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

II. Principal Investigators:

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III. Project Summary:

The purpose of this project is to reduce the abundance of northern pike in the upper Yampa River to a level that does not inhibit recovery of endangered fishes. In 2001, 230 northern pike were captured using fyke nets; in 2002, 237 pike were captured. During 2003, electrofishing passes were added to fyke-net efforts, and a control-treatment approach was used to quantify depletive effects. Because of fish movements, the approach did not work very well. The study has been redesigned for 2004. All northern pike removed from the river were relocated to nearby ponds to provide fishing opportunities for local anglers.

IV. Study Schedule:

Initial Year: 2001
Final Year: Continued as needed.

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. Accomplishments of FY 2003 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Northern pike were collected with fyke nets and electrofishing during the 2003 field season. Two hundred and three northern pike were collected in fyke nets (Table 1); six hundred and fifty three by electrofishing (Table 2). Final disposition of all fish is outlined in Table 3.

The electrofishing removal area was divided into five individual, but connected, reaches of the middle Yampa River. Three separate electrofishing passes were made through all reaches. Two reaches were established as controls where captured fish were tagged and released back into the river. Fish collected from the three removal reaches were tagged, removed from the river, and stocked into public fishing ponds. Reaches were staggered with three removal reaches separated by two control reaches. Lengths of reaches averaged 7.56 river miles in length and ranged from 5 to 12.8 river miles.

Two hundred and seventy-three (42 percent) of the six hundred and fifty three northern pike captured by electrofishing methods were captured in control reaches and were tagged and released back into the river (Table 2). Three hundred and eighty fish (58 percent) were captured in removal reaches and stocked into public fishing ponds near Hayden and Craig, Colorado. Fish ranged in length from 117-990 mm, with a mean of 547.59 mm. No significant differences in total length were detected between reaches ($F_{4, 646} = 2.0614$, P= 0.0843).

No statistically significant depletive effects (i.e., negative slope) were shown within electrofishing removal or control reaches (Figure 1). A t-Test comparing the catch per mile of the last sampling pass of the control reaches with the last sampling pass of the removal reaches showed no statistically significant difference (P= 0.260547). Similarly, a t-Test comparing the total catch per mile for all passes revealed no statistically significant differences (P= 0.262805) between control and removal reaches. Analysis of variance showed a significant difference in catch per mile among reaches ($F_{4, 10}$= 4.2016, P= 0.0298). A Fisher's least significant difference test indicated that reaches 1, 2, and 3 were different (lower) in catch per mile than reaches 4 and 5 (LSD= 6.949).

Movement of northern pike was observed from fish recaptured from the control reaches. Of the sixteen northern pike recaptured in control reaches, eleven were recaptured in a reach other than where they were initially captured. It is important to consider this as a minimum estimate as fish could have moved out of the entire sampling reach and therefore not been subject to recapture. In any case, approximately 68% of fish moved between sampling reaches during the study, making depletion estimates and removal efforts difficult. Additionally, four fish recaptured in the river were fish that had been removed from the river and stocked into angling ponds. It is assumed that either anglers restocked these fish into the river or they escaped when the ponds were reconnected to the river during high flows.

Movement of northern pike prevented control reaches from functioning as planned under the current study design. Comparison of fish abundance in control versus removal areas is meaningless due to the movement exhibited by northern pike. All the fish in control areas cannot be marked; thus, it can never be known whether fish in removal areas include unmarked control fish.

A difference in the size of fish captured occurred between fyke nets and electrofishing (Figure 2). Electrofishing captured a larger portion of smaller individuals than fyke nets (Figure 2, bottom). Fyke nets captured a higher percentage of fish in the intermediate size classes (500-800 mm) and fewer smaller fish than electrofishing. Fyke net data from 2001, 2002, and 2003 (Figure 2, top) revealed that smaller size classes were caught in 2003 than 2001 and 2002, suggesting a possible depletive effect. The average length of fish captured in 2003 was less than in 2001 and 2002 (590 in 2003, 598 in 2002, and 620 in 2001).

VII. Recommendations:

1. Discontinue use of control reaches and make appropriate study design changes.
2. Continue translocating northern pike into angler-accessible ponds.
3. Expand northern pike removal area up to Steamboat Lake.
4. Increase the number of sampling passes to help show a depletive effect.
5. Do not stock northern pike into ponds that may reconnect to the river within the stocking season.

VIII. Project Status:

The project is considered on track but minor revisions are suggested. It is subject to review prior to continuation.

IX. FY 03 Budget Status:

A. Funds Provided: $82,100
B. Funds expended: $82,100
C. Difference: 0
D. Percent of the FY 2003 work completed: 100
E. Recovery Program funds spent for publication charges: -0-

X. Status of Data Submission:

Data will be sent to the database manager in 2003. Data are currently being entered in Microsoft™ Excel spreadsheets.

XI. Signed: Sam Finney_____ November 7, 2003_____
Principal Investigator Date

Table 1. Upper Yampa River fyke net captured northern pike, Spring 2003.

USFWS Yampa River Northern Pike Translocation
May 13- June 20, 2003

Date	Carpenter Ranch	Yampa SWA
May 13	1	0
May 14	7	11
May 15	17	17
May 16	5	9
May 17	3	5
May 19	0	3
May 20	7	3
May 21	5	2
May 22	7	10
May 29	5	0
May 30	3	3
May 31	0	5
June 3	4	1
June 4	2	0
June 5	0	4
June 6	1	1
June 9	9	0
June 10	1	7
June 11	1	1
June 12	3	1
June 13	4	6
June 16	7	0
June 17	2	5
June 18	3	0
June 19	3	6
June 20	2	1
Subtotal	102	101
Total	203	

Mean total length, 590.0345 mm; median, 582 mm; range, 300-985 mm.

Table 2. Catch summary for northern pike captured by electrofishing in the Yampa River, Spring 2003.

	Pass 1	Pass 2	Pass 3	Total/ Reach
Reach 1 Removal Rm 177.5 -168	# Caught 39	# Caught 9 # Recaps. 0	# Caught 13 # Recaps. 0	61 0
Reach 2 Control Rm 168-163	# Caught 30	# Caught 19 # Recaps. 1	# Caught 35 # Recaps. 0	84 1
Reach 3 Removal Rm 163-157.5	# Caught 26	# Caught 20 # Recaps. 0	# Caught 44 # Recaps. 5	90 5
Reach 4 Control Rm 157.5-152.5	# Caught 39	# Caught 66 # Recaps. 1	# Caught 84 # Recaps. 4	189 5
Reach 5 Removal Rm 152.5-139.7	# Caught 36 # Recaps. 1	# Caught 60 # Recaps. 1	# Caught 133 # Recaps. 3	225 5
Total Removal Total Control **Grand Total** Total Recaps.	101 69 170 1	89 85 174 3	190 119 309 12	380 273 **653** 16

Table 3. Summary of translocation destination of all northern pike captured in the Yampa River in 2003.

2003 Fyke Netting

203	Total northern pike
19	Stocked into Loudy-Simpson
175	Stocked into State Wildlife Area
1	Given to Carpenter Ranch
8	Deceased

2003 Electrofishing

653	Total northern pike
34	Stocked into Loudy-Simpson
311	Stocked into State Wildlife Area
30	Sacrificed by CDOW for otolith analysis
269	Returned to the River (control reaches)
9	Deceased

Figure 1. Changes in northern pike catch rates through time in five reaches sampled in the Yampa River, Spring 2003. No statistically significant depletive effects were observed.

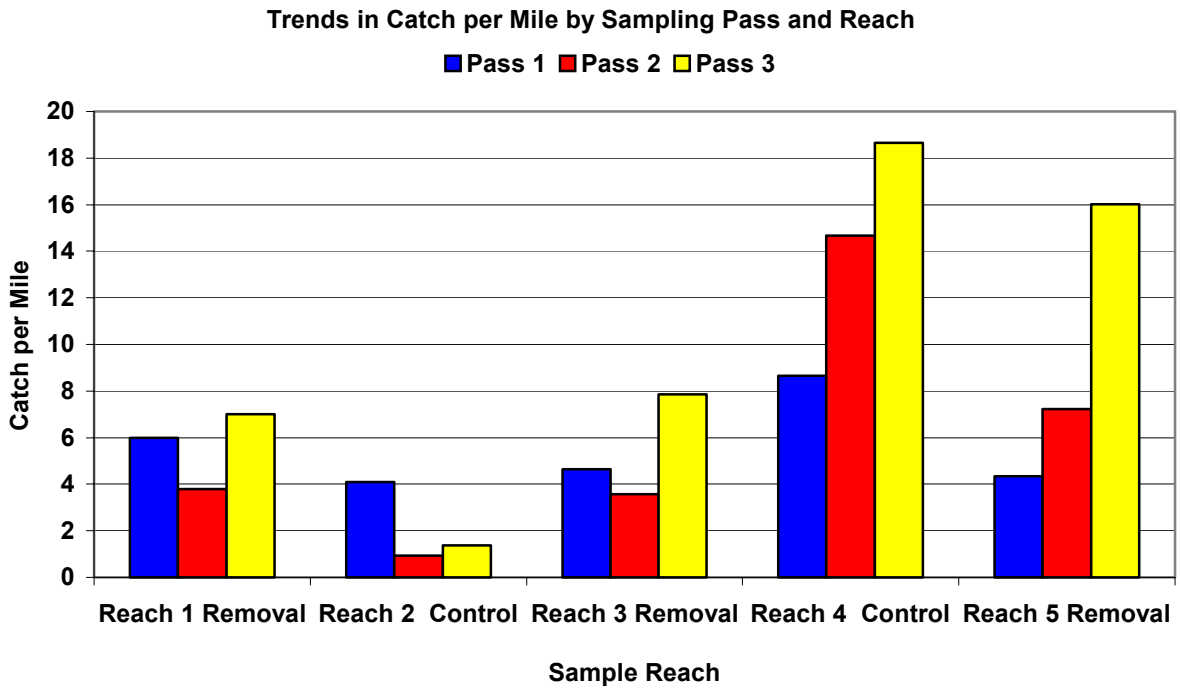

Figure 2. Fyke net data length frequency from 2001-2003 (top) and 2003 electrofishing data length frequency (bottom), Yampa River, Colorado.