



The Natal Origins of Rainbow Trout in Grand Canyon: A Lines of Evidence Review

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Why investigate natal origins?

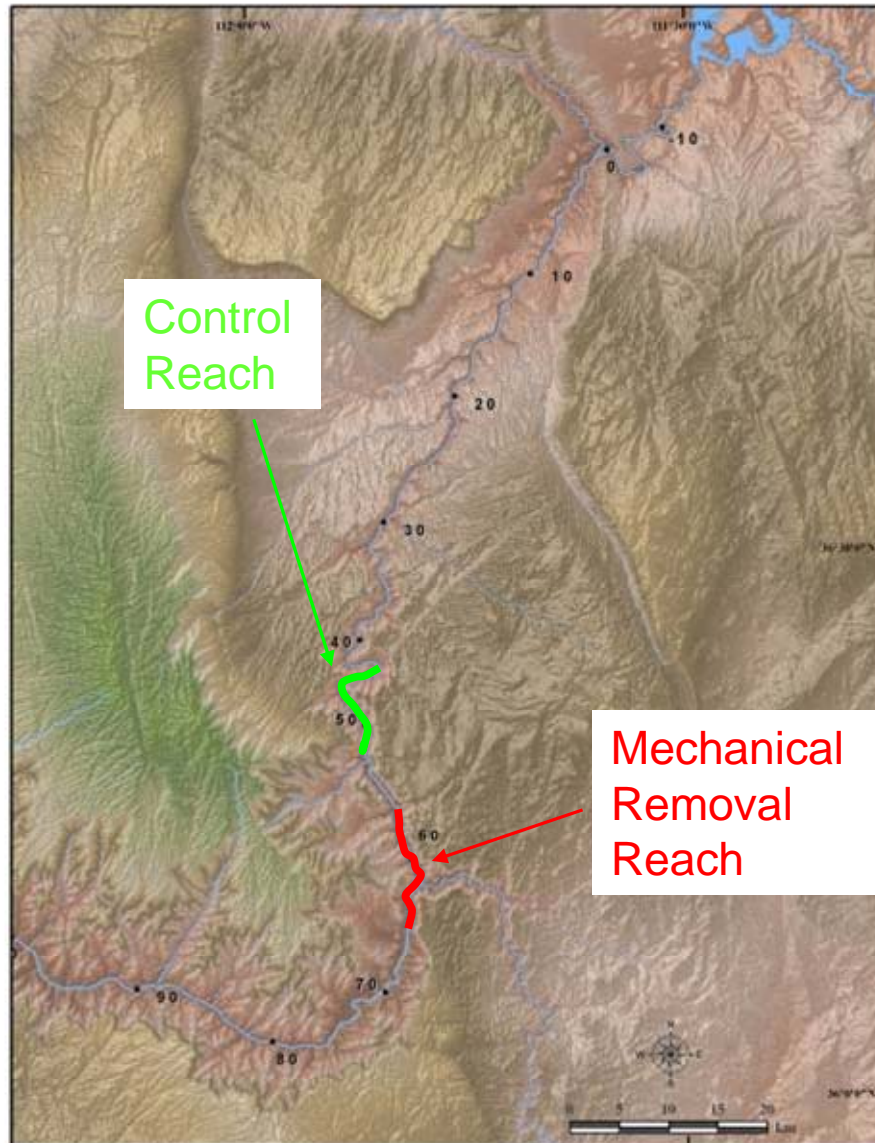
- **Supports management efforts**
 - Recreational fishery in Lees Ferry reach
 - Native fishes conservation
- **Supports work plan prioritization**



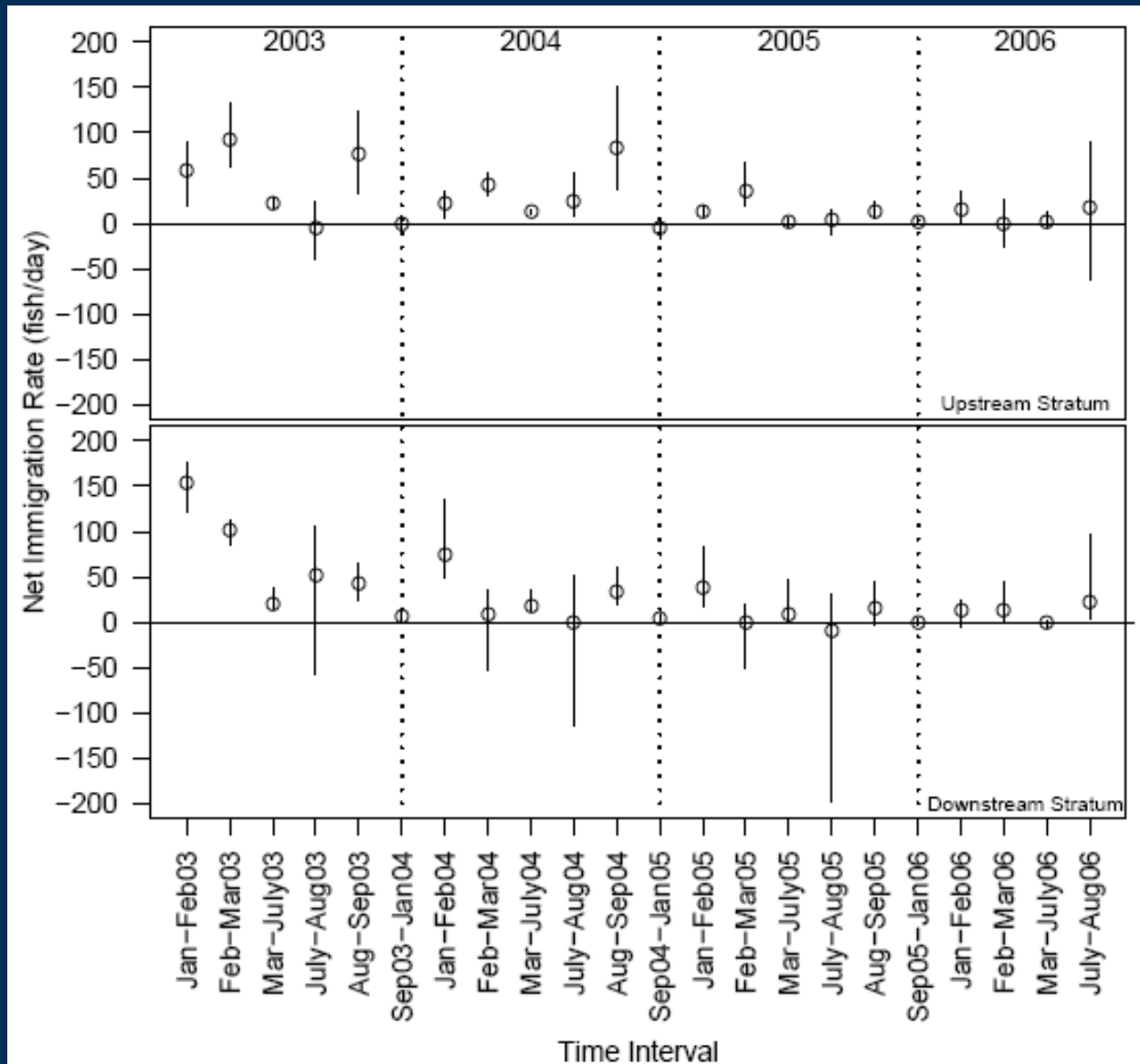
Available lines of evidence

- Mechanical removal project data
- Spawning habitat availability
- Geographic distribution patterns
- Length-frequency distribution patterns
- Correlated temporal patterns

Mechanical Removal Project Data

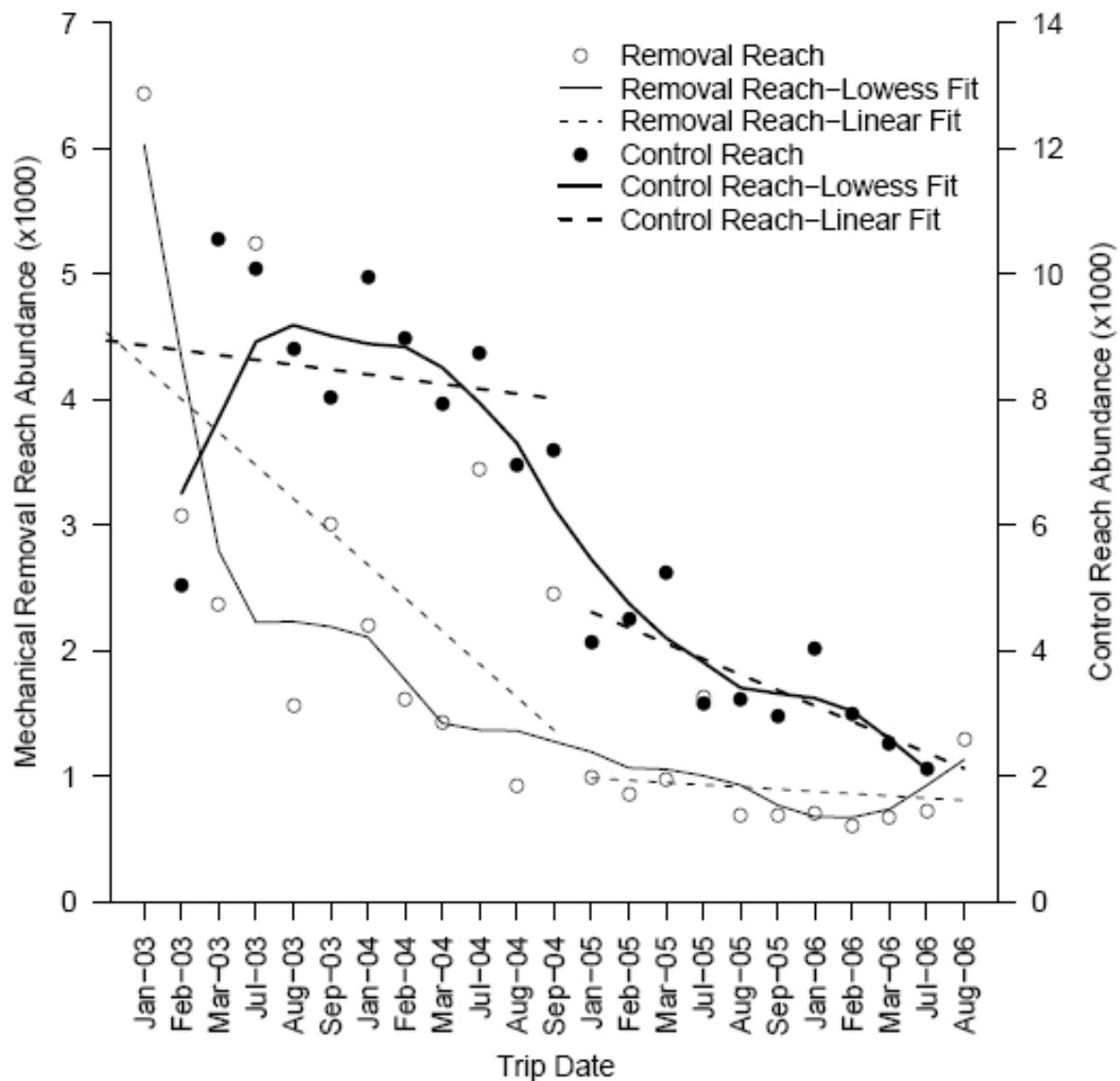


RBT immigration following removals



Coggins
2008

RBT immigration following removals



Spawning Habitat Availability 1990-91

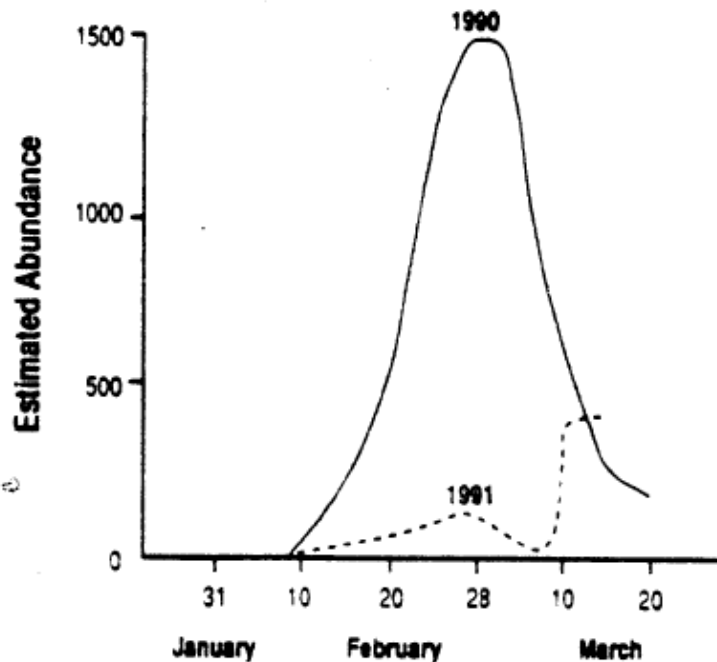


Figure 1-3. Estimated abundance of spawning rainbow trout during the 1990 and 1991 study periods in the lowermost 600 m of Nankoweap Creek, Grand Canyon, Arizona.

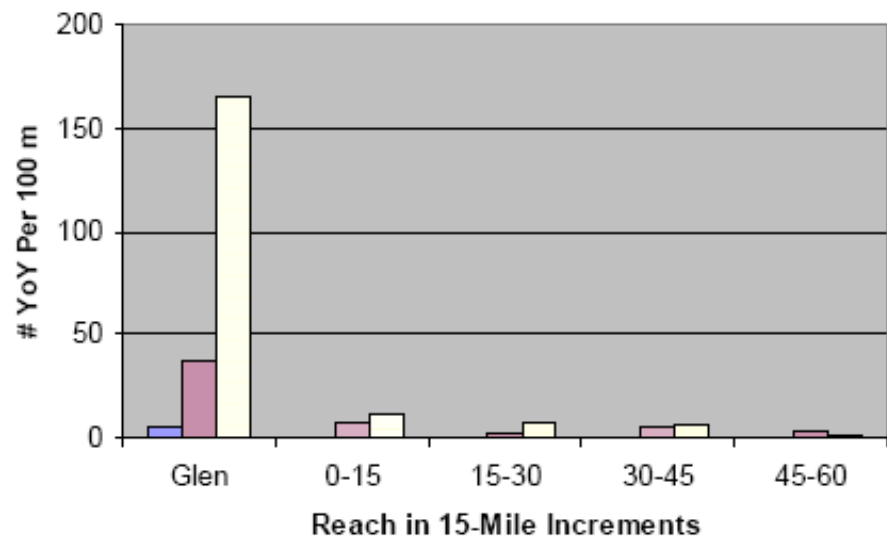
Brown et al.
1991

Spawning Habitat Availability 2004

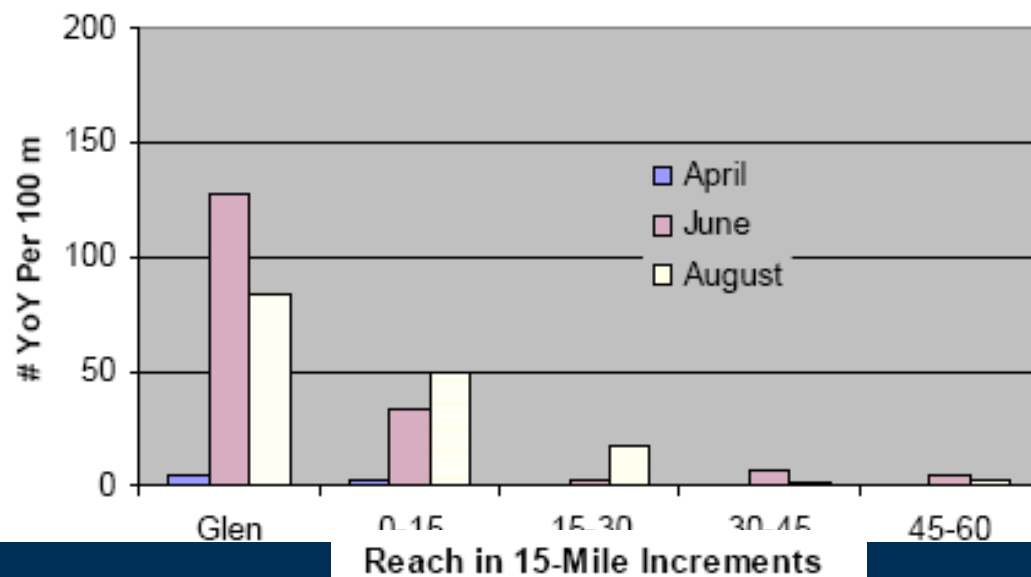
- Korman et al. 2005 estimated Nankoweap Creek had capacity for 2000 spawning rainbow trout in 2004
- Observed: 12 adults, 2 redds, 0 YOY

Mainstem Spawning Habitat Availability 2004

Boat Electrofishing



Backpack Electrofishing



Korman et al. 2005



Geographic Distribution Patterns - BNT

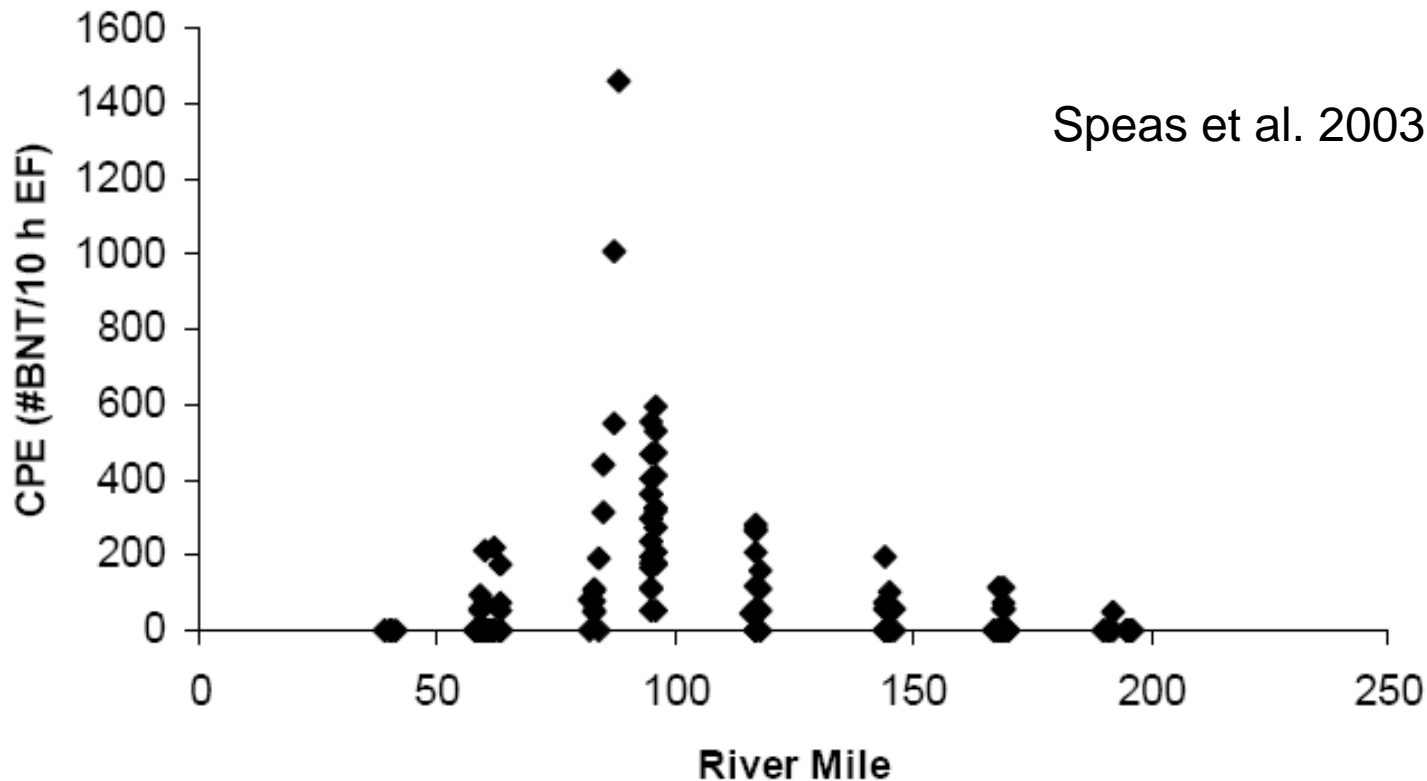


Figure 3. Catch-per-effort (# fish/10 h EF) of brown trout by river mile, Colorado River in Grand Canyon, March 2001.

Geographic Distribution Patterns - BNT

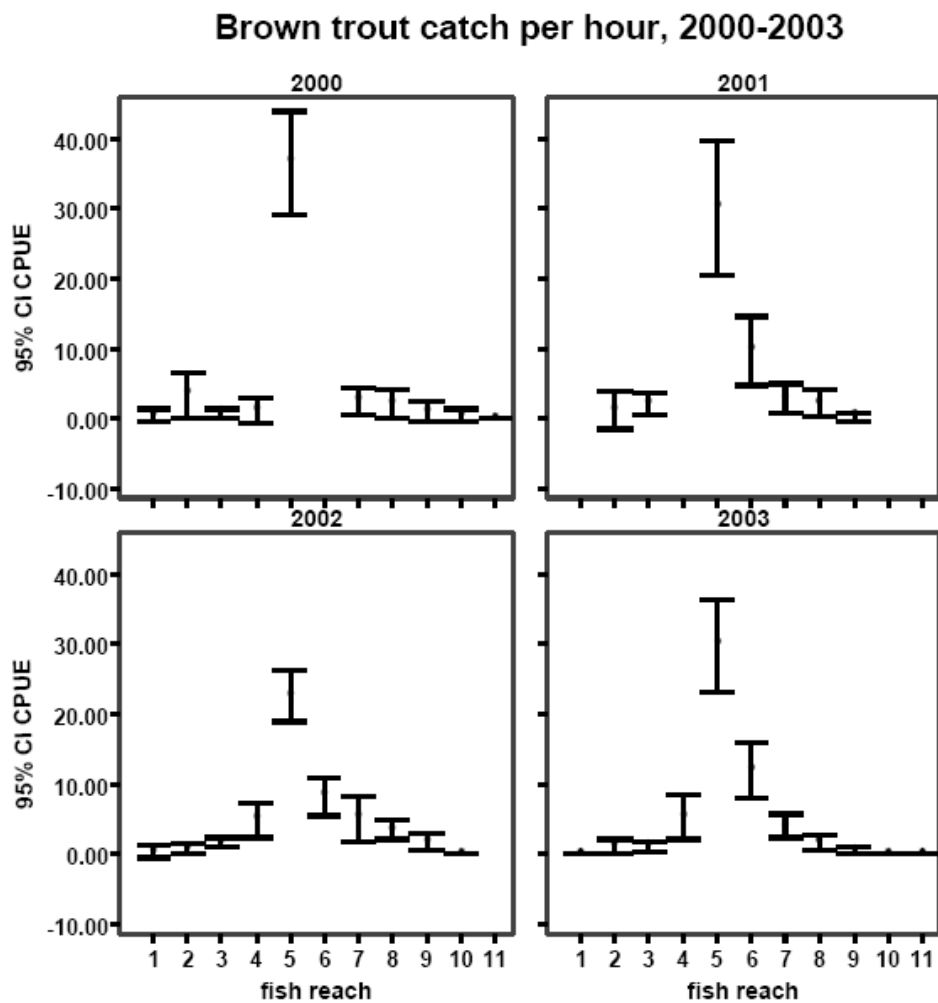


Figure 2. Mean brown trout catch per hour of electrofishing by sampling reach during 2000-2003 (Colorado River, Grand Canyon).

Geographic Distribution Patterns - RBT

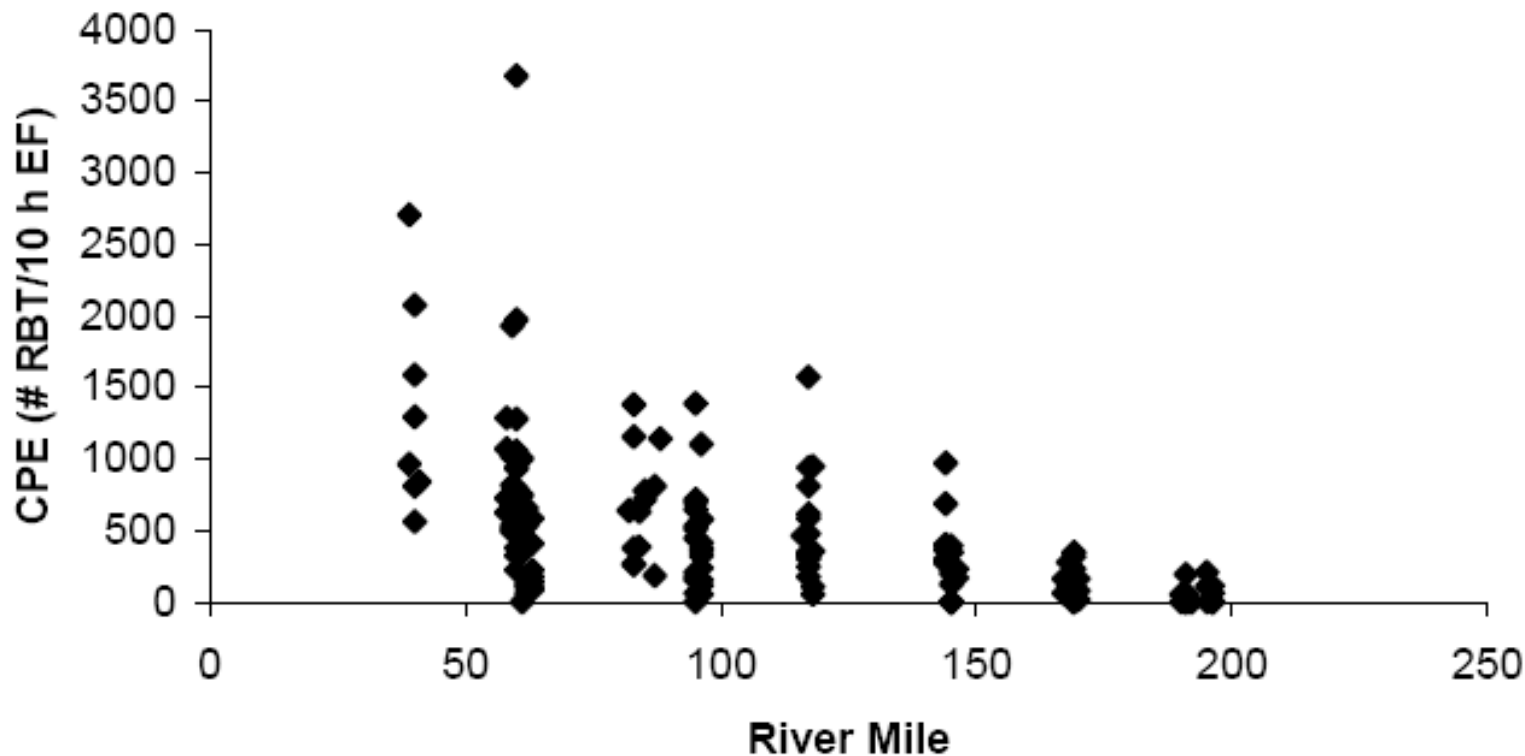
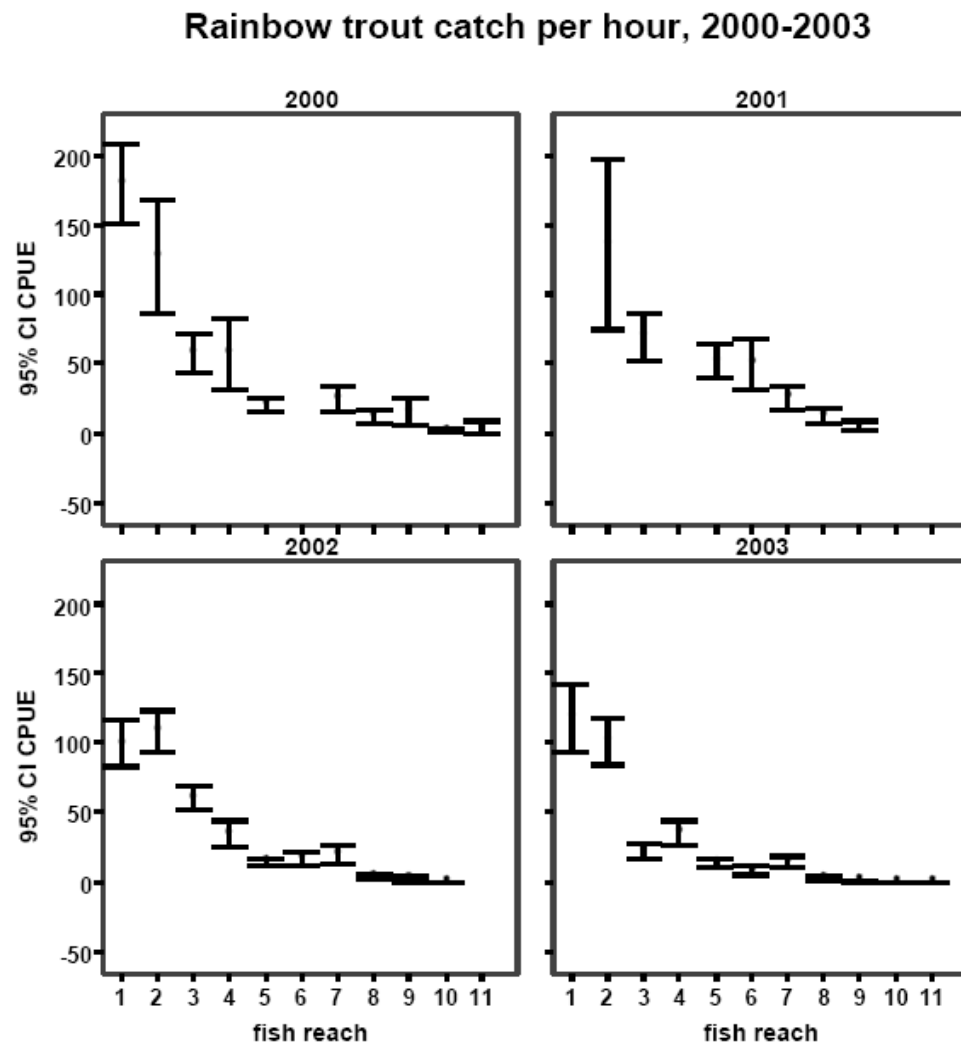


Figure 2. Catch-per-effort (# fish/10 h EF) of rainbow trout by river mile, Colorado River in Grand Canyon, March 2001.

Geographic Distribution Patterns - RBT

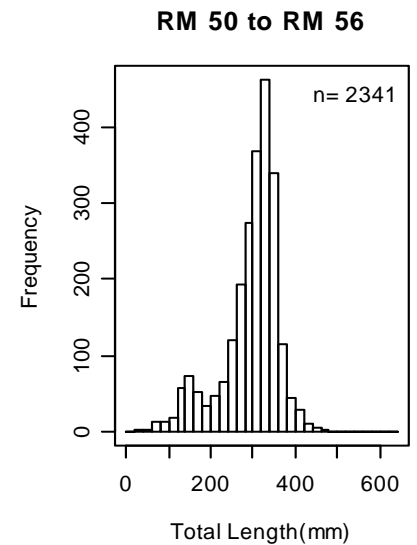
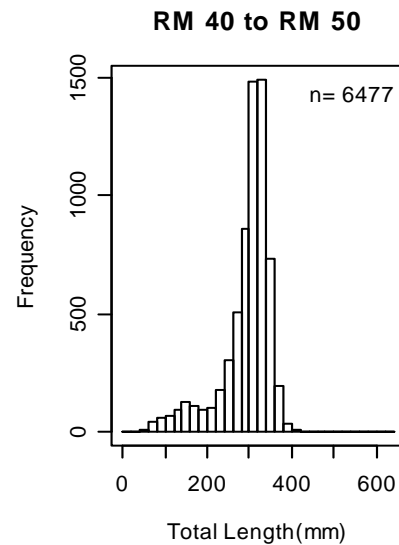
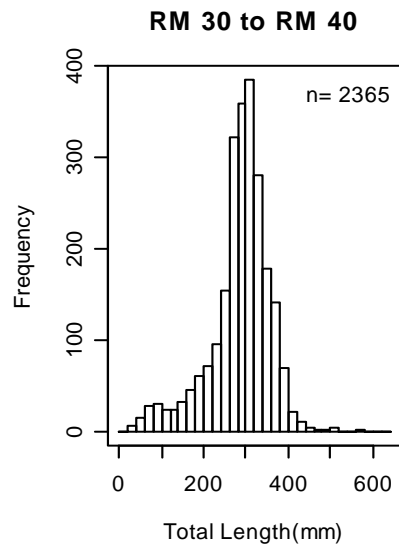
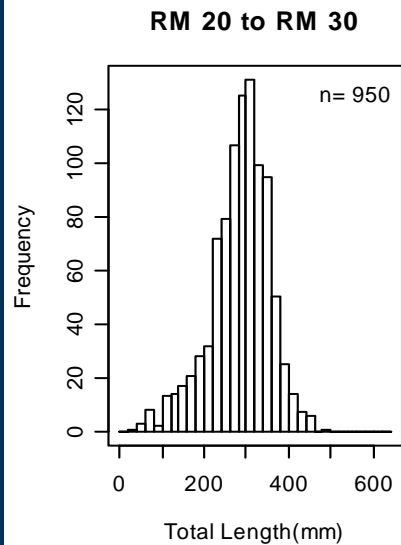
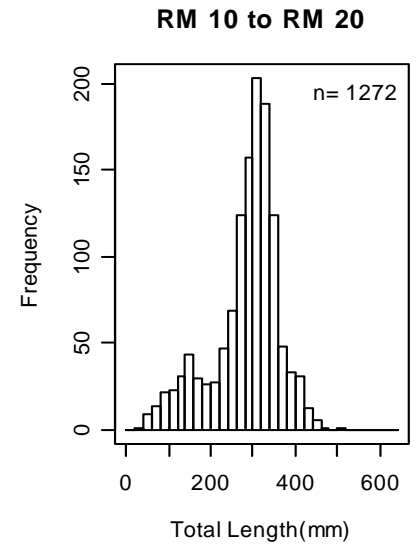
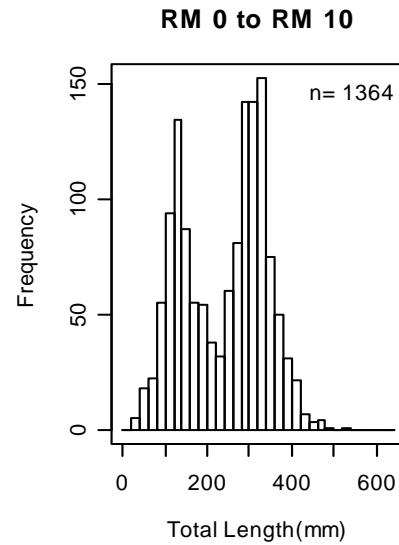
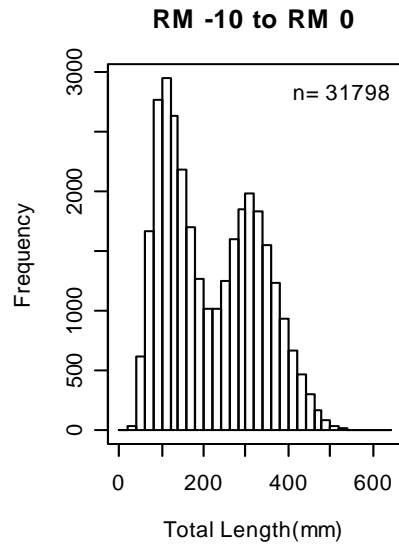
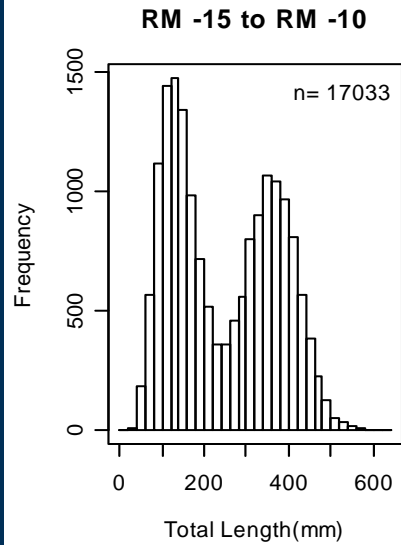


Rogers et al. 2006



Figure 1. Mean rainbow trout catch per unit effort (fish per hour) by sampling reach during 2000-2003 (Colorado River, Grand Canyon).

Length Frequency Distributions

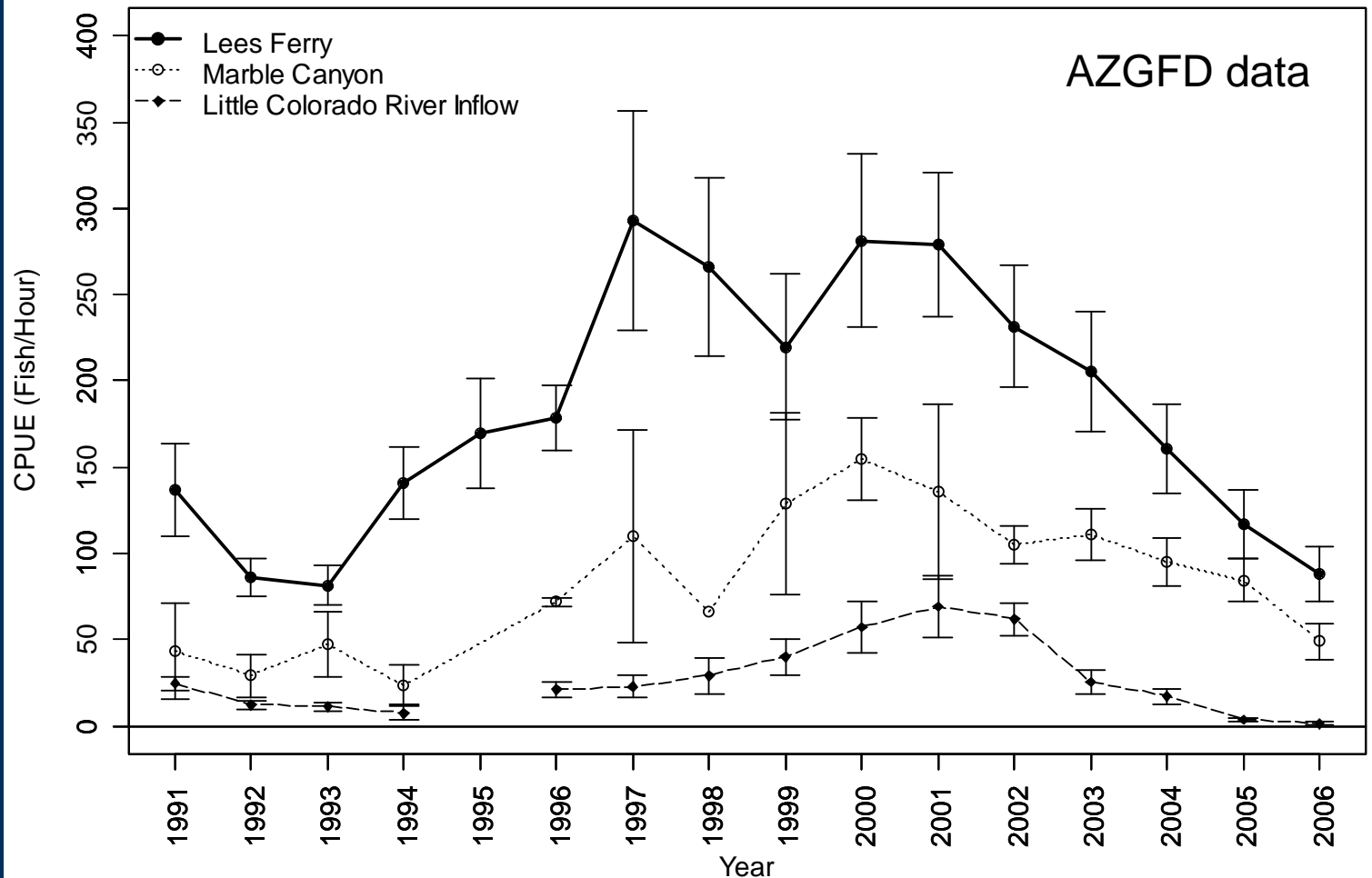


Length Frequency Distributions

- Possible factors leading to observed distributions (Korman et al. 2005):
 - Survival of YOY RBT in Marble Canyon is 2.5-3 times greater than in Glen Canyon
 - Juvenile production in Marble Canyon is lower than in Glen Canyon
 - Second possibility is more plausible

Correlated Temporal Patterns

Rainbow Trout Electrofishing Catch Rate



Conclusion and Recommendation

- **Conclusion:** Most likely that majority of rainbow trout in Colorado River in Glen, Marble, and Grand Canyons is produced in Glen Canyon/Lees Ferry reach
- **Recommendation:** Do not pursue additional research into natal origin of rainbow trout at this time