



Chute Falls Humpback Chub Translocations Objectives, Effectiveness and Future Work

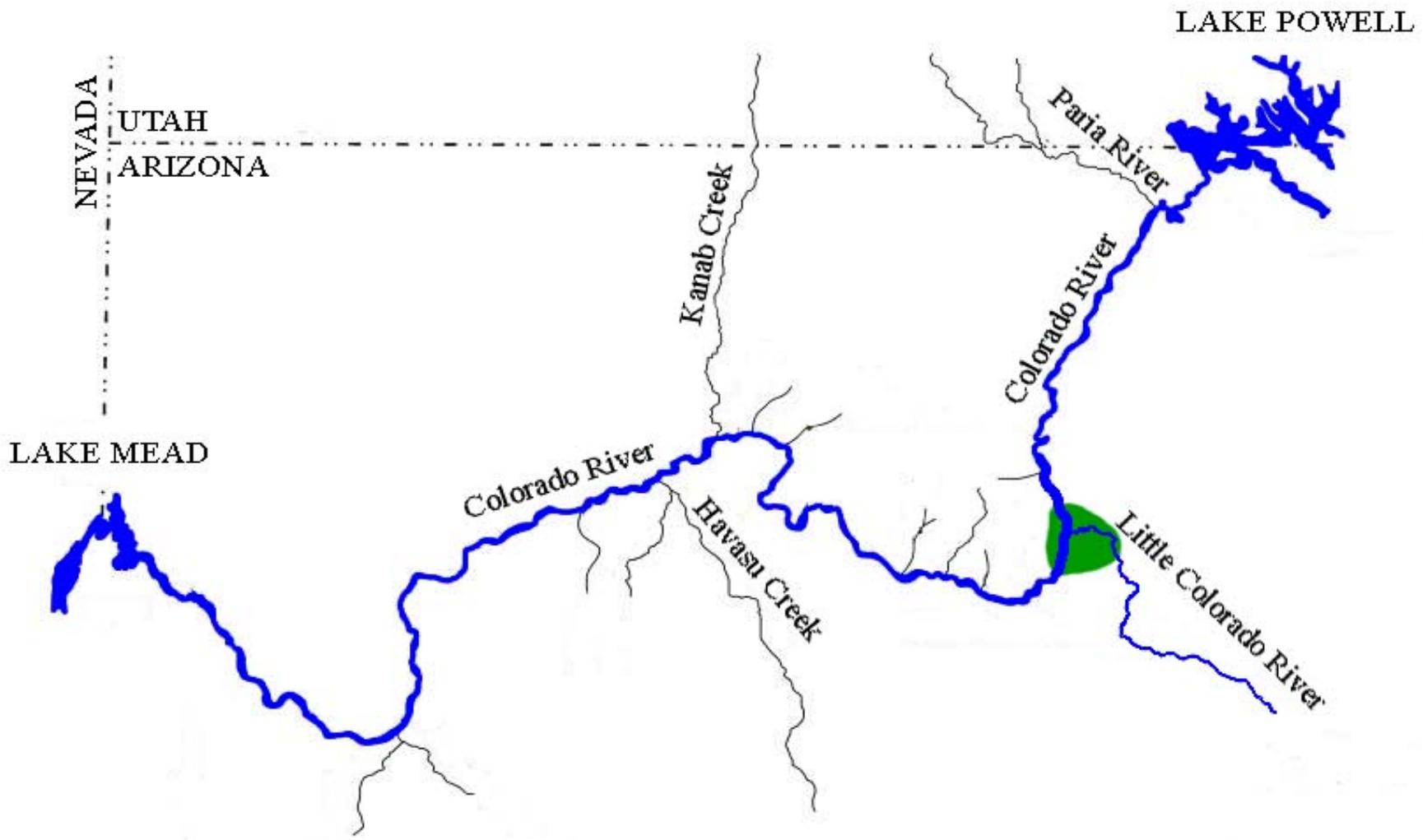
22 January 2013

Kirk Young - USFWS

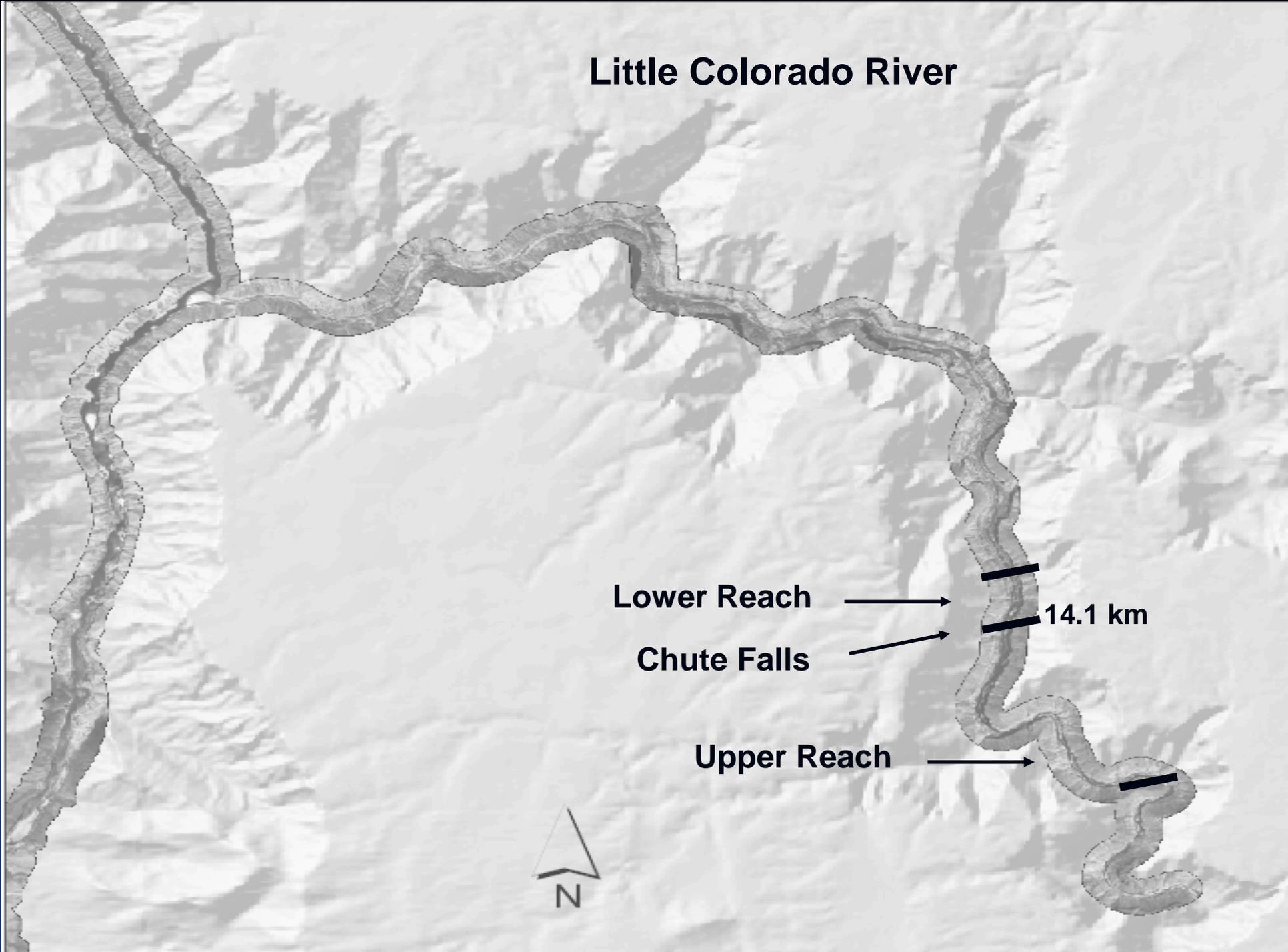
C.F. Translocation Outline

- Background
- Project Objectives
- Results/Knowledge and Effectiveness
- Future Work





Little Colorado River



Lower Reach



Chute Falls



Upper Reach



14.1 km



Background

Chute Falls:

- No HBC above Chute Falls – fish barrier
- High CO₂ levels – prevent HBC?
- High productivity and higher winter Temps

Translocation:

- Translocations began 2003; 8 to date
- 2,060 HBC over 10 years
- ~1,217 PIT tagged
- Annual Monitoring – Hoop Nets



Objectives

2003-2005 Translocations

- Determine if HBC can survive and remain above Chute Falls;
- Determine if HBC grow (given increased food availability, but potential detrimental impacts from CO₂);
- Determine if HBC can recruit to adulthood;
- Determine if HBC spawning population will develop.



Objectives

2006-current

- Conduct mark/recapture population estimates – 2 reaches (>CF and LA to CF) to determine:
 - Migration patterns
 - Growth rates
 - Spawning activity
 - Assess overall benefit to LCR HBC



Results

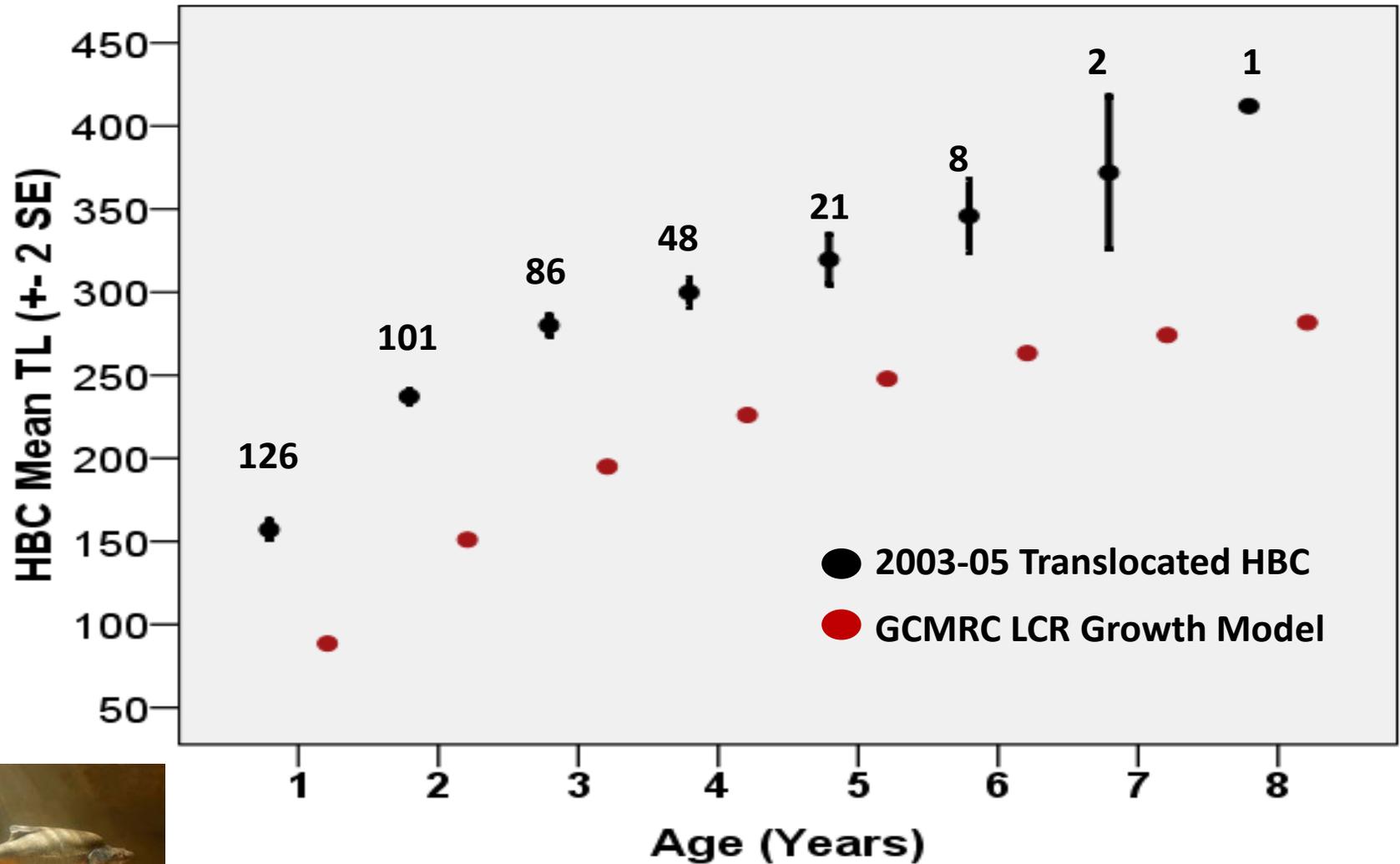
Survival

- Several HBC found above CF ≥ 4 years
(6 years - max)
- Fish detected upstream to rkm 17.89
 - >3.5 km above CF; 1.5 km above release site
- Most fish vacated $>CF$ during 2009-2010 Exodus



Results

Growth



Results

Spawning

Above CF:

- > 200 HBC in Spawning Coloration (116F; 99M)
- 6 Females (ripe, gravid or spent)
- 142 males ripe
- 3 YOY (54-63 mm) in 2007
- Spawning appears to occur, probably transient; fish could be moved out by spring freshets

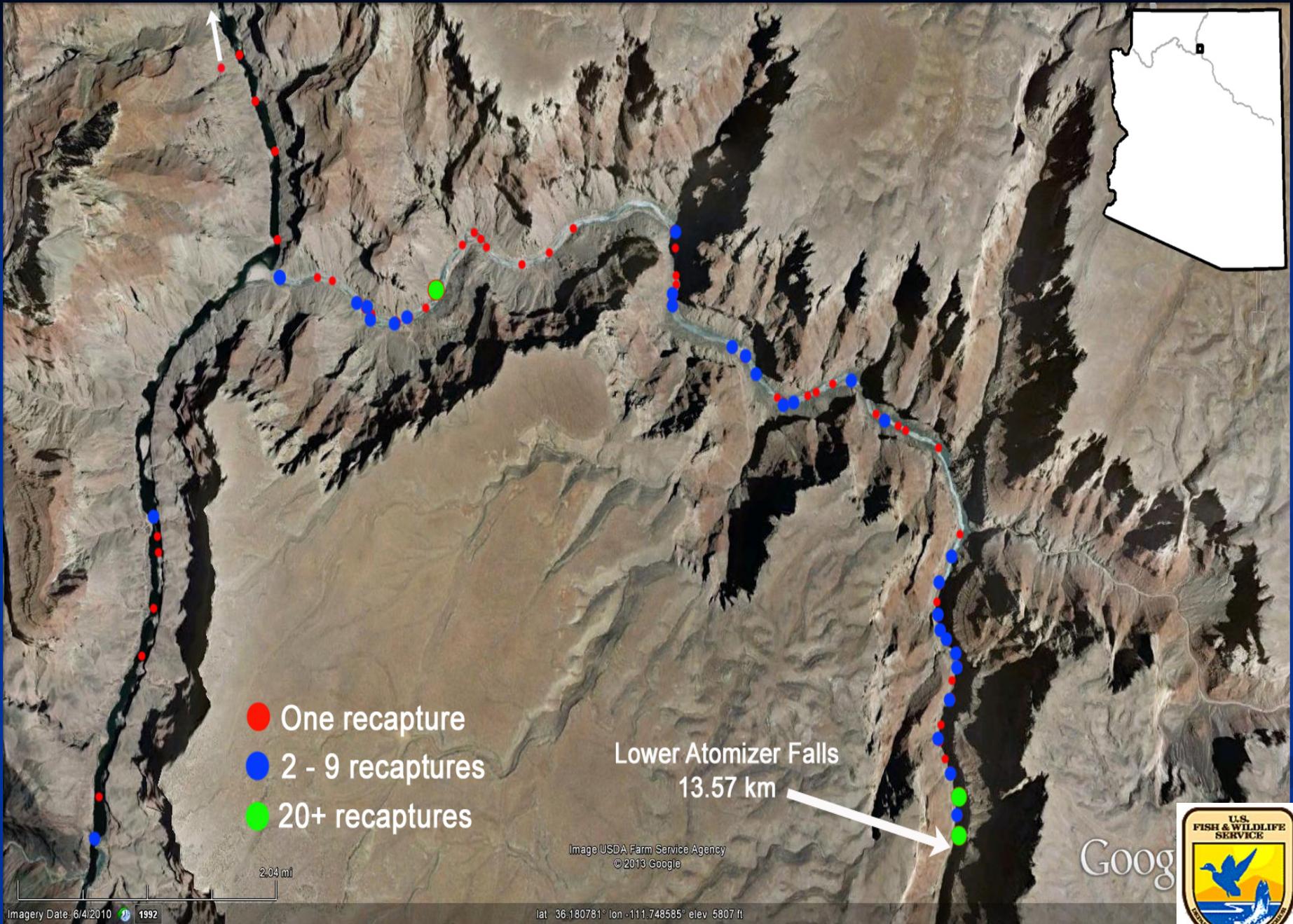


Results

Migration Patterns

- Chute not barrier
5 fish surmounted;
- Movement
throughout, including
Colorado R.





Results

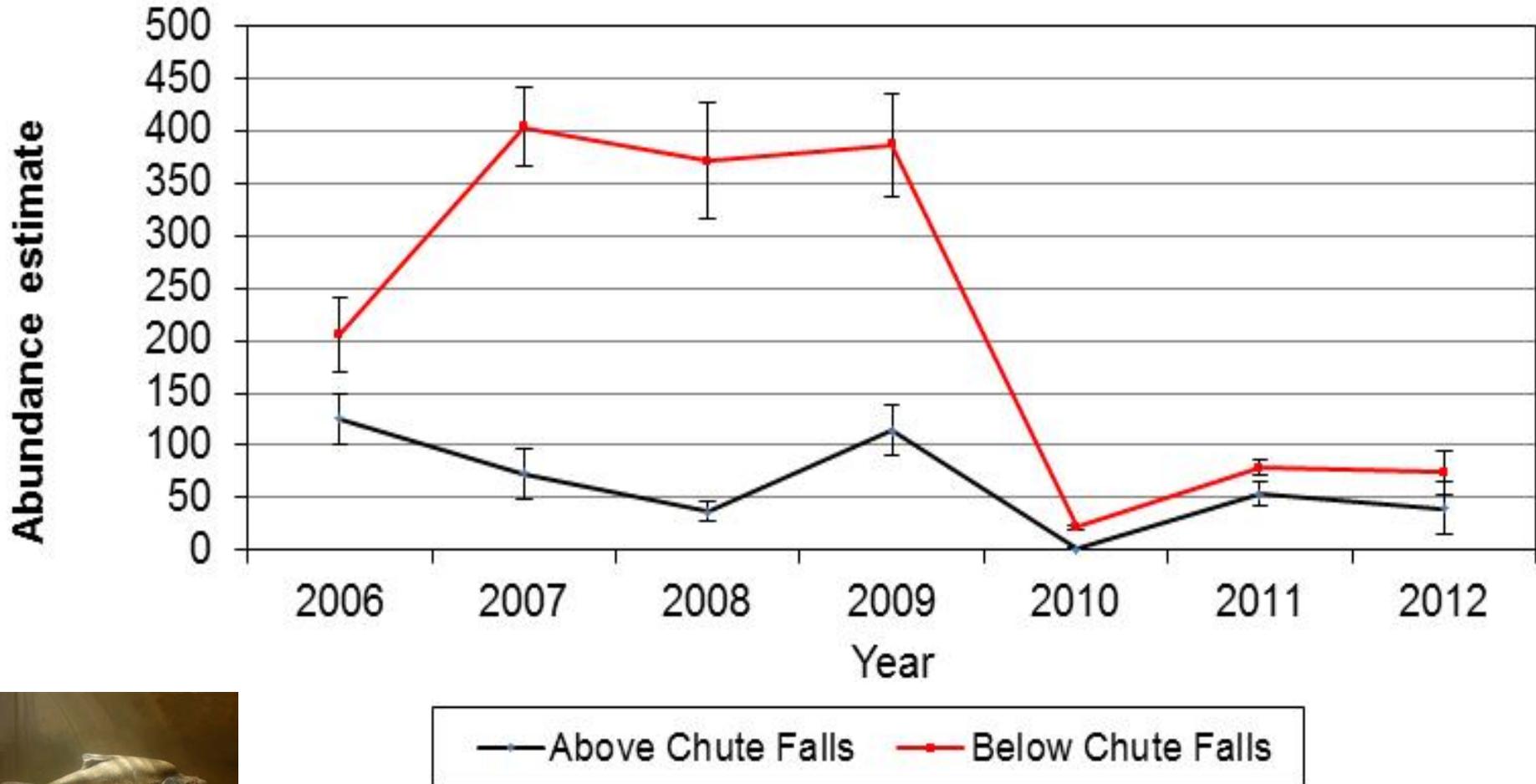
What is Benefit to LCR HBC

- Not fully quantified yet, but potentially large
- Pop Estimates and Survival/mortality estimates key

Here's what we know.....



Abundances of Humpback Chub ≥ 200 mm above and below Chute Falls



June 2010

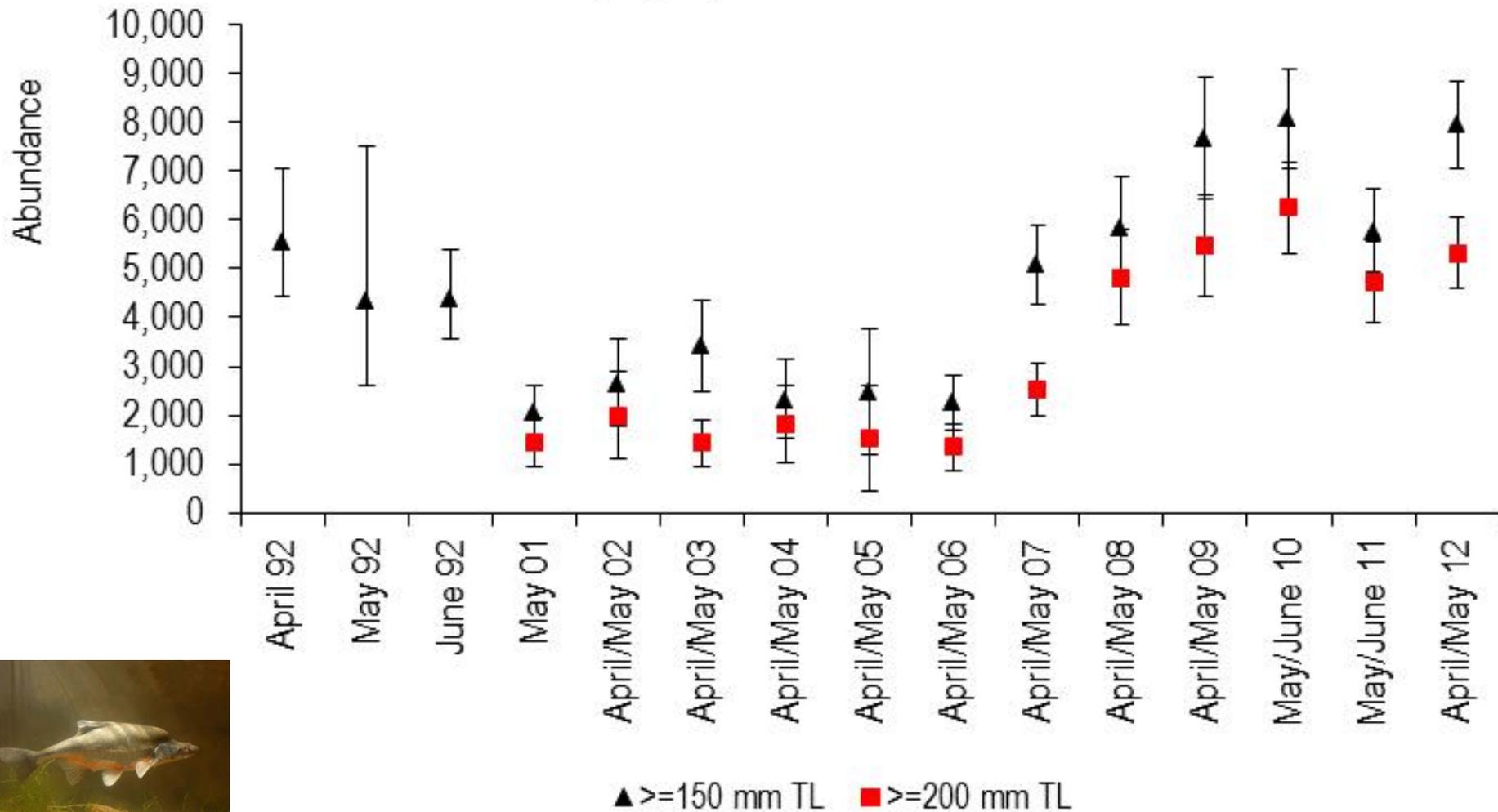


October 2012



LCR - Spring Abundance of HBC ≥ 150 mm and ≥ 200 mm

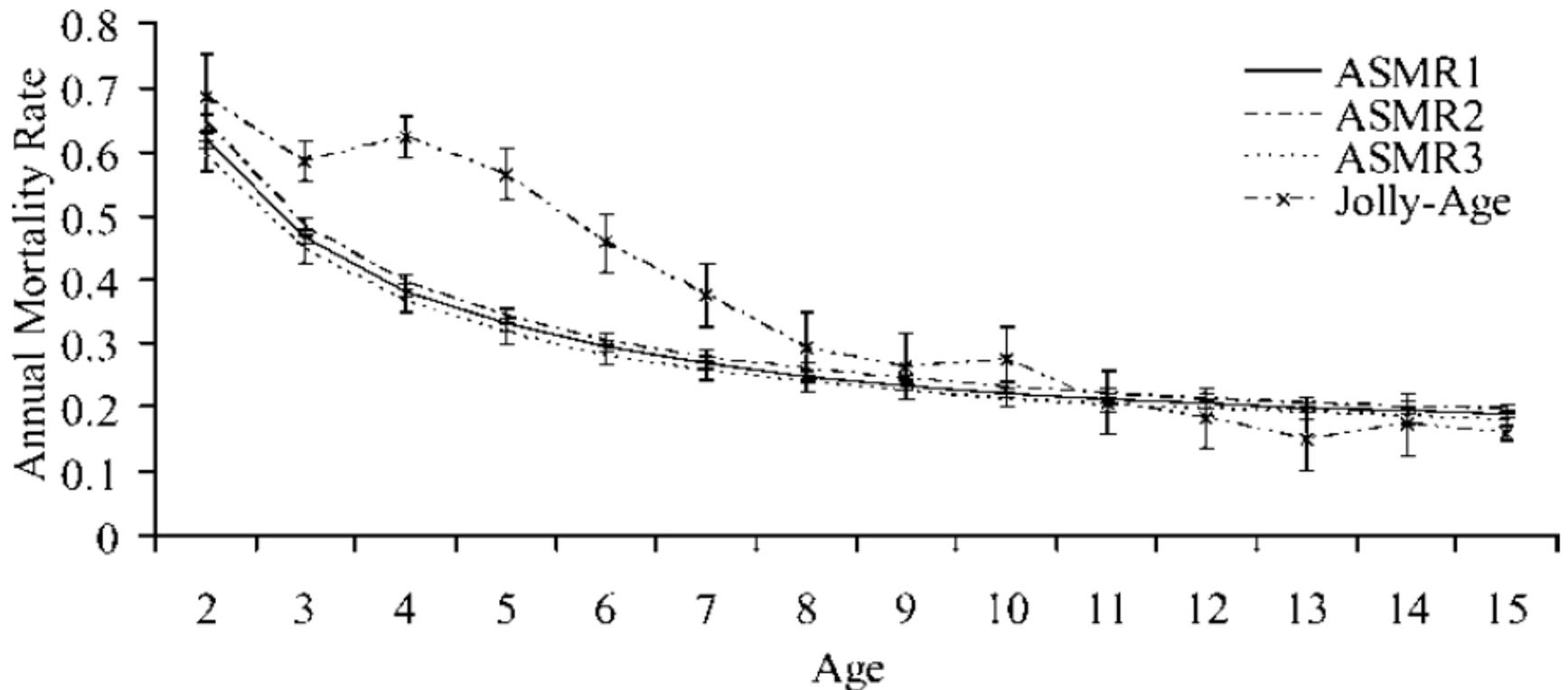
A) Spring Abundances



Results

Mortality/Survival rates?

Coggins et al. 2006: 68% mortality/32% survival age 2;
Age 0 & 1 mortality > but not quantified



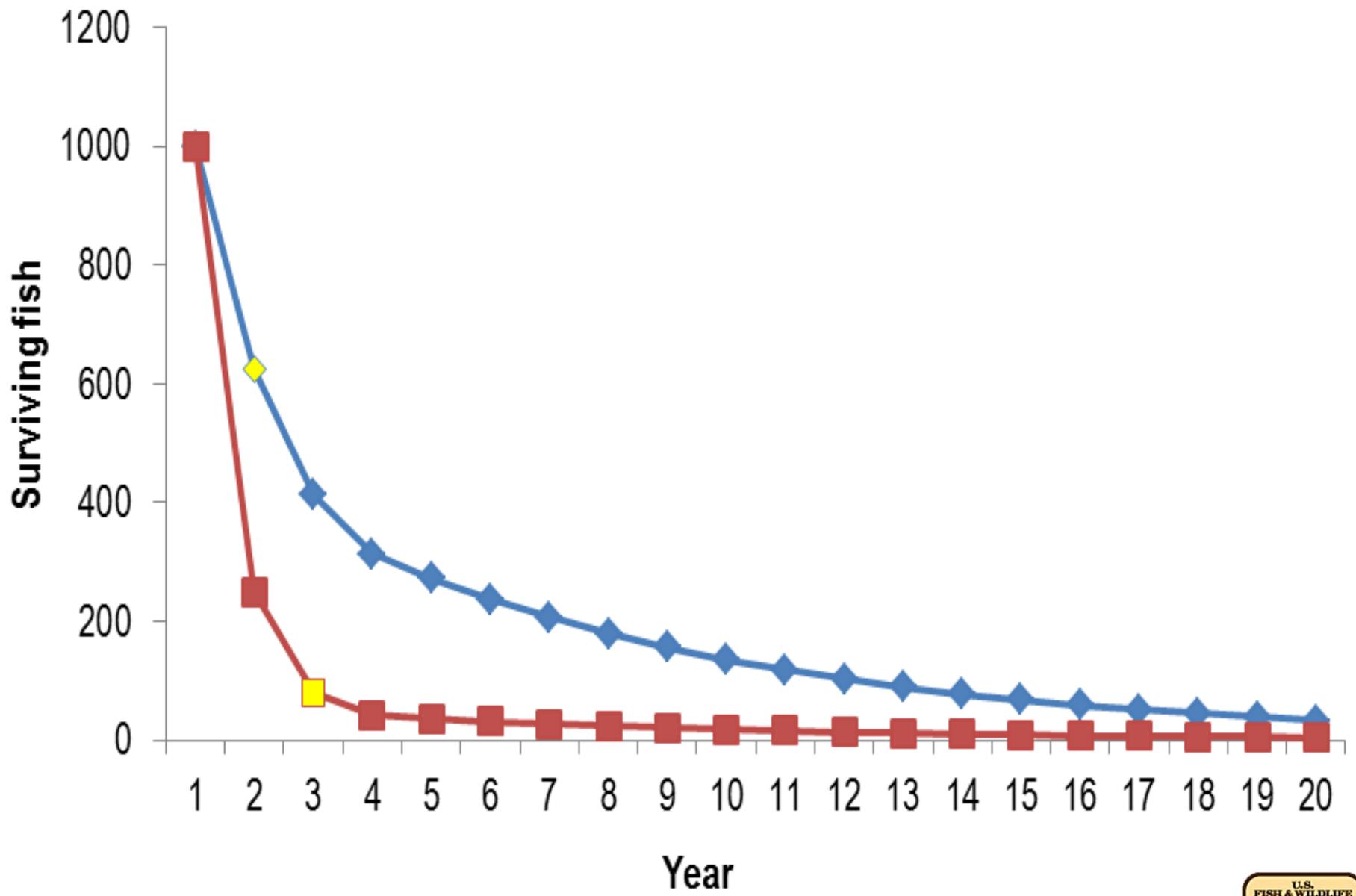
Results

Benefit to LCR HBC

Survival Rates, monitoring data -- AGE 1 Fish:

Trans YR	Number	Recap YR	Recap Number	% Survival
2008	299	2009	214	>71%
2010	109	2011	50	>46%
2011	96	2012	59	>61%
Coggins et al. 2006 (age 2)				<32%





—◆— 0.5 Coggins et al. (2006) —■— Coggins et al. (2006)



Results

Benefit to LCR HBC

- Assuming survival is Greater @ CF:

Scenario: → 1/2 LCR Mortality (Coggins); → 1000 fish translocated @ age 1		Age 2	Age 3	Age 4
		After 1 YR	After 2 YRS	After 3 YRS
Chute Falls (50% LCR Mort.)	# Survive	625	413	314
Little Colorado (Coggins et al. 2006)	# Survive	250	80	42



Results

Chute Falls Translocation – Knowledge Summary

- Fast Growth - Adult at Age 2 vs. Age 3
- High Survival
- High Potential to recruit to adult
- Some evidence spawning may occur
- Evidence for good retention during most years
- Populations susceptible to stochastic events (interruption/emigration)
- Appears to be one of few tools available to directly increase adult population if needed in future



Needs

- Refine Survival/Mortality & Recruitment to adult
- Define Optimal Translocation Densities
 - YOY translocation
 - Age 1
- Understand Spawning Component
 - Natural Recruitment
 - Fidelity
 - Genetics



Thank You Questions?

