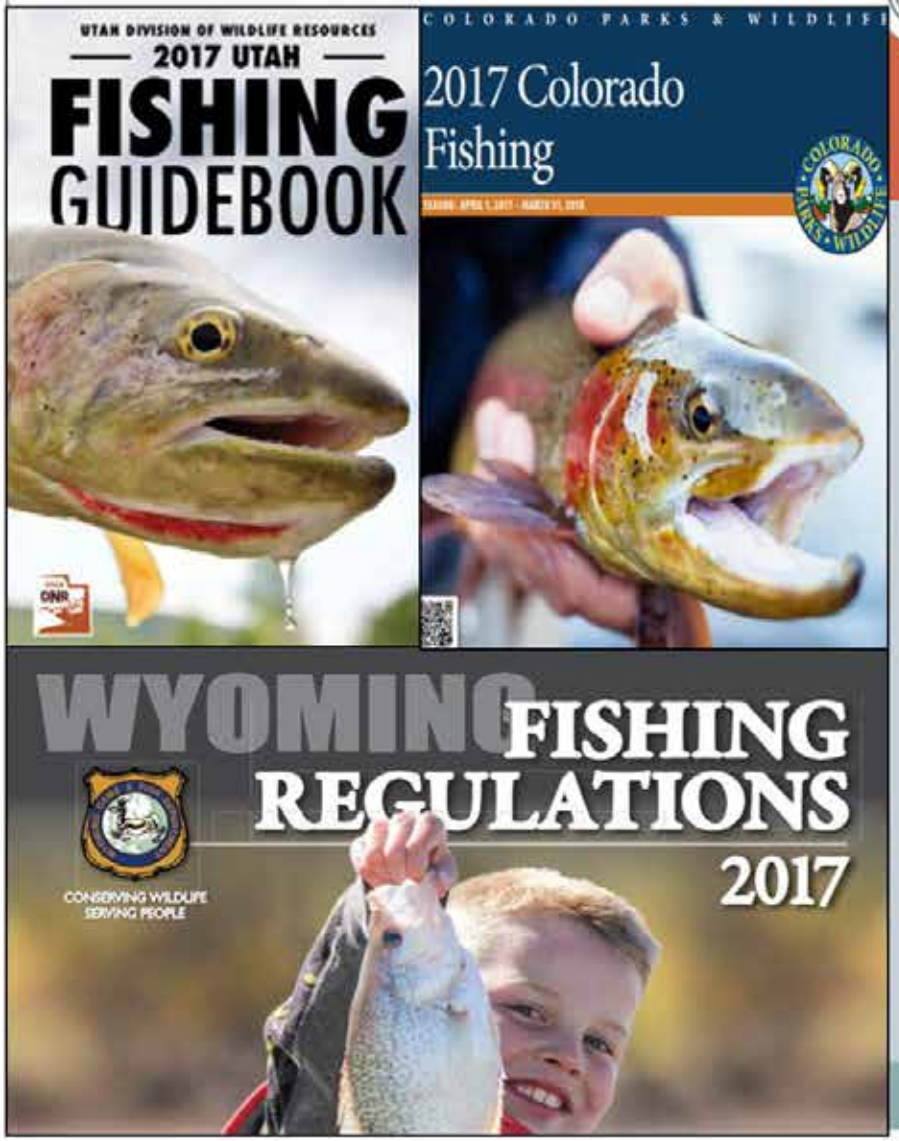
- Continued suppression of reservoir populations
  - Replacement fisheries
  - Angler assistance
  - Mechanical removal
- Maintenance of screens and nets, as needed

Long term (post 2023) actions

Water Operations

- Reservoir releases are likely a component of nonnative fish control
  - Spill avoidance
  - Flows alteration to disrupt spawning
  - Reservoir elevations to reduce in-reservoir reproduction

Long term (post 2023) actions



Policy

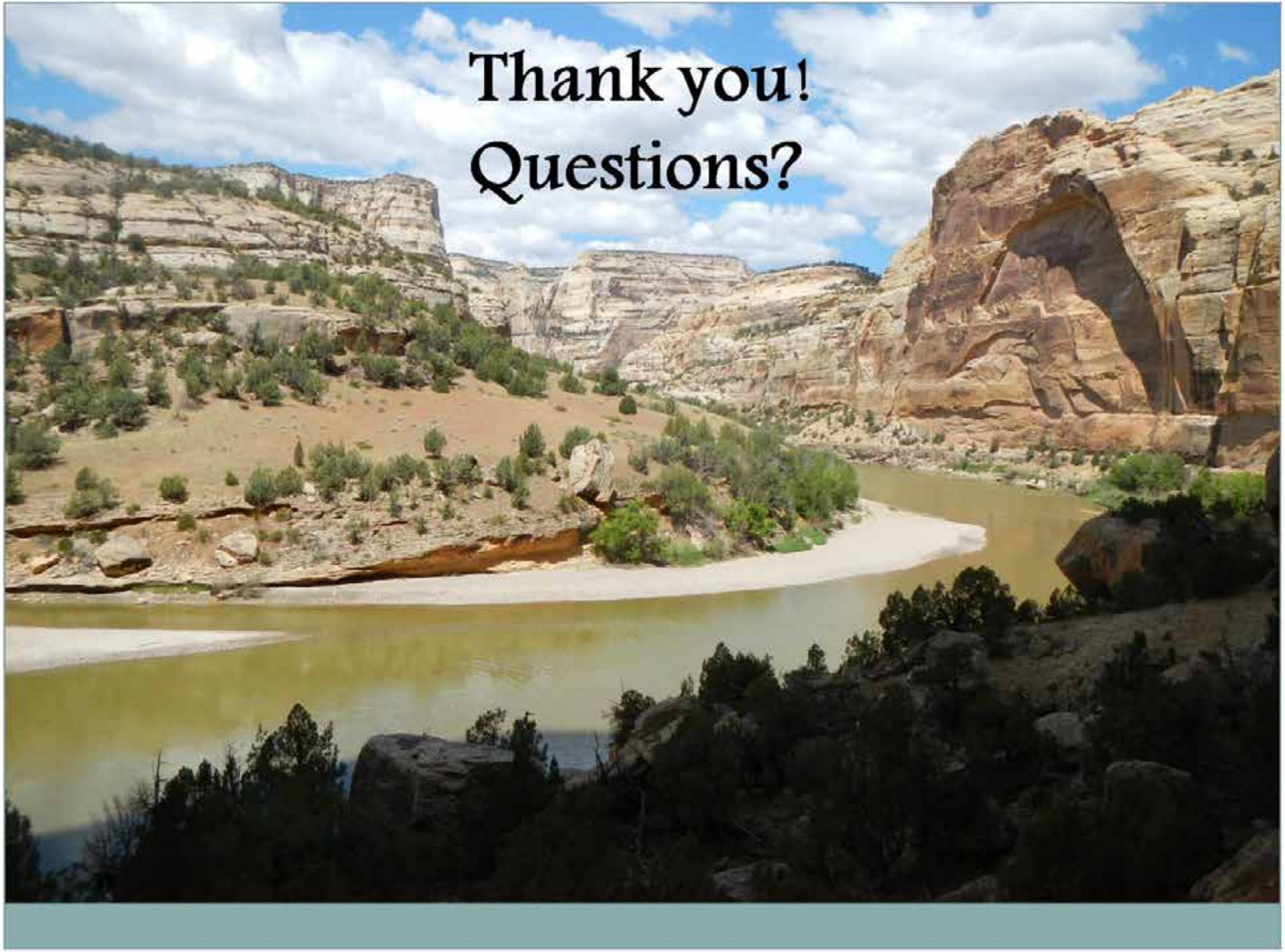
- Outreach
  - Harvest regulations
  - Messaging to anglers and communities
- Rapid reaction to new introductions
  - Species translocation
  - New species

Long term (post 2023) management

- Implementation of an effective in-river removal strategy
- Control of reservoir populations and maintenance of replacement angling opportunities
- Operation and maintenance of screens and nets
- Consistent outreach and policy messaging

Long term (post 2023) management

- In my opinion, these actions are primarily state wildlife agency duties after recovery
  - Fundamentally it is sport fish management
    - state jurisdiction
    - many reservoirs are state parks
  - Similar to nonnative salmonid management
- Long-term, consistent funding will be important to pay for these actions
  - Source of funding TBD


Thank you!
Questions?

Species Compatibility

- Non-Compatible
  - Smallmouth bass
  - Northern pike
  - Walleye
  - White sucker
  - Red shiner
  - Burbot

- Compatible
  - Salmonids
  - Bluegill
  - Black crappie
  - Largemouth bass
  - Fathead minnow
  - Yellow perch
  - Palmetto bass*
  - Sterile walleye*
  - Tiger muskie*

Eliminate → Replacement

Recovery Elements

- Information and Education
- Habitat and Flow Management
- Habitat Restoration
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- Propagation and Genetics
- Research and Monitoring

STReaMS

STReaMS

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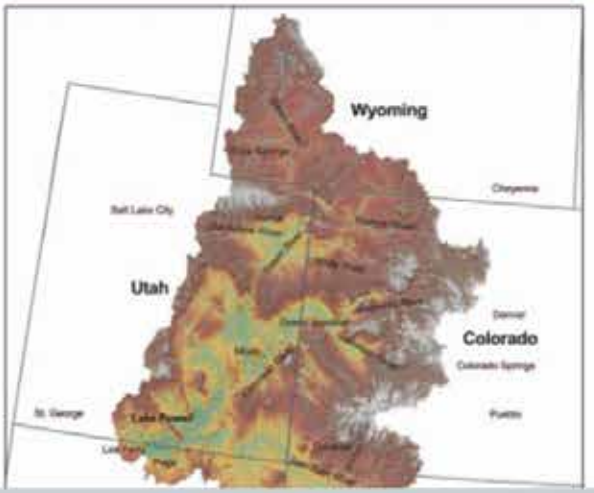
STReaMS - The Species Tagging, Research and Monitoring System

Welcome to the STReaM System online database! This site provides a centralized location for the data from the Upper Colorado and San Juan River Endangered Fish Recovery Programs. These collaborative programs are aimed at recovery of endangered fishes in their respective river basins while allowing water development in those areas to continue. As a result of ongoing recovery activities over the past two decades, primarily stocking and monitoring, a large quantity of data pertaining to both stocked and wild endangered fishes has been collected. The STReaMS database facilitates the retrieval, management, and entry of this data.



Upper Colorado River Endangered Fish Recovery Program

The Upper Colorado Recovery Program is a unique partnership of local, state, and federal agencies, water and power interests, and environmental groups working to recover endangered fish in the Upper Colorado River Basin while water development proceeds in accordance with federal and state laws and interstate compacts.

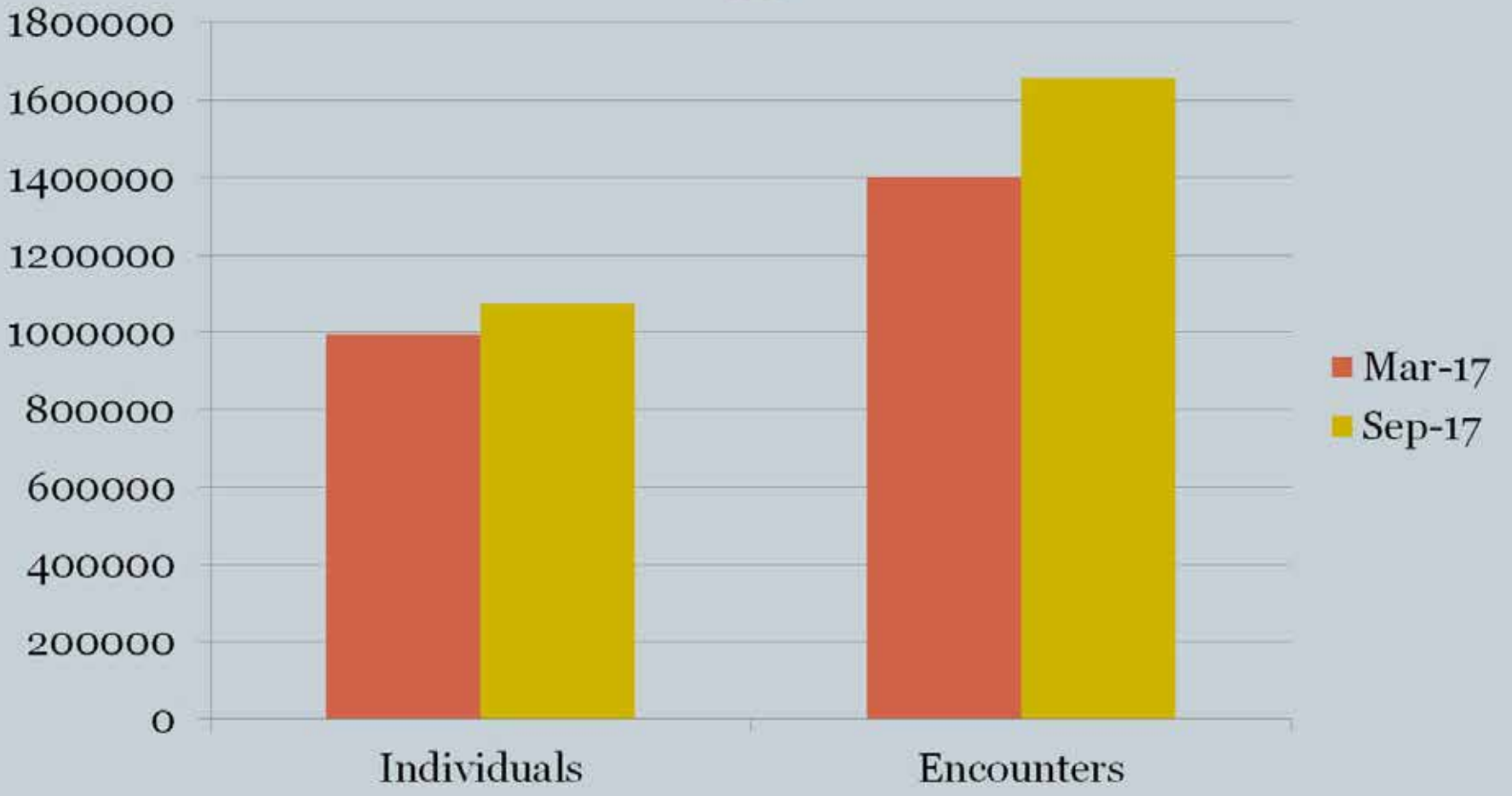
This major undertaking involves restoring and managing stream flows and habitat, boosting wild populations with hatchery-raised endangered fish, and reducing negative interactions with certain nonnative fish species. The goal of recovery is to achieve natural, self-sustaining populations of the endangered fish so they no longer require protection

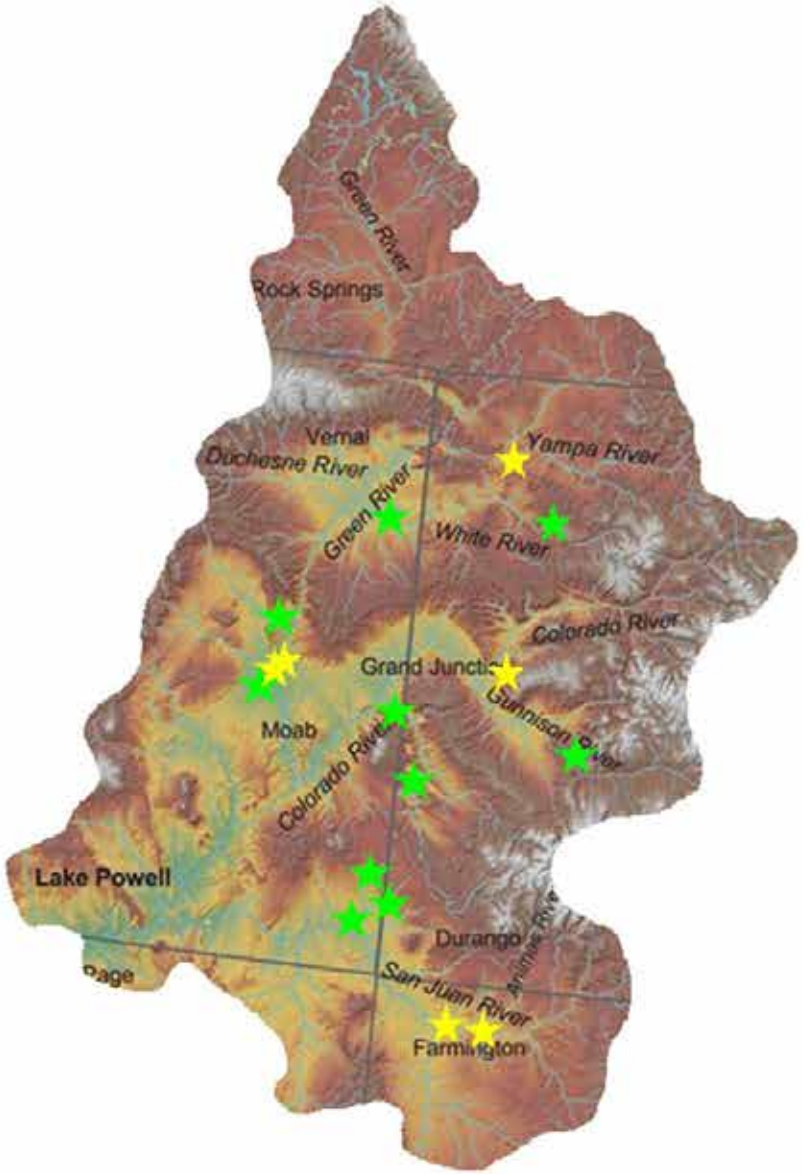
Warner College of Natural Resources

Colorado Natural Heritage Program

Colorado State University

Data in STReaMS





Currently over 20 Stationary PIAs deployed across Upper Basin/San Juan

NRCS
U.S. Department of Agriculture
Natural Resources Conservation Service

Colorado Division of Wildlife

Colorado State University

USGS
science for a changing world

U.S. Department of the Interior
Bureau of Reclamation

Utah State University

San Juan River Basin
Recovery Implementation Program

U.S. Fish & Wildlife Service

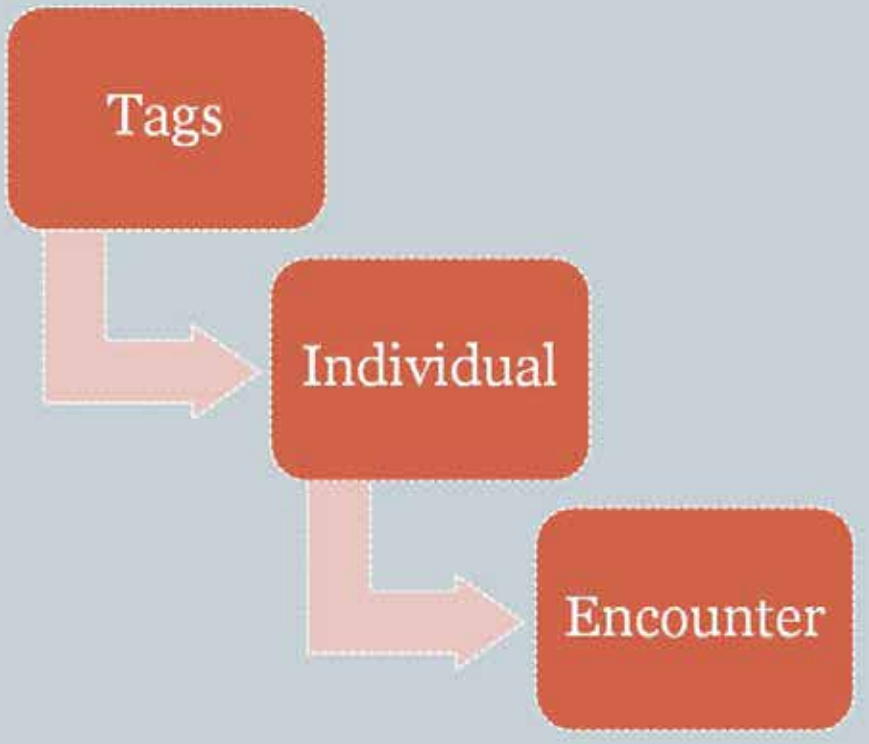
QUESTAR

Upper Colorado River Endangered Fish Recovery Program

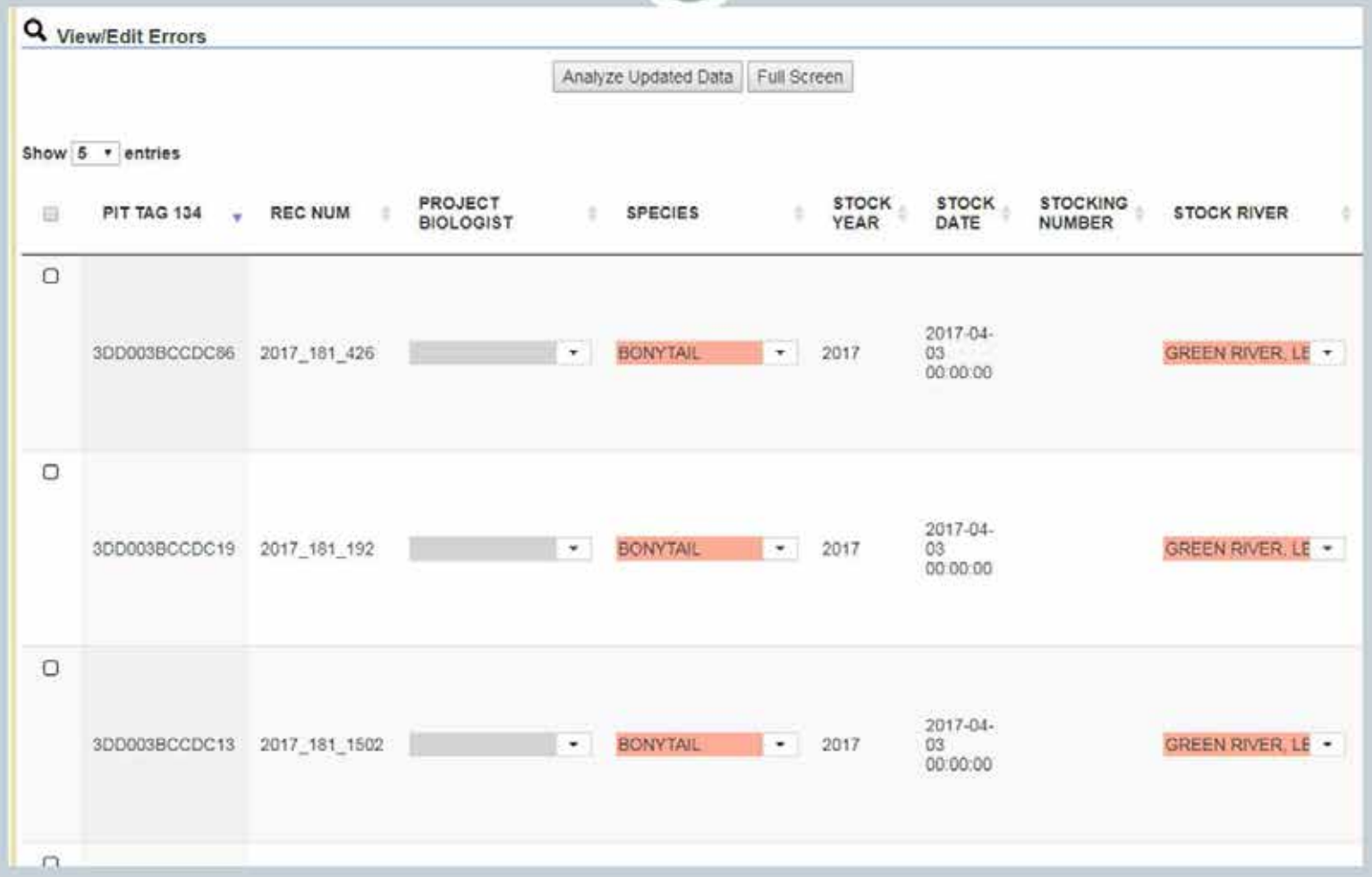
U.S. Department of the Interior
Bureau of Land Management

- 2017
  - Enhance structure
  - Complete upload tools
  - Quality check current data

Enhanced Structure



Upload Tools



Quality Check Current Records

Show 50 entries

ID	DBA Flag	Current Tag	Species
638257	C	423E70521C	Xyrauchen texanus
638255	C	423E214809	Xyrauchen texanus
638254	C	3D91BF18D1019	Xyrauchen texanus
7196	I	1F1E4D4E28	Ptychocheilus lucius
7142	I	1F20265843	Ptychocheilus lucius

Field recorded sex:

Database admin flag: Invalid

Database admin notes: [JWS 2017:] Stocked in CO as BT, captured in SJ as CPM, tag distributed to Mumma, invalidated SJ record, reset species to BT.

Record number:

Original MS Access table: PTYLUC_FIRST_ENC

Source file:

- 2017
  - Enhance structure
  - Complete upload tools
  - Quality check current data
- 2018
  - Develop query and analysis tools
  - Finalize help menus
  - Enhance quality control tools

Recovery Elements

- Information and Education
- Habitat and Flow Management
- Habitat Restoration
- Nonnative Fish Management
- Database Management
- Propagation and Genetics
- Research and Monitoring

Species Status Assessments

Humpback Chub

Colorado Pikeminnow

Razorback Sucker

Humpback Chub SSA

- Peer-review/Stakeholders 7th Draft July 21, 2017
- Peer reviewers comments due August 18, 2017
- Region 2 comments
  - Characterization of the Nonnative Fish threat
  - Program Office developing responses to their comments
- All peer reviewer comments received
- Dr. Valdez is addressing comments we received
- This will be the final draft for Service

HBC SSA Response to comments

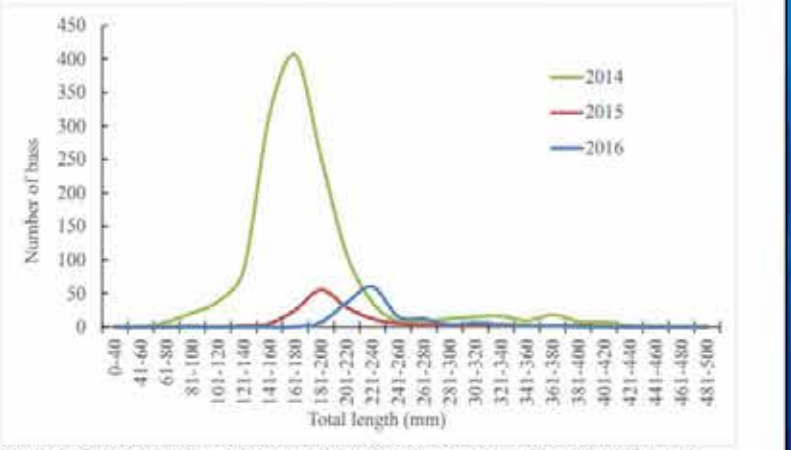


Figure 7. Smallmouth bass length-frequency distribution in Desolation/Gray Canyons, 2014-2016. Bass from large cohorts seen in 2014 continue to persist and grow.

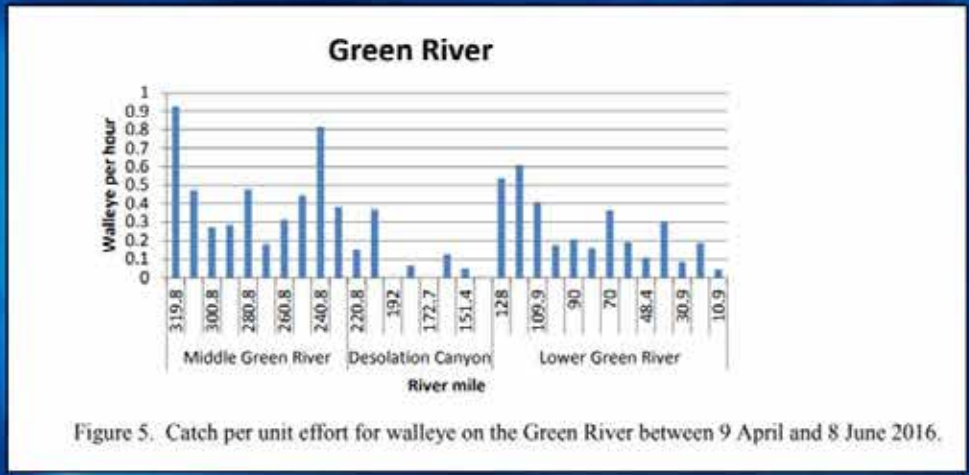
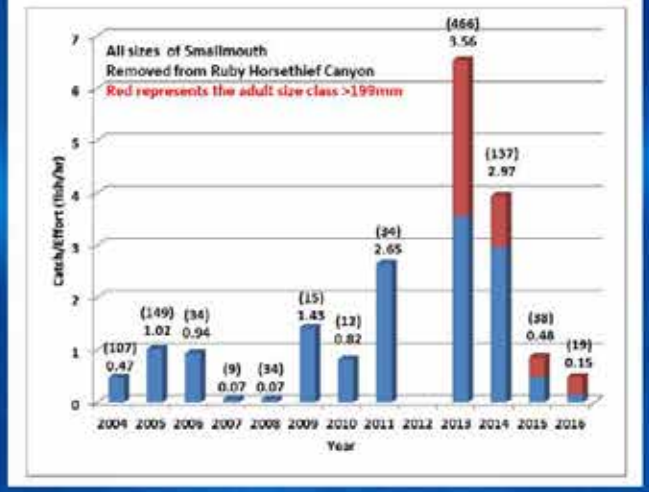
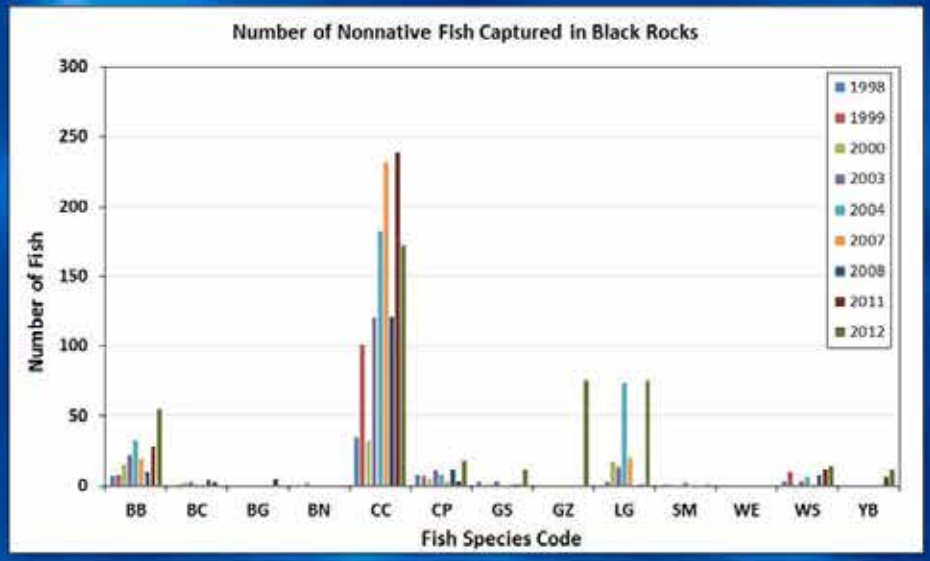


Figure 5. Catch per unit effort for walleye on the Green River between 9 April and 8 June 2016.





Colorado Pikeminnow SSA

- Program Office developing Draft SSA
  - Viability chapter based on Population Viability Analysis (PVA)
- PVA being conducted by Dr. Phil Miller
- Three subbasins and scenarios
  - Green/Colorado River
    - Increase survival of age-0 production via summer base-flow management
    - Increase carrying capacity via reduced nonnative fish
    - Increase survival of young via reduced nonnative fish predation
    - Colorado only: Range expansion through fish passage
  - San Juan River
    - Increase survival of young via reduced nonnative fish predation
    - Increase stocking
    - Increase carrying capacity via reestablishing in upper river and Animas

Razorback Sucker SSA

- Contract completed November 2016
- Additional comments were received in August 2017
- Program Office is reformatting to fit more with the humpback chub and FWS' SSA Guidance
- Humpback chub and Colorado pikeminnow are the priority

Propagation

- Bonytail
  - 35,000
  - Average 250 mm Total Length
- Razorback Sucker
  - 6,000-10,000
  - Average 350 mm Total Length