AMERICAN WHITEWATER

Gunnison River Flow Study 2013

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Purpose of Presentation

- Present results of Gunnison River Flow Survey
- Recommend that GBRT :
  - Integrate data into NCNA
  - Use data to develop quantitative metric for use in BIP modeling
  - Set an aspirational goal of protecting the full range of boatable flows and recreational opportunities

Presentation Outline

- Organizational Background
- AW in Colorado - Flow Studies
- Gunnison Project Intro
- Boating in the Gunnison Basin
- Gunnison River Flow Study 2013
  - What
  - Where
  - Methodology & Results
  - Discussion
  - Recommendations
  - Rationale

Organizational Background

Since 1954 to "conserve and restore America's whitewater resources and to enhance opportunities to enjoy them safely".

Connecting the interests of human-powered recreational river users with science-based data.

AW in Colorado

- CO: Since 2007, all basins in the State
  - Providing paddlers opportunity to participate in planning, management and conservation.

- Surveys to define recreational flow needs and inform policy and management:
  - Yampa-White Basin (NCNA)
  - Colorado Basin (NCNA)
  - Dolores & San Miguel Rivers (Management Plan)
  - Colorado River Basin Supply and Demand Study

Gunnison Project – 2012/2013

- Survey to define recreational flow needs
  - Inform decision-makers, provide strategy and rationale
  - Encourage integration of data into planning (i.e. BIP)
  - Leading to informed nonconsumptive protections

Gunnison Gorge National Conservation Area

From alpine creeks to desert floats

Daisy Creek

Gunnison town-run

Black Canyon

Taylor River

Dominguez-Escalante

Uncompahgre River

Gunnison River Flow Study: What

- **Online survey to define recreational flow needs**
- 331 respondents
  - 92% private, 15% commercial
  - 78% advanced or expert paddlers
  - Kayakers 66%, rafters 30%, canoeists 3%
- Outreach:
  - Emailed 600+ CO members, all Basin outfitters
  - Hosted 'Regional Paddler Dialogues'
  - Events and River Festivals
  - Web and social media
  - Published LTE's

17 River Segments

- Most correspond to GBRT's 'Priority' NCNA segments
- By USGS gage

Adapted from Table 2
AW Flow Study Report p.6

WW Resource Location	USGS Gage	GBRT NCNA Segment**	Respondent Numbers
Black Canyon	usgs-09128000	2	52
Gunnison Gorge	usgs-09128000	3	126
Gunnison Whitewater Park	usgs-09114500	17	67
Gunnison above Blue Mesa	usgs-09114500	17	70
Lake Fork Gunnison	usgs-09124500	19	47
Lower Gunnison	usgs-09144250	4 & 5	55
North Fork Gunnison	usgs-09132500	6	23
Taylor River below Reservoir	usgs-09110000	16	118
Uncompahgre above Ridgway Reservoir	usgs-09146020	12	27

2 Question Types for each segment

A. Overall Flow Evaluations. 5 point scale (-2 to 2):
   - *Unacceptable (-2)*
   - *Slightly Unacceptable (-1)*
   - *Marginal (0)*
   - *Slightly Acceptable (1)*
   - *Acceptable (2)*

B. Specific Flow Evaluations. Open ended questions:
   - *Lowest Navigable*
   - *Lowest Acceptable*
   - *Technical*
   - *Standard*
   - *High Challenge*
   - *Highest Safe*

Overall Flow Evaluations e.g.

Gunnison River Basin Flow Survey 2013 Exit this survey >>

9. Comparing Whitewater Flows for the Taylor River

For the questions on this page please rate the quality of the run and/or play features, in your particular craft, at each flow. Please pay particular attention to the gage referred to and respond with acceptable flows for that gage only.

30. Please report the quality of the following flows on the Taylor River for your craft and skill level. Consider all the flow-dependent characteristics that contribute to the quality of your trip (e.g., boatability, whitewater challenge, safety, availability of surfing or other play areas, aesthetics, and length of run).

Taylor River sections include: 1) New Generation to South Bank (upper Taylor); 2) South Bank to Five Mile (middle Taylor); 3) Five Mile to Almont (lower Taylor)

For more information on this stretch of river visit: http://www.americanwhitewater.org/content/River/detail/id/428/

Flows represented are flow levels at the USGS Taylor River Below Taylor Park Reservoir, CO Gage.

	Unacceptable	Slightly Unacceptable	Marginal	Slightly Acceptable	Acceptable
100	○	○	○	○	○
200	○	○	○	○	○
300	○	○	○	○	○
400	○	○	○	○	○
500	○	○	○	○	○
600	○	○	○	○	○
700	○	○	○	○	○
800	○	○	○	○	○
900	○	○	○	○	○
1000	○	○	○	○	○
1200	○	○	○	○	○
1400	○	○	○	○	○
1600	○	○	○	○	○

Results: Overall Flow Evaluations

- Data organized to identify **minimum**, **optimal**, **range of acceptable**, flows

Table 1, AW Flow Study Report p. 5

Gunnison River Basin Segment	Minimum Flow (CFS)	Optimal Flows (CFS)	Range of Acceptable Flow (CFS)
Black Canyon	600	800 - 1600	600 - 3000
Cimarron River	400	600 - 1200	400 - 2000
Daisy Creek	500	700 – 1600	500 - 2500
Escalante	400	500 - 1000	400 - 3000
Gunnison Gorge	600	800 – 3000	6000 - 15000
Gunnison Whitewater Park	600	900 – 5000	600 - 5000
Gunnison Town Runs (above Blue Mesa)	500	700 – 3000	500 - 3000
Lake Fork Gunnison	500	800 – 2500	500 - 1800
Lower Gunnison	800	1000 – 10000	800 - 20000
North Fork Gunnison	600	900 - 4000	600 - 10000
Oh-Be-Joyful Creek	500	700 – 1200	500 – 1800
Ridgway Whitewater Park	500	600 – 900	500 – 2000
Slate River	500	700 – 2500	500 – 2500
Taylor River	400	500 – 1400	400 – 3000
Uncompahgre above Ridgeway Reservoir	500	600 1800	500 – 2500
Uncompahgre below Ridgeway Reservoir	400	500 – 1400	400 – 2000
Upper East	600	900 – 2500	600 – 3000

Flow Evaluation Curve

- Graphically represents minimum, optimal, range of acceptable flows.

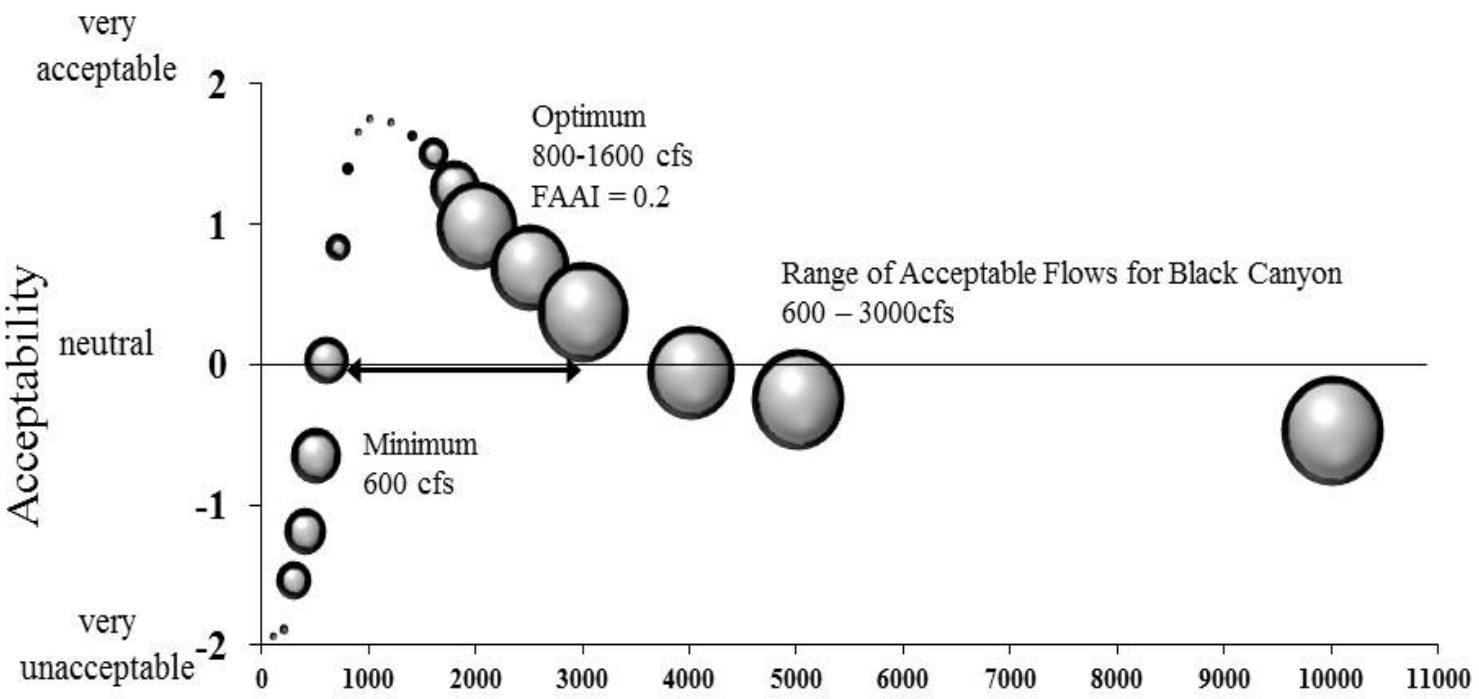


Figure 1.B, AW Flow Study Report p. 9

Flow Agreement Acceptability Index (FAAI)

Table 1.B, AW Flow Study p. 10

Specific Flow CFS	Mean Acceptability	FAAI
100	-1.93	0
200	-1.88	0.06
300	-1.53	0.24
400	-1.18	0.29
500	-0.64	0.35
600	0.04	0.3
700	0.84	0.17
800	1.4	0.08
900	1.66	0.05
1000	1.76	0
1200	1.73	0.05
1400	1.64	0.07
1600	1.51	0.2
1800	1.27	0.34
2000	1	0.56
2500	0.7	0.54
3000	0.38	0.63
4000	-0.05	0.6
5000	-0.24	0.64
10000	-0.46	0.7

- Describes respondent agreement for flows
- FAAI statistics range between 0 complete agreement, to 1 complete disagreement
- Appendix B contains Flow-Acceptability Curves and FAAI data for each Gunnison Basin study segment

Single Flow Judgments e.g.

31. From a recreational perspective what is the lowest flow required to navigate this stretch? (please specify in cfs)

32. From a recreational perspective what is the lowest acceptable flow that provides a reasonable experience on this run? The lowest acceptable is the lowest flow you would return to boat in your preferred craft, not the minimum flow that allows you to navigate. (please specify in cfs)

33. Some people are interested in taking trips at lower flows for a technical trip. Think of this "technical trip" in your craft. What is the best or optimal flow for a technical trip? (please specify in cfs)

34. Many people are interested in a "standard" whitewater trip at medium flows. Think of this "standard trip" in your craft. What is the best or optimal flow for a standard trip? (please specify in cfs)

35. Some people are interested in taking trips at higher flows for increased whitewater challenge. Think of this "high challenge trip" in your craft. What is the best or optimal flow for a high challenge trip? (please specify in cfs)

36. What is the highest safe flow for your craft and skill level? (please specify in cfs)

37. What is your preferred craft for running the Taylor River? (Choose one)

- ☐ Hard shell kayak/canoe
- ☐ Raft/Shredder
- ☐ Inflatable kayak/canoe
- ☐ Open canoe
- ☐ Other (please specify)

38. Do you have any general comments on flows that you feel have not been addressed in the questions we've asked? Specifically if you do not have a good record of flows or dates from when you have run the river please include any qualitative observations on flows needs.

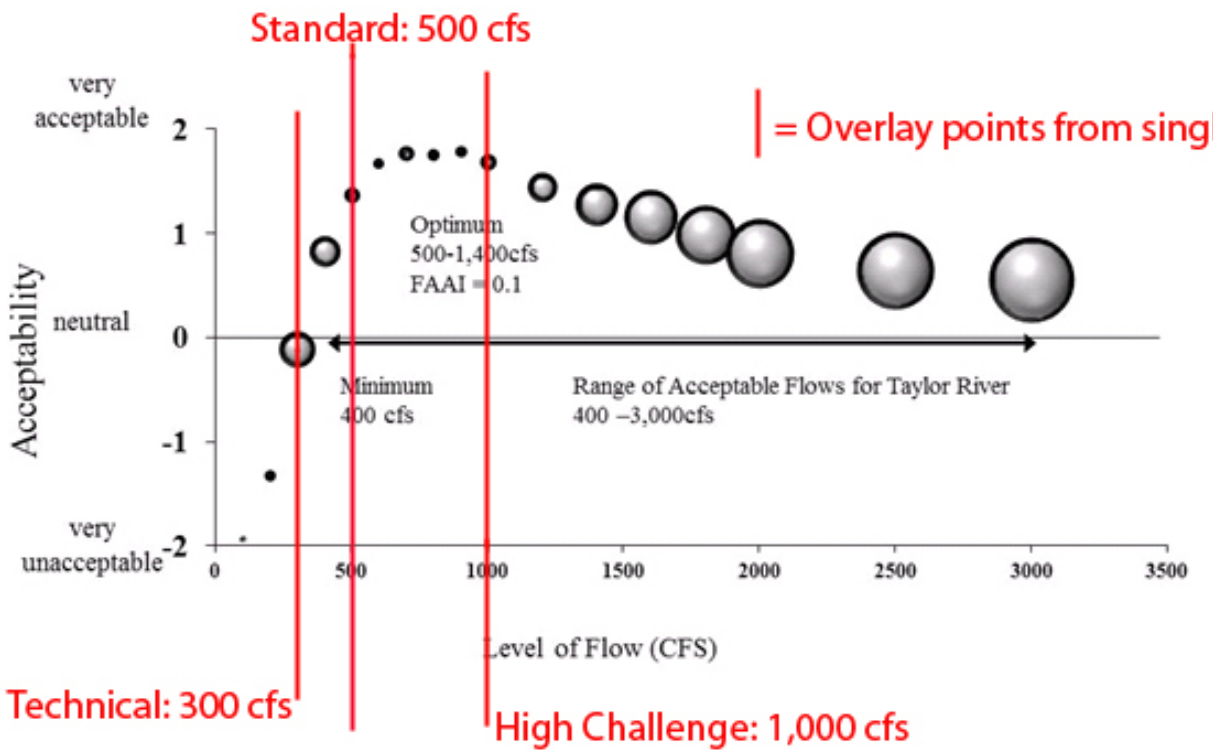
Results: Single Flow Judgments

Table 4, AW Flow Study Report, p.12

Gunnison River Basin Segment	Lowest Navigable Flow (CFS)	Lowest Acceptable Flow (CFS)	Technical Flow (CFS)	Standard Flow (CFS)	High Challenge Flow (CFS)	Highest Safe Flow (CFS)
Black Canyon	500	650	600	1000	1800	2000
Daisy Creek	400	500	400	750	1200	1400
Cimarron River	325	475	400	600	1000	1200
Escalante	300	350	300	500	900	1100
Gunnison Gorge	400	600	500	1000	3000	4750
Gunnison Whitewater Park	400	500	500	1000	2500	4000
Gunnison Town Runs (above Blue Mesa)	338	500	425	800	2500	4000
Lake Fork Gunnison	400	500	500	800	1550	2000
Lower Gunnison	600	800	700	1500	5000	10000
North Fork Gunnison	550	650	600	1200	2500	3000
Oh-Be-Joyful Creek	400	500	400	700	1000	1000
Ridgeway Whitewater Park	300	400	350	NA	1000	1500
Slate River	400	500	450	800	1200	1500
Taylor River	250	350	300	500	1000	1600
Uncompahgre above reservoir	350	450	380	600	950	1400
Uncompahgre below reservoir	350	400	350	600	1100	1000
Upper East	500	600	500	1000	2000	2000

Integrated Single Flow Evaluations & FAAI Index Curve (e.g. Taylor)

Figure 3, AW Flow Study Report p. 13



Discussion

- Good WW conditions require higher stream flows than **minimum acceptable** or **lowest navigable**
- Baseline information describes relationship between streamflows and WW recreation in the Gunnison Basin
- High levels of agreement on **optimal** flows for all 17 segments
- Report data makes it possible to develop a metric to analyze impacts to WW boating under:
  - Future supply and demand scenarios
  - Gunnison BIP modeling process

Recommendations

- Integrate data into NCNA
- Collaborate to develop a quantitative "boatable days" metric as part of BIP modeling process
- Ensure that final Gunnison BIP quantifies boatable flows and assesses them in modeling context
- Set an aspirational goal of protecting boatable flows in the **optimal range**

Rationale: Watershed Benefits

Shared interests with conservation and ag community

- Natural flow patterns compliment other nonconsumptive needs
- Quantification = economic reason to keep Gunnison Basin water in Basin

Rationale: Economic Benefits

- Gunnison Basin commercial rafting: $6,347,748 in 2011[1]
- Colorado commercial rafting: $54 million, 2600 jobs in 2006[2]
- Colorado Basin river related recreation[3]:
  - $26 billion in economic output
  - 25,000 jobs

Uncompahgre River

1. Greiner and Warner, 2012
2. Loomis, 2008
3. Southwick and Associates, 2012

Rationale: Consistent Policy

- GBRT Principles and Priorities (current version) call for quantification
- CWCB BIP Draft Guidance recommends quantification of all values
  - Mentions AW methodology in NC Toolbox
- NCNA integration completes SWSI intent
- Other west slope RTs have quantified
  - Positions GBRT on common platform with other West-Slope RTs
  - Important for West Slope caucus participation

Questions & Comments

Escalante Creek

Gunnison Gorge