

I. Project Title: Translocation of northern pike from the Yampa River upstream of Craig, Colorado.

II. Principal Investigator:

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III. Project Summary:

This project has been progressing virtually unchanged since 2004. For a more detailed description of the background of this project, literature reviews of northern pike and its life history and requirements, effects that non native introductions have on standing stocks, and non native removal history in the Program, see previous annual reports. Objectives of this study are to reduce numbers of adult northern pike in the study reach, determine population size and structure, maintain public support for the Recovery Program by providing off-channel angling opportunities, and to monitor the smallmouth bass population in the study area.

IV. Study Schedule: The study is ongoing.

V. Relationship to RIPRAP:

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

III.A.1.b Control northern pike.

III.A.1.b(1) Remove and translocate northern pike and other sportfishes from Yampa River

VI. Accomplishment of FY 2010 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Northern Pike Population Estimation and Removal Effectiveness

We conducted 7 electrofishing passes through our 38-mile study section of the upper Yampa River from Hayden to Craig. The first pass was a marking pass and the subsequent passes were used for removal. Seven hundred sixty-nine unique northern pike of all sizes were captured, of which 679 were removed or relocated. The population estimate, prior to removal, of adult northern pike (≥ 300 mm) in 2010 was 806 (573-1039 95% C.I.).

Of the estimated 806 adults (21 fish/mile, 22 and 18 fish/mile in 2009 and 2008 respectively), we removed or translocated 628 (78% compared to 31, 57.9, and 24.4% from 2009-2007 respectively). Additionally, 125 of the estimated 153 juvenile northern pike (41-276 95% C.I.) were removed or translocated (81%). Of the 628 northern pike, the Colorado Division of Wildlife took 32 for a study and the remaining were translocated to the Yampa River State Park Headquarters pond for anglers.

Of the 183 northern pike tagged on the first pass, we recaptured 93, and 11 were captured downstream of our study area by the Colorado Division of Wildlife (4) and Colorado State University (7; 56% removal of tagged fish compared to 52%, and 22% in 2008 and 2009 respectively). These fish were recaptured up to 27 miles downstream of our study reach.

Length-frequency of pike captured in 2010 shows a bimodal distribution with young and old age classes present (Figure 1). Younger fish are well represented in the sample indicating successful spawning and recruitment in the last few years. Approximately 10% of the catch measured >700mm. We observed depletion among passes (Figure 2). It is important to note that Passes 8 and 9 occurred after peak runoff (June 14-18) and were performed using only one boat instead of two as part of another study. Catch per unit effort by pass also shows evidence of depletion until Passes 8 and 9 (Figure 3). Pass 8 occurred at the descending limb of the hydrograph at high flows, and Pass 9 occurred within a few days of Pass 8, but at less than half the flow. This supports the idea that substantial immigration into the study area occurs after high water and that lower flows correlate with higher catch rates.

As in past years, we observed that some reaches contain more northern pike than others, most notably river miles (RM) 139 and 151, both of which have one primary backwater where most of the northern pike are captured (Figure 4).

Northern Pike Foreign Tags

In 2010, we captured 36 northern pike that had been tagged by previous investigators up to five years ago. The colors of the floy tags included white, red, yellow, green, grey and blue. Two fish were tagged upstream of our study reach in Catamount Reservoir, 13 fish came from this study reach from previous years, and the rest were tagged downstream of this study reach. Three fish captured had been released in Loudy-Simpson in 2008 and 2009, and one fish captured had been released into the State Park Headquarters Pond in 2008. Adult northern pike from this sample on average grew 90 mm/year.

Smallmouth Bass

Ten individual smallmouth bass were captured in this study. A population estimate was not attempted. These fish ranged from 220-441 mm. Two were tagged downstream with

grey floy tags, and one had two pelvic fin clips but no floy tag. We are unsure of the reason for the two pelvic clips; the researchers in adjacent areas have clipped one pelvic fin in the past, but not two.

VII. Recommendations:

Since we have documented this year and in previous years that northern pike move both upstream and downstream, removal needs to be employed in all sections of river where northern pike occur, otherwise the effects of removal will probably be negligible due to repopulation from source populations. We recommend that we employ removal efforts on all sections of the Yampa River where northern pike occur to be able to determine if we can decrease their populations.

Our data documents escapement of northern pike and/or smallmouth bass from Elkhead reservoir, the State Wildlife ponds, Loudy- Simpson pond, and the State Park Headquarters pond. This year we captured three northern pike that were released into Loudy-Simpson pond that re-entered the main river, and one that was released into the State Park Headquarters pond in 2008 that was recaptured in the river. This year all our translocated northern pike went into the Yampa River State Park Headquarters pond. Of the sites where northern pike have been translocated to date, this site is the only one with no chance of connecting to the river. Fishing pressure at this site is extremely high. We have counted as many as 22 anglers at a time there. One of the main threats to recovery of the endangered fish is predation by non-native fish. Since escapement of northern pike and smallmouth bass continues to be an issue, we recommend euthanizing northern pike and smallmouth bass as the only way to ensure they are removed from their populations. If euthanasia is not adopted, then we recommend stocking northern pike only at the State Park Headquarters pond given that there is no connection to the river. To minimize transportation of fish from the pond to the river, we recommend that signs be posted at the State Headquarters Pond educating anglers on the reasoning behind stocking northern pike in the pond and that it is illegal to move them back to the river.

On October 26 and 27, 2009, Loudy-Simpson pond was sampled by electrofishing and gill netting. Twelve northern pike were captured, of which only one was tagged. The remaining 11 were small, untagged fish suggesting that there likely has been successful spawning and recruitment at this site, and that it does not winterkill each year. At a high water event, any of these fish can enter the river. Therefore, stocking northern pike into Loudy-Simpson should be discontinued. In addition, we recommend removing northern pike from Loudy-Simpson using netting and electrofishing since we know that at high water there is a connection to the Yampa River. We should treat Loudy-Simpson as any other backwater containing northern pike in our study reach.

By doing a mark-recapture population estimate, we tag fish that then continue to stay in the river. By using a depletion estimate, we can eliminate the need to release northern pike back into the river and still gather reliable population data. By using our 2010 data in a depletion model, we estimate 742 northern pike (679-805 95% C.I.) compared to a

mark-recapture estimate of 806 (573-1039 95% C.I.). During the mark pass we released 183 northern pike back to the river, of which 79 were not recaptured. Given that the difference in the estimates is not substantial, we recommend using depletion estimates for this project instead of mark-recapture.

VIII. Project Status: The project is ongoing.

IX. FY 2010 Budget Status:

- A. Funds Provided: \$166,247
- B. Funds Expended: \$166,247
- C. Difference: 0
- D. Percent of the FY 2010 work completed, and projected costs to complete:100
- E. Recovery Program funds spent for publication charges:0

X. Status of Data Submission: Data has been submitted to Travis Francis, USFWS-Grand Junction CRFP.

XI. Signed: Aaron Webber November 1, 2010
Principal Investigator Date

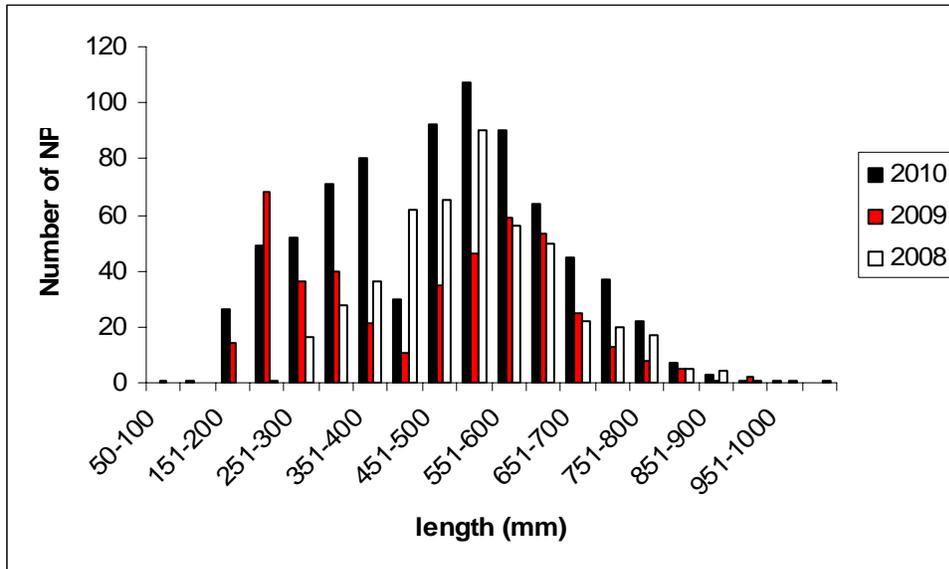


Figure 1. Length frequency of Yampa River northern pike captured 2008-2010.

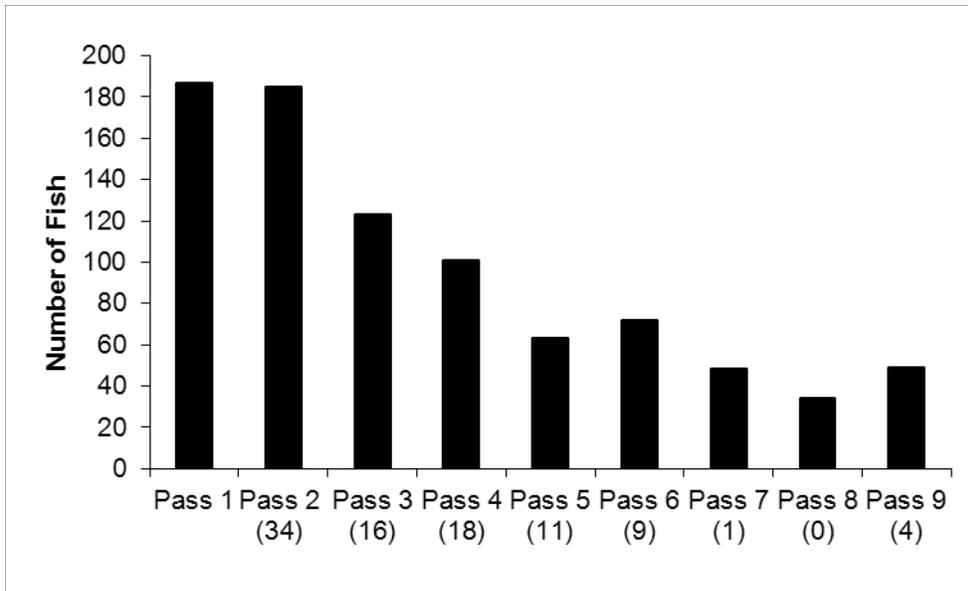


Figure 2. Northern pike captured by pass in the Yampa River, 2010. Parentheses indicate number of recaptured fish captured from fish tagged during Pass 1.

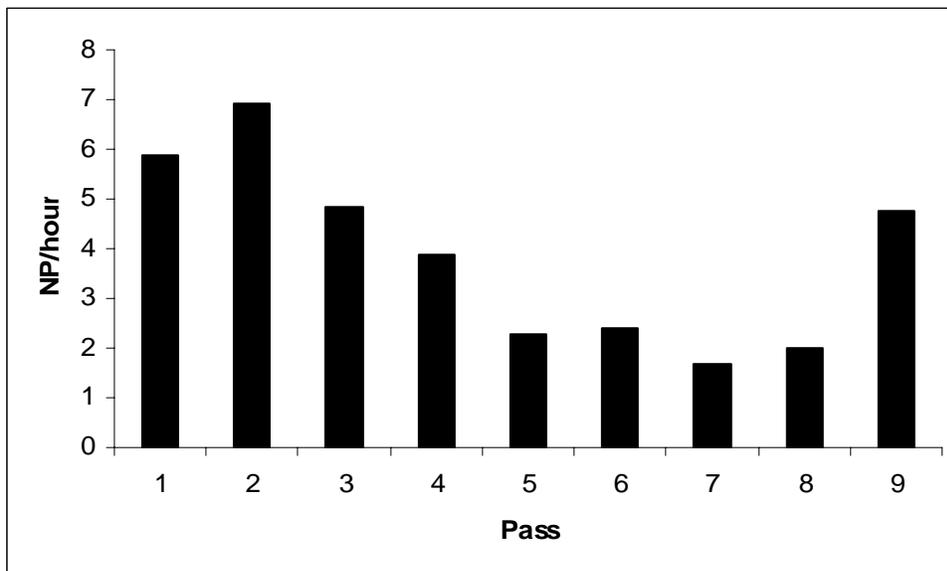


Figure 3. Northern pike captured per hour by pass, Yampa River 2010.

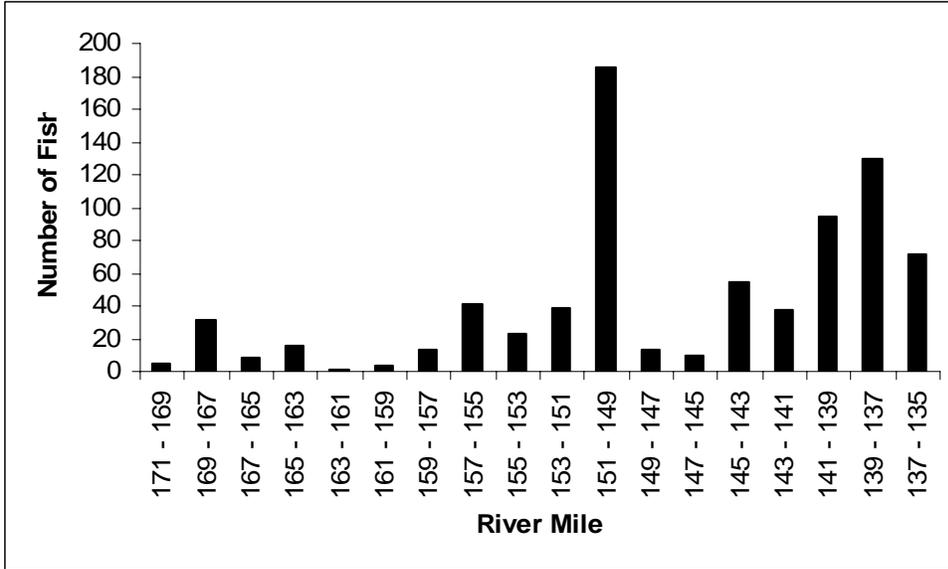


Figure 4. Total number of northern pike captured by river mile reach, Yampa River 2010.

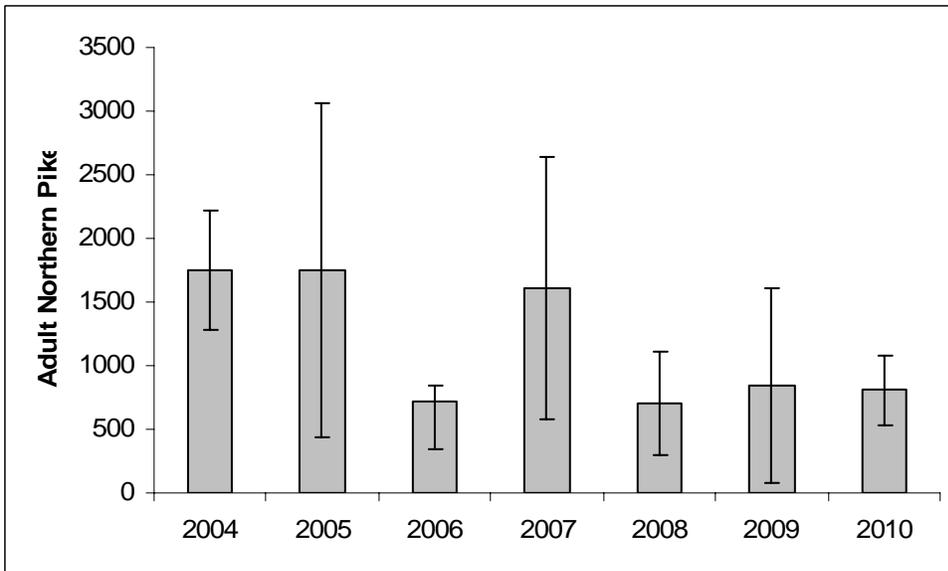


Figure 5. Northern pike population estimates and 95% confidence intervals 2004-2010.

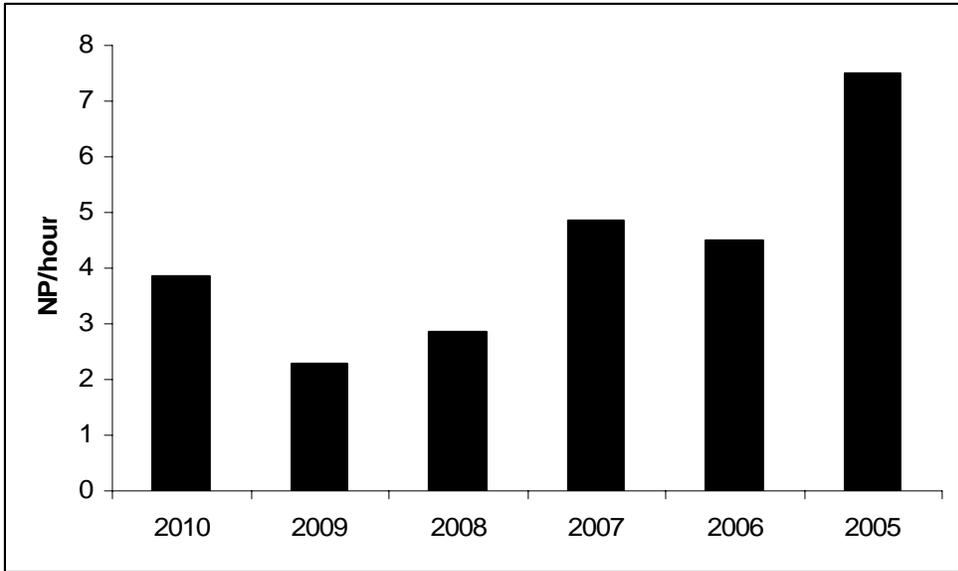


Figure 6. Overall northern pike catch rates 2005-2010 for project 98b.