



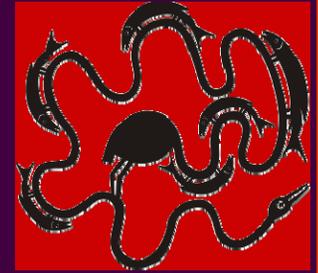
Grand Canyon Native Fishes Update

AMP Technical Workgroup meeting
25 May 2006

USGS Southwest Biological Science Center
Grand Canyon Monitoring and Research Center
M.E. Andersen



Questions partially addressed by this presentation



- What is the status of native fishes this year (2006)?
- How could humpback chub sampling protocols be improved?
- Where are Grand Canyon humpback chub concentrated?
- Are our humpback chub population estimation methods robust?
- How are humpback chub population estimates being used?



Resources for this presentation

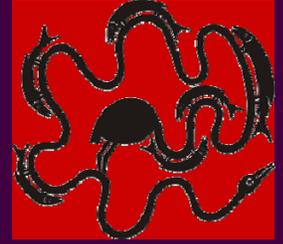
- New Peer-reviewed Literature
- **Preliminary** 2006 native fish update (FWS, AGF)
- Recovery Goals legal case
- Santa Barbara panel/Kitchell et al. 2003
- AMWG guidance



Resources for this presentation: Peer-reviewed publications

- Paukert et al. 2005. Effects of repeated hoopnetting and handling on bonytail.
- Stone. 2005. Effect of baiting on hoop net catch rate of...humpback chub.
- Stone and Gorman. 2006. Ontogenesis of... humpback chub in the LCR.
- Coggins et al. 2006a. Age-structured mark-recapture analysis...
- Coggins et al. 2006b. Abundance trends and status of the LCR...humpback chub.
- Paukert et al. 2006. Distribution and movement of humpback chub...





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- What is the status of native fishes this year (2006)?



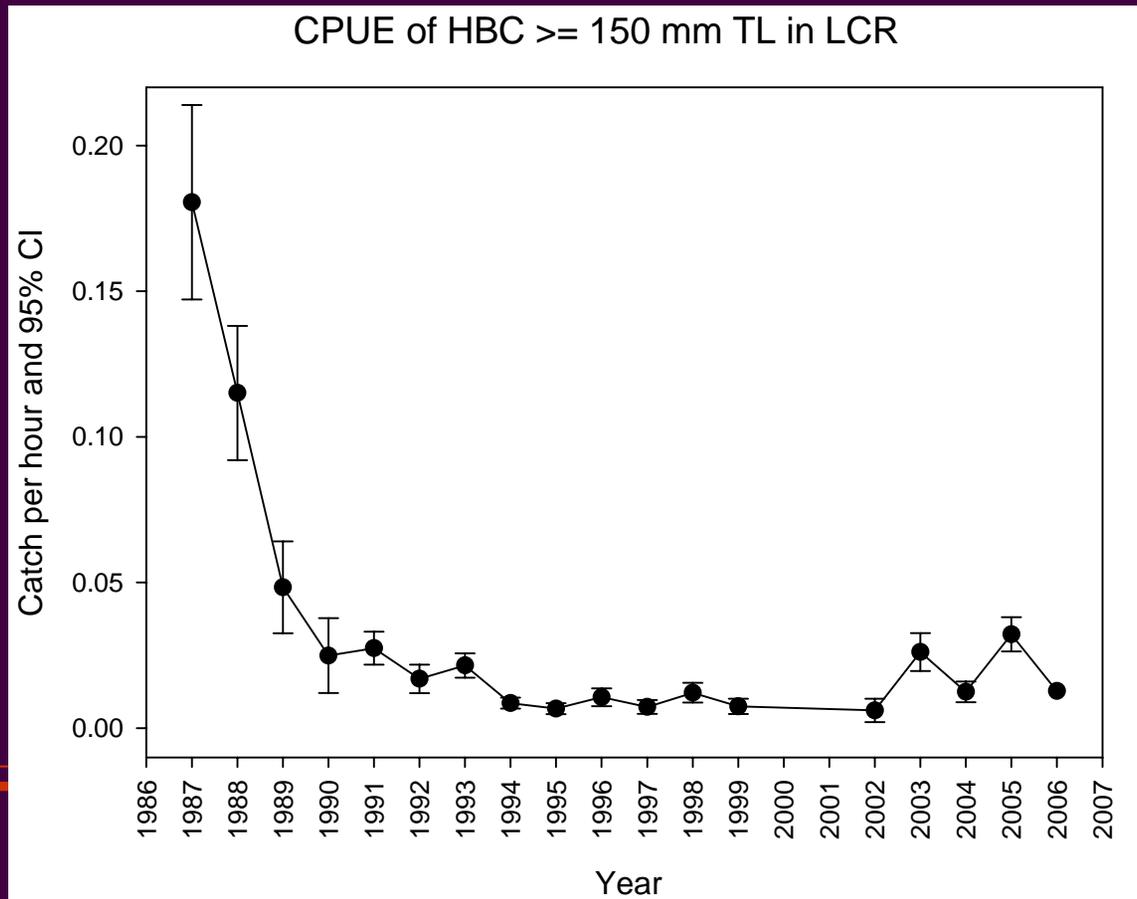
Provisional USFWS 2006 observations

- Blue water in LCR this spring
- HBC clustered at Salt Camp, adults throughout system
- High numbers of one year old HBC in LCR this year
- High numbers of bluehead sucker observed



Provisional AZGFD 2006 observations

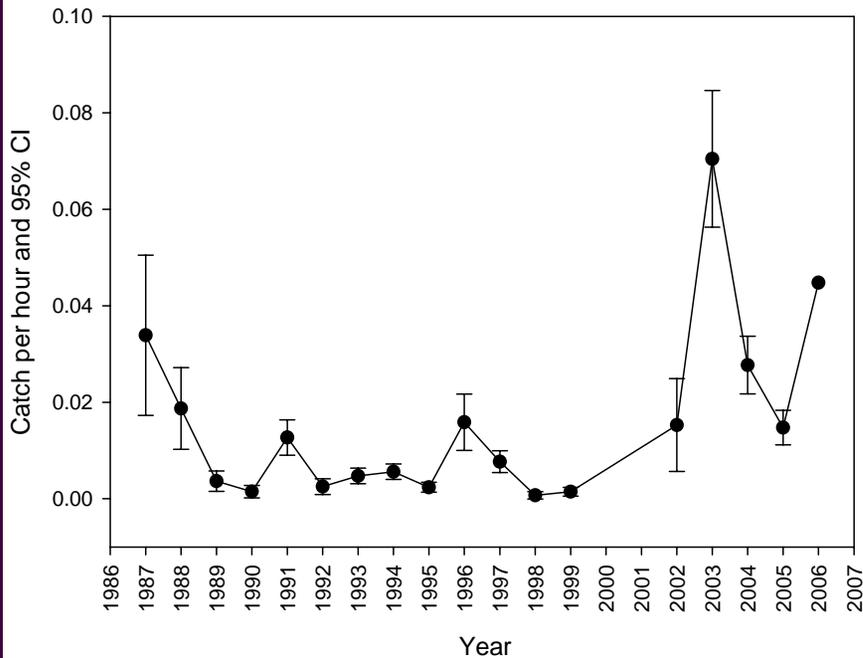
- HBC catch rate, lower 1200 m LCR



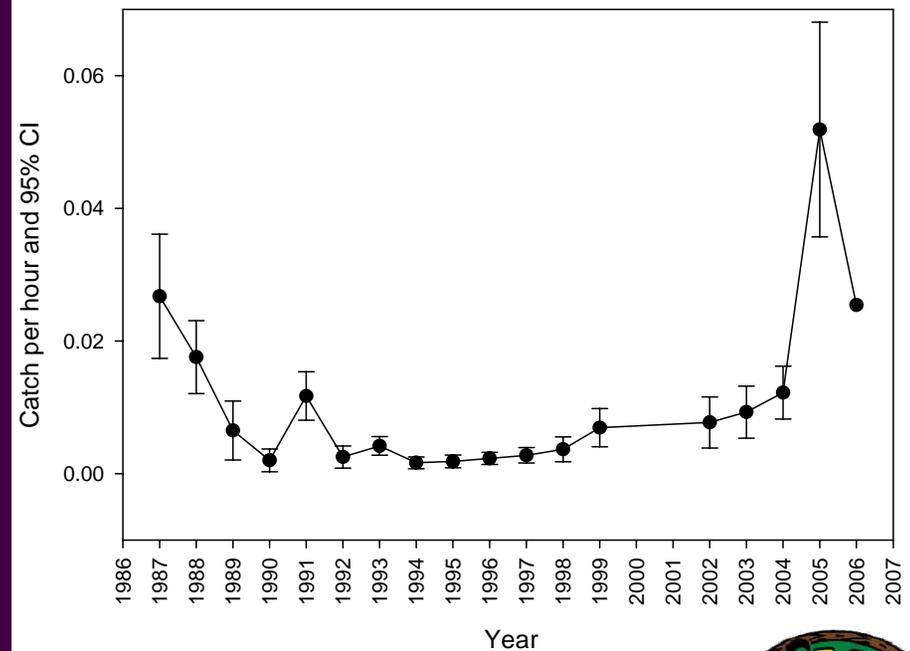
Provisional AZGFD 2006 observations

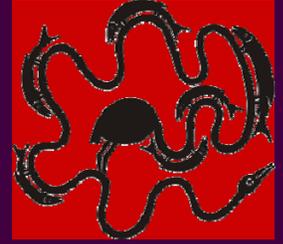
- Native fish catch rates, lower 1200 m LCR

CPUE of FMS \geq 150 mm TL in LCR



CPUE of BHS \geq 150 mm TL in LCR

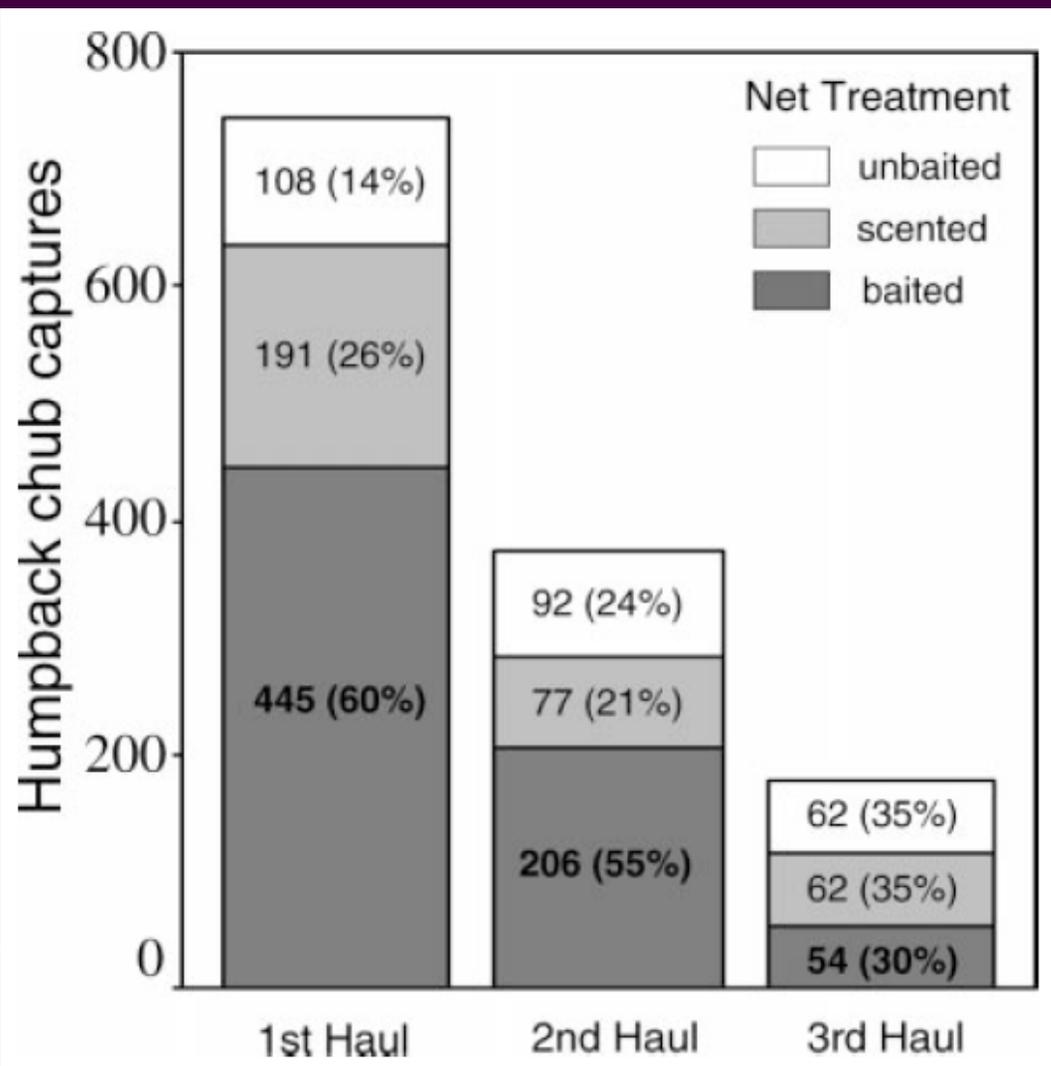




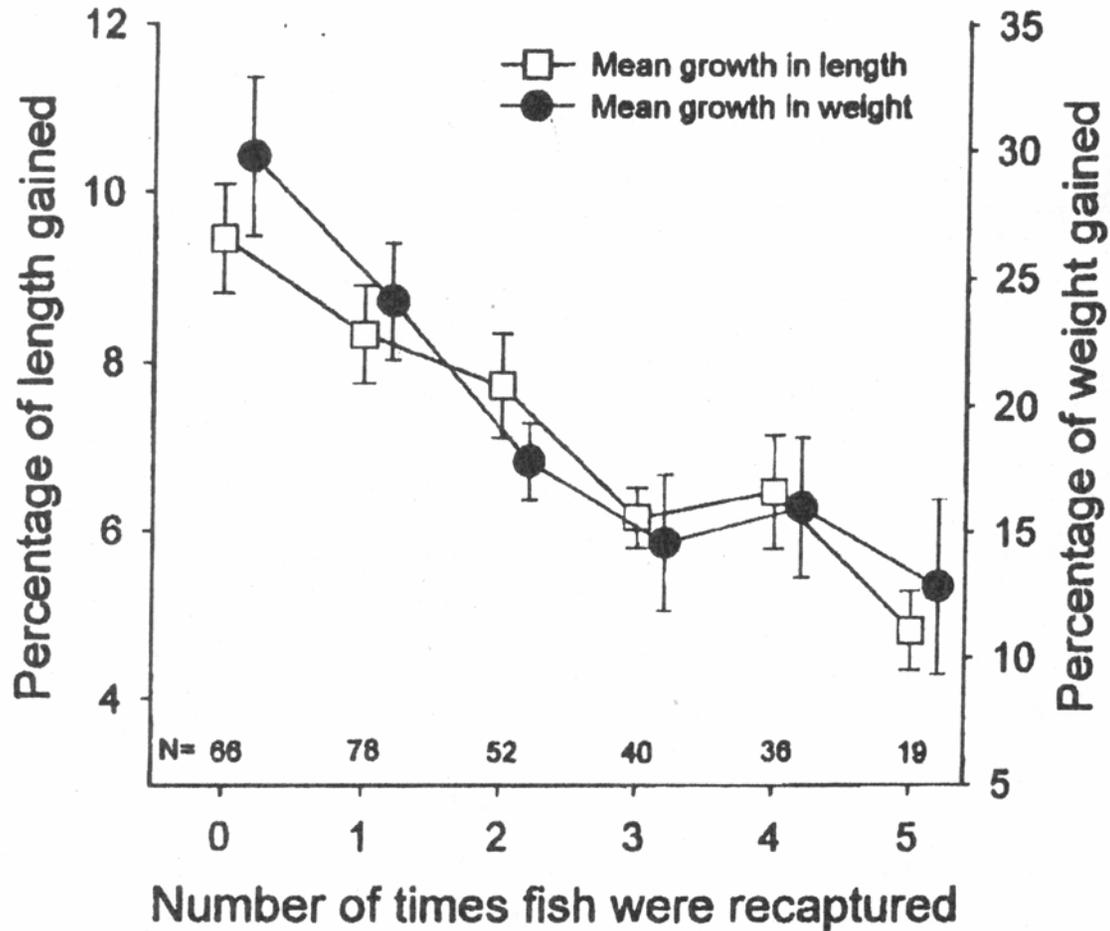
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- How could humpback chub sampling protocols be improved?

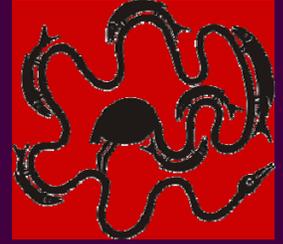


Stone 2005



Paukert et al. 2005





- Where are Grand Canyon humpback chub concentrated?
 - Microhabitat use in the Little Colorado River
 - Grand Canyon



Stone and Gorman 2006

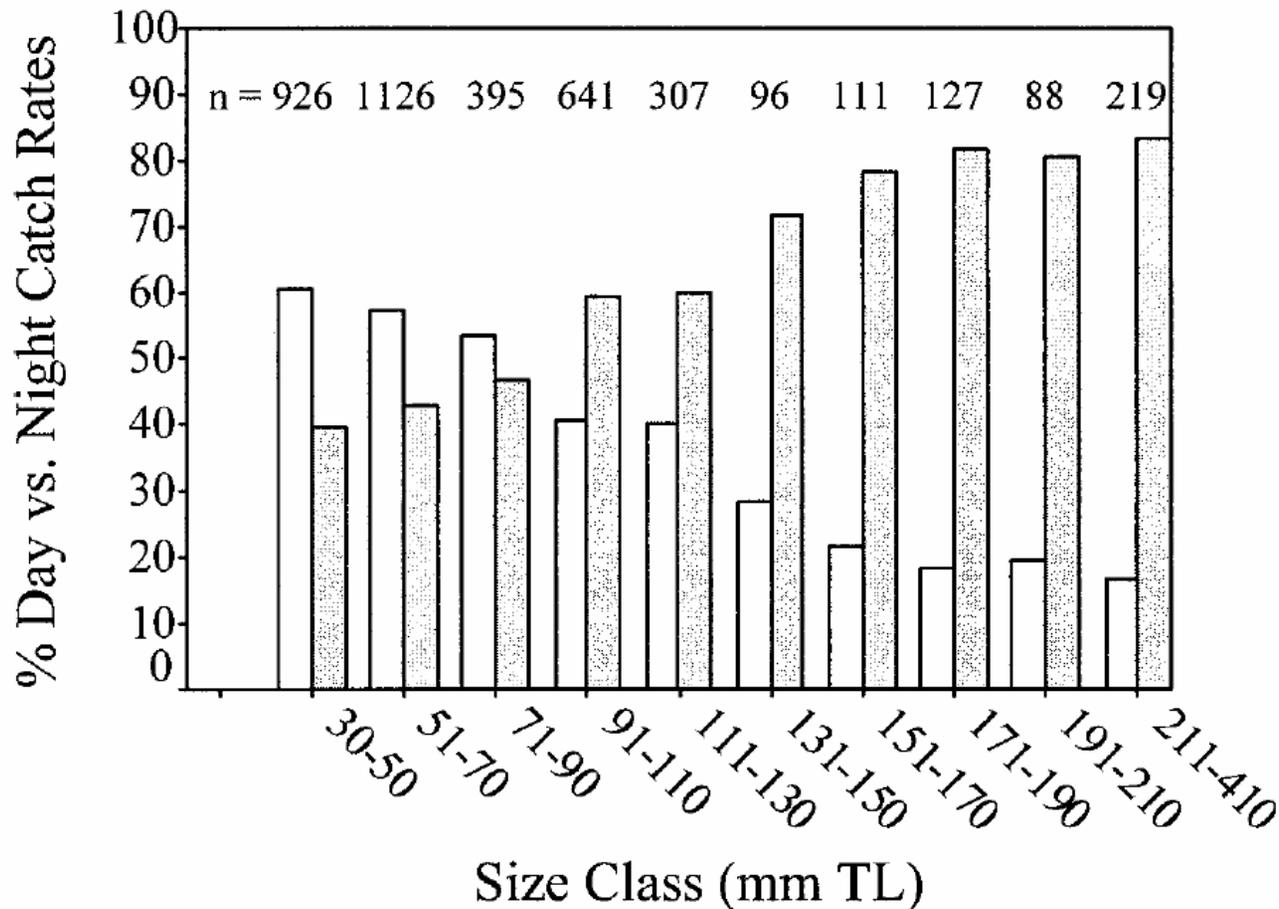
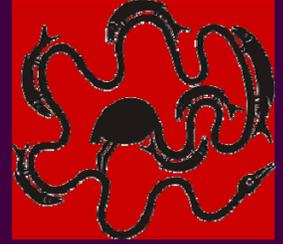


FIG. 2.—Proportions of day (clear bars) versus night (shaded bars) catch rates of humpback chub from ten different size classes during summers 1992–1994 in the Little Colorado River, Arizona



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- Are our population estimation methods robust?

AMWG recommendation on concurrent estimate (2004)

- Motion: approve the TWG-approved budget as distributed to the AMWG, with the following changes:
 - reprogram the budget amount in Line 91 to allow for concurrent multi-pass mainstream and mark-recapture mainstream and LCR population estimates in the spring
 - direct GCMRC to **do as much simulation modeling as possible** [vis-à-vis the two fish-counting protocols] and report to AMWG at its Fall 2004 meeting
 - Voting Results: Yes = 22 No = 0 Abstaining = 0

AMWG recommendations to the Secretary of the Interior

- ...Rather than the field data collection for the concurrent estimates occurring in 2005 at a cost of \$400K-\$500K, **much less expensive simulation modeling should be conducted** to evaluate the accuracy and precision of closed and open population mark-recapture estimators...

Santa Barbara panel

Kitchell et al. 2003

- Conclusions/Recommendations
 - Upper Basin methods appropriate, could be improved with more data
 - Maintain sampling timing in both basins
 - Age-structured mark-recapture model (ASMR) is appropriate for Grand Canyon population, but can be improved
 - Workshop needed assembling Upper Basin and GCMRC participants

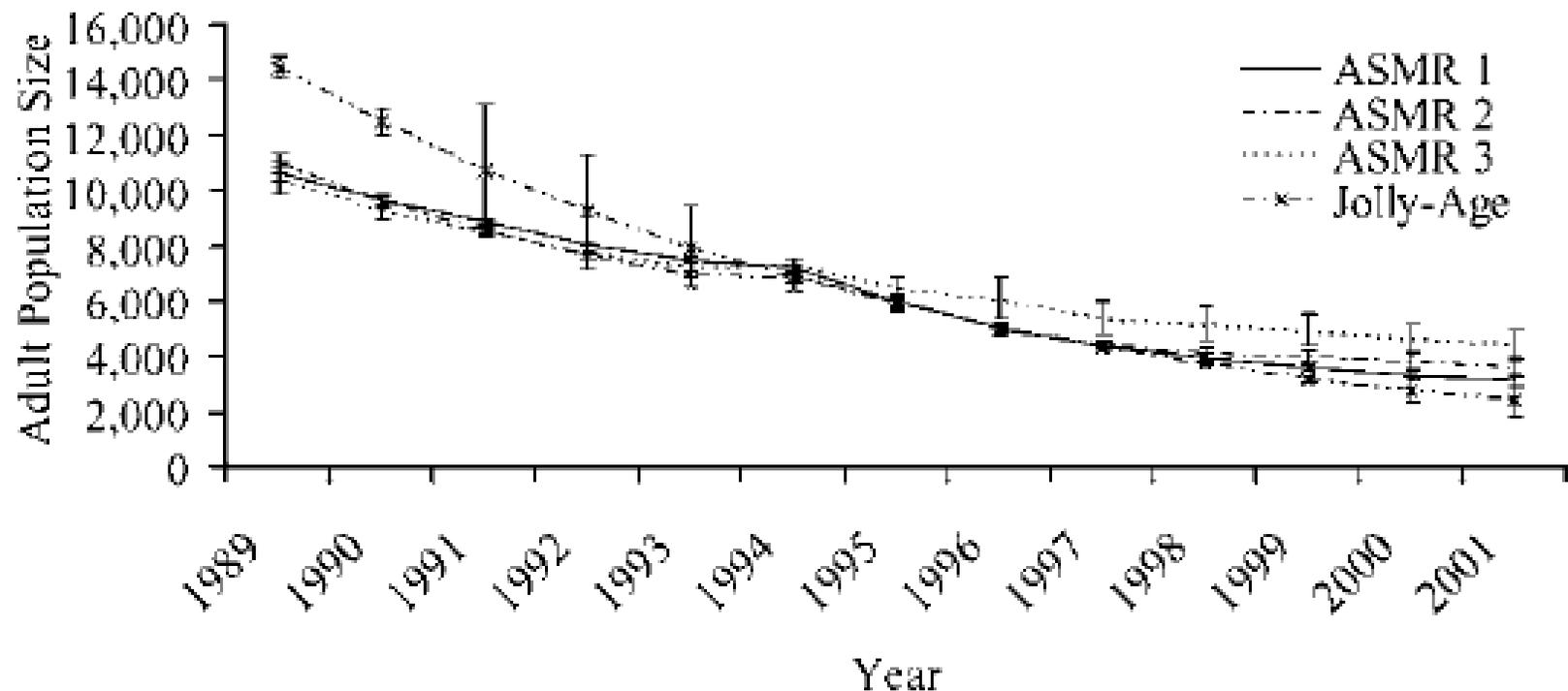
Coggins et al. 2006a

- Age-Structured Mark-Recapture (ASMR) is an appropriate open model for estimating capture probabilities, survival, abundance, and recruitment of fishes
- Method is well suited to sparse, long-term mark recapture data



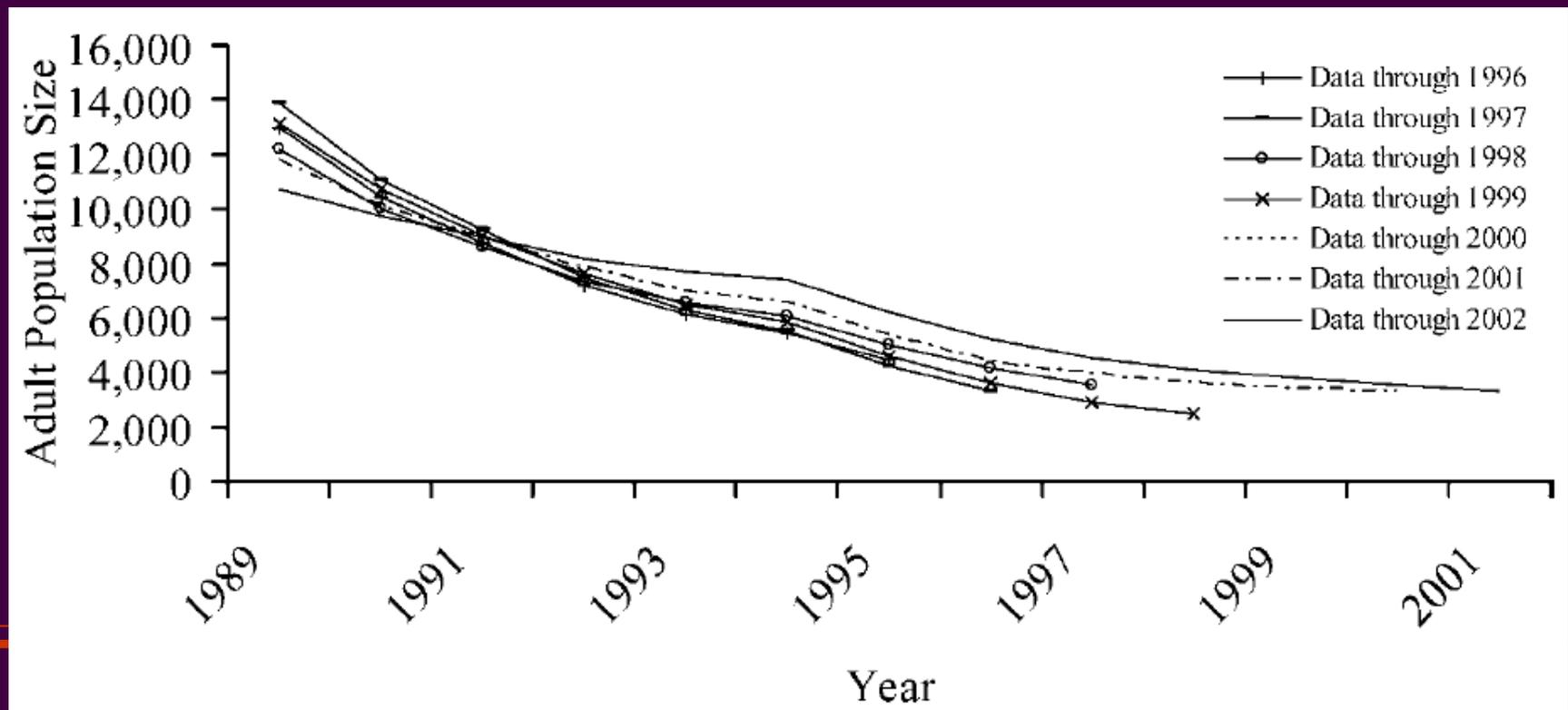
Coggins et al. 2006b

- The Grand Canyon humpback chub population has declined

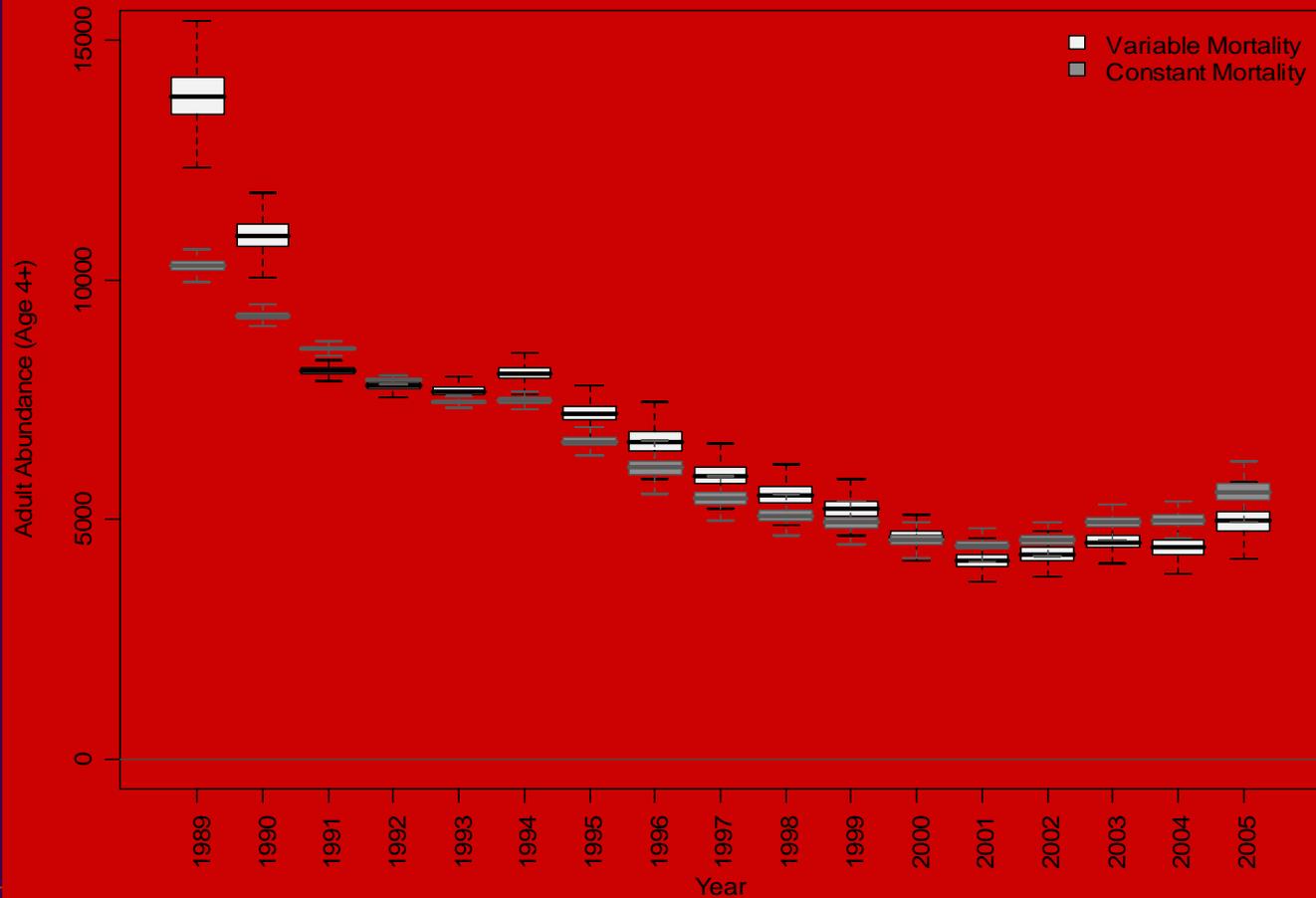


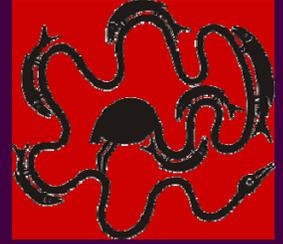
Coggins et al. 2006b

- Data through different years yields different results



ASMR Models of GC Adult (4+ yrs.) HBC Population through 2005





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- How are our population estimates being used?



USFWS 2002 Recovery Goals for Grand Canyon HBC (I)

- Established REQUIREMENTS FOR DOWNLISTING:
- Core population over 5 years starting with first estimate acceptable to USFWS (closed model)
- Adult trend does not decline
- Recruitment \geq Mortality
- Each core pop. est. $>$ 2,100 adults



USFWS 2002 Recovery Goals for Grand Canyon HBC (II)

- Adequate habitat and range provided
- Protection from overutilization
- Adequate protection from diseases and predation
- Adequate regulatory mechanisms
- Protection from other natural or man made factors



Earthjustice suit

- Plaintiffs: Grand Canyon Trust, et al.
- Defendants: Gale Norton, USFWS, et al.
- Filed: 31 March 2004 in U.S. District Court for Arizona

Earthjustice suit (cont'd)

■ First Claim:

- Recovery goals violate ESA
- Don't provide for HBC recovery
- No objective, measurable criteria for recovery
- No estimates of time and cost
- No population goal

Earthjustice suit (cont'd)

■ Second Claim

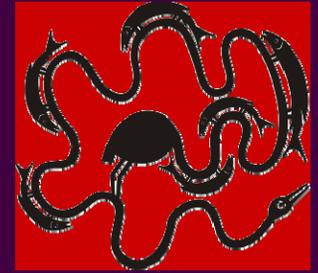
- Recovery Goals violate APA because
 - FWS ignored relevant facts
 - Did not employ best available science
 - Failed to support conclusions

Order 04-CV-636-PHX-FJM

18 January 2006

- First claim proceeds
- Second claim dismissed
- Granted: summary judgment for plaintiffs
 - Defendants violated non-discretionary duties to provide time and cost estimates
- Denied: remainder of plaintiffs' motion for summary judgment
- Defendants ordered to withdraw 2002 Recovery Goals

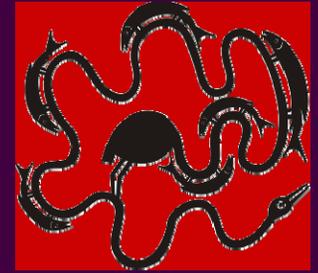
Summary



- What is the status of native fishes this year (2006)?
- **Provisional** data suggest that native fish populations in the Little Colorado River are stable this year



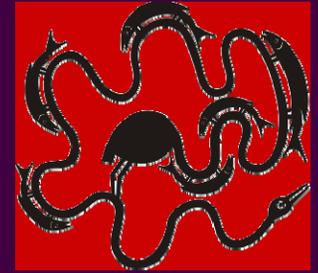
Summary



- How could humpback chub sampling protocols be improved?
- Baiting hoop nets increases capture rates and retention
- Reduced number of handling occasions is likely to increase growth rates among captured fish



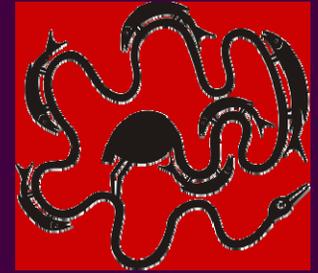
Summary



- Where are Grand Canyon humpback chub concentrated?
- Young HBC emphasize near shore shallow habitats by day
- Adult HBC emphasize deeper mainstem LCR habitats by day
- These distributions are reversed at night



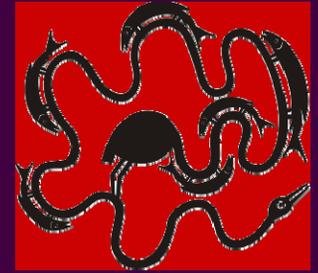
Summary



- Where are Grand Canyon humpback chub concentrated?
- The majority of the Grand Canyon population is found in close association with the LCR
- HBC have strong site fidelity, whatever their site of first capture



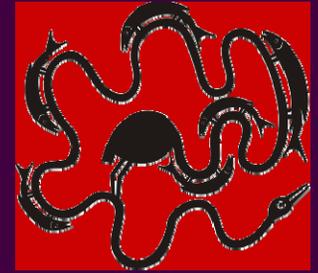
Summary



- Are our population estimation methods robust?
- The ASMR model is receiving strong peer support
- Using HBC data through 2005 indicates that the population is stabilizing



Summary



- How are our population estimates being used?
- The ASMR model is helping us evaluate treatments
- The 2002 Recovery Goals have been set aside



