



*Program Director's Office Update  
to  
Implementation Committee*

*March 13, 2017*

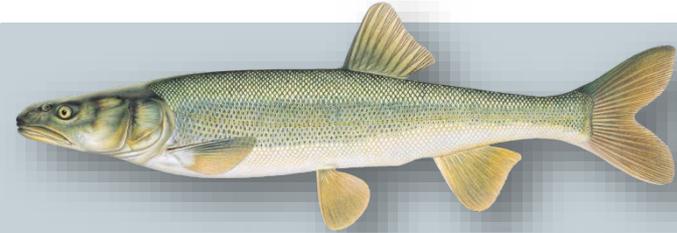


**Upper Colorado River  
Endangered Fish Recovery Program**



# Upper Colorado River Endangered Fish Recovery Program

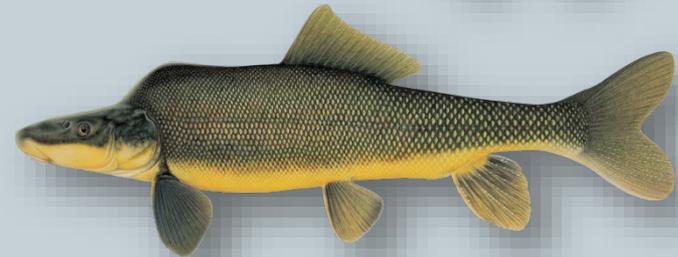
- Established in 1988
- Partners
  - State of Colorado
  - State of Utah
  - State of Wyoming
  - Bureau of Reclamation
  - Colorado River Energy Distributors Association
  - Colorado Water Congress
  - National Park Service
  - The Nature Conservancy
  - U.S. Fish and Wildlife Service
  - Utah Water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



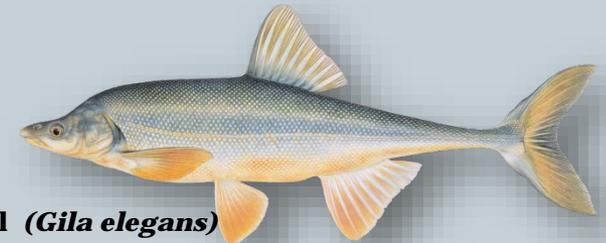
**Colorado pikeminnow (*Ptychocheilus lucius*)**



**Humpback chub (*Gila cypha*)**



**Razorback sucker (*Xyrauchen texanus*)**

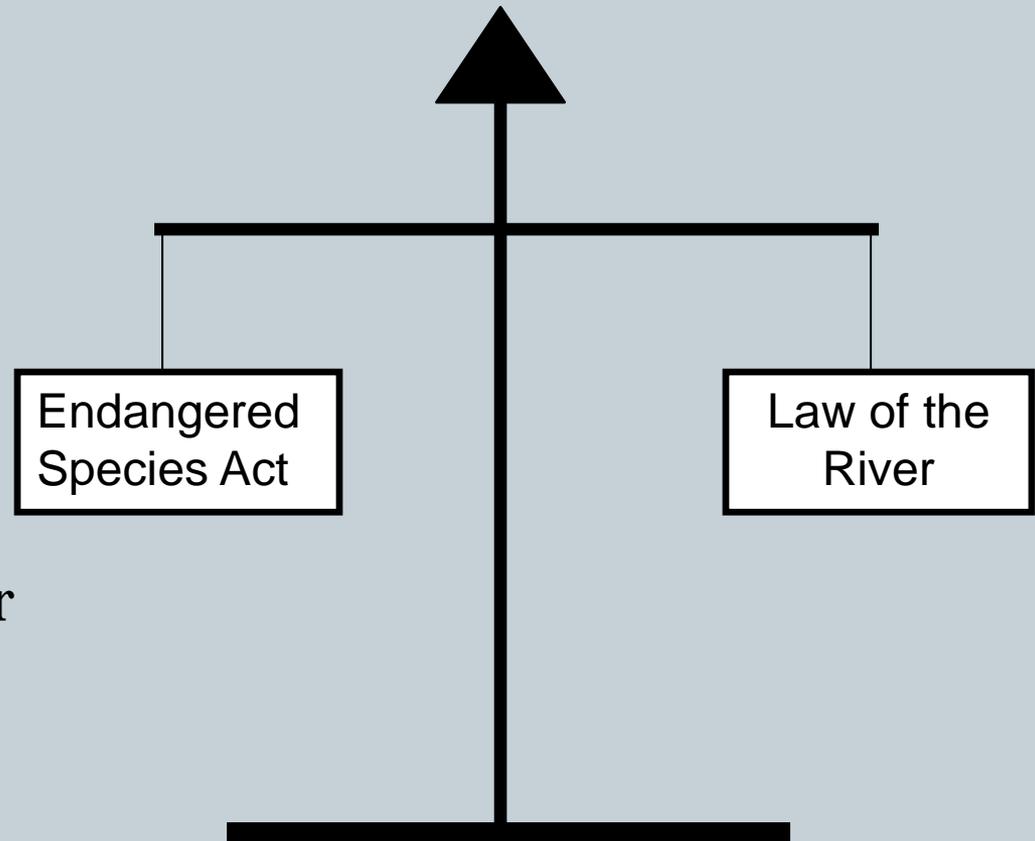


**Bonytail (*Gila elegans*)**

Fish Illustrations by Joe Tomelleri

# The Goal of the Recovery Program

- The purpose of this Recovery Program is to recover the endangered fishes while water development proceeds in compliance with all applicable Federal and State laws.
- Providing Endangered Species Act compliance for federal, tribal, state and private existing and new water projects throughout the Colorado River Basin above Lake Powell.



# 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)

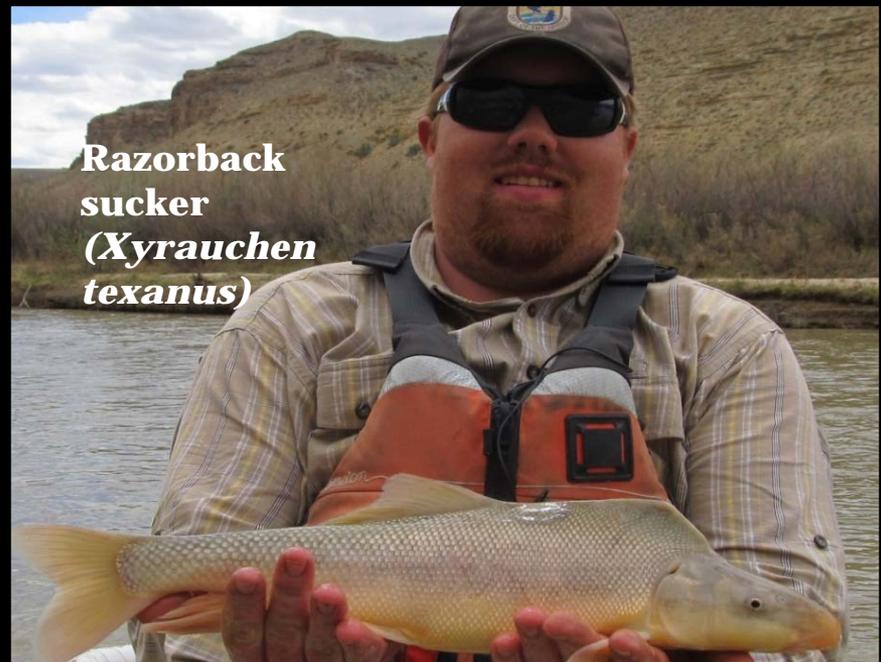
State	Number of Projects	Historic Depletions (Acre-Feet/Yr)	New Depletions (Acre-Feet/Yr)	Total Depletions (Acre-Feet/Yr)
Colorado	1224	1,915,682	207,195	2,122,877
Utah	250	517,898	97,622	615,520
Wyoming	410	83,498	36,013	119,511
Regional*	238	(regional)	(regional)	0
<b>Total</b>	<b>2,122</b>	<b>2,517,078</b>	<b>340,830</b>	<b>2,857,908</b>

\* Amount included in individual state's new depletions

# The Endangered Colorado River fish



**Colorado  
pikeminnow  
(*Ptychocheilus  
lucius*)**



**Razorback  
sucker  
(*Xyrauchen  
texanus*)**



**Bonytail  
(*Gila  
elegans*)**



**Humpback chub  
(*Gila cypha*)**

# Progress To Recovery



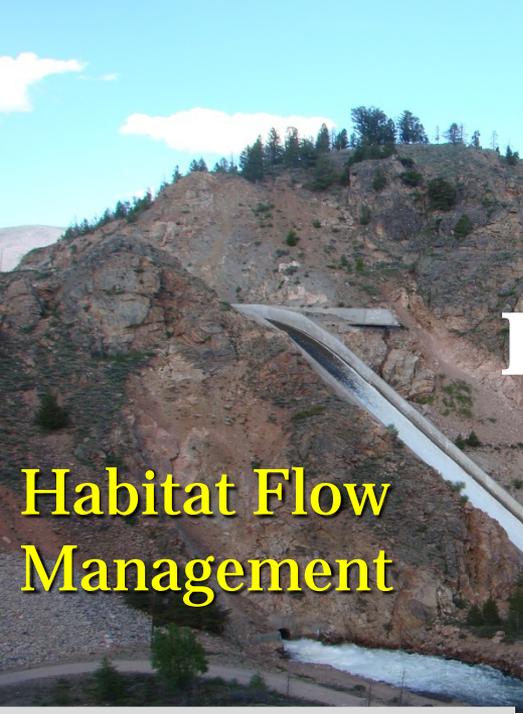
Species	General Population Trend	Recovery Plan Revisions Initiated?	Species Status Assessment Initiated? Timeline
 <p><i>Colorado pikeminnow</i></p>	<p>Numbers of wild adults in decline in both CO and GR sub-basins. Stocked fish increase in SJR. Threats (flow and NNF) being managed.</p>	<p><b>Yes</b>, Draft shared w/ stakeholders in Nov 2014; currently conducting PVA to inform SSA</p>	<p><b>Yes</b>, draft to stakeholders / peers in Fall 2017. Working with Dr. Phil Miller on a PVA – due Summer 2017. Downlisting does not appear imminent.</p>
 <p><i>Humpback chub</i></p>	<p>Number of adults has stabilized after declines in the late 1990's. Lower Basin population doing very well.</p>	<p><b>Yes</b>, Recovery Plan will be revised as SSA nears completion.</p>	<p><b>Yes</b>, will be redistributed to the Recovery Team, stakeholders, peers - April 2017. Downlisting could be considered.</p>
 <p><i>Razorback sucker</i></p>	<p>Positive trends reported throughout Critical Habitat (upper and lower basins). Still need to see significant recruitment.</p>	<p><b>No</b>, Waiting to see outcome of the SSA.</p>	<p><b>Yes</b>, draft will be redistributed to upper and lower basin stakeholders May 2017. Downlisting does not appear imminent.</p>
 <p><i>Bonytail</i></p>	<p>Still trying to rebuild wild populations from hatchery stocks. Wild spawning confirmed in 2015!!</p>	<p>No</p>	<p><b>No</b></p>

**Habitat Development**



# Recovery Elements

**Habitat Flow Management**



**Research and Monitoring**

**Managing Nonnative fish**



**Stocking Endangered Fish**

# Recovery Elements



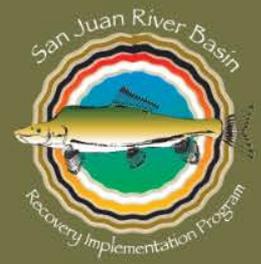
- **Information and Education**
- **Habitat and Flow Management**
- **Habitat Development**
- **Nonnative Fish Management**
- **Database Management**
- **Propagation and Genetics**
- **Research and Monitoring**

Upper Colorado River



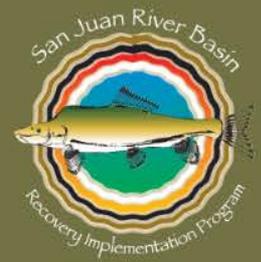
Endangered Fish  
Recovery Program

# Public Involvement and Outreach Progress Report





# Education



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

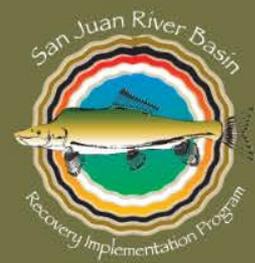


## 4<sup>th</sup> Grade Education Program in Northeastern Utah (UDWR)





# Increase Public Awareness and Support



**MEMBERS**  
DENVER POST PERKS HAS OVER 200 COUPON OFFERS  
DENVERPOSTMEMBERSERVICES.COM

**SPORTS**  
NFL PLAYERS KNOW THEIR PROTESTS ARE UNCOMFORTABLE. AND THAT'S THE POINT. » 1C

**COUPONS**  
TOTAL COUPON SAVINGS IN TODAY'S PAPER: \$130  
DENVERPOST.COM/COUPONS

Voice of the Rocky Mountain Empire

## THE SUNDAY DENVER POST

MOSTLY SUNNY » 85° » 5:17 » 11:8 » SEPTEMBER 18, 2016 » DENVERPOST.COM » © THE DENVER POST » 12 PAGES » \$4.00 PER COPY (OUTSIDE METRO AREAS)

### PRESCRIPTION PAINKILLERS

# Big money, big problems

By Geoff Meacham, *He Eshley Whyte and Ken Wines*  
*The Associated Press and Center for Public Integrity*

The makers of prescription painkillers have adopted a general strategy that involves hundreds of lobbyists and millions in campaign contributions to help sell their products. The industry has spent more than \$800 million nationwide on lobbying and campaign contributions in 2015, more than 200 times what those advocating for stricter policies spent and eight times more than the influential gun lobby received for similar activities during the same period, The AP and Center for Public Integrity found. That they often campaign for the same legislation, a strategy that involves lobbying groups that use the names of independent scientists and doctors, such as the American Cancer Society, adds to the confusion. The industry has also employed an annual average of 420 lobbyists to make its case outside from Virginia, Wash., to Tallahassee, Fla., during that span, when opioid-addictive nature came under increasing scrutiny.

The pharmaceutical companies and allied groups have a number of legislative interests in addition to...

### DENVER & THE WEST

### RAZORBACK SUCKER FISH

# TIPPING THE SCALES

THREE YEARS AFTER FLOODING, TOWNS AWAIT REPAIRS

The five-day deluge in 2013 killed 10 people and destroyed more than 1,800 homes and businesses — some of which have yet to be repaired. » 1B

**BUSINESS**  
COMPANIES ARE PITCHING A "FIT" TO EMPLOYEES

Companies are making use of fitness trackers — similar to Fitbit — to promote wellness strategies to promote healthy and active lifestyles among their employees. » 1K

**NATION & WORLD**  
U.S. MISTAKENLY STRIKES SYRIAN TROOPS IN IRAQ

Humanitarian organizations were killed when American air strikes hit the Syrian border town of Idlib. U.S. military officials say the strikes were a mistake. » 2B

**Life & Culture** » Denver resident Erin McInerney, 23, will co-produce a new series of PBS' "Survivor" premiering Wednesday. » 1A

**INSIDE** Books » 6E | Crosswords » 12E | Lottery » 2B | Movies » 4E | Obituaries » 10B | Paper Trails » 11E

**BELDON HOME SOLUTIONS**

50% OFF LABOR AND SPECIAL FINANCING AVAILABLE!



Denver Post Reporter Bruce Finley and Photographer Helen Richardson on the Colorado River. Region 6 External Affairs, Steve Segin and Rob Mansheim coordinated this trip.



U.S. Fish and Wildlife biological technicians Nathan Vargas, left, and Jen Herdman, right, and crew leader Brendan Crowley, seated in boat, go prepared for a day of electric fishing along the 9-Mile Reach of the Colorado River in Grand Junction on Aug. 16. Helen B. Richardson, The Denver Post

### Endangered Colorado species is bouncing back after 25-year, \$360 million, government-run rescue

By Bruce Finley *The Denver Post*

beneficiaries of a 25-year, \$360 million government-run rescue.

The proof can be seen on the prow of a federal electric-fishing raft, which runs up the bank of the Colorado River and catches them for monitoring or removal.

U.S. Fish and Wildlife Service biologist Derek Drexler, sorting mostly non-toxic predators on a recent summer morning, also found suckers — which, if not eaten as babies, can grow fast and live for 40 years.

"Yep! There it is!" Drexler cried, recognizing Now they're making a major turnaround...

### MOUNTAIN TOWNS

### Summer tourism sets new record

### Some locals question whether that is actually a good thing.

By Jason Blewett *The Denver Post*

It was another banner summer in Colorado's high country. Record sales on revenues, record lodging occupancy, record traffic counts.

That makes five years in a row of bow-never summers. It's a historic record, but not for the mountain towns.

Record Record Record.

With natural summer tourism business in the mountains soaring anywhere from 4 percent to 14 percent for the past several years, the headline poses the question: Is there such a thing as too hot?

Ask the marketing people who measure their tourism-growth success by the soaring list rentals for their favorite trails and their rental cottages dwindle from a dozen to a few weeks, and have the opposite response: Pleasant or the least bit soggy. This community is about more than money.

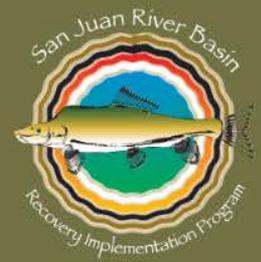
Colorado's tourism-dependent communities, dinged from the recession, tourism boomers pulled with big events, festivals and attractions designed to bolster the summer months.

Whiner takes care of itself. If there's snow, judges are full with visitors who pay big dollars.

INSIDE Books » 6E | Crosswords » 12E | Lottery » 2B | Movies » 4E | Obituaries » 10B | Paper Trails » 11E



# Increase Public Awareness and Support



## NEWS RELEASE

April 21, 2016  
FOR IMMEDIATE RELEASE

Contact: Krissy Wilson, Native Aquatic Species Program  
Coordinator, UDWR  
801-538-4756

Brent Stettler, Conservation Outreach Manager,  
UDWR  
435-613-3707

Dr. Tom Czapl, Propagation and Genetics  
Coordinator, Upper Colorado River Endangered  
Fish Recovery Program  
303-236-9884

### ENDANGERED BONYTAIL SPAWNING CONFIRMED IN A GREEN RIVER FLOODPLAIN

JENSEN, UTAH – For the past four years, the Upper Colorado River Endangered Fish Recovery Program and its partner the Bureau of Reclamation have coordinated spring releases from Flaming Gorge Dam to connect floodplain habitats along the Green River near Jensen, Utah to provide important nursery habitat for endangered Colorado River fish. The primary beneficiary of those releases to date have been larval endangered razorback sucker (*Xyrauchen texanus*). In 2015, however, Utah Division of Wildlife Resource (UDWR) researchers, Matthew Breen, Dr. Robert Schelly and Randy Staffeldt determined that endangered adult bonytail (*Gila elegans*), entered the Stewart Lake managed floodplain. When the floodplain was drained in autumn, UDWR handled 19 young-of-year native chub ranging in total length from 37 – 64 mm. Four of these fish did not survive and were preserved according to standard protocol.

In the past, UDWR assumed the incidental chubs they encounter when draining Stewart Lake were likely roundtail chubs (*Gila robusta*). However, in reviewing their data this winter, the researchers realized the size of the four *Gila* collected did not fit with the timing of roundtail chub spawning and that these fish might be evidence of the first documented reproduction of bonytail in the wild! The preserved specimens were then positively identified as bonytail via morphometric (scale and body measurement) analyses by Dr.



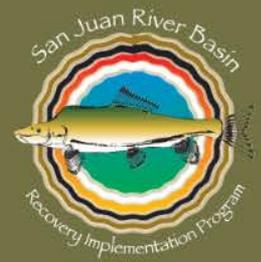
ABOVE: Young-of-year bonytail captured at Stewart Lake, Jensen, Utah.

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





# Partners Working Together



Bonytail Harvest at Wahweap Fish Hatchery

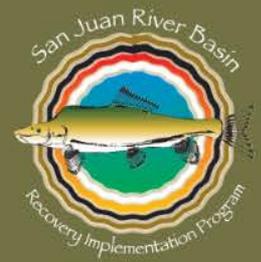


Utah Water Users Meeting



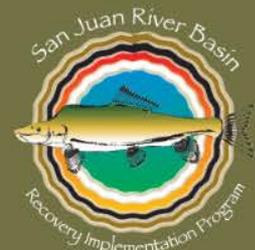


# Partner Fishing Tournaments



**Colorado Parks and Wildlife's Ridgway Fishing Tournament removed over 2,000 smallmouth bass.**

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



# New Interpretive Signs

## Utah Field House

In the museum pond are two of the four species of endangered fish native to the Green and Colorado River drainages.

**Bonytail (*Gila elegans*):** The bonytail is a big-river minnow belonging to the Cyprinidae Family, a group of freshwater fishes that includes carp and goldfish. It is the rarest of the four endangered fish species with no known wild populations. These fish grow up to 22 inches in length and feed on insects, plankton and plant matter.

**Razorback sucker (*Xyrauchen texanus*):** The distinctive feature of the Razorback Sucker is the prominent keel located immediately behind the head, and running down the back of the fish. It allows the fish to remain stable in turbulent water. The mouth is positioned on the underside of the head allowing for feeding on insect larvae and organic matter along the river bottom. Although spawning occurs in the wild, the survival of juvenile fish is extremely low due to predation by non-native fish and the loss of nursery habitat.



colorado pikeminnow (*Ptychocheilus lucius*)

humpback chub (*Gila cypha*)

### Four Endangered Fish Species

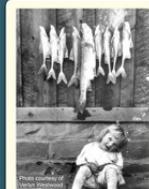
## A Fish Story

### Once Plentiful

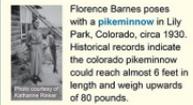
The four endangered fish species of the Green and Colorado Rivers were once a plentiful and valued food source for those who fished within their waters. However, man's modifications, such as the building of dams, loss of habitat, changes in water composition and introduction of non-native fish, proved a lethal combination of factors and fish numbers began to plummet.



Carl Gaenslen and his friends pose with a pikeminnow caught in the upper Green River, in the early 1920's. Known also as whitefish or white salmon, a pikeminnow as large as the one above was a considerable harvest, and could feed a family for multiple days.



Mary Rutledge of Moab sits beneath a stringer of bonytail chubs and one pikeminnow, circa 1920. Note the long pencil-thin tail on the chubs for which the species was named.



Florence Barnes poses with a pikeminnow in Lily Park, Colorado, circa 1930. Historical records indicate the colorado pikeminnow could reach almost 6 feet in length and weigh upwards of 60 pounds.

Right: Pat and Polch Mantle stand with beaming smiles as they hold up a pikeminnow as "tall" as themselves. The Mantle along the Yampa River a day Dinosaur National M

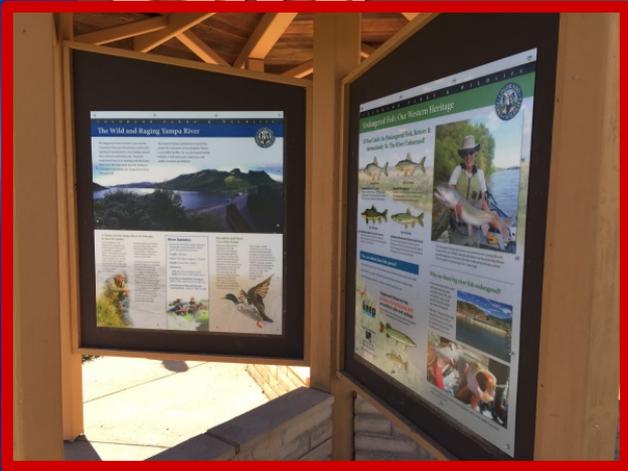


## Recovery

**The first step to recovery.** The first step to recovery for the declining populations was organizing a partnership of state and federal agencies, along with water and energy interests and environmental groups, with a goal of mitigating these human factors. Hence, in 1998 the Upper Colorado Endangered Fish Recovery Program was organized, under the authority of the Endangered Species Act.

### A successful recovery can be measured.

A successful recovery can be measured by a self sustaining, genetically diverse wild population of fish with a reduction of the threats which caused the fish to first be listed. These include habitat restoration, especially floodplains which are essential for juvenile fish survival, hatchery propagation and stocking to re-establish brood stock; and research and monitoring to evaluate both successes and failures, all of which are crucial to the survival of these fish.



## Stagecoach Reservoir

### A Nursery for Fish

The land before you is a protected unit of the Colorado River Wildlife Management Area (WRMA). The WRMA was established to protect endangered fish in the Upper Colorado River Basin, including the bonytail, humpback chub, razorback sucker, and Colorado pikeminnow.

The WRMA is managed to allow water to move freely over the river's banks and into adjacent low-lying areas when water levels are high. Larvae of the endangered fish enter these areas, where they grow and are protected from predators. Juvenile fish re-enter the river with a better chance of survival.

razorback sucker

### Protecting Our Western Heritage

Four Colorado River fish species are at risk of extinction and are protected by the Federal Endangered Species Act. These fish species are part of the West's heritage and are found nowhere else in the world.

The decline of these fish species may mean other native species in this ecosystem are also in trouble. These fish depend on a healthy ecosystem, and so do we!

**Why are These Big River Fish Endangered?**  
Over time, the Colorado River Basin has changed dramatically, by us, agriculture, and other economic uses have reduced water flow. In addition, introduced non-native sport fish, carp, catfish, and other fish, compete with and eat the native fish.

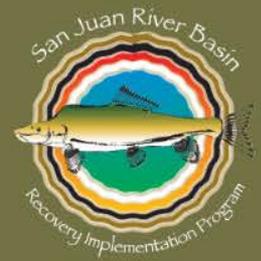
**The Path to Recovery**  
The Upper Colorado River Endowed Fish Recovery Program and its partners conduct research, manage the riparian flow of the floodplains, remove non-native fish, stock hatchery raised native fish, and restore habitat. The Colorado River Wildlife Management Area protects this valuable habitat for endangered fish.

- Up to 20 inches** - Humpback chub (*Gila cypha*)  
Proliferates in shallow, fast-moving water. They are found in the Colorado and Utah.
- Up to 22 inches** - Bonytail (*Gila elegans*)  
These fish are found in the Colorado and Utah. They are found in the Colorado and Utah.
- Up to 45 inches** - Colorado pikeminnow (*Ptychocheilus lucius*)  
These fish are found in the Colorado and Utah. They are found in the Colorado and Utah.
- Up to 36 inches** - Razorback sucker (*Xyrauchen texanus*)  
These fish are found in the Colorado and Utah. They are found in the Colorado and Utah.

## Colo. R. WMA



# Information & Education Committee

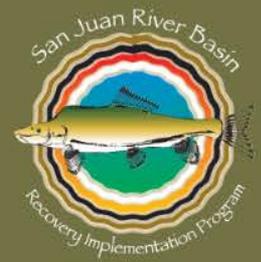


## Your Water – Your Fish – Your Future

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 is currently in review with their public affairs personnel. The Colorado River District is due next with other water users to follow.



# Public Events



**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**

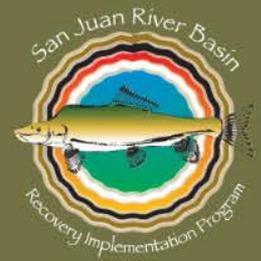
**Endangered Species Day, Denver Aquarium, May 2017**

**Palisade Peach Festival, July 2017**

**Grand Junction & Palisade Farmer's Market, throughout the summer**



# Live Exhibits of Endangered Fish



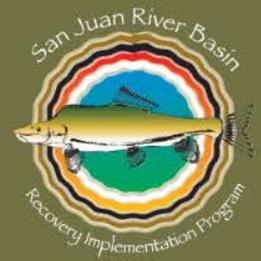
## Denver Aquarium



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.



# Future Exhibits of Endangered Fish



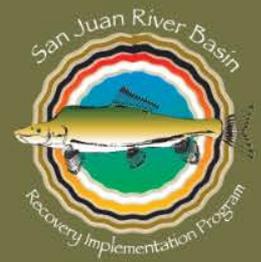
Children's Nature Center,  
Mesa Mall, Grand Junction, CO

Children's Nature Center is currently in permitting to secure endangered fish for display. Michael Gross from Ouray National Fish Hatchery has been instrumental in driving this project and a future aquaculture facility at Palisade High School, Palisade, CO.

John McConnell Math and Science Center of Western Colorado will have a new facility at Colorado Mesa University. At this new location, they will have a live exhibit of Colorado River endangered fish. They are currently in the planning phase.

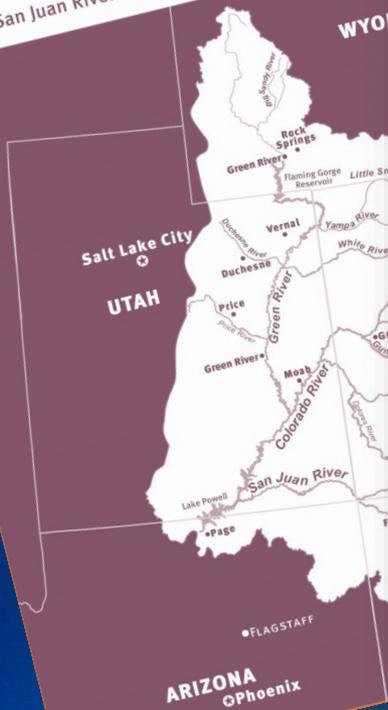


# Publications



## 2016 - 2017 Highlights

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



### Upper Colorado River Endangered Fish Recovery Program



### Working Together to Recover

The Upper Colorado River Endangered Fish Recovery Program Implementation Program use innovative, cost-effective measures to the same time, water and hydropower resources are managed within the needs of people in growing western communities.

The recovery programs' partners represent state and federal power customers, and American Indian tribes. These partners believe greater results than independent efforts and minimizes conflicts, so

The recovery programs currently provide ESA compliant 3.7 million acre-feet per year. No lawsuits have been filed on ES

### Nonnative Fish: The Greater

The overall goal for recovery of the four endangered fish and protect the habitat on which those populations depend. The recovery elements.

#### Providing Flows



#### Managing Nonnative



#### Stocking Endangered Fish

**In the Upper Basin, despite years of significant effort, the nonnative fish threat remains largely uncontrolled.**

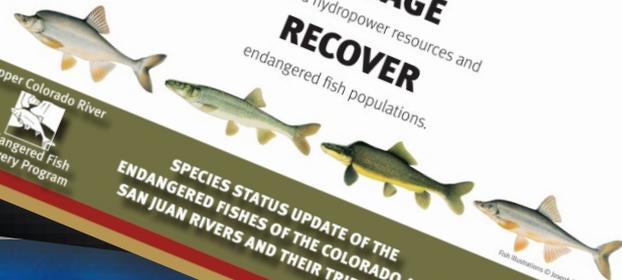
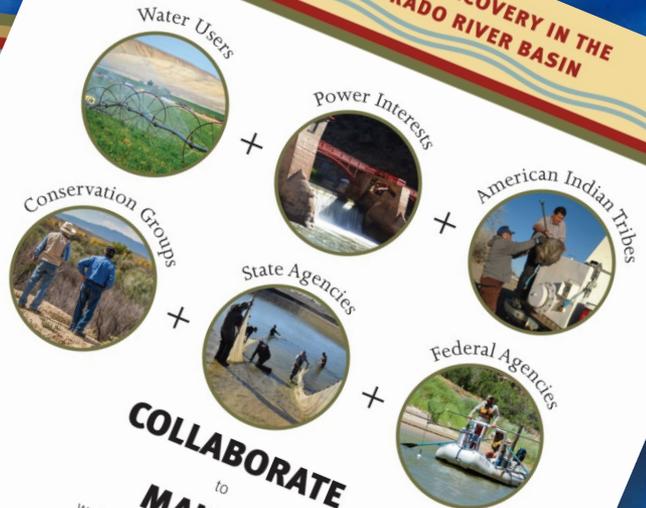


## swimming upstream

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



## THE PATH TO FISH RECOVERY IN THE UPPER COLORADO RIVER BASIN



### SPECIES STATUS UPDATE OF THE ENDANGERED FISHES OF THE COLORADO AND SAN JUAN RIVERS AND THEIR TRIBUTARIES

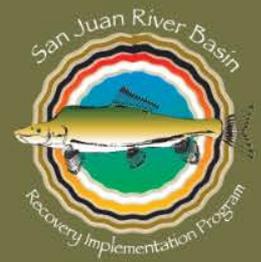
Upper Colorado River Endangered Fish Recovery Program

Fish Illustrations © Kenneth R. Fausch





# Educational Items



## Temporary Tattoos



BONYTAIL



HUMPBACK CHUB



RAZORBACK SUCKER



COLORADO PIKEMINNOW



Lapel Pins + Trading Cards



## Paper Stickers



Upper Colorado River Endangered Fish Recovery Program

Colorado

Working Together to Recover

## Ruler

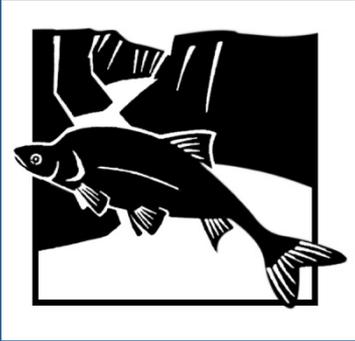
Raft / Boat Beverage Holder



# Recovery Elements



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



# Hydrology and Instream Flow Updates

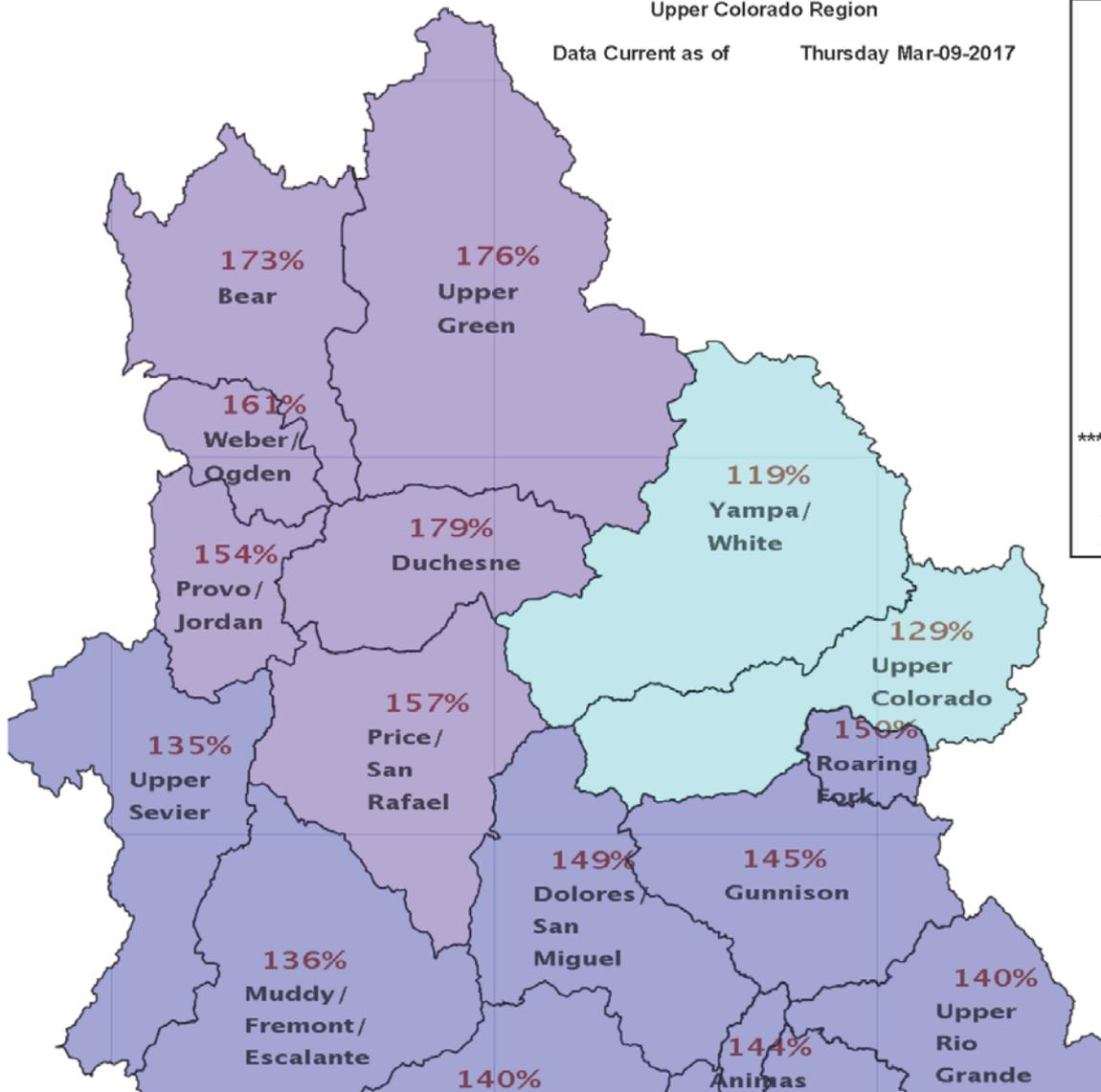


Upper Colorado River  
Endangered Fish Recovery Program

## Snow Pack Conditions Map

### Upper Colorado Region

Data Current as of Thursday Mar-09-2017



### Percent of Seasonal Median Snow Water Equivalent(SWE)\*

- Less than 50 Percent of Median
- 51 to 70 Percent of Median
- 71 to 90 Percent of Median
- 91 to 110 Percent of Median
- 111 to 130 Percent of Median
- 131 to 150 Percent of Median
- Greater than 150 Percent of Median

\*\*\*Click Sub-Basin to view yearly Snow Pack Chart\*\*\*

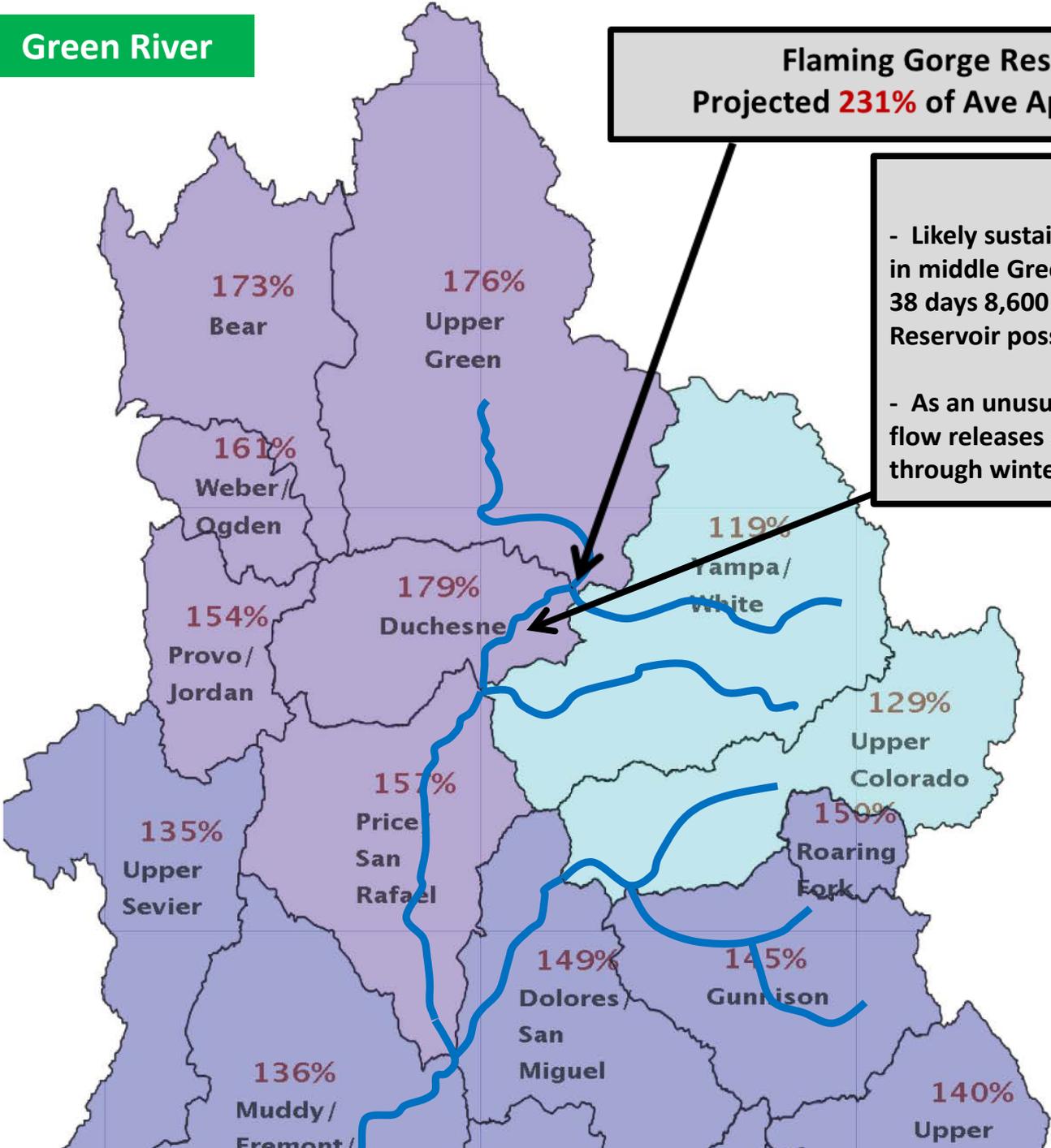
\* Percent values based on daily measured SWE data from NRCS Snotel stations as compared to daily historical median values.

# Green River

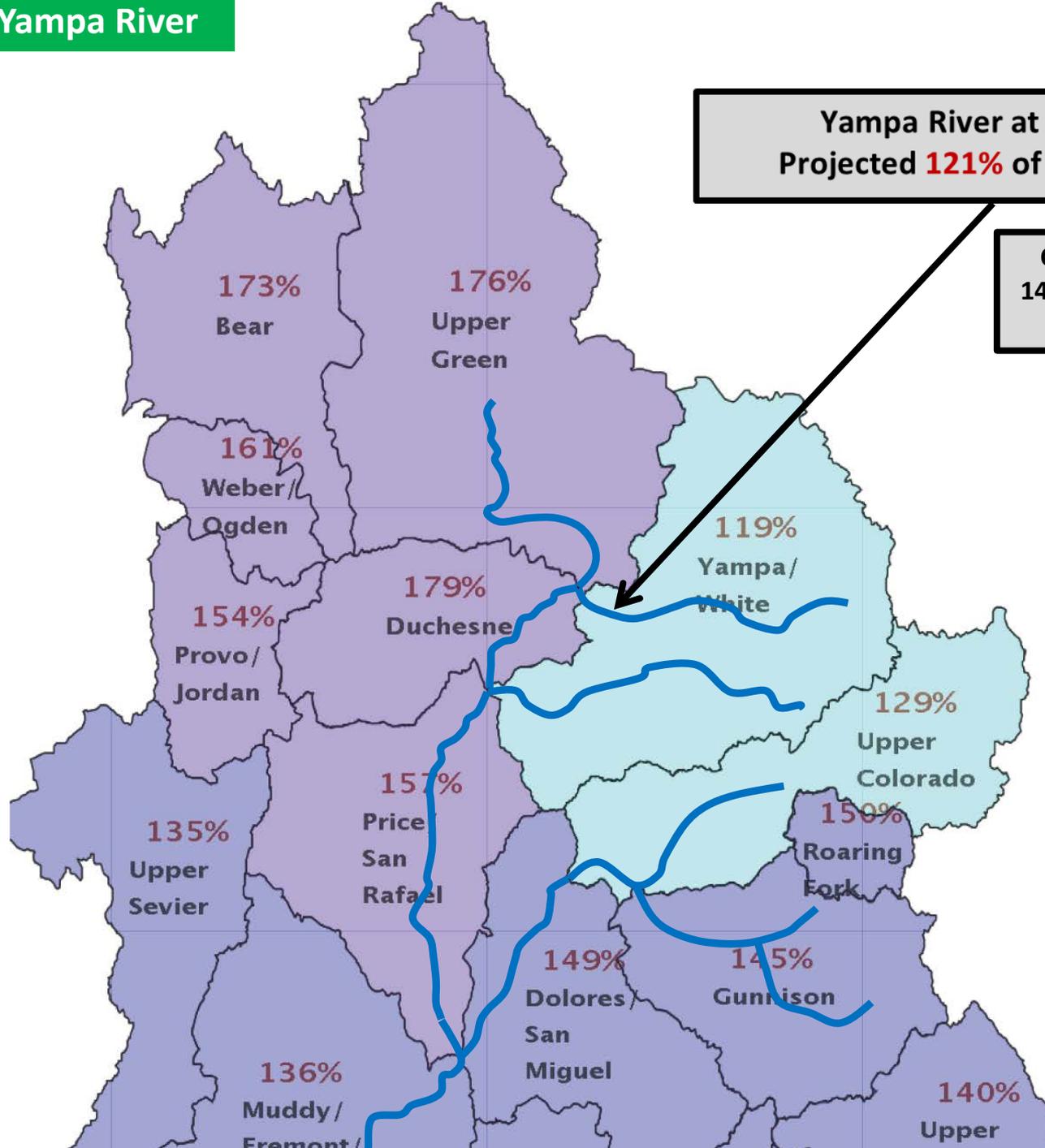
**Flaming Gorge Reservoir**  
Projected **231%** of Ave Apr-Jul inflow

**> 95-Percentile Year**

- Likely sustained floodplain wetland inundation in middle Green River (current estimate, up to 38 days 8,600 cfs release from Flaming Gorge Reservoir possible)
- As an unusually high runoff year, higher base flow releases are anticipated late summer through winter



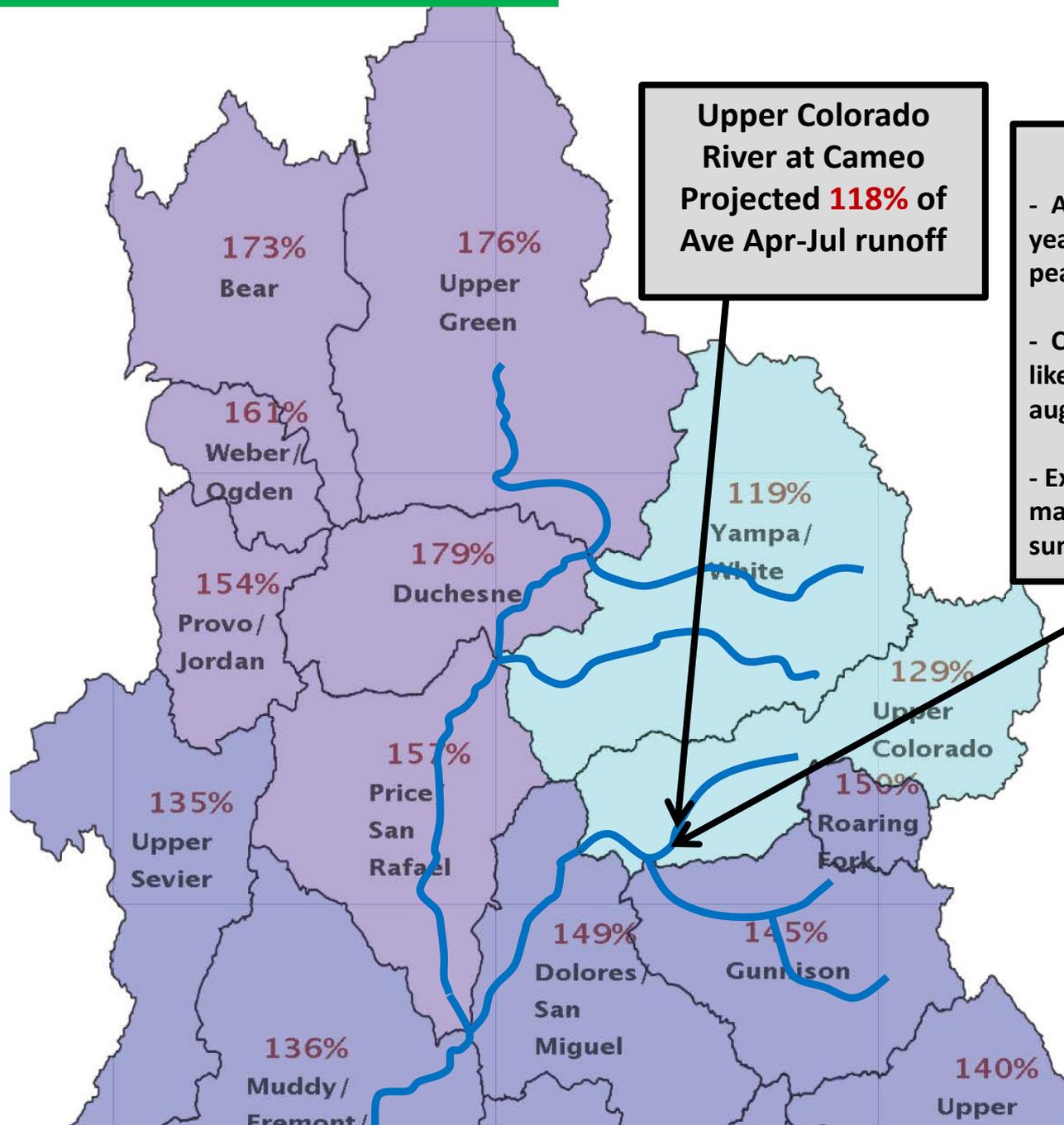
# Yampa River



Yampa River at Deerlodge Park  
Projected **121%** of Ave Apr-Jul runoff

CBRFC projects a peak flow of 14,000 cfs, just slightly above the long-term average of 13,500

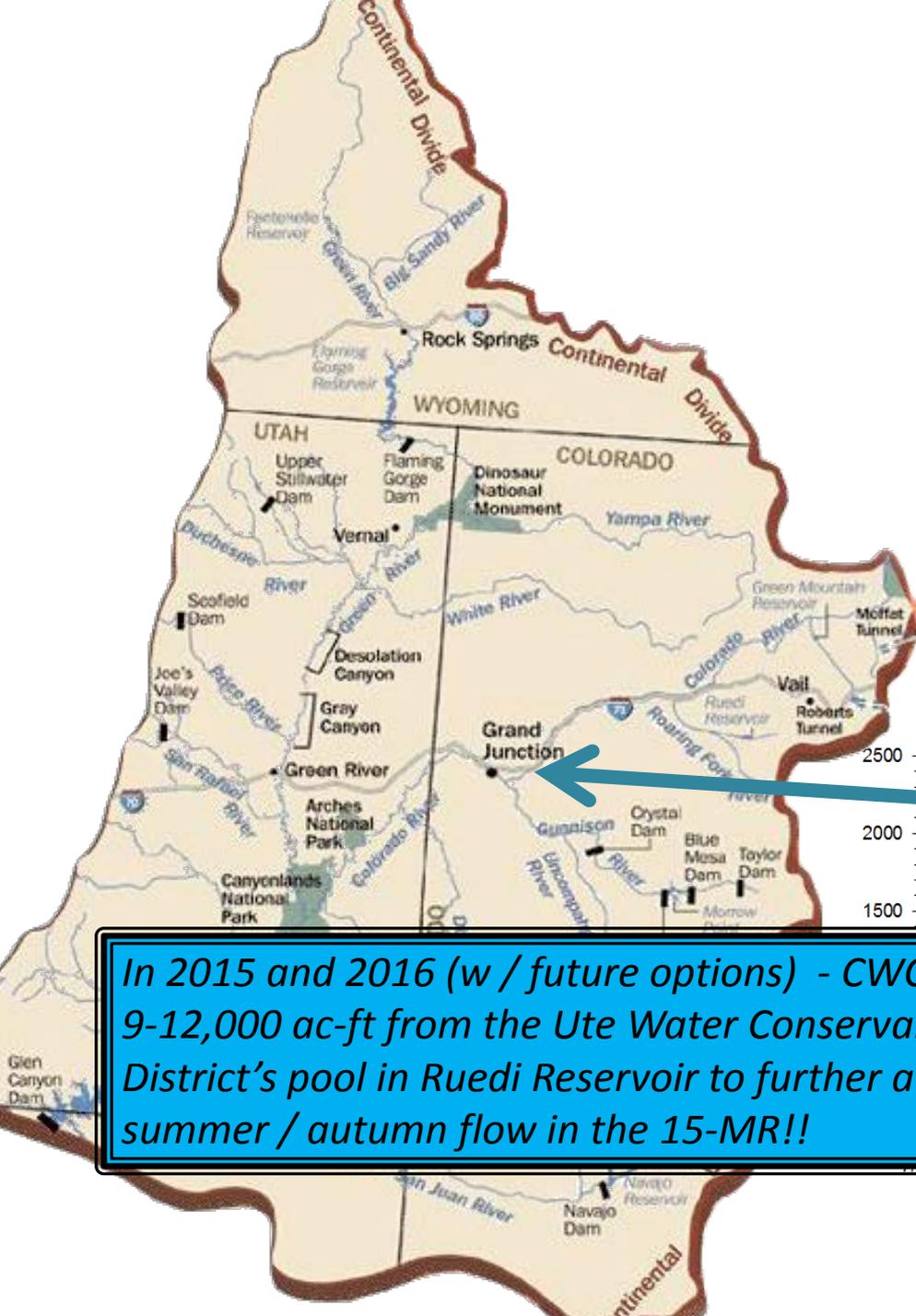
# Upper Colorado (15-Mile Reach)



Upper Colorado River at Cameo  
Projected **118%** of Ave Apr-Jul runoff

15-Mile Reach

- Anticipating a “**wet-average**” runoff year, likely to correspond to 21,750 cfs peak flow target (PBO)
- CROS typically implemented in years like these (not too wet, not too dry) to augment peak
- Expectation for sufficient water to maintain adequate base flows through summer-fall

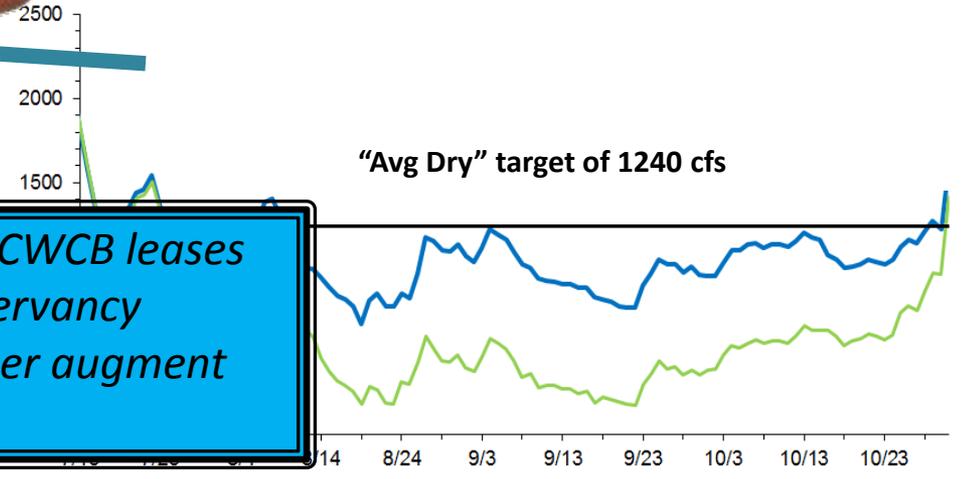


**Coordinated Water Releases (1997-2016) to Benefit Endangered Fishes in the Colorado River**

Reservoirs		Acre-Feet	
Granby	80,069	Green Mtn	768,980
Palisade Bypass	212,072	Ruedi	401,504
Williams Fork	107,569	Willow Ck	17,918
Windy Gap	4,624	Wolford Mtn	169,458

Total Ac-Ft: **1,762,194**

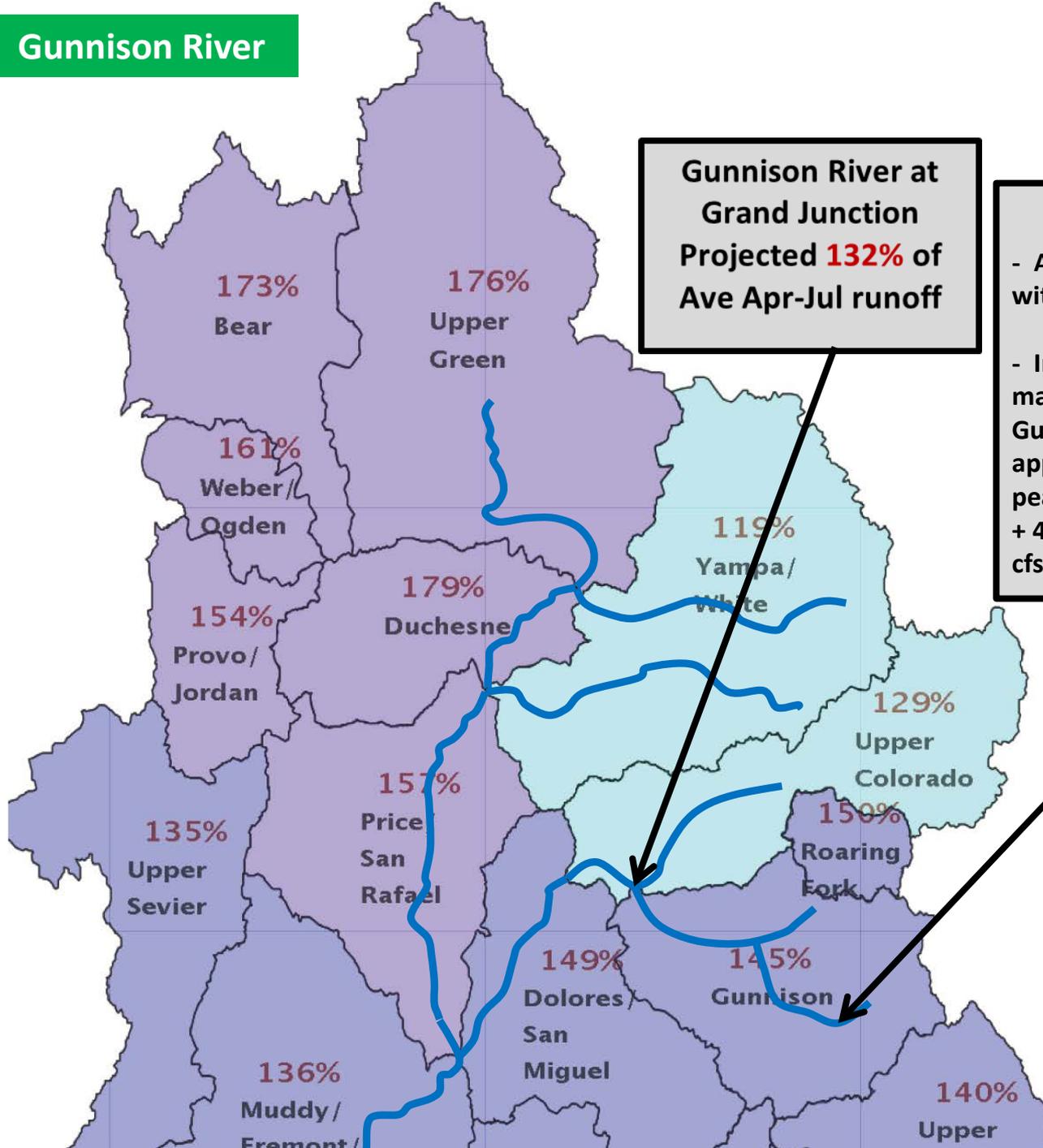
**Impact of Releases for the 15-Mile Reach at Colorado River nr Palisade Gage 2016**



*In 2015 and 2016 (w / future options) - CWCB leases 9-12,000 ac-ft from the Ute Water Conservancy District's pool in Ruedi Reservoir to further augment summer / autumn flow in the 15-MR!!*

- 15 Mile Reach Flow WITH Reservoir Releases
- 15 Mile Reach Flow WITHOUT Reservoir Releases
- USFWS Recommended Mean Monthly Flow July - October 2016

# Gunnison River

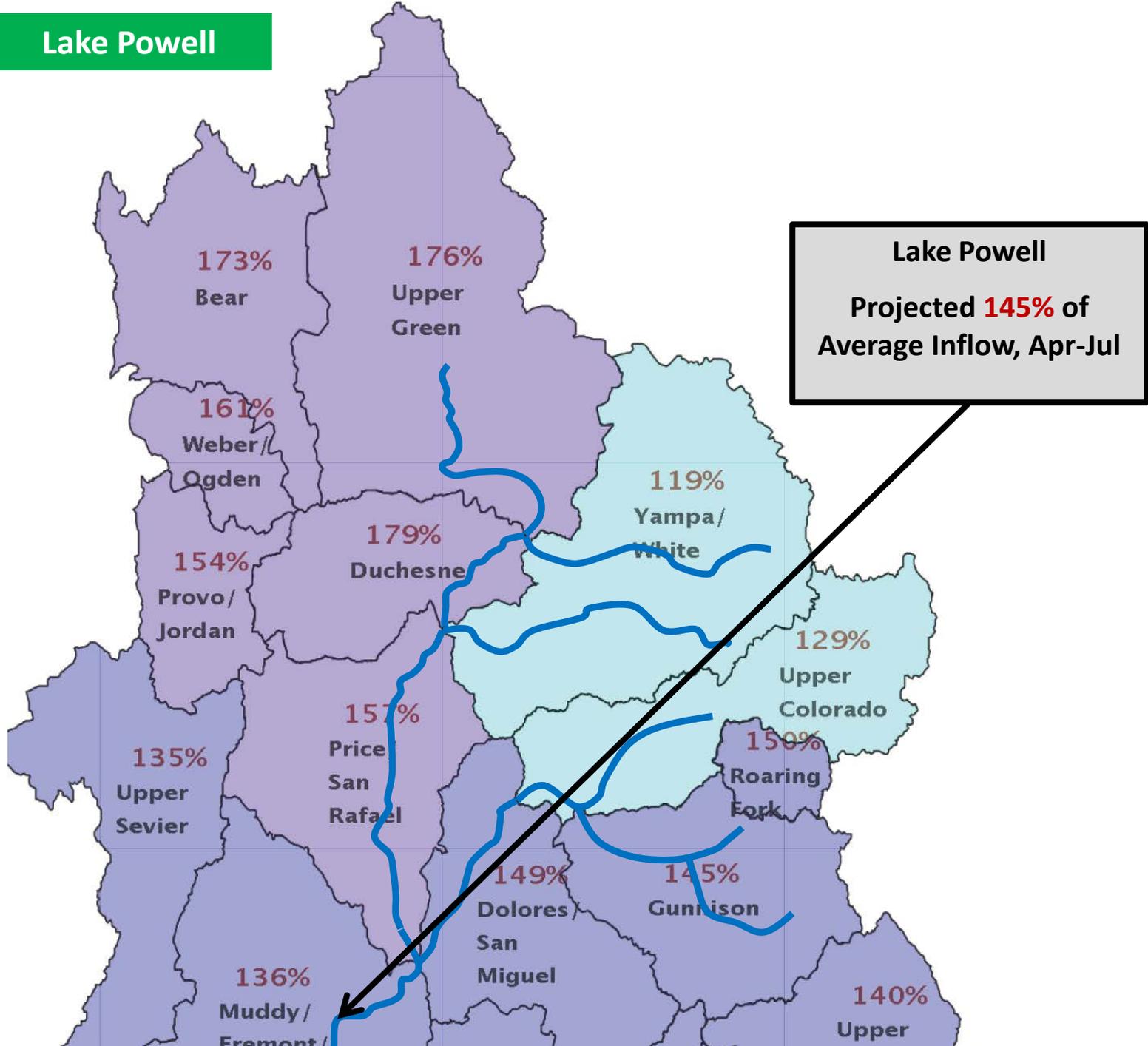


Gunnison River at Grand Junction  
Projected **132%** of Ave Apr-Jul runoff

Aspinall Unit of CRSP

- Anticipating a **"moderate wet"** year, with **144%** of average inflow
- In that case, USBR will attempt to match peak flow from the North Fork Gunnison River to achieve approximately 10 days of bankfull peak (14,350 cfs) at Whitewater gage + 40 days of half-bankfull flows (8,070 cfs).

# Lake Powell



# Updates

- White River Management Plan
- GREAT Committee
- GRUWAT modeling of current /future water development and protection of adequate Green River flows
- Review of 15-Mile-Reach PBO & Recovery Efforts
- Long-term flow protection needs/strategies
- Flaming Gorge spring flow request

# Recovery Elements



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

# Stewart Lake: Primary Sampling Site for LTSP Studies



## # of Age-0 RBS Collected During Fall Draining @ Stewart Lake

<b>2012</b>	<b>-</b>
<b>2013</b>	<b>613</b>
<b>2014</b>	<b>749</b>
<b>2015</b>	<b>87</b>
<b>2016</b>	<b>2,105</b>

# Capital Projects to Reconnect Habitat and Reduce Entrainment



Price-Stubb Fish Passage, 2008



Grand Valley Project Fish Passage, 2004



Redlands Fish Screen, 2005



Grand Valley Project Fish Screen, 2007



Redlands Fish Passage, 1996



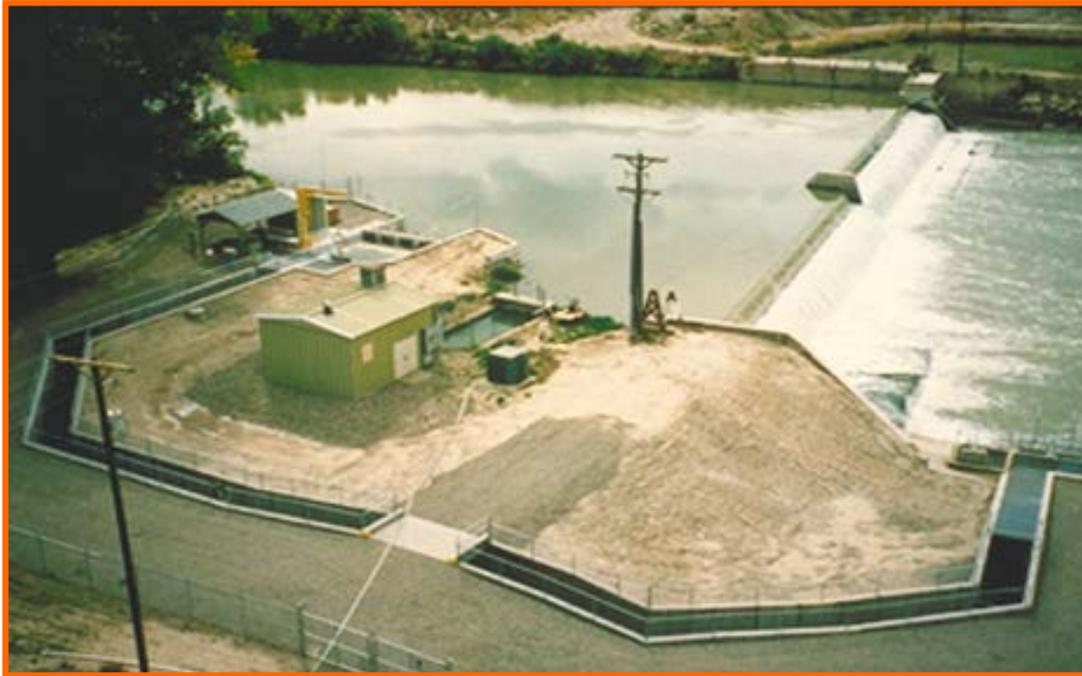
GVIC Fish Screen, 2002



GVIC Fish Passage, 1998



# Fish Ladders : Grand Valley



*Redlands Fish Ladder on the Lower Gunnison River.*

Year	# of CPM passed
1996	1
1997	18
1998	23
1999	5
2000	4
2001	1
2002	7
2003	3
2004	5
2005	4
2006	10
2007	21
2008	0
2009	2
2010	4
2011	2
2012	12
2013	2
2014	17
2015	6
2016	32

# Tusher Diversion Rebuilt in 2016

Program still needs to address entrainment



# Recovery Elements



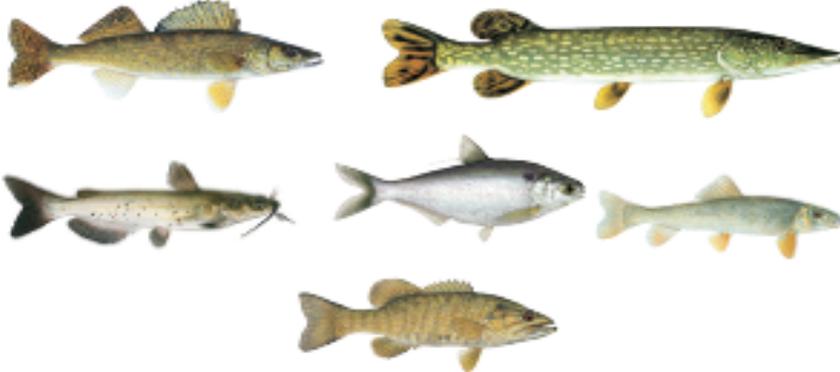
- Information and Education
- Habitat and Flow Management
- Habitat Development
- **Nonnative Fish Management**
- Database Management
- Propagation and Genetics
- Research and Monitoring

# **Managing Nonnative Fish: Recovering River Ecosystems & Preserving Angler Opportunity in the Upper Colorado River Basin**

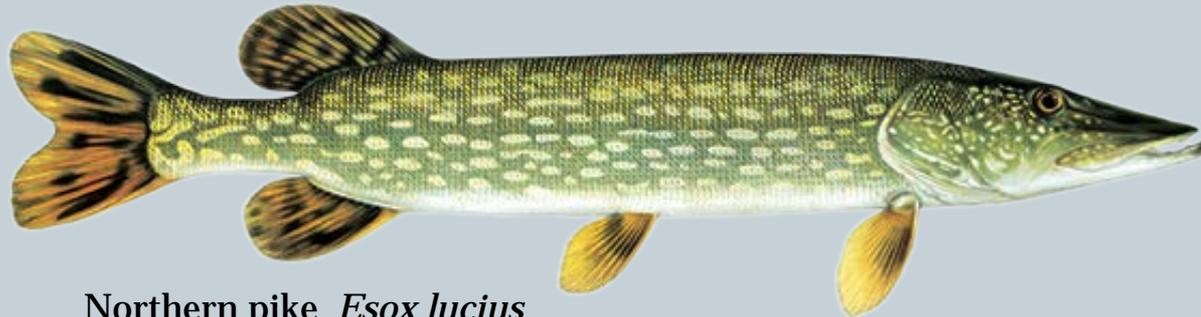
**Kevin McAbee**  
**Nonnative Fish Coordinator**



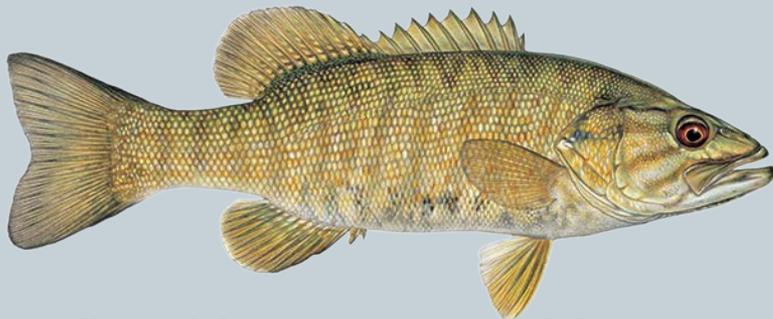
**Upper Colorado River  
Endangered Fish  
Recovery Program**

River	Presence of Invasive Species	
	Program Inception	Today
Colorado		
Gunnison		
Green		
White		
Yampa		

# 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.

# Focal Species' Predatory Impact



# Abundant Offspring Production



Smallmouth bass and northern pike are able to increase populations quickly

# We Have Come a Long Way



## Early 2000s

- Paucity of data
- Uncertain sources
- ~6 miles of in-river removal
- Translocation of fish

## Now

- Outstanding research
- Sources identified
- 600 + miles in all major sub-basins
- No translocations

# But We Have a Long Way To Go

## Now

- In-river removal is time & labor intensive, and expensive
- Prevent reservoir escapement
- Work with anglers to find solutions

## Future

- Need to use landscape scale strategies, such as flow manipulation
- Increased capital costs for screens & nets
- Replacement fisheries and halting illicit introduction

# Two-tiered Strategy

## In-River

## In-Reservoir



# Two-tiered Strategy

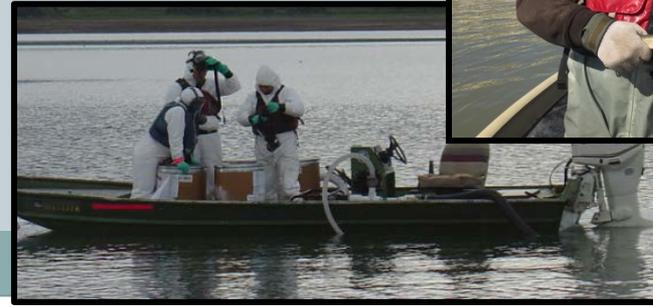
**Rivers: native fish recovery areas**

- Large scale removal
- Disrupt spawning

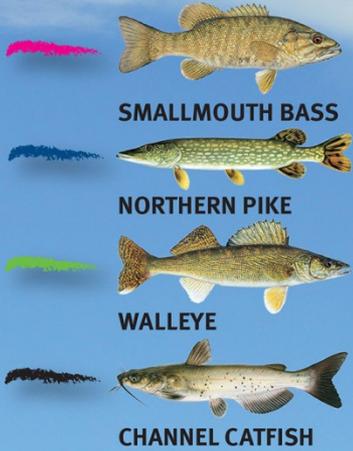


**Reservoirs: compatible angling opportunities**

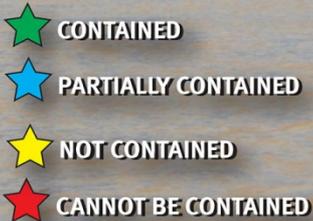
- Source eradication & containment
- Provide replacement fisheries for anglers



### IN RIVER REMOVAL



### RESERVOIR SOURCES OF NONNATIVE FISH



# Landscape Scale Nonnative Fish Management Via Flow Manipulation

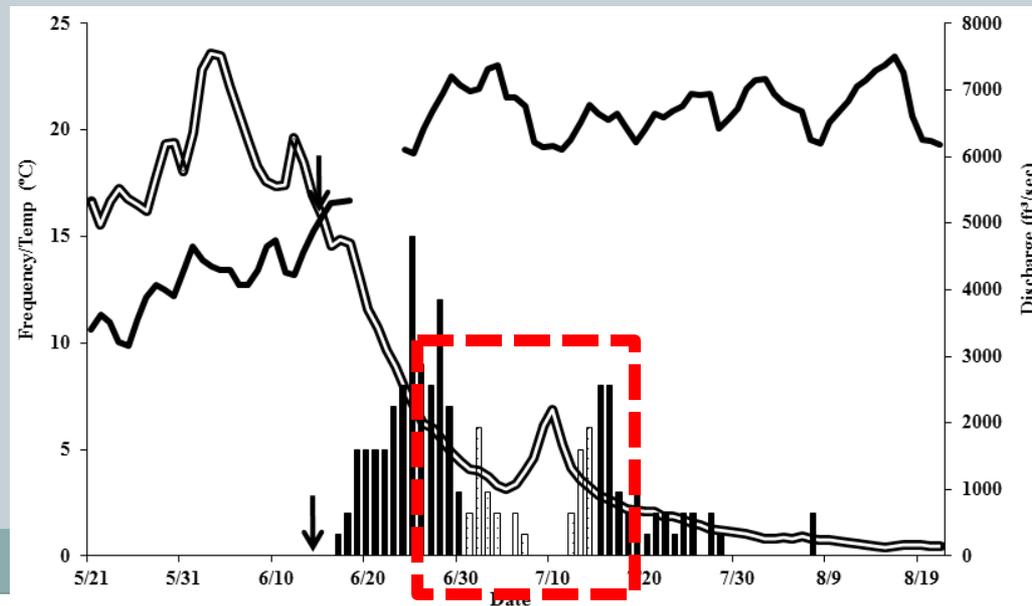


- Disrupt reproduction by disturbing bass nests with short-duration increased flows
  - Primarily in drier hydrology years
  - Multi-year benefits
  - Reduce year classes that persist
  - Enhance in-river removal

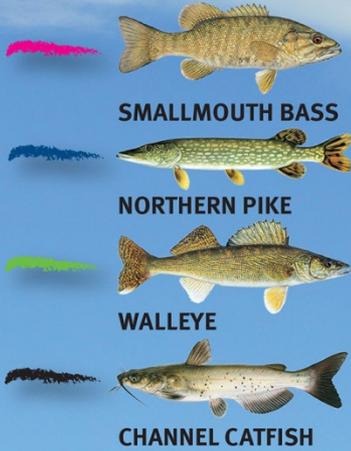


# Landscape Scale Nonnative Fish Management Via Flow Manipulation

- Natural “experiment” in 2015 provided positive results
- Hope to experiment using Flaming Gorge releases



**IN RIVER REMOVAL**



**RESERVOIR SOURCES OF NONNATIVE FISH**

- ★ CONTAINED
- ★ PARTIALLY CONTAINED
- ★ NOT CONTAINED
- ★ CANNOT BE CONTAINED



# Eliminate Reservoir Sources

## Recovery Goal

- Eliminate escapement of problematic nonnative fish



## Community Goal

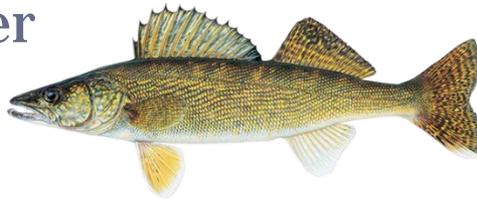
- Provide anglers, local communities, and state partners with valuable recreational waters



# Species Compatibility

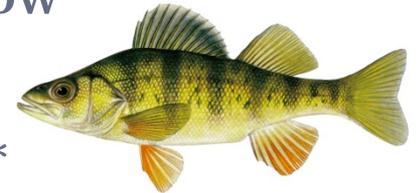
## ● Non-Compatible

- 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

# Eliminate Reservoir Sources

## Recovery Program Action

- Installation and maintenance of screening structures



## Community Action

- Provide input for new lake management
- Accept new fisheries and regulations



# 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*
Red Fleet Reservoir	Sterile Walleye (2015)	Rotenone treatment; downstream screen	2018*
Ridgway Reservoir	In-development	Spillway net	2019*
Stagecoach Reservoir and Lake Catamount	Trout	Spillway net; outlet screen (Catamount)	2020*

**Stakeholders are working diligently!**

# Angling Policies Support Recovery



- Harvest regulations support elimination via angler assistance and communication
  - Utah and Wyoming implementing “Must-keep”
  - Colorado implementing “Unlimited Catch”
    - ✦ Still need to apply a non-consumptive use for enhanced removal and regulation effectiveness
- Illicit introduction statutes support prevention
  - Prosecution and enforcement of these laws are critical
  - Illicit introduction delays recovery and costs millions
    - ✦ i.e. Ridgway Reservoir illicit smallmouth bass population

# Where Do We Go From Here



## Rivers

- Continue the most effective in-river removal strategy
  - Experimentally implement flow manipulation below Flaming Gorge

## Reservoirs

- Continue to complete reservoir screening actions
  - Continued funding – SCTF (Colorado) and ESMF (Utah) dollars critical

## Basin-wide

- Support Recovery through policy and regulation changes
  - Request Colorado enact non-consumptive regulations for focal species

# Where Do We Go From Here



- Nonnative fish management will be a long-term commitment in order to preserve native fish populations, even past recovery and de-listing;
- We just don't know what those long-term commitments will look like until we get the current nonnative fish populations under control.

**Thank you!**  
**Questions?**



# Recovery Elements



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

# STReaMS (streamsystem.org)

ps://streamsystem.org/viewEdit/encountersList.php



Home View & Edit Data Batch Uploads Downloads Help & Documentation Contact

### Browse Encounters

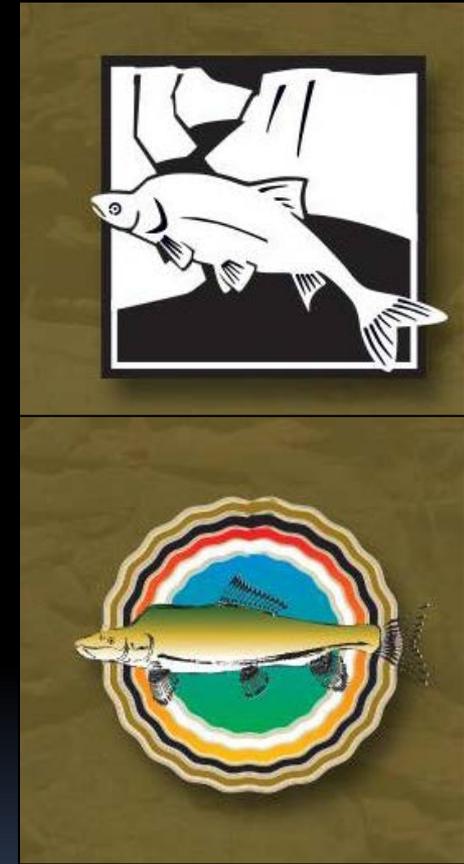
You are viewing 1,412,195 of 1,412,195 encounters. [View Related Individuals](#)

How would you like to filter results?

IDs (>100 is slow):	Tags (>100 is slow):	Species: --All--	Encounter Type: --All--	River: --All--	Basin: --All--	Rive
<input type="text"/>	<input type="text"/>	Study: --All--	Sampling/Stocking Org: --All--	Parent Org: --All--	PIA Location: --All--	Dat
		Harvest Type: --All--	Release Type: --All--	Year Class: --All--	Federal Status: --All--	Mo

[Filter Results](#)

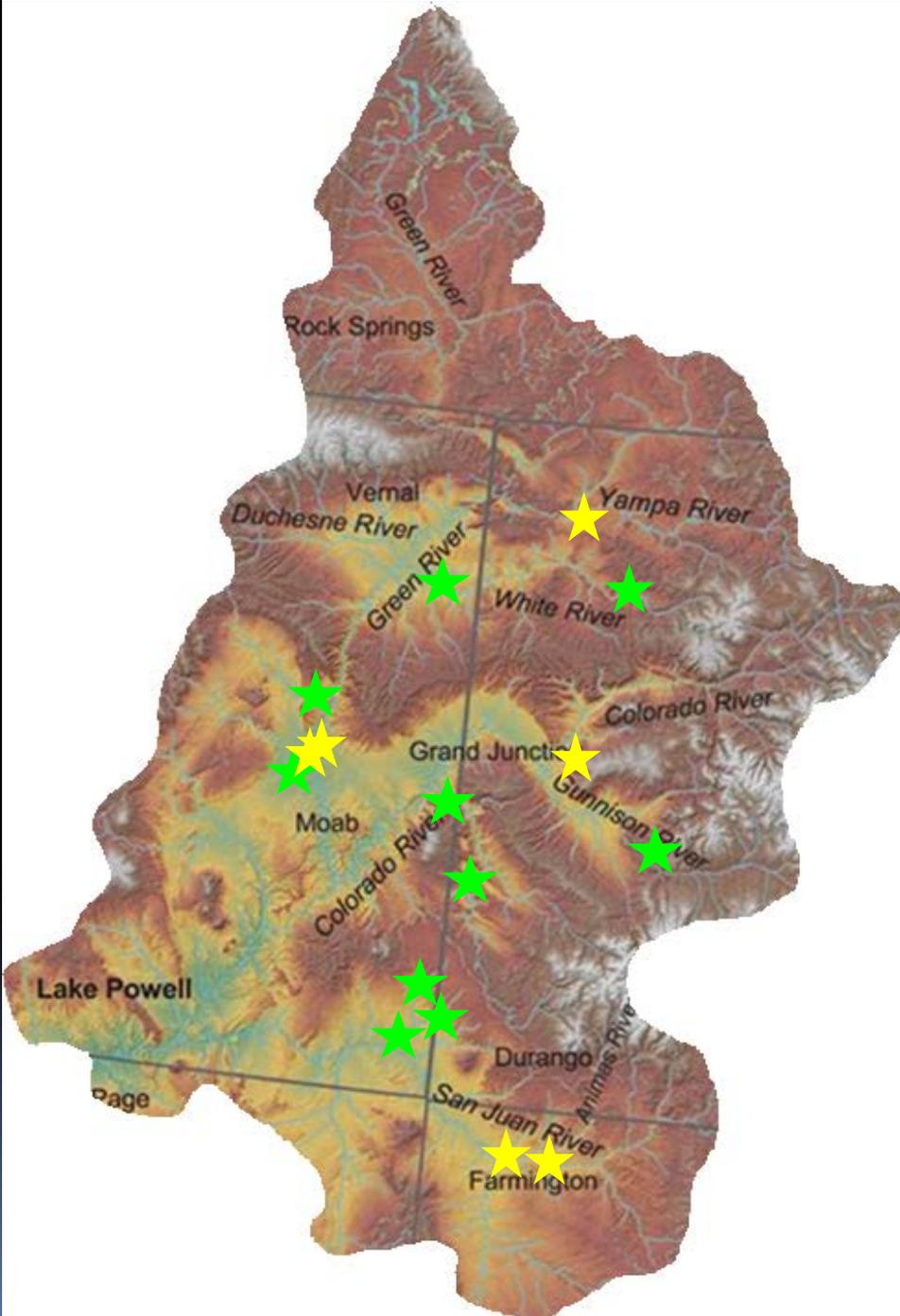
[Clear Filters](#) [Download](#) [New Encounter](#)



WARNER COLLEGE OF  
Natural Resources



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



# Examples



## Bonytail Stocked in Dolores (preliminary results)

	2014	2016
Fish stocked	4553	4926
Total Fish Detected	63	622
Fish Detected +1 month	63	95
Fish detected +1 year	4	
Fish detected +2 years	3	

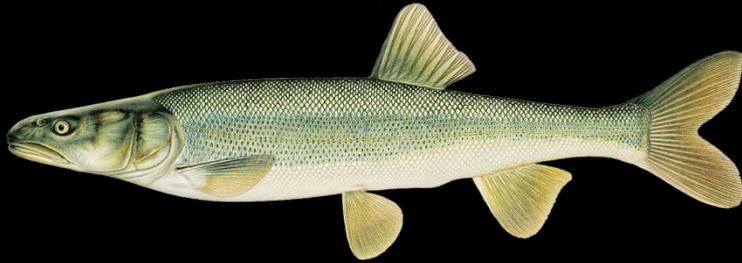
# Examples



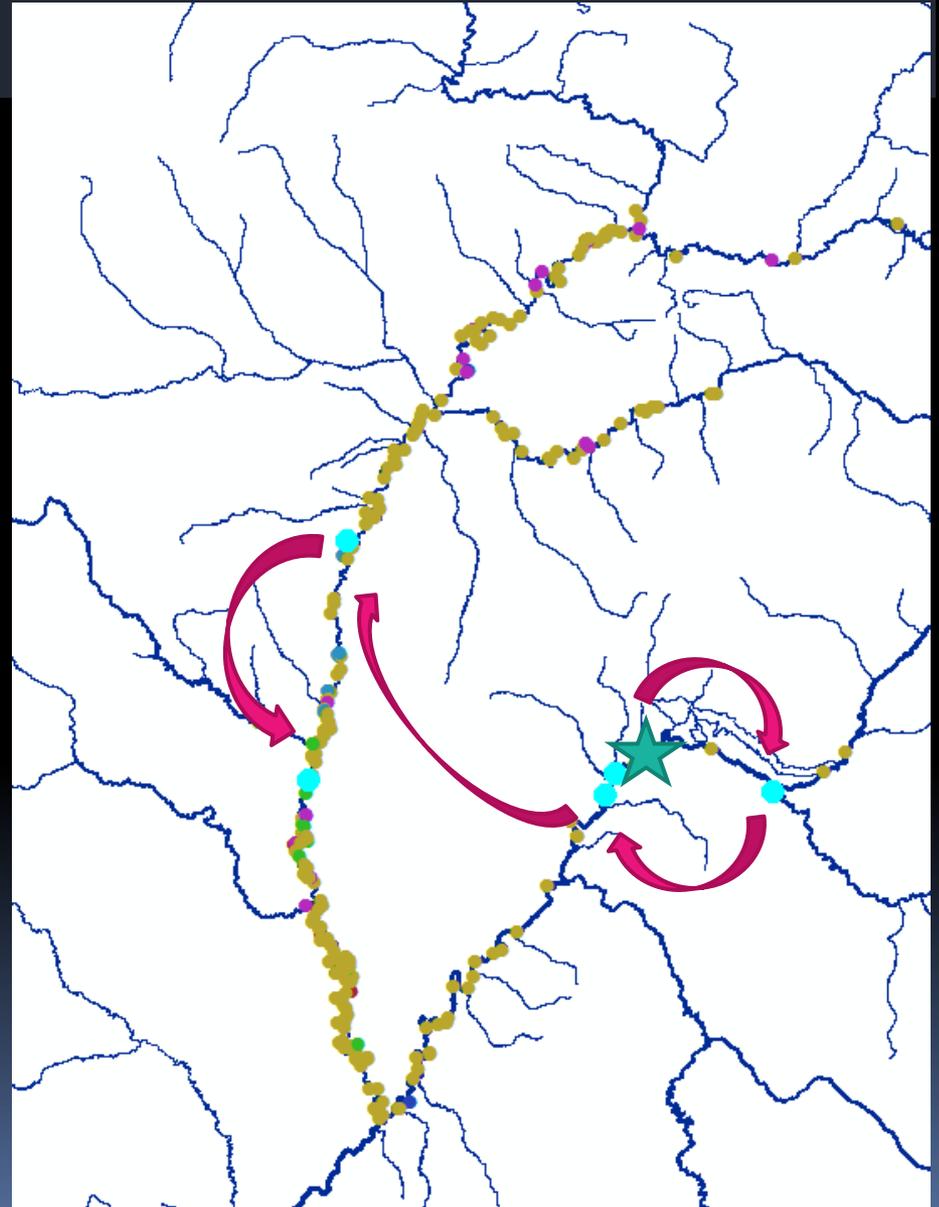
## Razorback in Lake Powell (preliminary results)

- 542 razorbacks have been seen both in Lake Powell and the Upper Basin.
- 480 were originally stocked in the Green River
- 20 moved from the Green to Lake Powell and then back into the Green (PIA at Green River Canal and Tusher Diversion)

# Examples



1997 Colorado  
2004 Gunnison  
2008 Colorado  
2010 Colorado  
2012 Green  
2013 GR Canal



# Next Steps



- Enhance structure
- Complete upload tools
- QAQC Current data
- Develop query and analysis tools

# Recovery Elements



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

# Propagation and Genetics



## Stocking, in 2013:

- Moved from 30,000, 12” to ~12,000, 14” razorback sucker
- Moved from 15,000, 8” to ~35,000, 10” bonytail

## Evaluating humpback chub genetics

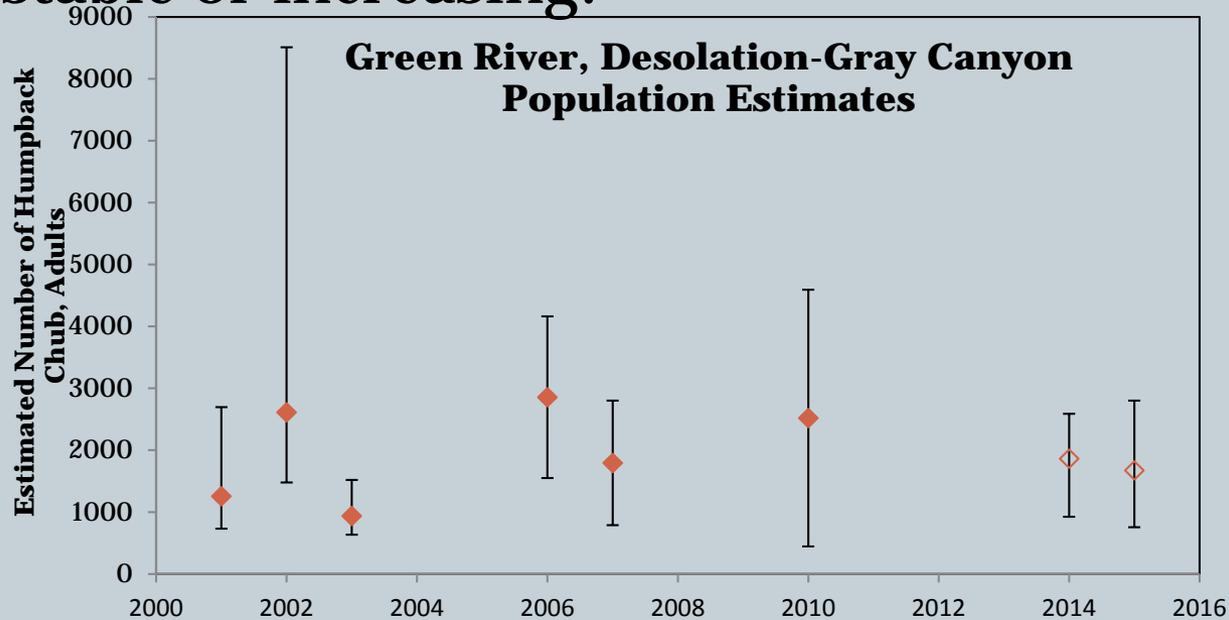
- Have representation of Desolation and Black Rocks populations at Service hatcheries
- Genetics study concludes we only need one broodstock, but have representation for both groups

# Research and Monitoring



## Humpback chub population estimates

- All are stable or increasing:



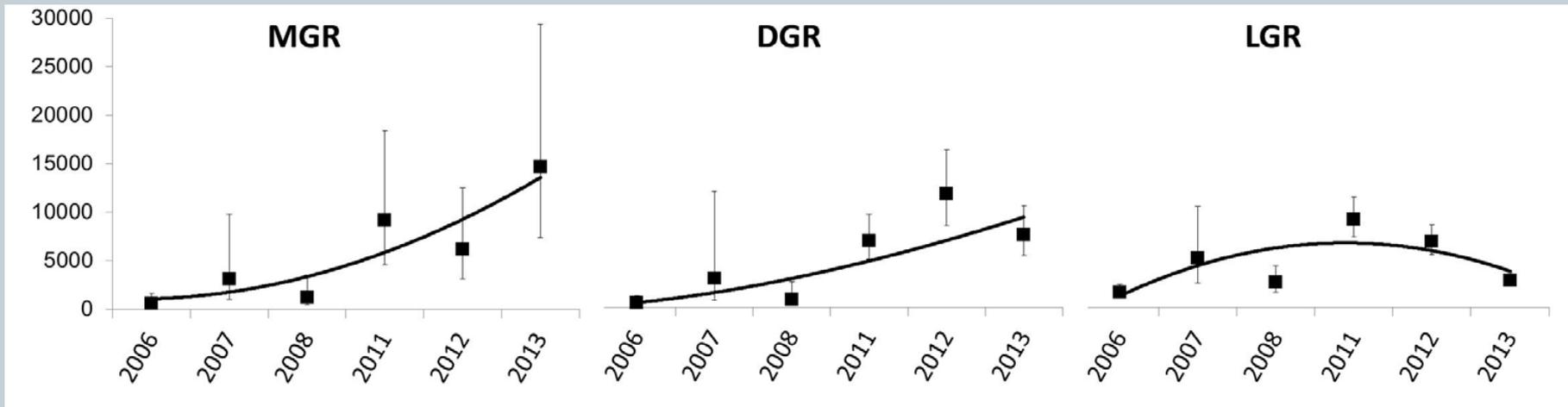
- DNM has a few individuals, usually not detected because we are not netting

# Research and Monitoring



## Razorback sucker monitoring and population estimates

- Both arms of Lake Powell
- Estimates for the Green River:
- For 2011-2013 mean estimates were 25,019 (ranging from 25,785-25,221 annually)

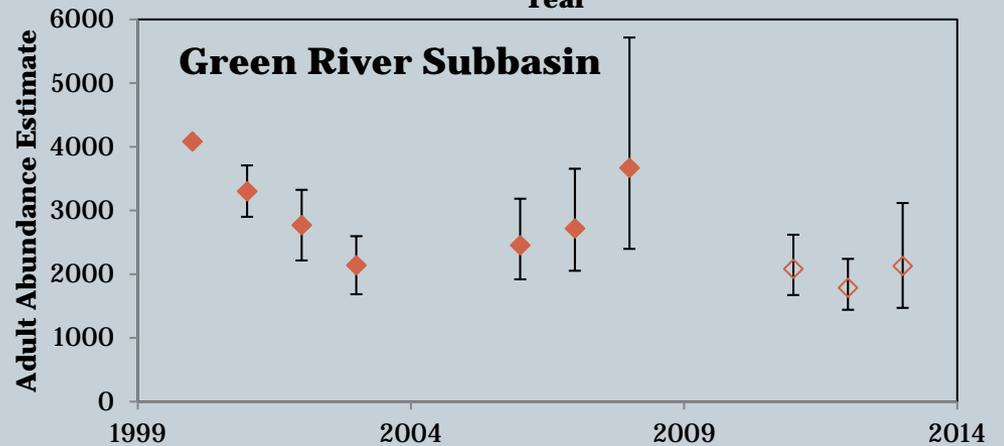
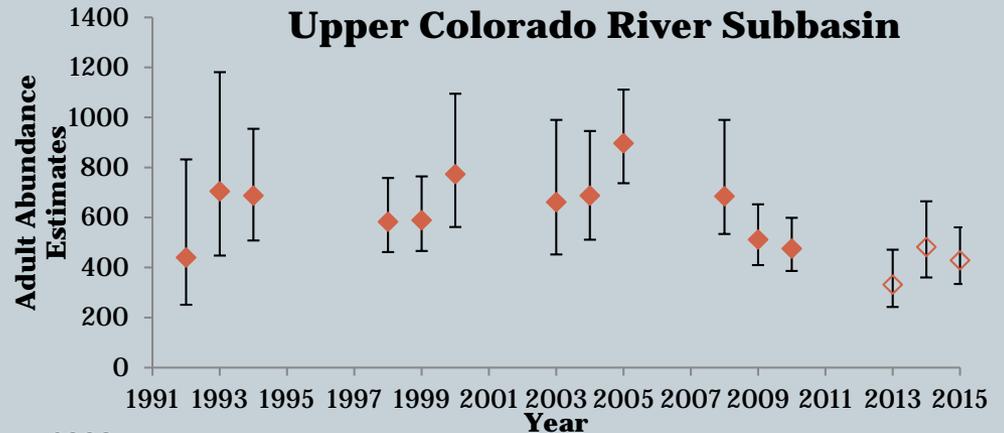


# Research and Monitoring



## Colorado pikeminnow population estimates

- Colorado River cycle will start in 2018
- Green River cycle started in 2016

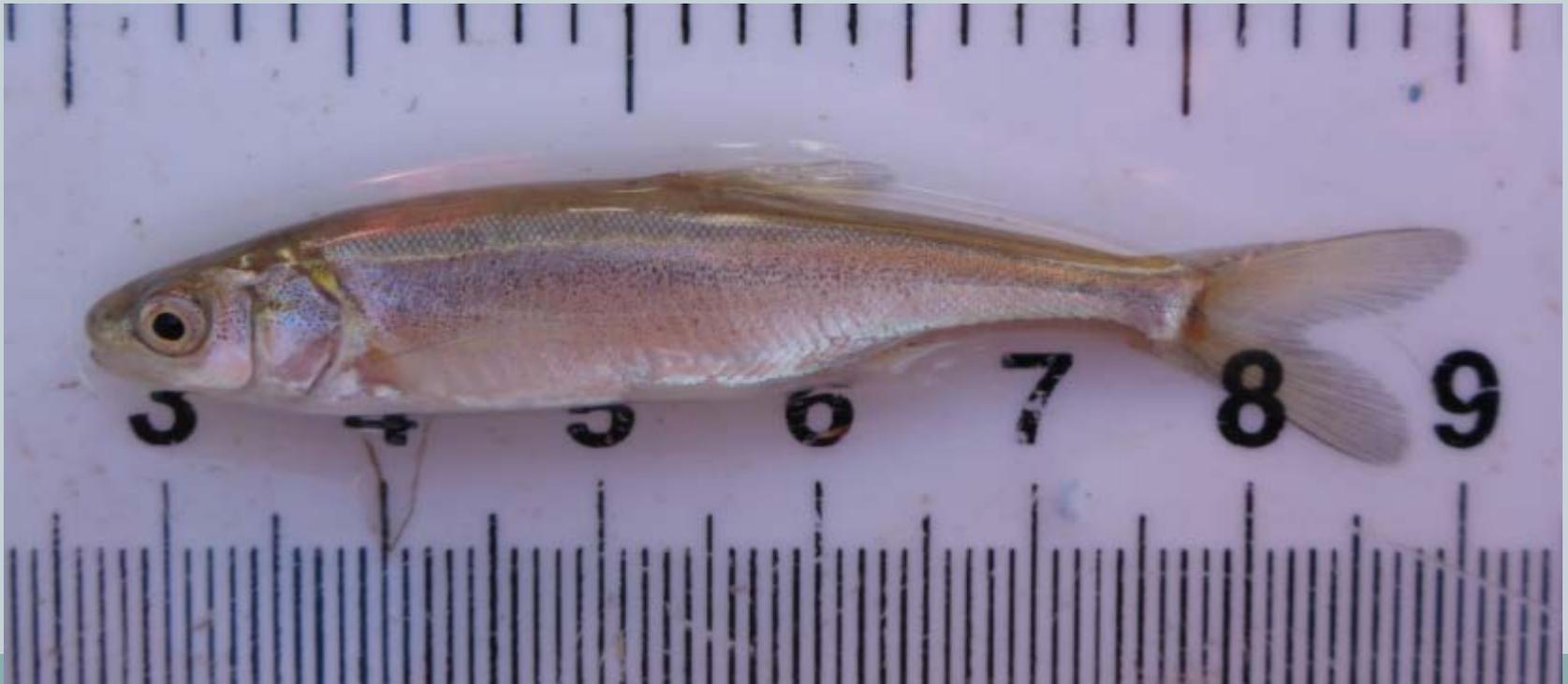


# Research and Monitoring



## Bonytail observations

- In 2016, spawned and grew in Stewart Lake and Johnson Bottom



# Research and Monitoring



## Species Status Assessments

### Humpback chub

- Last set of comments being addressed
- New draft by end of the week
- Then out for recovery team; programs; and peer review

### Razorback sucker

- Used a Delphi survey, canvased 54 experts on the species
- Being reviewed for framework guidelines consistency
- Biologically justify timelines
- Identify methodology to get to viability

# Research and Monitoring



## Colorado pikeminnow Population Viability Analysis

- Developed future scenarios for Green River
- Working on scenarios for Upper Colorado and San Juan rivers
- Webinar/conference call April 6th

