

I. Project Title:  
Native fish response to nonnative fish control in the middle Green River, Utah.

II. Principal Investigator:

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III. Project Summary:

Control actions targeting nonnative gamefish species are being evaluated across the Upper Basin to determine the level of reduction in abundance of these species necessary to minimize the threat to the recovery of the endangered Colorado River fishes. There are two key aspects to evaluating control of nonnative fishes: (1) can the abundance of the target species be reduced significantly by the approaches employed, and (2) is there a measurable positive response by populations of the endangered fish species and associated native fish community?

Given the preliminary stage of nonnative fish control evaluations and the confinement to select river reaches, the most likely first observed positive response will be evident in early life-stages of the native fish community (e.g. flannelmouth and bluehead sucker, roundtail chub and speckled dace). Adult response will not be observed for several years following any significant removal. Also a response may not be observed because of the large ranging area of adults. A positive response in endangered fish species may be more difficult to measure statistically without a longer time frame for observation due to generation times within endangered fish populations. Data necessary for these analyses will be generated by current and future young-of-year sampling and population estimation projects for these endangered species in conjunction with nonnative fish removal efforts.

This project will focus on determining a response of early life-stages of native and small-bodied fishes to removal of nonnative predators; primarily smallmouth bass and northern pike. These fish will serve as indicators of the response that would be experienced by endangered fish species occupying the same habitat types, if their numbers were high enough to detect such a response.

IV. Study Schedule: 2005 – 2008

V. Relationship to RIPRAP:

Green River Action Plan: Mainstem

III. Reduce negative impacts of nonnative fishes and sportfish management activities  
(Nonnative and sportfish management)

III.A.2.c Evaluate the effectiveness (e.g., nonnative and native fish response) and develop and implement an integrated, viable active control program.

VI. Accomplishment of FY 2005 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

*Objective 1:* Implement removal of northern pike from Island Park to Sand Wash and smallmouth bass from Split Mountain to Sand Wash.

Removal of northern pike in the middle Green River began in the spring of 2001 in the middle Green River in the reach of river from Island Park to Sand Wash (Project # 109). Smallmouth bass removal was initiated in early June 2004 beginning at Split Mountain to Sand Wash (Project # 123).

*Objective 2:* Assess abundance of northern pike and smallmouth bass in the middle Green River to determine removal effect.

All northern pike captured from Island Park to Sand Wash have been removed. Since the initiation of northern pike removal in the middle Green River in 2001, catch rates have declined substantially. In 2001, 248 northern pike were removed from the middle Green River and with approximately the same effort; in 2003 only 22 were captured and removed. Catch-per-effort and a depletion will be used to estimate annual abundance of northern pike in the middle Green River. Capture-recapture abundance estimates will be generated for smallmouth bass each year by completing one tagging pass and three removal passes from Split Mountain (RM 318) to Sand Wash (RM 215) during the summer of 2004. This will be repeated in subsequent years and will allow a determination of removal effect. Northern pike will also continue to be removed in subsequent years.

*Objective 3:* Estimate response of small-bodied native fish to removal of northern pike and smallmouth bass in the middle Green River.

Sampling to evaluate a response of small-bodied native fish to nonnative predator removal was conducted by seining suitable low-flow and backwater habitats. Three low-velocity habitats were sampled every five miles dependent upon the number of these habits available within the reach. Currently, the first two backwaters encountered in each 5-mile subreach are sampled under project # 138, YOY Colorado pikeminnow monitoring. Sampled backwaters were blocked at the mouth using a large small mesh seine to allow for closed sampling and a better evaluation of fish species composition and densities. This was also to facilitate depletion sampling for abundance estimation.

Backwater/low velocity habitats were sampled using a 1.2 m x 4 m seine with 3 mm mesh. At least two non-overlapping seine hauls were conducted in each habitat sampled. Preferably the two seine hauls were parallel to one another and perpendicular to the axis of the backwater. However, if water depth was too great, a haul was completed along one shoreline. The first two seine hauls were taken at 1/3 and 2/3 the distance from the mouth of the backwater. Additional seine hauls were sometimes completed in other portions of the habitat including the mouth or shallow tail of a backwater. Length of each seine haul, maximum depth, and average depth were recorded for each sample. All endangered and native fishes were identified, measured (mm) for total length, and returned alive to the habitat. Ray counts were completed for all chubs (*Gila* spp.) captured. All nonnative fishes were enumerated and returned to the backwater habitat.

Table 1. Total numbers, lengths and mean catch-per-unit-effort (CPUE; fish/100m<sup>2</sup>), by species for native fish and white sucker caught in backwater habitats of the middle Green River in October 2005.

<i>Species</i>	Number Caught	Mean Length (mm)	Length Range (mm)	CPUE (Fish/100m <sup>2</sup> )
Bluehead sucker	6	56	50 – 60	0.1
Chub ( <i>Gila</i> spp.)	29	52	31 – 104	0.3
YOY Colorado pikeminnow	55	48	30 – 70	0.5
Juvenile Colorado Pikeminnow	2	128	123 – 132	0.02
Flannelmouth sucker	25	58	38 – 123	0.2
Speckled dace	3	51	49 – 52	0.03
White Sucker	48	64	44 - 87	0.4

Table 2. Total numbers, lengths and mean catch-per-unit-effort (CPUE; fish/100m<sup>2</sup>), by species for small-bodied nonnative fish caught in backwater habitats of the middle Green River in October 2005.

Species	Number Caught	CPUE (Fish/100m <sup>2</sup> )
Black crappie	105	1.0
Black bullhead	1	0.01
Channel catfish	8	0.1
Carp	46	0.4
Fathead minnow	1849	17.0
Green sunfish	38	0.3
Red shiner	38,705	356.3
Sand shiner	12,113	11.5
Smallmouth bass	7	0.1

VII. Recommendations: Continue monitoring efforts as outlined in approved scope of work.

VIII. Project Status: on track and ongoing

IX. FY 2005 Budget Status

A. Funds Provided: \$31,482

B. Funds Expended: \$31,482

C. Difference: \$0

D. Percent of the FY 2005 work completed, and projected costs to complete: 100%  
Recovery Program funds spent for publication charges: \$0

X. Status of Data Submission: Data will be submitted to database manager January 2006.

XI. Signed: Ron Brunson                      November 3, 2005  
Principal Investigator                      Date