The Feasibility of Augmenting the Grand Canyon Population of Humpback Chub (*Gila cypha*)

by

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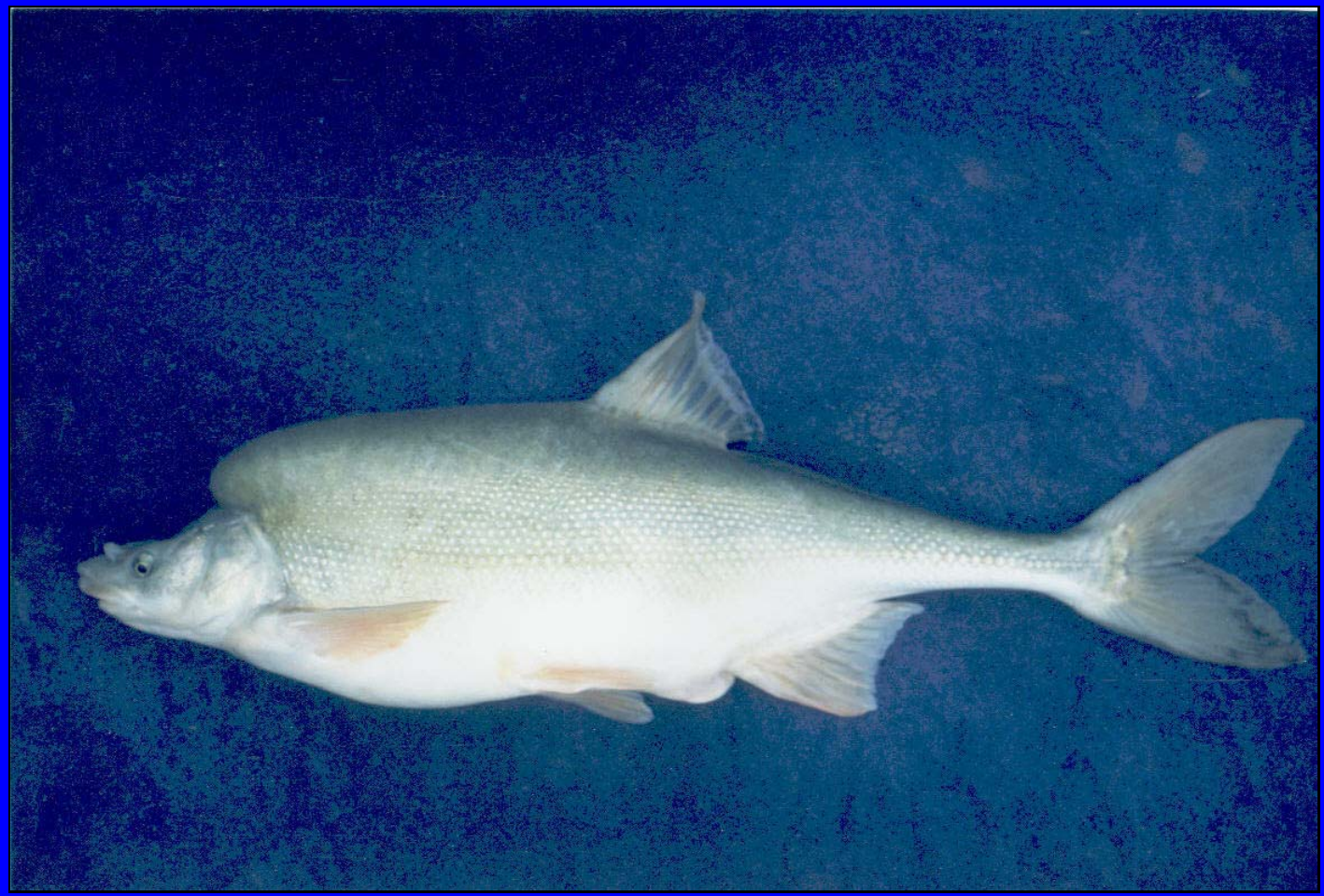
The humpback chub

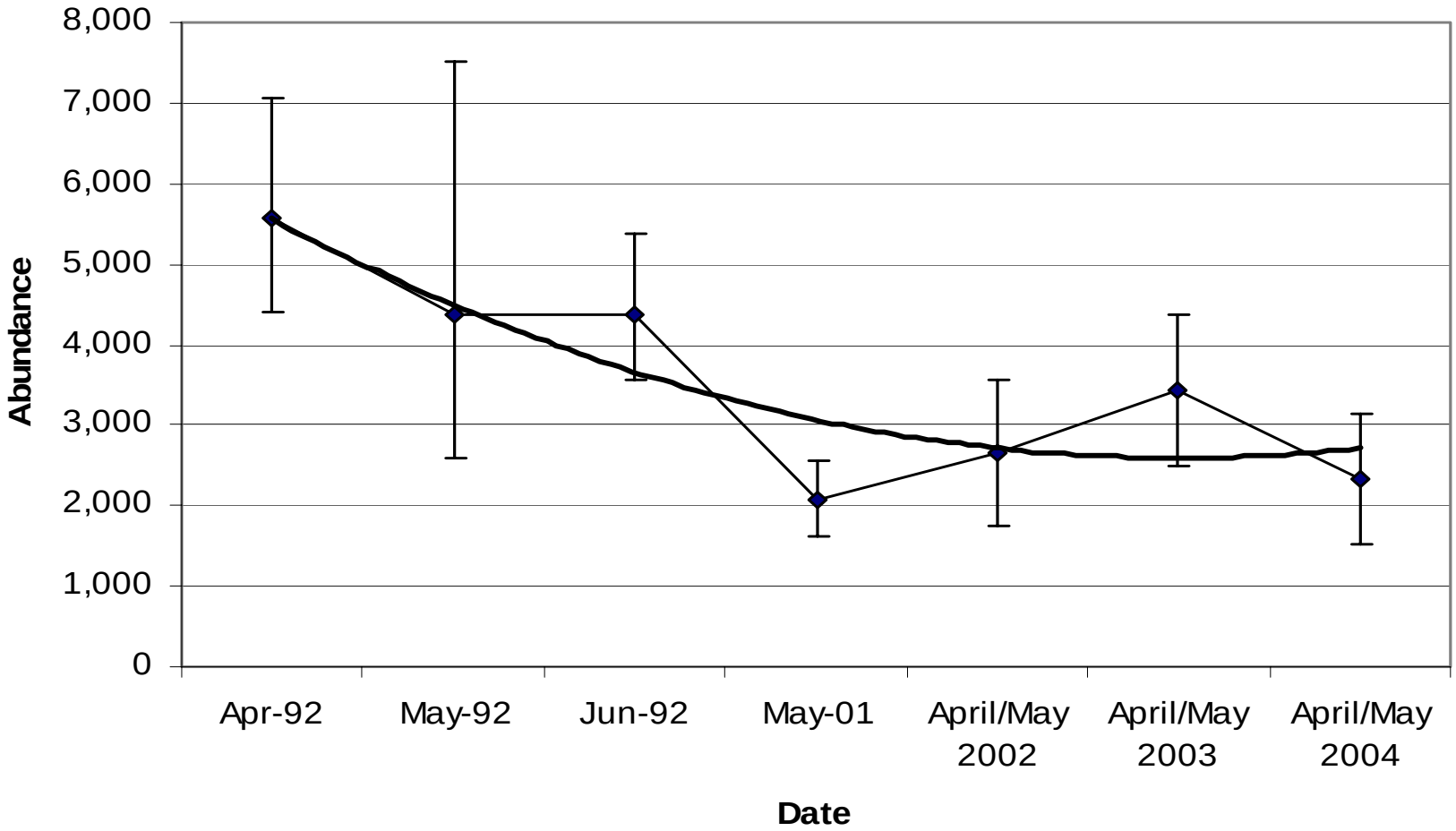


Rationale

- Report stemmed from AMWG request to determine feasibility of establishing a captive broodstock.

- Report was extended to include growing out wild caught age-0 fish for release back into the wild, and translocations.

Closed abundance estimates in Little Colorado River since 1992



Three alternatives discussed:

- 1. Development of a captive broodstock.
- 2. Capture of wild age-0 fish for grow out and release back into the wild.
- 3. Translocations above Chute Falls and to other tributaries in Grand Canyon.

Captive broodstock: two approaches

- 1. Captive broodstock for use as a genetic refugium – risk free.
- 2. Captive broodstock used for stocking back into the wild – numerous biological risks involved.

Biological risks of captive broodstock:

- Introgression
- Inbreeding depression
- Decreasing the wild Ne at large
- Domestication

Prerequisites of captive broodstock program:

- Will likely require a facility large enough to hold several thousand fish.
- Will need a quarantine facility.
- Development of a formal captive broodstock management plan.

Where to begin right now

- The Willow Beach fish (~ 80 are left) can function as a beginning point.
- This will require some genetics work being completed or that will need to be performed.

Captive broodstock:

- Needs to be identified in a Recovery Plan as a recovery option.
- Should be a last resort based on USFWS/NOAA policy statements, and the scientific community at large.
- Basically, habitat restoration should be a first priority before captive broodstock.

Grow out of wild caught age-0 fish for supplemental stocking

- Advantages – bypasses many of the more serious risks associated with captive broodstock.

- Risks – Some minor risks associated with ethology, and density dependant issues in the wild.

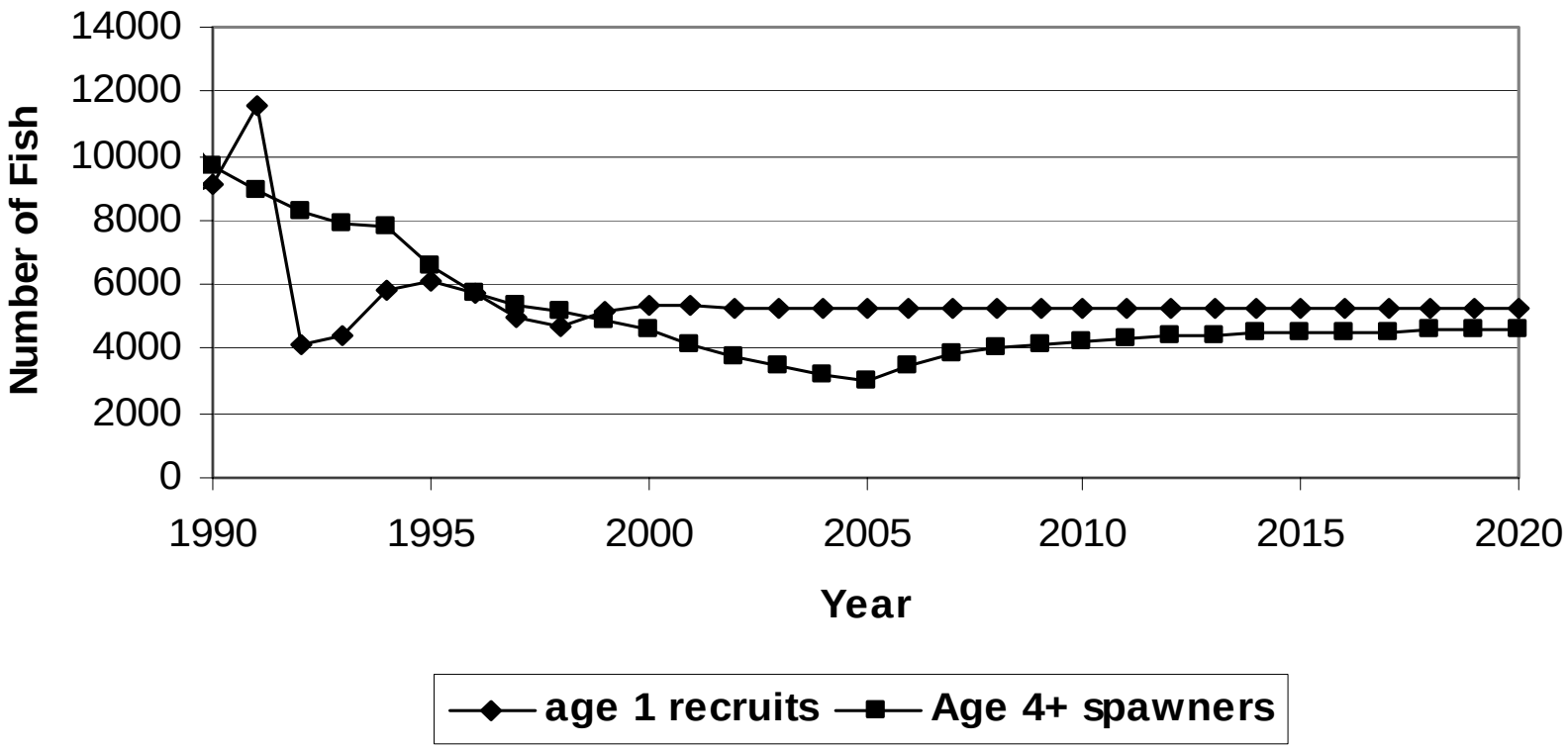
Strategy

- Collect wild age-0 fish from the Little Colorado River.
- Grow in captivity under natural rearing conditions until 150+ mm
- Release back into the wild on an annual basis.

Potential objectives

- Maintain populations at levels found in 2000.
- Recover fish to levels found in early 1990s.

Modeling: ~1,400 fish/year



Translocations

- Above Chute Falls
- Other tributaries in Grand Canyon

Chute Falls

- Activities already begun
- Risks – some risks for eventual inbreeding
- Benefits – Population expansion, range expansion, promotes a self-sustaining population.

Other Tributaries

- Havasu, Shinumo, and Bright Angel
- There may be potential for large abundance increases if combined with with mechanical removal

Priority Conclusions

- Translocations already begun.
- Grow out of age-0 may require 1,000-5,000 fish per year to achieve goals, but is relatively risk free.
- Captive broodstock should be last resort because of high potential for biological risks.

Thank you!

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