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Managing Water in the West

Operation of Flaming Gorge Dam to Assist in Recovery of Endangered Fish

Spring 2014

Bureau of Reclamation

Upper Colorado Regional Office

U.S. Department of the Interior
Bureau of Reclamation

Flow Proposal Process

- Recovery Program Research Request
  - Received Mar 21, 2014
  - Implement Larval Trigger Study Plan
- FGTWG meeting
  - March 20 and April 22, 2014
  - 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, 2014
  - 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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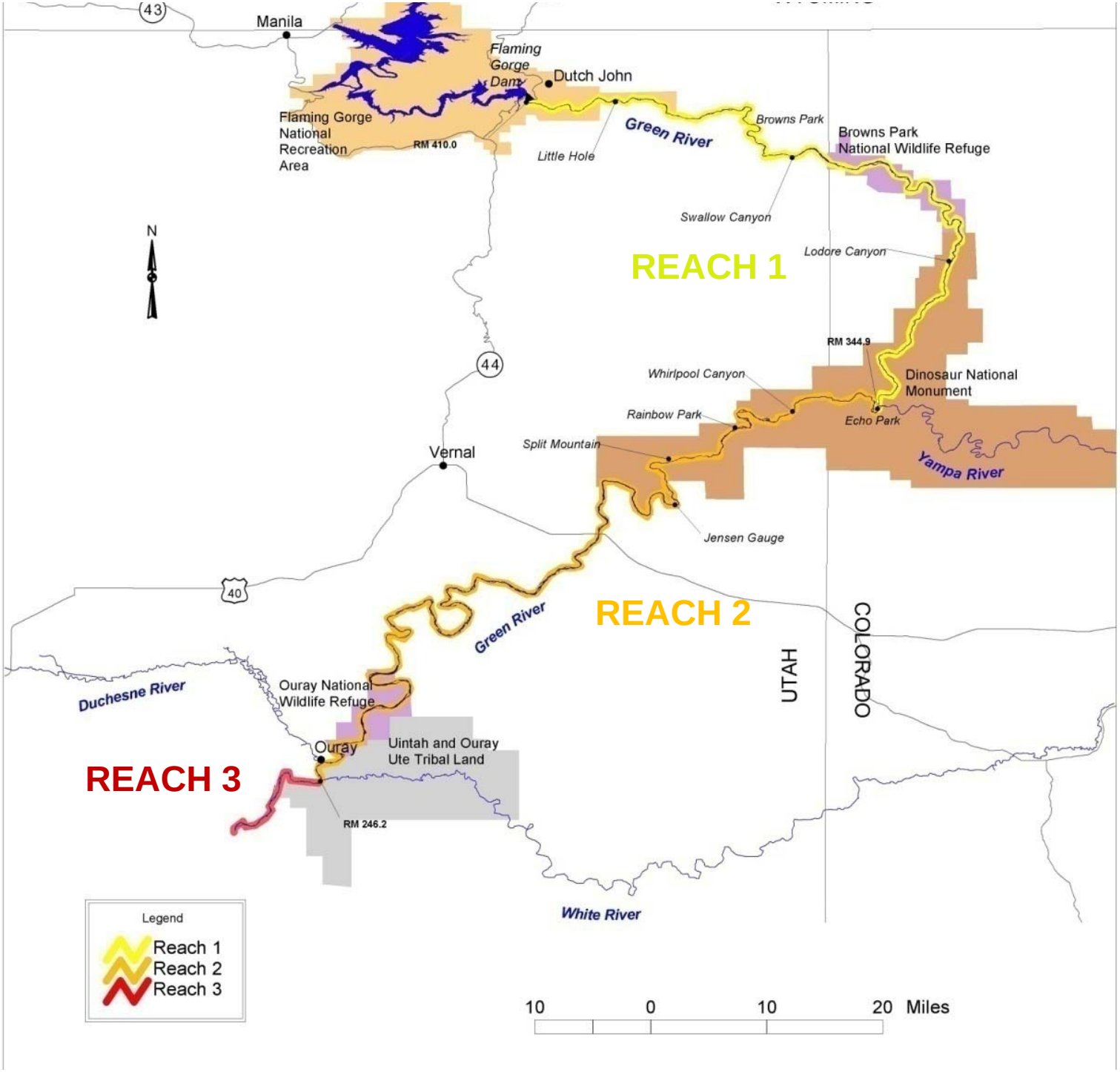
43
Manila
Flaming Gorge Dam
Dutch John
Flaming Gorge National Recreation Area
RM 410.0
Little Hole
Green River
Browns Park
Browns Park National Wildlife Refuge
Swallow Canyon
Lodore Canyon
N
REACH 1
RM 344.9
44
Whirlpool Canyon
Dinosaur National Monument
Rainbow Park
Echo Park
Split Mountain
Vernal
Yampa River
Jensen Gauge
40
Green River
REACH 2
UTAH
COLORADO
Duchesne River
Ouray National Wildlife Refuge
Ouray
Uintah and Ouray Ute Tribal Land
REACH 3
RM 246.2
White River
Legend
Reach 1
Reach 2
Reach 3
10 0 10 20 Miles

2014: Moderately Wet Hydrologic Category

(May 1 inflow forecast 1,328 – 1,786 KAF)

Reach	Magnitude (cfs)	Duration
Reach 1	≥ 4,600 cfs	that necessary to achieve duration target in Reach 2
Reach 2	≥ 18,600 cfs ≥ 20,300 cfs	≥ 2 weeks ≥ 1 day

FGTWG recommendation:

- **Pursue moderately wet year flow objectives which would provide connection of river to moderately wet wetlands for 1-14 days or more during period of larval drift as described in the Larval Trigger Study Plan.**

- **Downramp at 350 cfs/day following peak flows**

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Average Hydrologic Category (Drier)
(May 1 inflow forecast 1,036 – 1,328 KAF)

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

Wet Hydrologic Category (Wetter)
(May 1 inflow forecast > 1,786 KAF)

Reach	Magnitude (cfs)	Duration
Reach 1	≥ 8,600 cfs	That necessary to achieve duration target in Reach 2
Reach 2	≥ 26,400 cfs ≥22,7000 cfs ≥18,600 cfs	One day Two weeks Four weeks

Entrainment of Larval Razorback Sucker

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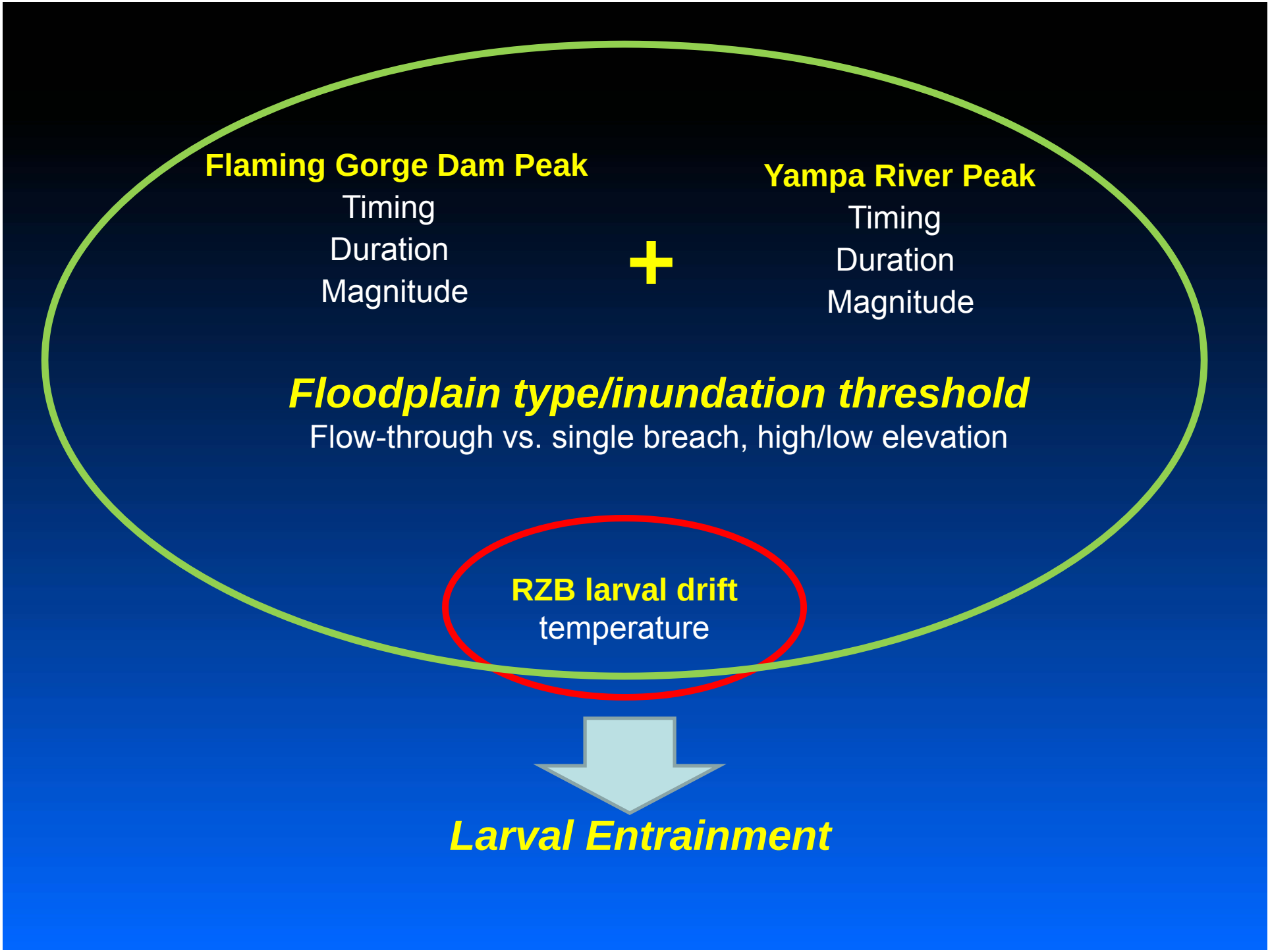
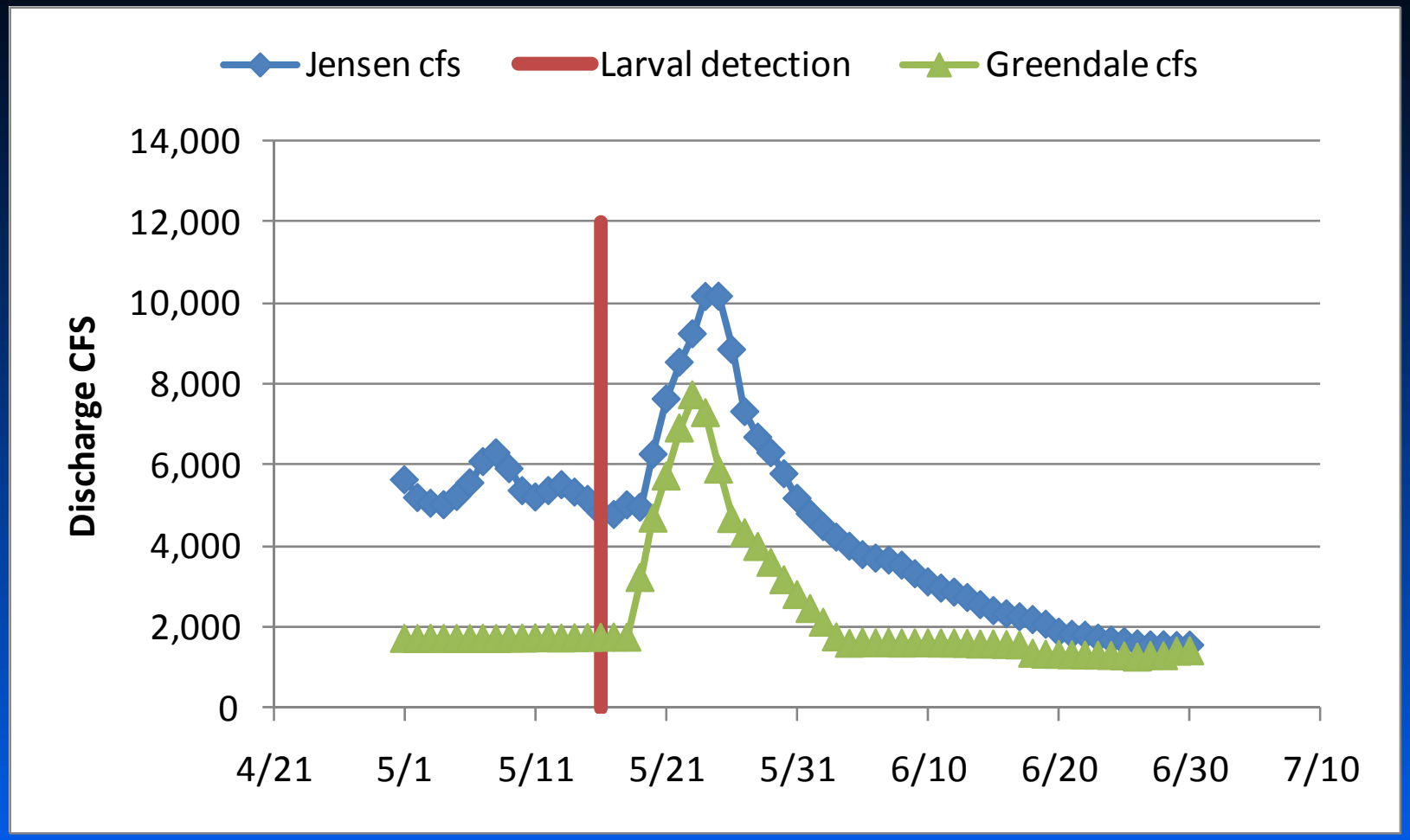

Flaming Gorge Dam Peak
Timing
Duration
Magnitude
+
Yampa River Peak
Timing
Duration
Magnitude
Floodplain type/inundation threshold
Flow-through vs. single breach, high/low elevation
RZB larval drift
temperature
Larval Entrainment

Spring Peak Flows 2012

Most wetlands dried up



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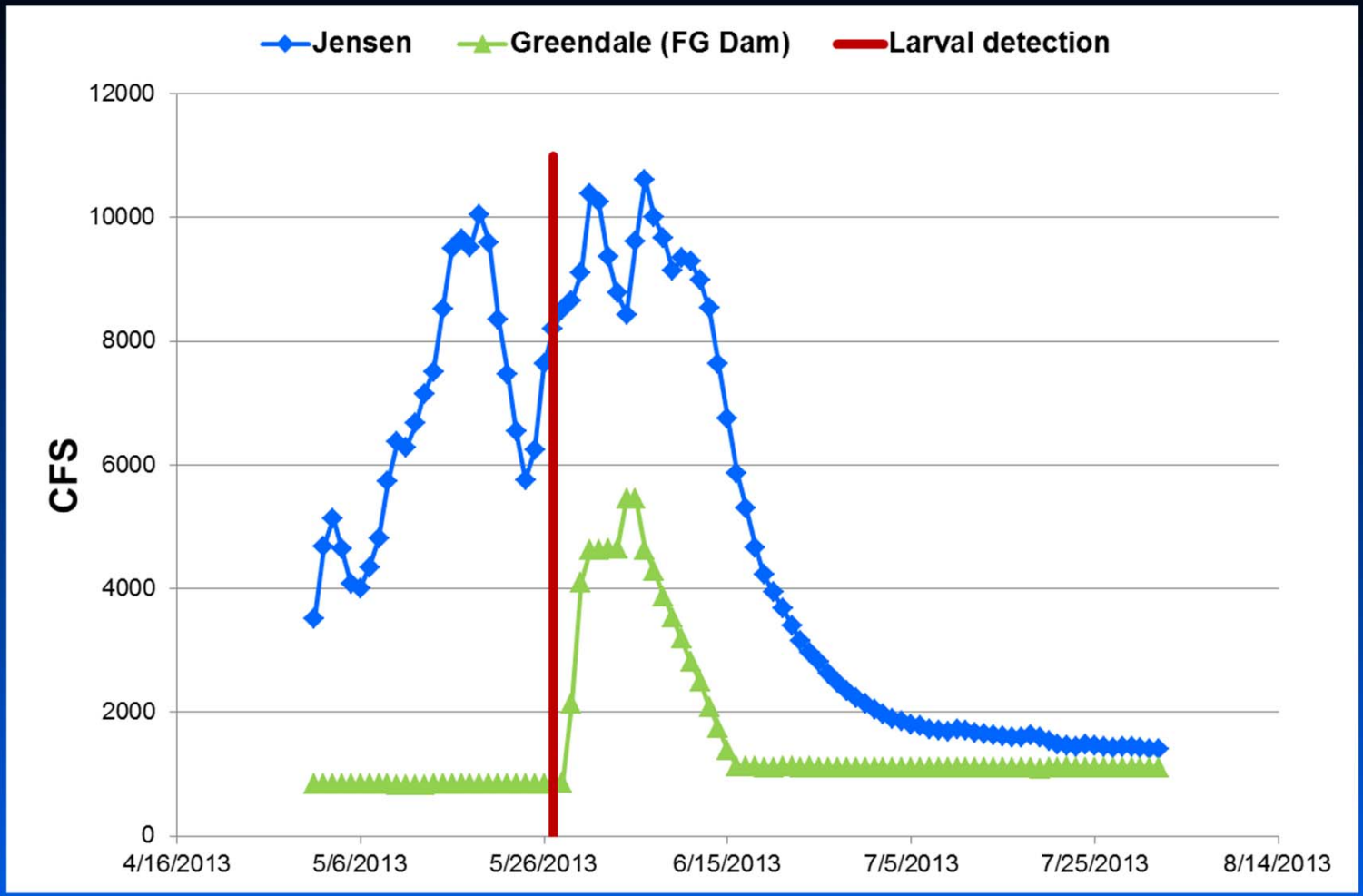
Spring Peak Flows 2013

Ca. 700 razorback salvaged from Stewart Lake



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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.

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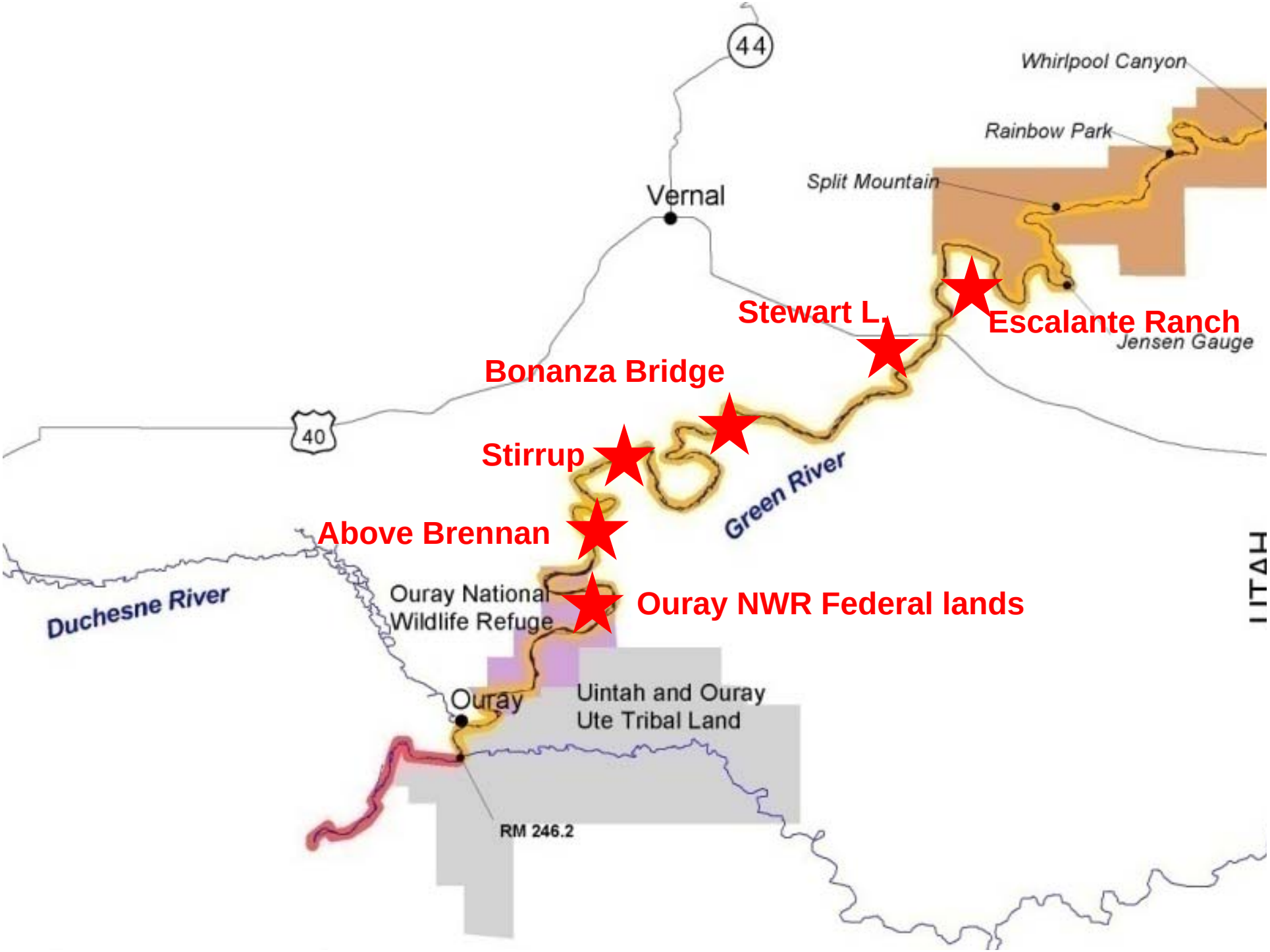
44
Vernal
Whirlpool Canyon
Rainbow Park
Split Mountain
Escalante Ranch
Jensen Gauge
Stewart L.
Bonanza Bridge
40
Stirrup
Green River
Above Brennan
Duchesne River
Ouray National
Wildlife Refuge
Ouray NWR Federal lands
Ouray
Uintah and Ouray
Ute Tribal Land
RM 246.2
UTAH

Moderately wet study sites and minimum inundation thresholds

Stewart L. (4000-8000 cfs)

Above Brennan (10,000 cfs)

Escalante Ranch (11,000 cfs)

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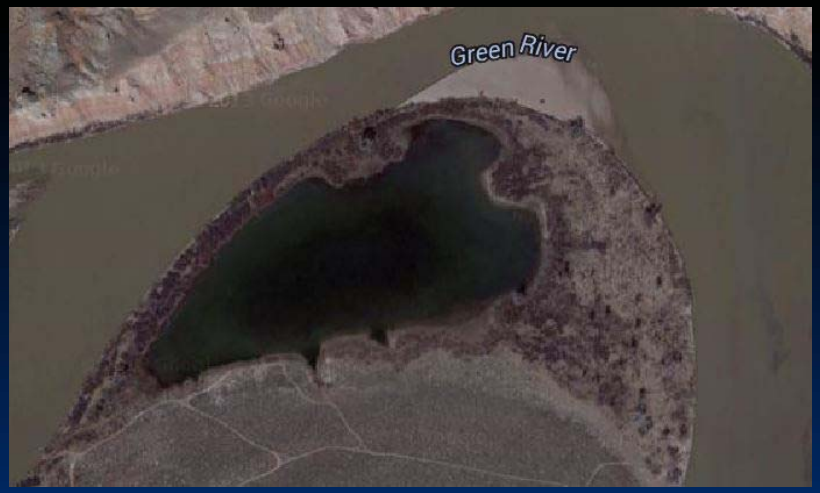
Stirrup (11,000 cfs)



Ouray NWR (ca. 14,000 cfs)

Bonanza Bridge (13,000 cfs)

Larval Light Trapping

Fall Young-of-Year Seining

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

Proposed Temperature Targets for 2014 (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 2014 (June through August).**


Questions
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