Upper Colorado River Endangered Fish Recovery Program

Welcome

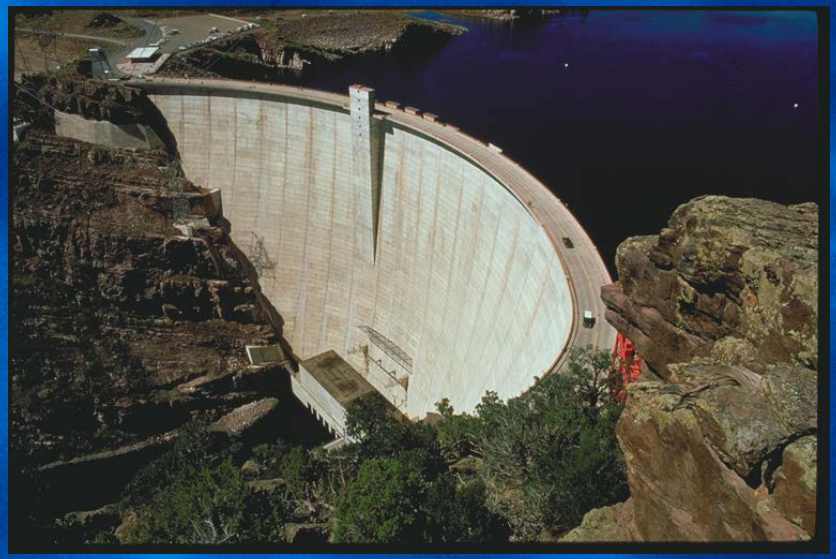
Upper Colorado River Endangered Fish Recovery Program Implementation Committee

Program Director's Office Update: April 5, 2018

Upper Colorado River Endangered Fish Recovery Program

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.



Upper Colorado River Endangered Fish Recovery Program

Our Partners

- **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

Upper Colorado River Endangered Fish Recovery Program

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

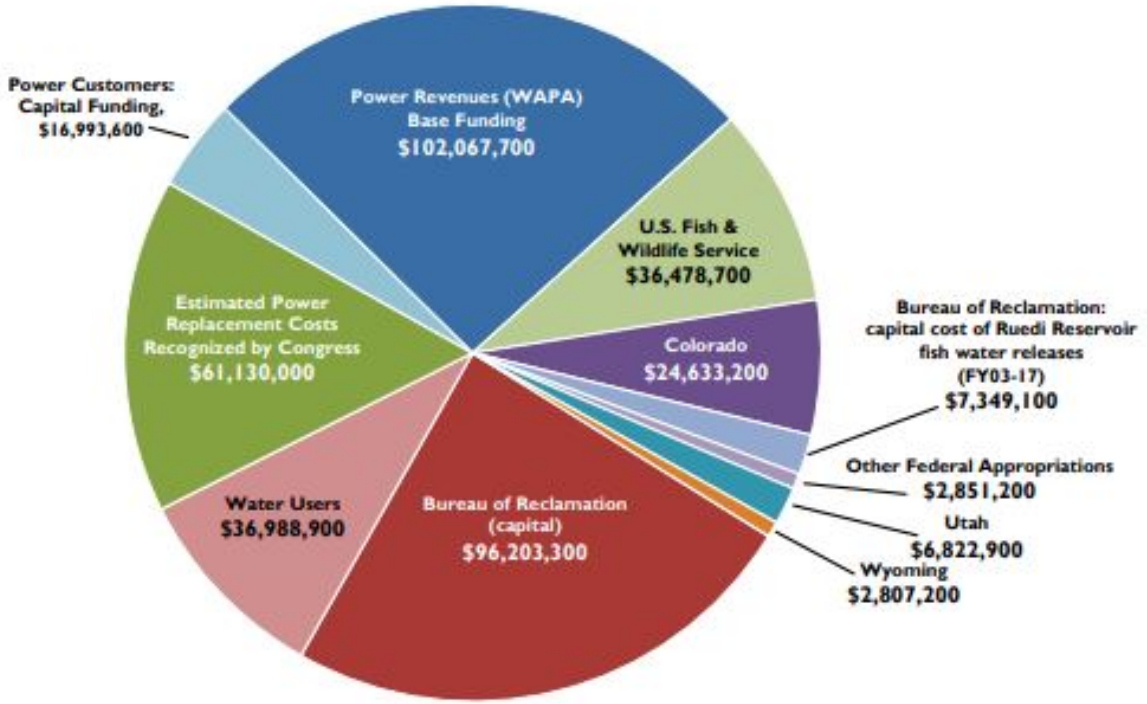
Upper Colorado River Endangered Fish Recovery Program
Summary of Endangered Species Act Section 7 Consultations
1/1988 through 12/31/2017

		Historical Depletions	New Depletions	Total
State	Number of Projects	Acre-Feet/Yr	Acre-Feet/Yr	Acre-Feet/Yr
Colorado	1232	1,915,682	207,213	2,122,895
Utah	263	517,898	98,777	616,675
Wyoming	416	83,498	36,574	120,072
CO/UT/WY	238[1]	(Regional)	(Regional)	
Total	**2,149**	**2,517,078**	**342,564**	**2,859,642**

[1]Small depletion projects (<100 acre-feet per year) consulted on between July 3, 1994, and October 1, 1997, when the Recovery Program did not track the number of these projects by state. Depletion totals associated with these 238 projects are captured by state under new depletions.

Expenditures
Upper Colorado River Endangered Fish Recovery Program

Total Partner Contributions = $394,325,800 (FY 1989-2018)



Program Actions

Upper Colorado River Endangered Fish Recovery Program

Recovery Elements

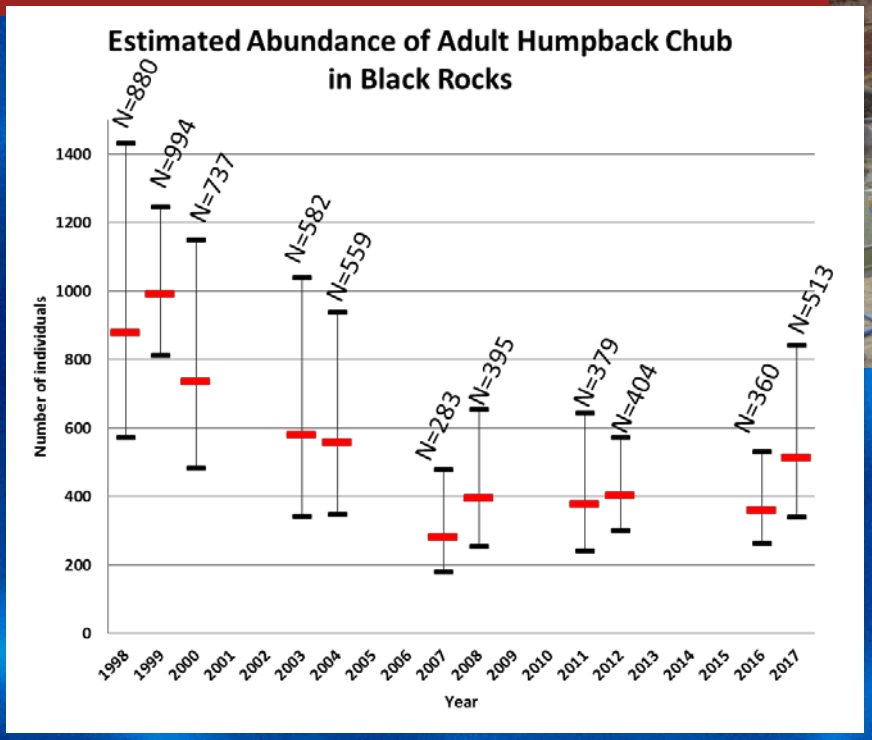
- Status of the Endangered Fish Populations
- Information and Education
- Instream Flows and Habitat Management
- Nonnative Fish Management
- Propagation and Data Management

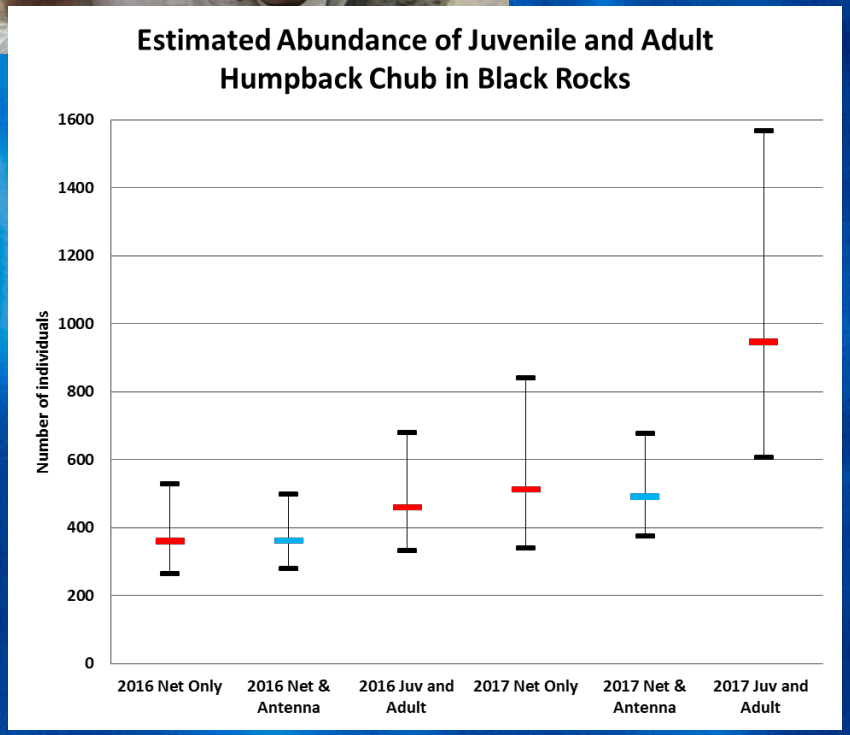
Upper Colorado River
Endangered Fish
Recovery Program

Species Status: Humpback Chub

Upper Colorado River
Endangered Fish
Recovery Program

Species Status: Humpback Chub



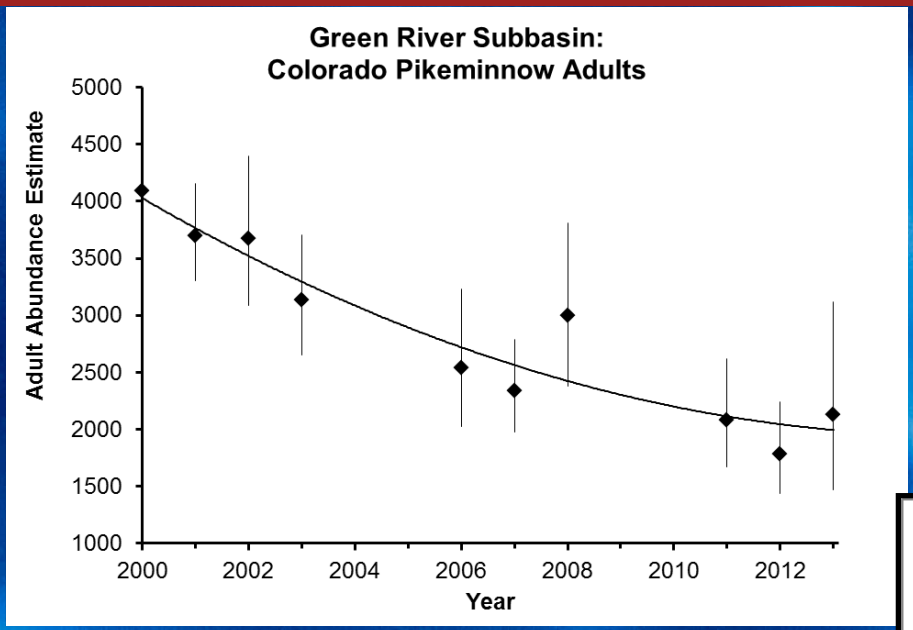


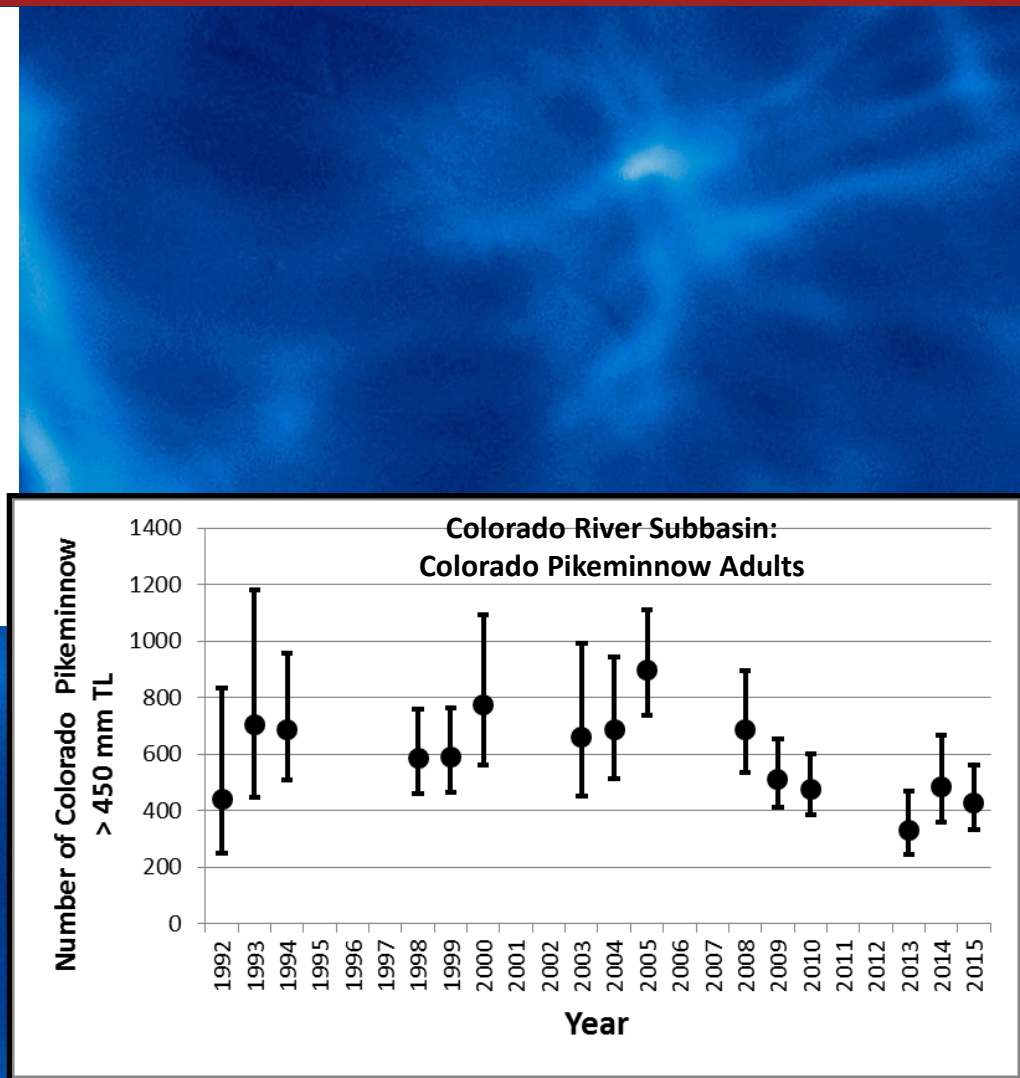
Upper Colorado River
Endangered Fish
Recovery Program

Species Status: Colorado Pikeminnow

Upper Colorado River Endangered Fish Recovery Program

Species Status: Colorado Pikeminnow



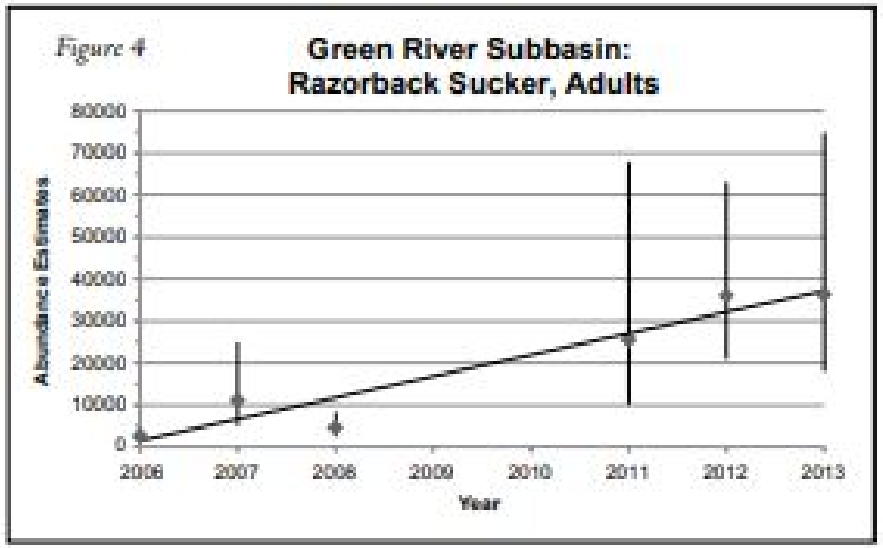


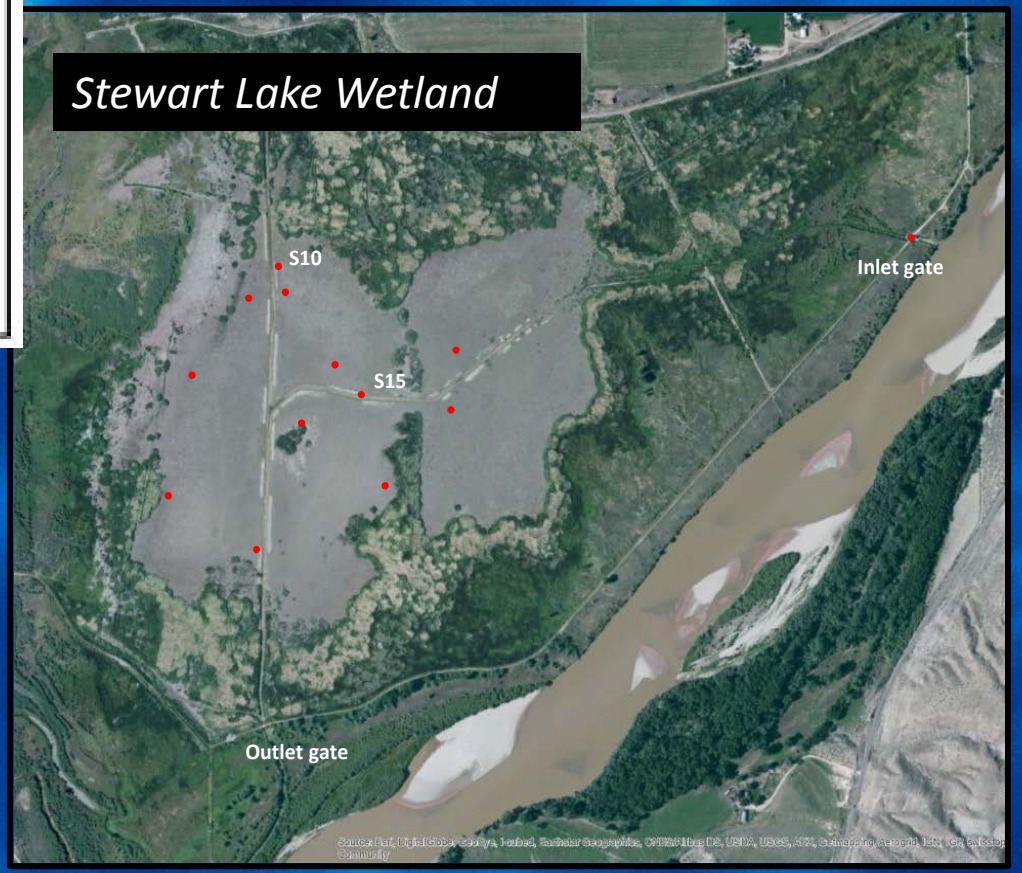
Upper Colorado River
Endangered Fish
Recovery Program

Species Status: Razorback Sucker

Upper Colorado River
Endangered Fish
Recovery Program

Species Status: Razorback Sucker





Upper Colorado River Endangered Fish Recovery Program

Species Status: Bonytail

- Program increases #'s and Size of Stocked Bonytail
- Encouraging discoveries of this spp. use of floodplain habitats
- PIT antenna reveal more re-sights than traditional sampling techniques.

Upper Colorado River Endangered Fish Recovery Program

Monitoring: Post 2023

- The measurable and objective demographic criteria in our 2002 Recovery Goals largely structure current monitoring efforts.
- In FY18, we will spend ~$1.5M (18% of our annual base funds) on monitoring endangered fish populations and related activities.
- Monitoring, in some form, will be a component of our Post 2023 future.
- Revised recovery plans will largely dictate the scope of this program element post 2023.

Upper Colorado River Endangered Fish Recovery Program

Recovery Progress Report

Spp.	Population Status	USWFS Pending Recovery Decisions
Colorado pikeminnow  • Listed as Endangered in 1967; recovery can occur in the Upper Basin. • Wild, self-sustaining populations are managed in Green and Colorado rivers.	• Adults in the Colorado and Green rivers have declined in the past decade, requiring increased effort to: a) reduce nonnative predators; and b) improve base flow management to increase survival of young Colorado pikeminnow.	• A Species Status Assessment (SSA) initiated in late 2015 and scheduled for completion in FY18. • Population Viability Analysis Report is undergoing Programs review • 5-yr review also scheduled for completion FY18 • Population declines in Colorado and Green rivers could delay a change in status.
Humpback chub  • Listed as Endangered in 1967; recovery is required in both Upper and Lower basins. • Wild, self-sustaining populations are managed in multiple locations in the Upper and Lower basin.	• 4 of 5 Upper Basin populations have sta bilized after declines were detected in the late 1990's. The fifth population (Yampa River) appears to have been lost. • In the Lower Basin, a population near the Little Colorado River is doing very well.	• The Service approved the final SSA in December 2017; 5-yr review signed in March 2018. • Long term stability in most populations served as the basis for the Service's decision to propose downlisting
Razorback sucker  • Listed as Endangered in 1991; recovery is required in both Upper and Lower basins. • A wild, self-sustaining population resides in Lake Mead; hatchery fish are stocked in other Lower Basin locations. • Razorback sucker raised in hatcheries are stocked in many Upper Basin rivers.	• In the Upper Basin, stocked adults are accumulating in Colorado, Green, and San Juan rivers and in the inflows to Lake Powell. • In the Lower Basin, the only wild, self- sustaining population is found in Lake Mead and the lower Grand Canyon. • Positive trends for this species are reported throughout the Colorado River.	• An SSA / 5-yr review for this species is scheduled for completion in FY18, which the Service will use to determine if downlisting is appropriate.
Bonytail  • Listed as Endangered in 1980; recovery is required in both Upper and Lower basins.	• Programs throughout the Upper and Lower basins rebuild populations with hatchery fish. • Spawning in the wild detected for the first time in Green River floodplains in 2015, 2016, and 2017.	• When survival of stocked fish improves the Service will initiate an SSA. • A 5-yr review for this species is scheduled in FY18.

Upper Colorado River Endangered Fish Recovery Program

Recovery Elements

- Status of the Endangered Fish Populations
- Information and Education
- Instream Flows and Habitat Management
- Nonnative Fish Management
- Propagation and Data Management

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

COLORADO RIVER

Humpback chub "stable," could move off endangered species list

By Bruce Finley
The Denver Post

Beauty can be in the eye of the beholder when it comes to the humpback chub, a fish that now is considered threatened as opposed to endangered. *Courtesy of USFWS*

After 50 years of work to rescue the Colorado River's imperiled native humpback chub, a fish that anglers long scorned as "trash" and the government tried to eradicate, federal wildlife authorities on Thursday pronounced them stable.

But dams and predators still threaten survival of these olive-gray fish with fleshy humps above their eyes. They evolved in turbulent canyon waters where they use powerful curved fins to hold their position.

U.S. Fish and Wildlife Service officials said chub populations appear steady enough for a legal reclassification from endangered to threatened. However, to prevent extinction of the chub, officials said extermination of predatory smallmouth bass and simulated high-water flows along the Colorado and Green rivers must continue.

"Is this fish in immediate danger of extinction? No. This is the right thing to do. Science supports it," said Tom Chart, director of the USFWS Upper Colorado River Endangered Fish Recovery Program. "We still have threats we need to manage. We're still concerned about how this will play out in the long-term."

The proposed reclassification reflects growing confidence in efforts to offset harm.

That harm began with dams built along the Colorado River and tributaries after settlers moved into arid regions of the West. Dams destroy habitat for native fish by trapping silt and lowering water temperatures. Four natives in Colorado require life support to survive: the humpback chub, razorback sucker, bonytail and pikeminnow.

Dams hit humpbacks especially hard. Yet the latest federal population estimates, based on netting, has confirmed 500 survivors in the Black Rocks area of Western Colorado. Another 3,500 have survived in Westwater Canyon of the Colorado River in Utah and about 12,000 live in Grand Canyon.

The West's remade rivers favor trout, coveted by anglers and the recreation industry, and non-native fish such as small-mouth bass that bully and devour humpback chubs. When baby chubs swim out of relatively warm tributaries into the main stem of the Colorado River, cold water shocks them, leaving them vulnerable to the trout and bass.

Humpback chubs have been listed as endangered since 1967 and the "threatened" classification still gives protection. The change signifies simply that biologists do not consider extinction to be imminent. Native Western fish appear in significant numbers on the nation's endangered species list because settlers of water-scarce areas clung to rivers, siphoning out water and discharging pollution.

Federal wildlife crews in recent years have honed techniques for controlling predator fish who prey on natives, cruising along rivers in boats that shoot out electricity and then scooping out stunned bass and other non-native predators. And the feds work with dam operators to release water periodically to mimic the scouring spring high flows that native fish need.

USFWS biologists currently are considering a new use of simulated two-day floods: targeting the bass.

"Quick increases in flow can really knock down the young small-mouth bass. There's a bunch of locations where we can do it," he said, suggesting the Flaming Gorge basin near the Wyoming-Utah border.

Bruce Finley: 303-954-1700, bfinley@denverpost.com or @finleybruce

U.S. FISH AND WILDLIFE SERVICE
Mountain-Prairie Region
134 Union Boulevard
Lakewood, Colorado 80228

For Immediate Release

March 22, 2018

Contact: Melanie Fischer, 303-236-9881, melanie_fischer@fws.gov

After Scientific Review, the U.S. Fish and Wildlife Service to Propose Reclassification of the Humpback Chub from Endangered to Threatened

DENVER — Things are looking up for a rare Colorado River fish, the endangered humpback chub. The U.S. Fish and Wildlife Service (Service) recently completed a species status assessment (SSA) and a 5-year status review that concluded the current risk of extinction is low, such that the species is not in danger of extinction throughout all of its range. The SSA explained that the largest population of humpback chub, which is found in the Colorado and Little Colorado rivers in the Grand Canyon of Arizona, is a stable population of about 12,000 adults.

Our SSA also explained that four smaller populations in the Green and Colorado rivers of the upper Colorado River basin have persisted and do not appear to be in immediate danger of extinction. All five populations are wild, persisting without the need for hatchery stocking. These population-monitoring results, when coupled with ongoing flow management and nonnative predatory fish control, mean that the humpback chub will be considered for reclassification from endangered to threatened in the next year.

Although this unique fish is making a big step toward recovery it still needs help. Conservation work by a diverse group of stakeholders has been one of the key contributions in recovering this native fish. State, tribal, federal, and private stakeholders collaborate via the Upper Colorado River Endangered Fish Recovery Program (established in 1988) and the Glen Canyon Dam Adaptive Management Program (established in 1997) to continue the monitoring programs and to reduce threats to this species' recovery. "Endangered species recovery in altered and heavily managed ecosystems like the Colorado River is a complicated endeavor," said Service Mountain-Prairie Regional Director Noreen Walsh. "Our best chance for continued success rests in the power of these collaborative partnerships."

The humpback chub, which was first described as a unique species from collections in the Grand Canyon in the 1940's, was not discovered in the upper Colorado River basin until the 1970's. It was placed on the original list of endangered species in 1967. Humpback chub prefer canyon-bound reaches of river where they complete their life cycle in swift, turbulent currents. The species gets its name from the fleshy hump behind its head. That adaptation coupled with large, curved fins allows the species to maintain position in the turbulent flows. Habitat alterations (from changes in river flows and inundation of canyon reaches), and competition and predation from invasive species are the greatest threats to the humpback chub.

In the 5-year review, the Service also recommends that the species recovery plan be revised to incorporate the best available scientific information on the species needs and actions that will be necessary to eventually delist humpback chub. Efforts to propose reclassification and to revise the recovery plan will be ongoing in the coming year. The proposed reclassification rule and the revised recovery plan will be made available for public comment in the future.

To review the SSA and the 5-year review please visit: www.fws.gov/mountain-prairie/
The U.S. Fish and Wildlife Service works with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. For more information, visit www.fws.gov, or connect with us through any of these social media channels: Facebook, Twitter, Flickr, and YouTube.

– FWS –

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 332 anglers who caught 1,359 fish, including 963 smallmouth bass and 396 northern pike. Large cash prizes were given out and the tournament was deemed a success.

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

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

Public Events

San Juan River Basin Recovery Implementation Program

CRWUA Annual Meeting, December 2017

Western Colorado Horticultural Society Conference, January 2018

Colorado Water Congress Annual Meeting, January 2018

Utah Water Users Meeting, March 2018

Ute Water Festival, May 2018

Endangered Species Day, Denver Aquarium, May 2018

Rocky Mountain Coal Mining Institute Annual Meeting, June 2018

Grand Junction Farmer's Market: July, August and September 2018

Palisade Peach Festival, August 2018

Palisade Farmer's Market, August, 2018

Upper Colorado River Endangered Fish Recovery Program

Live Exhibits of Endangered Fish

San Juan River Basin Recovery Implementation Program

Eureka! McConnell

Grand Junction, CO

Denver Aquarium

Denver, CO

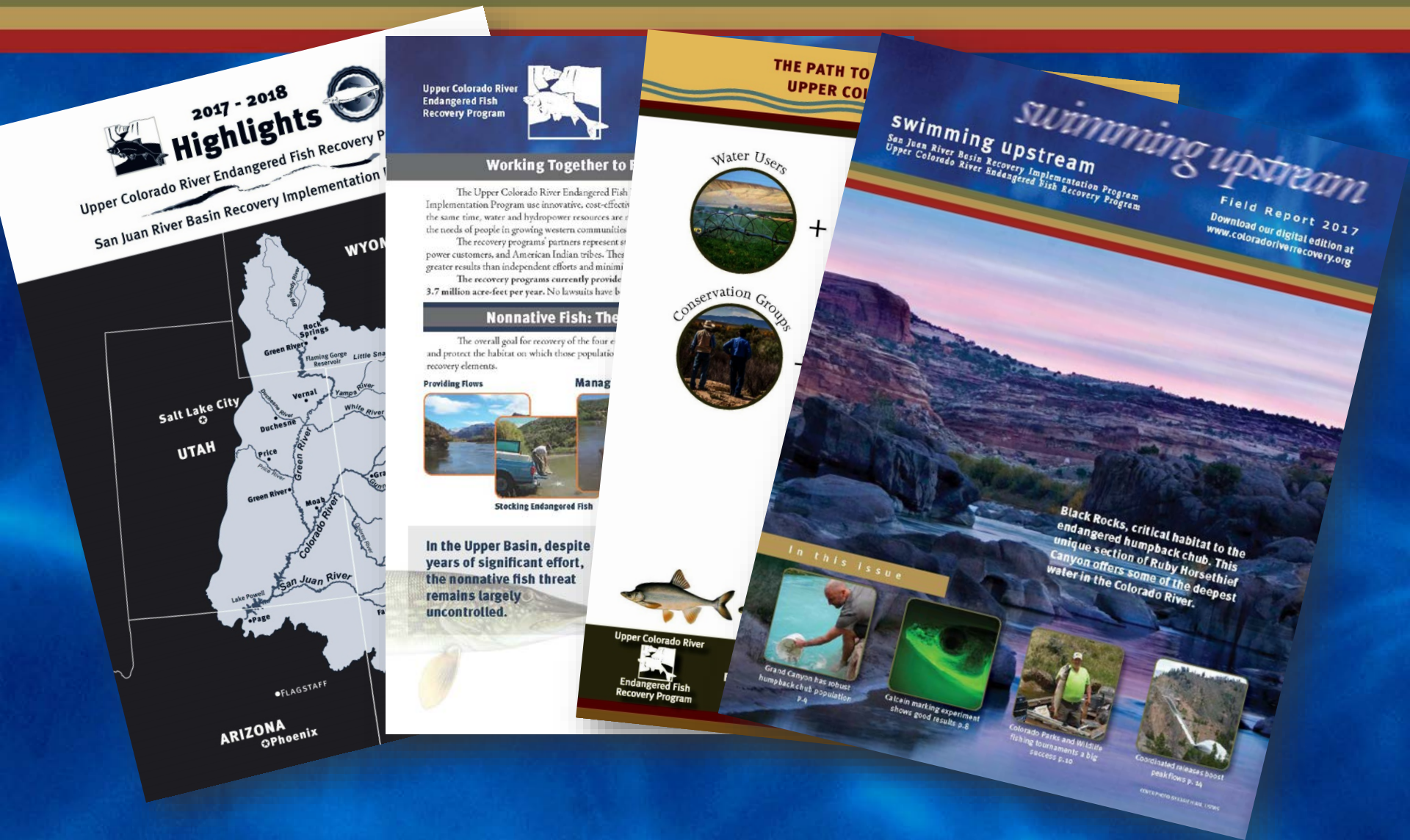
Utah Field House

Vernal, UT

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

Vinyl Die-Cut Stickers

Raft / Boat Beverage Holder

Upper Colorado River Endangered Fish Recovery Program

I&E Post 2023

San Juan River Basin Recovery Implementation Program

Increase Outreach Efforts in Critical Habitat

- **Creation of “Friends Group” and increase volunteers for public events, geographically located in critical habitat.**
- **Continue to provide high quality educational items that inform and inspire local citizens to care about endangered fish in the upper Colorado River basin.**
- **I&E Coordinator position should be located in Grand Junction, CO or Vernal, UT to better facilitate outreach post 2023.**

Upper Colorado River Endangered Fish Recovery Program

Recovery Elements

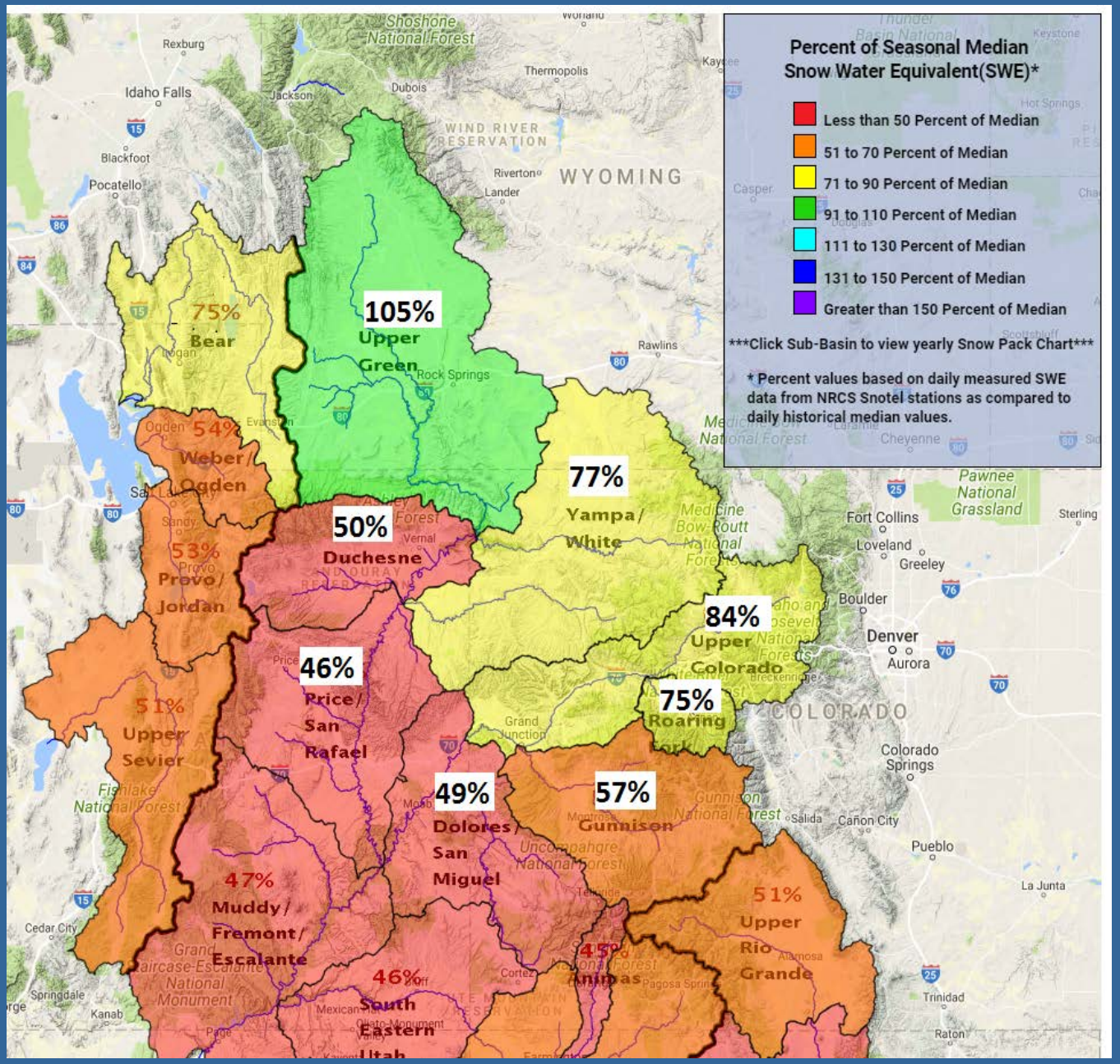
- Status of the Endangered Fish Populations
- Information and Education
- Instream Flows and Habitat Management
- Nonnative Fish Management
- Propagation and Data Management

Instream Flow and Habitat Updates

Upper Colorado River
Endangered Fish Recovery Program

2018 Water Outlook

Snow Water Equivalent as Percent of Median, April 4

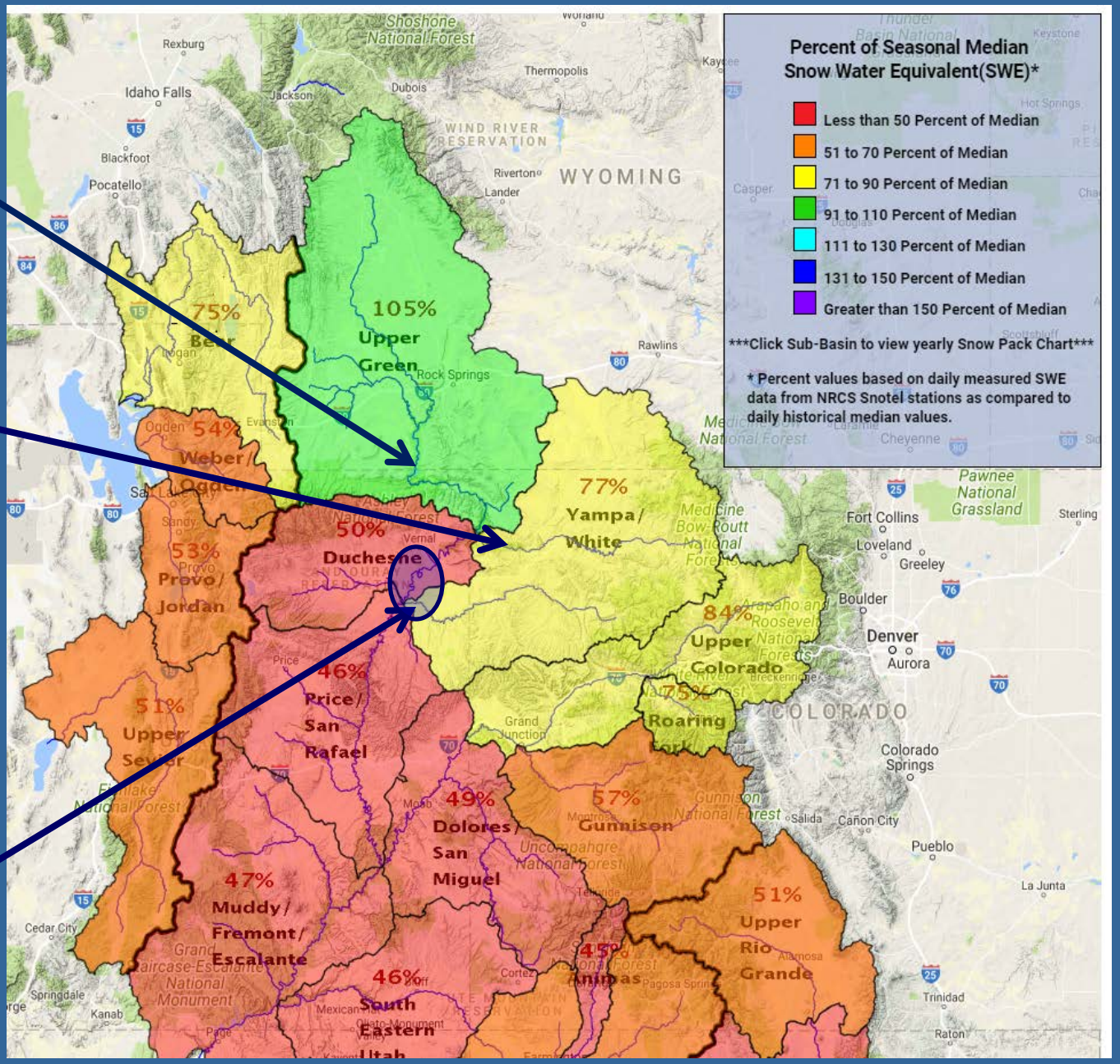


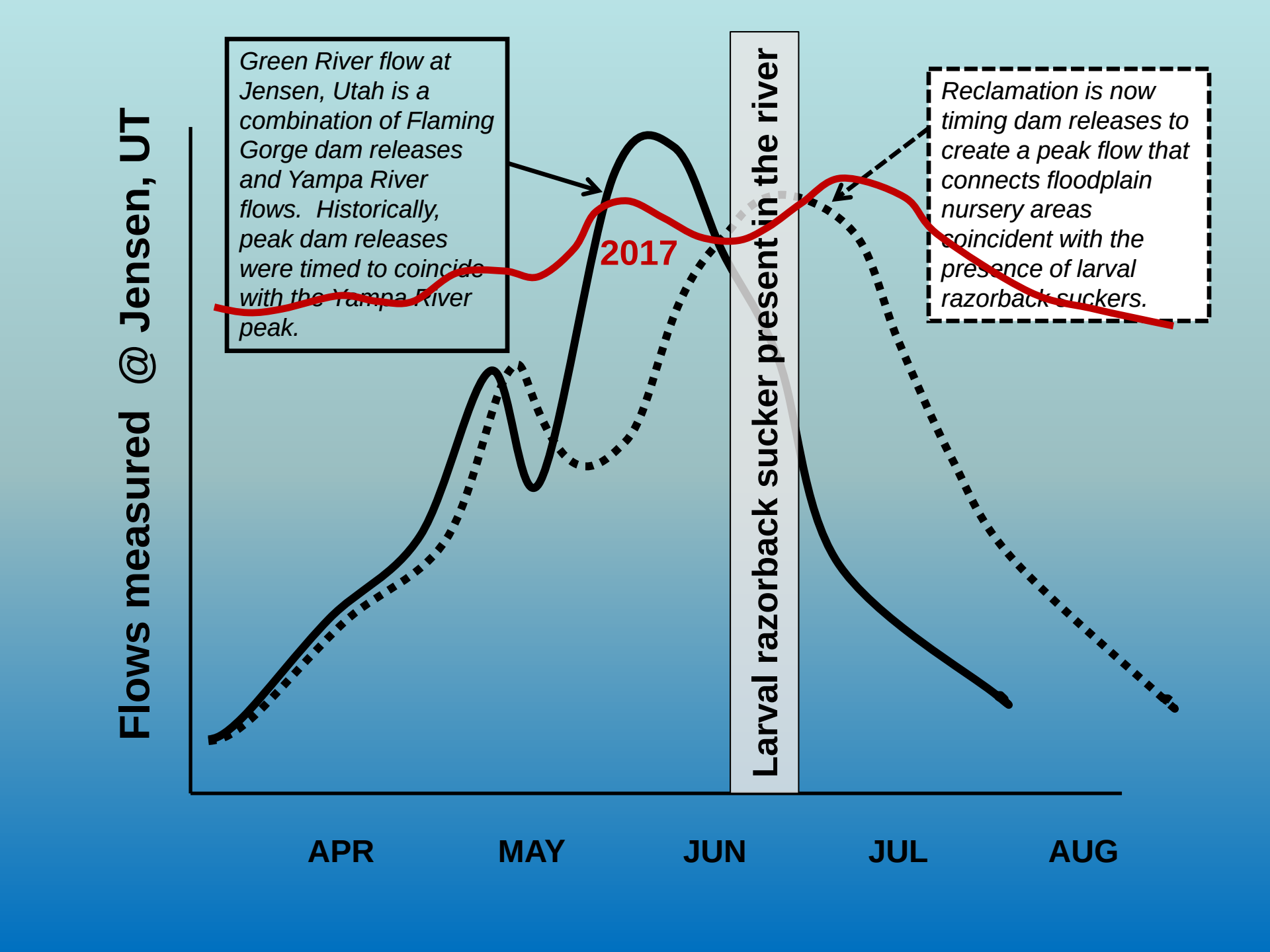
Flaming Gorge, projected 96% of Ave Apr-Jul inflow ("Average-Dry" condition)

Yampa River projected 60% of Ave Apr-Jul inflow ("Moderately Dry" to "Dry" condition)

Projected peak: ~8,500 cfs

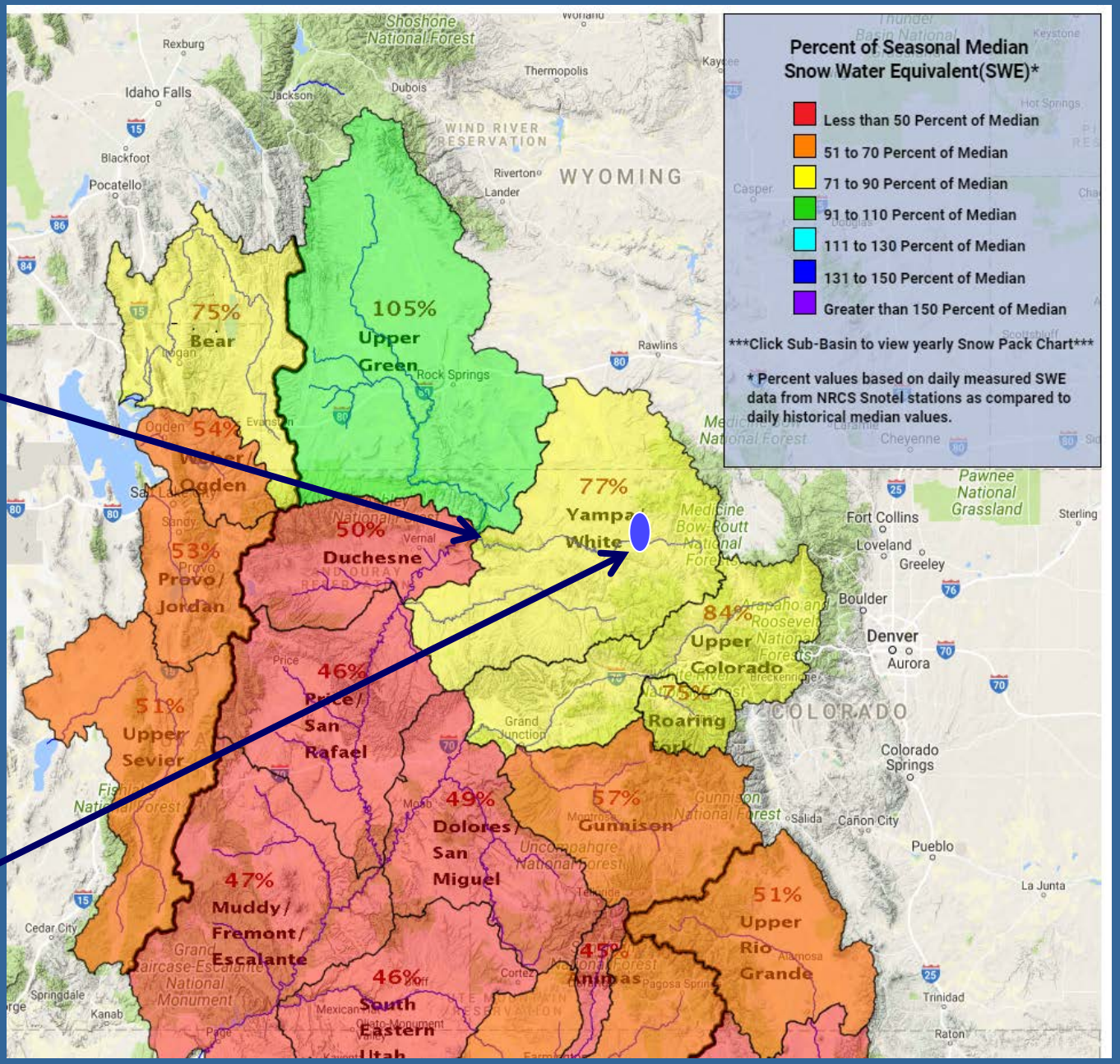
Larval-triggered spring release requested this year from Flaming Gorge Dam

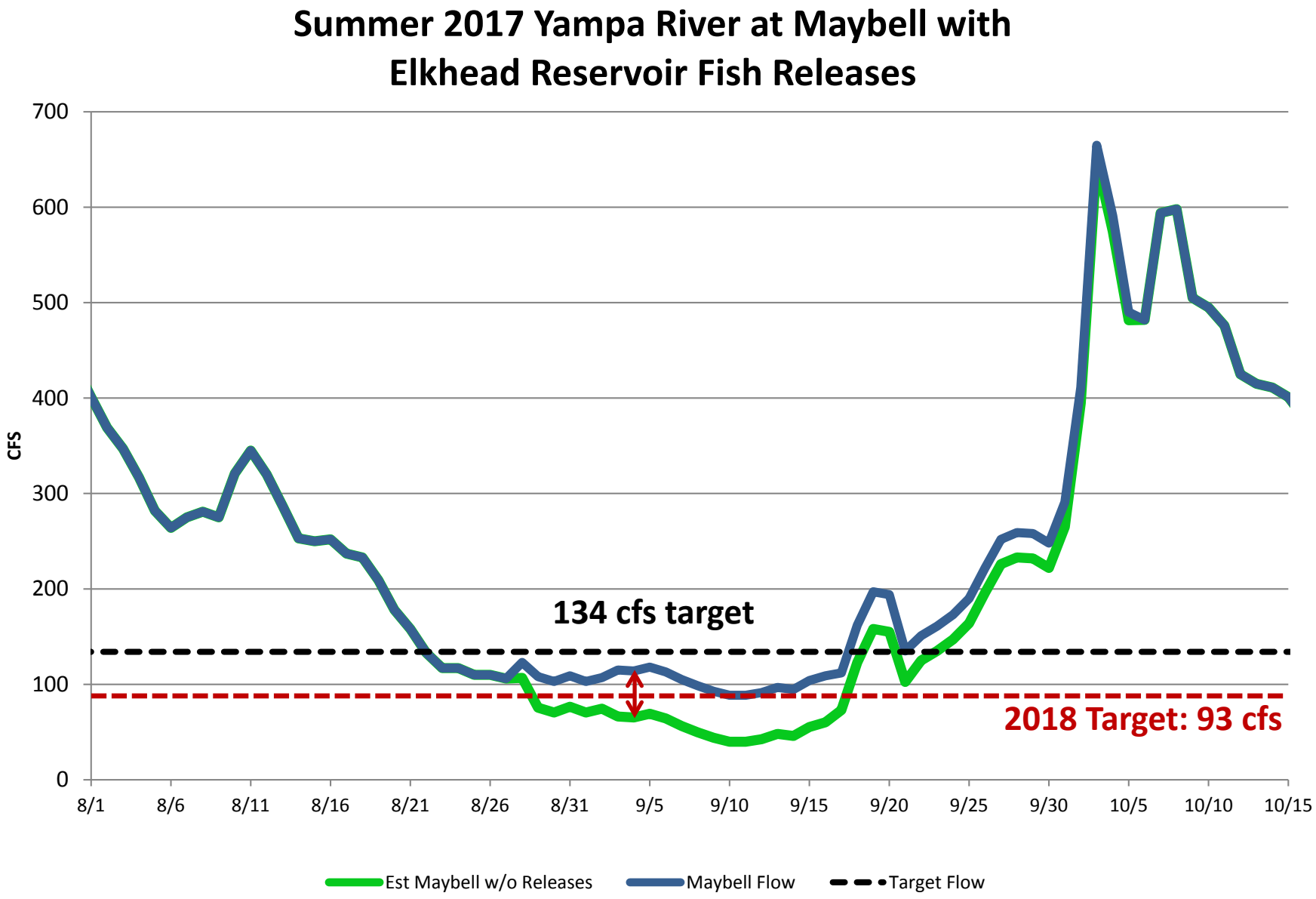



Green River flow at Jensen, Utah is a combination of Flaming Gorge dam releases and Yampa River flows. Historically, peak dam releases were timed to coincide with the Yampa River peak.
Reclamation is now timing dam releases to create a peak flow that connects floodplain nursery areas coincident with the presence of larval razorback suckers.
2017
Larval razorback sucker present in the river
Flows measured @ Jensen, UT
APR
MAY
JUN
JUL
AUG

Yampa River projected 60% of Ave Apr-Jul inflow ("Moderately Dry" to "Dry" condition)

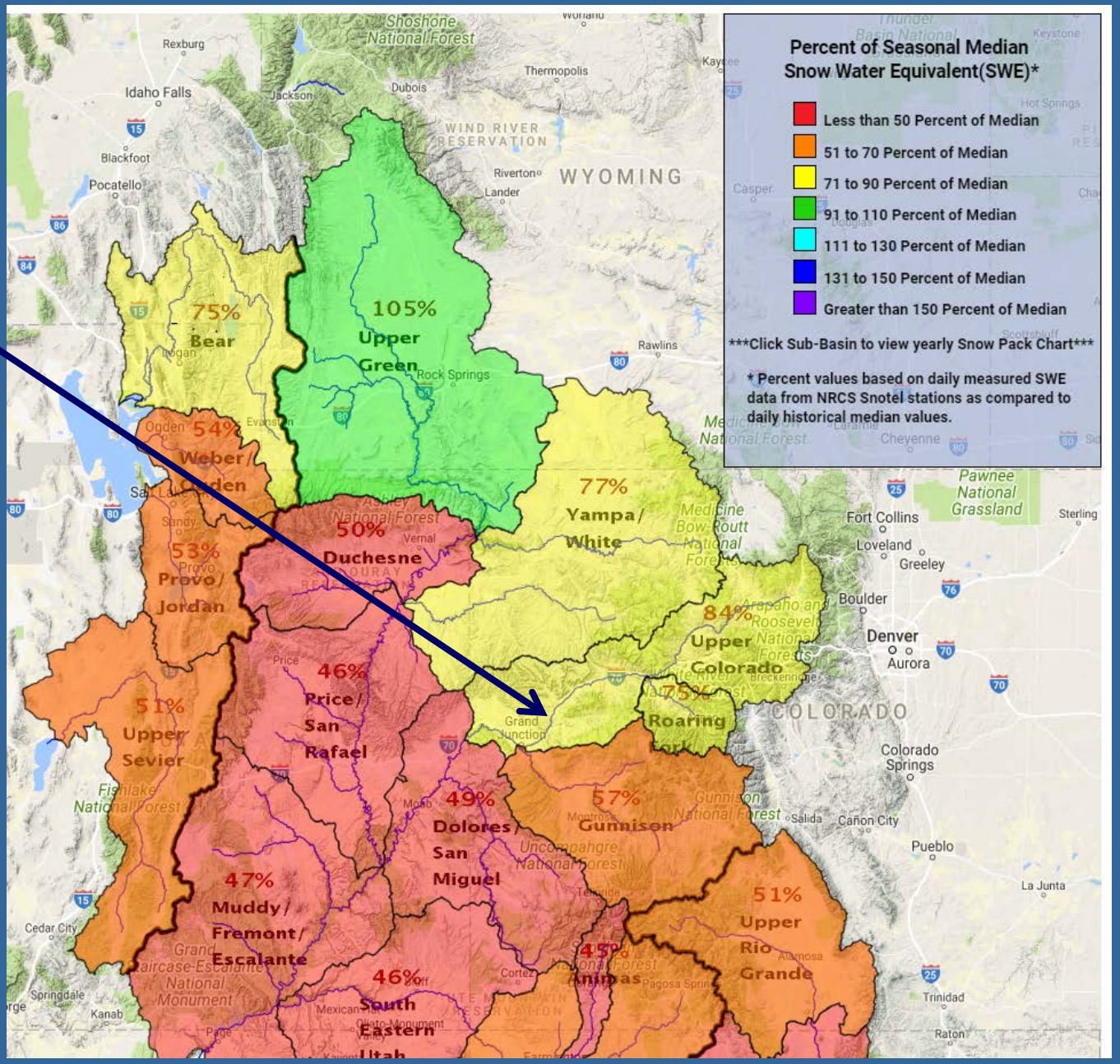
Anticipated Program lease of <u>additional</u> Elkhead Reservoir water this year to support late summer base flows



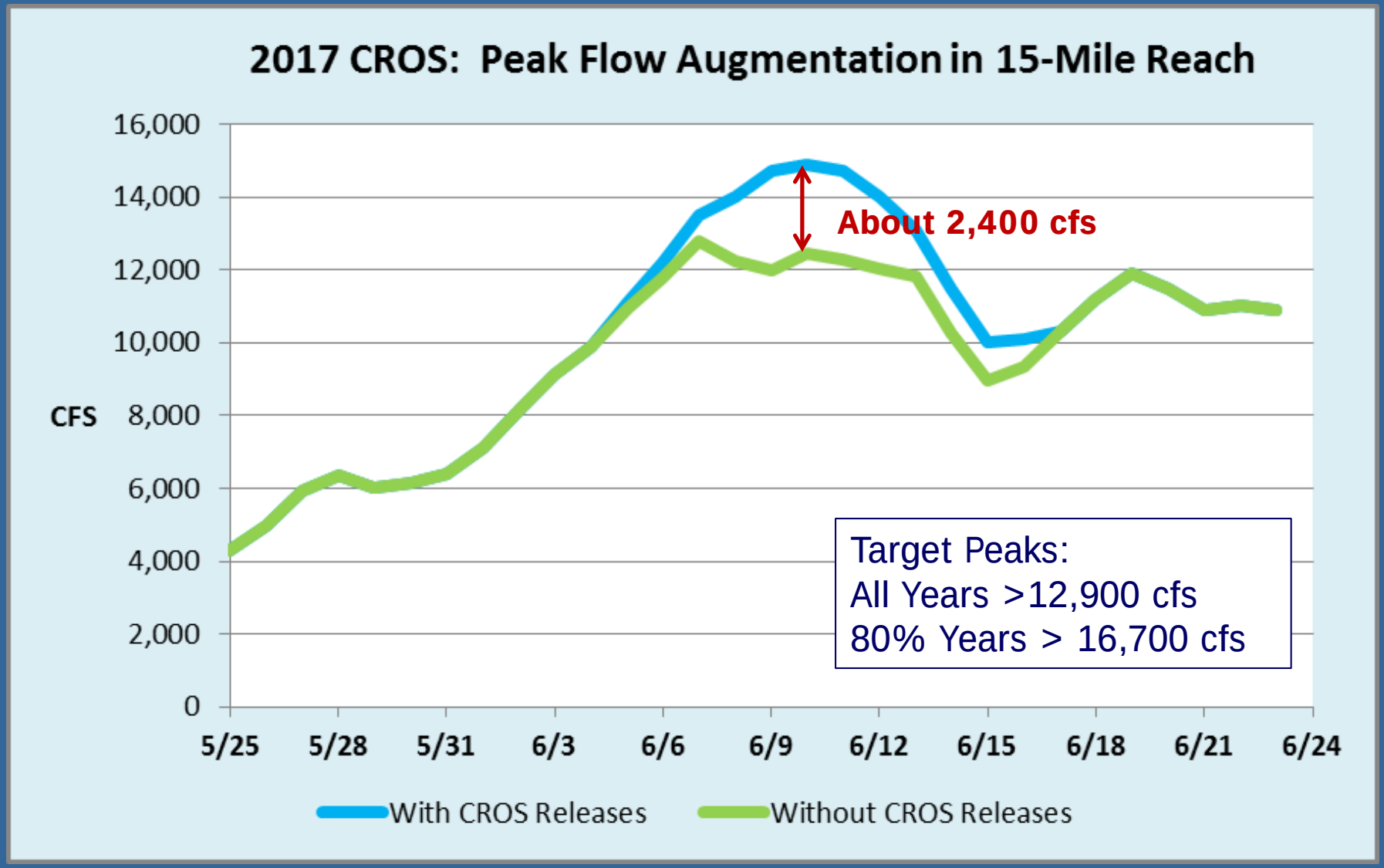

Summer 2017 Yampa River at Maybell with Elkhead Reservoir Fish Releases
CFS
700
600
500
400
300
200
100
0
8/1
8/6
8/11
8/16
8/21
8/26
8/31
9/5
9/10
9/15
9/20
9/25
9/30
10/5
10/10
10/15
134 cfs target
2018 Target: 93 cfs
Est Maybell w/o Releases
Maybell Flow
Target Flow

Colorado River above 15-Mile Reach projected 67% of Ave Apr-Jul inflow ("Dry" condition)

No 'CROS' peak flow augmentation anticipated this year

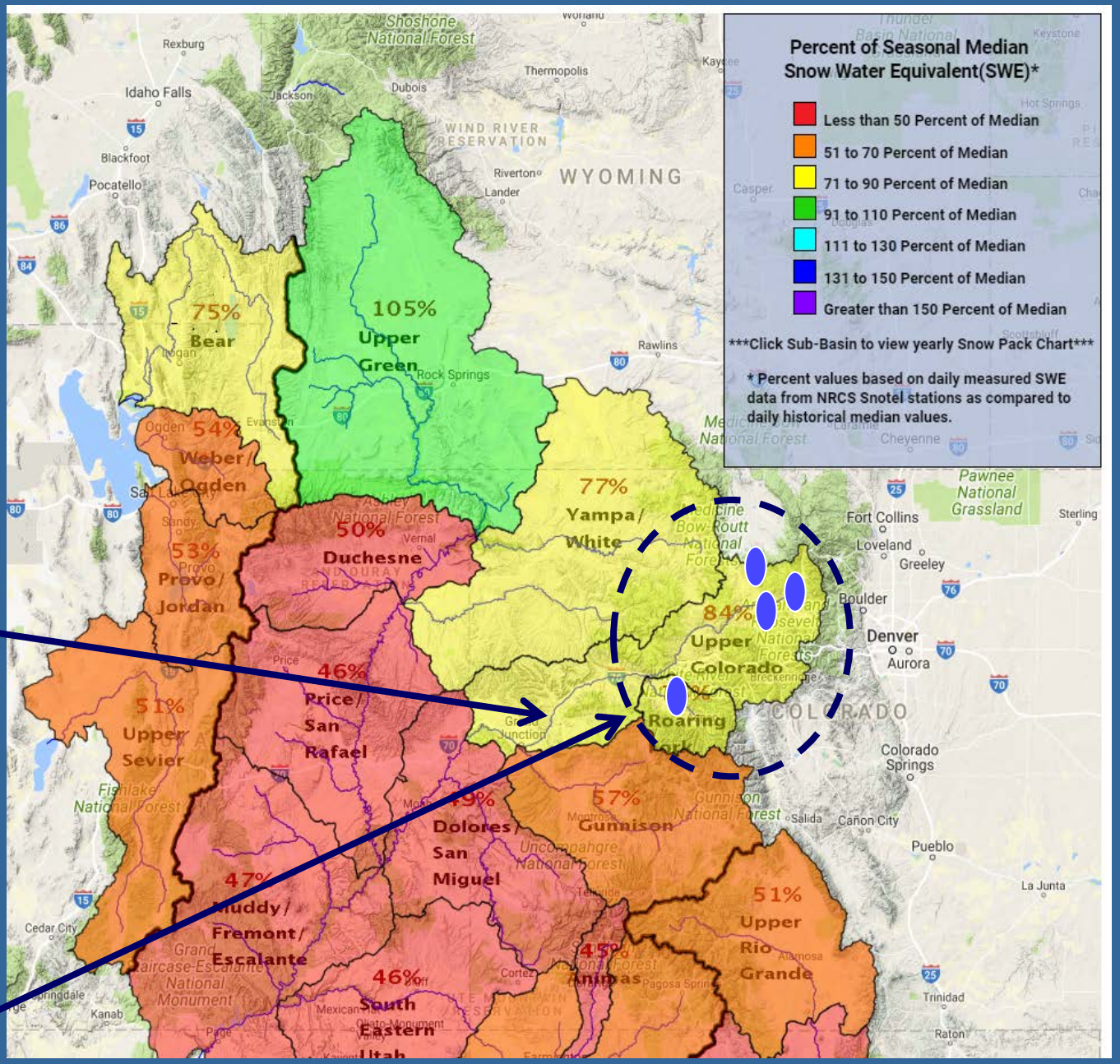


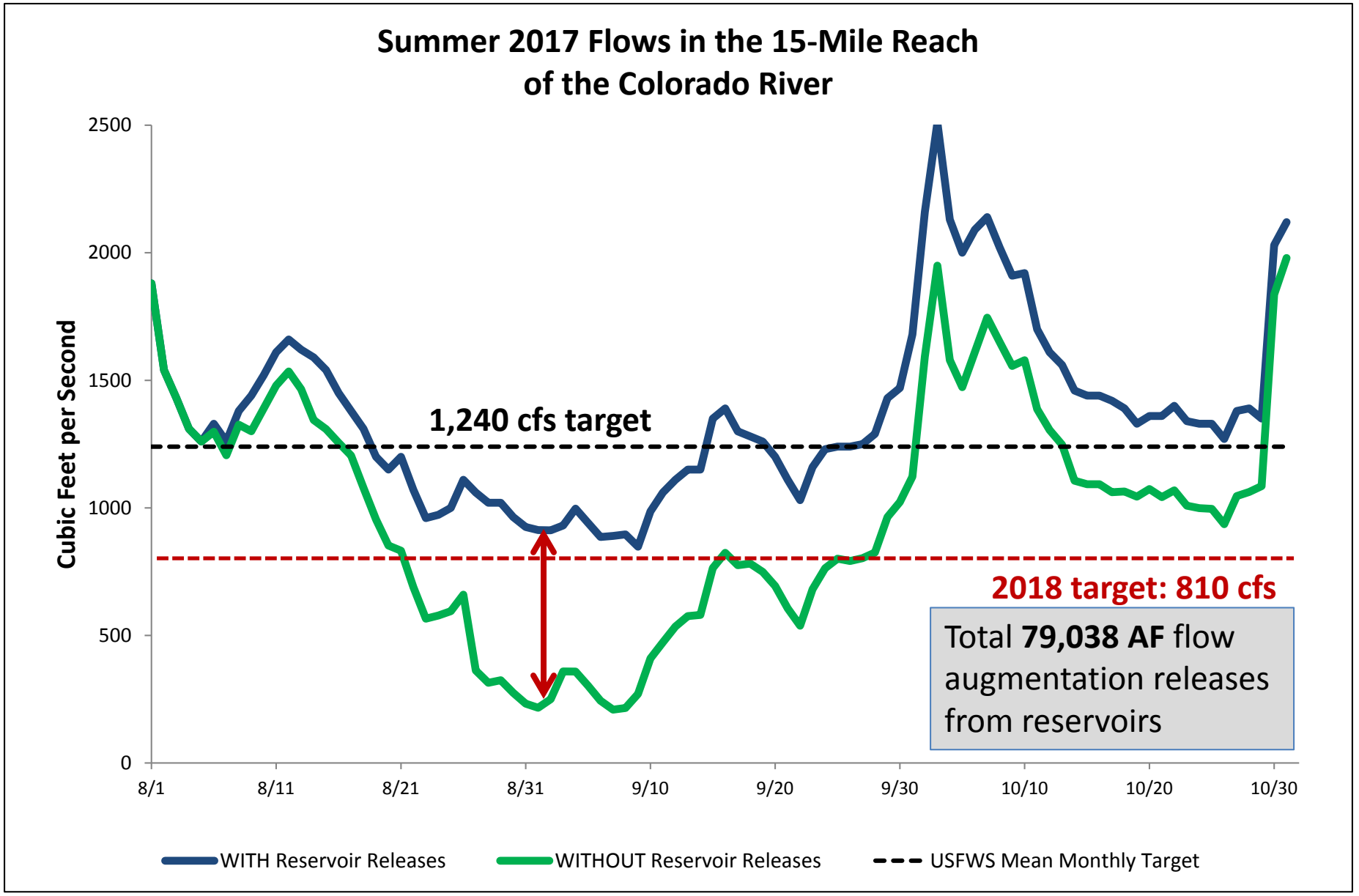
Peak flows in the **Mainstem Colorado 15-Mile Reach** were significantly boosted in 2017for the third year in a row with CROS releases:



No 'CROS' peak flow augmentation anticipated this year

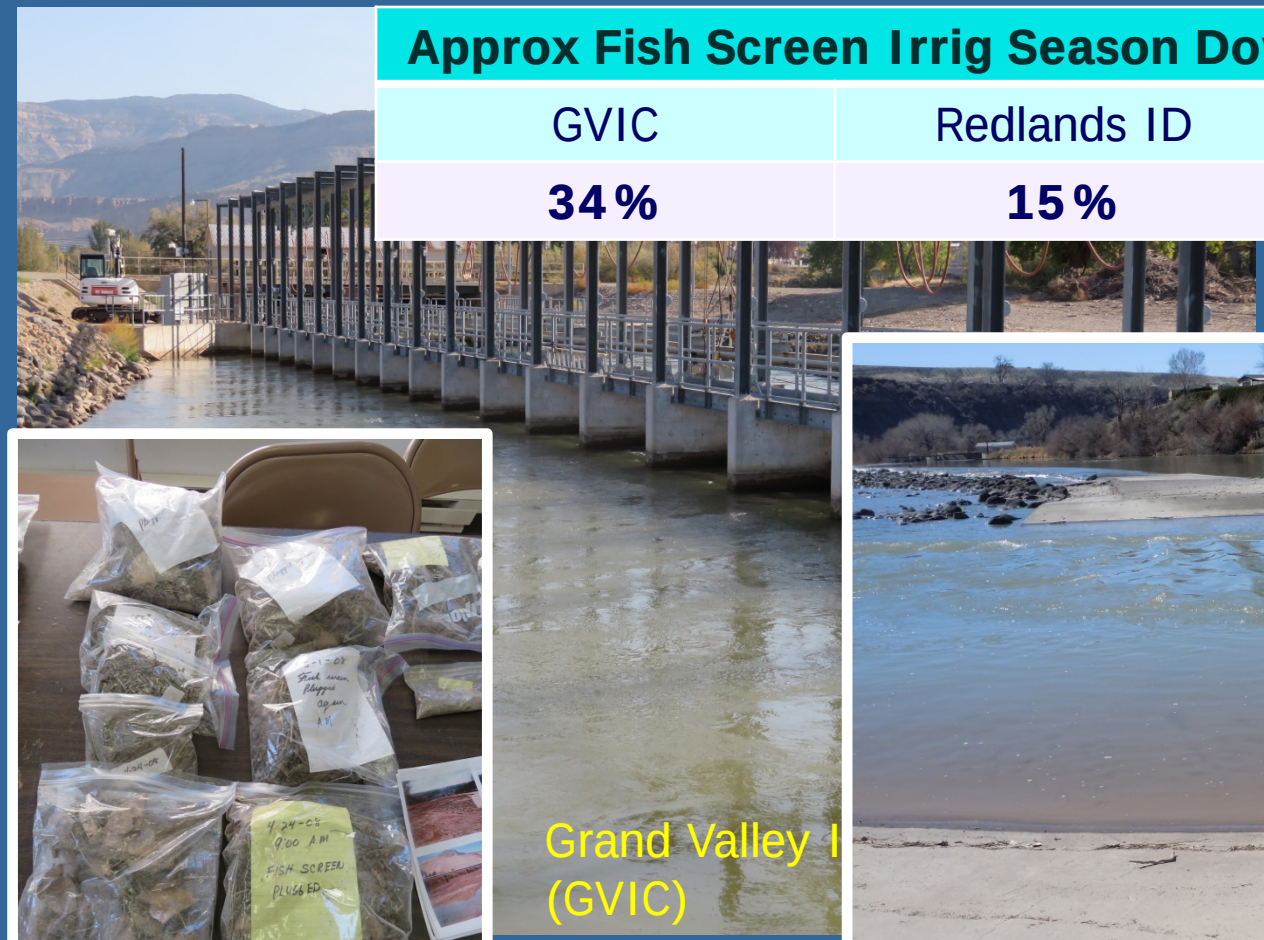
But … will be coordinating 'fish pool' releases to try to maintain dry year base flows in 15-Mile Reach Aug thru Oct




Summer 2017 Flows in the 15-Mile Reach of the Colorado River
Cubic Feet per Second
2500
2000
1500
1000
500
0
8/1
8/11
8/21
8/31
9/10
9/20
9/30
10/10
10/20
10/30
1,240 cfs target
2018 target: 810 cfs
Total 79,038 AF flow augmentation releases from reservoirs
WITH Reservoir Releases
WITHOUT Reservoir Releases
USFWS Mean Monthly Target

15-Mile Reach fish screens & passages remain an ongoing challenge

Approx Fish Screen Irrig Season Downtime 2009-2017		
GVIC	Redlands ID	GVWUA
34%	**15%**	**8%**



Encouraging news: interesting initiatives by Grand Valley irrigators and others

System Conservation Pilot Program (SCPP)

- Thousands of acre-feet reduced consumptive use by GVWUA in 2017 pilot effort (temporary, voluntary, compensated conservation)
- GVWUA following-up this year with other conservation funding sources
- Not cheap: typically $200-$350 per AF reduced CU

Non-federal water leasing

- Districts want to acquire up to 5,000 additional AF leased water annually for delivery to Grand Valley Power Plant and 15-Mile Reach
- Contract in process with Reclamation to deliver this 'non-federal' water through federal Grand Valley Project infrastructure

Colorado Water Trust!

- Water Acquisitions Pilot Project – solicitation for applicants w/ CWCB

No-so-encouraging news: warming temperatures mean less water in our future

Two 2017 papers indicate that rising temperatures = less runoff per unit snowpack in UCR basin

- **Udall and Overpeck, 2017 (WRR)**

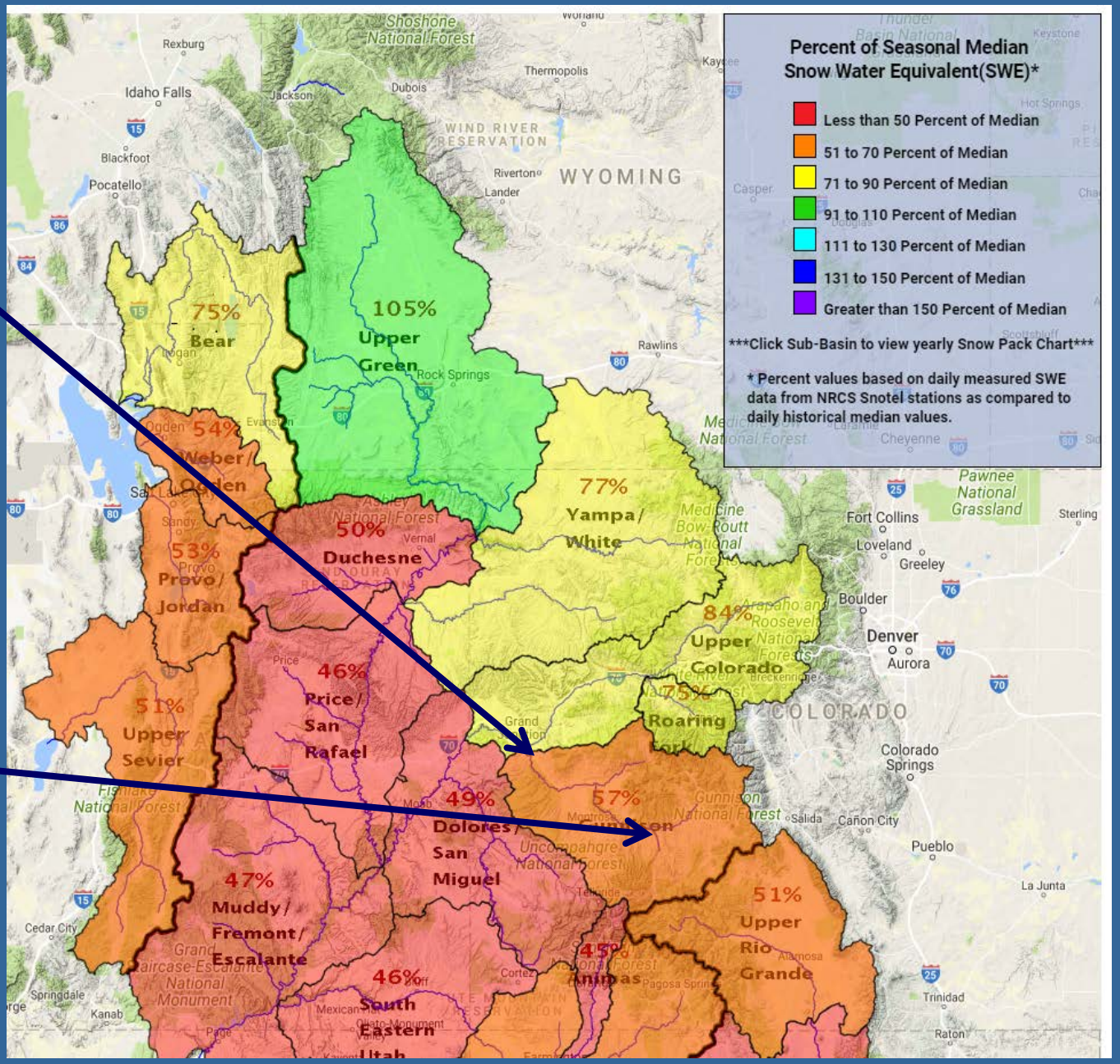
  Approximately 1/3 of reduced flow in the Colorado River during 2000-2014 drought is attributable to higher temperatures -- not lack of precipitation

- **McCabe et al, 2017 (JAMS)**

  Since the late 1980s, increases in temperature have reduced upper basin runoff efficiency (ratio of streamflow to precipitation) – resulting in an average 7% reduction in annual streamflow

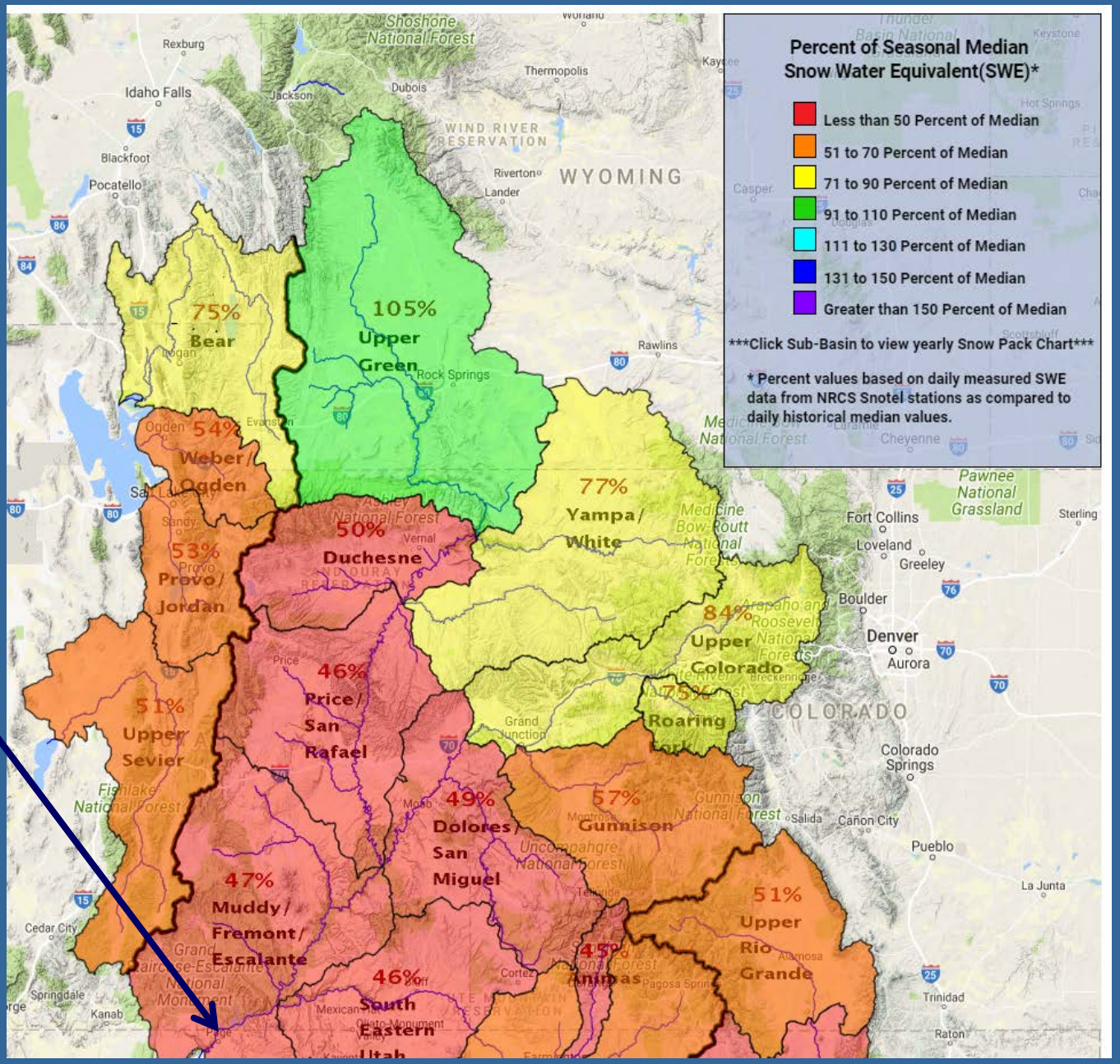
Gunnison River at Grand Junction, projected 49% of Ave Apr-Jul inflow

USBR Aspinall Unit ROD specifies peak flow target and subsequent summer base flows based on Blue Mesa Reservoir inflow, currently projected 'Dry' to 'Moderately Dry' condition



Lake Powell projected Apr-Jul inflow 47% of Average

Would be comparable to drought years of 2002 and 2012



Post-2023

- **Stakeholder discussions underway to determine what will replace the Recovery Program post-2023**
- **Eventually (perhaps fall of this year?) expecting request for recommended strategies/activities/actions from a water technical workgroup to ensure long-term flow protections within the envisioned post-2023 framework/structure**
- **Given the current mix of mechanisms and varied status of flow protections across the upper basin, we anticipate intense work ahead in a tight timeframe!**

Upper Colorado River Endangered Fish Recovery Program

Recovery Elements

- Status of the Endangered Fish Populations
- Information and Education
- Instream Flows and Habitat Management
- Nonnative Fish Management
- Propagation and Data Management

Managing Predatory Nonnative Fish:

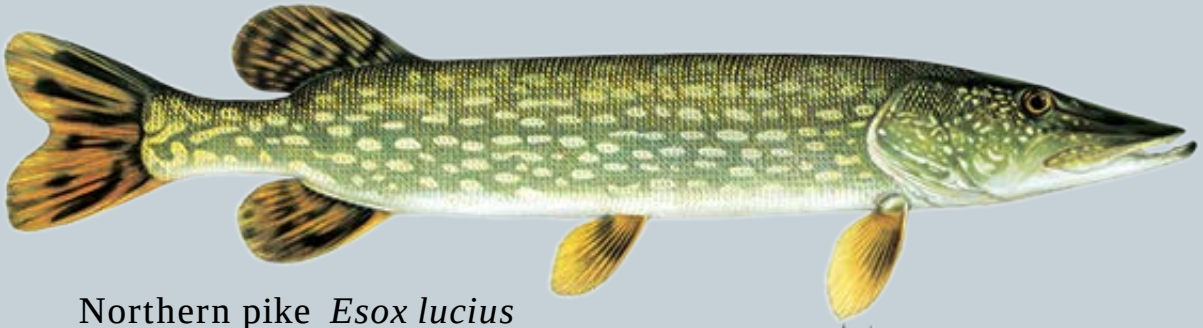
A Long Term Commitment for Endangered Species Recovery

Kevin McAbee

Nonnative Fish Coordinator

Upper Colorado River
Endangered Fish
Recovery Program

Three Focal Nonnative Fish



Northern pike *Esox lucius*

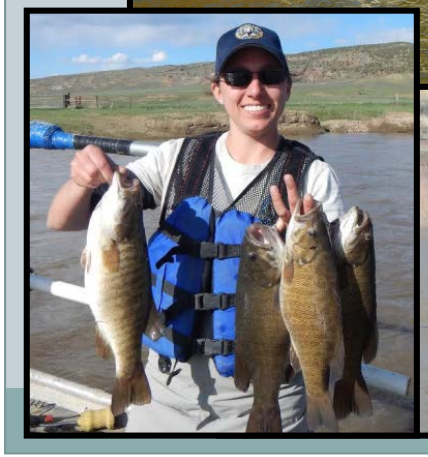
Smallmouth bass *Micropterus dolomieu*

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
Green River
Price River
Rifle Gap Reservoir
Highline Lake
Rifle
Green River
Grand Junction
Gunnison River
Moab
Colorado River
Ridgway Reservoir
Aspinall Unit
Dolores River
McPhee Reservoir
Lake Powell
San Juan River
La Plata River
Animas River
Farmington
Navajo Reservoir

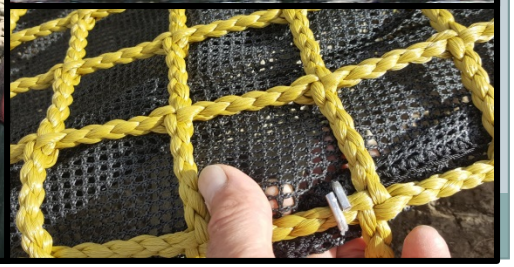
Two-tiered Strategy

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

- In-River disruption of northern pike and smallmouth bass spawning
  - Adult catch rates declining

Photo: Melanie Fischer

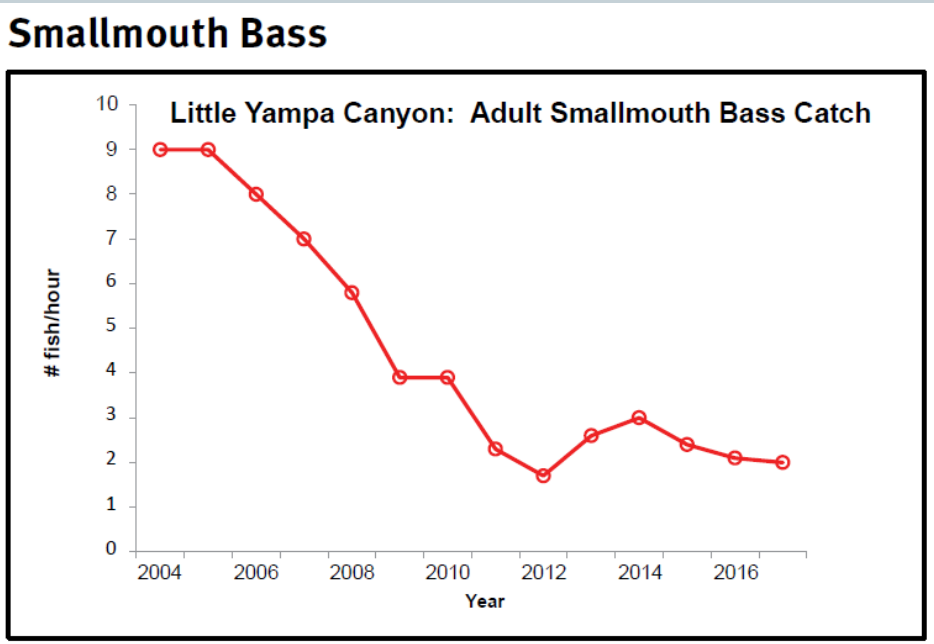


Figure: John Hawkins

Major Accomplishments: 2017

- In-River disruption of northern pike and smallmouth bass spawning
  - Adult catch rates declining

Photo: Tory Eyre

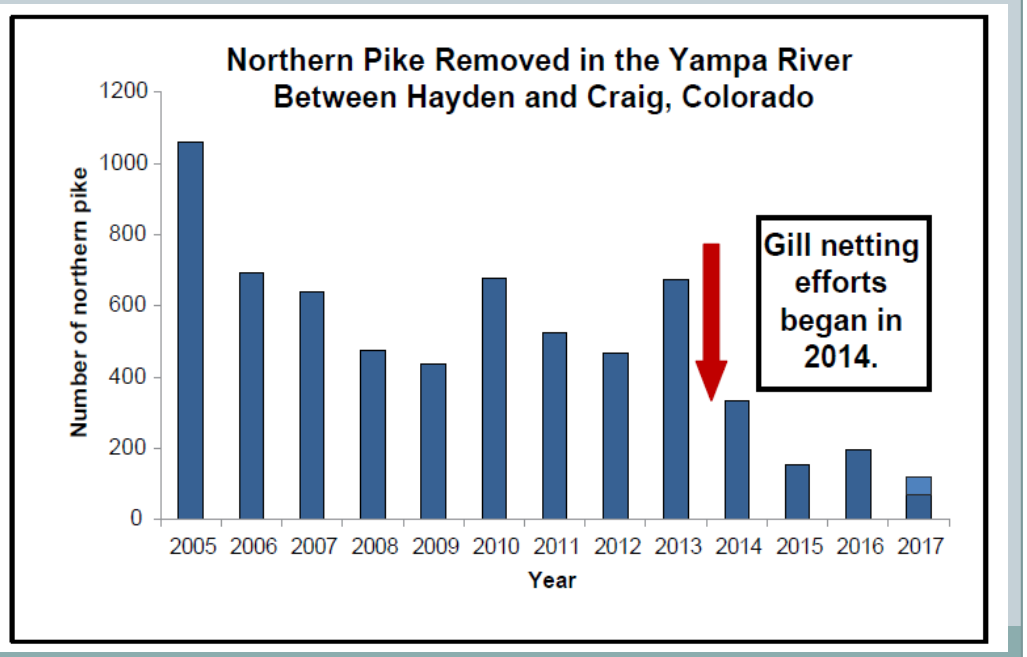
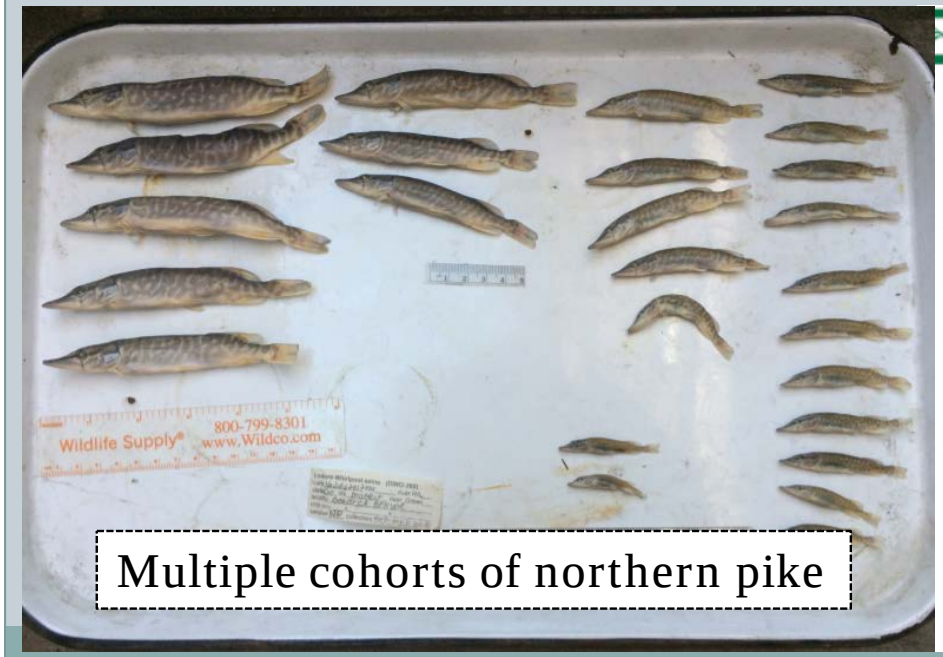


Figure: Chris Smith

Major Challenges: 2017

- Flaming Gorge releases supported northern pike production in upper Green River (Browns Park NWR area)



Multiple cohorts of northern pike

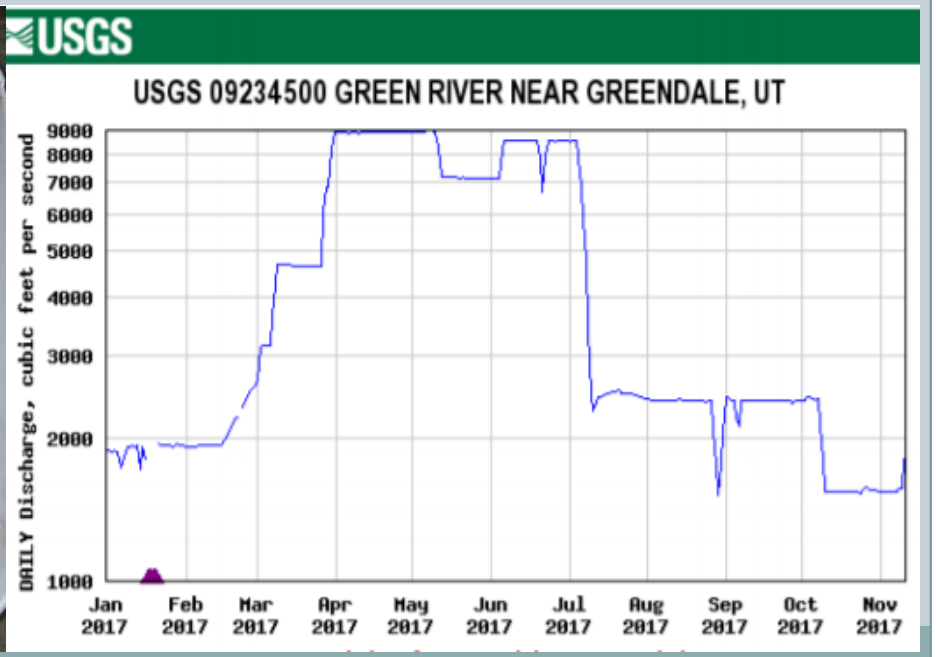


Photo: Ed Kluender

Major Challenges: 2017

- Establishment of smallmouth bass in White River where removal is constrained by flows

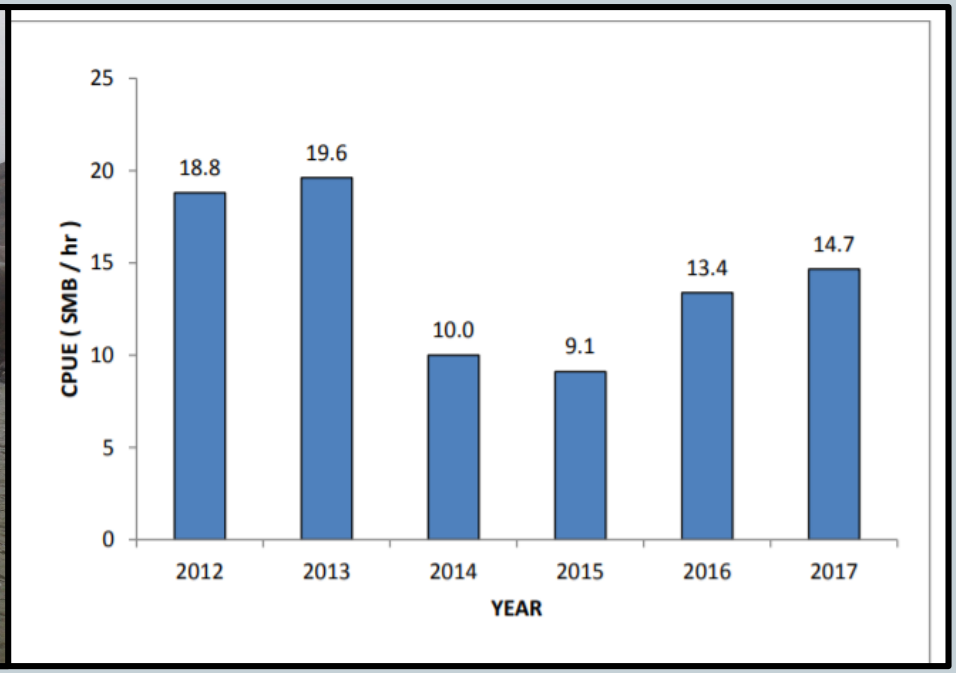


Photo: Tildon Jones

Figure: Chris Smith

Major Accomplishments: 2017

- Reservoir screening successful in Highline Lake; Rifle Gap & Elkhead Reservoirs

Successfully spilled Elkhead Reservoir through net for first time in 2017!

Major Accomplishments: 2017

- Lake management plans applied in Elkhead, Rifle Gap, Starvation, and Red Fleet Reservoirs

Stocking of largemouth bass in Elkhead Reservoir and sterile walleye in Rifle Gap and Red Fleet Reservoirs in 2017!

Major Challenges: 2017

- No screening projects completed in 2017 or 2018
  - Starvation Reservoir screen delayed
  - Four major projects to complete by ~2021

Ridgway Reservoir continues to be the highest priority; Red Fleet Reservoir is the closest to installation

Reservoir Projects Delayed

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* 2020?
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* 2021?

Looking Forward: 2018

- Dry hydrology: increase effort for bass removal

- Increase urgency for screening projects

- Northern pike produced in 2017: monitor & remove
- Updated schedule: complete projects prior to 2021 Report to Congress

Managing Predatory Nonnative Fish

A Long Term Commitment For Endangered Species Recovery

Long term (post 2023) actions

Rivers

- In-river removal
  - Flexible to environmental conditions
    - Increased effort in dry hydrology years
  - Coordinated crews
- Novel tools and techniques

Long term (post 2023) actions

Reservoir

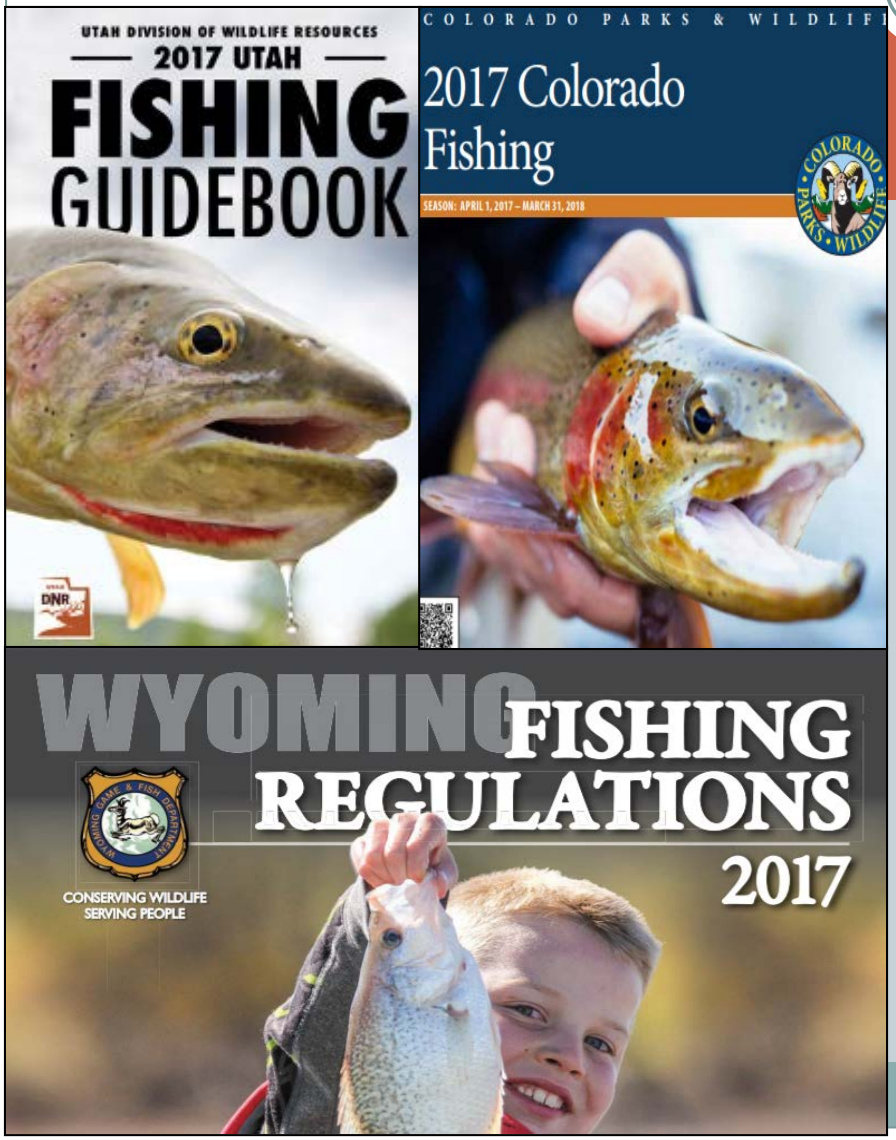
- Continued suppression of reservoir populations
  - Replacement fisheries
  - Angler assistance
  - Mechanical removal
- Maintenance of screens and nets, as needed

Long term (post 2023) actions

Water Operations

- Reservoir operations are a component of nonnative fish management
- Releases impact downstream conditions
  - Escapement
  - Spawning

Long term (post 2023) actions



Policy

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

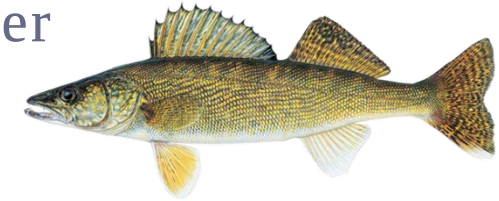
Nonnative fish management is a long-term commitment

- **In-river actions may change in scope, size, or location, but they can not cease**
- **Completion of reservoir screening capital projects before 2023 is critical**


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

Species of Concern

- Documented 5 fertile adult Grass Carp in 2017
  - Reproduction confirmed in 2015 and 2016

Photo: John Caldwell

- Potential for a risk assessment (USGS) to consider potential impacts to Colorado River basin

Upper Colorado River Endangered Fish Recovery Program

Recovery Elements

- Status of the Endangered Fish Populations
- Information and Education
- Instream Flows and Habitat Management
- Nonnative Fish Management
- Propagation and Data Management

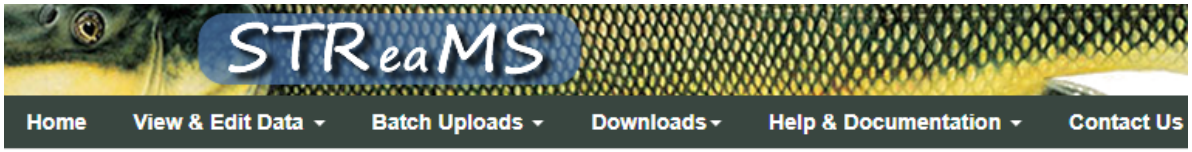
STReaMS

Spring 2018 Update

Colorado State University

Warner College of Natural Resources

Colorado Natural Heritage Program



STReaMS - The Species Tagging, Research and Monitoring System

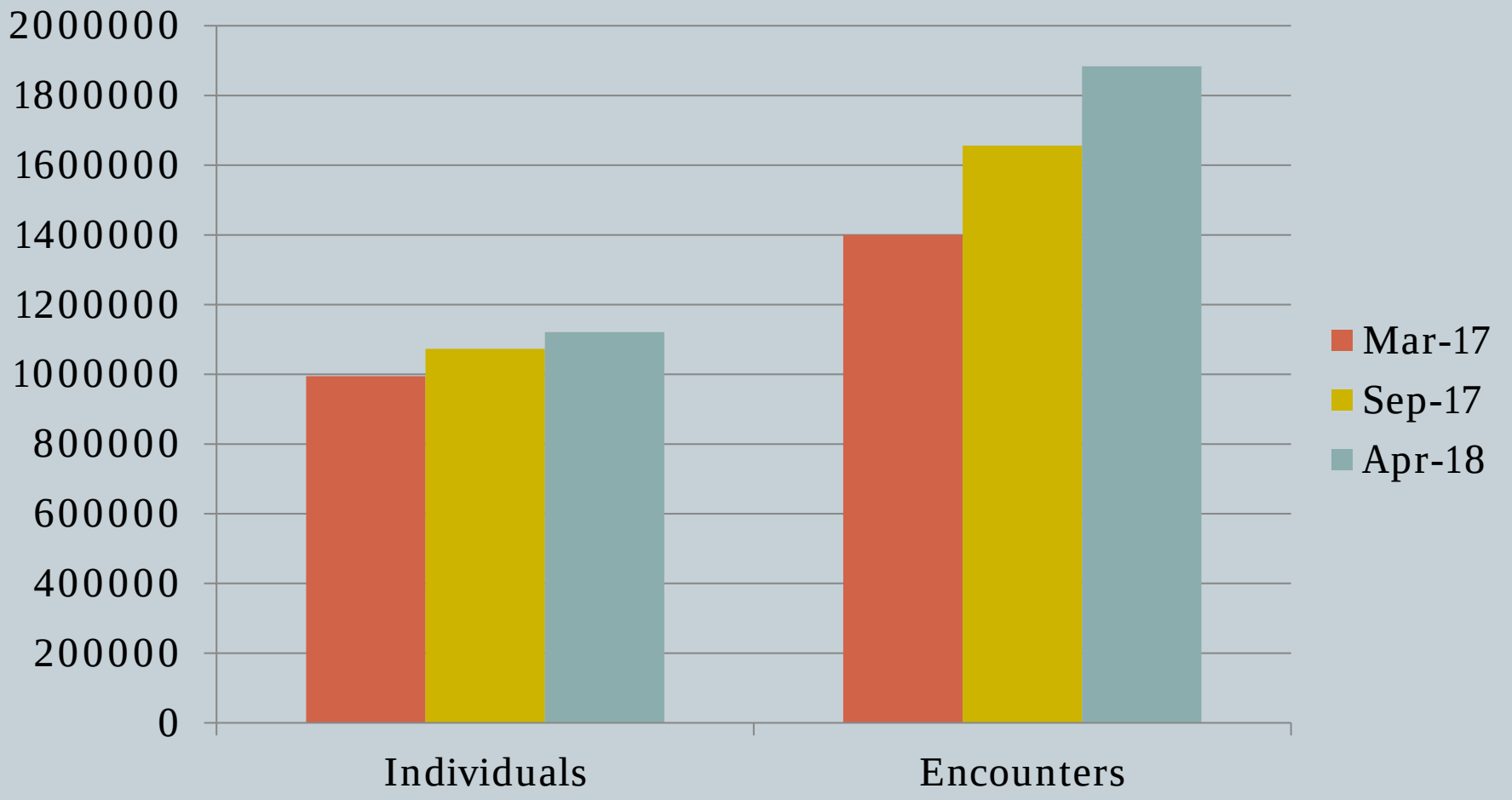
Welcome to the STReaM System online database! This site provides a centralized location for the data from the Upper Colorado and San Juan River Endangered Fish Recovery Programs. These collaborative programs are aimed at recovery of endangered fishes in their respective river basins while allowing water 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.

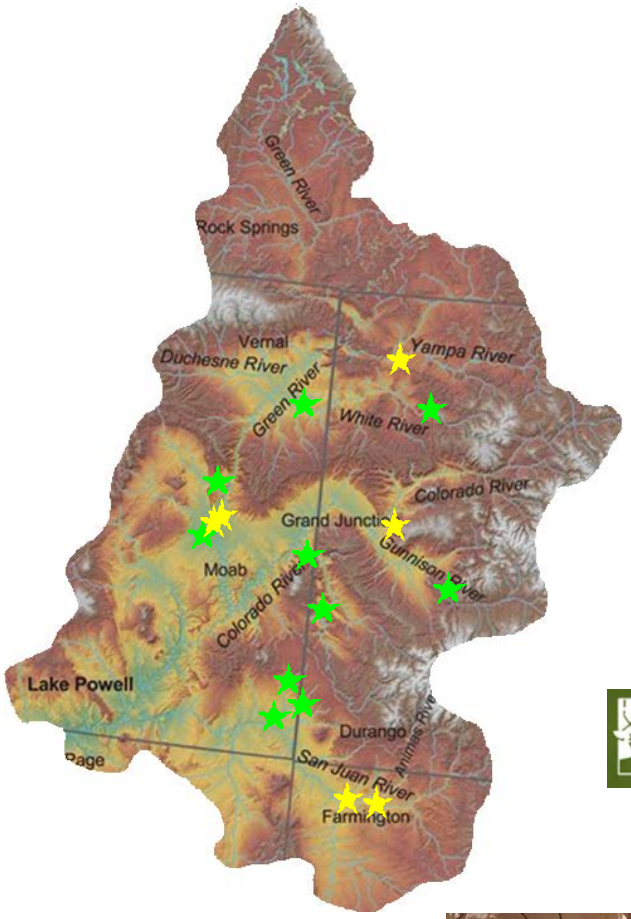
Upper Colorado River Endangered Fish Recovery Program

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 under the federal Endangered Species Act. To see how the data are used, explore our documents and publications

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

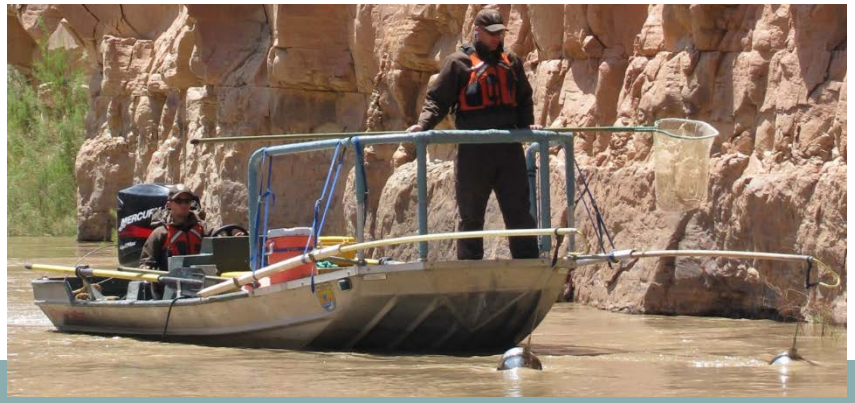
UtahState University

Upper Colorado River Endangered Fish Recovery Program

San Juan River Basin Recovery Implementation Program

U.S. Fish & Wildlife Service

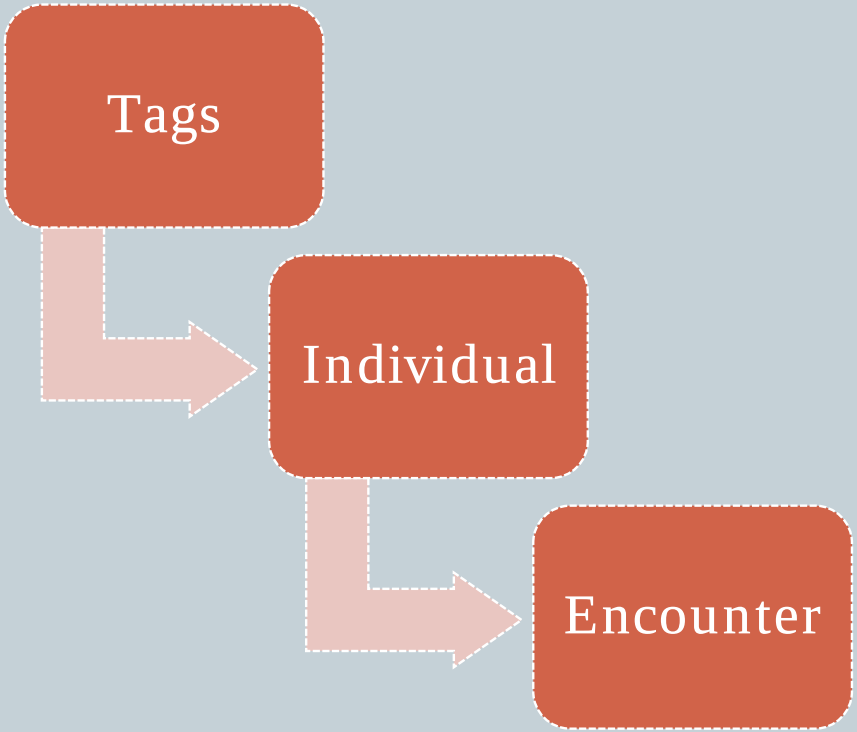
QUESTAR

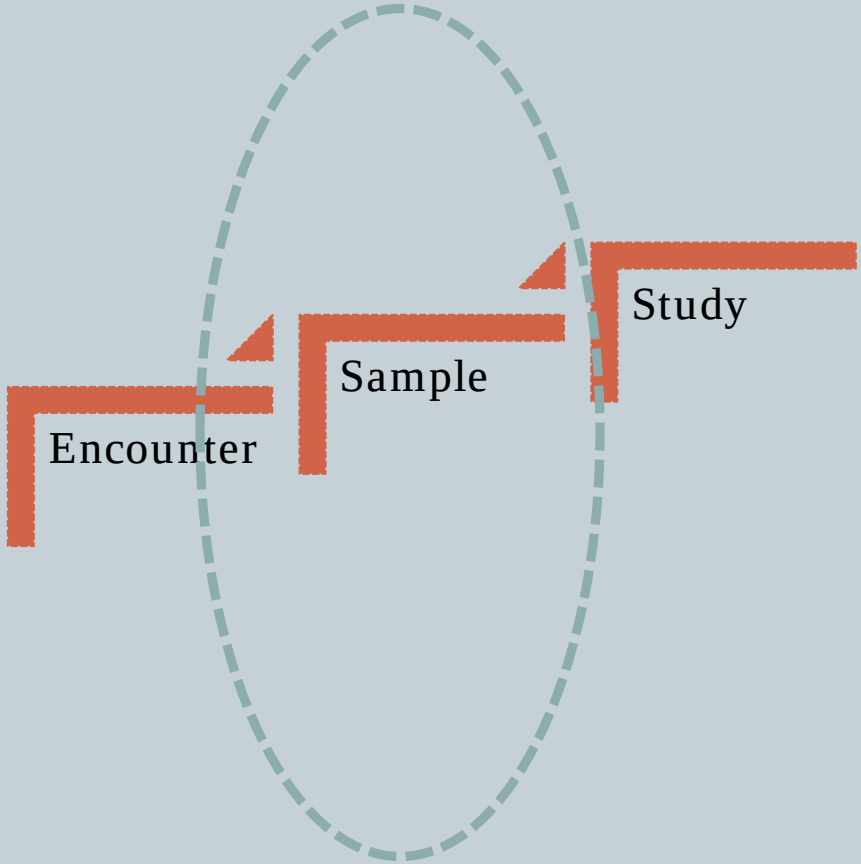


U.S. Department of the Interior
Bureau of Land Management

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

Enhanced Structure



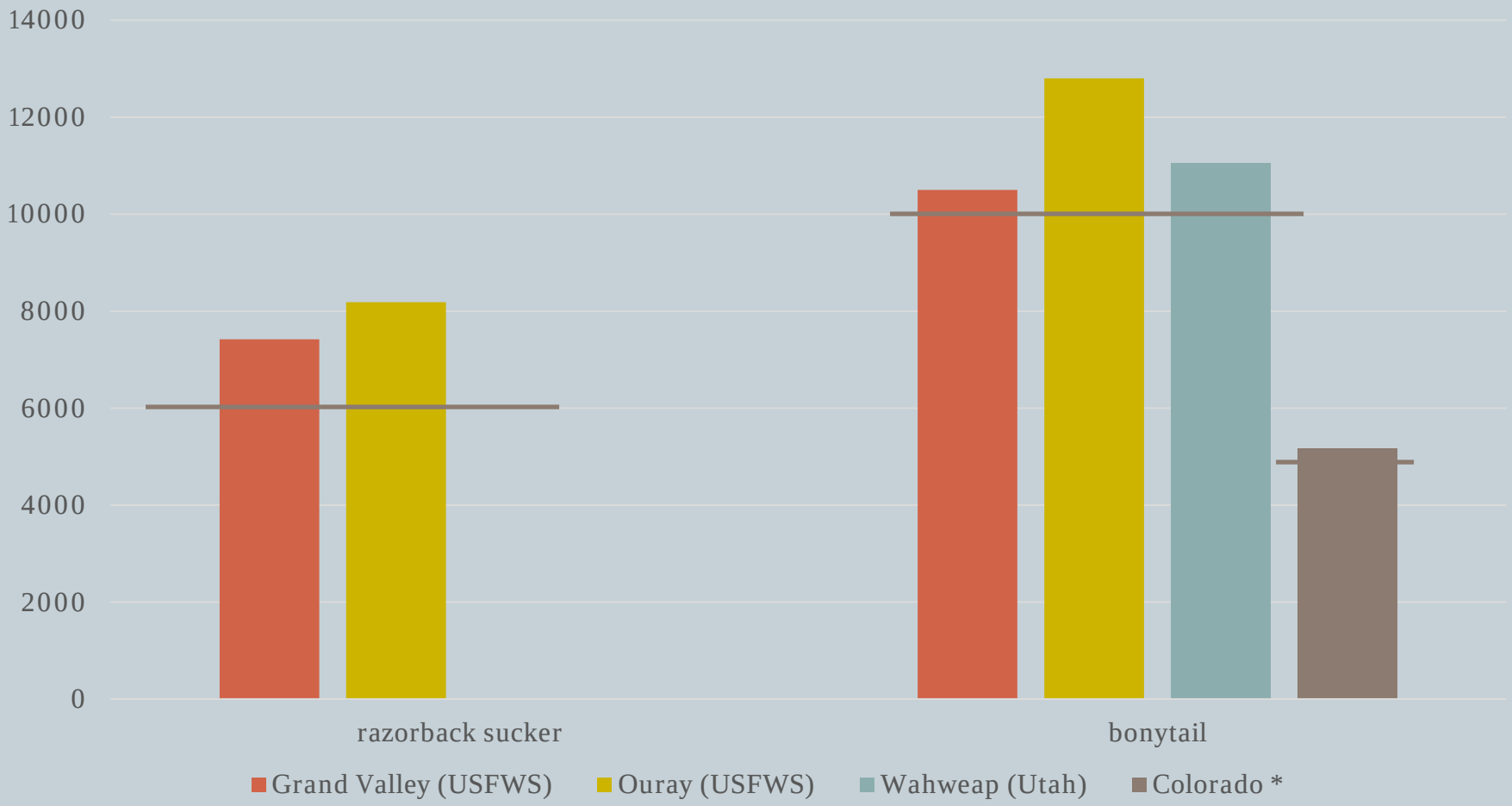


Propagation & Genetics

Bonytail

Razorback sucker

Program Hatchery Efforts



Populations and Survival

Razorback sucker

- ~36,000 adults in the Green River
- Survival estimates
  - < 1 year 0.05
  - > 1 year 0.15

Bonytail

- Still hard to find post-stocking
- Antennas have added 52,000 encounters to 2,000 captures
- Documented survival >1 year still very low

Implementation of HCP

- Systematic, standardized, necropsy-based method of both internal and external examinations of fish
- Developed by Utah and rolled out to program hatcheries

Values as Percent of Total Sample

ery Fat		Spleen		Hind gut		Kidney		Liver		Bile		Fins	
B	20%	0	80%	N	90%	A	65%	0		0	100%		
R	65%	1	10%	S	10%	B	25%	1	60%	1			
G		2	10%	M		C	10%	2	30%	2			
NO		X	30%	G		D		3	10%	X	0		
E	15%			U		E		X	1.50				
OT				OT		F							
						OT							

Summary of Normals					
85%	80%	90%	90%	NA	100%
Summary of Means					
NA	0.30	NA	NA	1.50	0
Summary of Specific Percent Indices					
NA	15.00%	NA	NA	50.0%	0%
Summary of Combined Percent Indices					
ex:	5.00		Feeding Index:		50.0

Post-2023

STReaMS	Propagation & Genetics
• Maintenance/storage • Data management	• Stocking • Broodstock

Upper Colorado River Endangered Fish Recovery Program

Recovery Progress Report

Spp.	Population Status	USWFS Pending Recovery Decisions
Colorado pikeminnow  • Listed as Endangered in 1967; recovery can occur in the Upper Basin. • Wild, self-sustaining populations are managed in Green and Colorado rivers.	• Adults in the Colorado and Green rivers have declined in the past decade, requiring increased effort to: a) reduce nonnative predators; and b) improve base flow management to increase survival of young Colorado pikeminnow.	• A Species Status Assessment (SSA) initiated in late 2015 and scheduled for completion in 2018. • Population Viability Analysis Report is undergoing Programs review • Recent population declines could delay downlisting
Humpback chub  • Listed as Endangered in 1967; recovery is required in both Upper and Lower basins. • Wild, self-sustaining populations are managed in multiple locations in the Upper and Lower basin.	• 4 of 5 Upper Basin populations have sta bilized after declines were detected in the late 1990's. The fifth population (Yampa River) appears to have been lost. • In the Lower Basin, a population near the Little Colorado River is doing very well.	• The Service approved the final SSA in December 2017. • Long term stability in most populations served as the basis for the Service's decision to propose downlisting
Razorback sucker  • Listed as Endangered in 1991; recovery is required in both Upper and Lower basins. • A wild, self-sustaining population resides in Lake Mead; hatchery fish are stocked in other Lower Basin locations. • Razorback sucker raised in hatcheries are stocked in many Upper Basin rivers.	• In the Upper Basin, stocked adults are accumulating in Colorado, Green, and San Juan rivers and in the inflows to Lake Powell. • In the Lower Basin, the only wild, self- sustaining population is found in Lake Mead and the lower Grand Canyon. • Positive trends for this species are reported throughout the Colorado River.	• An SSA for this species is scheduled for completion in 2018, which the Service will use to determine if downlisting is appropriate.
Bonytail  • Listed as Endangered in 1980; recovery is required in both Upper and Lower basins.	• Programs throughout the Upper and Lower basins rebuild populations with hatchery fish. • Spawning in the wild detected for the first time in Green River floodplains in 2015, 2016, and 2017.	• When survival of stocked fish improves the Service will initiate an SSA.