

What do we know after two years of the brown trout incentivized harvest program?

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Glen Canyon Dam Adaptive Management Program
Annual Reporting Meeting, January 24-25, 2023

Project Background

- Project J. Socioeconomic research in the Colorado River Ecosystem
 - J.2. Brown trout incentivized harvest
- Cooperators: Arizona State University, Northern Arizona University
- LTEMP Resource goals: Humpback Chub. Meet humpback chub recovery goals, including maintaining a self-sustaining population, spawning habitat, and aggregations in the Colorado River and its tributaries below the Glen Canyon Dam.



Brown trout incentivized harvest

_____ name _____ phone number _____

_____ address/PO box _____

_____ city, state, zip code (or foreign equivalent)

Can we contact you for future research? **y / n**

Please describe each brown trout caught:

Bag #	Fish length (inches or millimeters)	River Reach (map on back)	Tackle
1	_____	_____	Fly <input type="checkbox"/> Lure <input type="checkbox"/>
2	_____	_____	Fly <input type="checkbox"/> Lure <input type="checkbox"/>
3	_____	_____	Fly <input type="checkbox"/> Lure <input type="checkbox"/>
4	_____	_____	Fly <input type="checkbox"/> Lure <input type="checkbox"/>

(please use another card for additional brown trout)

Fish lengths based on (circle one)? **guess/ tape/ fishboard**

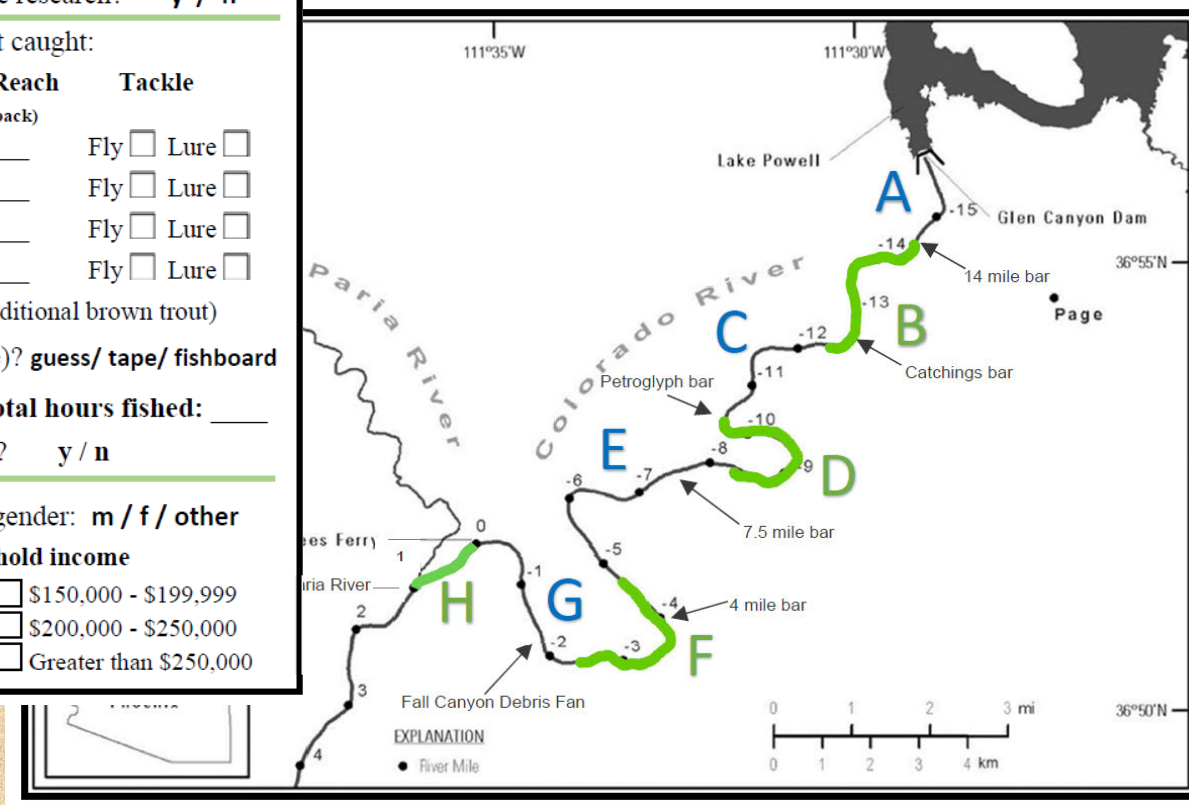
Date (mm/dd/yy): _____ Total hours fished: _____

Did you hire a guide? **y / n**

age: _____ gender: **m / f / other**

annual gross household income

<input type="checkbox"/> Less than \$50,000	<input type="checkbox"/> \$150,000 - \$199,999
<input type="checkbox"/> \$50,000 - \$99,999	<input type="checkbox"/> \$200,000 - \$250,000
<input type="checkbox"/> \$100,000 - \$149,999	<input type="checkbox"/> Greater than \$250,000



Incentive structure

Date	Item	Award amount
Nov. 2020	Implementation	\$25/fish
March 2021	Increase in base	\$33/fish
April 2021	Bonanza	\$33/fish, \$50 for 3rd fish, \$50 PIT tagged fish, \$300/sonic tagged fish, \$500/most, \$250/best video
May 2021	Base	\$33/fish
Augusts 2021	Increase in base	\$33/fish and \$50 for 3rd fish
September 2021	Increase in base	\$33/fish, \$50 for 3rd fish, \$300 for PIT tagged fish
Dec 2021- Jan 2022	Bonanza	\$33/fish, \$50 for 3rd fish, \$300 for PIT/sonic tagged fish, \$500 for most, \$500 for largest
February 2022	Base	\$33/fish, \$50 for 3rd fish, \$300 for PIT tagged fish

GCNRA angling videos

VIDEO

Turning in Your Brown Trout Harvest

Glen Canyon National Recreation Area



Jeff Arnold
Fisheries Biologist, National Park Service

DESCRIPTION

Fisheries Biologist Jeff Arnold explains how to properly clean, tag, and deposit your brown trout harvest in the Brown Trout Incentivized Harvest.

VIDEO

Brown Trout Baits and Locations

Glen Canyon National Recreation Area



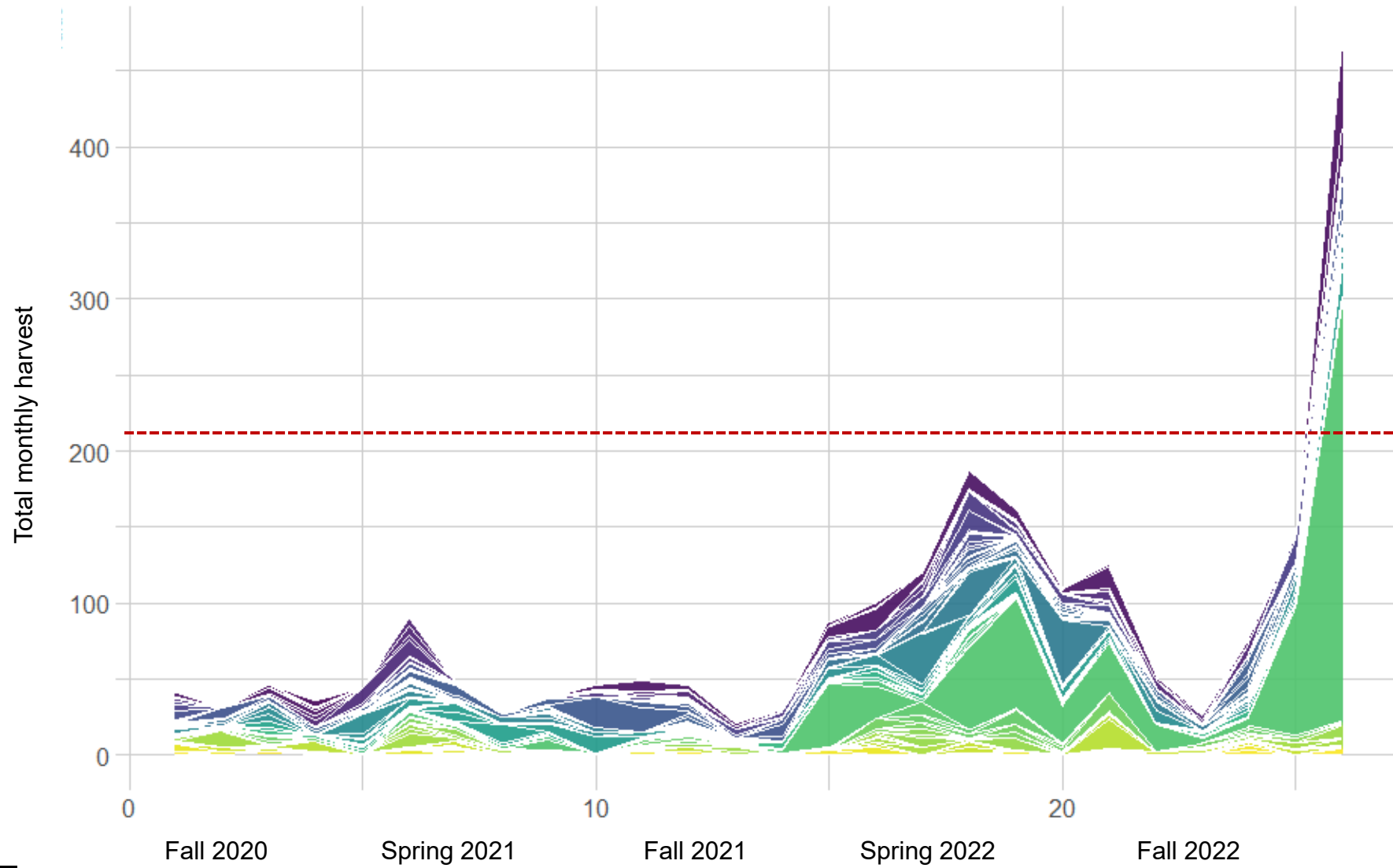
DESCRIPTION

The best places on the Colorado River between Glen Canyon Dam and Lees Ferry, and the most successful baits used.

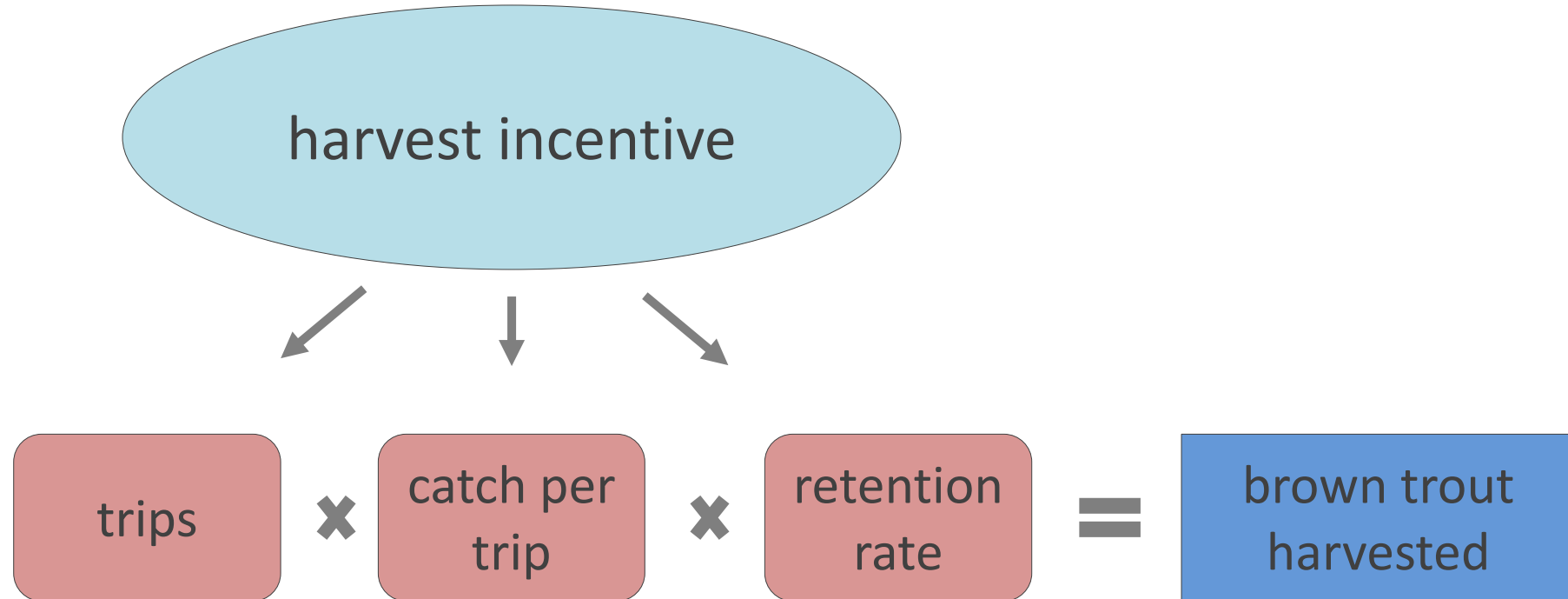
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Program Monthly Brown Trout Harvest

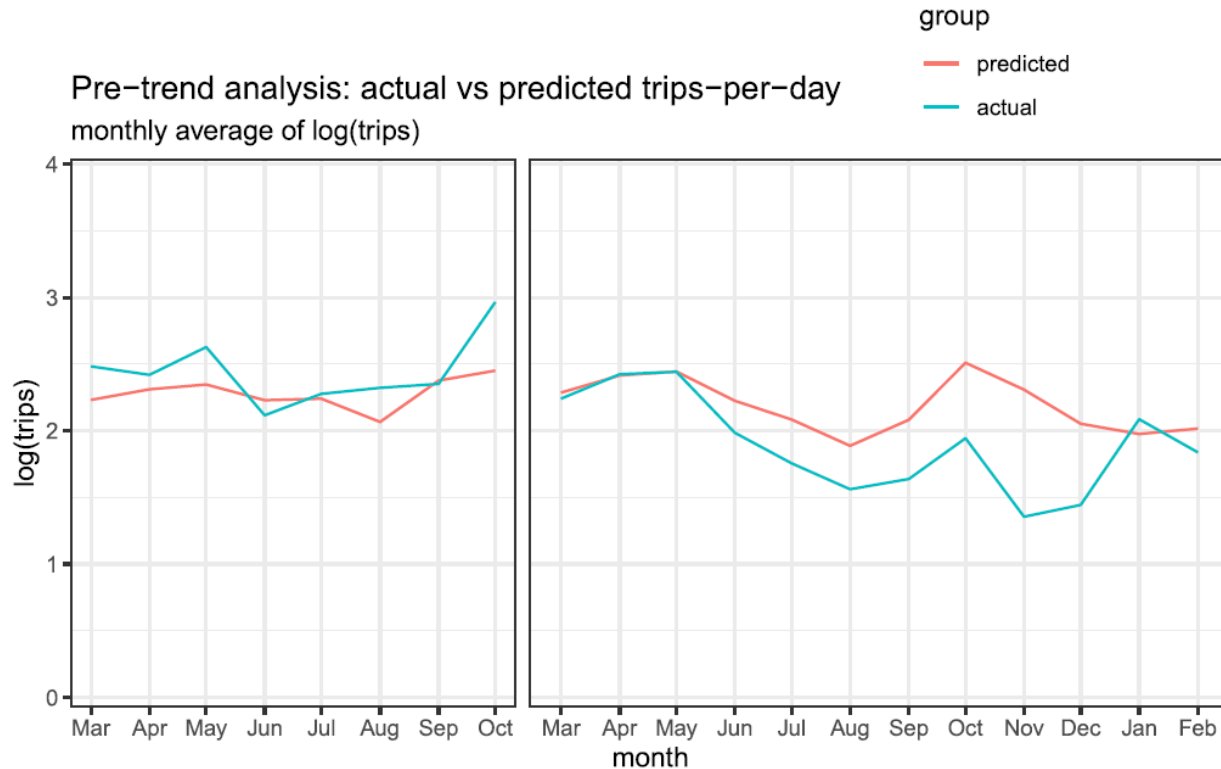


Total brown trout harvest

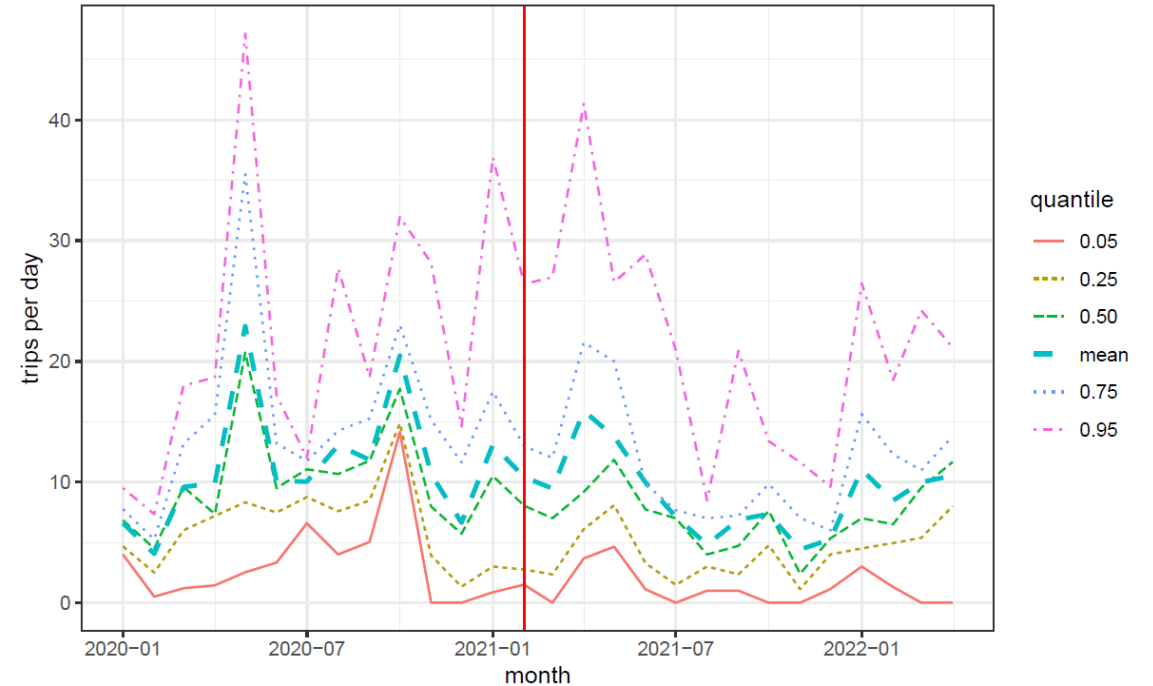


Margin 1: Total trips

Pre-trend analysis: actual vs predicted trips-per-day
monthly average of log(trips)

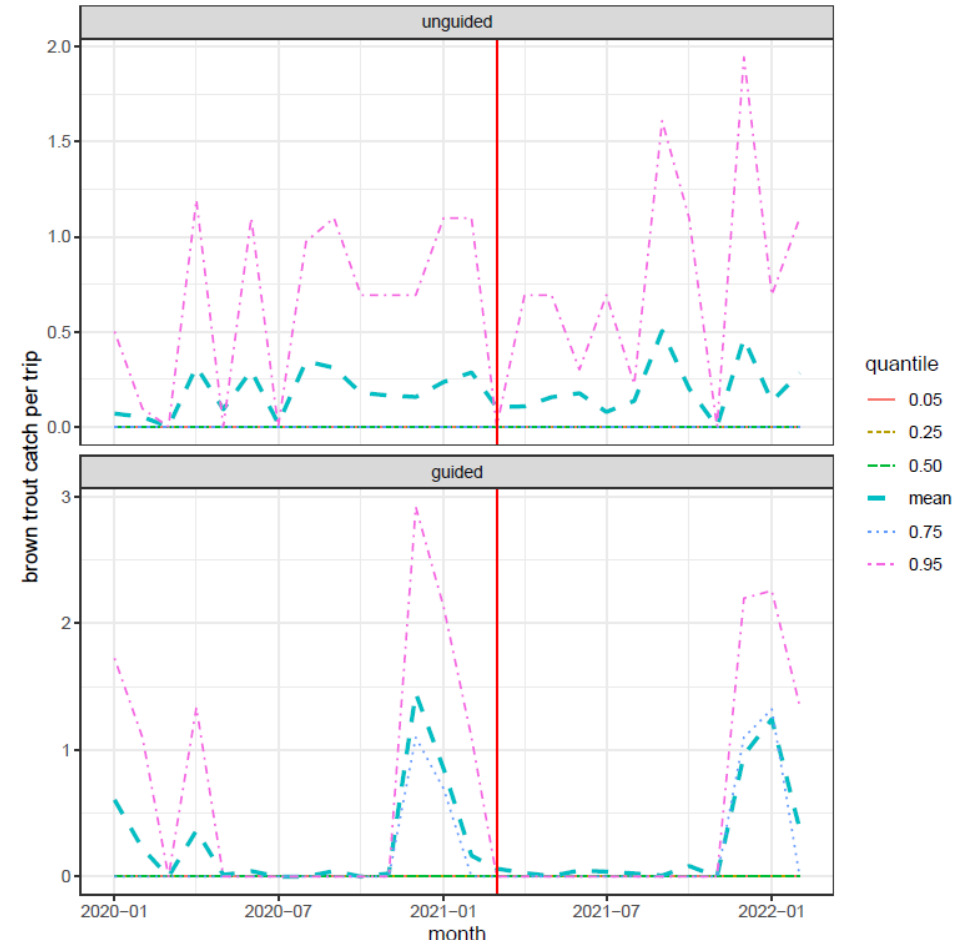
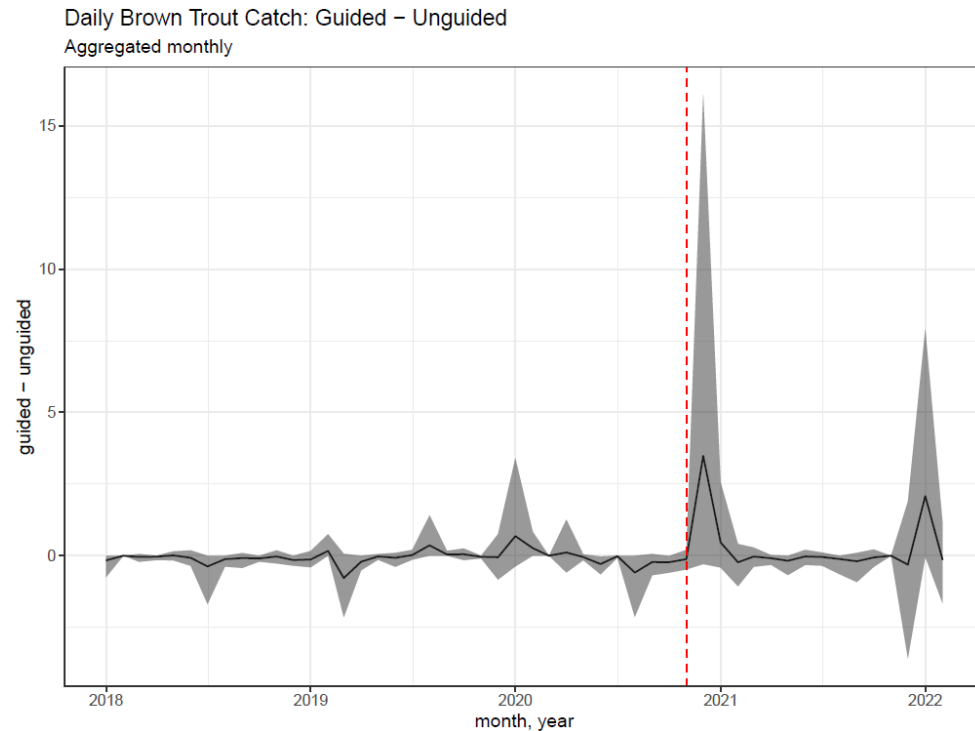


Monthly raw distributions of daily Lees Ferry fishing trips by unguided anglers. The red vertical line marks the March 2021 treatment date.



We fail to reject the hypothesis that the introduction of the harvest incentive and any of its associated price levers had no effect on daily trip-taking to Lees Ferry.

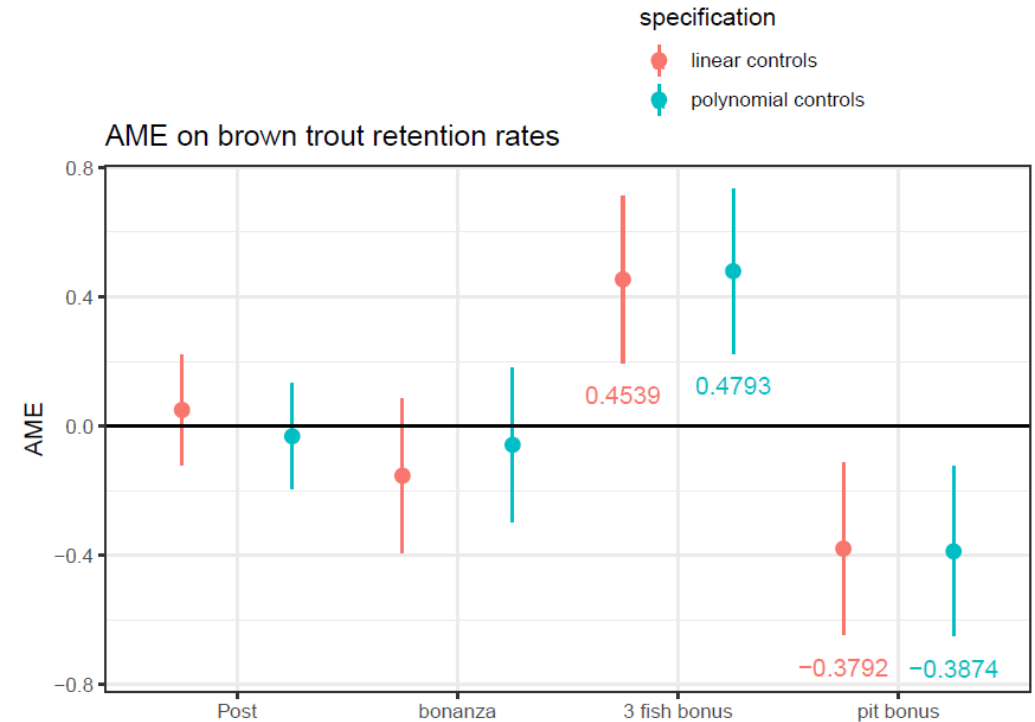
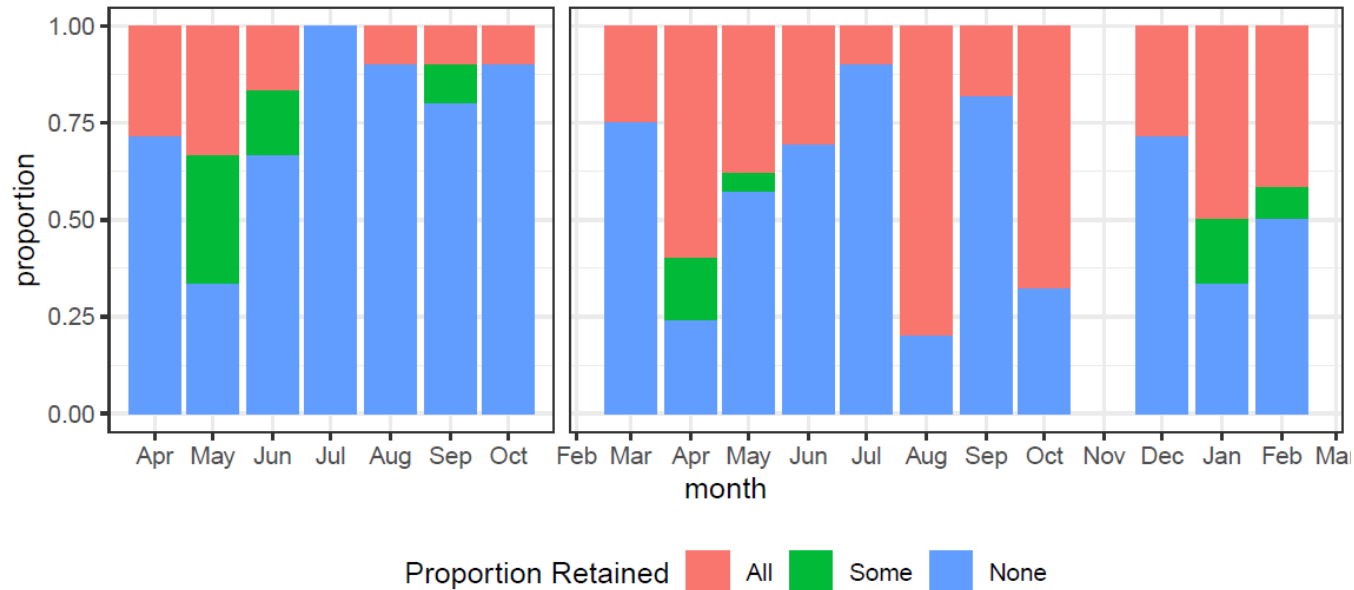
Margin 2: Catch-per-trip



We reject the hypothesis that the program had no effect on brown trout catch and suggest that the overall program effect on this margin was negative.

Margin 3: Retention rate

The proportion of unguided anglers who retained none, some, or all their caught brown trout by month. The break in the graph indicates the program kickoff with the potentially treated month November 2020 - February 2021 removed.



We fail to reject that the program kick-off and bonanza events had no effect on the percent of caught brown trout that unguided boat anglers retained, it appears that the adoption of the \$50 bonus for every third fish in August 2021 increased brown trout retention rates.

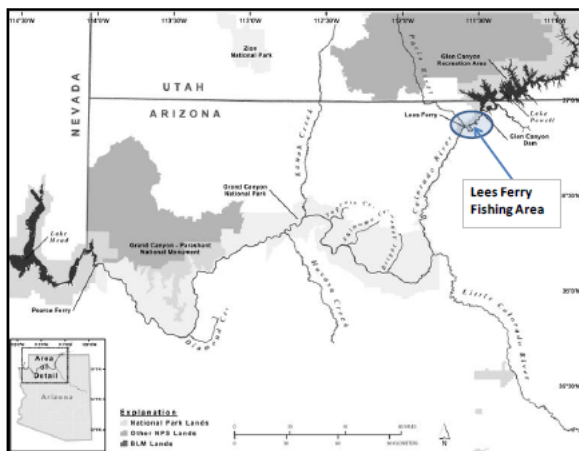
Conclusion

- Our models predict an annual harvest of 284 brown trout in the first year and that 196 of those would have been harvested without the program.
- Additional survey research may identify how program design may drive the ‘one angler’ effect and what that means for program efficacy and cost-effectiveness.
- The Program did not have a negative impact on the fishery’s rainbow trout stock, as catch and retention rates of rainbow trout were unaffected.

Mail survey data collection

OMB Control Number: 1024-0272
Expiration Date: 8-31-2018

Glen Canyon Angler Survey



PAPERWORK REDUCTION ACT STATEMENT The National Park Service is authorized by 16 U.S.C. 1a-7 to collect this information. This information will be used by park managers to evaluate fishing trips at Lee's Ferry. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. Please do not put your name or that of any member of your group on the questionnaire. The permanent data associated with this collection will be anonymous.

BURDEN ESTIMATE: The public reporting burden for this form is estimated to average 20 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to: the NPS Information Collection Review Coordinator, National Park Service, 1201 Oakridge Dr., Fort Collins, CO 80525.

In the past few months you were contacted by Arizona Game and Fish and asked to participate in a short creel survey while fishing in the vicinity of Lee's Ferry. We would like you to think about that trip when completing this survey.

check ONE box at the bottom of the table to indicate whether you prefer Trip A, Trip B, or Not Visit.

Characteristic	Trip A	Trip B	Not Visit
	Assume that everything about your Lee's Ferry trip were the same except the following	Assume that everything about your Lee's Ferry trip were the same except the following	
Large River Flow Level	40,000 cfs	25,000 cfs	I would not choose to take a Lee's Ferry Fishing trip if these were my only choices
Large River flow fluctuation	5,000-8,000 cfs flow fluctuations	5,000-8,000 cfs flow fluctuations	
Number of Fish Caught	Same number of fish as you caught on your trip	Double the number of fish you caught on your trip	
Chance of fish caught	Double the chance of catching a trophy fish	Same chance of catching a trophy fish as on your trip	
How much individual trip costs increased by	\$75	\$700	
How much I would choose to pay (check one only)	Trip A <input type="checkbox"/>	Trip B <input type="checkbox"/>	Not Visit <input type="checkbox"/>

check ONE box at the bottom of the table to indicate whether you prefer Trip A, Trip B, or Not Visit.

Characteristic	Trip A	Trip B	Not Visit
	Assume that everything about your Lee's Ferry trip were the same except the following	Assume that everything about your Lee's Ferry trip were the same except the following	
Large River Flow Level	3,000 cfs	40,000 cfs	I would not choose to take a Lee's Ferry Fishing trip if these were my only choices
Large River flow fluctuation	5,000-8,000 cfs flow fluctuations	Steady Flow levels	
Number of Fish Caught	Double the number of fish you caught on your trip	Same number of fish as you caught on your trip	
Chance of fish caught	Same chance of catching a trophy fish as on your trip	Same chance of catching a trophy fish as on your trip	
How much individual trip costs increased by	\$25	\$75	
How much I would choose to pay (check one only)	Trip A <input type="checkbox"/>	Trip B <input type="checkbox"/>	Not Visit <input type="checkbox"/>

Incentive structure

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February 2022	Base	\$33/fish, \$50 for 3rd fish, \$300 for PIT tagged fish
February 2023	Proposed Base	\$33/fish, \$50 for 3rd fish, \$15 for PIT tagged fish, \$300 for fish greater than 20 inches

Questions?