2012 Flaming Gorge Work Group

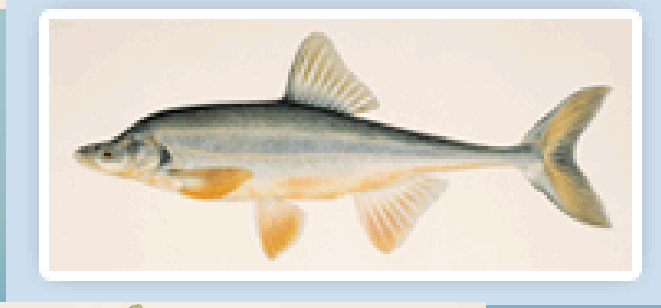
Upper Colorado River Endangered Fish Recovery Program: Updates and Larval Trigger Study Plan

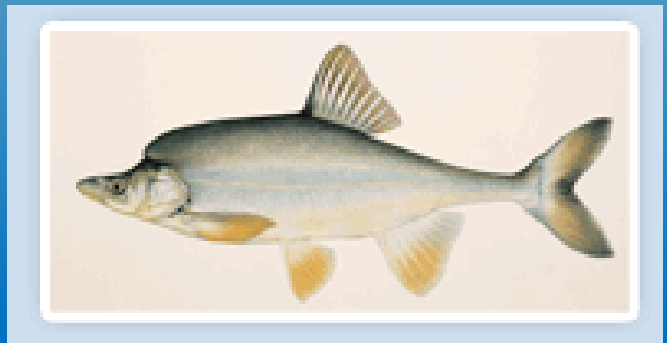
Tom Chart, USFWS, Program Director

April 18, 2012

Upper Colorado River Endangered Fish Recovery Program

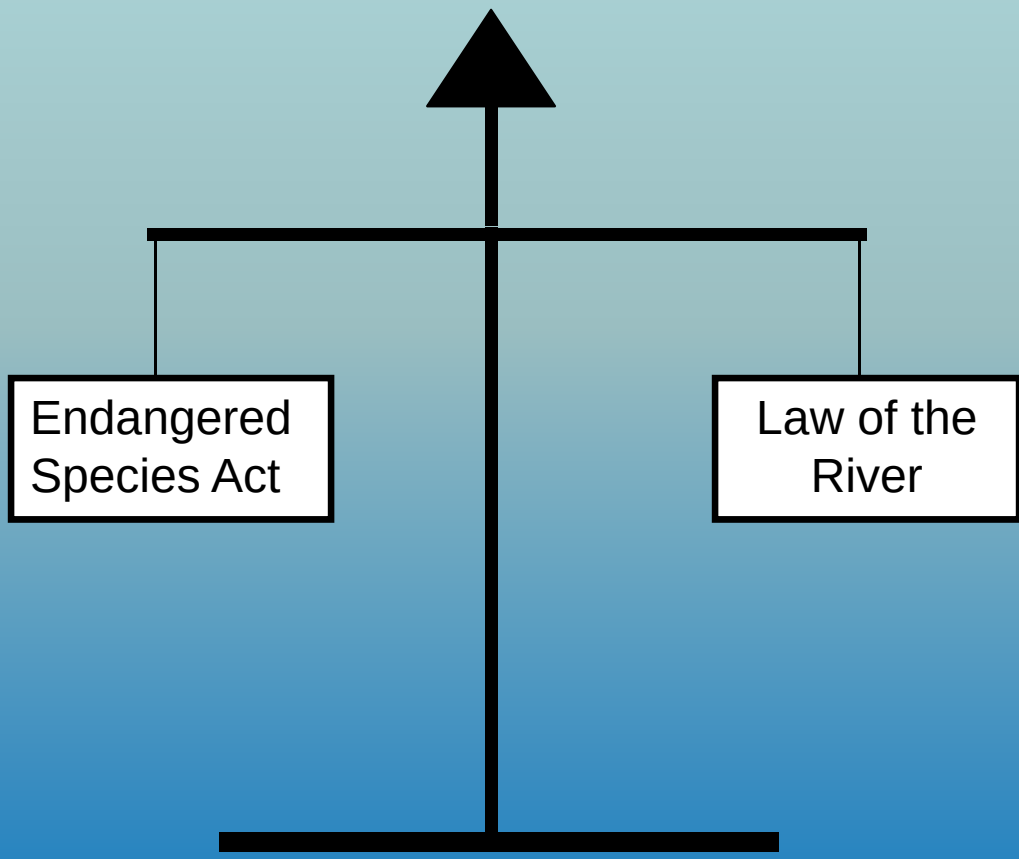
- Partners
  - State of Colorado
  - State of Utah
  - State of Wyoming
  - Bureau of Reclamation
  - Colorado River Energy Distributors Association
  - Colorado Water Congress
  - National Park Service
  - The Nature Conservancy
  - U.S. Fish and Wildlife Service
  - Utah Water Users Association
  -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





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.



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

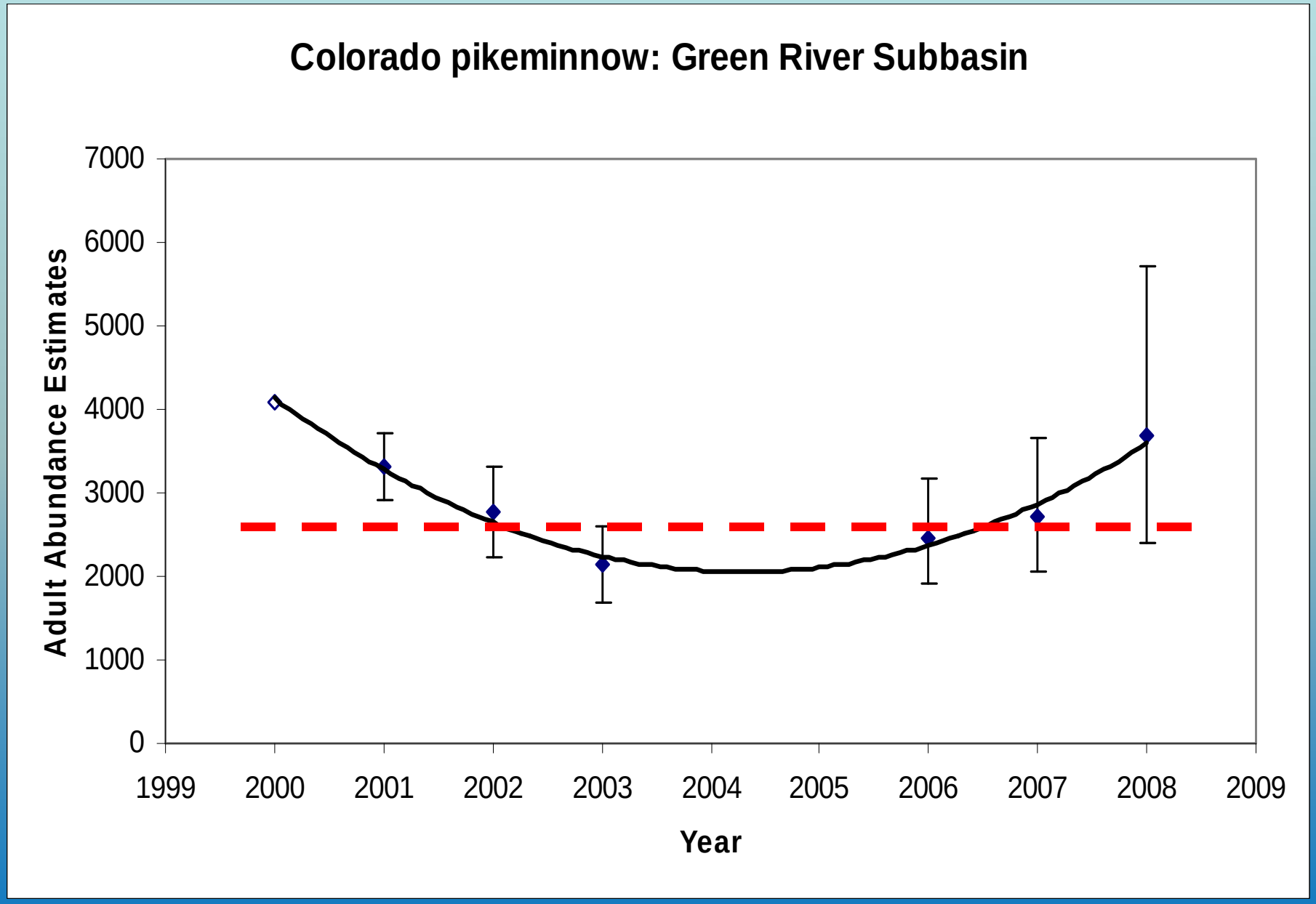
Summary of Endangered Species Act Section 7 Consultations (1/1988 through 12/31/2011)				
State	**Number of Projects**	**Historic Depletions**	**New Depletions (Acre-Feet/Yr)**	**Total Depletions (Acre-Feet/Yr)**
Colorado	1,167	1,915,682	206,416	2,122,098
Utah	219	517,670	91,051	608,721
Wyoming	377	83,498	34,248	117,747
Regional*	238	(regional)	(regional)	0
Total	**2,001**	**2,516,850**	**331,715**	**2,848,565**

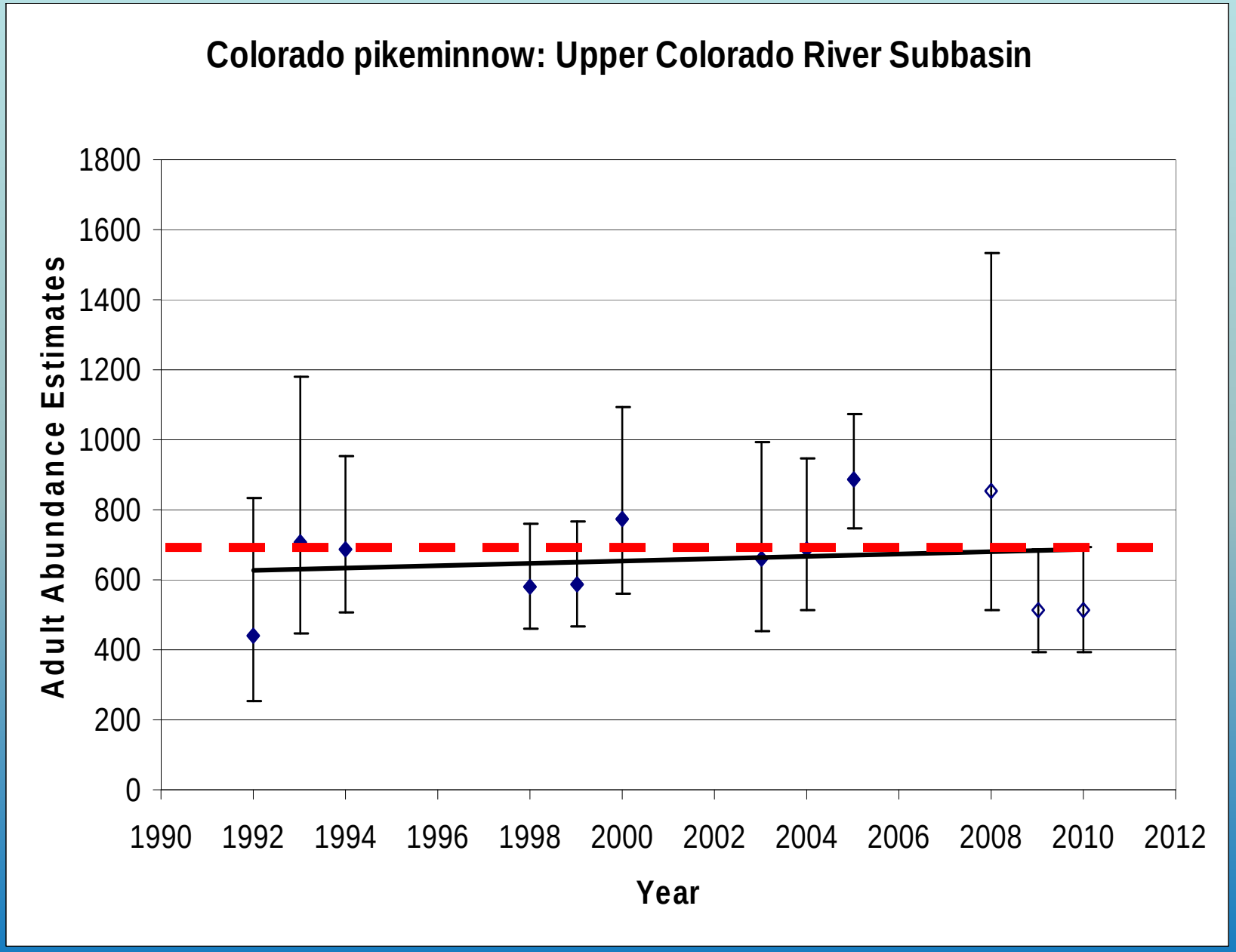
* Amount included in individual state's new depletions

Recovery Elements

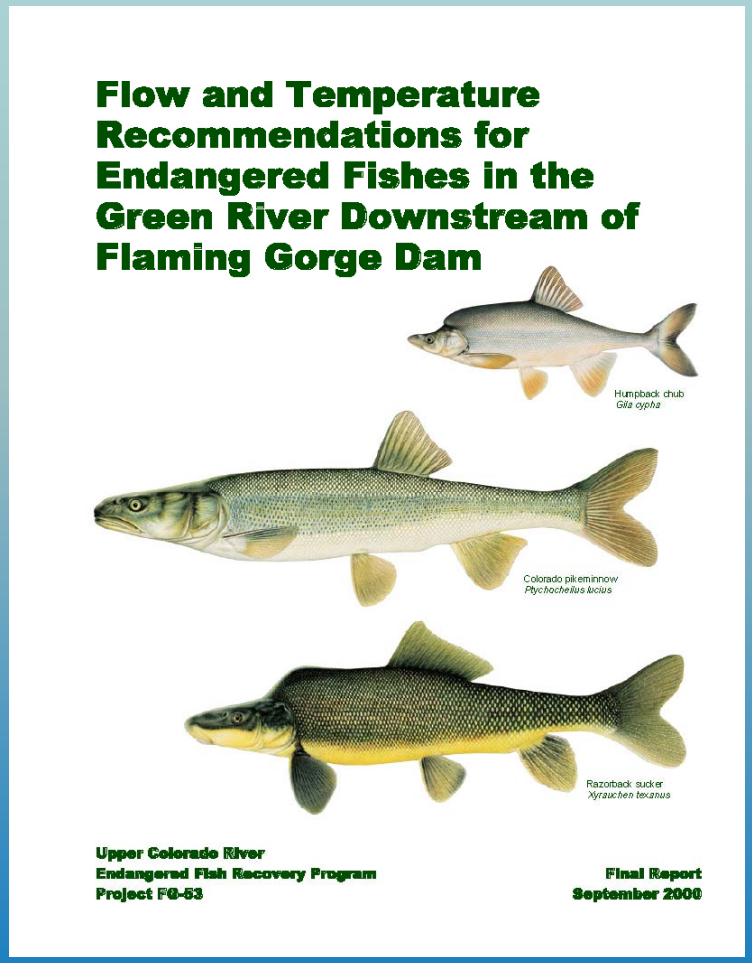
Recovery Program's Progress to Recovery

Species	Timeline to Downlist / Delist (yrs)	Progress made on management actions to remove threats to recovery and status of meeting demographic criteria.
Colorado pikeminnow	2013 / 2020	**Management Actions: 78% of the actions required by USFWS to downlist have been met or partially met. Demographics: IF, Colorado (CO) and Green (GR) river populations do not decline significantly from current levels and 1,000 age-5 fish are present in SJR (mod to hi likelihood) – Downlisting could occur in 2013.**
Bonytail	2020 / 2023	**Management Actions:: 72% of the actions required by USFWS to downlist have been met or partially met. Demographics: Stocking programs in the GR and CO rivers have been marginally successful. However, there is not enough new information to suggest the 2020 deadline should be revised.**
Razorback sucker	2020 / 2023	**Management Actions: 85% of the actions required by USFWS to downlist have been met or partially met. Demographics: Stocking programs in the GR, CO, and San Juan rivers appear to be successful. Neither Program has initiated population estimation, but current information indicates the 2020 timeline is still achievable.**
Humpback chub	**2016 / 2019**	**Management Actions: 60% of the actions required by USFWS to downlist have been met or partially met. Demographics: IF, over a 5-year period, one of the five upper Basin populations rebounds to meet the "core criteria" of 2,100 adults, and the other Upper Basin populations increase (low to mod likelihood) - Downlisting could occur in 2016.**


Colorado pikeminnow: Green River Subbasin
Adult Abundance Estimates
7000
6000
5000
4000
3000
2000
1000
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Year


Colorado pikeminnow: Upper Colorado River Subbasin
Adult Abundance Estimates
1800
1600
1400
1200
1000
800
600
400
200
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

Each Year the FGTWG provides BOR a technical (biological and physical) interpretation of:



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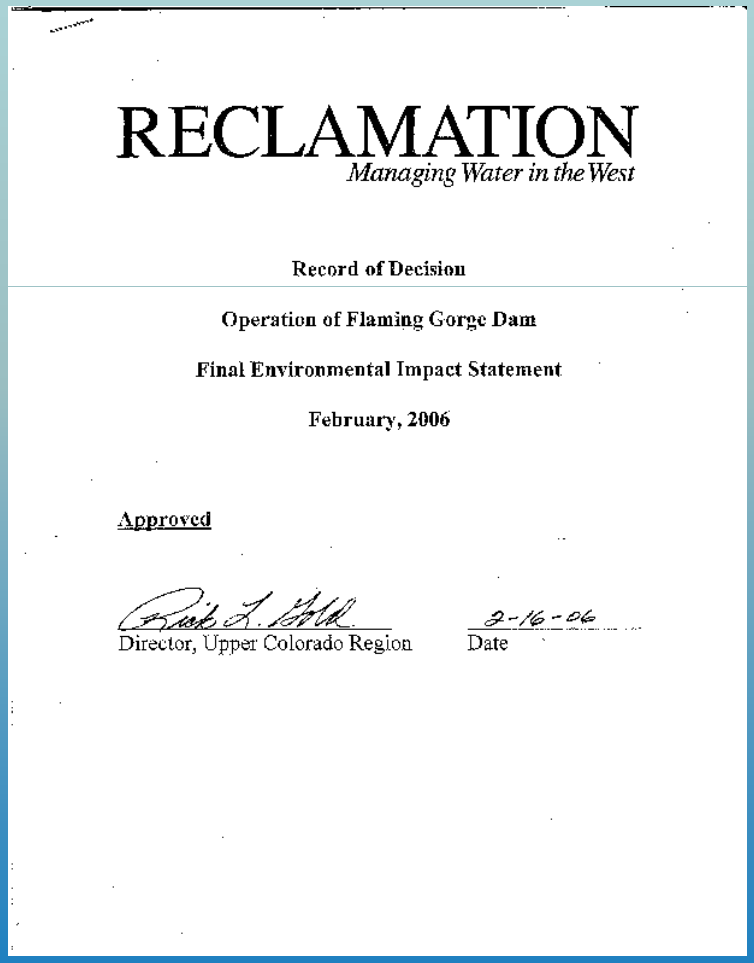


RECLAMATION
Managing Water in the West

Record of Decision

Operation of Flaming Gorge Dam

Final Environmental Impact Statement

February, 2006

Approved

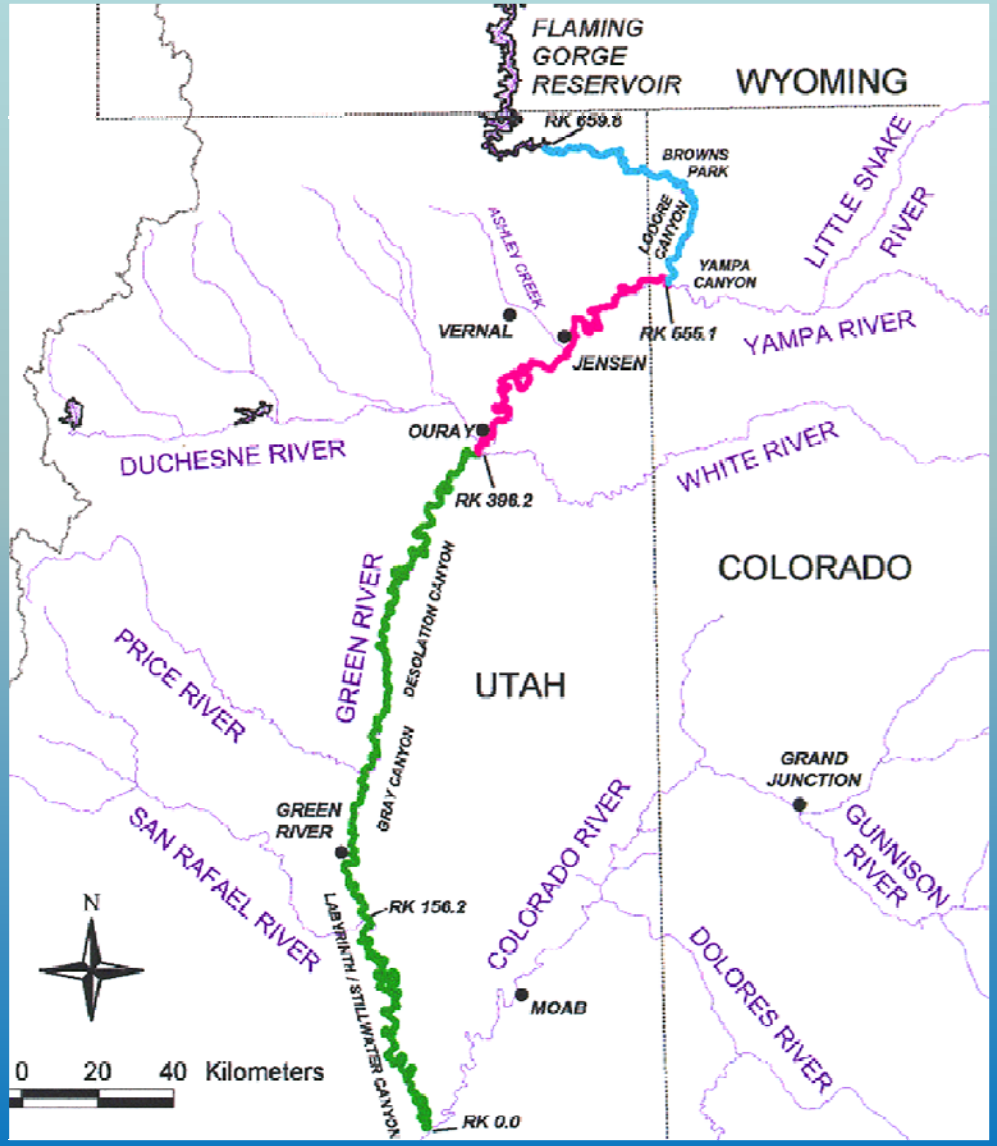
Director, Upper Colorado Region — Date 2-16-06

Muth et al. 2000

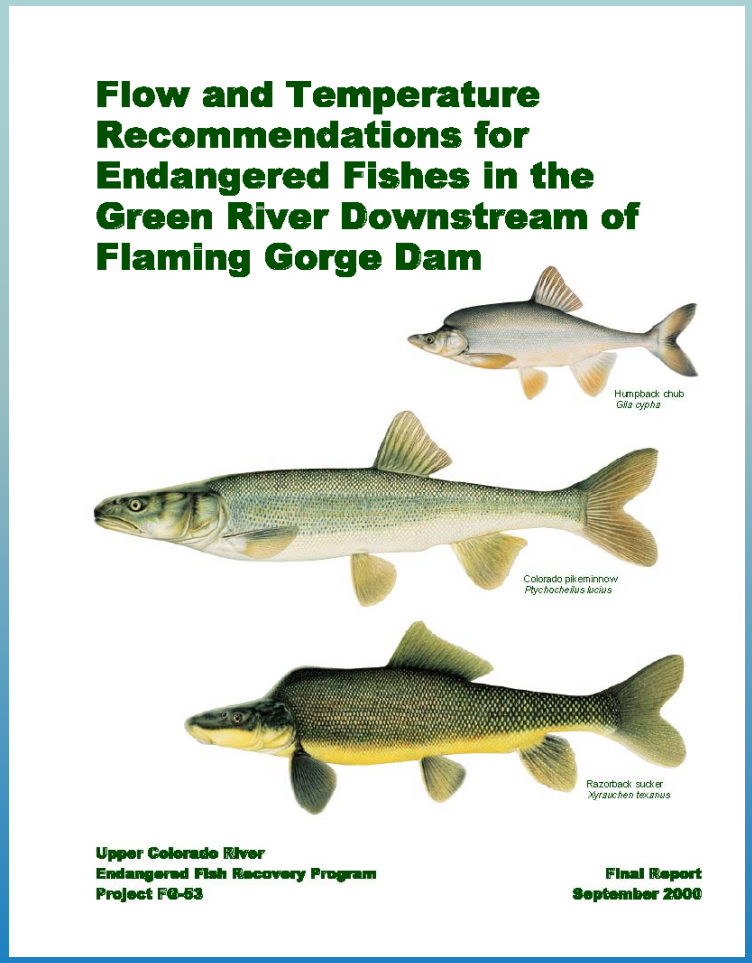
BOR's Record of Decision

Green River Reaches

- **Reach 1**: Flaming Gorge Dam to Yampa River
  - adult CPM in Lodore
- **Reach 2**: Yampa to White River
  - RBS spawning
  - RBS and CPM nursery habitat
  - adult HBC in upper portion
- **Reach 3**: White to Colorado River
  - HBC in Desolation and Gray canyons
  - CPM (RBS) spawning
  - RBS and CPM nursery habitat

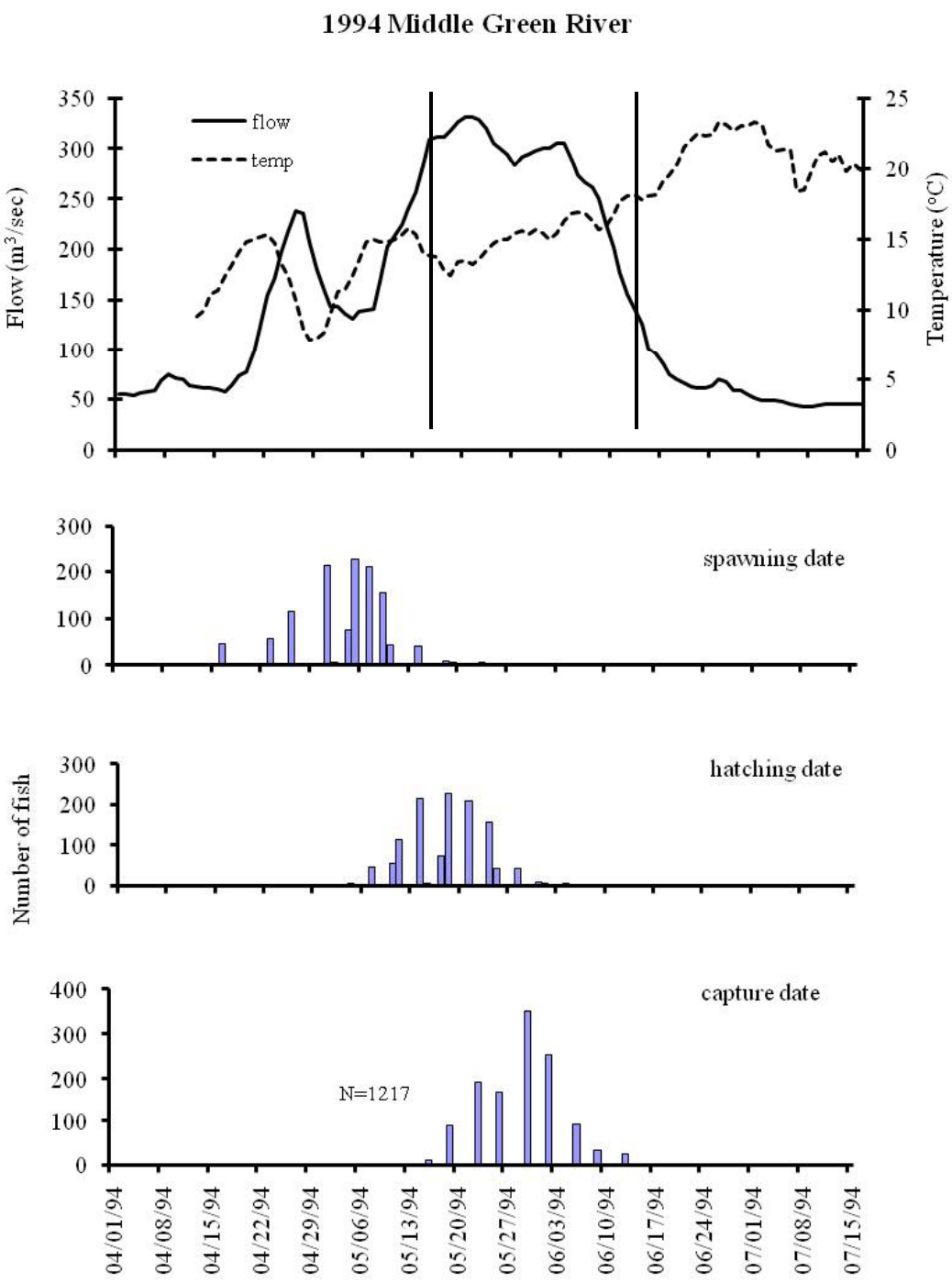


Key Components of Spring Flow Recommendations:

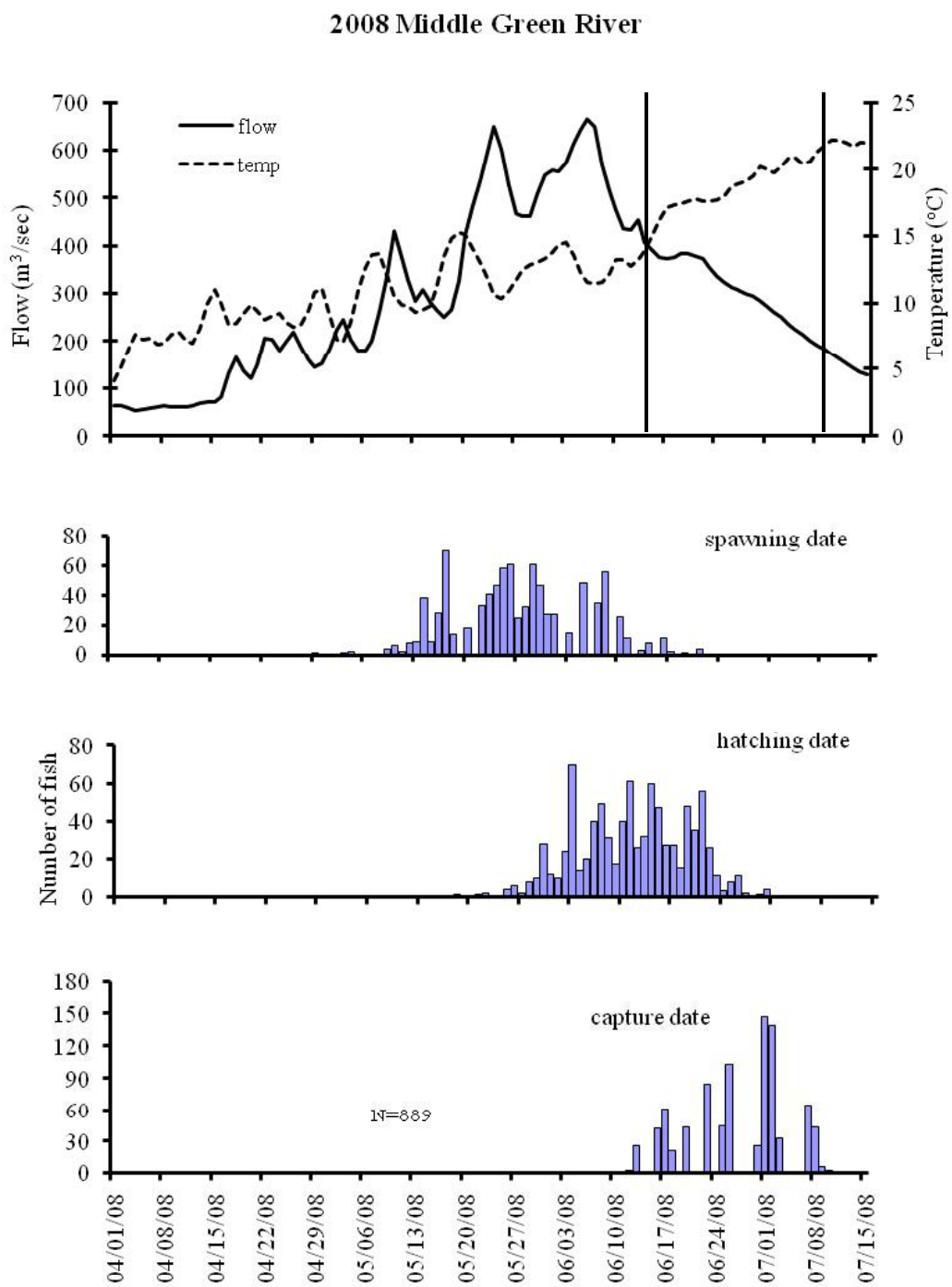


- Importance of 18,600 cfs in Reach 2 in avg or wetter years = significant floodplain connection in the ONWR
- FGD releases should be timed to match peak, or immediate post-peak of the Yampa River
- FGD releases should be timed to coincide with presence of sucker larvae (many other timing factors)

Timing of reproduction, MG, 1994



Timing of reproduction, MG, 2008



New Information:

- *Report reviews various aspects of razorback sucker life history*

- *Reviews FGD operations and Yampa River flows in relation to presence of larval razorback sucker (1992 – 2009) in the Uintah Basin*

- *Determines that to provide critical nursery habitat for larval razorback sucker (flooded wetlands), FGD releases will need to occur after the Yampa River peak in most years.*

SYNTHESIS OF FLOOD PLAIN WETLAND INFORMATION: TIMING OF RAZORBACK SUCKER REPRODUCTION IN THE GREEN RIVER, UTAH, RELATED TO STREAM FLOW, WATER TEMPERATURE, AND FLOOD PLAIN WETLAND AVAILABILITY

By

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U. S. Fish and Wildlife Service
Vernal, Utah (GBH)

Draft Final Report

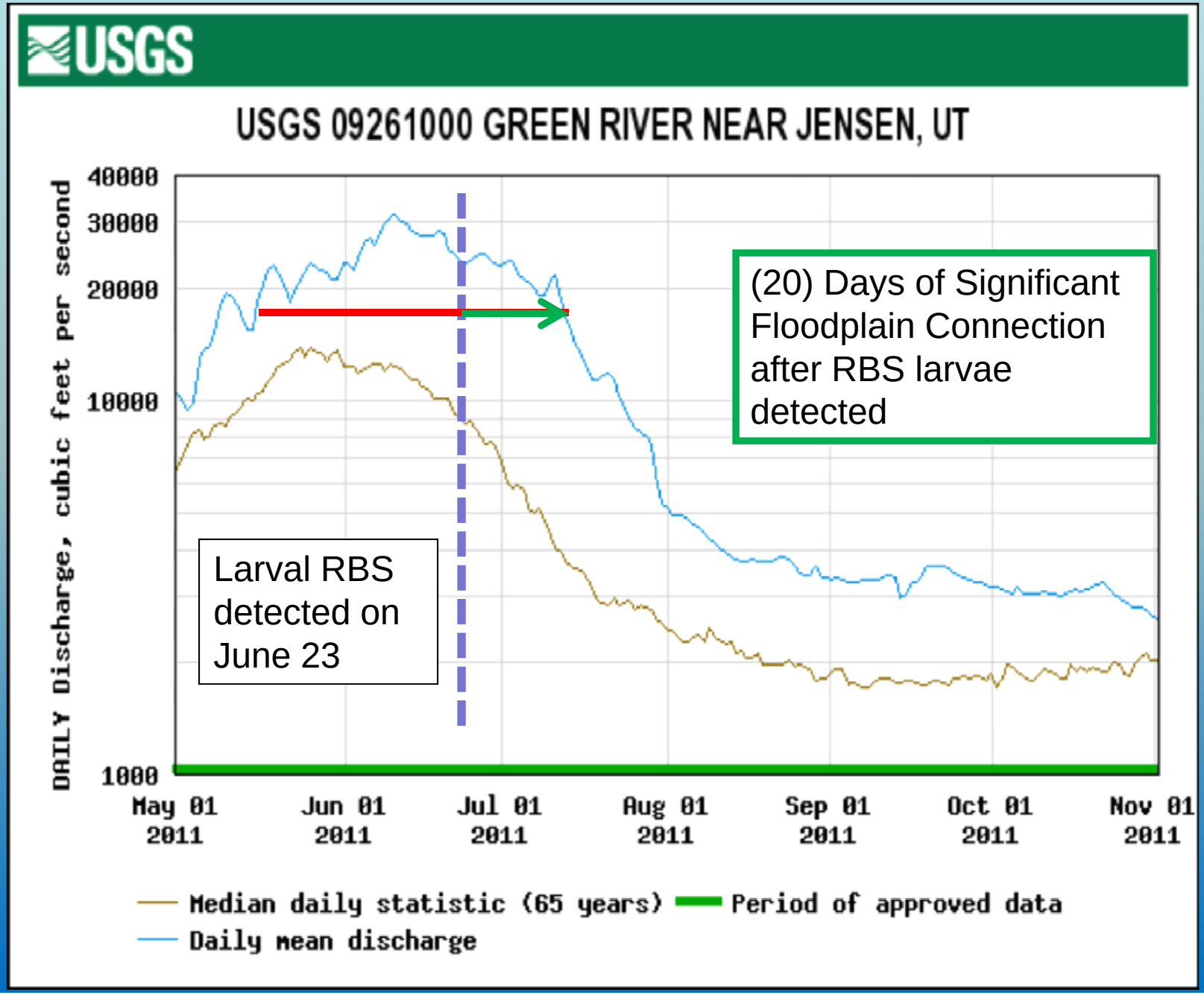
Colorado River Recovery Implementation Program Projects 22F and FR-FP
Synthesis
Larval Fish Laboratory Contribution 162
March 2011

Bestgen et al. 2012

Reproduction of razorback sucker, Green River, 1993-2010

- Coincident with increasing water temperature (8-18 C), increasing or peak flows, earlier when warm, later if cool
- Once started, mean spawning date is 3 weeks after first spawning, mean hatching is 2 weeks after mean spawn, and mean capture time 2 weeks after that.
- Long and later reproductive period in cold water!

2011 Flows


USGS
USGS 09261000 GREEN RIVER NEAR JENSEN, UT
DAILY Discharge, cubic feet per second
40000
30000
20000
10000
1000
May 01 2011
Jun 01 2011
Jul 01 2011
Aug 01 2011
Sep 01 2011
Oct 01 2011
Nov 01 2011
(20) Days of Significant Floodplain Connection after RBS larvae detected
Larval RBS detected on June 23
Median daily statistic (65 years)
Period of approved data
Daily mean discharge

2011: High Flow Related Biological Results

- **Wild produced, Age-0 razorback sucker (80 – 161mm TL) collected in two Green River floodplains in September**
  - Last time over-summer survival detected in this portion of the river was in 1996.
- **Razorback sucker adults are found spawning in the White River for the first time ever!**

STUDY PLAN TO EXAMINE THE EFFECTS OF USING LARVAL RAZORBACK SUCKER OCCURRENCE IN THE GREEN RIVER AS A TRIGGER FOR FLAMING GORGE DAM PEAK RELEASES

Prepared by the Larval Trigger Study Plan Ad Hoc Committee

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Jerry Wilhite, Western Area Power Administration
Shane Capron, Western Area Power Administration
David Speas, Bureau of Reclamation
Heather Hermansen, Bureau of Reclamation
Kevin McAbee, U.S. Fish and Wildlife Service
Jana Mohrman, U.S. Fish and Wildlife Service
Melissa Trammell, National Park Service
Brandon Albrecht, Environmental Group Representative

Coordinated by

The Upper Colorado River Endangered Fish Recovery Program

Final Report March 2012

LTSP: Study Matrix and Timeline

	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
3 years	**8,300 ≤ x < 14,000 cfs**	Stewart Lake (f), Above Brennan (f), Old Charley Wash (s)	Dry	Moderately dry	Moderately dry and average (below median)
	14,000 ≤ x < 18,600 cfs	Same as previous plus Thunder Ranch (f), Bonanza Bridge (f), Johnson Bottom (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)
3 years	**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

(a) f = flow-through wetland, s = single-breach wetland

(b) Up to eight wetlands would be sampled in a given year with the three in the lowest flow category being sampled in all years.

(c) Refer to Table 1 for exceedance percentages and peak flow recommendations for each hydrologic condition. Note that the hydrologic conditions presented are the driest that could support a particular combination of peak flow magnitude and duration. For any combination, wetter hydrology could also support an experiment.

Peak Flows: 2011

Recovery Program Research Request :

Address 3 Critical Uncertainties:

1. Can timing of the spring peak discharge from Flaming Gorge dam be altered to maximize overlap with the abundance of wild razorback sucker larvae in Reach 2 of the Green River?

2. Given changes in floodplain habitats since the flow recommendations were developed, what flows are necessary to result in successful entrainment of wild larvae in floodplains in Reach 2?

3. Are these wetlands successful in promoting survival of razorback suckers (both fall and over-winter survival)?

Peak Flows: 2011

Recovery Program Research Request :

- Primary Objective: Time Flaming Gorge releases to connect floodplains when wild produced razorback sucker larvae are present in the Green River.
  - Once larval suckers are present, and If, hydrology remains **Wet-Average, Moderately Wet or Wet Categories** (<40% exceedance) we request flows that maintain 18,600cfs or greater for two weeks or more in Reach 2. *[with contingencies for drier conditions]*
- Secondary Objective: Assist in meeting the objectives of Recovery Program Project No.C6 RZ-RECR: *Razorback emigration from the Stirrup floodplain*
  - Recovery Program therefore requests 15,000cfs for 5 consecutive days in Reach 2 to assist in meeting these project objectives

Stirrup Wetland

15,000 cfs = passable by endangered fish

Stirrup: 2008-2010 results

1) 2008 results
   a) antenna trouble
   b) 3 razorback sucker
   c) 3 Colorado pikeminnow
   d) 1 bonytail (rare; stocked 2007)
   e) 1 roundtail chub
   f) **7 unique endangered fish**

2) 2009 results
   a) 31 razorback sucker
   b) 5 bonytail (rare; stocked 2008)
   c) 4 Colorado pikeminnow
   d) **40 unique endangered fish**

3) 2010 results
   a) 31 razorback sucker
   b) 5 bonytail
   c) 6 Colorado pikeminnow
   d) **42 unique endangered fish**

Base Flow Request :

USFWS Utah Field Office, in cooperation with Recovery Program

1. Reclamation selects reach 1 target according to ROD base flow range

2. Base flow target is then augmented by as much as 40% according to ROD allowances through September 30th

Colorado pikeminnow

YOY Colorado pikeminnow

Young-of-year pikeminnow collections : 2000 - 2010

Year	# of age-0 pikeminnow collected	Average flow between July 15 and September 30	Years base flows dropped below 1000 cfs
2000	31	1423	
2001	8	1073	X
2002	0	876	X
2003	2	1101	X
2004	60	1367	
2005	8	1958	
2006	5	1213	X
2007	3	1122	X
2008	18	2376	
2009	325	2610	
2010	454	2292	
2011	**0**	**8660**	

Base Flow Request :
YOY Colorado pikeminnow habitat

- In general, higher flows and other flow-dependent variables correspond with higher recruitment
- But it is a complex relationship involving
  - Multi-year effects of flows (peak and base)
  - Non-native species
  - Habitat characteristics (backwater volume & area)