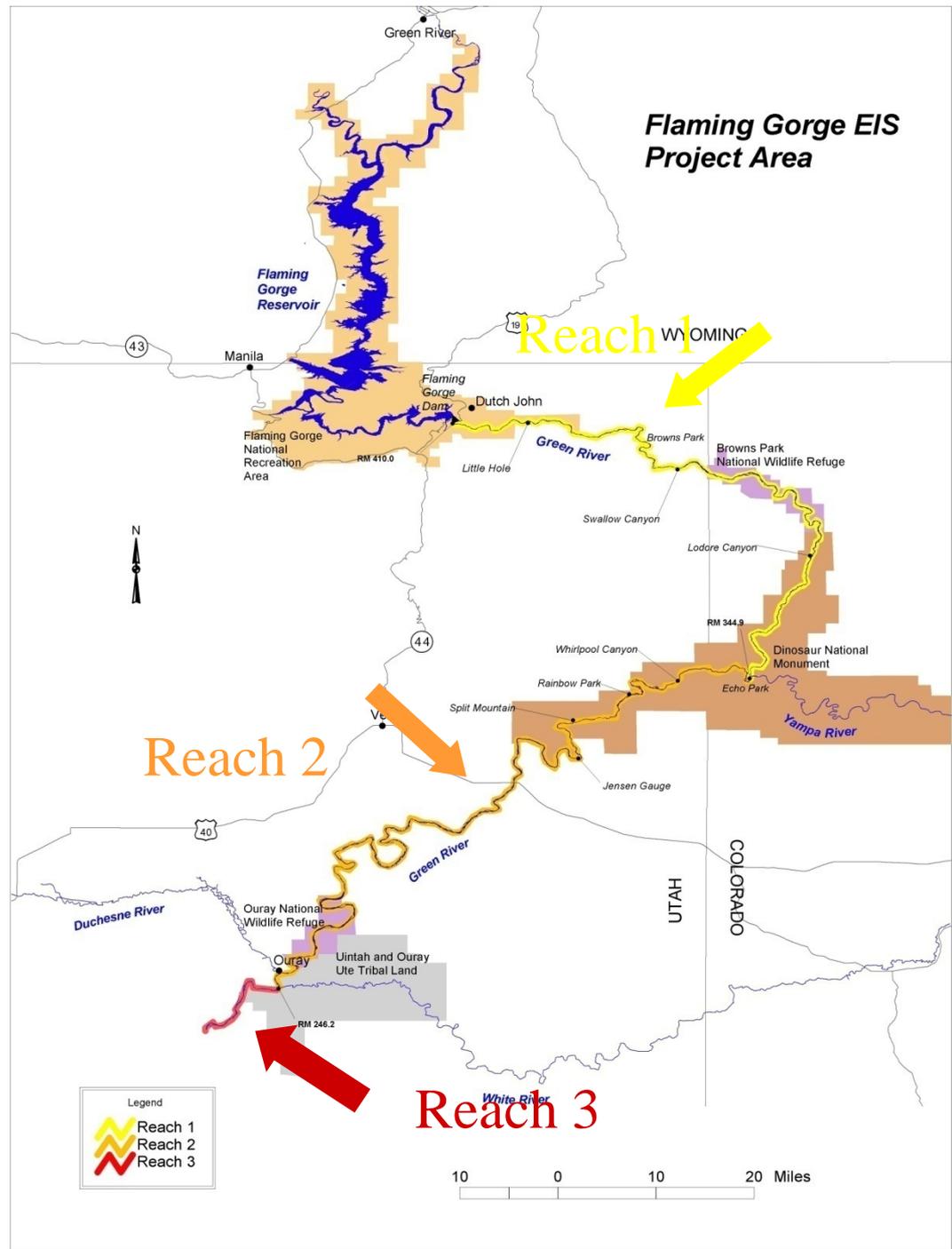


Flaming Gorge TWG Flow and Temperature Recommendations Spring 2010

**Bureau of Reclamation
Upper Colorado Region**

GEOGRAPHIC SCOPE



Percentage Exceedances and Hydrologic Classifications

| Hydrologic Classification | Percentage Exceedance Range |
|---------------------------|-----------------------------|
| Wet | <10 |
| Moderately Wet | 30 to 10.1 |
| Average | 70 to 30.1 |
| Moderately Dry | 90 to 70.1 |
| Dry | >90 |

Hydrologic Classification

- Unregulated inflow volume (April-July)
 - » Green River Basin Yampa River Basin
- 2006 mod dry average
- 2007 dry mod dry
- 2008 mod dry mod wet
- 2009 average mod wet
- 2010 mod dry mod dry

Recovery Program Research Request

- 1. Research-driven (Stirrup wetland experiment)**
- 2. Maintain dam releases to achieve a minimum flow of 15,000 cfs for a minimum of 5 days in reach 2 (dry and moderately dry)**
- 3. If 5 days not possible, then maintain peak flows at 15,000 cfs for as long as possible**

Stirrup Wetland











15,000 cfs = passable by endangered fish

Stirrup: 2008-2009 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

- 2) 2009 results
 - a) 31 razorback sucker
 - b) 5 bonytail (rare; stocked 2008)
 - c) 4 Colorado pikeminnow

Dry Hydrologic Category

(May 1 inflow forecast < 427 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 | 2 days except in extremely dry years ($\geq 98\%$ exceedance conditions) |

- Downramp at 350 cfs/day following peak flows

Moderately Dry Hydrologic Category

(May 1 inflow forecast 427 - 788 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:

- Attempt to meet Recovery Program request to achieve 15,000 cfs in reach 2 for a minimum of 5 days
- If Recovery Program request is not possible, maintain reach 1 flows for 4,300 cfs for one week to meet reach 2 ROD target
- Downramp at 350 cfs/day following peak flows

Average Hydrologic Category

(May 1 inflow forecast > 788 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 | Two weeks (i.e. 14 days) in 25% of all average years |
| | $\geq 8,300$ cfs in 50% of average years | One week (i.e. 7 days) in 50% of average years |

FGTWG recommendation:

- Attempt to meet Recovery Program request to achieve 15,000 cfs in reach 2 for a minimum of 5 days
- Manage reach1 flows to achieve at least one week at 8,300 cfs in reach 2
- Downramp at 500 cfs/day following peak flows

Base Flow Request

1. 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 is then augmented by as much as 40% according to ROD allowances through September 30th
4. To help assure higher base flows, reduce duration of spring peak releases from two weeks to one week
5. “...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

Colorado pikeminnow



Juvenile Colorado pikeminnow habitat, Jensen/Ouray

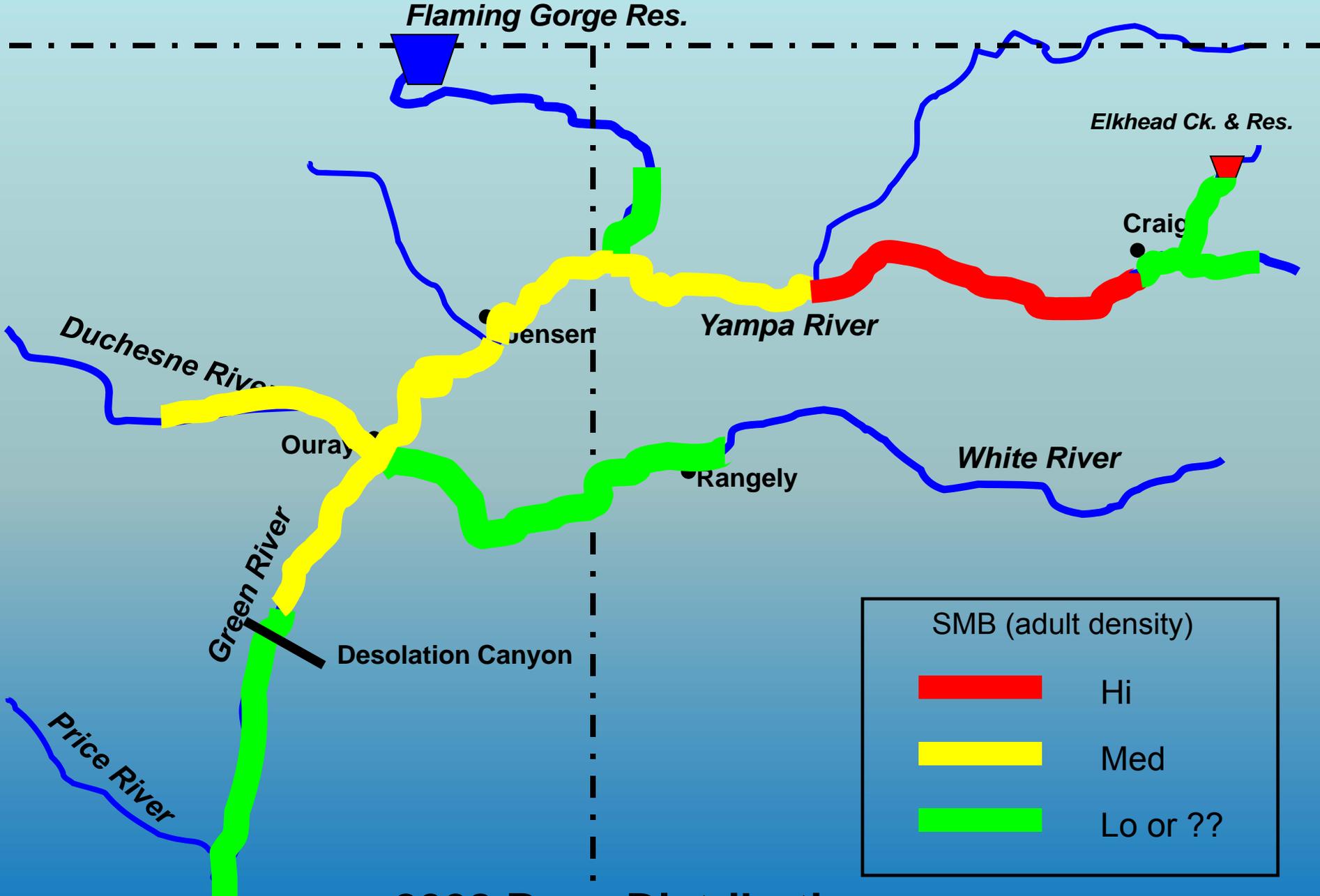


Young-of-year pikeminnow collections in relation to flow

| 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 | |

Smallmouth Bass



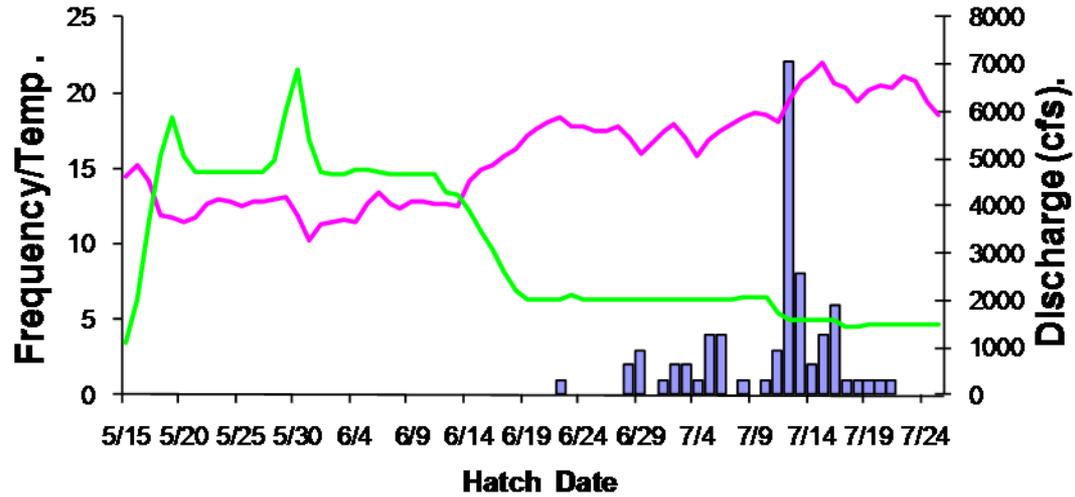


2008 Bass Distribution

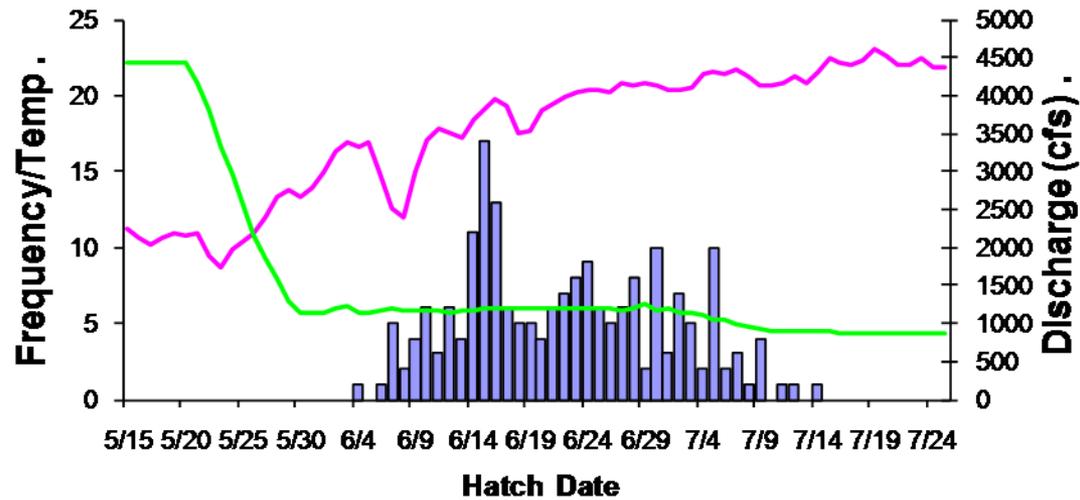
Smallmouth Bass

1. Spawning temperature 16 C (61 F)
 2. Spawning sequence and hatching dates can be delayed by higher flows, cooler temperatures
 3. Growth rates also slower under cooler temperatures
 4. Smaller body size of offspring in fall months increases odds that they won't survive the winter
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Green River 2005



Green River 2007

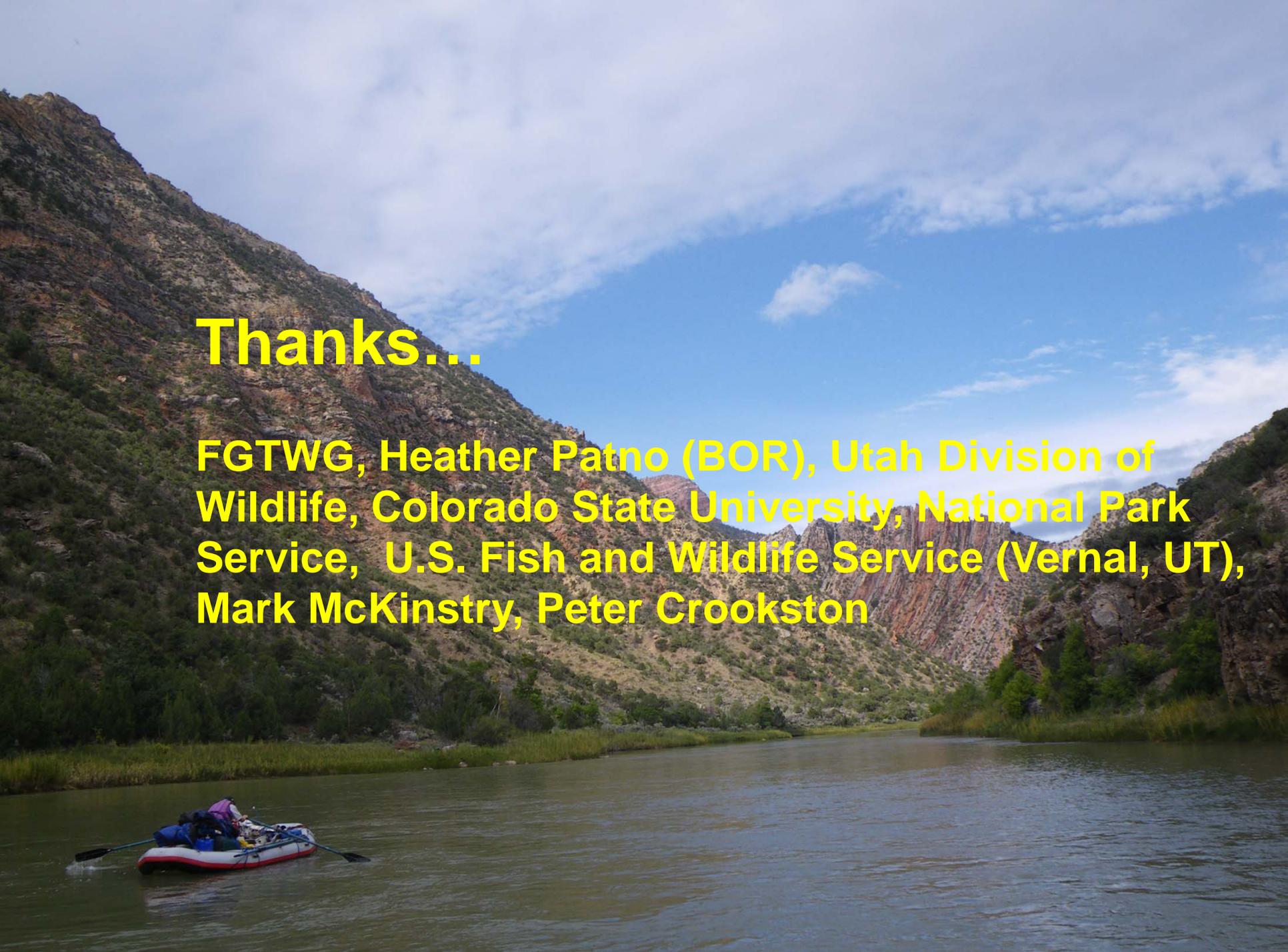


Proposed Temperature Targets for 2009

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.

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).



Thanks...

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Wildlife, Colorado State University, National Park
Service, U.S. Fish and Wildlife Service (Vernal, UT),
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