Warm-water Fishes Research Initiative

A Prospectus:
Presented to the Adaptive Management Work Group
October 26, 2004

Southwest Biological Science Center
Grand Canyon Monitoring and Research Center

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

- A significant concern associated with warmer water temperatures released from Glen Canyon Dam is the expansion of existing or establishment of new non-native fish species in the CRE.
  - Warming from low reservoir levels.
  - Warming From TCD
Background

In response to this concern, AMWG and TWG passed the following motions:

- “That GCMRC and TWG make a recommendation to AMWG in October 2004 on warm water species studies including a plan starting in January 2005”

- “GCMRC will develop a process, a schedule, and a recommended budget for suppression and control of non-native fish (warm water species) to be presented to AMWG at their October meeting”.
In general, the primary sampling gear that is used in the Colorado River is most efficient for fish that have the following characteristics:

- Tend to occupy slow to moderate water velocity habitat
- Tend to be associated with shorelines
- Trout, carp, flannelmouth sucker, small bodied non-native fishes, and juvenile fishes
Background

- We are much less certain of sampling efficiency of our present gear types for:
  - Adult centrarchids (bass) and adult ictalurids (catfish)
  - Adult humpback chub and adult bluehead sucker

Does the occasion capture of a striped bass in a trammel net mean that there is a high abundance of STB or did we just get lucky with inefficient gear?

What does it mean when we set a trammel net in Middle Granite Gorge and fail to catch a humpback chub? No HBC present? Highly inefficient gear?
Need

- As opposed to mechanical removal of salmonids, to develop a warm-water species removal program
  - We need basic research related how to capture warm-water non-native fishes. Evaluation of efficiencies of present and alternate capture gear.
  - We need a science based recommendation on best methodologies and strategies on how to develop a warm-water removal program.
- As identified in the draft core monitoring plan
  - We also need basic research related to capture efficiency of present sampling gear of native fishes in the mainstem.
- We believe these two needs can be accomplished simultaneously
Potential Methodologies

- **Fish Detection vs Capture**
  - Currently we can only detect the presence of fish through capture

- **Alternate Detection Methods and Utility**
  - Hydro-acoustics (sonar, fish finders)
    - Quick detection of fish presence
    - Potential ability to enumerate
    - Potential ability to assist with maximizing efficiency of inefficient gear
    - No to little ability to determine species
Potential Methodologies

- Alternate Detection Methods and Utility
  - Didson Camera
    - Quick detection of fish presence
    - Potential ability to enumerate
    - Potential ability to assist with maximizing efficiency of inefficient gear
    - Potential ability to determine species
    - Limited range, potential to utilize with other hydroacoustics
  - Demo at end of presentation
Potential Methodologies

- **Alternate Capture Methods and Utility**
  - **Modified Electrofishing Configurations**
    - Submerged anodes and ticklers
    - Demonstrated ability to capture catfish in slow water and lakes
  - **Angling (long-line or trot-line)**
    - Much more effective at capturing channel catfish than trammel nets
  - **Pheromone Traps??**
    - Under development by John Teeter, Penn State

[USGS logo]
Potential Methodologies

Potential Study Plan

- Deploy detection gear, current sampling gear, alternate (test) sampling gear in systematic ways and in multiple river reaches and habitat types to estimate relative species specific capture efficiencies.
- May also elect to conduct depletion trials with gears that demonstrate high efficiencies.
- May also elect to fit non-native fish with radio or acoustic telemetry tags to better understand movement, habitat use, and gear efficiency.
Potential Objectives

1. Evaluate feasibility of utilizing alternate detection, enumeration, and capture gears in the Colorado River including sonar enumeration and imaging, telemetry, modified electrofishing configurations, and angling (trot line).

2. Estimate species-specific relative capture efficiency for existing and proposed gear types.

3. Recommend methodologies and strategies for the development of a warm water fish removal program and modifications to core monitoring for mainstem resident native and non-native fishes.
Schedule and Process

- Proposed as a GCMRC led initiative
  - Perceived need to begin soon, avoid 6-12 month delay for procurement process
- Anticipate 3 year study
- 2005
  - Host workshop in January or early February
    - Invite potential collaborators
    - Product would be a study plan
  - March
    - Develop team and assign work
  - April
    - Apply for permits
    - Secure logistics
    - Procure equipment
  - June and July
    - 2 Sampling trips, possibly below Diamond Creek
Schedule and Process

- **2005**
  - Fall
    - Brief TWG on first year findings
- **2006**
  - June and July
    - 2 Sampling trips, possibly below Diamond Creek
  - Fall
    - Brief TWG on second year findings
- **2007**
  - Final Report by June
  - Recommendations to develop warm-water removal program and modifications to core monitoring program
Potential Cooperators

- Ecometric (Korman, Walters, Martell, Pine)
- AZGFD
- USFWS-AZFRO-Flagstaff
- SWCA-Flagstaff
- Tribal Nations
- John Teeter, Penn State
## Preliminary Budget Projection (x1000)

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