

Technology Partnering – Canal Companies, Fremont Madison Irrigation District, & Henry's Fork Foundation

Henry's Fork Watershed Council

March 13, 2019

Outline

- What needs are we addressing?
- What are the proposals?
- What is the proposed funding?

What needs are we addressing?

- Canal Companies & FMID –
 - Reliable delivery of water
 - Better & more timely control
 - Save mileage & labor for adjusting structures
 - Reduce charges for storage delivery
 - Better information for management decisions
- Henry's Fork Foundation
 - Reduce physical drawdown of Island Park Reservoir
 - Improve consistency of streamflows in lower Henry's Fork
 - Better ability to measure flows

Canal & FMID Needs

Aaron Dalling

***Irrigated ag is an economic
engine for the region***



Excess use of storage water can be a significant cost

5.5 Rental Prices

5.5.101 *Tier 1:* If the storage system fills, the rental shall be \$7.00 per acre-foot.

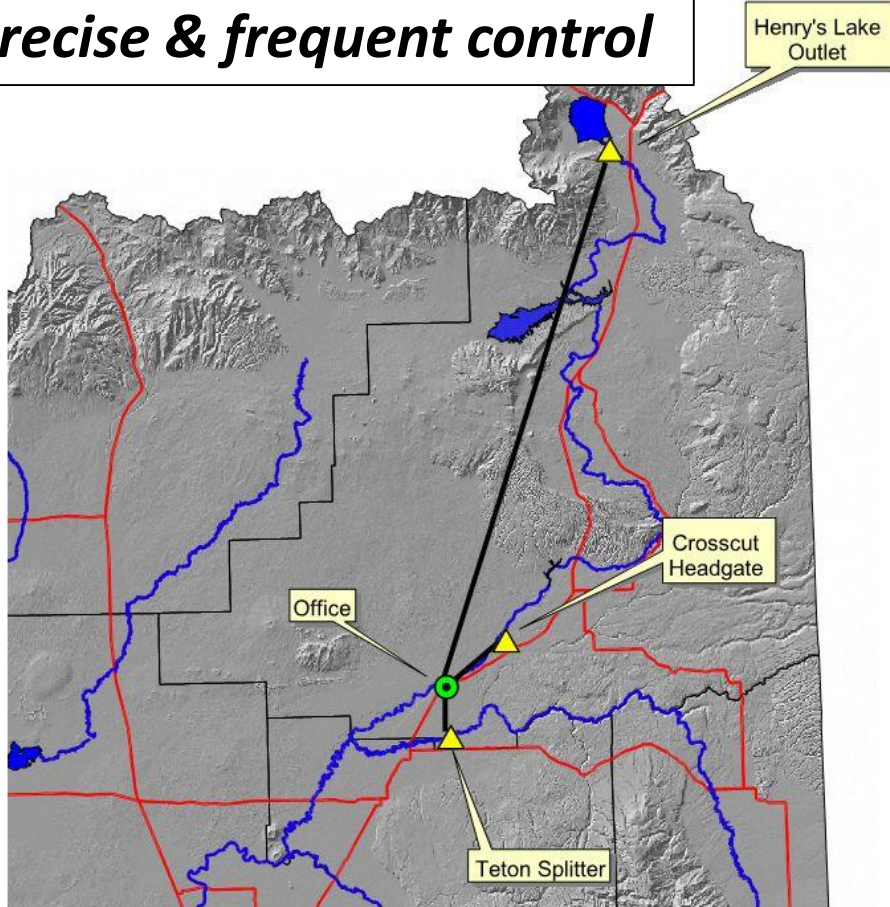
5.5.102 *Tier 2:* If the storage system does not fill augmentation pursuant to Rule 5.2.105(a), the Milner shall be \$17.00 per acre-foot.

5.5.103 *Tier 3:* If the storage system does not fill as provided pursuant to Rule 5.2.105(a), the rental shall be \$25.00 per acre-foot.

Stipulated Augmentation Rental -Water District 01

November 1 Carryover 1000s AF	<----- April 1 to Sept 30 Heise Forecast 1000s Acre-Feet----->						
	< 2,450	< 2,920	< 3,450	< 4,208	< 5,042	< 5,670	> 5,670
0	0	0	0	0	150000	185000	185000
100	0	0	0	0	150000	185000	185000
200	0	0	0	0	150000	185000	185000
300	0	0	0	0	150000	185000	185000
400	0	0	0	0	150000	185000	185000
500	0	0	0	0	150000	185000	185000
600	0	0	0	60000	150000	185000	185000
700	0	0	0	60000	150000	185000	185000
800	0	0	0	60000	150000	185000	185000
900	0	0	60000	60000	150000	185000	185000
1,000	0	0	60000	60000	150000	185000	185000
1,100	0	0	60000	60000	150000	185000	185000
1,200	0	0	60000	60000	150000	185000	185000
1,300	0	0	60000	60000	150000	185000	185000
1,400	0	0	60000	60000	150000	185000	185000
1,500	0	0	100000	150000	185000	185000	185000
1,600	0	0	100000	150000	185000	185000	185000
1,700	0	0	100000	150000	185000	185000	185000
1,800	0	0	100000	150000	185000	185000	185000
1,900	0	0	100000	150000	185000	185000	185000
2,000	0	0	100000	150000	185000	185000	185000
2,100	0	0	100000	150000	205000	205000	205000
2,200	0	0	100000	150000	205000	205000	205000
2,300	0	0	100000	150000	205000	205000	205000
2,400	0	0	100000	150000	205000	205000	205000
2,500	0	0	100000	150000	205000	205000	205000
2,600	0	0	185000	185000	205000	205000	205000
2,700	0	0	185000	185000	205000	205000	205000
2,800	0	0	185000	185000	205000	205000	205000
2,900	0	0	185000	185000	205000	205000	205000
3,000	60000	60000	185000	185000	205000	205000	205000
3,100	60000	60000	185000	185000	205000	205000	205000
3,200	100000	100000	185000	185000	205000	205000	205000
3,300	100000	100000	185000	185000	205000	205000	205000
3,400	100000	100000	185000	185000	205000	205000	205000
3,500	100000	100000	185000	185000	205000	205000	205000
3,600	100000	100000	185000	185000	205000	205000	205000

***Logistics are difficult for
precise & frequent control***



Crow-flight Distances:

- Office – Henry's Lake:
47 miles
- Office – Crosscut:
4 miles
- Office – Splitter:
7 miles

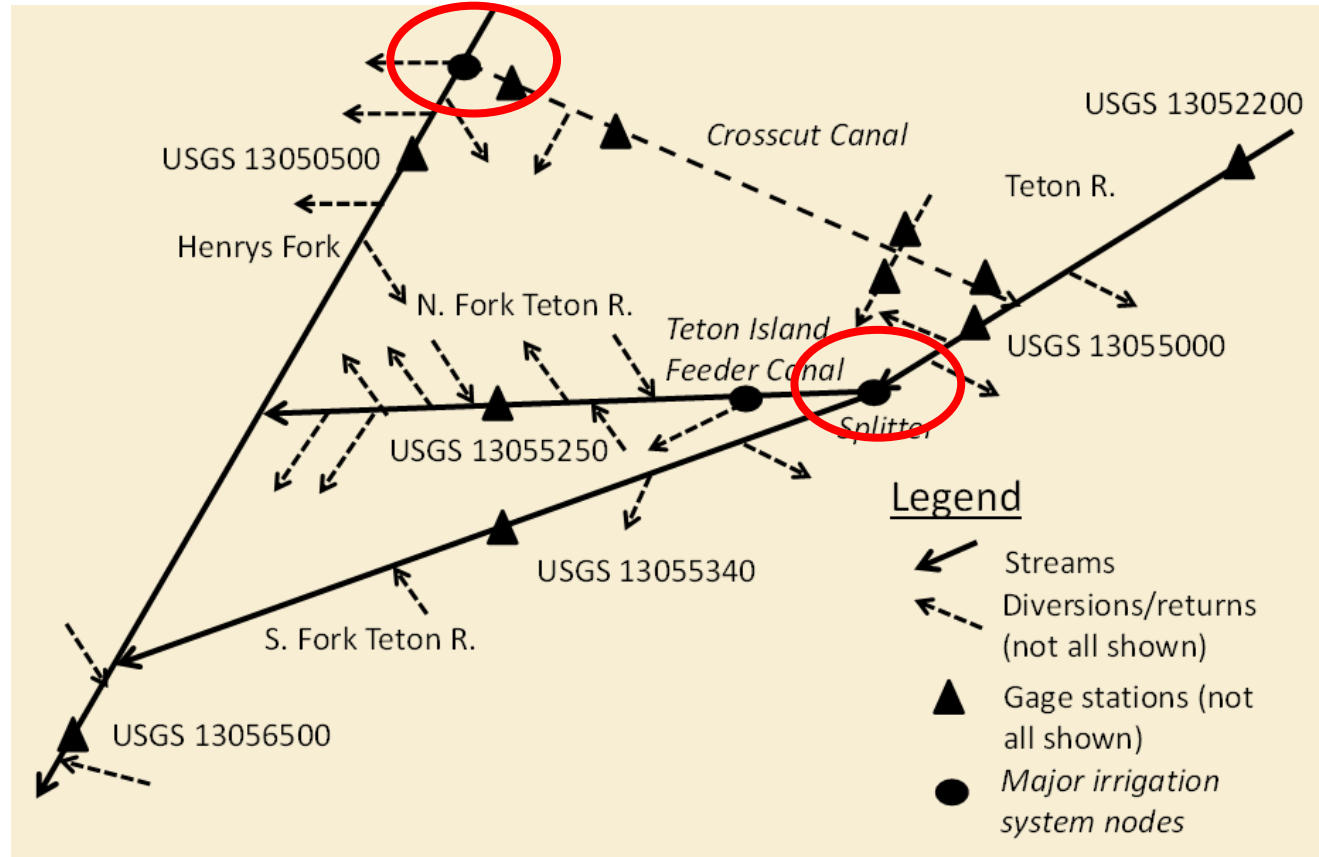
Travel Times:

- Office – Henry's Lake:
60 minutes
- Office – Crosscut:
12 minutes
- Office – Splitter:
12 minutes

Henry's Lake Site Map



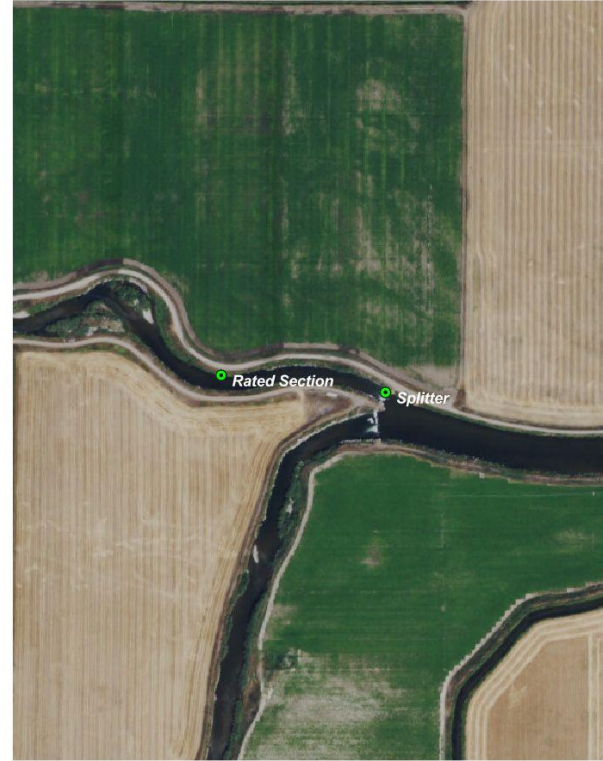
Crosscut & Splitter Relationship



Crosscut & Splitter Site Maps

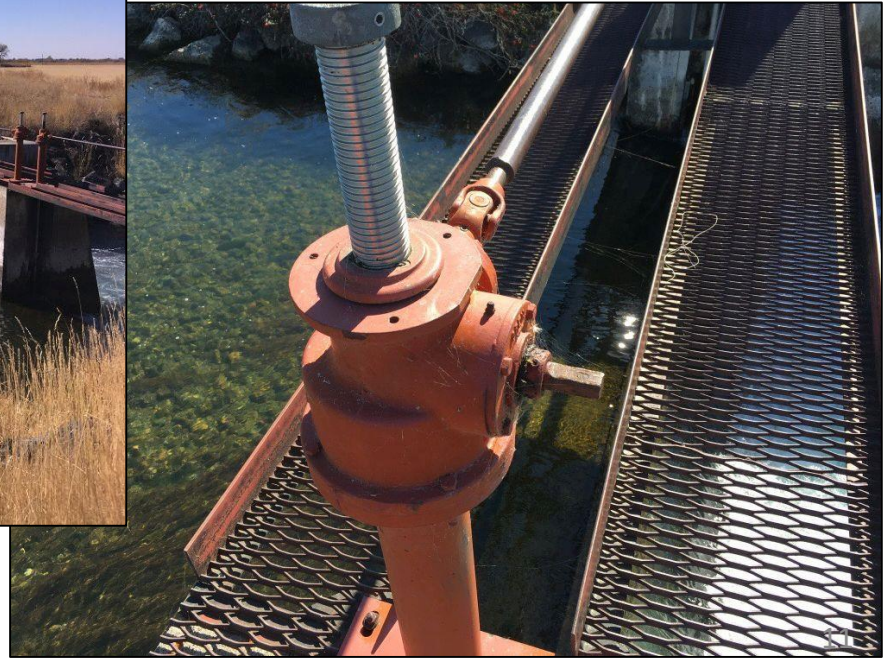


Map 2



Map 3

Splitter Configuration



Fishery & Angling Needs

Rob Van Kirk

Increased drawdown of Island Park Reservoir

INCREASES

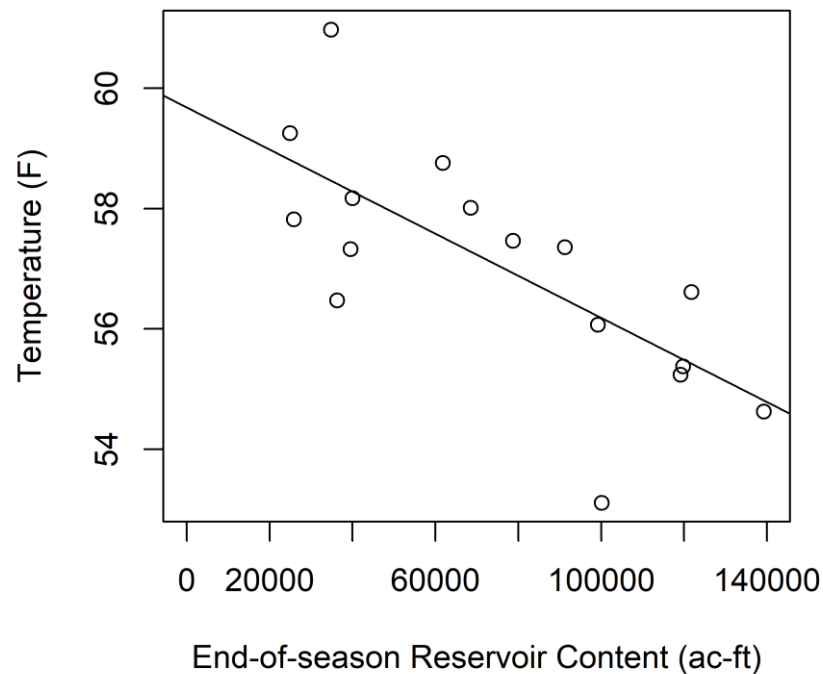
- Algae and cyanobacteria in reservoir
- Mid-summer flow below reservoir
- Suspended sediment delivery
- Turbidity
- Water temperature downstream

DECREASES

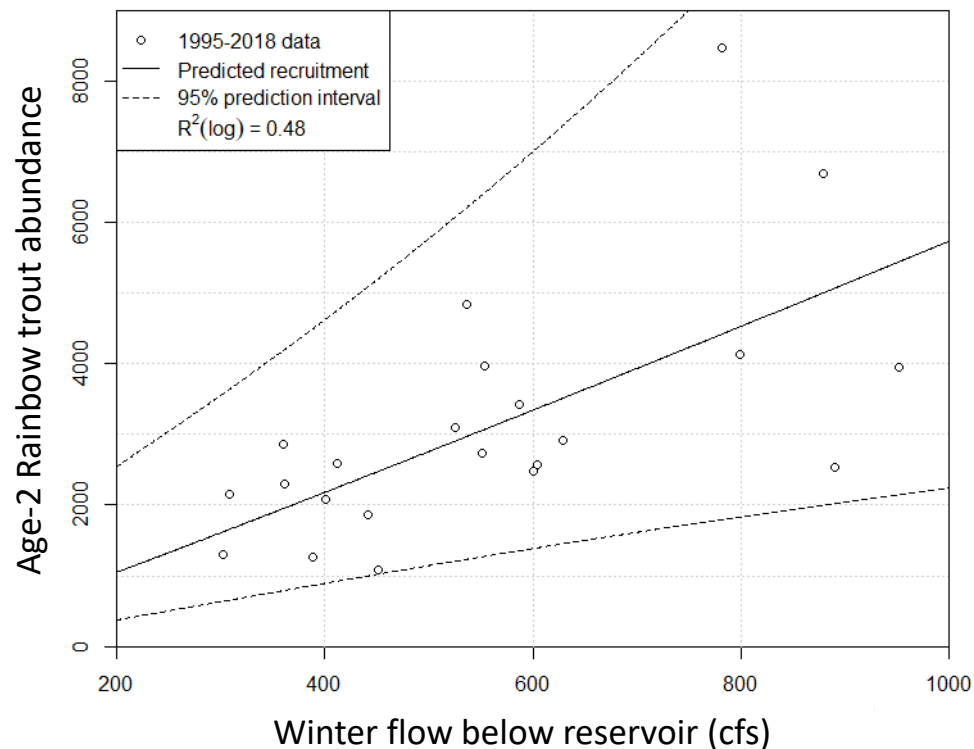
- Trout habitat in reservoir
- Quality of angling experience in river
- Winter flow when refilling
- Trout recruitment (dependent on winter flow)
- Certainty of refill the following year

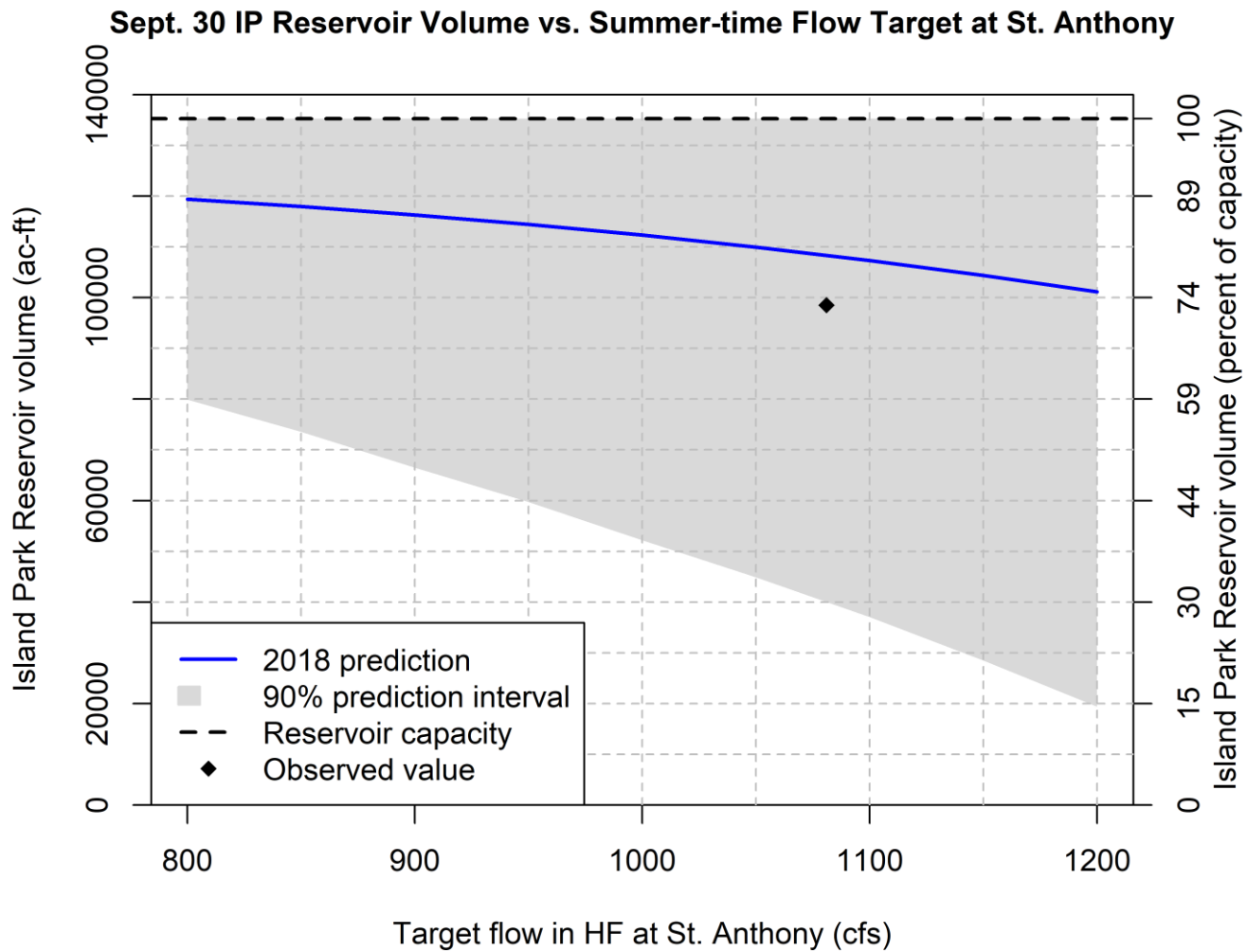


Mean Summer Water Temperature



Rainbow Trout Recruitment





Island Park Reservoir: Water year 2018

- Water-year 2018 was pretty average
 - 102% of average precipitation
 - 105% of average streamflow
 - Very dry summer
 - Summer flow 85% of average, BUT
- Reservoir carryover way above average
 - Mean Sept. 30 content: 43% full
 - Sept. 30 content in Island Park: 74% full
 - Saved storage equivalent to 80% increase in winter outflow (360 cfs vs. 200 cfs)



Precision management saved much of that water:

- Island Park Reservoir carryover is higher when:
 - Natural flow availability is higher
 - Irrigation demand is lower
 - Streamflow at St. Anthony is lower (mean is 1,411 cfs; each 100 cfs summer flow at St. Anthony is worth 4,300 ac-ft in IP)
- In 2018, we aimed for 1,000 cfs, achieved 1,085 cfs, and dropped below 1,000 cfs on only 10 days.
- Difference between mean and 1,085 cfs saved 14,018 ac-ft in Island Park (increased winter flow by 70 cfs)
- Increased precision at splitter and Crosscut could save another 8,000 ac-ft by eliminating excess delivery down South Fork Teton
- Increased precision in delivery to Teton Island Feeder could save 3,000 ac-ft in storage charged to Teton Island Feeder and/or FMID

Flow Measurement Needs

- Sites on Teton River to support automation project
- Other canals of interest to FMID and Canal Companies
- Teton River at old Tetonia gage site (TWUA)
- Buffalo River at Ponds Lodge (former USGS station)
- Henry's Fork at Island Park (during times of rapid aquatic plant growth and decay between USGS rating adjustments)
- Henry's Fork at Parker-Salem (Red Road) Bridge
- Systematic survey of lower Henry's Fork to quantify fish habitat and identify reaches of groundwater inflow (Utah State U. project)

Measuring flow the “old-school” way



Proposals

BC Contor

- Water control equipment & fixed-point measurement stations
 - Remote control of Crosscut gate
 - Remote control of Teton Splitter gates
 - Remote control of Henry's Lake outlet
 - Stand-alone water-level telemetry stations
- Acoustic Doppler Current Profiler
 - Instrument purchase
 - Operational budget

Henry's Lake Remote Control

- Actuator on one gate
- Control equipment
- Transducer at USGS rated section
- Solar panels, batteries & regulators
- Communications hardware

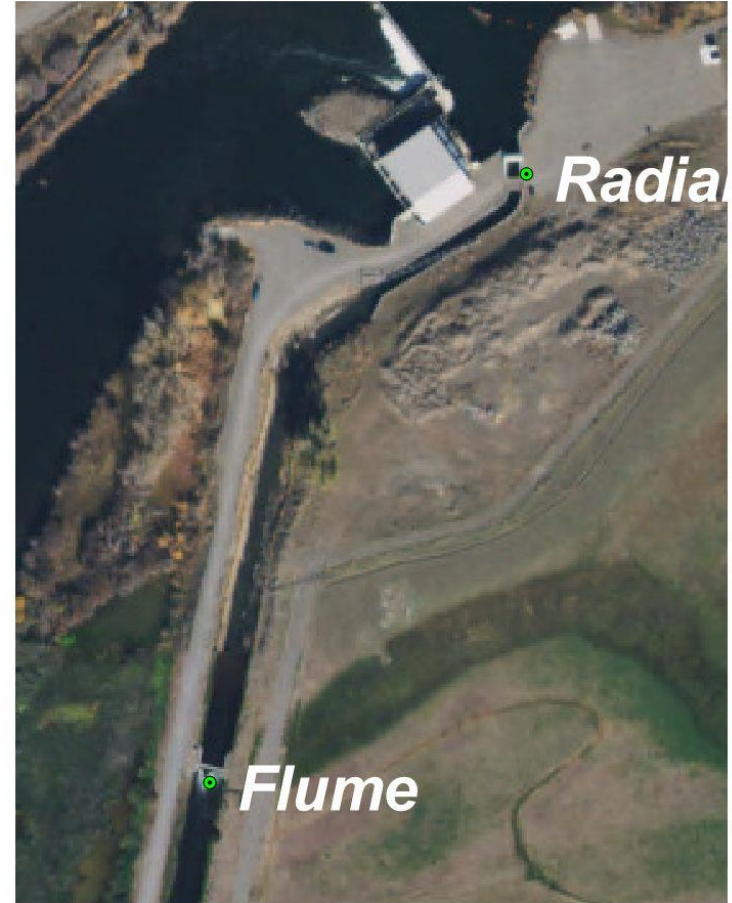
~ \$18,000



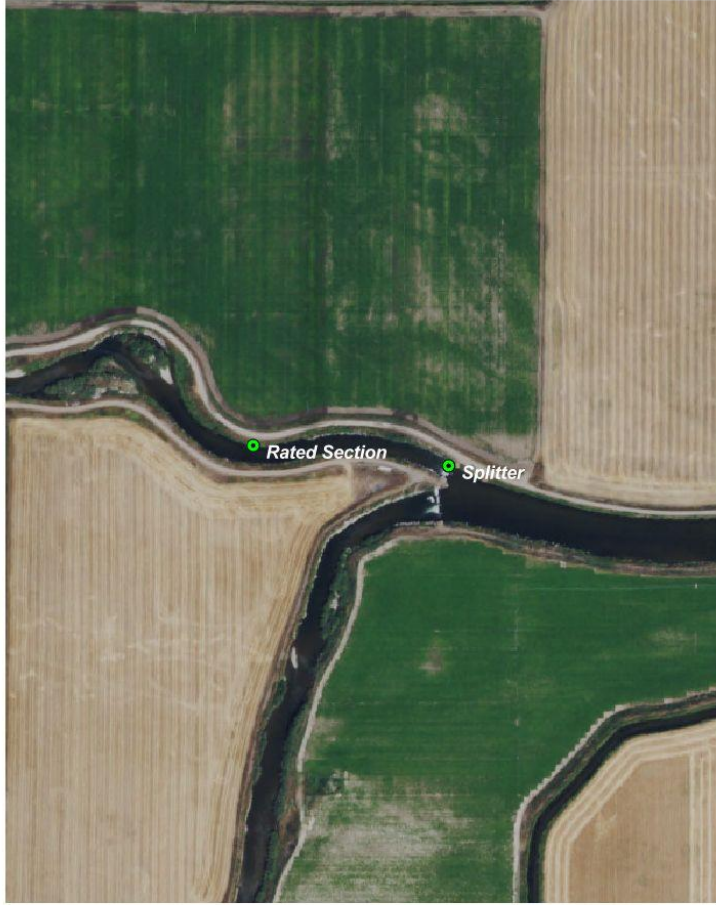
Crosscut Remote Control

- Upstream transducer
- Controller for existing gate actuator
- Downstream transducer
- Transducer in flume
- Communications equipment

~ \$13,000



Map 2



Map 3

Teton Splitter Remote Control

- Upstream transducer
- Downstream transducer
- Actuators on two gates
- Control equipment
- Solar panels, batteries & regulators
- Rated-section transducer
- Communications hardware

~ \$21,000

FMID Office

- Communication hardware
- Dedicated server
- Software licenses



~ \$7,000

Stand-alone Instruments (6 locations)

- Pressure transducer
- Solar power & batteries
- Datalogger & communication



From Davis Instruments - for illustration purposes only

~ \$17,000



ADCP

- Sensor w/ Compass
- GPS
- Small boat for small channels
- Large boat for large channels

~ \$27,000 hardware

~ ½ FTE operations?

Funding

- Crosscut \$13,000
- Splitter \$21,000
- Henry's Lake \$18,000
- FMID Office \$ 7,000
- Stand-alone \$17,000

} *Apply for USBOR
Water Smart Grant -
In-kind & cash match
from Canals, FMID &
HFF*

- ADCP Hardware \$27,000
- ADCP Operation ~ ½ FTE

} *FMID (HFF buys the GPS)*
}
HFF

QUESTIONS & DISCUSSION