

I. Project Title: Development of a Northern Pike Control Program in the Middle Green River

II. Principal Investigator(s):

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III. Project Summary:

The purpose of this project is to decrease the adult northern pike population in the middle Green River and develop an effective control program. The goal is to sufficiently reduce the abundance of adults such that predatory and competitive impacts on growth, recruitment, and survival of endangered and other native fishes are minimized. The study objectives are:

1. Capture and remove (lethally) adult northern pike from reaches of the middle Green River.
2. Initiate annual removal efforts before pike have an opportunity to spawn in the Green River, its tributaries, or floodplain habitats.
3. Reduce the abundance of adult northern pike in the middle Green River.
4. Determine the efficiency of removal efforts.
5. Identify the means and levels of northern pike control necessary to minimize the threat of predation/competition on endangered and other native fishes.

Progress to date includes the removal of 414 northern pike from the middle Green River. Following the removal of 248 northern pike in 2001, catch rates have remained relatively low and steady at 18 – 42 northern pike removed per year.

IV. Study Schedule: Initial year-2001
Final year-2007

V. Relationship to RIPRAP:

General Recovery Program Support Action Plan

- III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A. Reduce negative interactions between nonnative and endangered fishes.
- III.A.2. Identify and implement viable active control measures.
- III.A.2.c. Evaluate the effectiveness and develop and implement an integrated, viable active control program.

Green River Action Plan: Mainstem

- III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A. Reduce negative impacts to endangered fishes from sportfish management activities.
- III.A.4. Develop and implement control programs for nonnative fishes in river reaches occupied by the endangered fishes to identify required levels of control. Each control activity will be evaluated for effectiveness, and then continued as needed.
- III.A.4.a. Northern pike in the middle Green River.

VI. Accomplishment of FY 2007 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1. Analyze northern pike cleithra collected during FY-2006 for age.

This task was not completed. No cleithra were collected during the FY2006 field season for analysis in the FY2007 field season.

Task 2. Analyze preserved stomachs collected from northern pike during FY-2006.

Stomach contents were not preserved in either 2006 or 2007; however, northern pike stomachs were quickly examined for presence/absence of fish and to determine if fish could be identified to species. We did not attempt to identify digested stomach contents. On 27 March, a 606 mm northern pike had multiple shiners and one white sucker (not measured) in its stomach. A 551 mm northern pike had one shiner in its stomach. Two other northern pike (male total length = 530 mm; female total length = 550 m) were captured during this early spring fyke-netting effort on 6 April from the mouth of Ashley Creek. Neither one had anything identifiable in its stomach; however, both were ripe. Other northern pike were observed for stomach contents during the Colorado pikeminnow abundance estimates; identifiable stomach contents included mottled sculpin and smallmouth bass. Additional ripe northern pike were found, including one 800 mm ripe female. Most ripe northern pike were captured in the mouth of Ashley Creek and the Stewart Lake drain this year; however, one ripe female was captured in the Island Park reach (located above Split Mountain).

Task 3. Capture and remove northern pike and other nonnative fishes.

This task was completed. Known concentration areas for northern pike in the middle Green River during spring include: mouth of Brush Creek (RM 304.5), Cliff Creek (RM 302.9), Stewart Lake Drain (RM 300), and Ashley Creek (RM 299). The primary habitats sampled were large relatively deep backwaters and tributary mouths. Sampling methods included the use of fyke nets, trammel nets, and electrofishing. Trammel nets were regularly used in conjunction with electrofishing as a productive sample method for other nonnative species. No northern pike were captured using this method in 2007.

2007 Results

Effort was extremely reduced in FY2007 from previous years. This is predominantly due to a short sampling period confined to March and April and an overall desire to predominantly focus spring removal efforts during other projects. Early spring efforts in 2007 included 11 fyke net-nights (one fyke net set out for one night is considered one fyke net-night) and 2.85 hours of electrofishing. This effort began on 26 March and ended 6 April 2007. A total of 4 northern pike were removed, including the two ripe fish caught on 6 April (mentioned above in Task 2). Lengths of northern pike ranged from 530 mm to 606 mm with a median length of 551 mm. Additional nonnative fish were removed during this effort including black crappie, creek chub, green sunfish, longnose dace, smallmouth bass, and white sucker (see Annual Reports for projects 123b and 150 for catch-per-effort information). The only native species captured during this effort was flannelmouth sucker.

Northern pike continue to be caught in the Green River during work on other projects: 10 during the Colorado pikeminnow abundance estimates and five during the smallmouth bass removal project. Lengths of northern pike ranged from 415 mm to 800 mm with a median length of 590 mm. All northern pike from all projects were frozen and stored until delivered to Colorado State University for the stable isotope study.

Length frequencies for all northern pike caught in 2007 show a continuing slight shift toward smaller fish (Figure 1). In 2002 and 2003, the predominant size class appears to be from 650 mm to 699 mm. Since 2003, the predominant size class appears to be smaller, though it does seem to vary from year to year. We consistently do not see pike smaller than 300 mm and this year was no exception.

Northern pike catch rates continue to be low in the middle Green River since removal efforts began in 2001; however, the fyke-netting catch rate was higher than previous years (Table 1; Figure 2). Fyke net catch rates were 0.56 pike/net-night in 2001, then down to 0.06 pike/net-night in 2002, 0.03 pike/net-night in 2003, 0.11 pike/net-night in 2004, 0.14 pike/net-night in 2005, 0.04 pike/net-night in 2006, and back up to 0.36 pike/net-night in 2007. Early spring electrofishing did not result in the removal of any northern pike; however, many other nonnative fish were removed during this effort (see annual reports for projects 123b and 150).

Table 1. Catch rates and total number of northern pike removed from the middle Green River: 2001 – 2007.

Year	Catch Per Unit Effort		Total # Caught
	#/electrofishing hour	#/Fyke net-night	
2001		0.56	248
2002		0.06	42
2003		0.03	22
2004	0.5	0.1	27
2005	0.5	0.14	37
2006	0.2	0.04	20 (3)*
2007	0.0	0.36	18 (4)*

*Number in parenthesis corresponds to CPUE values listed in table (number caught during early spring removal efforts).

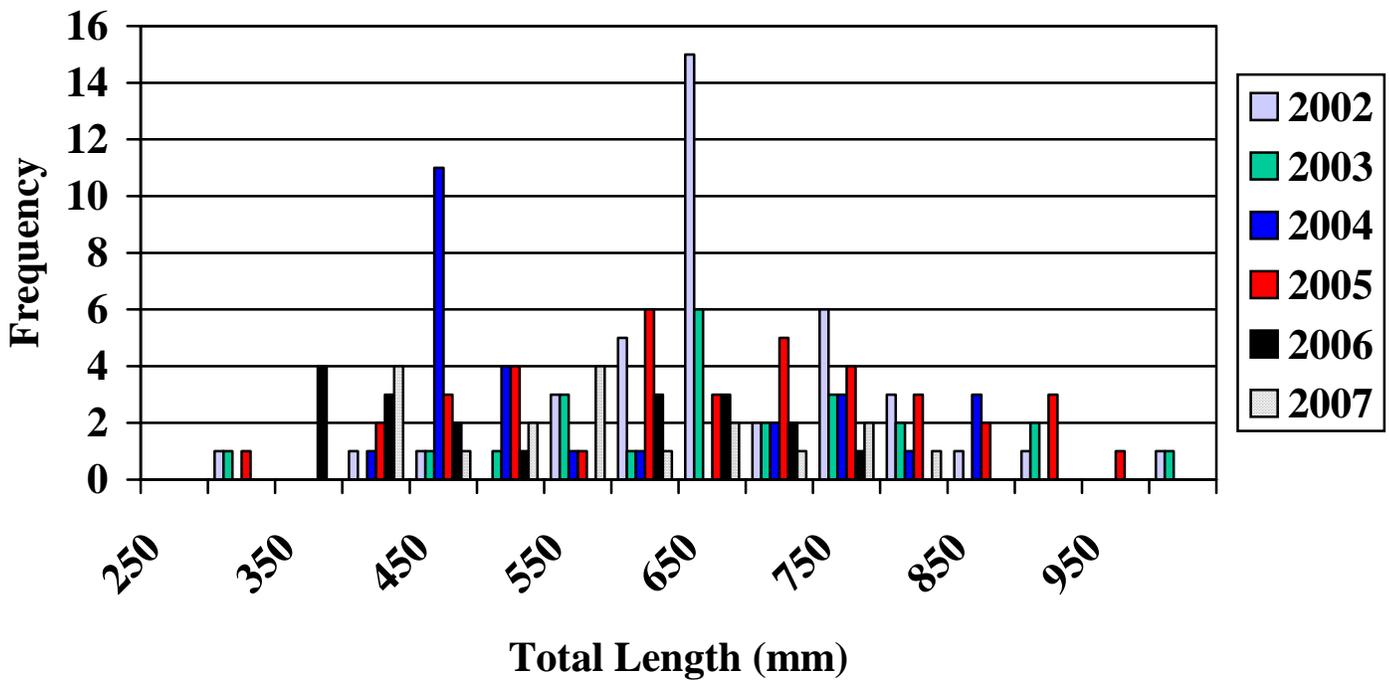


Figure 1. Length frequency of northern pike caught in the middle Green River: 2002 – 2007.

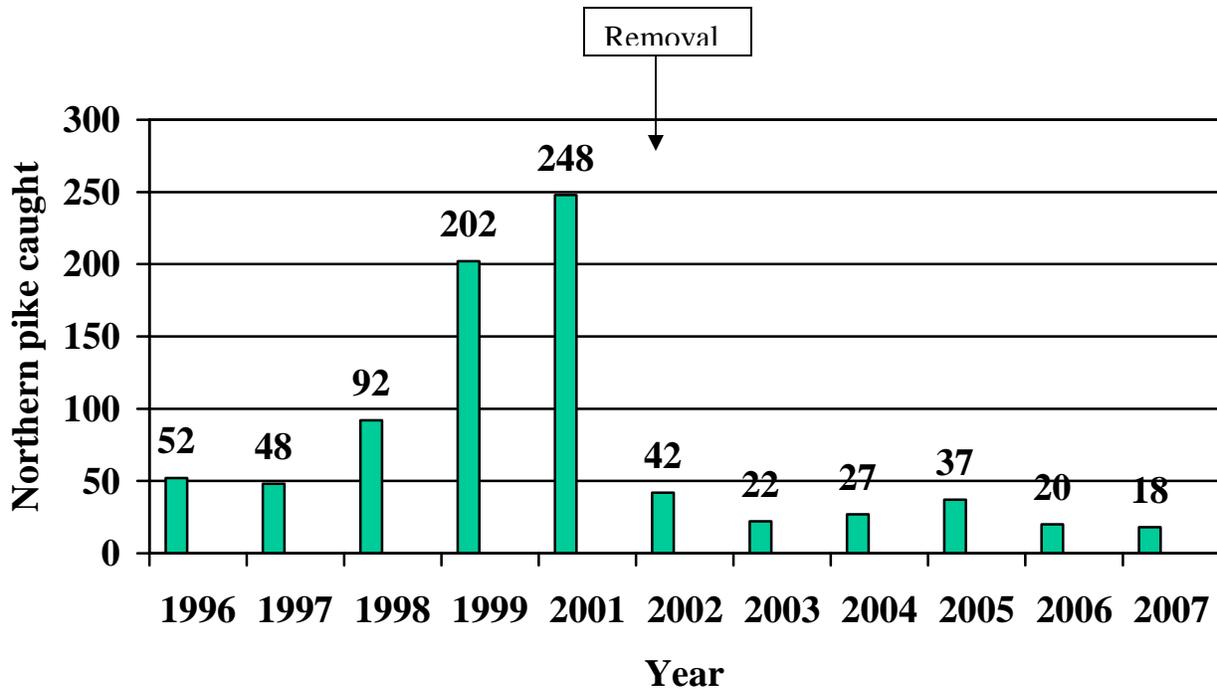


Figure 2. Number of northern pike captured in the middle Green River from 1996 – 2007.

Task 4. Data entry and analysis.

The data for this removal effort has been entered into a database. Any analysis performed will be completed by the nonnative removal workshop in December 2007.

Task 5. Prepare Recovery Program FY-2007 annual progress report.

Annual report was completed and submitted in November 2007.

VII. Recommendations:

- Continue with a minimal effort of early spring nonnative removal in the middle Green River. In early spring when flows begin rising, many low flow areas are overrun with nonnative species causing them to become more susceptible to our gear. We were able to remove two ripe adult northern pike and a large number of white suckers from these areas with very little effort this spring.
- Continue collection of data on other sympatric species encountered while conducting removal efforts.

VIII. Project Status: On track and ongoing

IX. FY 2007 Budget Status

- A. Funds Provided: \$9,000
- B. Funds Expended: \$0
- C. Difference: \$9,000
- D. Percent of the FY 2006 work completed, and projected costs to complete: 100%
- E. Recovery Program funds spent for publication charges: \$0

There was a misunderstanding with this project. We were unaware that we were receiving funds specifically for northern pike removal. Our understanding was that it would be discontinued except for the minimal amount of effort of early spring removal approved in 123b. Therefore, we did not spend this money and will gladly return it to the Program.

X. Status of Data Submission:

All tagging data for 2001 – 2006 have been submitted to the database manager. Tagging data for 2007 will be submitted by November 2007.

XI. Signed: Trina Hedrick October 13, 2007
Principal Investigator Date