

FY-2001 PROPOSED SCOPE OF WORK for:
Yampa pike spawning habitat exclusion

Project No.: CAP-31

Lead Agencies: Colorado Division of Wildlife
Submitted by: Tom Nesler
Address: CDOW
317 W. Prospect
Fort Collins, CO 80526
Phone: CDOW: (303) 472-4384
Fax: CDOW: (303) 472-4457
E-mail: tom.nesler@state.co.us
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Category:

- Ongoing Project
 Ongoing-revised project
 Requested New Start

Expected Funding Source:

- Annual Funds
 Capital Funds
 Other (In-kind Services)

I. Title Proposal: Yampa pike spawning habitat exclusion

II. Relationship to RIPRAP:

General Recovery Program Support Action Plan:

III.A.2.c. Implement and evaluate the effectiveness of viable active control measures.

Yampa and Little Snake Rivers:

III.A.1. Implement Yampa Basin aquatic wildlife management plan.

III.A.1.c. Reduce northern pike reproduction in the Yampa River.

>* III.A.1.c.(2) 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 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 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; reduction of northern pike reproduction and abundance, and increased abundance of Colorado pikeminnow and other native fish species in the Yampa River.

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 its opportunities to spawn and reproduce 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 be ineffective, or have short term benefits; but long-term control of northern pike requires control of a significant amount of available spawning habitats. 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 gillnet. 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 the 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 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 for future assessment as pike spawning habitat. (January 2001)
2. Conduct site visits of all identified potential habitats to evaluate feasibility of control and estimate design, materials necessary to implement. (January-February, 2001)
3. Select 2-3 sites and conduct pilot screening to test design and materials, and investigate operational constraints and effectiveness. (March-June, 2001)
4. Prepare final report including feasibility of approach and screening materials, evaluation of results from pilot sites for effectiveness and operation requirements, and a proposed scope of work required to expand approach to proposed reach-wide scale. (July-August, 2001)

VIII. FY 2001 Work:

Deliverables/Due Dates: (see Section VII above)

IX. Budget Summary:

FY 2001: All tasks. \$20,000.00

Outyears: All Tasks. To be determined.

X. Reviewers

Suggested: Pfeifer, Muth, Hawkins, Elmblad

XI. References:

Nesler, T. P. 1995. Interactions between endangered fishes and introduced gamefishes in the Yampa River, Colorado, 1987-1991. Final report. Colorado Division of Wildlife, Ft Collins. 184 pp.

Tyus, H. M. and J. F. Saunders, III. 1996. Nonnative fishes in the Upper Colorado River Basin and a strategic plan for their control. Final report. Coop. Agreement 14-48-0006-95-923. U.S. Fish and Wildlife Service, Denver. 85pp.