Colorado River fish monitoring in Grand Canyon, Arizona: 1990-2013 humpback chub, *Gila cypha*, aggregations.

Glen Canyon Dam Adaptive Management Program
Annual Reporting Meeting
January 28, 2014

William R. Persons[1] (wpersons@usgs.gov)
David R. VanHaverbeke[2]
Brian Healy[3]

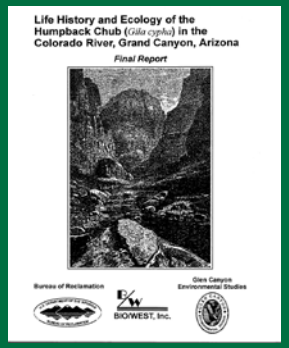
[1] Grand Canyon Monitoring and Research Center
[2] U.S. Fish and Wildlife Service
[3] Grand Canyon National Park

U.S. Department of the Interior
U.S. Geological Survey

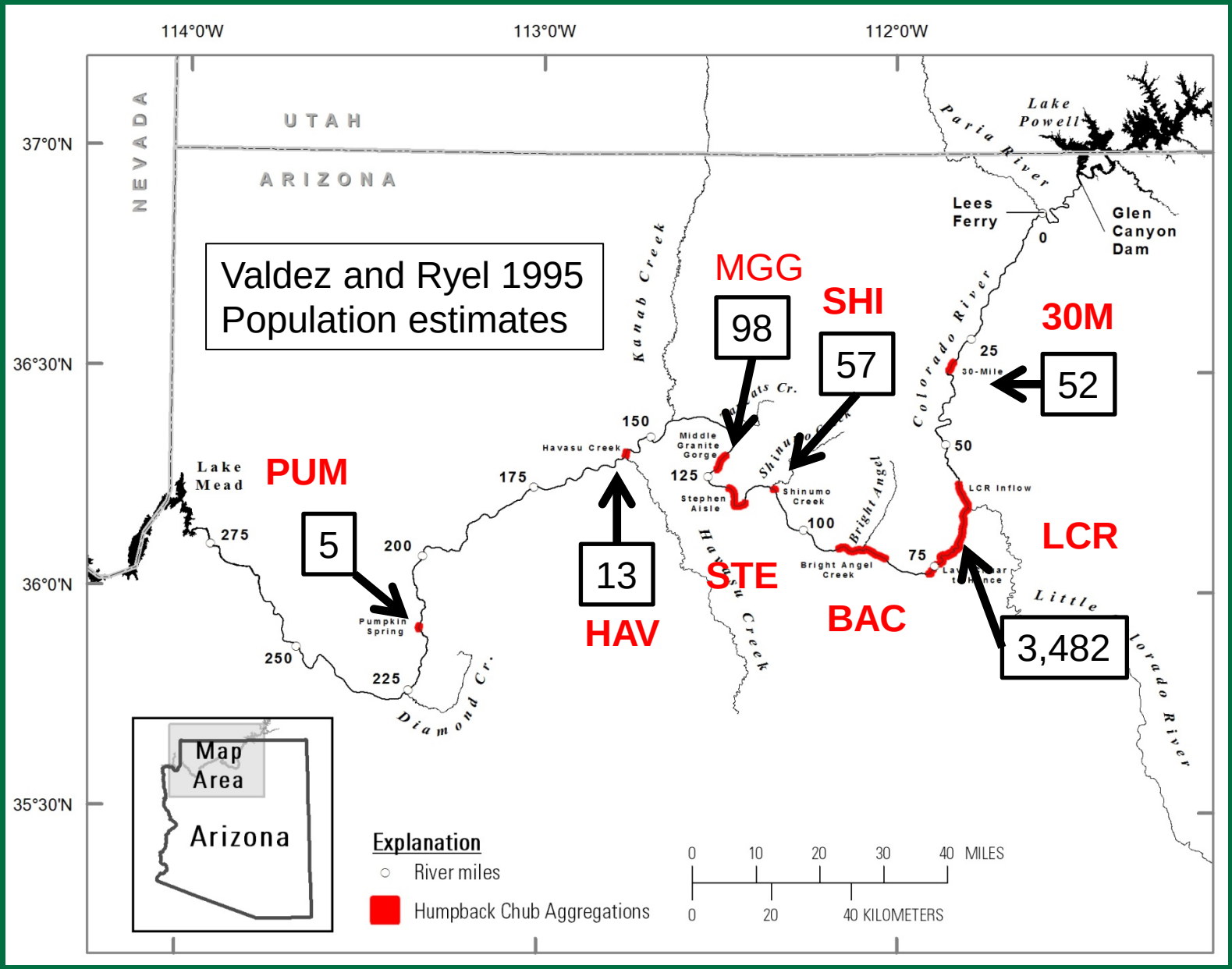
Aggregation:

"a consistent and disjunct group of fish with no significant exchange of individuals with other aggregations, as indicated by recapture of PIT-tagged juveniles and adults and movement of radio-tagged adults"

(Valdez and Ryel, 1995).



USGS



USGS

Map courtesy of Tom Gushue, GCMRC

Outline:

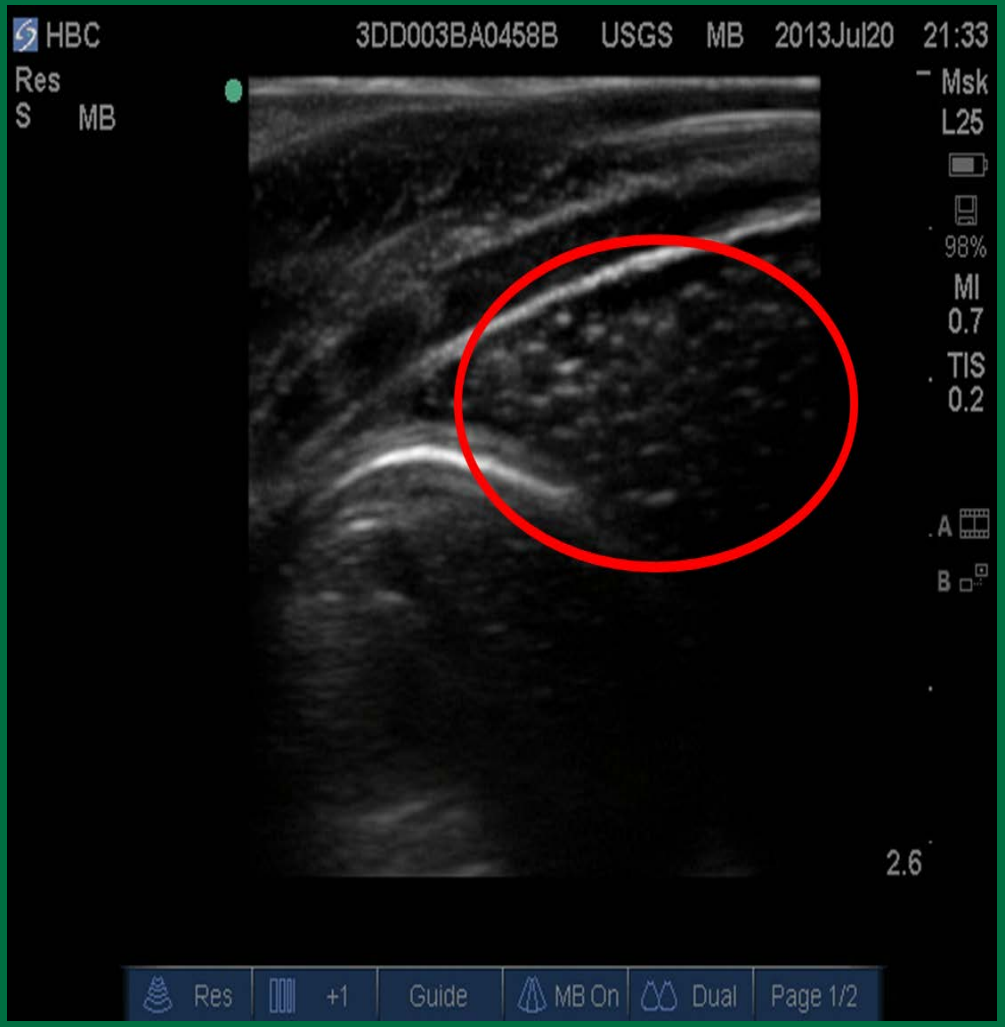
- Problems with population estimates using pooled capture probabilities
- Ultrasound
- Trends in catch rates
- 30 Mile, Shinumo, Havasu
  - Catch per unit effort
  - Distribution
  - Contribution of translocations
- Future directions

USGS

Ultrasound Results

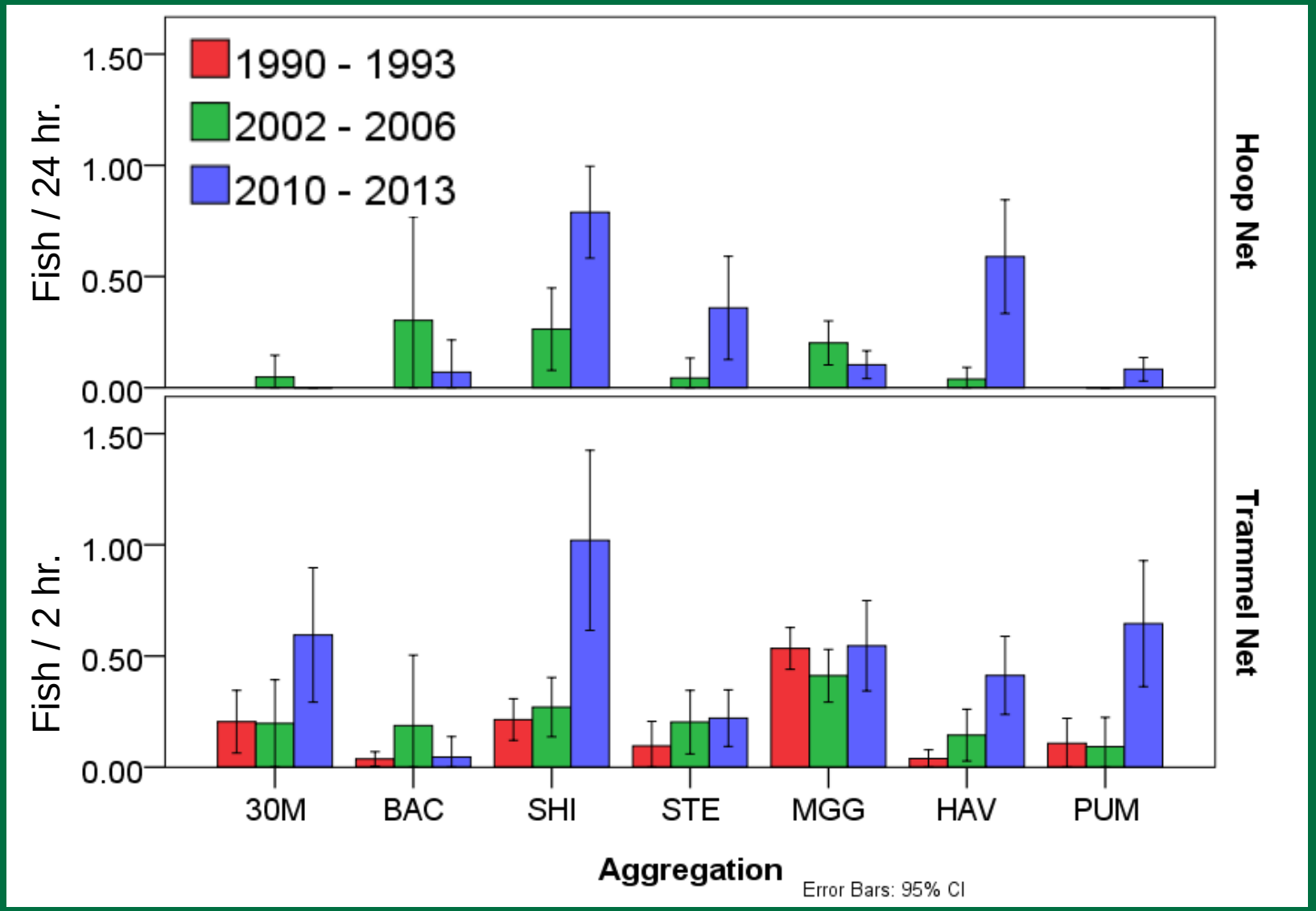
(see Poster session for more detail)

- Identified egg development with ultrasonic imaging
- Documented egg development in
  - LCR
  - Colorado River
  - Havasu Creek



USGS

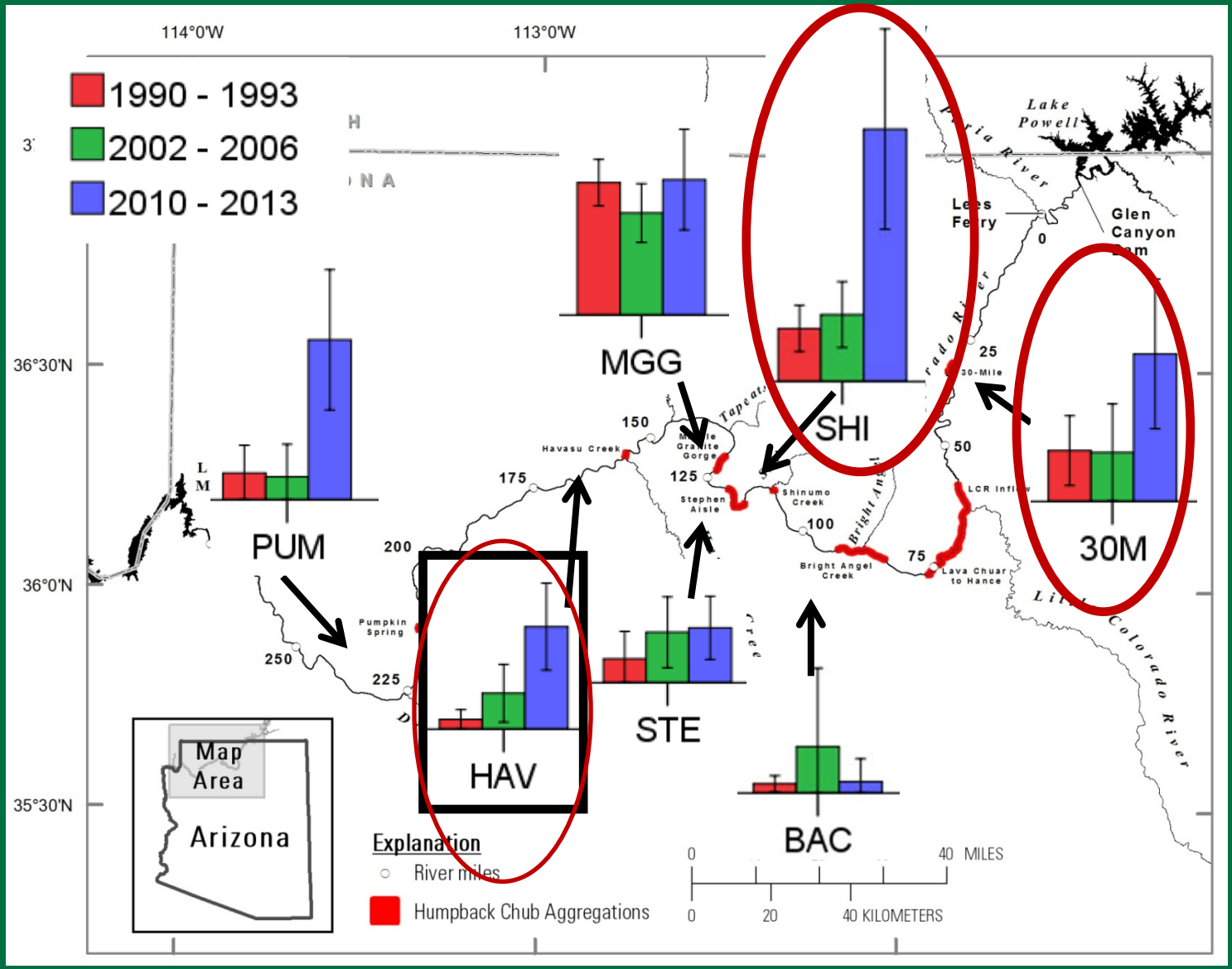
Catch per unit effort of HBC > 150 mm



USGS

PRELIMINARY DATA from GCMRC fish capture history database, SUBJECT TO REVISION, DO NOT CITE

TRAMMEL NET CPUE

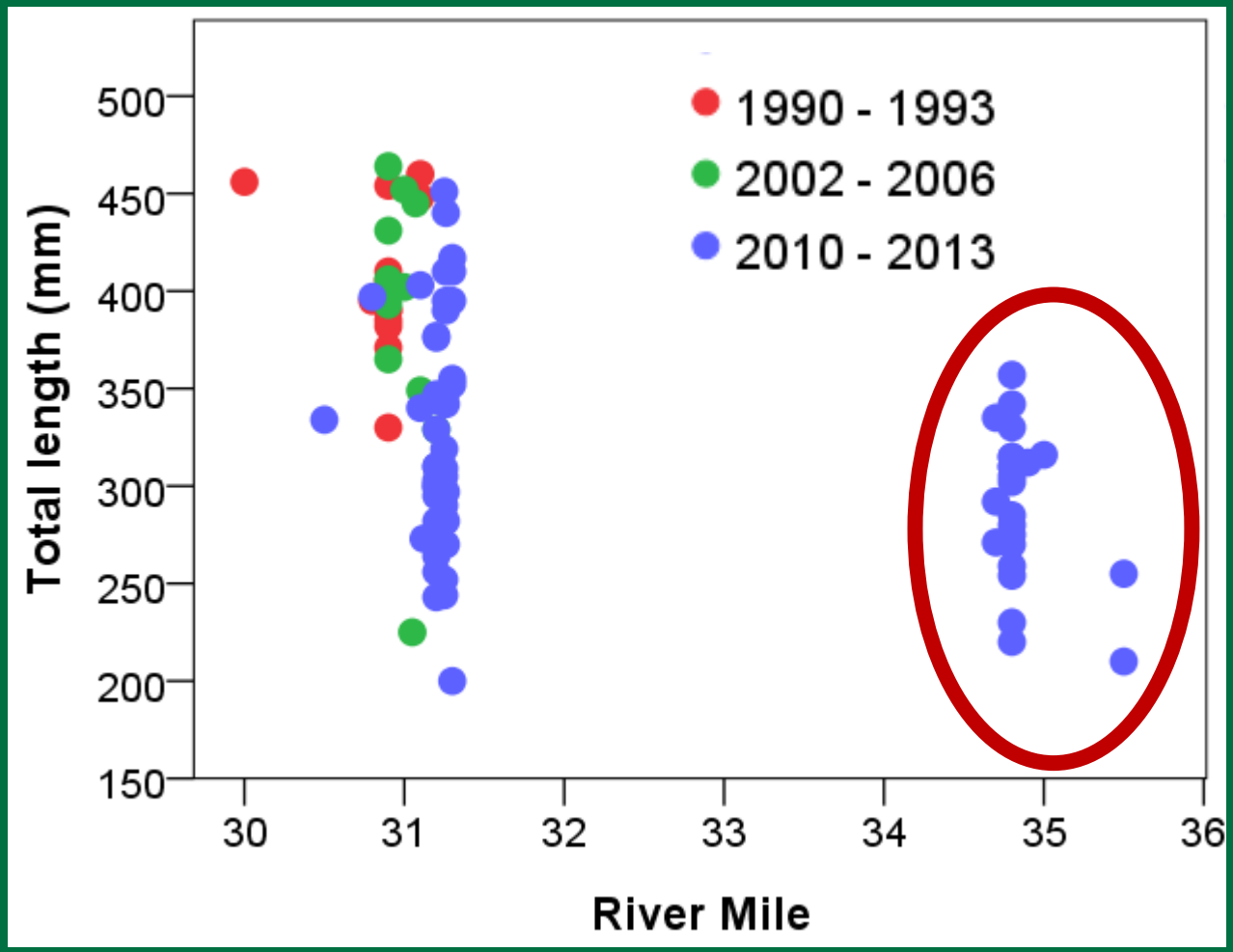


USGS

Map courtesy of Tom Gushue, GCMRC

PRELIMINARY DATA from GCMRC fish capture history database, SUBJECT TO REVISION, DO NOT CITE

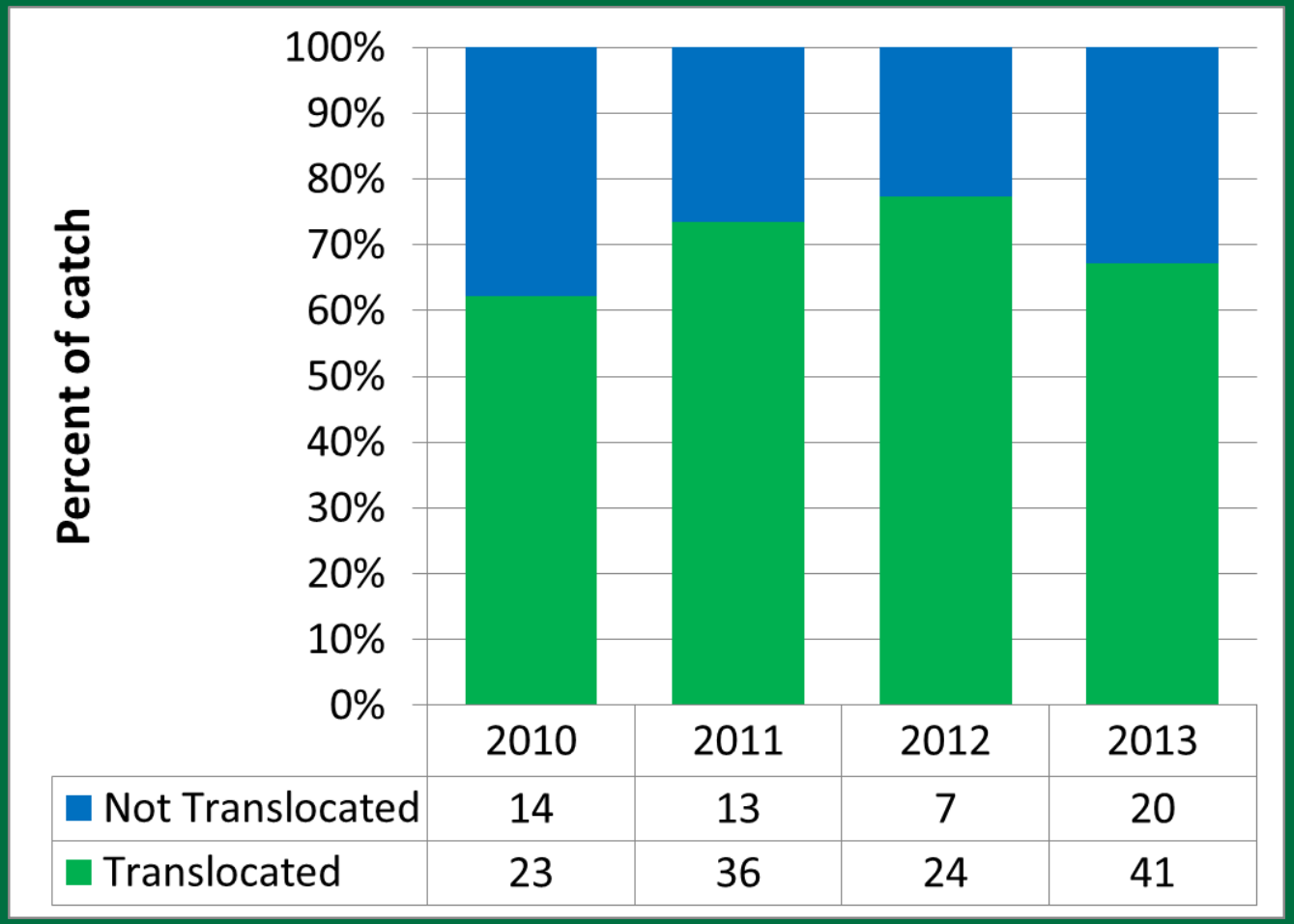
30 Mile range expansion?



USGS

PRELIMINARY DATA from GCMRC fish capture history database, SUBJECT TO REVISION, DO NOT CITE

Shinumo translocations contribute to mainstem aggregation:

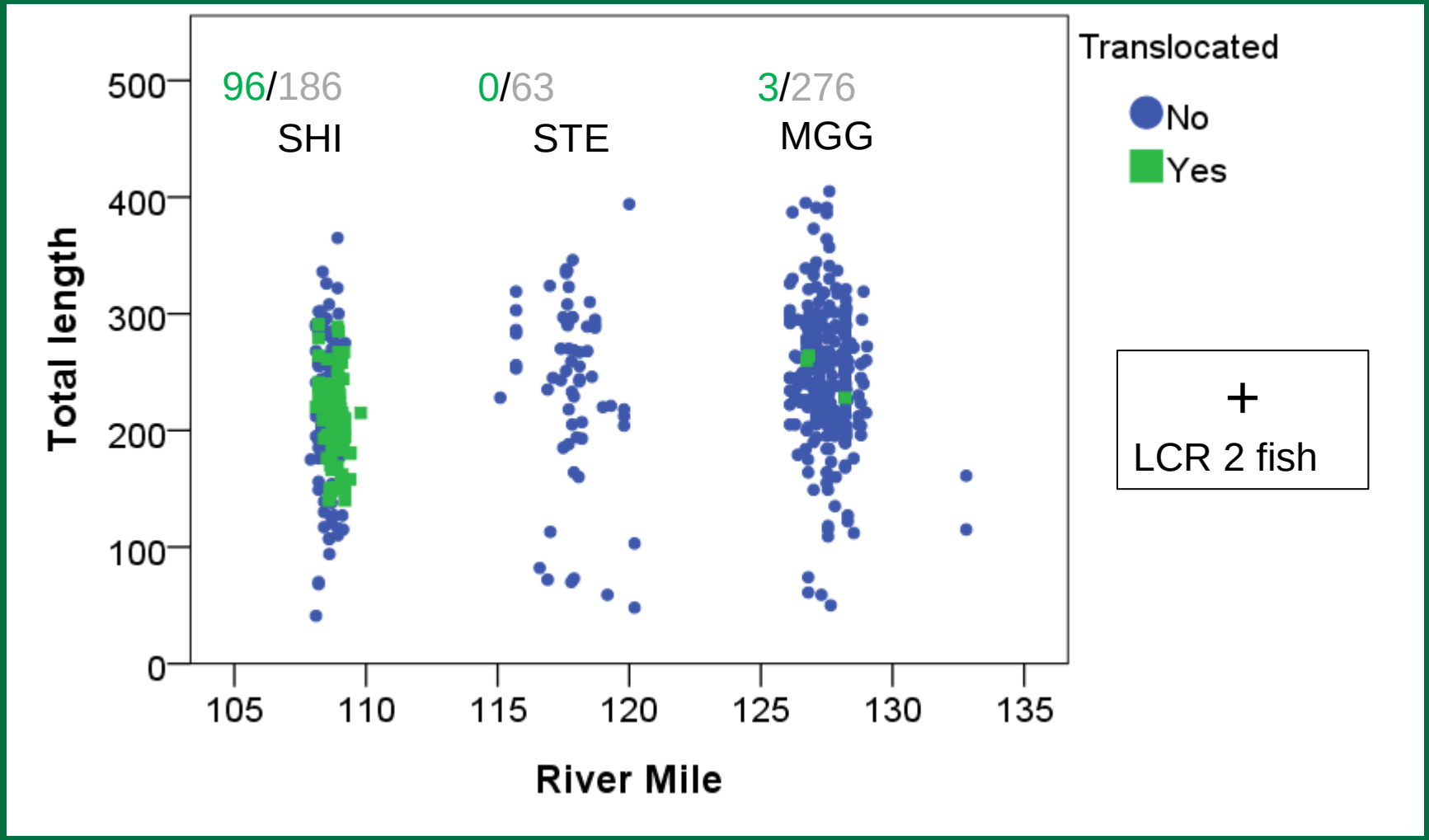


	2010	2011	2012	2013
Not Translocated	14	13	7	20
Translocated	23	36	24	41

USGS

PRELIMINARY DATA from GCMRC fish capture history database, SUBJECT TO REVISION, DO NOT CITE

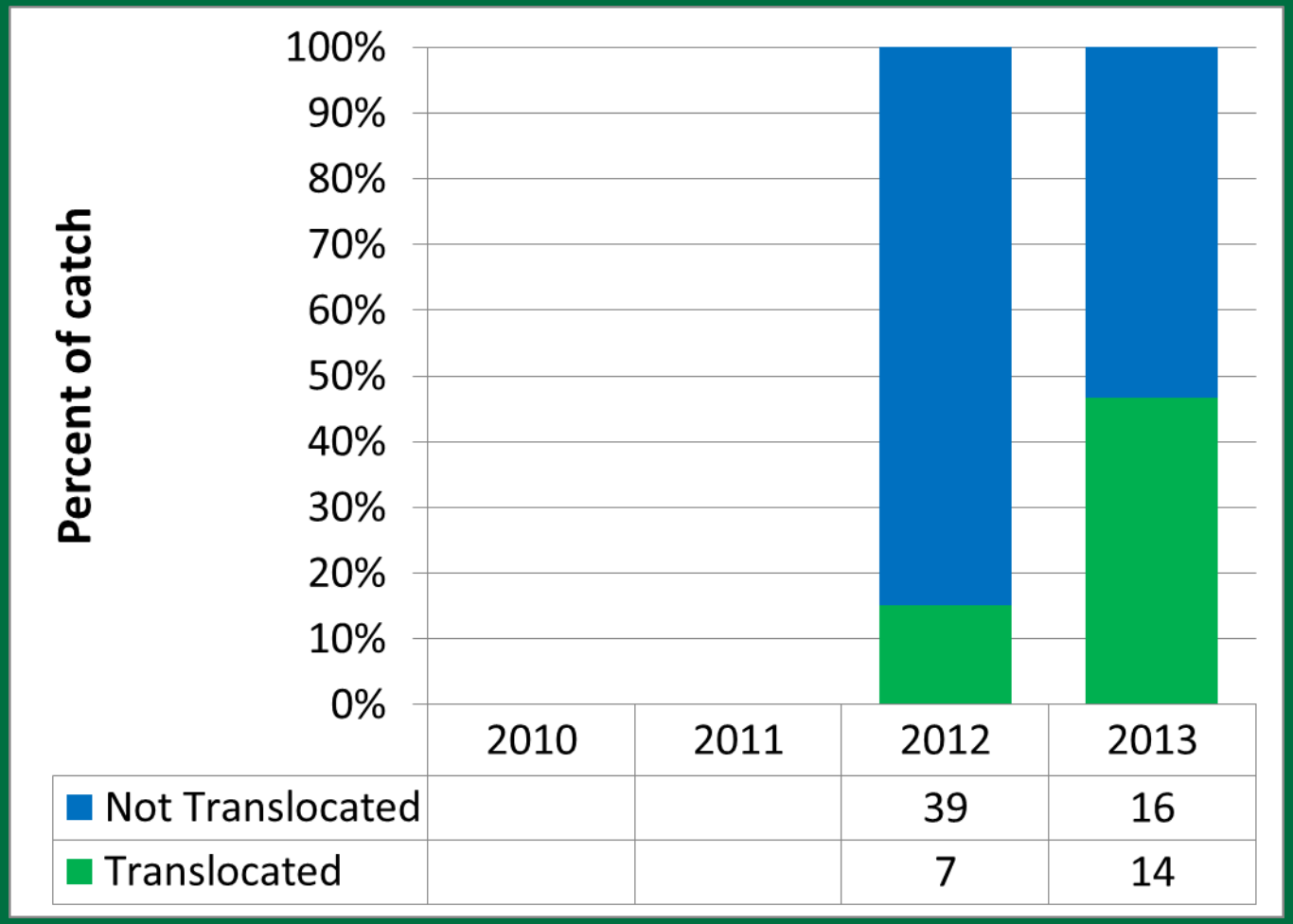
Where do Shinumo Translocations Go?



USGS

PRELIMINARY DATA from GCMRC fish capture history database, SUBJECT TO REVISION, DO NOT CITE

Havasu translocations contribute to mainstem aggregation:



USGS

PRELIMINARY DATA from GCMRC fish capture history database, SUBJECT TO REVISION, DO NOT CITE

Site Fidelity 1989-2013

Includes LCR antenna detections

		RECAPTURE LOCATION									
MARK	n	30M	LCR	BAC	SHI	STE	MGG	HAV	PUM	Total	Site Fidelity
30 M	72	**31**	3							34	91.2%
LCR	51,061	2	**22,093**			1	1	1		22,098	100.0%
BAC	30		1							1	0.0%
SHI	1,017		1		101					102	99.0%
STE	88		1			3	2			6	50.0%
MGG	355						73			73	100.0%
HAV	680		2					62		64	96.9%
PUM	36								3	3	100.0%
Total	53,339	33	22,101	0	101	4	76	63	3	22,381	

USGS

PRELIMINARY DATA from GCMRC fish capture history database, SUBJECT TO REVISION, DO NOT CITE

Key findings:

Increasing abundance and distribution of HBC:

- **Key Drivers:**
  - **Generally warmer than normal water during last decade, especially 2004, 2005, 2011**
  - **Translocations**
    - **Shinumo Creek: 1,102 fish 2009-2013**
    - **Havasu Creek: 840 fish 2011-2013**
  - **Mechanical trout removal at LCR confluence 2003-2006, 2009 and system wide decline in trout (2000-2007)**
  - **Good production of humpback chub from Little Colorado River and high juvenile survival**

USGS

Future Directions:

- Increase sampling effort at areas outside of known aggregations.
- Reduce trammel net effort at most locations
- Investigate use of slow shocking for small humpback chub
- Humpback chub natal origins project 2014
  - Continue Portable ultrasound research
  - Revise otolith microchemistry project

USGS

Contact Information:

William Persons wpersons@usgs.gov
USGS Grand Canyon Monitoring and Research Center
928-556-7323

David R. VanHaverbeke randy_vanhaverbeke@fws.gov
US Fish and Wildlife Service
928-556-2154
Brian Healy brian_healy@nps.gov
Grand Canyon National Park
928-638-7453

USGS