

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

II. Principal Investigator:

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III. Project Summary:

The objective of this study is to remove as many northern pike and smallmouth bass as possible from the Yampa River from Hayden to Craig, CO. We use electrofishing boats and electrofish this reach seven times a year. We euthanize all smallmouth bass and any northern pike < 20 in. Northern pike > 20 in. are taken to the Yampa River State Park headquarters pond for angling opportunities for the public.

IV. Study Schedule: 2004-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 2011 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. We did not use mark-recapture for a population estimate in this project as we have in previous years because the Biology Committee decided that the benefit of obtaining an imprecise population estimate (as has been the case since the start of this project) did not outweigh the cost of marking and releasing northern pike that otherwise could be removed from the system. We decided instead to use depletion to estimate the population if the numbers of captures would allow for this technique. Thus all 7 passes were used as removal passes. We removed 525 northern pike of all sizes from our study reach (419 adults \geq 300 mm TL, 106 juveniles). The

population estimate, prior to removal, of adult northern pike (≥ 300 mm) in 2011 was 465 (440-489 95% C.I.), and 110 for juvenile northern pike (106-115 95% C.I.). Using this estimate, the exploitation rate would be 90% for adults and 96% for juveniles, and there would have been 12 fish/mile in the river before removal (21 and 22 fish/mile in 2010 and 2009 respectively). We removed or translocated all 525 northern pike. Thirty were given to the Colorado Parks and Wildlife for study, and at their request, pike < 508 mm were euthanized. The remaining fish were released into the Yampa River State Park headquarters pond for angling opportunities.

Length-frequency of pike captured in 2011 shows small and large size classes present (Figure 1). Younger age-classes were well represented in the sample indicating successful spawning and recruitment in the last few years. We observed depletion among passes (Figure 2 and 3). Passes 1-4 occurred before high water, and passes 5-7 after high water. We removed fish most effectively in the first 2 passes. Both overall numbers and catch per effort decreased during subsequent passes. As in past years, we observed that some reaches contained more northern pike than others, most notably river miles 139 and 151, both of which have one primary backwater where most of the northern pike were captured (Figure 4).

Northern Pike Foreign Tags

In 2011, we captured 22 northern pike that had been tagged during prior sampling efforts. Colors of Floy tags included white, yellow, grey, and orange. Tagged fish ranged from 478-1005 mm. One fish was tagged upstream of our study reach in Catamount Reservoir, and another was tagged in Elkhead Reservoir. Another came from as far as 40 miles downstream. All fish put into the Yampa River State Headquarters pond have their left pelvic fin clipped in order to detect escapement of fish without tags. The headquarters pond rarely connects to the Yampa River, so stocked fish that are recaptured in the river were most likely illegally moved by anglers. One fish we captured had its left pelvic fin clipped and had a few millimeters of regrowth on it. It did not have a Floy tag. We suspect this fish was stocked into the Yampa River State Headquarters pond and an angler captured it, removed its Floy tag, and released it back into the river. If this happened, this would be the second time we have documented anglers moving fish back to the river from the pond (the other case was a pike released into the pond in 2009 and captured in the river in 2010 with a Floy tag to track where it had been captured previously). We suspect angler transfer in both cases, since the Yampa River State Headquarters pond did not connect to the river during the years when translocation of pike is thought to have occurred.

Smallmouth Bass

Thirty-seven smallmouth bass were captured in this study, 11 of which were tagged (10 grey, 1 yellow). These fish ranged from 211-429 mm. They were all euthanized. Eight of these fish were escapees from Elkhead Reservoir. The other 3 bass were tagged

downstream from our study reach. One had travelled 34 miles upstream between tagging and recapture. All recaptured bass were initially tagged in 2009 or 2010.

VII. Recommendations:

We captured the largest numbers of northern pike in our first three passes (127, 186, and 95), but the subsequent four passes yielded far fewer pike (29, 24, 34, and 30). This seems to be a recurring trend. We are most effective at removing pike earlier in the season when flows range between 1800-3200 CFS (USGS gauge below Craig). After several passes, we seem to remove the majority of the available fish and then become less effective at capturing the remaining fish as flows increase. We tend to be less effective at capturing fish at flows >3200. After high water, there seems to be a small window of opportunity where the flows are high enough to navigate the river and again we capture northern pike and see a substantial increase in numbers of bass that seem to congregate near backwaters for spawning. Our middle passes seem to not be very effective for removing pike. Therefore, we recommend reducing the number of removal passes from 7 to 5. If this were done, every effort would be made to conduct our first three passes as early in the season as possible, before high flows. The last two passes would be conducted after high water, just before flows are too low to navigate the river. It is our professional opinion that we would be able to capture the majority of pike present in the first three sampling passes. We also feel that we could still be effective in capturing pike during our last two passes, as well as capturing many spawning bass. We feel the majority of our target fish that we would have captured in the two passes we propose to eliminate would still be available for capture in our last two passes, when they would be more susceptible to our sampling gear. We feel that resources conserved by eliminating these two nonnative fish removal passes could better be used to fund other endangered fish work (e.g., documenting use of flooded bottomlands by razorback sucker after the 2011 high flows).

Eight of our sample of 37 bass were known to have escaped from Elkhead Reservoir. Elkhead Reservoir is a known source for both bass and northern pike. Until escapement of these two species from Elkhead Reservoir is completely eliminated, downstream removal efforts will continue to be confounded by new insurgencies of these nonnative predators. Screening and other passive efforts aimed at keeping nonnative fish from escaping reservoirs have yet to prove completely effective. Therefore, if the Recovery Program really hopes to solve the issue of these two nonnative predators in the river, the complete elimination of smallmouth bass and northern pike within Elkhead Reservoir (and other point sources) may need to be considered. Although it would prove highly controversial, the application of rotenone to Elkhead Reservoir may be the most expedient method of eliminating smallmouth bass and northern pike populations from this recurring point source.

Our data documents escapement of northern pike from the Yampa River State Park headquarters pond during years in which the pond was not connected to the river. We

stock all northern pike > 508 mm into this pond in order to provide and maintain an angling opportunity for the public, while still managing these nonnative predators in the river. Despite these efforts, evidence seems to indicate that someone is illegally transporting these fish back to the river, thus undermining our management efforts. This is occurring despite a local law enforcement presence at the Yampa River State Park headquarters, indicating some care and planning is likely being taken in this venture. In order to discourage further illegal stocking, we recommend a moratorium be placed on stocking northern pike into the Yampa River State Park headquarters pond for a period of one year. In conjunction with the moratorium, we recommend that Colorado Parks and Wildlife and the Recovery Program publicly announce the reason for the moratorium (i.e., violations of fishing regulations and illegal stocking). Hopefully such an action would publicly convey the message that illegal stocking efforts are being taken seriously and will no longer be tolerated. After a year, stocking this water body with northern pike for anglers could be reevaluated.

VIII. Project Status: The project is ongoing.

IX. FY 2011 Budget Status:

- A. Funds Provided: \$163,984.44
- B. Funds Expended: \$163,984.44
- C. Difference: 0
- D. Percent of the FY 2011 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 October 12, 2011
Principal Investigator Date

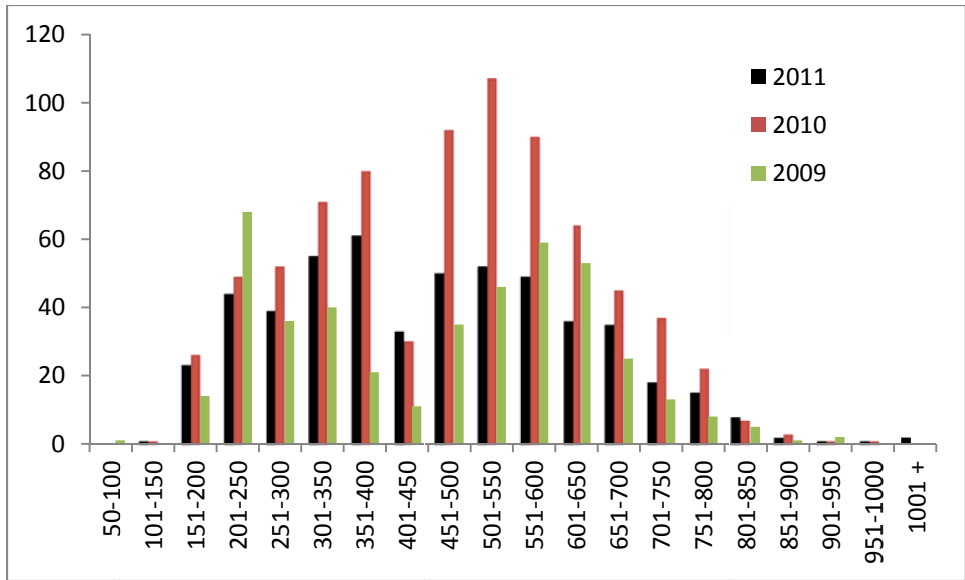


Figure 1. Length frequency (TL mm) of Yampa River northern pike captured 2009-2011.

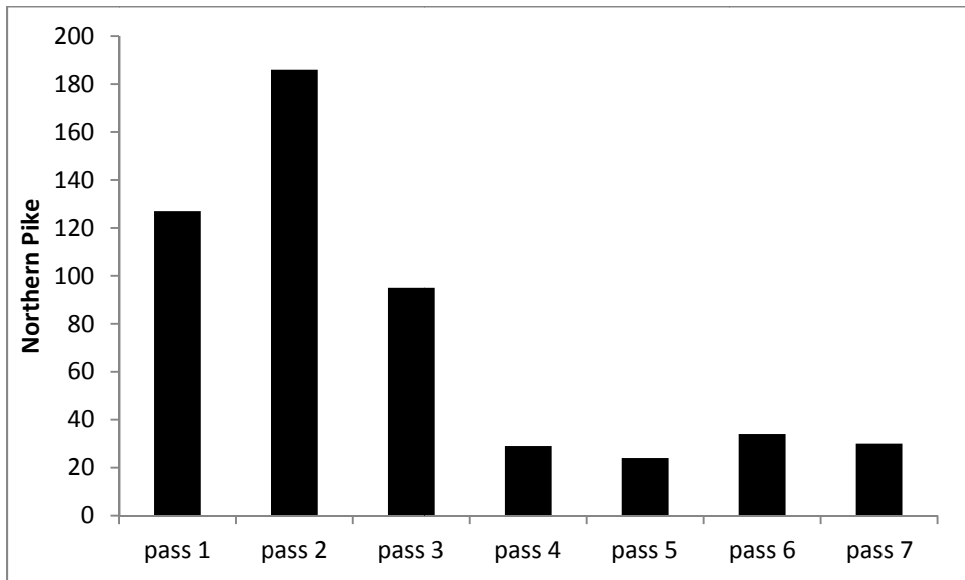


Figure 2. Northern pike captured by pass in the Yampa River, 2011.

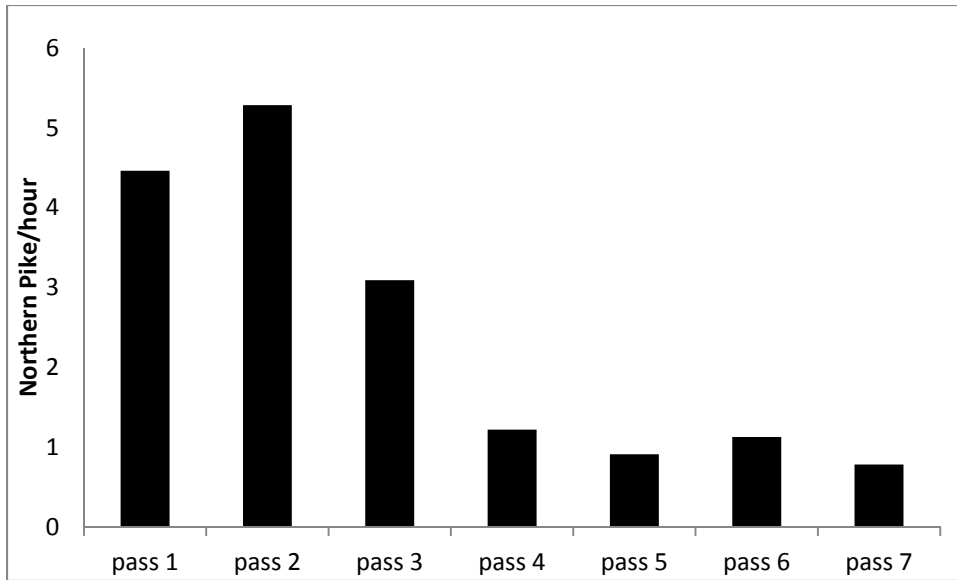


Figure 3. Northern pike captured per hour by pass, Yampa River 2011.

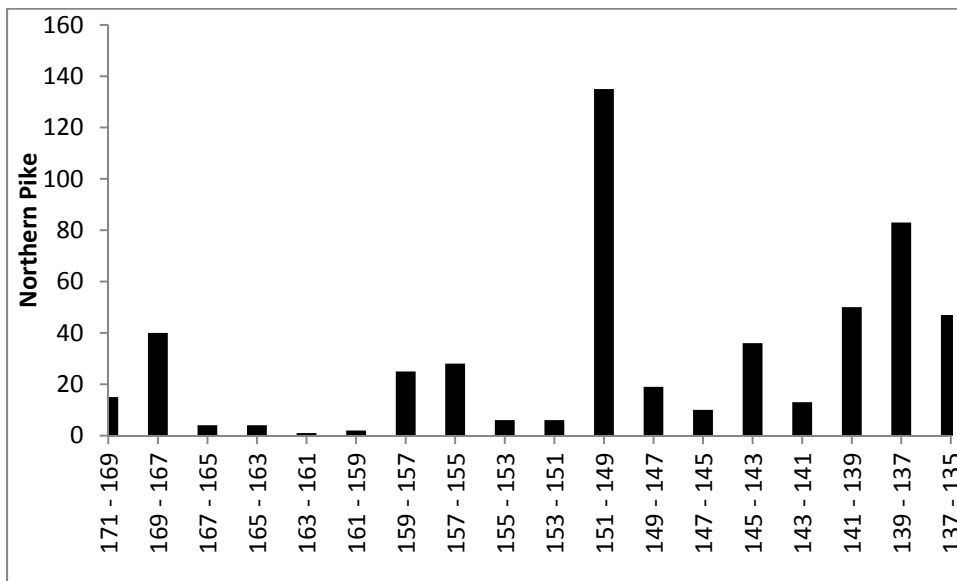


Figure 4. Total number of northern pike captured by river mile reach, Yampa River 2011.

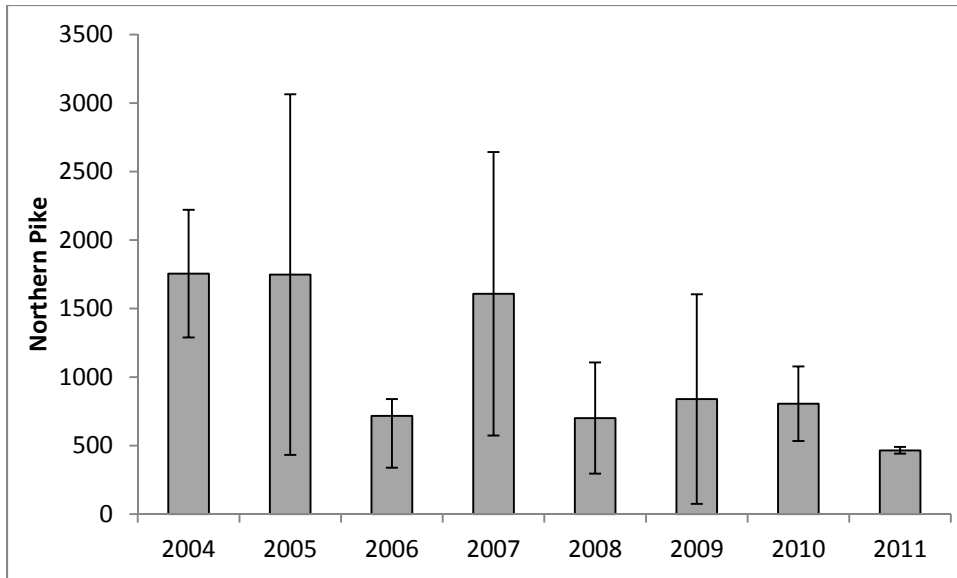


Figure 5. Northern pike population estimates and 95% confidence intervals 2004-2011.

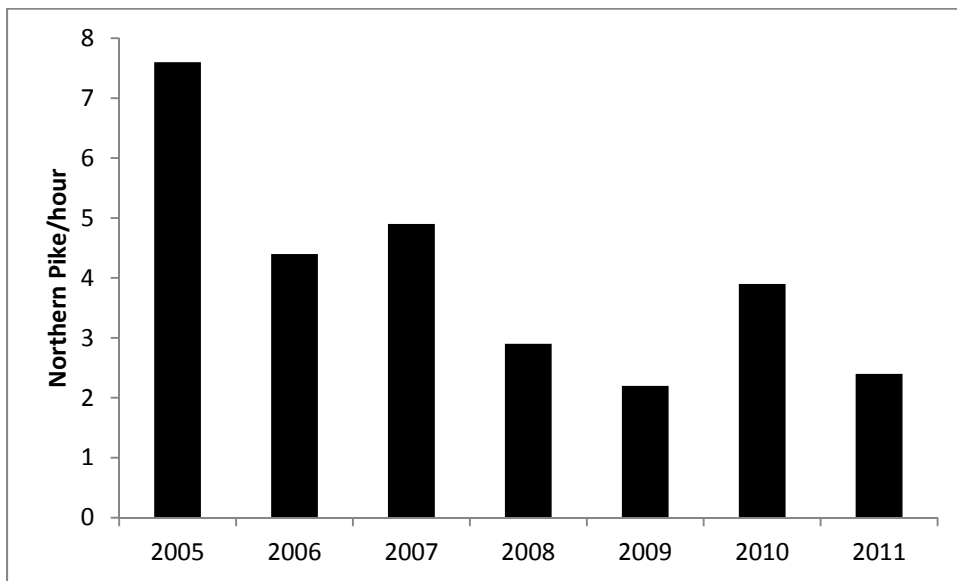


Figure 6. Overall northern pike catch rates by hour, 2005-2011 for project 98b.