

RECLAMATION

Managing Water in the West

Green River Flows for Endangered Fish Spring/Summer 2016

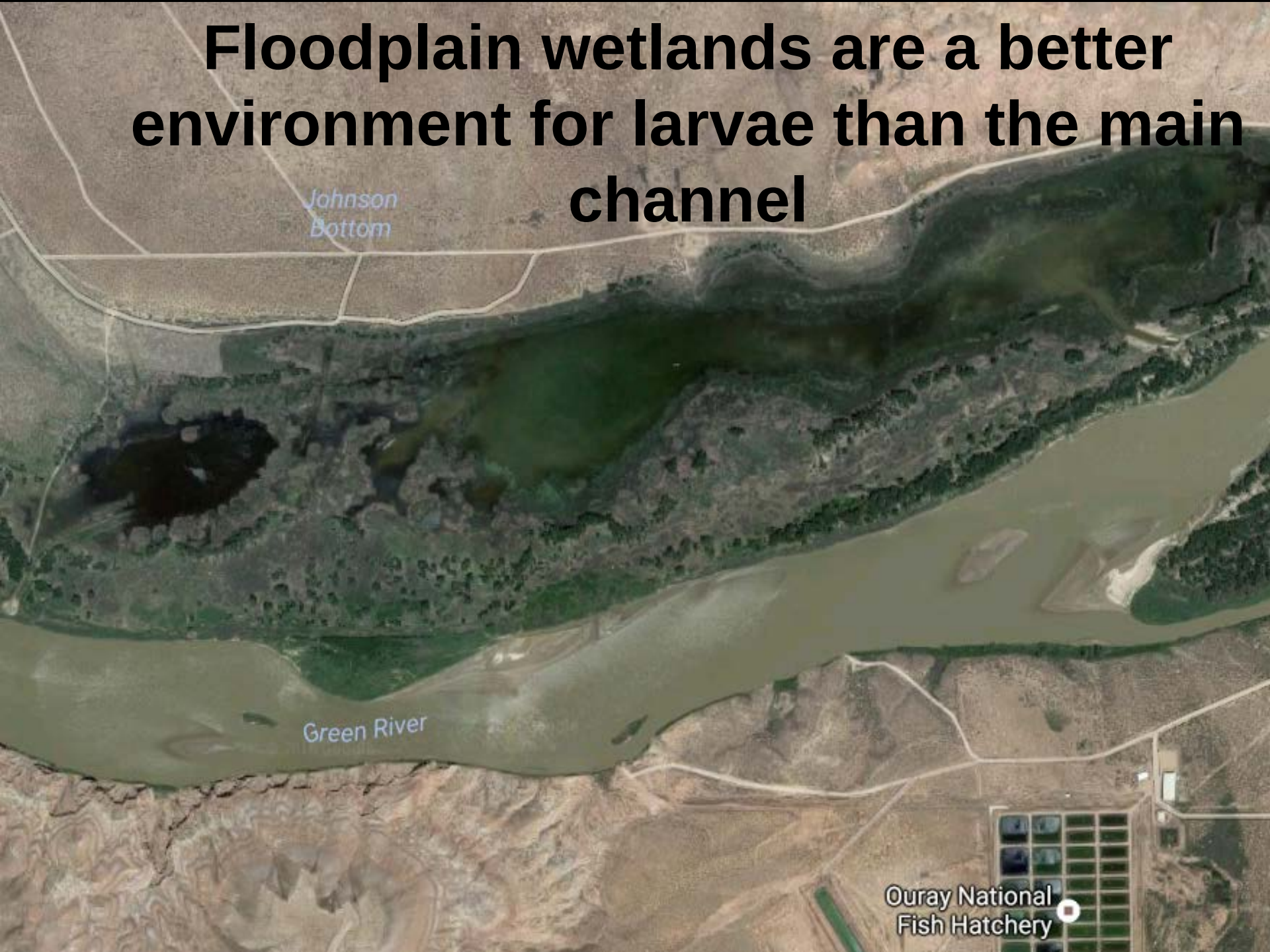
Bureau of Reclamation
Upper Colorado Regional Office



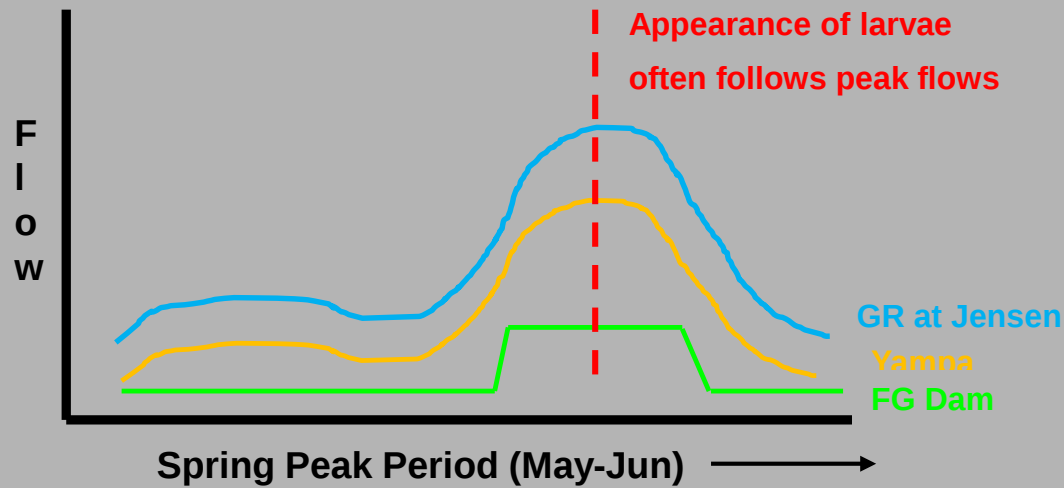
U.S. Department of the Interior
Bureau of Reclamation



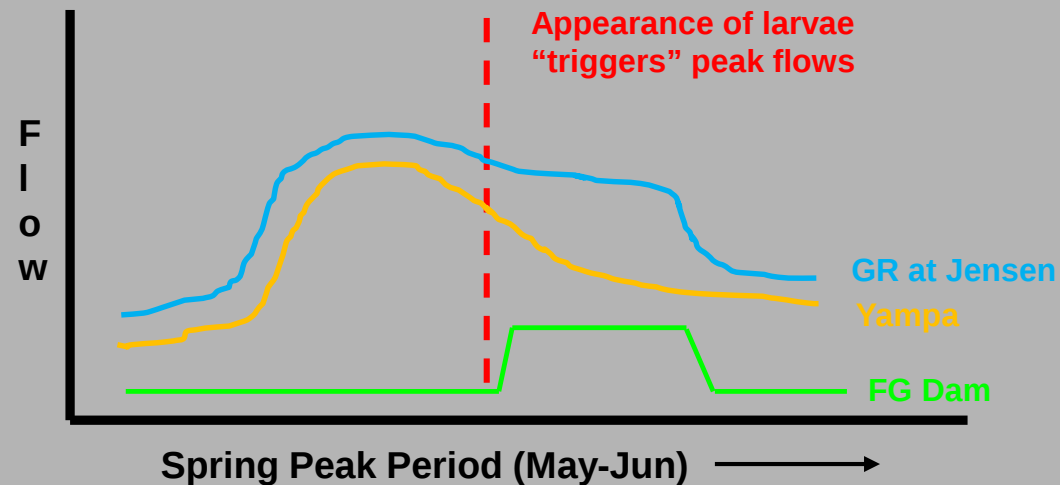
Floodplain wetlands are a better environment for larvae than the main channel



FG Dam
matching
the Yampa
peak

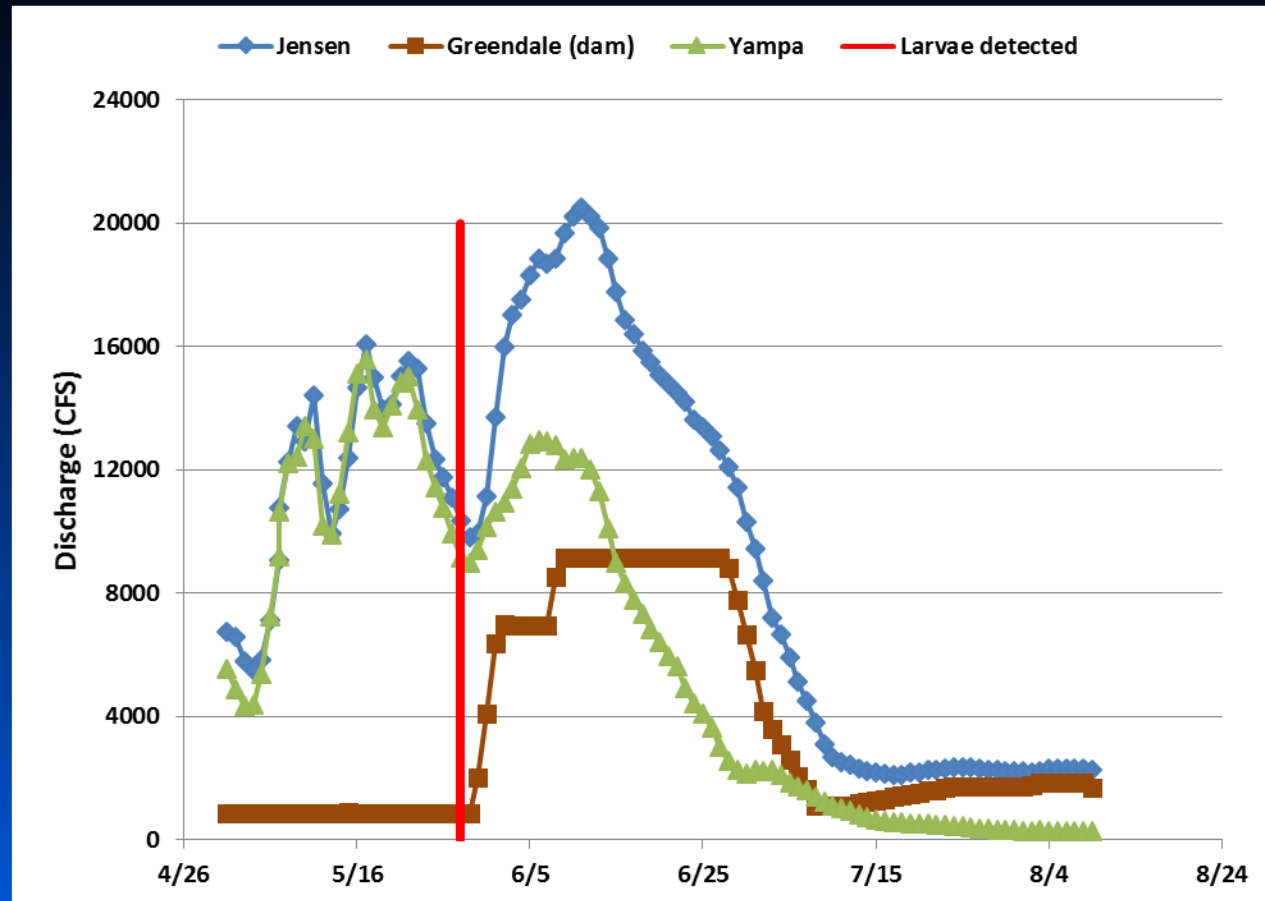


FG Dam
matching
larval
appearance



"Timing of the spring peak release under the range of possible operational scenarios would occur with the peak flows and immediate post peak flows on the Yampa River."

Spring Peak/Summer Flows 2016



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2016 Larval Trigger Chronology

- **Early May:** USFWS/UDWR personnel begin light trapping for larval razorback sucker in floodplain wetland habitats. Hydrologic classification is moderately dry.
- **May 28:** USFWS/UDWR report larval razorback sucker detected in several wetland habitats (Stewart Lake, Johnson Bottom, Stirrup, Above Brennan, and Bonanza).
- **May 31:** Reclamation begins up-ramp to 6,600 cfs from Flaming Gorge Dam, later increased to 8,600 cfs

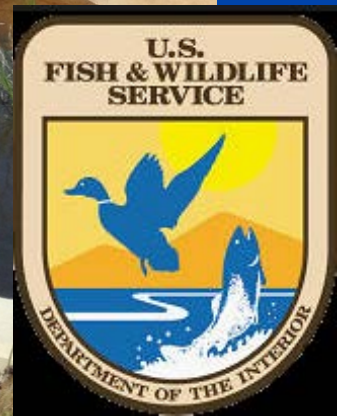


2016 Larval Trigger Chronology, cont'd

- May 31: Stewart Lake outlet gate opened after confirming RZ larvae staged in Stewart outlet canal; similar operations take place at Johnson Bottom (USFWS).
- June 14: Inlet and outlet gates closed upon reaching equilibrium with river level



Johnson Bottom Restoration at Ouray NWR



Results to Date

- **Stewart Lake**
 - Supplemental water provided Jul-Aug
 - Aug 2: Single hoop net captures 50 young of year RZ (i.e., lots)
 - SL to be drained/flushed during mid-September; young RZ returned to river, tagged if large enough
- **Johnson Bottom, Stirrup, Above Brennan, and Bonanza:**
 - All had entrained larvae but no YOY captured yet (difficult sampling)

Stewart Lake suckers typically grow from 20-25 mm when they enter the wetland to 40-90 mm in slightly less than 2 months, doubling or tripling in size; Survival in the wild increases significantly



Conclusions—Peak Flow

- 2016 marks the fifth consecutive year of successful flow-facilitated larval entrainment (“Larval Trigger Study Plan”) in the Jensen-Ouray reach of the Green River.
- Excellent real-time coordination between USFWS, UDWR, BOR, and others on implementation of flow proposal in response to larval presence and rising/falling water levels to maximize entrainment.
- Entrainment of larvae into Stewart Lake, Johnson Bottom and others successful as a result of flow coordination and monitoring.
- LTSP/ROD moderately dry objectives exceeded (~28-35 days at or above 8,300 cfs during larval drift)
- Unusual hydrology due to unprecedented rainfall in May (i.e., a “moderately dry” year became “average”)

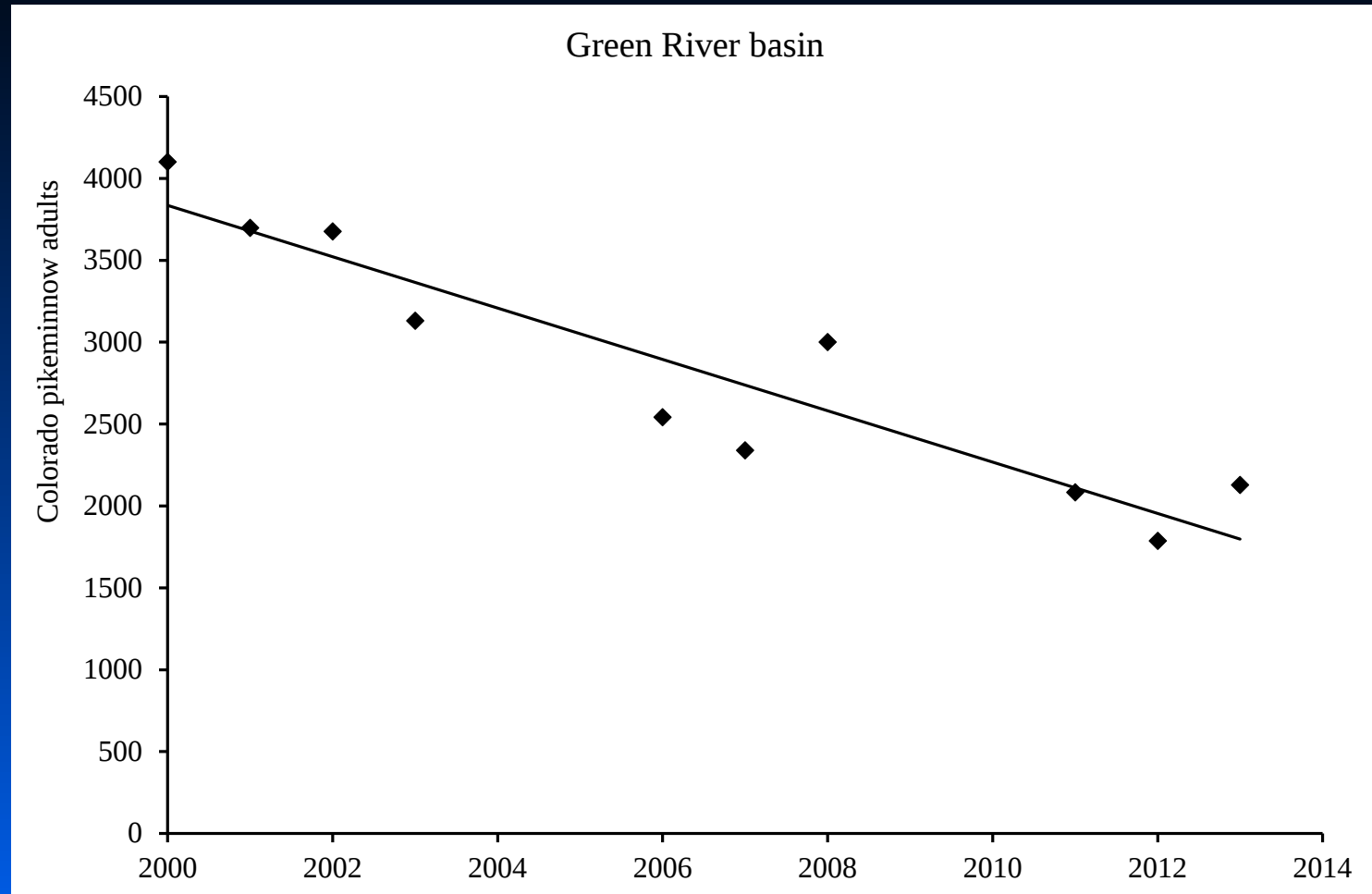
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Base flows and Colorado Pikeminnow



Colorado Pikeminnow
are fun to catch on sport
tackle and continued to
be caught periodically in
the C section near
Browns Park

Green River Colorado Pikeminnow in Decline



Juvenile Colorado pikeminnow habitat, Jensen/Ouray



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Base Flows

1. Request for base flows from USFWS (Recovery Program) received April 22, 2016; recommended augmentation of base flow objective for pikeminnow habitat within ROD allowances (i.e., increase by as much 40% above target through September 30th)
2. Aug 1: FG releases 1,700 cfs; goal is to maintain flows at or near 2,000-2,400 in Jensen per ROD allowances
3. ROD and proposed summer base flows (Jensen) for pikeminnow habitat:

	Dry	Moderately Dry	Average	Moderately Wet	Wet
2006 ROD	900-1,100 cfs	1,100-1,500 cfs	1,500-2,400 cfs	2,400-2,800 cfs	2,800-3,000 cfs
Proposed	1,700-1,800 cfs	1,800-2,000 cfs	2,000-2,600 cfs	2,200-2,800 cfs	2,400-3,000 cfs
% change	75	46	18	-4	-7

Temperature Objectives

- 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 operators raised selective withdrawal gates on June 15; Lodore objectives appear to have been met*
- 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 (June through August).
 - *Results pending retrieval of data loggers.*

2016: The 11th year of ROD implementation.

Year	May 1 st Apr-Jul inflow forecast (KAF)	Spring Hydrologic Classification	Observed Apr-Jul inflow forecast (KAF)	Observed Classification
2006	1,100	Average (above med.)	724	Moderately Dry
2007	500	Moderately Dry	370	Dry
2008	820	Average (below med.)	728	Moderately Dry
2009	890	Average (below med.)	1,197	Average (above median)
2010	515	Moderately Dry	705	Moderately Dry
2011	1,660	Moderately Wet	1,925	Wet
2012	630	Moderately Dry	570	Moderately Dry
2013	480	Moderately Dry	361	Dry
2014	1,320	Average (above med.)	1,159	Average (above median)
2015	570	Dry	1,036	Average (below median)
2016	770	Average (below med.)	1,048	Average (above median)

