March 9 2015

~ 20 Miles to Lake Powell

Species	Year	Days sampling	Days detecting	Number detected	*Number captured	Percent female
Razorback sucker	2015	6[a]	107	499	16	---
	2016	6	36	472	167	53%
	2017	13	111	615	183	48%
	2018	11	365?	899	227	
	2019	12	135 (Jan-May)	683	82	
	Total unique			1477	444	
Colorado pikeminnow	2015			15	6	---
	2016			8	6	---
	2017			7	6	---
	2018			45	3	---
	2019			12	17	---
	Total unique			72	24	

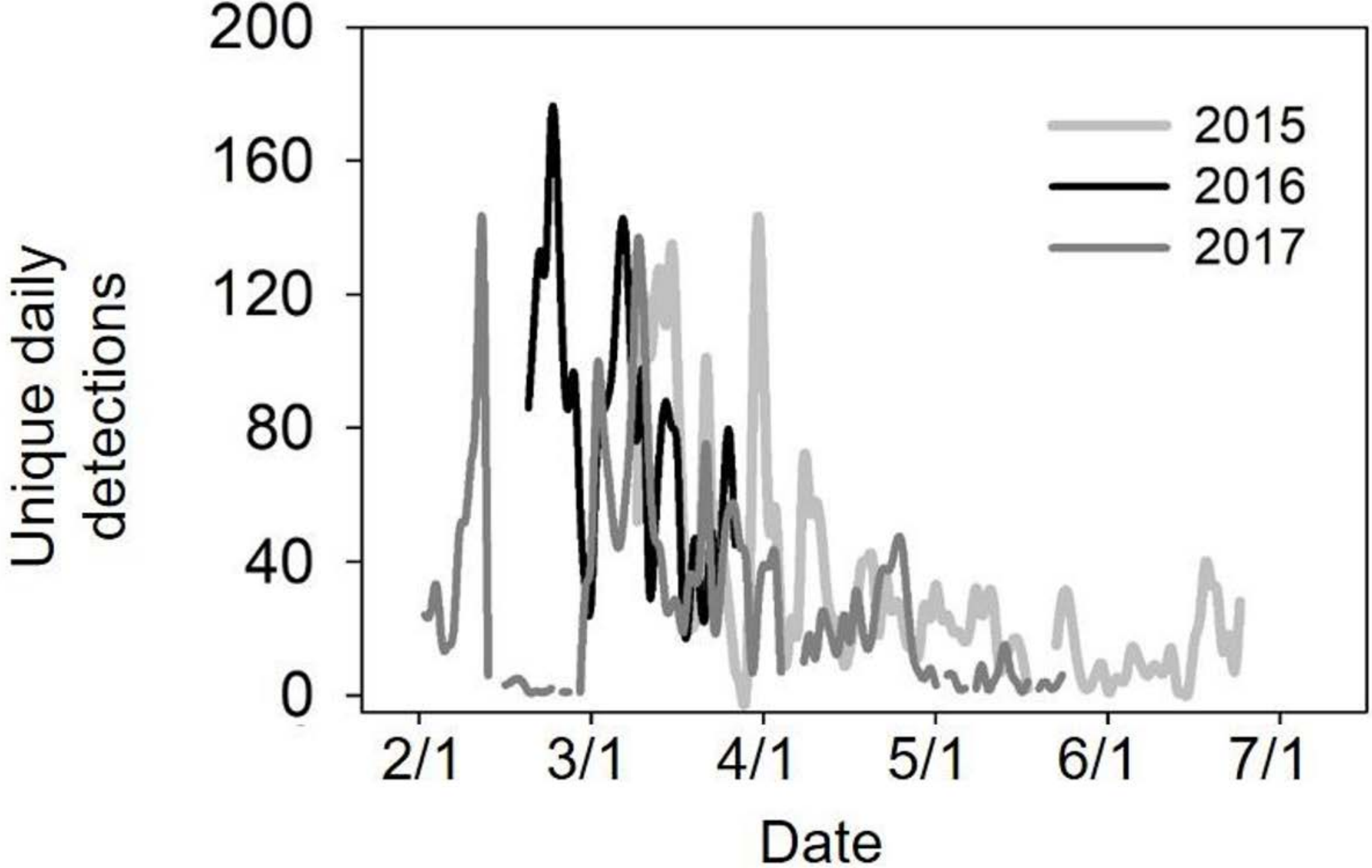
*15-20% of Razorback Sucker lacked tags

Population estimate

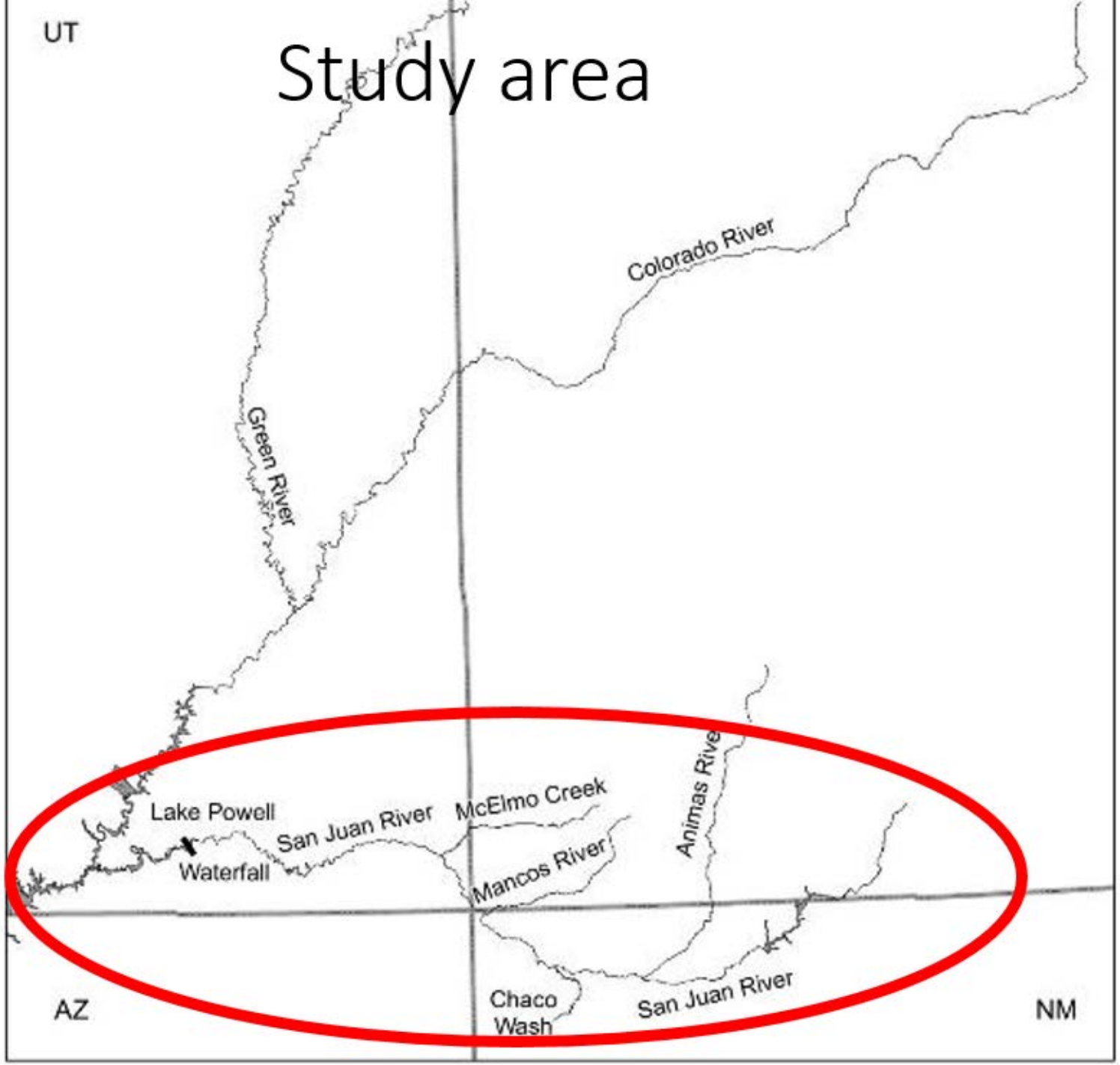
- USFWS population estimates from 112.5 km of the upper river in 2015 ranged from 2,296 to 4,073.

- We estimated 755 fish downstream of the waterfall in 2017 (19-33% of San Juan River population).

- Downlisting criteria (endangered → threatened) is 5,800 adult razorback sucker in the San Juan River.

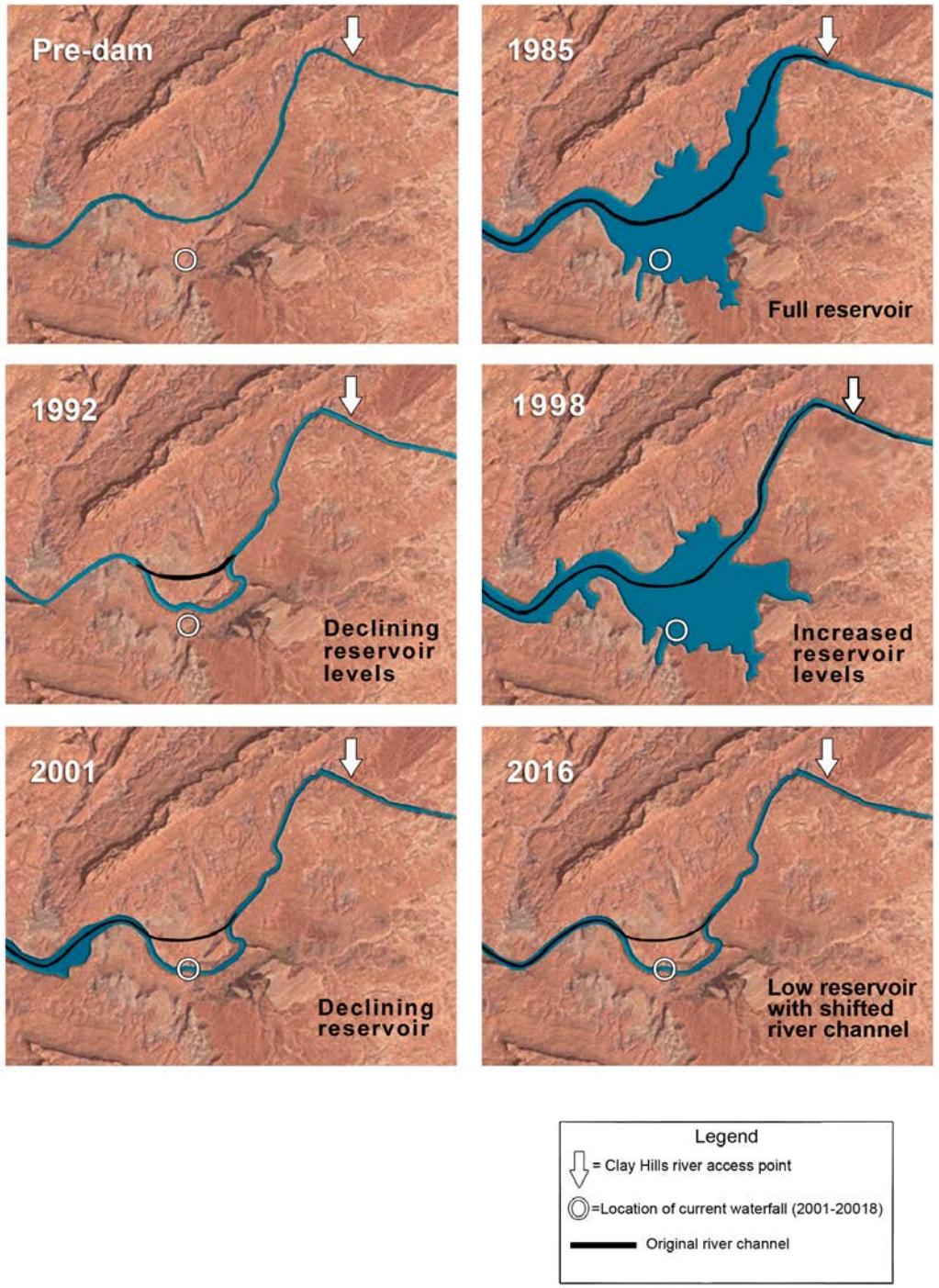

200
160
120
80
40
0
Unique daily detections
2015
2016
2017
2/1
3/1
4/1
5/1
6/1
7/1
Date

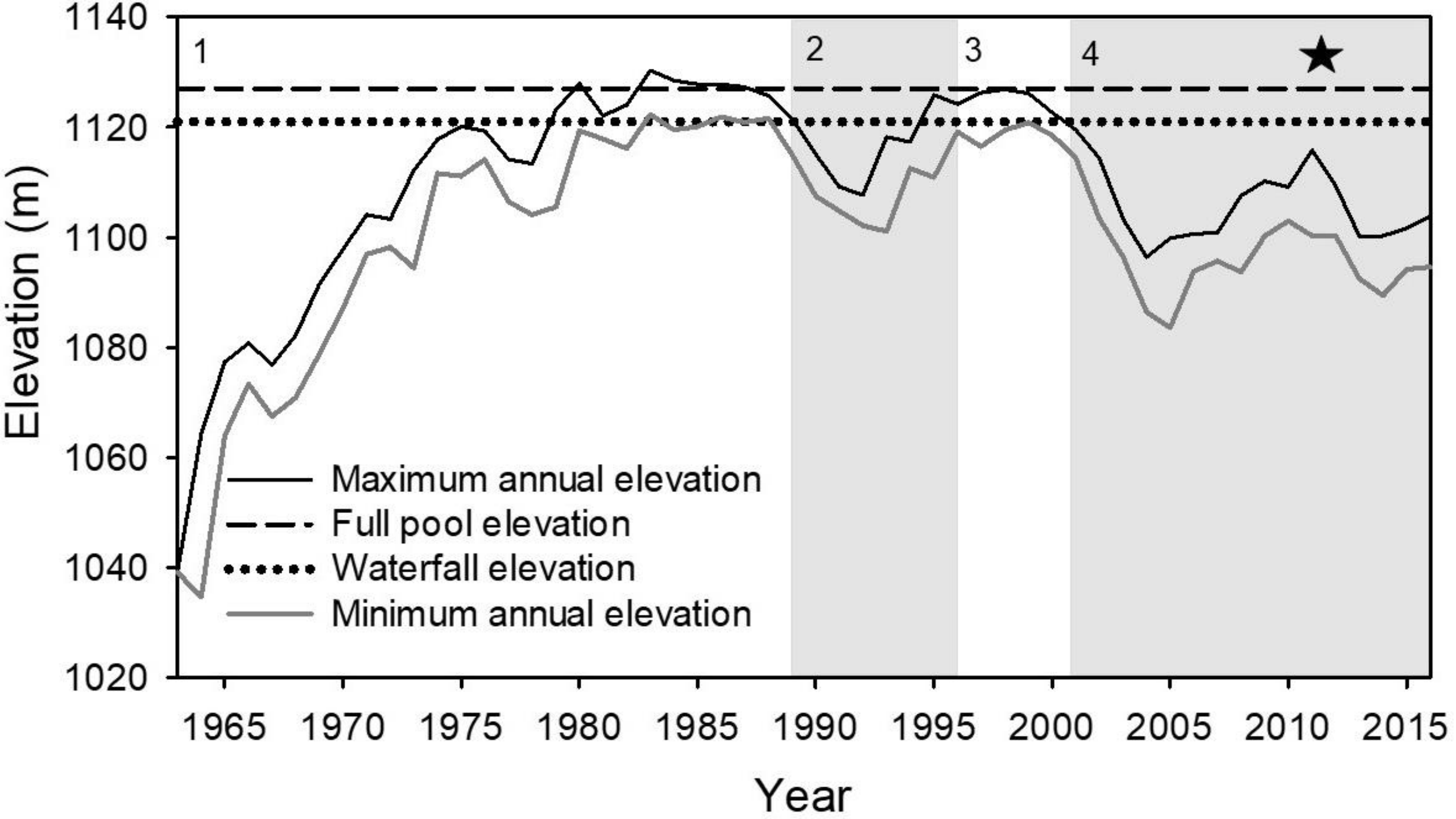
Study area


UT
Colorado River
Green River
Lake Powell
San Juan River
McElmo Creek
Waterfall
Mancos River
Animas River
Chaco
Wash
San Juan River
AZ
NM

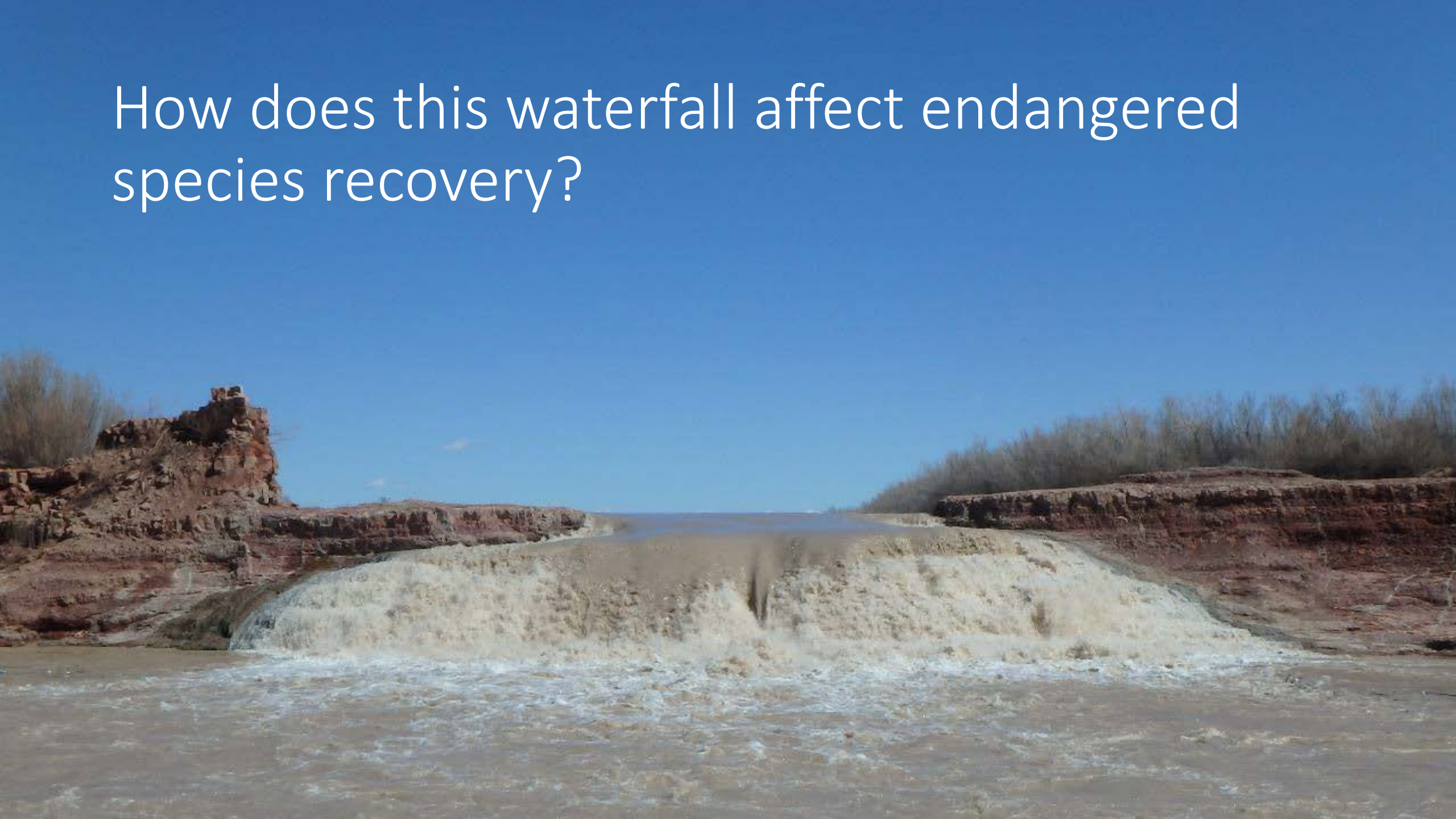
Lake Powell-San Juan Inflow

Since the 1980s, reservoir fluctuations affected superimposition processes and shifted the channel.




1140
1120
1100
1080
1060
1040
1020
Elevation (m)
1
2
3
4
Maximum annual elevation
Full pool elevation
Waterfall elevation
Minimum annual elevation
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Year

How does this waterfall affect endangered species recovery?



Implications to the upper San Juan River

- Within-basin and trans-basin pathways are lost
- Fish traveling past waterfall are currently not counted and can’t return
- Appears to be lotic, lentic, and adfluvial life histories
- **Barrier to nonnative fish!!!!**
- Fish passage: total connectivity, translocations, selective passage, or hands-off?

Current Methods

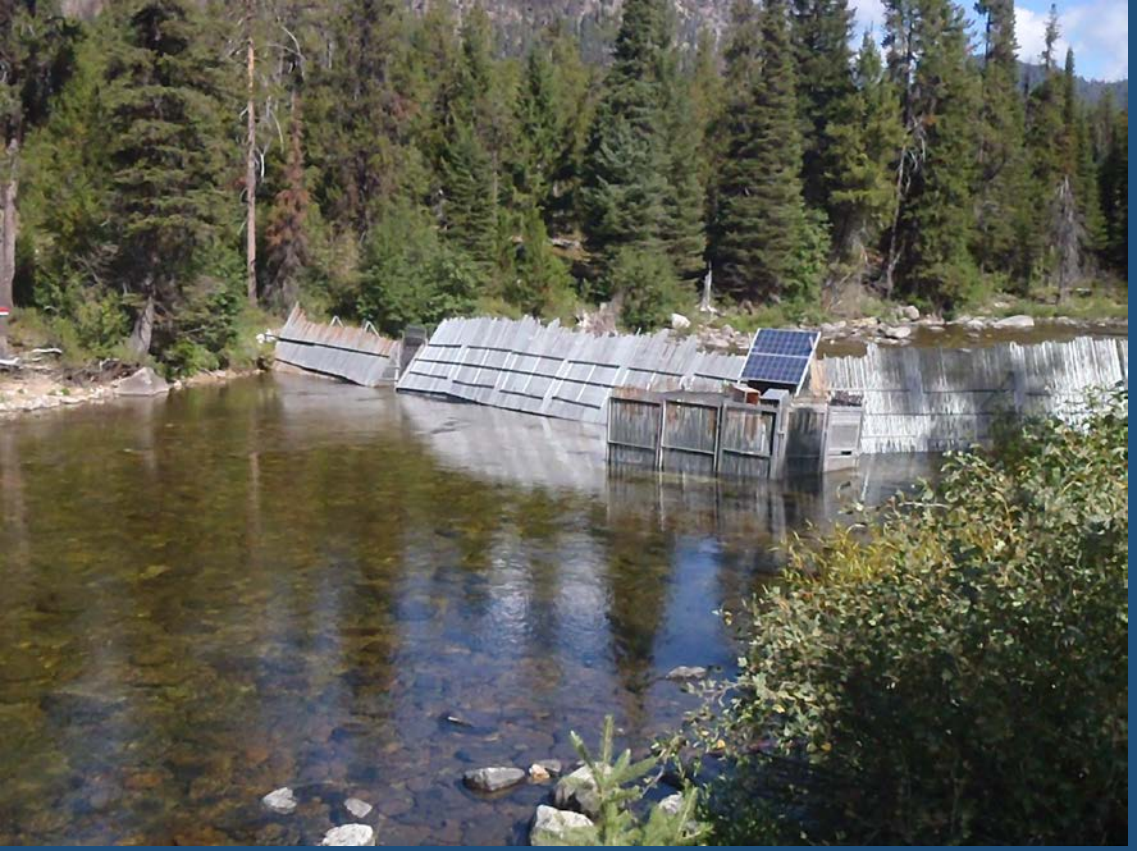
Expert Visits

FWS, BOR and outside experts

Cabela's

San Juan River
Google

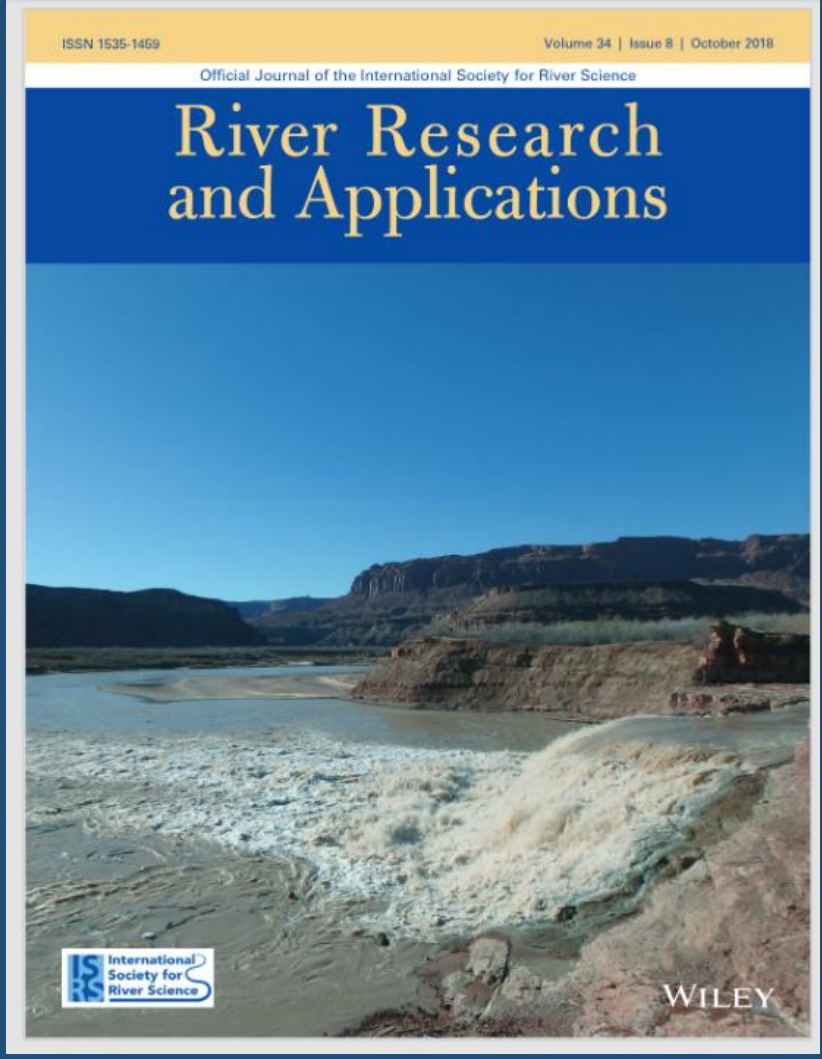
Mikes Mesa
Clay Hills Boat Ramp
San Juan River
Waterfall
San Juan River
Google



Better Traps

Solutions?

- Continued electrofishing and transport
- Dynamite waterfall—free passage
- Excavate old channel—Reclamation Denver TSC
- Selective passage at waterfall—Reclamation Denver TSC
- Construct barrier at Clay Hills and selective passage (sheet piling)—Reclamation Denver TSC
- Build a better fish trap—FishBio, CA
- Ignore problem



Cathcart et al. 2018. River Research and Applications 34: 948-956

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MUCH ADO ABOUT SOMETHING: OPTIONS FOR SOLVING THE FISH PASSAGE PROBLEM AT THE PIUTE FARMS WATERFALL

Mark McKinstry (USBR), Casey Pennock (KSU), Nate Cathcart (AG&FD), Eliza Gilbert (USFWS), Peter MacKinnon (USU)

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