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Managing Water in the West

Flaming Gorge Technical Work Group Flow Proposal Spring 2013

Bureau of Reclamation
Upper Colorado Regional Office



U.S. Department of the Interior
Bureau of Reclamation

Flow Proposal Process

- **Recovery Program Research Request**
 - Received Feb 2013
 - Implement Larval Trigger Study Plan
- **FGTWG meeting**
 - March 6 and April 5, 2013
 - Comprised of cooperating agency biologists/hydrologists (WAPA, FWS, BOR)
 - Considers hydrology, Recover Program request, status of endangered fish, flow recommendations (ROD), and current science (Larval Trigger Study Plan) via adaptive management.
 - Presents a range alternatives depending on hydrology
- **FGWG (this meeting)**
 - April 24, 2013
 - Public input on flow proposal
- **Reclamation Decision (May)**
 - BOR management considers FGTWG proposal, public input (FGWG), resource status; makes final decision on spring flows

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Entrainment of Larval Razorback Sucker

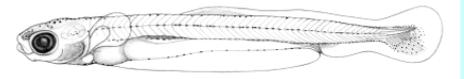


Developmental Phases

Protolarva



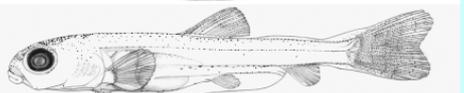
Flexion mesolarva



Postflexion mesolarva



Metalarva

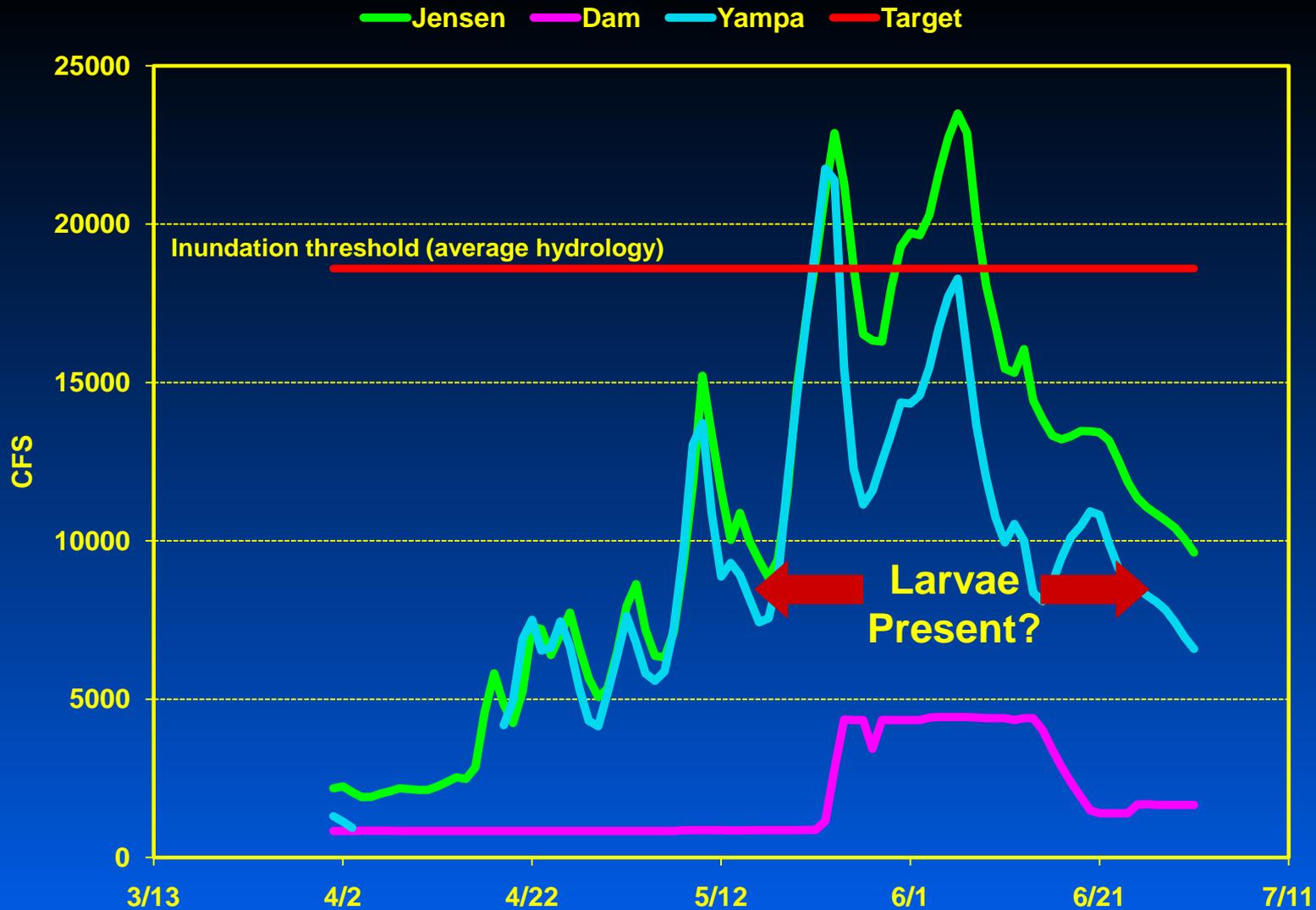


Early juvenile (YOY)



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Spring Peak Flows 2008

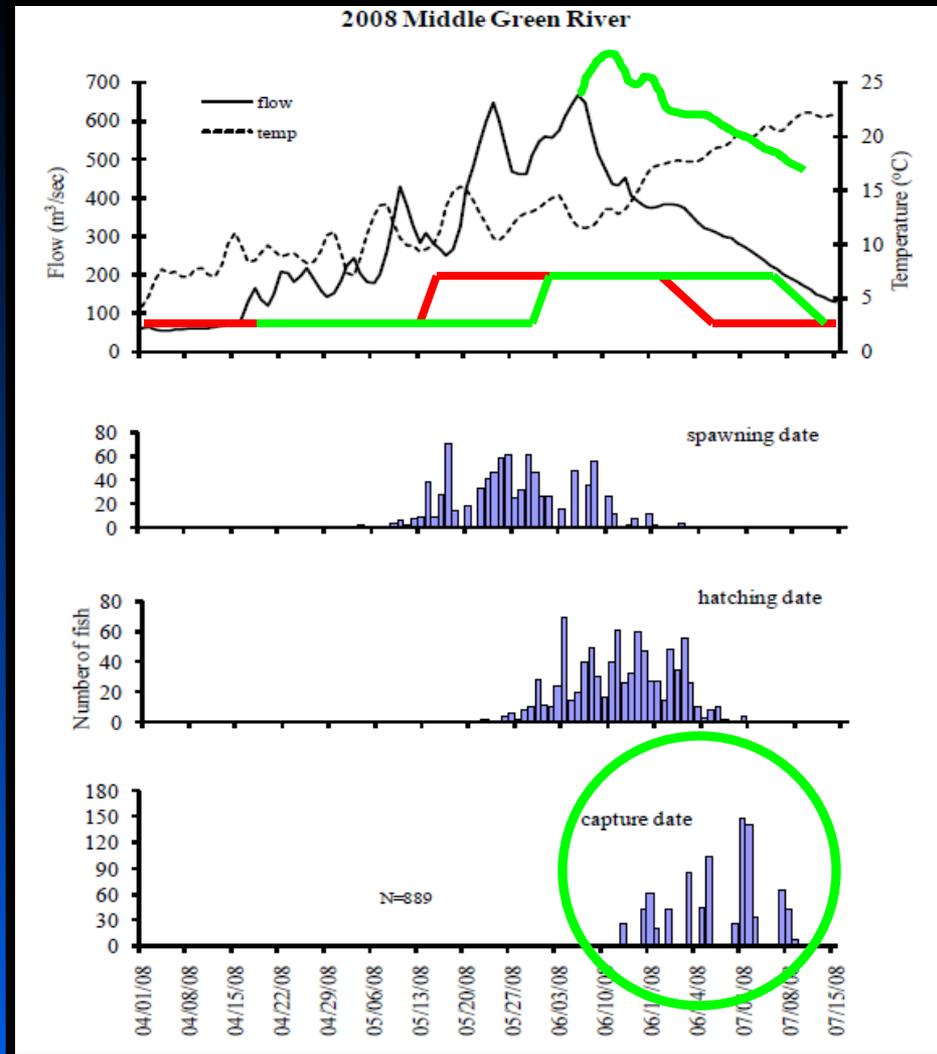


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Peaks in drift and river flow are temporally mismatched in most years (1992 – 2010)

Flaming
Gorge
Dam
release

Idealized
release
under LTSP
matching
Yampa peak
or
immediate
post-peak



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Recovery Program Research Request

Larval Trigger Study Plan

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)		
		$1 \leq x < 7$	$7 \leq x < 14$	$x \geq 14$
$8,300 \leq x < 14,000$ cfs	Stewart Lake (f), Above Brennan (f), Old Charley Wash (s)	Dry	Moderately dry	Moderately dry and average (below median)
$14,000 \leq x < 18,600$ 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)
$18,600 \leq x < 20,300$ cfs	Same as previous	Average (above median)	Average (above median)	Average (above median)
$20,300 \leq x < 26,400$ 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
$x \geq 26,400$ 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.

Dry and moderately dry study sites

**Stewart Lake near Jensen
(outlet entrains at 5,000-8,000 cfs)**



**Old Charley near Ouray
(not available in 2013)**



**Above Brennan
(~13,000 cfs)**



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Dry Hydrologic Category*

(May 1 inflow forecast < 428 KAF)

Reach	Magnitude (cfs)	Duration
Reach 1 (Dam-Yampa R.)	≥ 4,300 cfs	that necessary to achieve duration target in Reach 2
Reach 2 (Yampa-White R.)	≥ 8,300 cfs	≥ 2 days except in extremely dry years (≥ 98% exceedance conditions)

FGTWG proposal

- Pursue dry year flow objectives which would provide connection of river to dry/moderately dry wetlands (*esp. Stewart Lake*) for 1-7 days during period of larval drift as described in the Larval Trigger Study Plan.
- Downramp at 350 cfs/day following peak flows

*BOR recommended category for 2013

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Moderately Dry Hydrologic Category

(May 1 inflow forecast 428 - 779 KAF)

Reach	Magnitude (cfs)	Duration
Reach 1	$\geq 4,300$ cfs	that necessary to achieve duration target in Reach 2
Reach 2	$\geq 8,300$ cfs	≥ 1 week (i.e. 7 days)

FGTWG recommendation:

- Pursue moderately dry year flow objectives which would provide connection of river to dry/moderately dry wetlands for 7-14 days during period of larval drift as described in the Larval Trigger Study Plan.
- Downramp at 350 cfs/day following peak flows

Average Hydrologic Category

(May 1 inflow forecast 779-1,761 KAF)

Reach	Magnitude (cfs)	Duration
Reach 1	$\geq 4,300$ cfs	That necessary to achieve duration target in Reach 2
Reach 2	$\geq 18,600$ cfs in 50% of average years ($\geq 8,300$ cfs in other years)	Two weeks (<i>i.e.</i> 14 days) in 25% of all average years

FGTWG recommendation:

- Pursue average objectives which would provide connection of river to dry-average wetlands as described in the Larval Trigger Study Plan.
- Downramp at 350 cfs/day following peak flows

Days above Specific Flow Thresholds in the Yampa River (Maybell plus Lily)

Mid-April forecast

April Midmonth Forecast	% Exceed	Days above 4,000 cfs	Days above 5,000 cfs	Days above 6,000 cfs	Days above 7,000 cfs	Days above 8,000 cfs	Days above 9,000 cfs	Days above 10,000 cfs
YAMPA	25%	42	34	20	14	4	0	0
	50%	36	23	17	8	2	0	0
	75%	30	17	10	4	1	0	0
	90%	29	14	8	3	0	0	0

**Some water to work with, but challenge will be matching dam releases
with presence of larval razorback sucker**

Base Flow Request

(forthcoming)

1. Typically prepared by USFWS field office, Salt Lake City, in cooperation with Recovery Program
2. Reclamation selects reach 1 target according to ROD base flow range
3. Base flow target can be augmented by as much as 40% according to ROD allowances through September 30th
4. “...we believe that maintaining adequate base flows in the forecasted dry year should be the primary goal” in order to:
 - a) maintain quality Colorado pikeminnow habitat and
 - b) disadvantage/research smallmouth bass

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Juvenile Colorado pikeminnow habitat, Jensen/Ouray



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Proposed Temperature Targets for 2013 (2006 ROD)

- Temperature of flows should be managed to be at least 18 degrees Celsius for 2 to 5 weeks in Upper Lodore Canyon during the beginning of the base flow period.
 - *Dam releases typically 13-16° C June 15-Sept 30*
- Water temperatures in the Green River should also be managed to be no more than 5 degrees Celsius colder than those of the Yampa River at the confluence of the Green and Yampa rivers for the summer of 2009 (June through August).

Spring 2013 recommendation:

The FGTWG recommends similar operations to 2012 while implementing improved management strategies and maintaining Stewart Lake through the summer.

Floodplain availability at various flow levels to achieve LTSP targets and a predictive analysis on larval presence will be discussed prior to and during the peak flow period.



Questions

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