

**Nonnative Fish Management Plan**  
**Summary of Plan tasks included in the GCMRC FY 10-11 work plan**  
**23 July 2009**

<b>Nonnative Plan Task</b>	<b>GCMRC FY 10-11 work plan reference</b>
<b>Monitoring</b>	
Expansion of current mainstem monitoring protocols	BIO 2.M4.10-11. Monitoring Mainstem Fishes
Implementing early detection protocol and nonnative fish monitoring in Lees Ferry	BIO 4.M2.10-11. Monitoring Lees Ferry Fishes
<b>Removal</b>	
Maintenance of trout abundance in the Little Colorado River confluence area at approximately 20 percent of January 2003 rainbow trout abundance	BIO 2.R16.10-11. Mainstem Nonnative Fish Control
Continued removal of trout in Shinumo Creek using backpack electrofishing in combination with other methods such as weirs and angling to support translocation efforts	Not in GCMRC work plan, but has been conducted by NPS, AZGFD, GCWC in conjunction with HBC translocation to Shinumo
<b>Research</b>	
Development of a model to identify the nonnative species posing the greatest risk to humpback chub	BIO 2.R17.10-11. Nonnative Control Plan Science Support. Some modeling also conducted in: Plan 12.P1.10-11. Identify Critical Ecosystem Interactions and Data Gaps
Identification of sources of juvenile and adult nonnative fish into the mainstem such as recruitment locations, tributary inflows, dam passage, and illegal stocking	BIO 2.R17.10-11. Nonnative Control Plan Science Support
Occupancy modeling for improvement of long-term nonnative fish monitoring, evaluation of nonnative fish population expansion or contraction, and development of early detection protocols	BIO 2.R17.10-11. Nonnative Control Plan Science Support. Some modeling also conducted in: Plan 12.P1.10-11. Identify Critical Ecosystem Interactions and Data Gaps
A small-bodied nonnative fish and YOY capture and monitoring study using slow-shocking techniques (nearshore ecology) throughout the mainstem	BIO 2.R15.10-11. Nearshore Ecology/Fall Steady Flows
Continued effort to develop remote PIT tag detection technology for application to nonnative fish and tributary streams	BIO 2.R13.10-11. Remote PIT Tag Reading (currently emphasizing native species)
Sonic telemetry studies for native and nonnative fish to compare and identify spatial and temporal movement patterns, tributary use, and spawning areas	BIO 2.R15.10-11. Nearshore Ecology/Fall Steady Flows (sonic studies emphasizing native fish)

<b>Nonnative Plan Task</b>	<b>GCMRC FY 10-11 work plan reference</b>
<b>Other Recommendations</b>	
An annual nonnative fish workshop with cooperators and other nonnative fish experts to 1889 review current information and to help prioritize efforts	BIO 2.R17.10-11. Nonnative Control Plan Science Support
A formalized reporting procedure for nonnative fish captured and observed by professional entities performing sampling within Grand Canyon	BIO 2.R17.10-11. Nonnative Control Plan Science Support (discussed at annual nonnative meeting)
<b>Contingency Planning</b>	
Defining agency roles and developing rapid response plans to nonnative fish expansions or new invasions	BIO 2.R17.10-11. Nonnative Control Plan Science Support (discussed at annual nonnative meeting)
Evaluation of response triggers to initiate control measures of nonnative fish abundance from changes in catch rate, distribution, species composition, and length frequencies (reviewed at annual nonnative meeting)	BIO 2.R17.10-11. Nonnative Control Plan Science Support (discussed at annual nonnative meeting)
Application of current capture methods used in Grand Canyon while more effective methods are being developed	BIO 2.R16.10-11. Mainstem Nonnative Fish Control
Implantation of sonic tags in nonnative fish to help evaluate dispersal, potential spawning activities, and other factors	BIO 2.R15.10-11. Nearshore Ecology/Fall Steady Flows (further investigating sonic tags)
Establishment of a nonnative fish contingency fund for ongoing monitoring and research activities	Described in Plan and being discussed with AMP committees

## **Nonnative Plan recommendations not addressed in GCMRC FY 10-11 work plan**

### **Monitoring**

- Implementing long-term monitoring program in tributaries and confluence areas of the Grand Canyon

### **Removal**

- Continued removal of trout in Bright Angel Creek using a weir and backpack electrofishing
- Pilot testing of catfish nets and stink cheese to remove and monitor channel catfish and bullhead spp. in the Little Colorado River and the confluence area (these gear types have been tested downstream of Diamond Creek)
- Chemical renovation and barrier construction in tributary streams identified as sources of nonnative fish into Grand Canyon

## **Research**

- Use of pheromone and sensory attractants to increase capture efficiencies for channel catfish and bullhead species
- Sonic telemetry studies for native and nonnative fish to compare and identify spatial and temporal movement patterns, tributary use, and spawning areas (however, nearshore ecology study is investigating sonic tags in small-bodied fishes, and sonic tags were used effectively in association with March 2008 High Flow Experiment)
- Experimental stream tests to investigate mechanisms by which nonnative fish negatively affect juvenile humpback chub
- Development of recommendations for flow manipulations of both water quantity (experimental flows) and temperature (a temperature control device) to disadvantage nonnative species while benefiting natives
- Modification of the William's Carp Cage to capture common carp in tributaries
- Future considerations for long-term nonnative fish control include stocking daughterless carp and introducing infectious agents that target nonnative fish species

## **Other Recommendations**

- Public outreach specifically for nonnative fish-management issues with attention to preventative measures such as deterring illegal stocking