COLORADO RIVER RECOVERY PROGRAM
FY-2002–2004 PROPOSED SCOPE OF WORK for:
(Yampa pike exclusion)

Lead Agency: Colorado Division of Wildlife
Submitted by: Tom Nesler (Project Leader)
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Date: February 26, 2004

Category: Expected Funding Source:
X Ongoing Project
X Annual Funds
__ Ongoing-revised project
__ Capital Funds
__ Requested New Start
__ Other (In-kind Services)

I. Title Proposal: Yampa pike spawning habitat exclusion

II. Relationship to RIPRAP:

Green River Action Plan: Yampa and Little Snake Rivers
III. Reduce negative impacts of nonnative fishes and sportfish management activities.
III.A.1. Implement Yampa Basin aquatic wildlife management plan.
III.A.1.b. (2) Reduce northern pike reproduction in the Yampa River.
III.A.1.b.(2)(b Implement remedial measures to reduce pike reproduction in Yampa River

III. Study Background/Rationale and Hypotheses: The life history characteristics of northern pike and their interactions with endangered Colorado River fishes was evaluated in Nesler (1995). Conclusions of that study indicated the population of northern pike existing in the Yampa River was maintained by reproduction occurring in suitable habitats that occurred largely upriver of critical habitat (Craig, Colorado). The population segment occurring in the river above Craig was referred to as the “sustaining” population, while the segment below Craig was the “transitory” segment. Spawning habitat requirements of northern pike were found mostly in off-channel habitats such as sloughs, flooded tributary backwaters, ponds, and irrigation channels providing the appropriate spawning substrate, low-velocity flows, stable water levels, and persistence as nursery habitat.

Nesler (1995) suggested a potential “recruitment window” for Colorado pikeminnow may result from possible northern pike predation on fish up to 450 mm in length, thereby reducing recruitment of Colorado pikeminnow from the Green River into the Yampa River to fish larger than that threshold size. Gape/body size and food habit analyses
indicated roundtail chub were completely vulnerable to pike predation; and that humpback chub in Yampa Canyon and juvenile razorback sucker in the middle Green River may be at risk due to significant rates of predation from adult pike.

Nesler (1995) concluded that effective control of northern pike via limiting access to suitable riverine spawning habitat would have to occur on a widespread scale to have long term results. The author recommended experimental control of northern pike be implemented to determine if population abundance can be reduced by 50%.

IV. Study Goals, Objectives, End Products:

Goal: To reduce spawning and reproduction by northern pike in Yampa River habitats, effecting a reduction in the abundance of pike in critical habitat for endangered fishes downstream.

Objectives:

1. To determine the feasibility and logistic requirements of using temporary screening with low-cost materials to prevent access to these habitats by spring spawning, adult northern pike on a reach-wide scale from Craig to Steamboat Springs.

2. To implement exclusionary screening of potential pike spawning habitats on a reach-wide scale and mechanically remove pike from any habitats where access by pike to screened spawning habitats has been gained due to temporary screen failure.

3. To monitor effectiveness of exclusionary screening of pike spawning habitats using trend analysis of capture rates for northern pike during ongoing mechanical removal efforts within critical habitat in the Yampa River downstream.

4. To evaluate and recommend design improvements in existing irrigation diversion and return systems to reduce potential northern pike spawning habitat or facilitate screening control.

End Product:

A final report providing the necessary justification and guidance for continuing or modifying control of northern pike in the Yampa River using screening of spawning habitats.

Draft report to coordinator December 1, 2003; to peer reviewers and Biology Committee January 1, 2004; final draft to Biology Committee March 15, 2004.
V. Study Area:

The Yampa River from Steamboat Springs to Craig, Colorado.

VI. Study Methods/Approach:

Control of nonnative fish in the Upper Colorado River Basin is defined as “reducing the numbers of one or more nonnative species to levels below which they are no longer an impediment to the recovery of endangered fish species” (Tyus and Saunders 1996). The conceptual approach being examined is the control of a nonnative fish species by significantly reducing opportunities to spawn and produce progeny. This approach appears feasible for northern pike in the Yampa River due to the specific spawning habitat requirements of the species and the relatively limited availability of this habitat. It is clear from results of other northern pike control efforts that mechanical removal can have short term benefits; but long-term control of northern pike requires control of a significant amount of available spawning habitat. In the Yampa River, a combination of efforts to control access to obvious off-channel spawning habitat with ongoing mechanical removal of adult fish is a logical strategy to evaluate for effective northern pike control.

Exclusion of identified northern pike spawning habitats from access by adult fish will be attempted using low-cost netting or fencing materials in the riverine entrances to sloughs, flooded tributaries, and irrigation diversion canals and returns. Suitable sites are habitats in which spring flows in the Yampa River have created low flow conditions, submerged vegetation, and water clarity that attract adult pike seeking to spawn. The spawning season for northern pike in the Yampa River is constrained by the onset, magnitude, and duration of spring flows inundating suitable sites. The effectiveness of employing screening at potential spawning sites is facilitated by the ability to use large mesh size screening which will reduce fouling and restriction of water movement. Effective exclusion can be accomplished by preventing access to potential spawning sites by the female pike, which are larger on average than males, and can be accomplished with a relatively large screen mesh size. One to two-inch mesh size appears adequate for excluding pike above 500mm in length, which would include the bulk of adult fish participating in spawning. A problem may occur due to potential trapping of fish if the screen acts like a gill net. A coarse mesh material or slightly smaller mesh size than necessary may be required to discourage gill capture of fish attempting to pass through the screen. Periodic checking and maintenance of the screens by either cooperating landowners/water users or hired field staff will be required. The frequency of possible maintenance is unknown, but intended to be minimal.

Trained fishery personnel with experience or knowledge of northern pike life history and spawning ecology will work with water conservation district and water user association personnel to identify all irrigation diversion and return flow sites in the Yampa basin through the project area. A second step will be to gain permission as needed from district/association members to access these sites and other potential pike spawning habitats on private property. The feasibility, set-up design, and material needs for
screening each of these sites will be determined to develop a reach-wide scope. In the 
first year, select sites may be screened as pilot projects to test materials and investigate 
operational constraints and effectiveness. This would complete objective 1 in the first 
year. Implementation of objectives 2–4 would be based on first year results and 
subsequent Recovery Program approval.

VII. Task Descriptions and Schedule:

1. Coordinate with water conservation district and water user association 
representatives in the Yampa River basin to determine the number and location of 
all diversion and return flow sites between Catamount Lake and Craig for future 
assessment as pike spawning habitat. (October 2001)

2. Conduct site visits of all identified potential habitats to evaluate feasibility of 
control and estimate design and materials necessary to implement. (October-
November 2001)

3. Select sites and conduct pilot screening to test design and materials, and 

4. Prepare final report including feasibility of approach and screening materials, 
evaluation of results from pilot sites for effectiveness and operational 
requirements, and a proposed scope of work required to expand approach to 
proposed reach-wide scale. (October 2003 through March 2004)

VIII. FY-2002 Work:

Deliverables/Due Dates: Annual Report due 12/2001

Budget

Tasks 1–3: $50,000

FY–2003 Work:


Budget

Task 3: $25,000

FY–2004 Work:

Deliverables/Due Dates: Annual Report due 12/2003
Draft report to coordinator December 1, 2003; to peer reviewers and Biology Committee January 1, 2004; final draft to Biology Committee March 15, 2004.

Budget:

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IX. Budget Summary:

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X. Reviewers (original SOW)

Frank Pfeiffer and Robert Muth, FWS
John Hawkins, CSU
Dave Langlois, CDOW

XI. References:
