The Recovery Program's Green River Flow Request and Field Updates

FGWG Mtg, Vernal, Utah
August 27, 2018

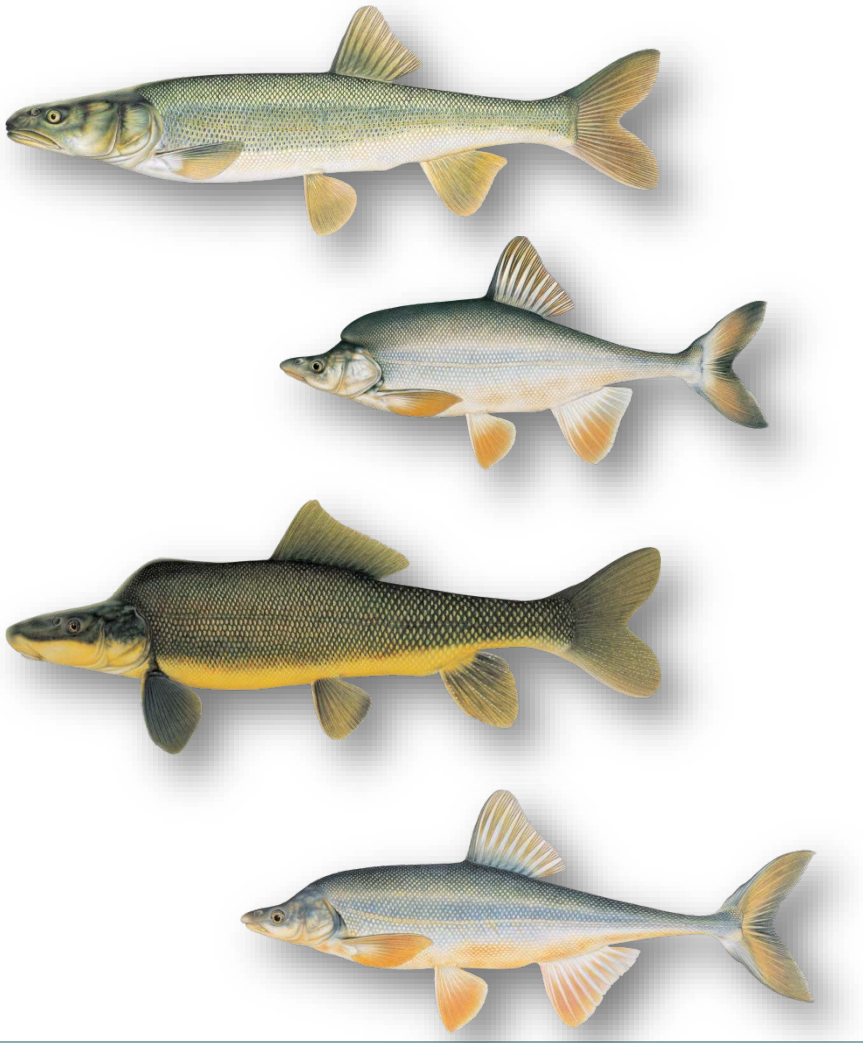
Upper Colorado River
Endangered Fish Recovery Program

Outline:

1. Program Basics
2. Spring operations and why
3. Smallmouth Bass Spike Flow Experiments
4. Questions

Upper Colorado River Endangered Fish Recovery Program

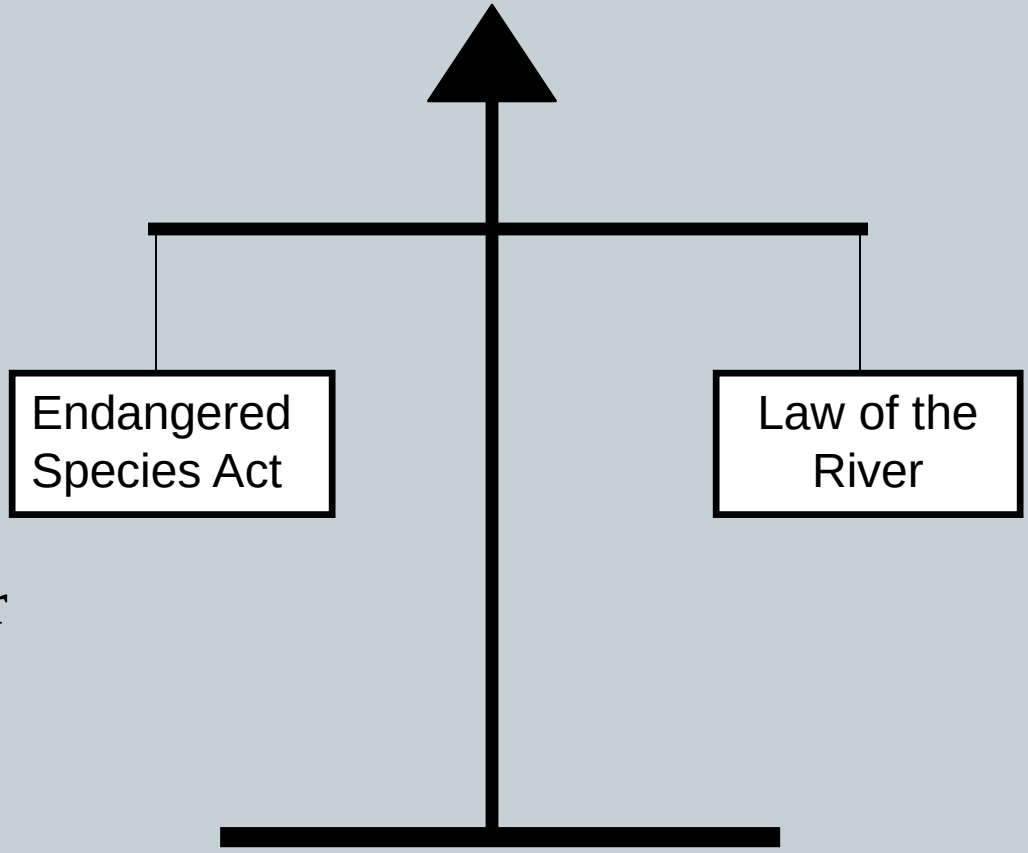
- Established in 1988
- Partners
  - State of Colorado
  - State of Utah
  - State of Wyoming
  - Bureau of Reclamation
  - Colorado River Energy Distributors Association
  - Colorado Water Congress
  - National Park Service
  - The Nature Conservancy
  - U.S. Fish and Wildlife Service
  - Utah Water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



Fish Illustrations by Joe Tomelleri

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.



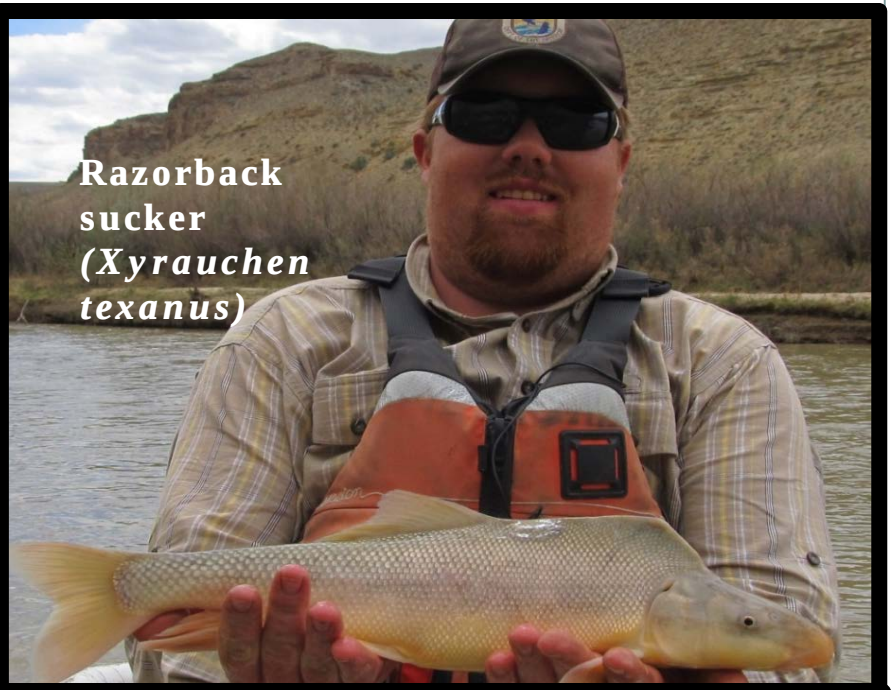
Recovery Program Provides ESA compliance for Historic and New Water Depletion Projects

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**

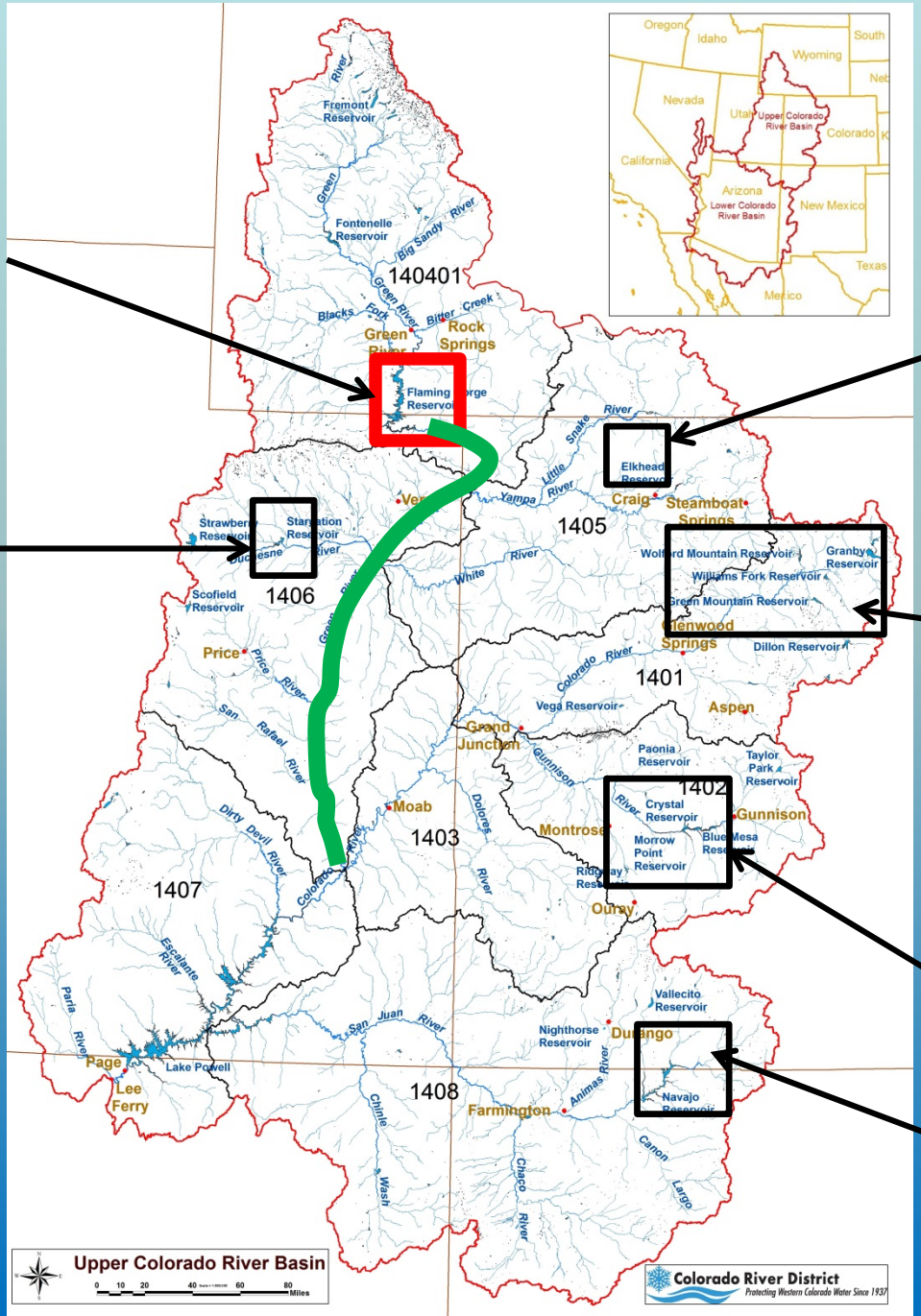
[1]Small depletion projects (<100 acre-feet per year) consulted on between July 3, 1994, and October 1, 1997, when the Recovery Program did not track the number of these projects by state. Depletion totals associated with these 238 projects are captured by state under new depletions.

The Endangered Colorado River fish



Recovery Elements

Instream Flow Management Occurs Throughout the Upper Basin



Flaming Gorge Reservoir (Green River):
Cooperators: BOR

Duchesne River Reservoirs:
Cooperators: CUWCD, BOR

Elkhead Reservoir (Yampa River):
Cooperators: CRWCD, City of Craig, TriState Power

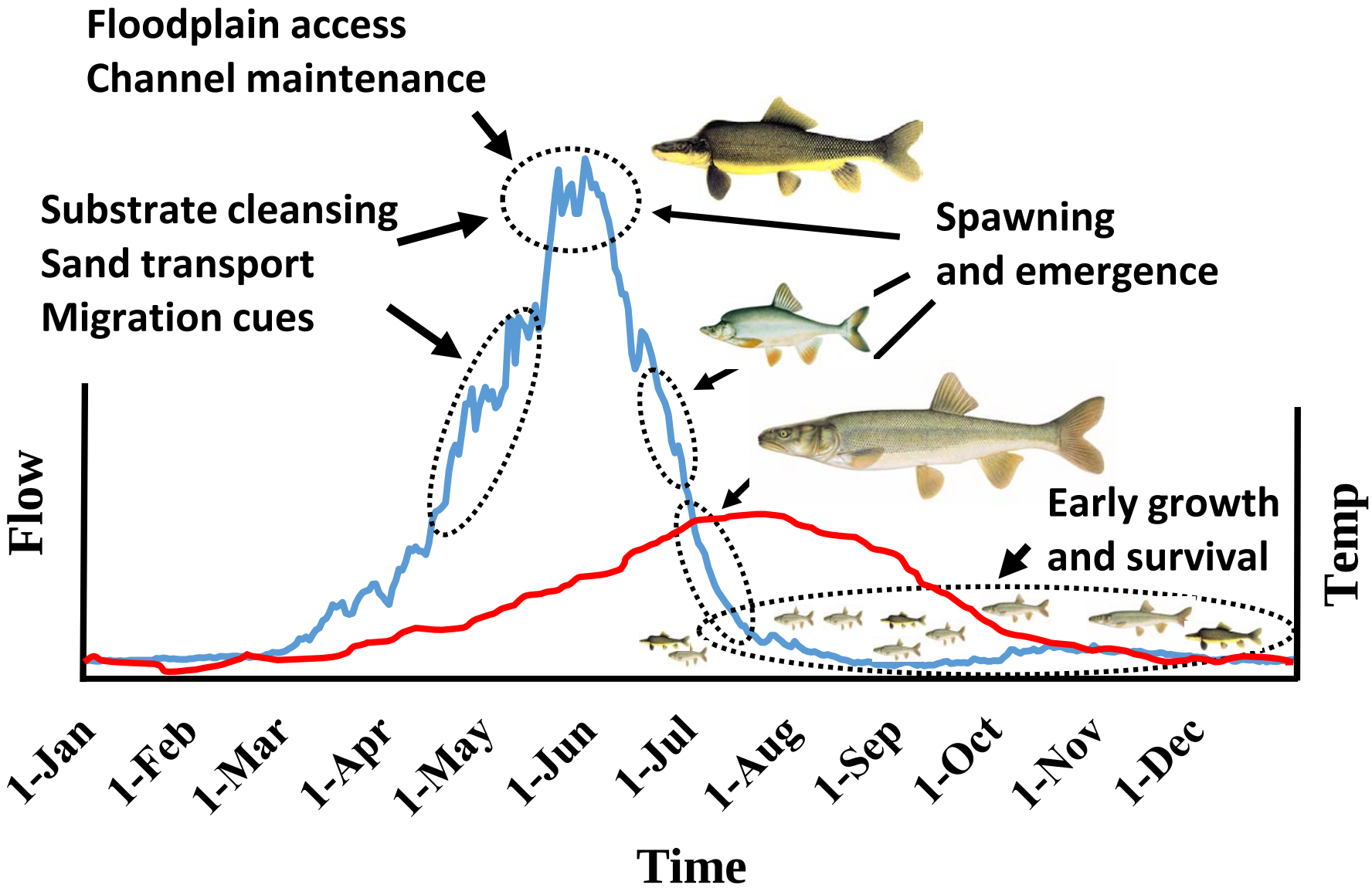
Upper Colorado Reservoirs:
Cooperators: CRWCD, East Slope Water Users (NoCWCD, City of Denver, Colorado Springs), West Slope Water Users (Cities of Grand Junction, Palisade), BOR, Grand Valley irrigators

Aspinall Unit (Gunnison River):
Cooperators: BOR

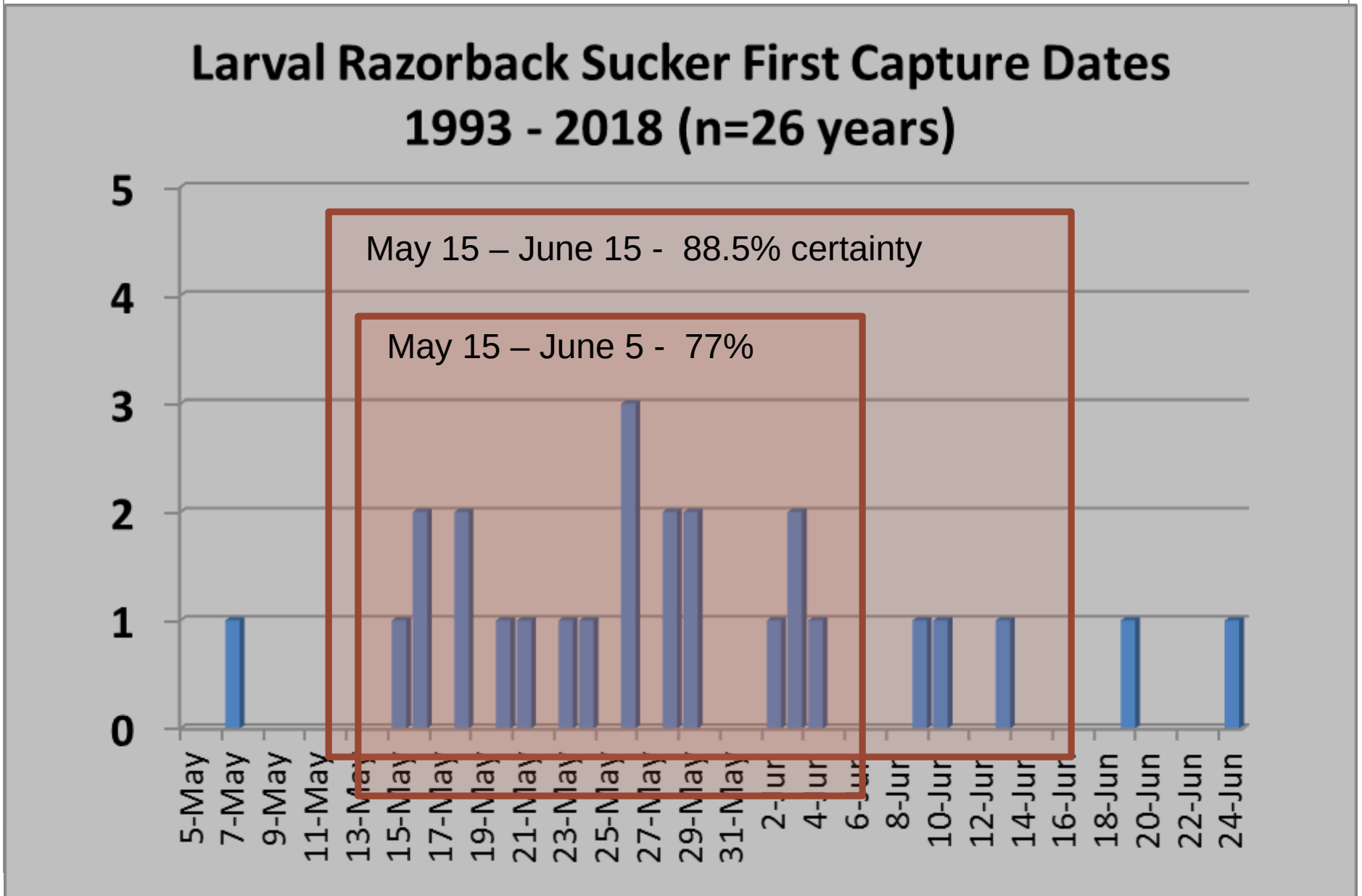
Navajo Reservoir (San Juan River):
Cooperators: BOR

Points of flow control

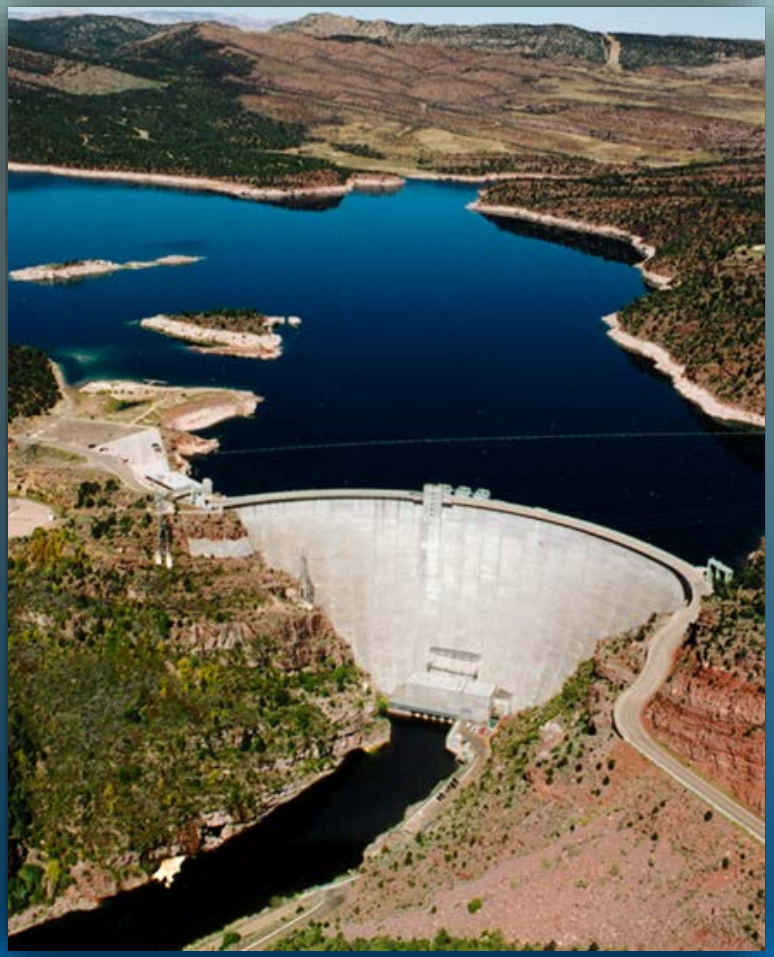
Flow, Temperature, Fish Ecology

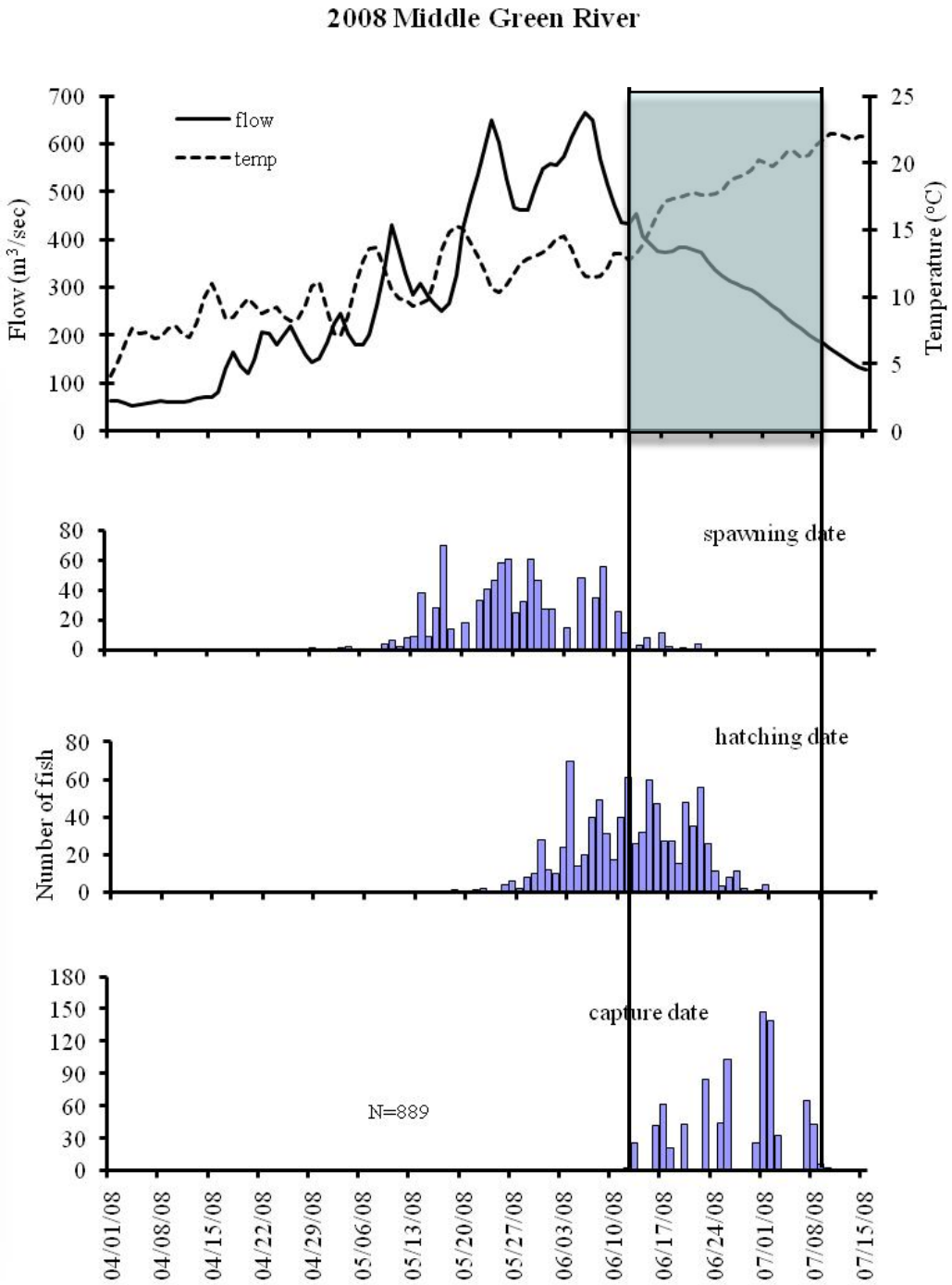


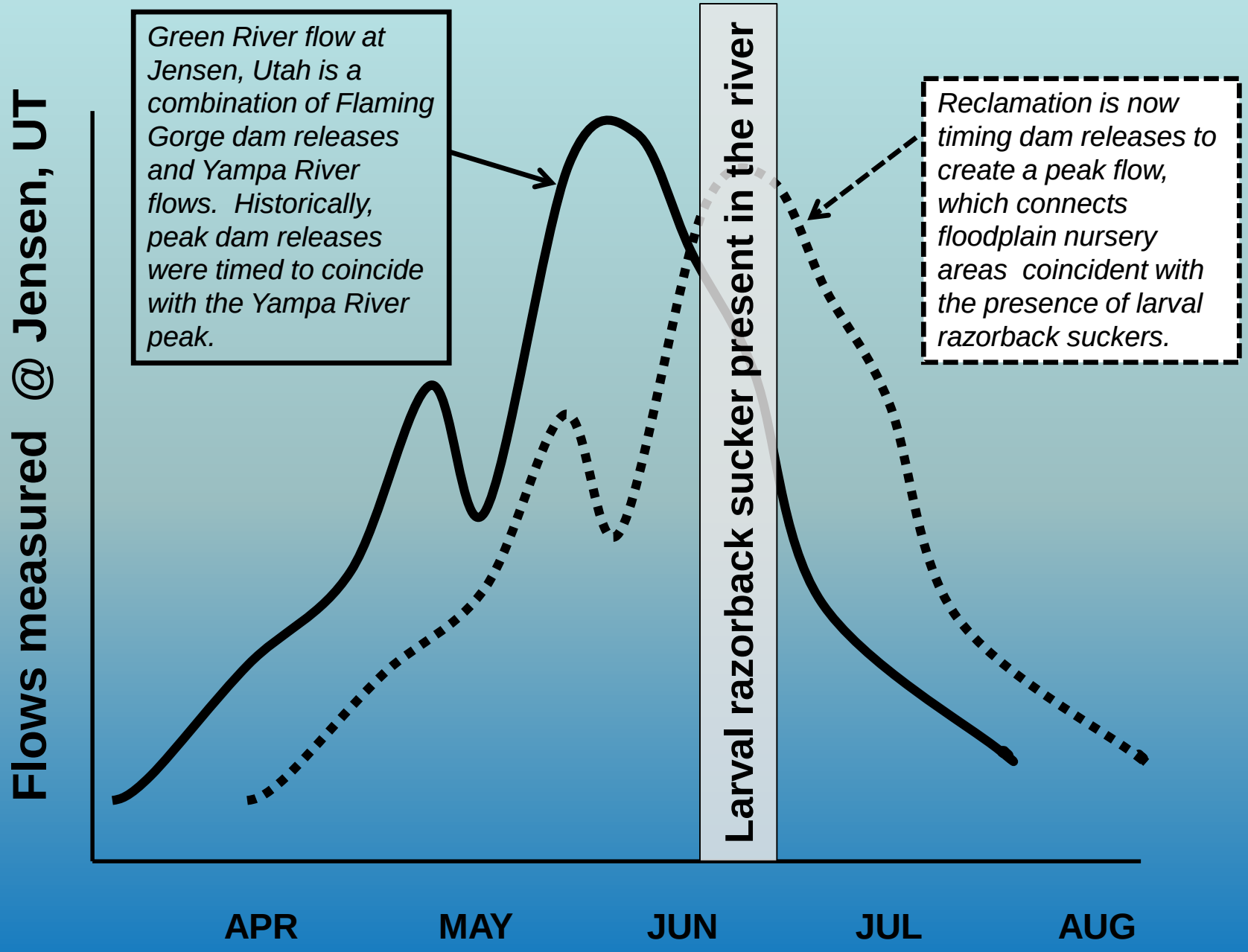
A History of Larval RBS 1st Capture Dates



Timing of reproduction, MG, 2008





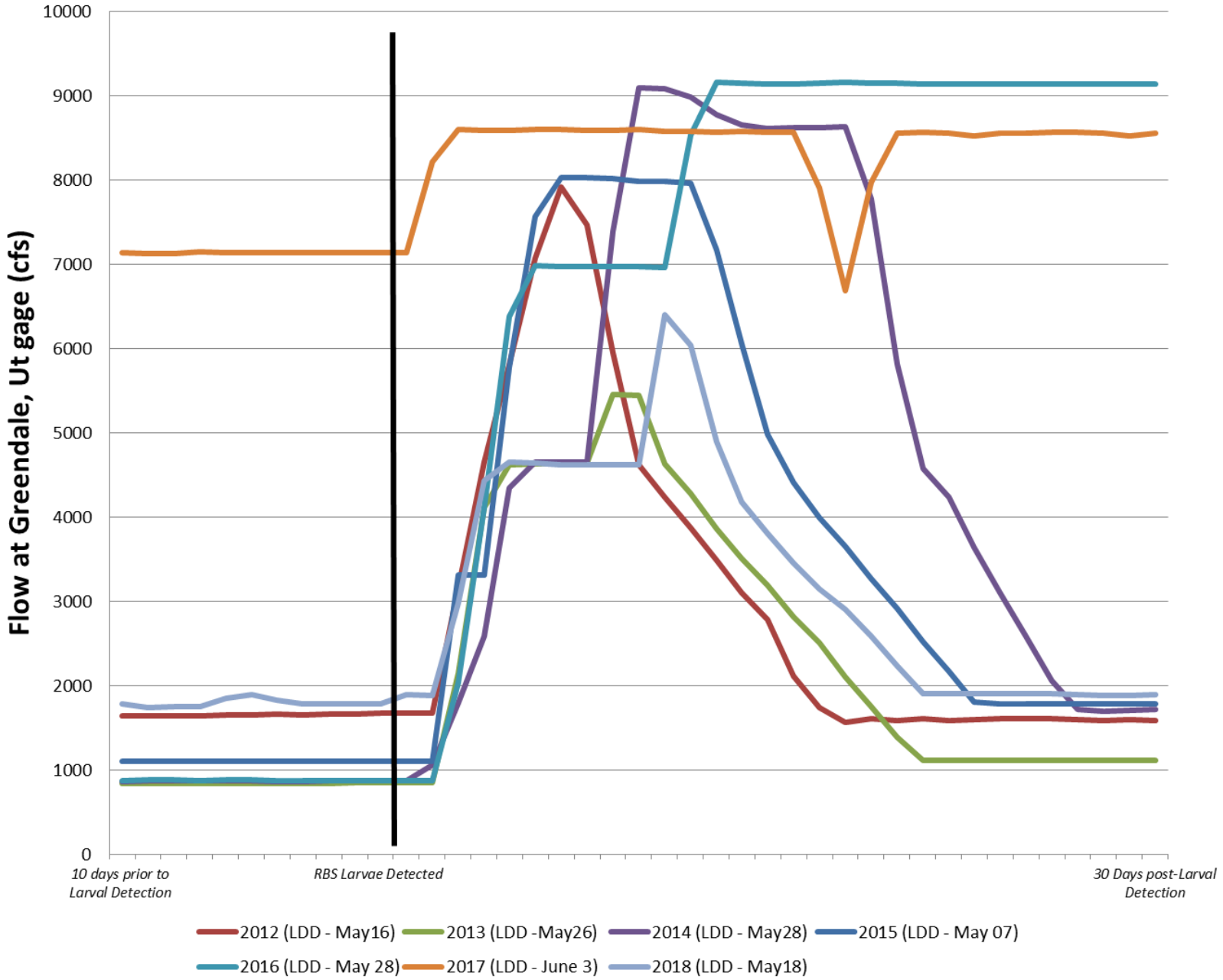

Green River flow at Jensen, Utah is a combination of Flaming Gorge dam releases and Yampa River flows. Historically, peak dam releases were timed to coincide with the Yampa River peak.
Reclamation is now timing dam releases to create a peak flow, which connects floodplain nursery areas coincident with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

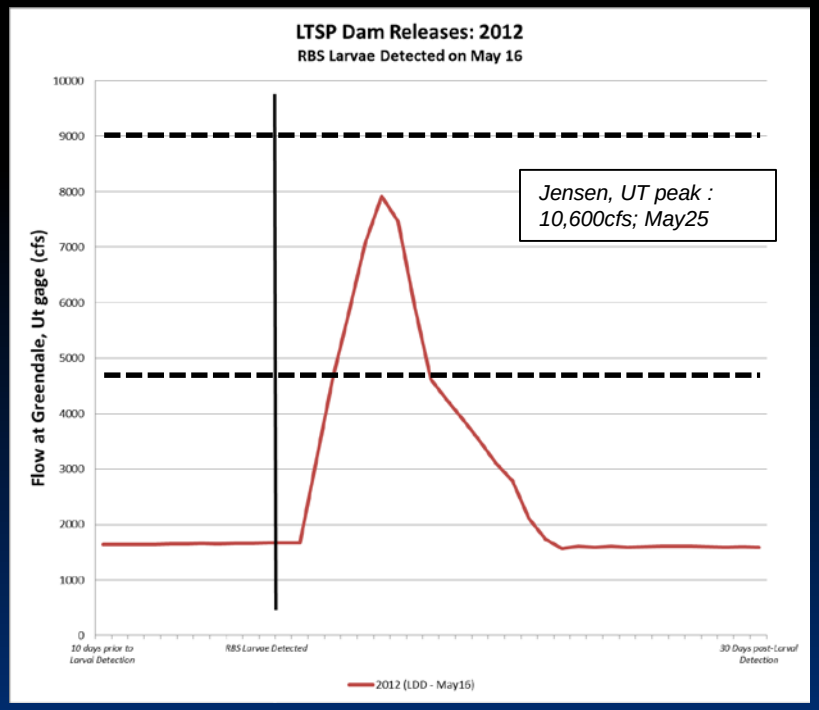
Larval Trigger Study Plan Matrix

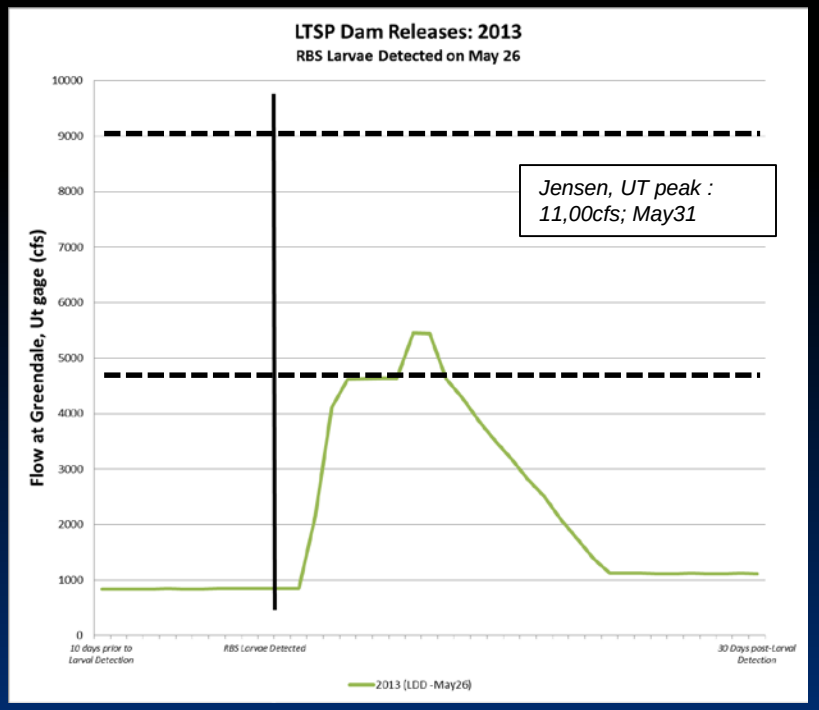
Peak Flow (x) as Measured at Jensen, Utah	Proposed Study Wetlands[a, b]	Number of Days (x) Flow to Be Exceeded and Corresponding Hydrologic Conditions [c]		
		1 ≤ x < 7	7 ≤ x < 14	x ≥14
8,300 ≤ x < 14,000 cfs	Stewart Lake (f), Above Brennan (f), Old Charley Wash (s)[d]	Dry	Moderately dry	Moderately dry and average (below median)
14,000 ≤ x < 18,600 cfs	Same as previous plus Escalante Ranch (f), Bonanza Bridge (f), Johnson Bottom[e] (s), Stirrup (s), Leota 7 (s)	Average (below median)	Average (below median)	Average (below median)
18,600 ≤ x < 20,300 cfs	Same as previous	Average (above median)	Average (above median)	Average (above median)
20,300 ≤ x < 26,400 cfs	Same as previous plus Baeser Bend (s), Wyasket (s), additional Leota units (7a and 4), Sheppard Bottom (s)	Moderately wet	Moderately wet	Moderately wet
x ≥ 26,400 cfs	Same as previous	Wet	Wet	Wet

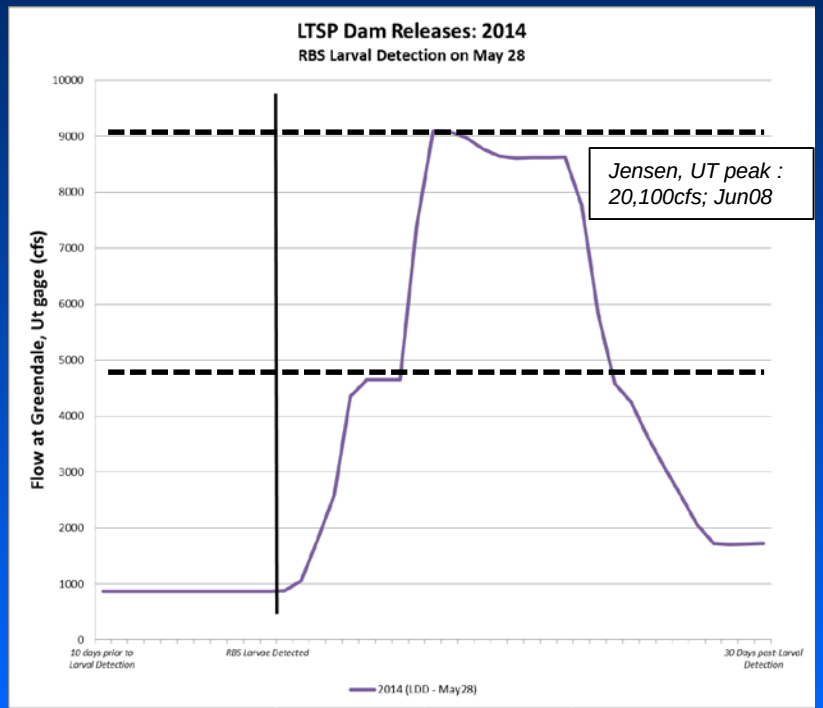
LTSP Dam Releases 2012 - 2018

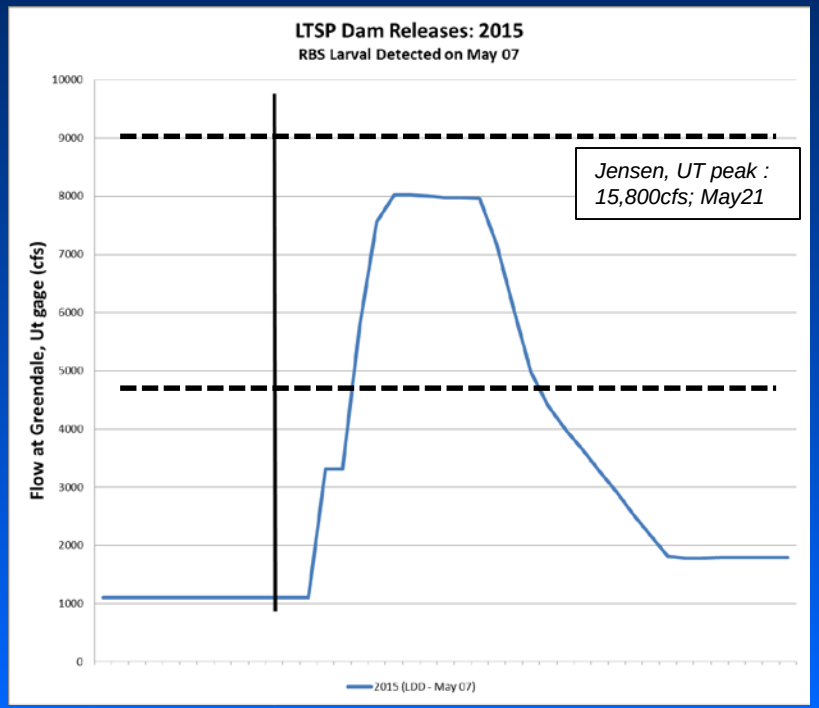
Date Standardized to RBS Larval Detection in Reach 2

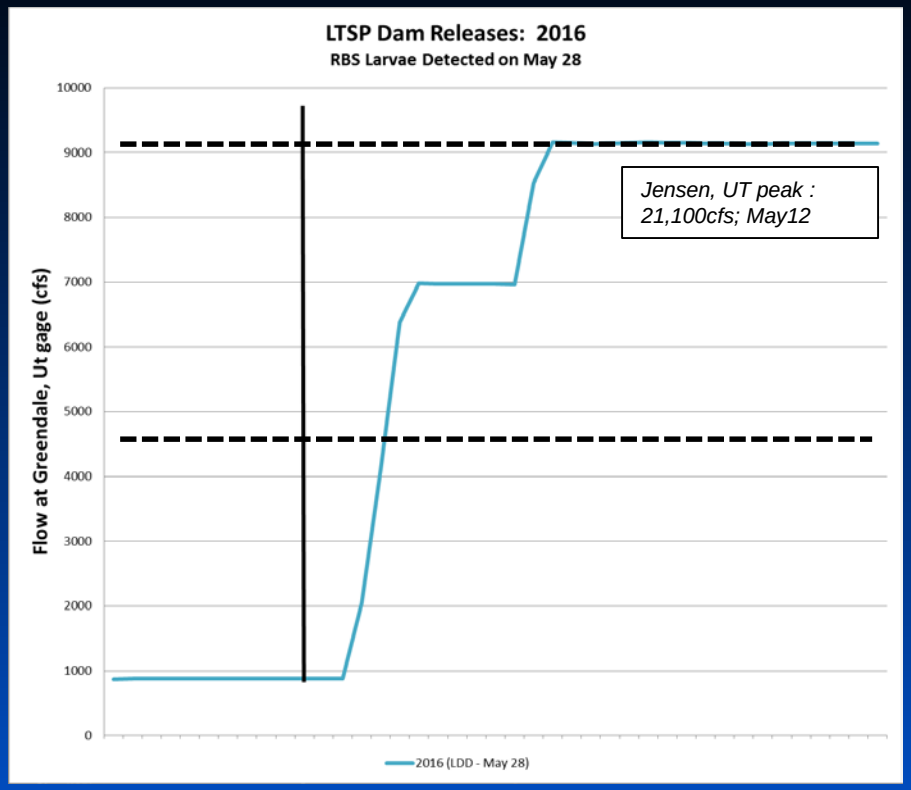


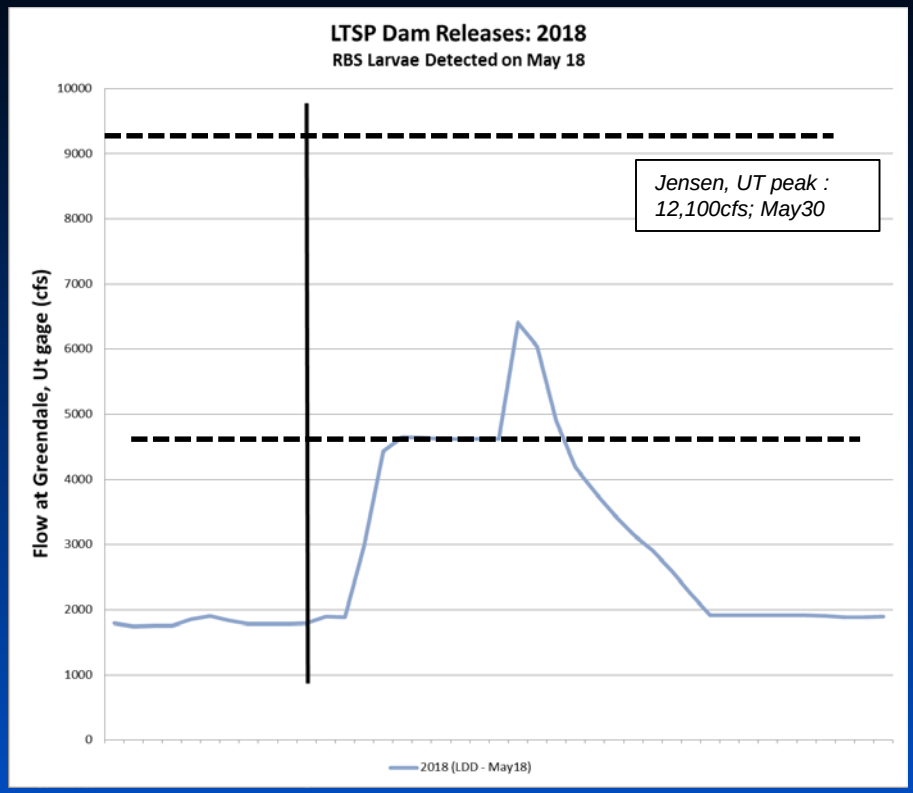

LTSP Dam Releases: 2012
RBS Larvae Detected on May 16
Jensen, UT peak : 10,600cfs; May25
Flow at Greendale, Ut gage (cfs)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10 days prior to Larval Detection
RBS Larvae Detected
30 Days post-Larval Detection
2012 (LDD - May16)


LTSP Dam Releases: 2013
RBS Larvae Detected on May 26
Jensen, UT peak : 11,00cfs; May31
Flow at Greendale, Ut gage (cfs)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10 days prior to Larval Detection
RBS Larvae Detected
30 Days post-Larval Detection
2013 (LDD - May26)


LTSP Dam Releases: 2014
RBS Larval Detection on May 28
Jensen, UT peak : 20,100cfs; Jun08
Flow at Greendale, Ut gage (cfs)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10 days prior to Larval Detection
RBS Larvae Detected
30 Days post-Larval Detection
2014 (LDD - May28)


LTSP Dam Releases: 2015
RBS Larval Detected on May 07
Jensen, UT peak : 15,800cfs; May21
Flow at Greendale, Ut gage (cfs)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
2015 (LDD - May 07)


LTSP Dam Releases: 2016
RBS Larvae Detected on May 28
Flow at Greendale, Ut gage (cfs)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jensen, UT peak : 21,100cfs; May12
2016 (LDD - May 28)

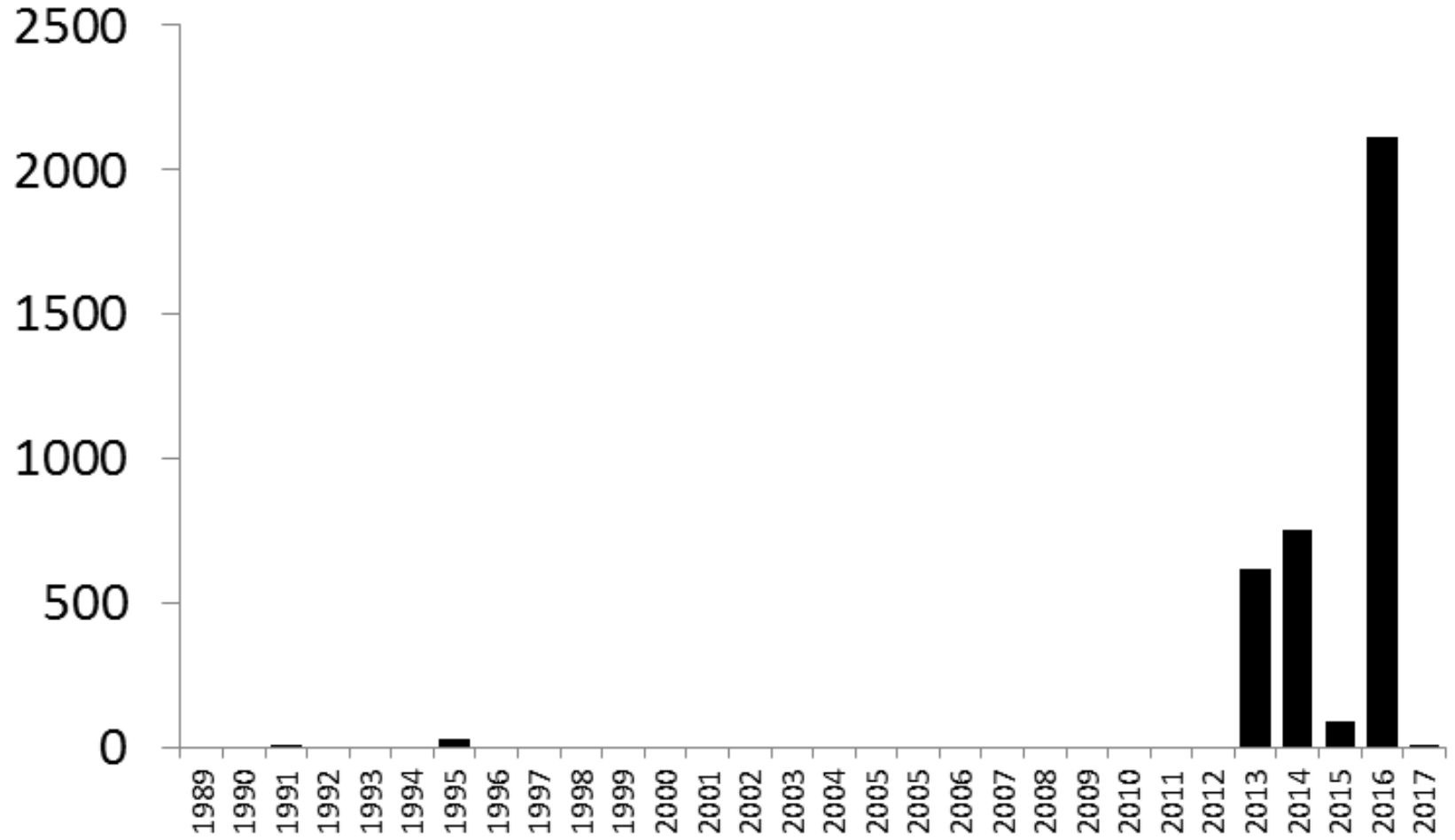

LTSP Dam Releases: 2018
RBS Larvae Detected on May 18
Flow at Greendale, Ut gage (cfs)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jensen, UT peak : 12,100cfs; May30
2018 (LDD - May18)

Floodplain wetlands are a better environment for larvae than the main channel

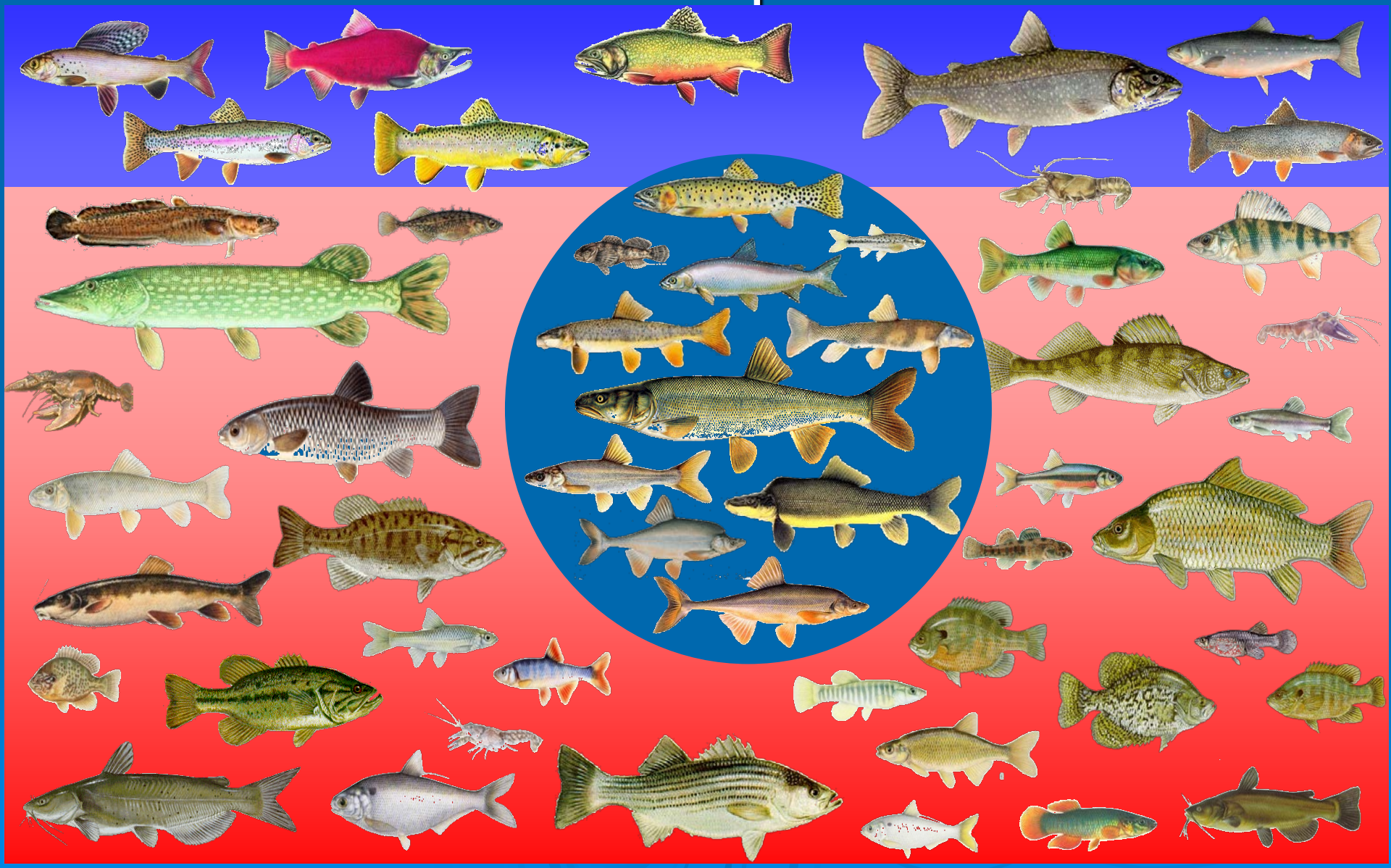
Juvenile Razorback Sucker Sampling w/ Seines @ Stewart Lake

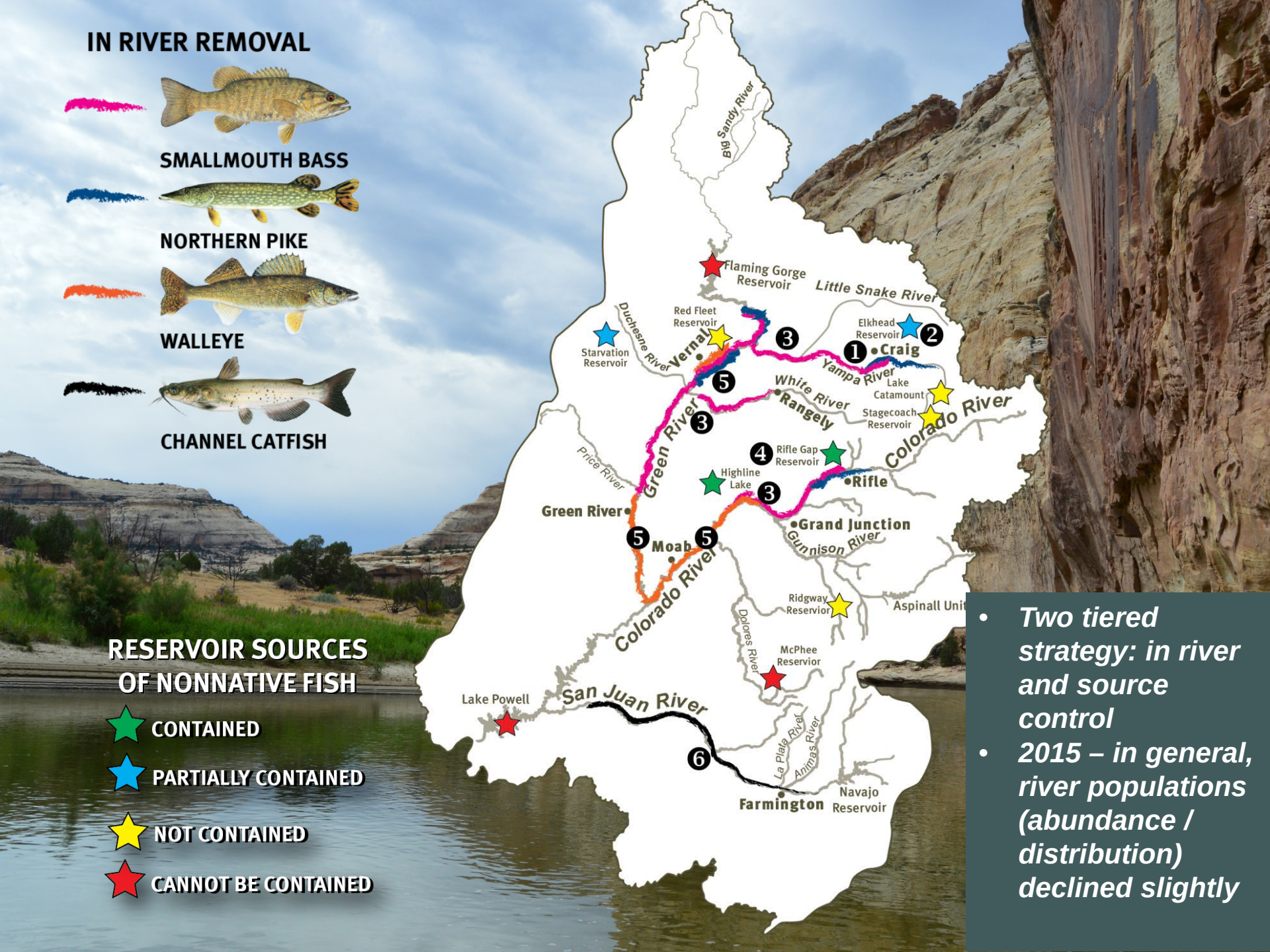
# of Age-0 RBS / Nonnative Sp. Collected During Fall Draining @ Stewart Lake		
	# of RBS	# of nonnative fish
2012	- (fish kill)	- (fish kill)
2013	613	60,330
2014	749	110,299
2015	87	371,866
2016	2,105	148,937
2017	2	110,181

Juvenile Razorback Suckers Captured in the Green River: 1989 - 2017

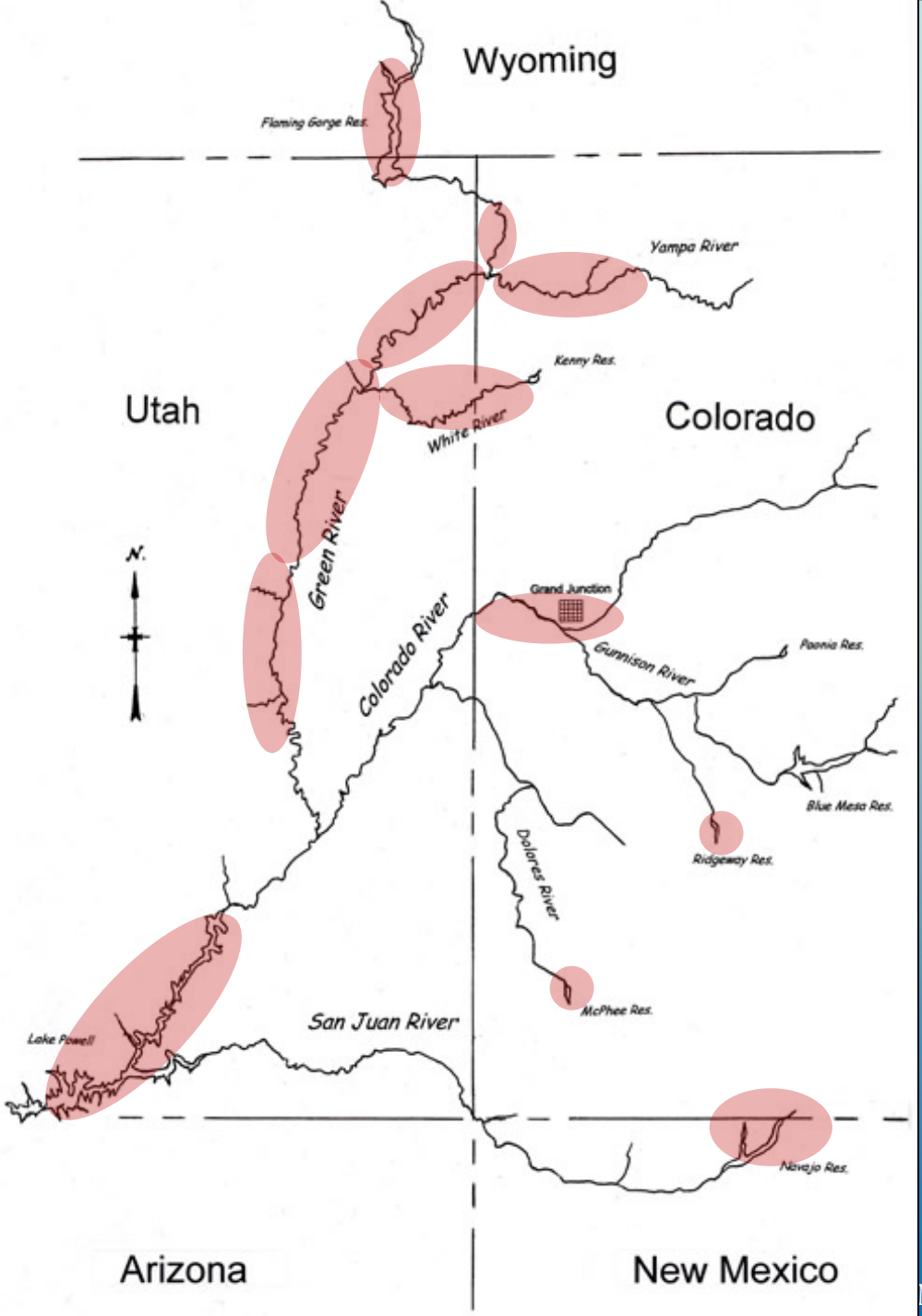


Upper Colorado River Major Threat: Invasive species



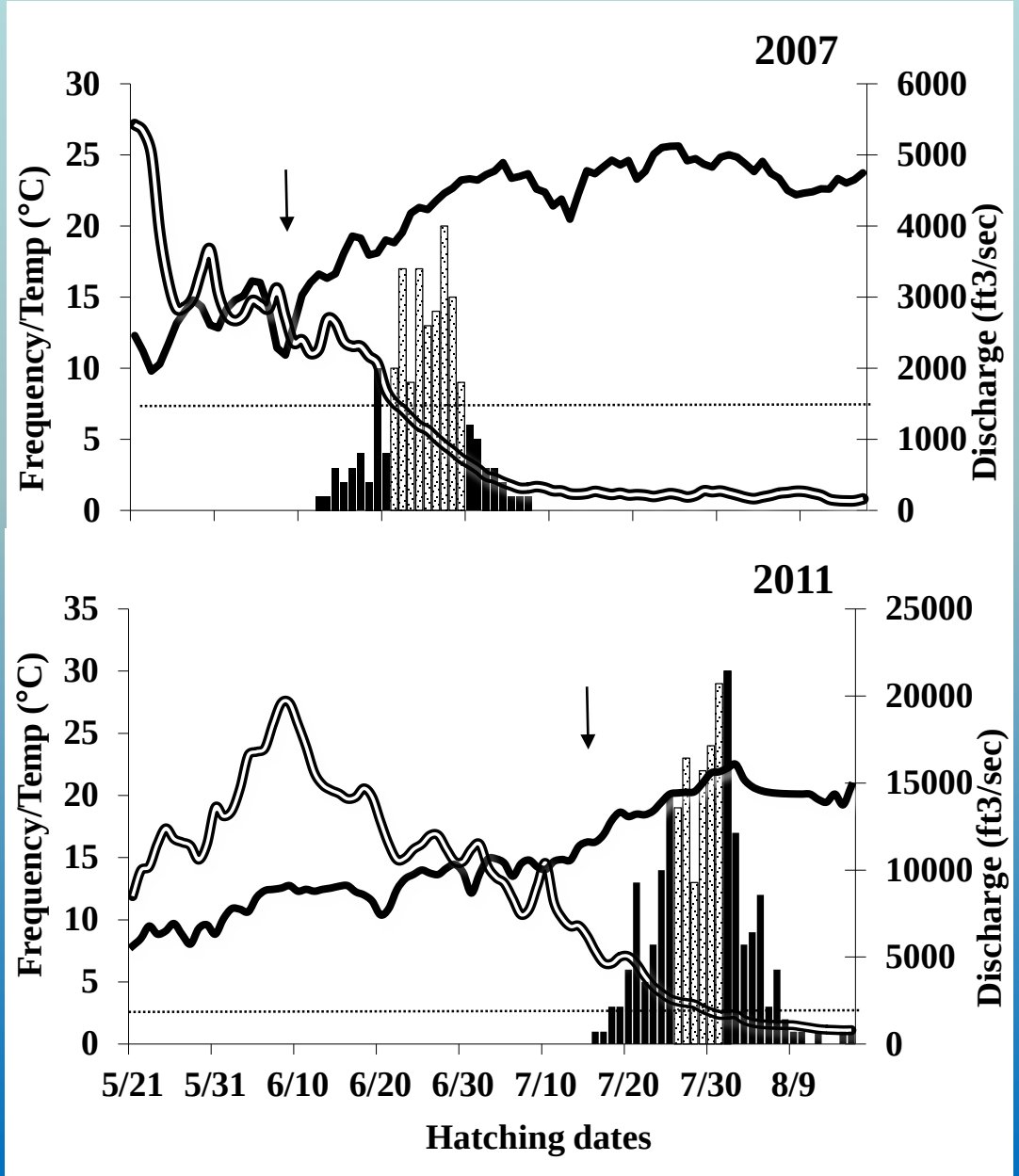

IN RIVER REMOVAL
SMALLMOUTH BASS
NORTHERN PIKE
WALLEYE
CHANNEL CATFISH
RESERVOIR SOURCES OF NONNATIVE FISH
CONTAINED
PARTIALLY CONTAINED
NOT CONTAINED
CANNOT BE CONTAINED
Big Sandy River
Flaming Gorge Reservoir
Little Snake River
Red Fleet Reservoir
Duchesne River
Starvation Reservoir
Vernal
Elkhead 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 Reservior
Aspinall Unit
Dolores River
McPhee Reservior
Lake Powell
San Juan River
La Plata River
Animas River
Navajo Reservoir
Farmington
• Two tiered strategy: in river and source control
• 2015 – in general, river populations (abundance / distribution) declined slightly

Upper Colorado River Basin Smallmouth Bass Distribution



MB)

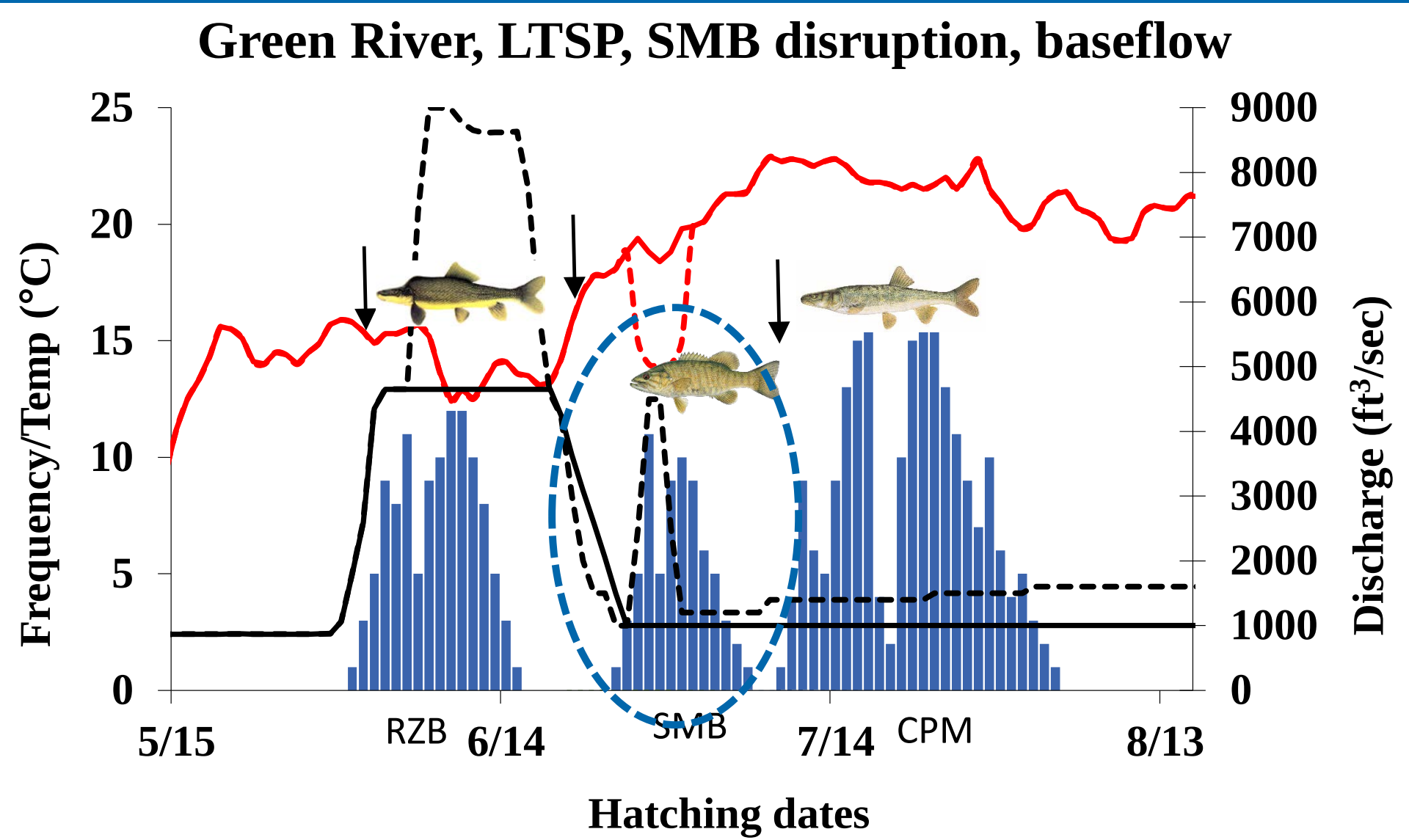
SMB hatching dates affected by water year



— *Low Flow year*

— *Hi Flow year*

FG Conservation Flow Patterns



Questions?