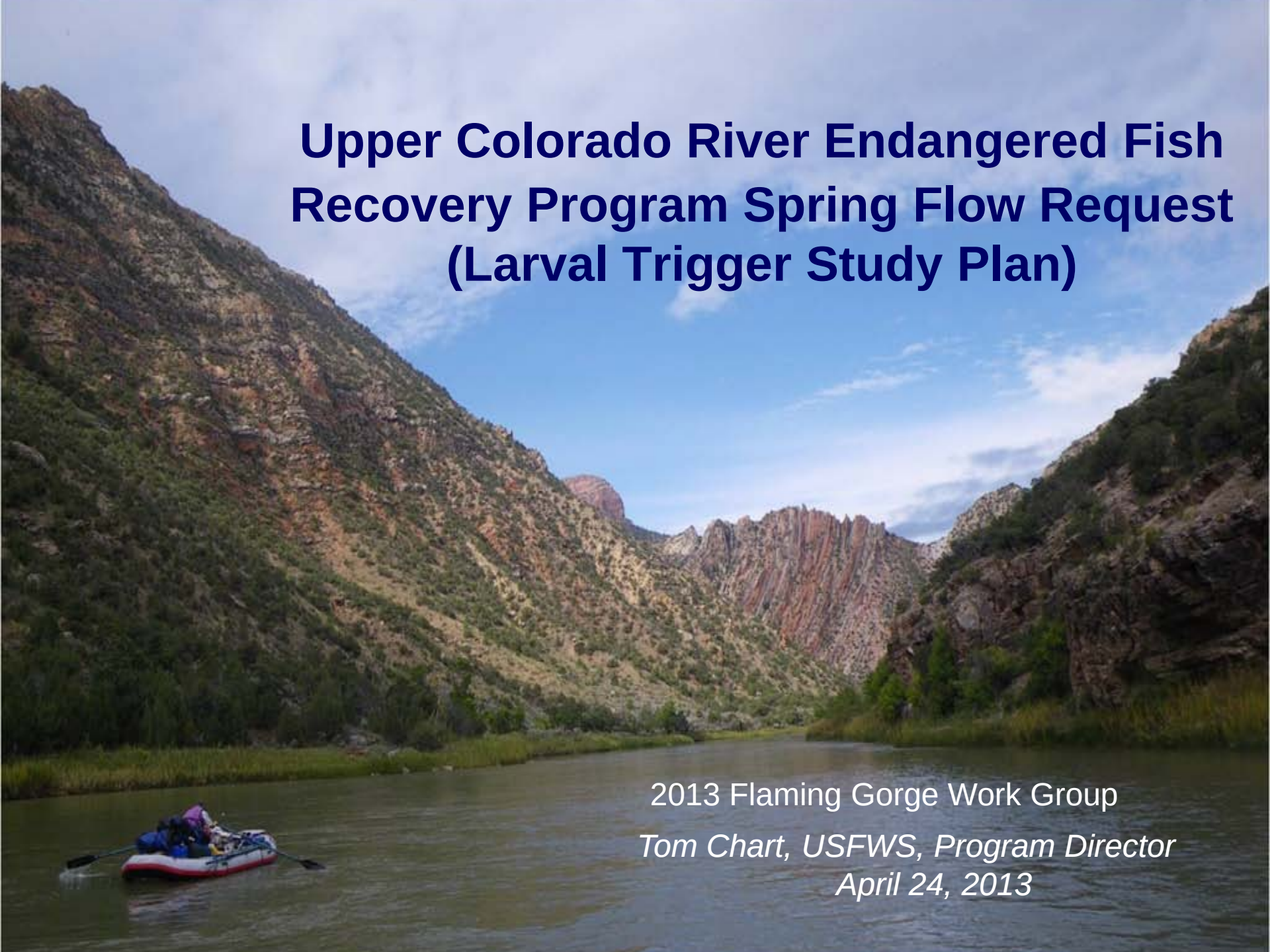


Upper Colorado River Endangered Fish Recovery Program Spring Flow Request (Larval Trigger Study Plan)

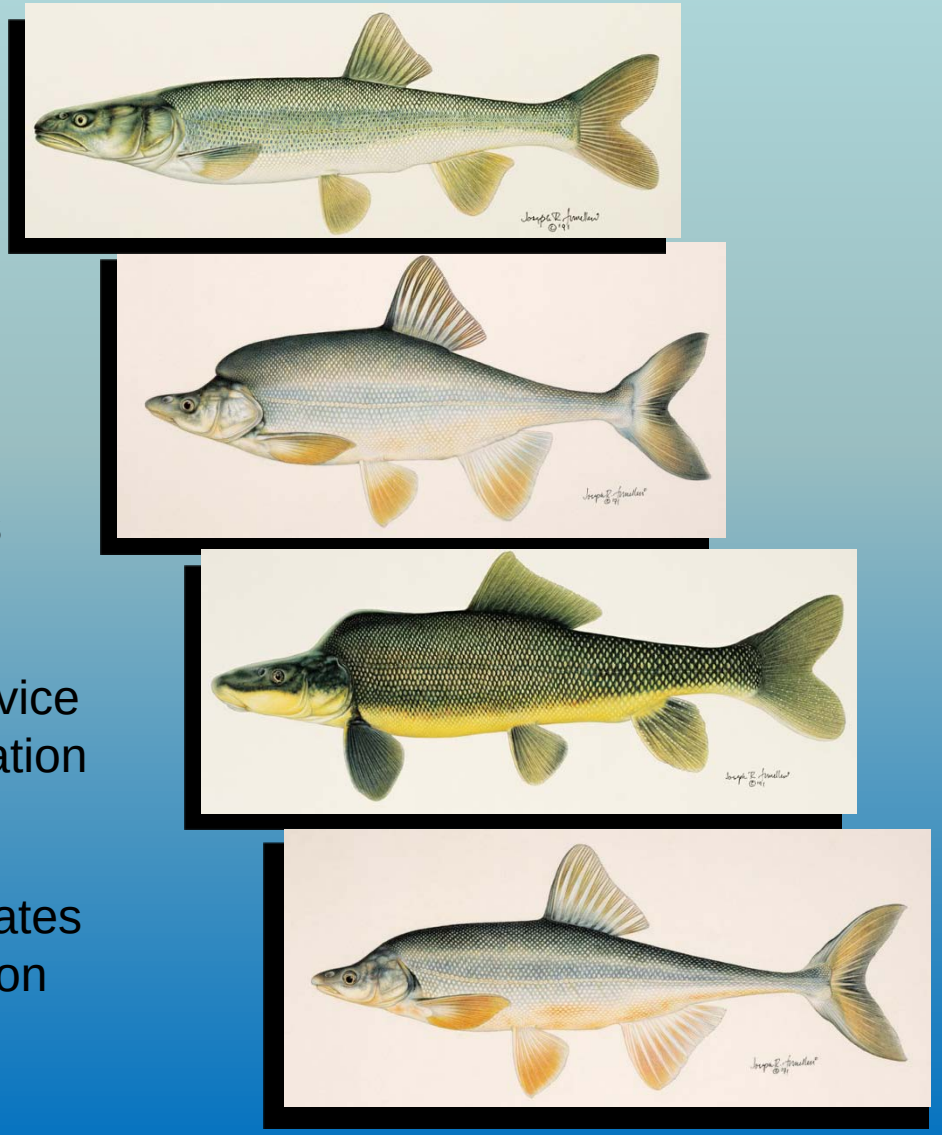
2013 Flaming Gorge Work Group

Tom Chart, USFWS, Program Director

April 24, 2013

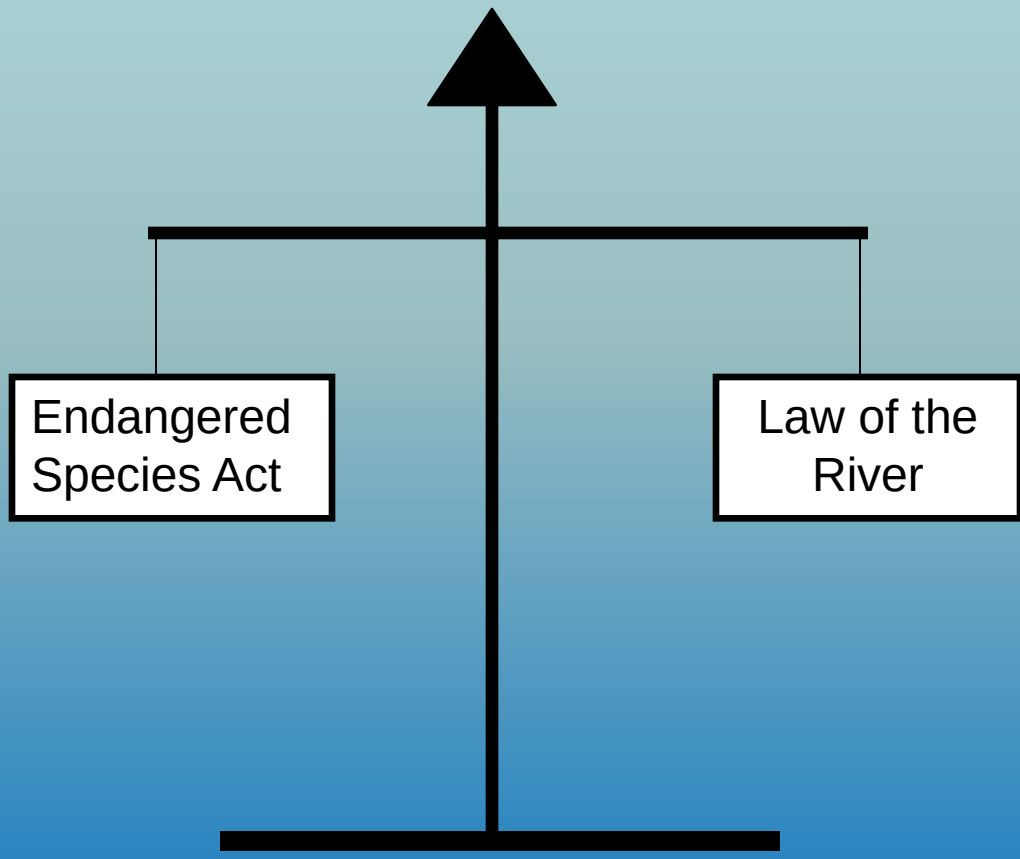
Upper Colorado River Endangered Fish Recovery Program

- 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 01/24/2013)				
State	**Number of Projects**	**Historic Depletions**	**New Depletions (Acre-Feet/Yr)**	**Total Depletions (Acre-Feet/Yr)**
Colorado	1,176	1,915,682	206,458	2,122,140
Utah	228	517,670	95,757	613,426
Wyoming	383	83,498	35,635	119,143
Regional*	238			
Total	**2,025**	**2,516,850**	**337,850**	**2,854,700**

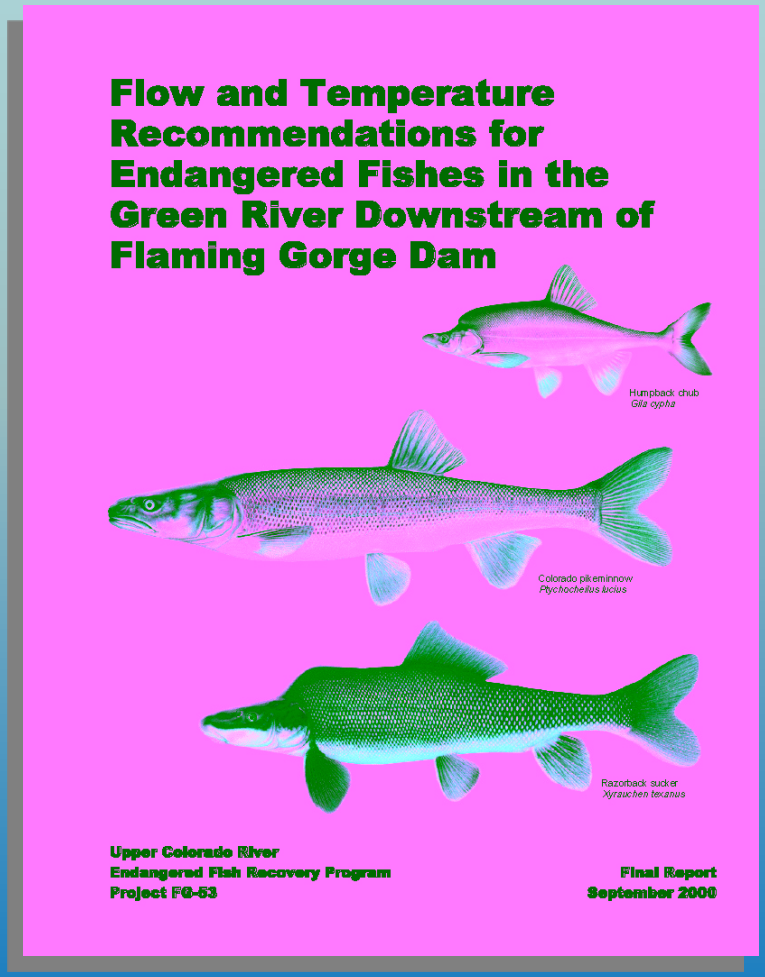
* Amount included in individual state's new depletions

Recovery Elements

Reproduction of razorback sucker, Green River, 1993-2010

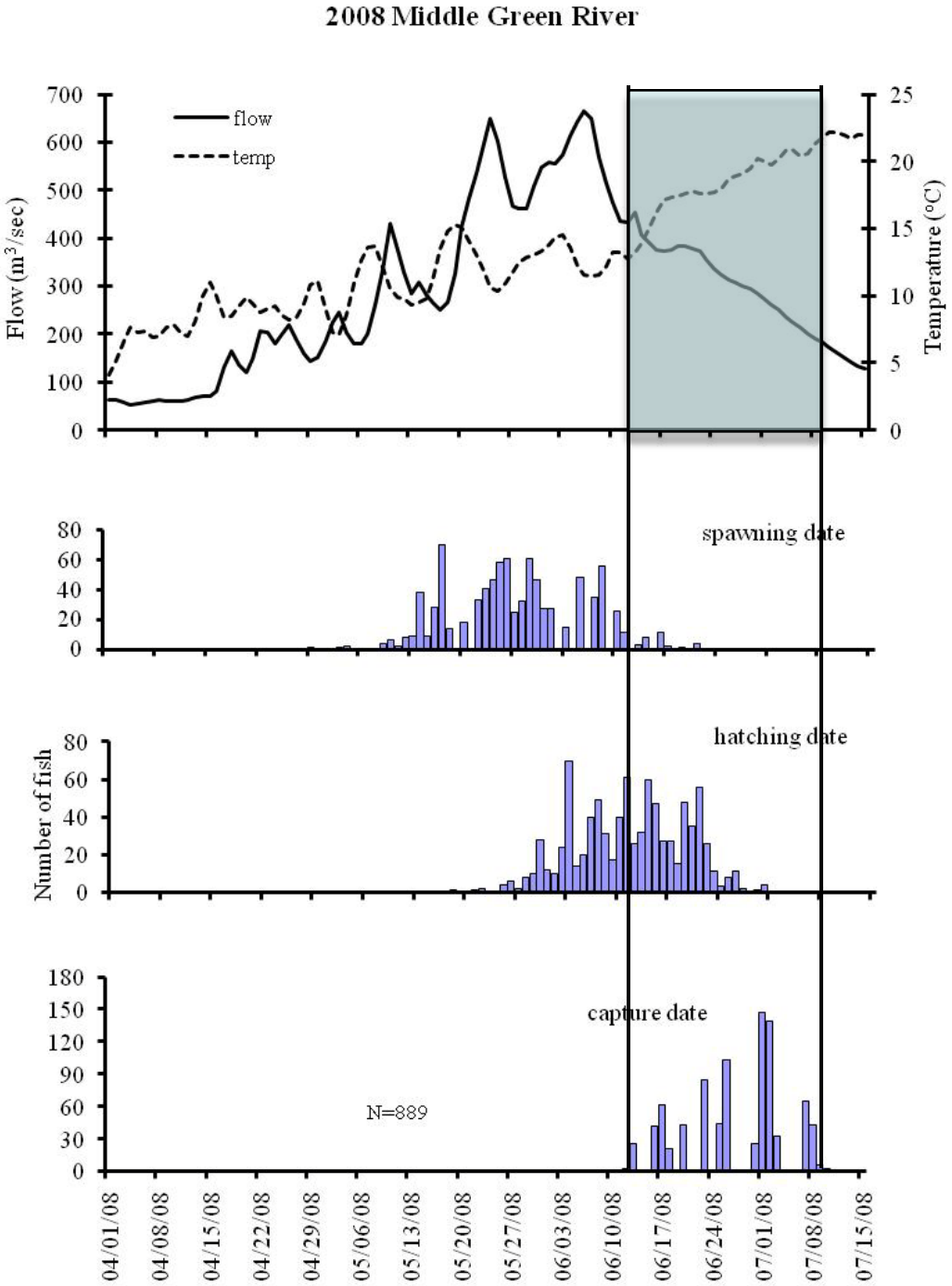
- Coincident with increasing water temperature (8-18 C), increasing or peak flows, earlier when warm, later if cool
- Once started, mean spawning date is 3 weeks after first spawning, mean hatching is 2 weeks after mean spawn, and mean capture time 2 weeks after that.
- Long and later reproductive period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

Flow Recommendations: Spring Peaks should focus on:



- 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, 2008



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)		
		$1 \leq x < 7$	$7 \leq x < 14$	$x \geq 14$
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)
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

3 years

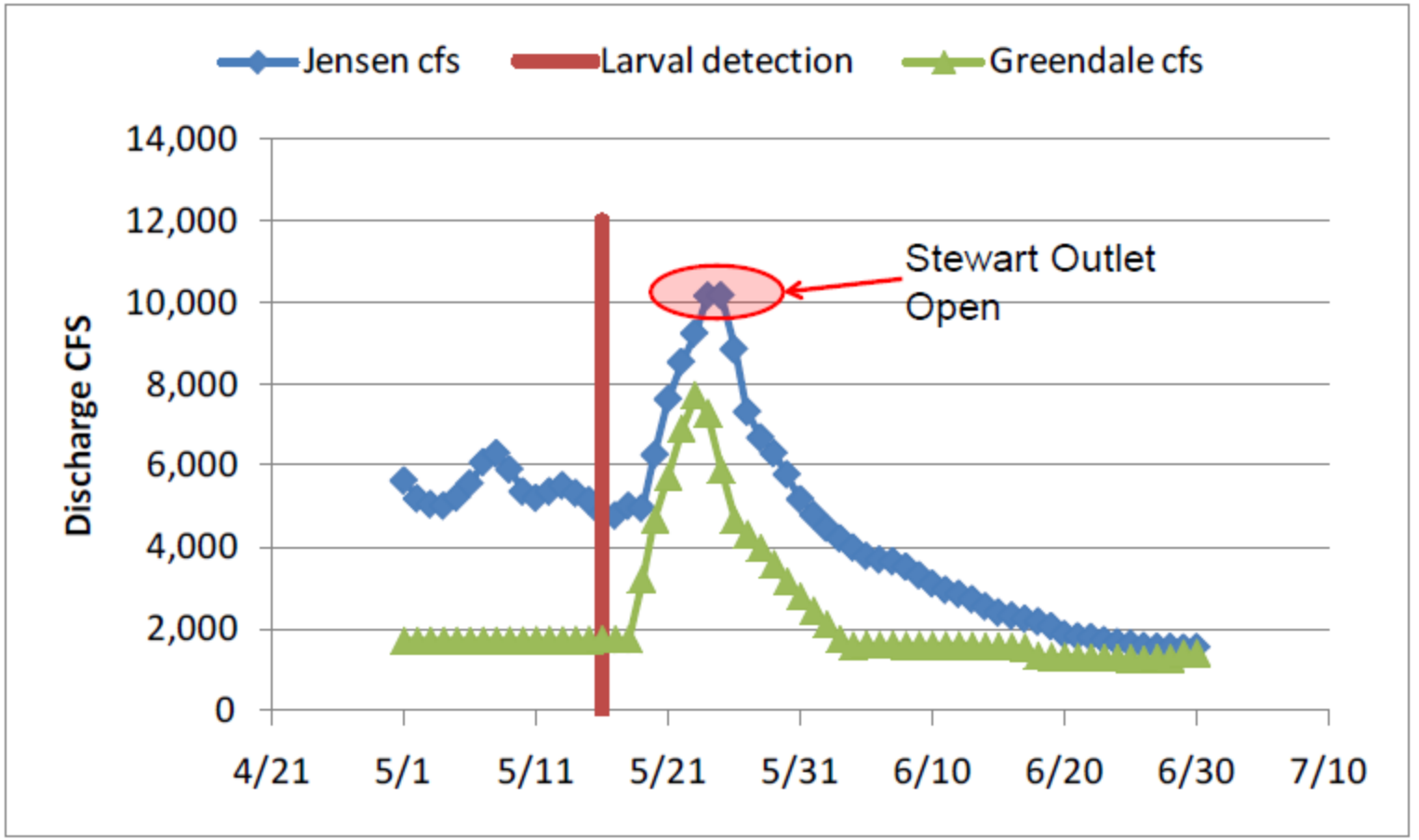
3 years

(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.

Larvae Detected May 16, 2012



Conclusions from 2012

- Excellent real time communication between USFWS and Reclamation result in well timed Flaming Gorge release
- Wild produced RBS larvae entrained in Stewart Lake and Old Charley Wash
- Despite bypass flows – floodplain inundation insufficient to provide oversummer larvae survival
  - All floodplains ‘reset’ – stage is set for a good experiment in 2013

2013 Recovery Program LTSP Projects (funded and ready-to-go)

- **Proj 22f (CSU Larval Fish Lab and USFWS)** – real time larval sampling to initiate the Flaming Gorge release.
- **Proj 164 (USFWS)** – larval, and later life stage sampling and water quality sampling in a variety of floodplains.
- **Proj 165 (UDWR)** - larval, and later life stage sampling and water quality sampling in Stewart Lake.
- **Proj 128 (CSU Larval Fish Lab, USFWS, and UDWR)** and other studies – Colorado pikeminnow population estimation detects juvenile and adult RBS in the main channel.

Upper Colorado River Endangered Fish Recovery Program
Spring Research Flow Request: 2012 vs 2013

Major Components of the Request	2012	2013
Recovery Program supports ROD ops	X	X
Primary: Implement the Larval Trigger Study Plan, i.e. time FG releases to presence of wild produced razorback sucker larvae. The FGTWG uses the LTSP to determine specific Reach 2 targets.	X	X
Limit FG releases to 8,600 cfs (i.e., no spillway releases) in deference to possible release of nonnative burbot from reservoir	X	
Secondary: Reach 2 flow of ≥ 15,000cfs for 5 consecutive days to connect the Stirrup floodplain.	X	
Baseflows – reserve the right to discuss later in the year	X	X

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	2018 / 2023	**Management Actions: 78% of the actions required by USFWS to downlist have been met or partially met. Demographics: Preliminary population estimates gathered in 2011 and 2012 from portions of the Green River sub-basin indicate a persistent decline. Researchers point to nonnative predators as a primary cause. USFWS thought that downlisting could be considered in 2013, but postpones until nonnatives are reduced and pikeminnow show signs of rebound.**
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.**