Warm-water Fishes Research Initiative

A Prospectus:
Presented to the Adaptive Management Work Group
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Grand Canyon Monitoring and Research Center

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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**

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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".*

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Background

- **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**

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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?

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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**

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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 hydro-acoustics**
    - **http://www.apl.washington.edu/programs/DIDSON/DIDSON.html**
    - **Demo at end of presentation**

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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**

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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.**

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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.**

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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**

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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**

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Potential Cooperators

- **Ecometric (Korman, Walters, Martell, Pine)**
- **AZGFD**
- **USFWS-AZFRO-Flagstaff**
- **SWCA-Flagstaff**
- **Tribal Nations**
- **John Teeter, Penn State**

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Preliminary Budget Projection (x1000)

	2005	2006	2007
Personnel			
GCMRC	80	80	20
Collaborators	100	100	20
Logistics			
2 annual river trips	70	70	0
Equipment	80	40	0
Travel & Workshop	20	10	5
Total	350	300	45

Didson Camera Demo Now

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