I. Project Title: Nonnative fish removal in the Duchesne River.

II. Principal Investigator(s):

Michael Montagne
U.S. Fish and Wildlife Service
1380 South 2350 West
Vernal, UT 84078
Office (435)789-0351 fax (435)789-4805
Email: mike_montagne@fws.gov

III. Product Summary: Predatory nonnative fishes: smallmouth bass *Micropterus dolomieu*, channel catfish *Ictalurus punctatus*, and northern pike *Esox lucius*, are common to abundant in the Duchesne River (Tyus et al. 1982,Cranney 1993). These fish were introduced at various times to provide sport fishing at various locations throughout the Colorado River Basin and Green River sub-basin, and all three have been identified as major or strategic threats to the recovery of endangered fishes throughout the Upper Colorado River Basin (Crowl 1995, Tyus and Saunders 1996, Hawkins and Nesler 1991). The goal of this project is to improve survival of endangered fish in the Duchesne and Green Rivers. To achieve this goal, the Duchesne River was divided into four reaches between the Myton Diversion and the confluence with the Green River and three electrofishing passes on each shoreline were made through each reach to mechanically remove nonnative fishes. Sixty-one channel catfish and 100 smallmouth bass were removed from the Duchesne River in 2005. No northern pike were removed or identified by field crews.

IV. Study Schedule

a. Initial year: FY05
b. Final year: FY06

V. Relationship to RIPRAP

Green River Action Plan: Duchesne River

III.A.3. Implement and evaluate the effects of viable measures to control negative interactions from nonnative fishes.

VI. Accomplishments of FY05 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings.

Study Area

The entire study area of the Lower Duchesne River is located on The Northern Ute Indian (Ute Tribe) Reservation (Ute Reservation) between the Myton Diversion (river mile [RM] 41.0) to the confluence of the Green River (RM 0).

Study Design

The study area was divided into four reaches. Reach one begins at the Myton Diversion and extends to the mouth of the Ouray School Canal (RM 27.5-41.0). Reach two begins at the mouth of the Ouray School Canal and extends to the old Randlett gauging station (RM 16.8-27.5). Reach three begins at the old Randlett gauging station and extends to the pipeline river miles (RM 8.0-16.8). Reach four begins at the pipeline and ends at the confluence of the Green River (RM 0.0-8.0).

Two electrofishing rafts, one for each shoreline, were used to sample the river. One to two one-mile sections in each reach were intensively electrofished and all fish captured were removed from the river. A total of six miles of river were sampled during each pass. A total of 18 miles of river were sampled during the study. Sampling was only done when flows were greater than 500 cubic feet per second (cfs).

All smallmouth bass, channel catfish, and northern pike removed from the river were to be translocated to Elders Pond on the Ute Reservation to help provide for a sport fishery for Ute Tribal members. No fish were taken to the pond if their numbers or sizes were too small to justify the effort. In this case, these fish were disposed of in a manner acceptable to the Ute Tribe and the Utah Division of Wildlife Resources.

All captured smallmouth bass, channel catfish, northern pike, and endangered fish were weighed (grams [g]) and measured (total length, millimeter [mm]). Endangered fish were also scanned for PIT tags, tagged with new PIT tags if needed, and then returned to the river. Additionally, catch per unit effort (fish/hour [CPUE]), fish composition, and relative abundance were calculated to help measure the efficiency of the nonnative removal control program.

2005 Sampling Results

Three electrofishing passes were completed on the Duchesne River between Myton, Utah, and the confluence with the Green River (RM 0.0-41.0) in 2005. The first two passes were completed on June 6-9 and 13-16 during the descending limb of the hydrograph. Before a third pass could be made, flows declined to the point were the river was not navigable. A third pass was conducted on October 3-6 thanks to releases from Starvation Reservoir into the Duchesne River, by the Central Utah Water Conservancy District, to achieve approximately 500 cfs.

Sixty-one channel catfish and 100 smallmouth bass were removed from the Duchesne River in 2005. No northern pike were removed or identified by field crews.

The number of channel catfish and smallmouth bass captured by pass ranged from14 to 28 and 22 to 50; and by reach from 5 to 31 and 6 to 40, respectively (Tables 1 and 2). The CPUE of channel catfish and smallmouth bass captured by pass ranged from 0.63 to 1.18 and 0.99 to 1.18; and by reach from 0.21 to 1.86 and 0.53 to 1.81, respectively (Tables 3 and 4). Common carp *Cyprinus carpio* and white sucker *Catostomus commersoni* made up most of the fish that were captured in the Duchesne River (Tables 5-9). Channel catfish ranged in length and weight from 240 to 649 mm and 130 to 2,432 g (Figures 1 and 2). Smallmouth bass ranged in length and weight from 61 to 396 mm and 3 to 952 g (Figures 3 and 4).

Three Colorado pikeminnow *Ptychocheilus lucius* were caught. Two were recaptures and one was a new fish that was tagged. The pikeminnow lengths ranged from 550 to 801 mm and weights from 1,480 to 5,547 g.

River flows ranged from 1,480 to 2,220 cfs during the first pass (June 6-9), 994 to 1,170 cfs during the second pass (June 13-16), and 490 to 545 cfs during the third pass (October 3-6).

Table 1. The number of channel catfish and smallmouth bass removed by pass from the Duchesne River in 2005.

Pass	Date	Channel Catfish	Smallmouth Bass
1	6/6-9/2005	28	28
2	6/13-16/2005	14	22
3	10/3-6/2005	19	50
Total		61	100

Table 2. The number of channel catfish and smallmouth bass removed by reach from the Duchesne River in 2005.

Reach	RM	Channel Catfish	Smallmouth Bass
1	27.5-41.0	5	40
2	16.8-27.5	18	31
3	8.0-16.8	31	23
4	0.0-8.0	7	6
Total		61	100

Table 3. Catch rates (fish/hour) for channel catfish and smallmouth bass by pass from the Duchesne River in 2005.

Pass	Date	Channel Catfish	Smallmouth Bass
1	6/6-9/2005	1.18	1.18
2	6/13-16/2005	0.63	0.99
3	10/3-6/2005	0.86	2.26
Total		0.9	1.47

Table 4. Catch rates (fish/hour) for channel catfish and smallmouth bass by reach from the Duchesne River in 2005.

Reach	RM	Channel Catfish	Smallmouth Bass
1	27.5-41.0	0.21	1.75
2	16.8-27.5	1.05	1.81
3	8.0-16.8	1.86	1.38
4	0.0-8.0	0.62	0.53
Total		0.9	1.47

Table 5. Relative abundance of all fish captured from the Duchesne River in 2005.

Species	Number Captured	Relative Abundance (%)	Catch/effort (fish/hr)*
Common carp *Cyprinus carpio*	129	41.1	11.25
White sucker *Catostomus commersoni*	106	33.8	9.24
Channel catfish *Ictalurus punctatus*	22	7.0	1.92
Flannelmouth sucker *Catosomus latipinnis*	21	6.7	1.83
Smallmouth bass *Micropterus dolomieui*	17	5.4	1.48
Brown trout *Salmo trutta*	6	1.9	0.52
Black bullhead *Ameiurus melas*	3	1.0	0.26
Red shiner *Notropis lutrensis*	3	1.0	0.26
Green sunfish *Lepomis cyanellus*	2	0.6	0.17
Rainbow trout *Oncorhynchus mykiss*	2	0.6	0.17
Bluehead sucker *Catostomus discobolus*	1	0.3	0.09
Colorado pikeminnow *Ptychocheilus lucius*	1	0.3	0.09
Fathead minnow *Pimephales promelas*	1	0.3	0.09
Total fish	314		

*There was a total of 11.47 hours of electrofishing conducted in the Duchesne River in 2005.

Table 6. Relative abundance and summary of species captured in reach 1 (RM 41-27.5).

Species	Number Captured	Relative Abundance (%)	Catch/effort (fish/hr)*
White sucker	68	54.0	16.83
Common carp	32	25.4	7.92
Flannelmouth sucker	12	9.5	2.97
Brown trout	5	4.0	1.24
Smallmouth bass	4	3.2	0.99
Black bullhead	2	1.6	0.50
Channel catfish	2	1.6	0.50
Red shiner	1	0.8	0.25
Total fish	126		

*There was a total of 40.4 hours of electrofishing conducted in reach 1 of the Duchesne River in 2005.

Table 7. Relative abundance and summary of species captured in reach 2 (RM 27.5-17).

Species	Number Captured	Relative Abundance (%)	Catch/effort (fish/hr)*
White sucker	34	40.0	9.50
Common carp	23	27.1	6.42
Smallmouth bass	12	14.1	3.35
Channel catfish	8	9.4	2.23
Flannelmouth sucker	2	2.4	0.56
Rainbow trout	2	2.4	0.56
Bluehead sucker	1	1.2	0.28
Brown trout	1	1.2	0.28
Colorado pikeminnow	1	1.2	0.28
Red shiner	1	1.2	0.28
Total fish	85		

*There was a total of 3.58 hours of electrofishing conducted in reach 1 of the Duchesne River in 2005.

Table 8. Relative abundance and summary of species captured in reach 3 (RM 17-8).

Species	Number Captured	Relative Abundance (%)	Catch/effort (fish/hr)*
Common carp	54	76.1	27.55
Channel catfish	6	8.5	3.06
White sucker	4	5.6	2.04
Flannelmouth sucker	3	4.2	1.53
Black bullhead	1	1.4	0.51
Fathead minnow	1	1.4	0.51
Red shiner	1	1.4	0.51
Smallmouth bass	1	1.4	0.51
Total fish	71		

*There was a total of 1.96 hours of electrofishing conducted in reach 1 of the Duchesne River in 2005.

Table 9. Relative abundance and summary of species captured in reach 4 (RM 8-0).

Species	Number Captured	Relative Abundance (%)	Catch/effort (fish/hr)*
Common carp	20	62.5	10.53
Channel catfish	6	18.8	3.16
Flannelmouth sucker	4	12.5	2.11
Green sunfish	2	6.3	1.05
Total fish	32		1.9 hours electrofishing

*There was a total of 1.90 hours of electrofishing conducted in reach 1 of the Duchesne River in 2005.

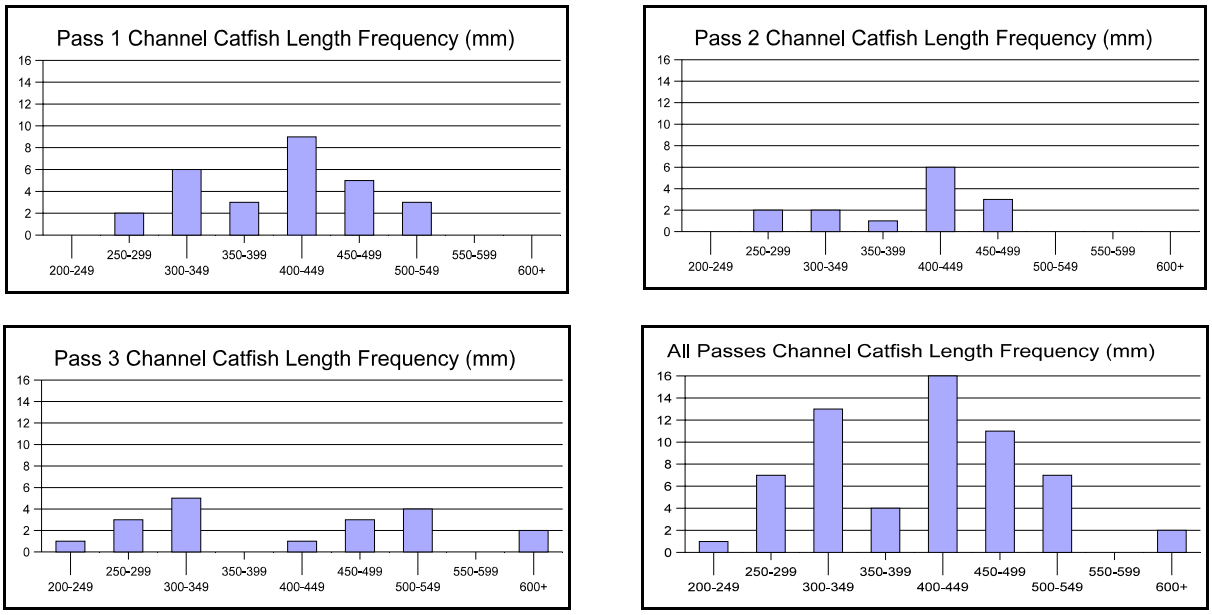

Figure 1. Length frequency of channel catfish captured by each pass and total channel catfish caught per pass.

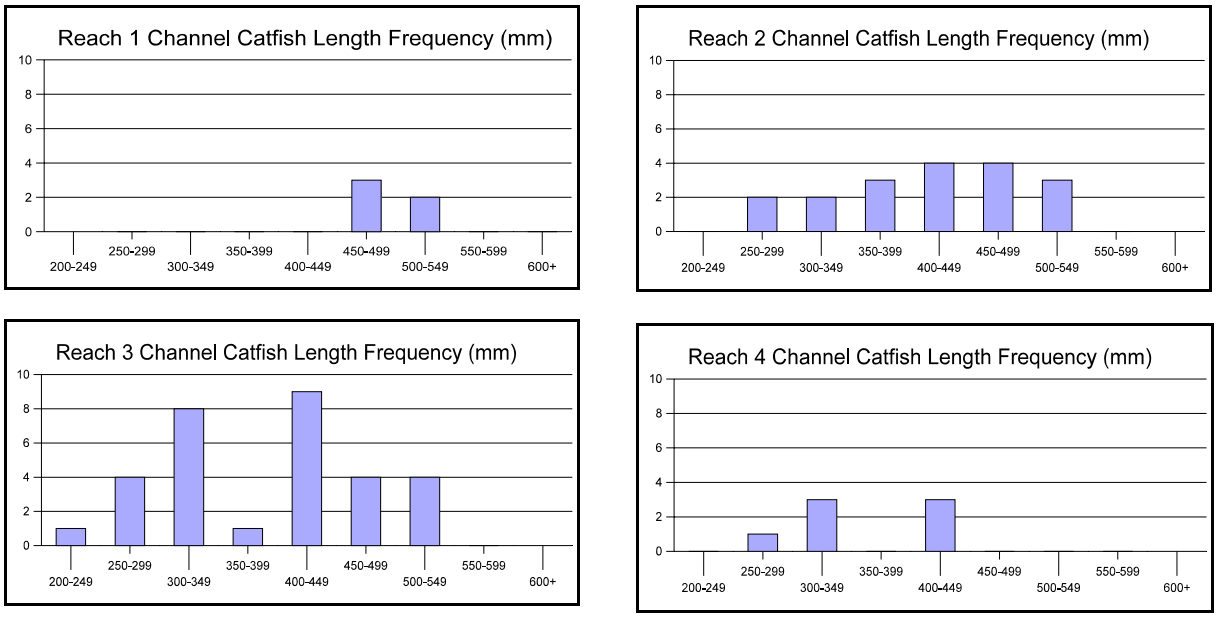

Figure 2. Length frequency of channel catfish captured by reach (all passes combined).

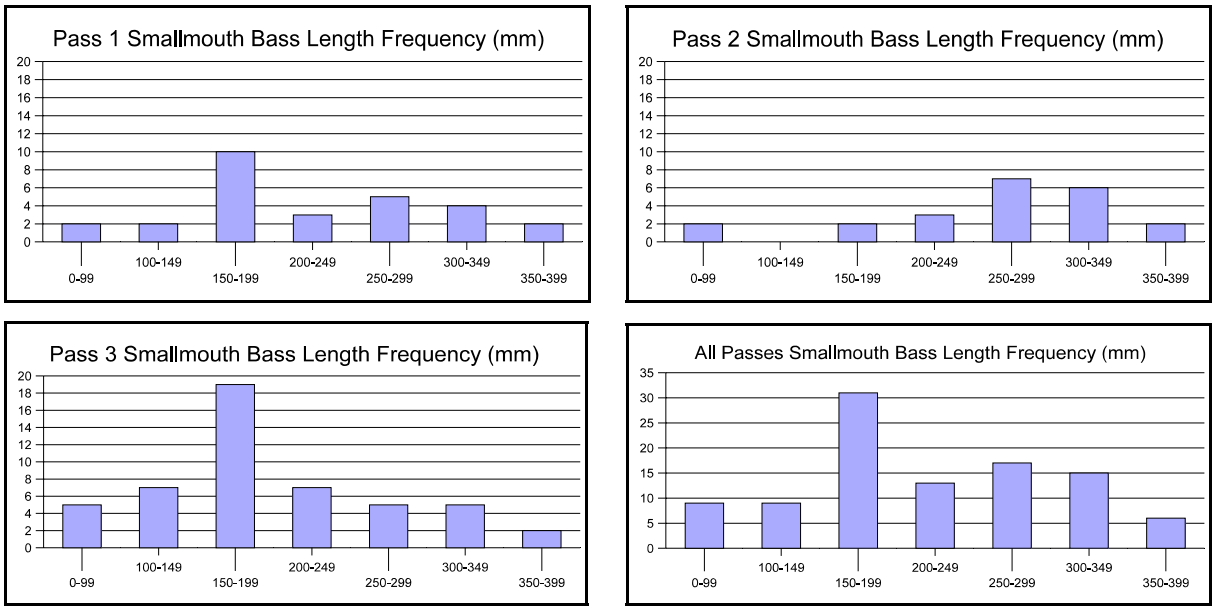

Figure 3. Length frequency of smallmouth bass captured by each pass and total smallmouth bass caught per pass.

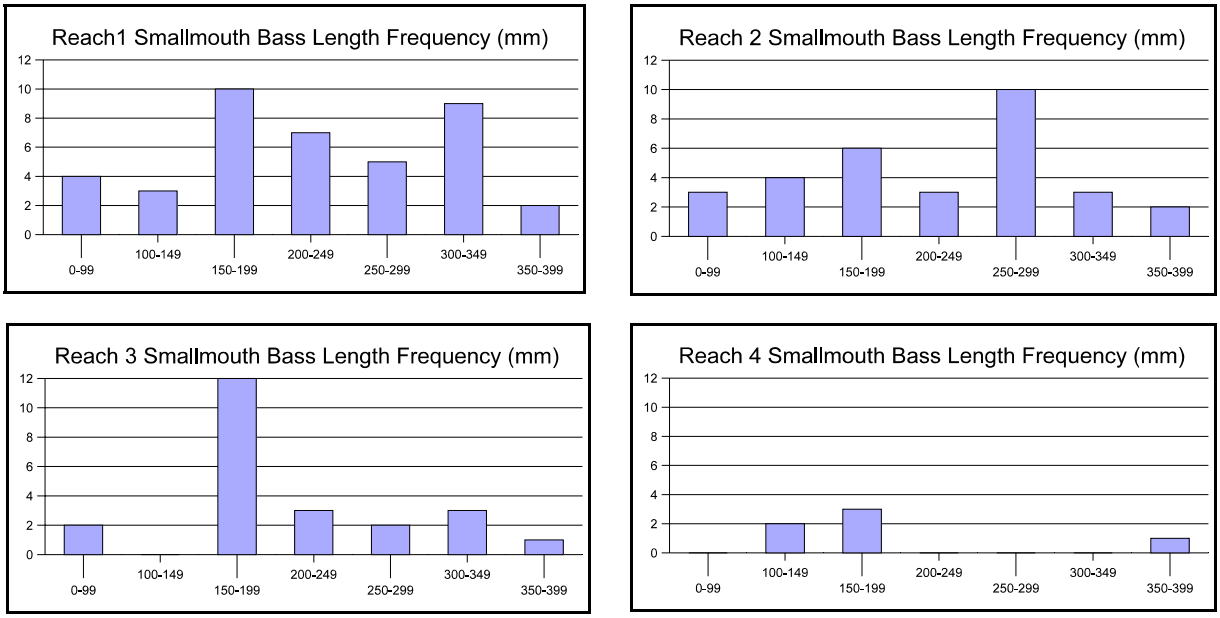

Figure 4. Length frequency of smallmouth bass captured by reach (all passes combined).

VII. Recommendations:

1. Continue nonnative removal efforts of channel catfish and smallmouth bass in the Duchesne River in 2006 for comparison to 2005 results.

2. Reevaluate necessity or value of nonnative fish removal from the Duchesne River after 2006.

VIII. Project Status:

Project continues through 2006.

IX. FY 05 Budget Status:

		Total
A.	Funds Provided:	28,560
B.	Funds Expended:	28,560
C.	Difference:	0
D.	Recovery Program Funds for Publications:	0

X. Status of Data Transmission:
Data is being entered and will be submitted to the program data base manager upon the completion of the study.

XI. Signed: *Michael Montagne* November 14,2005
Principal Investigator Date

References:

Cranney, S.J. 1993. Lower Duchesne River fishery investigations - 1993. Draft Report. Utah Division of Wildlife Resources, Vernal, Utah.

Crowl, T.W. 1995. Nonnative fish control report for the Green and Duchesne rivers. RIP Annual Report Meeting. Grand Junction, Colorado.

Hawkins, J. A., and T. P. Nesler. 1991. Nonnative fishes in the upper Colorado River basin: an issue paper. Final Report. Colorado State University Larval Fish Laboratory and Colorado Division of Wildlife, Fort Collins.

Tyus, H.M, B.D. Burdick, R.A. Valdez, C.M. Haynes, T.A. Lytle, and C.R. Berry. 1982. Fishes of the Upper Colorado River Basin: distribution, abundance, and status. Pages 12-70, in W.H. Miller, H.M. Tyus, and C.A. Carlson (eds). Fishes of the Upper Colorado River System: Present and Future. Fishes of the Upper Colorado River Basin: distribution, abundance, and status. American Fisheries Society, Bethesda. MD.

Tyus, H.M. and J.F. Saunders, III. 1996. Nonnative fishes in natural ecosystems and a strategic plan for control of nonnatives in the Upper Colorado River Basin. Draft Report. Center for Limnology, University of Colorado, Boulder, Colorado. For the Recovery Implementation Program for Endangered fish Species in the Upper Colorado River Basin. Cooperative Agreement No. 14-48-0006-95-923, U.S. Fish and Wildlife Service, Denver, Colorado.