

**COLORADO RIVER RECOVERY PROGRAM
FY 2009 AND FY 2010 PROPOSED SCOPE OF WORK**

Project No.: 98a

Middle Yampa River northern pike removal and evaluation; Middle Yampa River (South Beach section) smallmouth bass removal and evaluation

Lead Agency: Colorado Division of Wildlife

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Category:

- Ongoing project
- Ongoing-revised project
- Requested new project
- Unsolicited proposal

Expected Funding Source:

- Annual funds
- Capital funds
- Other (explain)

I. Title of Proposal:

Middle Yampa River northern pike removal and evaluation; Middle Yampa River smallmouth bass removal and evaluation

II. Relationship to RIPRAP:

This study will remove northern pike from the middle Yampa River and evaluate the efficiency of that effort. Smallmouth bass will also be removed from the entire CDOW study area and the efficiency of the removal evaluated.

Green River Action Plan: Yampa and Little Snake rivers:

III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).

III.A.1. Implement Yampa Basin aquatic wildlife management plan in reaches of the Yampa River occupied by endangered fishes. Each control activity will be evaluated for effectiveness and then continue as needed.

III.A.1.b. Control northern pike.

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

III. Study Background/Rationale and Considerations:

Study Background/Rationale:

Susceptibility of the Colorado River Basin to nonnative fish establishment has been attributed to the low diversity of the native fish fauna, a high degree of endemism of this fauna, and the highly altered physical habitat of the basin (Hawkins and Nesler 1991). Bezzerides and Bestgen (2002) report that the native fish fauna of the Colorado River Basin consists of at least 35 species, while at least 100 nonnative fishes have been introduced into the basin (Tyus and Saunders (2000). Twenty-eight of these nonnative fish species were identified as threats to native fishes through a recent survey of regional fisheries biologists (Hawkins and Nesler 1991). Of these 28 species, the northern pike (*Esox lucius*) was considered by biologists as the third greatest hazard to native fishes (Hawkins and Nesler 1991).

In Colorado, the northern pike is one of 40 known, introduced fish species currently existing within the Colorado River Basin (Nesler 2003). This species has been extensively introduced outside of the species' native range for use as a large, sportfish, and as a predator to control other fishes (Scott and Crossman 1973). Northern pike were first introduced to the Yampa River Basin of Colorado in 1977. Less than 1,000 fingerling northern pike were released into Elkhead Reservoir to predate on a large number of nonnative suckers present (Roehm 2004). Elkhead Creek is located approximately four miles upstream of Craig, and is the receiving stream of Elkhead Reservoir. This creek is tributary to the Yampa River. Movement of northern pike downstream was evidenced by collection of this species in the Yampa River, as early as 1979 (Tyus and Beard 1990). Northern pike numbers within the river had increased by the early 1980s (Wick et al. 1985; Tyus and Beard 1990). Subsequent downstream movement of northern pike into the Green River was first documented less than five years after initial release in Elkhead Reservoir (Tyus and Beard 1990). This species has since established itself as a self-sustaining population within the Yampa River.

Influences of such introductions on native fish fauna are cause for great concern, especially in areas occupied by endangered species. The Yampa River downstream of Craig is designated by the U.S. Fish and Wildlife Service (USFWS) as critical habitat for the federal- and state-listed Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*). Primary threats to these native species include competition with, and predation by nonnative fish species (USFWS 2002). The northern pike has been identified as one of two principal, nonnative hazards to juvenile and adult Colorado pikeminnow (USFWS 2002). Northern pike and Colorado pikeminnow share similar habitat in the spring and early summer during the spawning season. Both species also rely on native sympatric species, such as roundtail chub (*Gila robusta*), flannelmouth sucker (*Catostomus latipinnis*), bluehead sucker (*Catostomus discobolus*), and speckled dace (*Rhinichthys osculus yarrowi*) as prey (Tyus and Beard 1990; Nesler 1995). Further, Nesler (1995) found that the nonnative redbside

shiner may also be a common prey item of northern pike and Colorado pikeminnow. Overall resource sharing between the two species may also increase the likelihood of northern pike predation on young and adult endangered fishes (Tyus and Beard 1990; Nesler 1995). Thus, the potential impacts of northern pike competition with, and predation of native, sympatric species (especially the Colorado pikeminnow) are severe.

Such negative interactions between introduced, nonnative sportfish and native fishes has prompted biologists to develop management plans comprising control of nonnative fishes. By 1997, a strategic plan for nonnative fish control was developed for the upper Colorado River Basin (Tyus and Saunders 1996), and implemented by the Upper Colorado River Endangered Fish Recovery Program (Upper Colorado Recovery Program (USFWS 2002). The three basic strategies recommended for nonnative fish control within the plan are predation, removal, and exclusion. An Aquatic Wildlife Management plan (CDOW 1998) specific to the Yampa Basin was developed by the Colorado Division of Wildlife (CDOW) in 1998 as part of the implementation process for recovery of endangered fishes. This plan suggests reducing northern pike abundance in riverine habitats, and evaluating such actions via monitoring for significant depletion of target species, temporally and spatially. A Nonnative Fish Management Policy (UCRRIP 2004) was adopted by the Upper Colorado Recovery Program in 2004. This policy indicates that the overall goals of nonnative fish management are to: 1) attain and maintain fish communities where populations of the endangered and other native fish species can persist and thrive, and 2) recovery goals for the endangered species can be achieved. Most recently, the CDOW and five other states have developed, and are signatories to a range-wide conservation agreement (UDWR 2004a) and strategy (UDWR 2004b) for the flannelmouth sucker, bluehead sucker, and roundtail chub. The goal of the agreement and strategy is to ensure the persistence of populations of the three species throughout the species' ranges. Successful implementation of such nonnative fish management goals will benefit endangered fishes, and sympatric, native non-listed fish species, as well.

This proposed study is one of several designed for removal of northern pike and smallmouth bass, and evaluation of such efforts within the upper Colorado River Basin. The CDOW and Colorado State University (CSU) have cooperatively worked together to develop the logistics within this proposal. These collaborative efforts will increase the efficiency and effectiveness of removing northern pike and smallmouth bass within the middle Yampa River. Evaluation of the removal efforts will assist the Upper Colorado Recovery Program in attaining nonnative fish management goals.

Study Considerations:

The CDOW will complete a minimum of three removal passes across 47.3 miles within the time frame that weather and river conditions allow. Further, the CDOW will work with CSU and the US Fish and Wildlife Service-Vernal office (USFWS) to complete four additional removal passes within Reach 1 and Reach 3. The mark and recapture passes for both species will occur in a three week time period.

A crew of eight to nine people will be required to complete this project. Temporaries will be hired for 18, 40-hour work weeks (4.5 months). Four weeks (two weeks pre-sampling and two weeks post-sampling) of the 18 weeks will be devoted to crew training, preparation and maintenance of boats and equipment, and data entry. Temporaries will work ten to eleven weeks on the river to capture, remove, and translocate northern pike and smallmouth bass. Three to four additional weeks during the period allotted for river sampling will be dedicated to crew recovery, use of compensation time, and boat/equipment maintenance. Temporary employees will not be paid overtime wages.

IV. Study Goals, Objectives, End Product:

Study Goals:

- 1) To reduce the number of northern pike occupying 47.3 river miles of critical habitat within the Yampa River downstream of Craig, Colorado (RM 134.2 – RM 60.6), thereby benefiting native fishes of the Yampa River Basin, as well as native fish communities downstream within the Green River Basin
- 2) To transport live northern pike collected from the study area for release in Loudy Simpson ponds (Craig), thereby increasing angler opportunities to harvest northern pike
- 3) To reduce the number of smallmouth bass occupying 47.3 river miles of critical habitat within the Yampa River downstream of Craig, Colorado for the benefit of Yampa and Green River native fishes.
- 4) To transport live smallmouth bass ($\geq 10''$ in total length) collected from the entire study area for release in the Craig Criminal Justice Center Pond and Elkhead Reservoir, thereby increasing angler opportunities to harvest smallmouth bass

Study Objectives:

- 1) To remove and translocate as many northern pike as possible within the study area via three or more removal passes
- 2) To estimate the number of northern pike occupying the study area by generating a population estimate for northern pike utilizing a mark-recapture methodology (1 marking pass, minimum of 3 removal passes)
- 3) To calculate the proportion of the estimated northern pike population that was removed
- 4) To remove and translocate as many smallmouth bass as possible within Critical Habitat of the middle Yampa River, downstream of Craig, CO, thereby benefiting native fishes of the Yampa River basin, as well as native fish communities downstream within the Green River Basin.
- 5) To provide CSU with smallmouth bass data to estimate the number of smallmouth bass occupying Critical Habitat of the middle Yampa River.
- 6) To calculate the proportion of the estimated smallmouth bass population that was removed

End Product:

Annual Reports will be prepared, peer reviewed, and distributed to interested parties following the 2009 and 2010 field seasons. Presentations will also be provided during the Annual Nonnative Fish Control Workshop, and at the Annual Recovery Program Researchers' Meeting.

V. Study Area:

The study area for this project will focus on 47.3 miles of the Yampa River just downstream of Craig, Colorado (RM 134.2) to just upstream of Cross Mountain Canyon (RM 60.6). Specific river segments to be sampled include: RM 134.2 (South Beach launch) to RM 124.0 (Round Bottom), RM 100.0 (upstream Government Bridge) to RM 91.0 (mouth of Little Juniper Canyon), RM 88.7 (downstream of Juniper Canyon) to RM 79.2 (old Maybell bridge launch), RM 79.2 to RM 71.0 (Sunbeam launch), and RM 71.0 to RM 60.6 (just upstream of Cross Mountain launch). Northern pike will not be removed by the CDOW in 24 miles of river, RM 124 (Round Bottom) to RM 100 (near Government Bridge). CSU has established this reach as a smallmouth bass study area. These 24 miles have also been included in previous studies for northern pike removal. Therefore, CSU will remove northern pike within these stretches in conjunction with their smallmouth bass study. CSU will also remove smallmouth bass and northern pike from downstream of Cross Mountain Canyon (RM 55.5) to just downstream of the Little Snake River confluence (RM 50.5). CSU's northern pike data will be collated with CDOW data and reported by CDOW. The CDOW will initiate removal of smallmouth across the entire CDOW study area. Approximately two miles of river within Juniper Canyon will not be sampled, due to non-navigable riverine conditions.

VI. Study Methods/Approach:

All northern pike, smallmouth bass, roundtail chub, and Colorado pikeminnow captured will be identified, measured in total length to the nearest millimeter (mm), and weighed to the nearest gram (g). Capture locations for northern pike and smallmouth bass will be recorded to the nearest tenth of a river mile. Northern pike and smallmouth bass collected will be examined for the presence of FLOY tags, and fin clips. Northern pike and smallmouth bass (individuals of both species must be a minimum of 150 mm total length) will be marked with unique, grey-colored FLOY tags, numbered from 3,200-3,700, and released alive. FLOY tag number and color will be recorded.

Colorado pikeminnow and roundtail chub captured will be scanned to determine the presence of passive integrated transponder (PIT) tags. PIT tag number will be recorded and stored in the PIT tag reader for those fish encountered with PIT tags. Individuals without PIT tags will be implanted with a new PIT tag following the appropriate protocol; tags for Colorado pikeminnow will be provided by the USFWS. Capture locations for Colorado pikeminnow and roundtail chub will be recorded to the nearest tenth of a river mile. UTM coordinates associated with capture locations will also be recorded, when possible. All Colorado pikeminnow and roundtail chub captured will

be released alive, immediately. Any native fish captured that is visibly stressed will not be processed, but rather returned to the location of capture within the river, immediately.

Incidental contact with other nonnative game fish (including centrarchids and walleye, excluding channel catfish) will result in lethal removal. Up to 20 specimens each of black crappie, largemouth bass, and walleye of various minimum sizes, identified by Pat Martinez, CDOW Researcher, in an earlier e-mail transmission, will be provided to Martinez for bioenergetics and isotope analyses (RP Project No. C18/19). Disposal of all the aforementioned fishes will be as follows: following capture, fish will be euthanized in the field, and preserved with ice. All other dead fish not provided to Martinez will be disposed of in the Mesa County landfill southeast of Grand Junction, Colorado.

Capturing and removing northern pike within main channel and backwater habitat will be the focus of this sampling effort. Further, capturing and removing smallmouth bass across the entire study area will commence in 2009. Incidental contact with Colorado pikeminnow and roundtail chub will be handled per the protocol below. This study will occur between the middle of April and end of June. Ten day trips across two weeks (seven/eight days on the river and two/three days travel) will constitute one pass. A minimum of three passes will be completed for northern pike and smallmouth bass removal in Reach 2, Reach 4, and Reach 5. A minimum of seven removal passes will be completed in Reach 1 and Reach 3.

The first pass for northern pike will be a removal pass. In order to integrate USFWS's study area into a combined northern pike estimate, the CDOW will initiate a northern pike tagging pass on April 20th, when USFWS plans to start on the river. This will likely be the CDOW's second pass overall. As such, the third pass will constitute the recapture pass and the second removal pass for northern pike. The smallmouth bass marking pass will commence when CSU initiates their third pass, a date which has not yet been determined.

Smallmouth bass that are removed during removal passes and are ≥ 10 inches in total length will be translocated to Craig Criminal Justice Center Pond until Elkhead Reservoir has ceased spilling over, at which point these fish will be translocated to Elkhead Reservoir. Smallmouth bass captured during removal passes that are less than 10 inches in total length will be euthanized and either deposited in Rio Blanco County Landfill or donated to CSU for research purposes.

Northern pike that are removed will be translocated to Yampa River State Park Headquarters West Pond, until peak run-off has ceased, at which point northern pike will be translocated to Loudy Simpson Pond, in Craig, CO. Northern pike and smallmouth bass that are removed from the river and translocated to other waters will be given a unique Gray FLOY tags, numbered 3,701-5,000, if they did not already have a tag when captured. Those fish that were previously tagged will be translocated with that same tag.

Two, three man electrofishing crews will utilize jon boats with outboard jet units within each river segment to perform mark-recapture sampling in the main channel. Each crew will simultaneously move downstream with Smith Root GPP 5.0 electrofishers. One crew will work one side of the river, while the second crew will work the other side. Island perimeters will also be electrofished. No river segment will be electrofished on consecutive days, to allow for fish to recover and redistribute. A third, chase boat, will be operated by two additional crew members to process northern pike at a maximum of 2.0 mile intervals, depending on the number of fish caught.

Backwaters where the CDOW has obtained permission to sample will also be included within the study. Both crews will sample backwater areas along both sides of the river. A trammel net will be used with a block and shock technique. Backwater habitats will be sampled until the river recedes and habitat is no longer accessible. Output power will be adjusted within backwaters based upon changes in river conductivity. Additionally, output power will be reduced during the boat approach to the blocked mouth. Both processes will minimize the potential for electrofishing injuries to fish.

Data collected will be analyzed to determine northern pike and smallmouth bass population estimates, fish densities, length frequency distributions, catch per unit effort, and movement. Length frequencies and catch per unit effort will also be determined for Colorado pikeminnow and roundtail chub. Annual Reports will include the data analyses mentioned above for all years of study in which comparable methodology and data exists. Data collected regarding Colorado pikeminnow will be provided to the USFWS.

VII. Task Description and Schedule:

Task 1. Establish landowner contacts, and obtain permission to access property (backwaters) for fish sampling.

Schedule: February - March of 2009 and 2010

Task 2. Plan logistics, hire and train personnel, order and maintain equipment, and prepare for sampling.

Schedule: February-April of 2009 and 2010

Task 3. Sample study area to capture, remove, and translocate northern pike and smallmouth bass. Limited data entry.

Schedule: First pass: April 6-April 17, 2009; April 5-16, 2010

Second pass: April 20-May 1, 2009; April 19-30, 2010

Third pass: May 18-May 29, 2009; May 17-May 28, 2010

Fourth pass: June 8-June 19, 2009; June 7-June 18, 2010

Task 4. Additional passes in South Beach section:

June 29-July 2, 2009; June 28-July 1, 2010

Task 5. Maintenance of equipment. Data entry, data analysis, and prepare final report. Present findings during the Annual Nonnative Fish Control Workshop, and at the Annual Recovery Program Researchers Meeting. (Task 4 in FY-2009 budget reflects additional labor for preparation and presentation of 2004-2007 synthesis report).

Schedule: August-December 2009, January 2010; August-December 2010, January 2011

VIII. FY-2009 Work:

Deliverables/Due Dates: Annual report due November 2009

FY-2009 Budget by Task:

Task 1.

Labor =

Two Wildlife Manager IIIs:

Lodging (8 nights @ \$65.00/night = \$520) x 2 positions = **\$1040**

(Deer Park Inn = \$130/night double occupancy)

Per diem (10 days @ \$42/day = \$420) x 2 positions = **\$840**

Total = \$1,880

Task 2.

Labor = Four seasonal technicians (Technician Is):

Salary (2, 40 hour weeks @ \$13.505/hour = \$1080) + Benefits : (11.69% = \$126) + Indirect costs (34.8% of \$1,206 = \$420) = \$1,500 x 4 positions = **\$6,000**

Equipment =

Smith Root GPP 5.0 Electrofisher (replacement) = **\$13,834**

Dip nets, fish measuring boards, and fish scales = **\$1,582:**

(12 short and long handles with interchangeable net heads @ \$79/each = \$948; 5 fish measuring boards @ \$42/each = \$210; 8 spring scales @ \$53/each = \$424)

Fish hauling tank and regulators, aerators, and oxygen = **\$4,363:**

(2 fish tank and regulators @ \$1,575/each=\$3,150;

6 re-circulating aerator set-ups @ \$158/each = \$948; 12 oxygen tanks rental @ \$22/each = \$264)

FLOY tags, guns, and needles (per FLOY Tag) = **\$1,386:**

(2,000 tags @ \$520/1,000 tags = \$1,040; 5 guns @ \$50/each = \$250; 12 needles @ \$8/each = \$96)

PIT tags and implanter (per Biomark) = **\$2,300**
 (500 tags @ \$4.50/tag = \$2,250; 2 sets of one dozen implanters @ \$25/dozen = \$50)

Waders, lifejackets, rain gear, electrofishing gloves = **\$2,176:**
 (4 pairs of waders @ \$79/each = \$316; 5 lifejackets @ \$116/each = \$580; 4 sets of heavy duty rain gear jackets and pants @ \$200/each = \$800; 16 pairs of gloves @ \$30/each = \$480)

GPS units (1 @ \$150/each) = **\$150**

Two-way radios (4 sets @ \$75/each) = **\$300**

Net pens (2 @ \$100/each = **\$200**

Factory calibration of Smith Root GPP 5.0 (3 @ \$280 each) = **\$840**

Maintenance of boats and trailers, excluding fuel (per Chuck's Marine, Marine Max, and Mercs and More)= **\$4,372** (includes replacement, repair, and maintenance of boat and trailer parts: (6 tune-ups @ \$100/ each =\$600; 6 spare jet sleeves/liners @ \$42/each = \$252; 3 spare impellers @ \$450/each = \$1,350; 9 spare water pumps and kits @ \$60/each = \$450; 6 spare throttle and steering cables @ \$45/each = \$270; motor oil and grease @ \$800; 2 spare batteries @ \$50/each = \$100; 6 trailer bunks @ \$50/each = \$300; trailer lights and bearings = \$250)

Boat fuel (3 @ \$1,400/each) = **\$4,200**

Maintenance of generators (oil and fuel) = **\$850**

Maintenance of electrofishers = **\$900:**
 (Spare anodes, cathodes, plugs, booms, wiring, and hardware)

Total = \$43,364

Task 3.

Labor =

Four seasonal technicians (Technician Is):

Salary (14, 40 hour weeks @ \$13.505/hour = \$7,563) + Benefits (11.69% = \$884) + Indirect costs (34.8% of \$8,447 = \$2,940) = \$11,387 x 4 positions = **\$45,548**

Lodging (8 nights/trip @ \$65.00/night = \$520/trip x 5 trips = \$2,600/pos. x 4 positions = **\$10,400**

Per diem (10 days/trip @ \$420/trip x 5 trips = \$2,100/pos. x 4 positions = **\$8,400**

Four Wildlife Manager IIIs:

Lodging (8 nights/trip @ \$65.00/night = \$520/trip x 5 trips = \$2,600/pos. x 4 positions = **\$10,400**

Per diem (10 days/trip @ \$420/trip x 5 trips = \$2,100/pos. x 4 positions = **\$8,400**

Total = \$83,148

Task 4.

Labor =

Four seasonal technicians:

Salary (2, 40 hour weeks (@ \$13.505/hour = \$4,322) + Benefits (11.69% = \$505) + Indirect Costs (34.8% = \$1,679) = **\$6,506**

Lodging (8 nights/trip @ \$65.00/night = \$520.00) x 4 positions = **\$2,080**

Per Diem (10 day trip @ \$420.00/trip) * 4 positions = **\$1,680**

Wildlife Manager III's

Lodging (8 nights/trip @ \$65.00/night = \$520.00) x 4 positions = **\$2,080**

Per Diem (10 day trip @ \$420.00/trip) * 4 positions = **\$1,680**

Total = \$14,026

Task 5.

Labor =

Four seasonal technicians (Technician Is):

Salary (2, 40 hour weeks @ \$13.505/hour = \$1080) + Benefits

(11.69% = \$126) + Indirect costs (34.8% of \$1,206 = \$420) =

\$1,627 x 4 positions = **\$6,508**

Total = \$6,508

Grand Total to CDOW = \$149,014

FY-2010 Work:

Deliverables/Due Dates:

Annual report due November 2010

FY-2010 Budget by Task:

Task 1.

Labor =

Two Wildlife Manager III's:

Lodging (8 nights @ \$65.00/night = \$520) x 2 positions = **\$1040**

(Deer Park Inn = \$130/night double occupancy)

Per diem (10 days @ \$42/day = \$420) x 2 positions = **\$840**

Total = \$1,880

Task 2.

Labor = Four seasonal technicians (Technician I):

Salary (2, 40 hour weeks @ \$13.505/hour = \$1080) + Benefits : (11.69%

= \$126) + Indirect costs (34.8% of \$1,206 = \$420) = \$1,500 x 4 positions

= **\$6,000**

Equipment =

Smith Root GPP 5.0 Electrofisher (replacement) = **\$13,834**

135 Mercury OptiMax Jet Drive Motor (per Clark Boats) = **\$8,000**

Dip nets, fish measuring boards, and fish scales = **\$1,582:**

(12 short and long handles with interchangeable net heads @ \$79/each = \$948; 5 fish measuring boards @ \$42/each = \$210; 8 spring scales @ \$53/each = \$424)

Aerators and oxygen = **\$896**

(4 re-circulating aerator set-ups @ \$158/each = \$632; 12 oxygen tanks rental @ \$22/each = \$264)

FLOY tags, guns, and needles (per FLOY Tag) = **\$1,386:**

(2,000 tags @ \$520/1,000 = \$1,040; 5 guns @ \$50/each = \$250; 12 needles @ \$8/each = \$96)

Waders, lifejackets, rain gear, and electrofishing gloves = **\$2,176**

(4 pairs of waders @ \$79/each = \$316; 5 lifejackets @ \$116/each = \$580; 4 sets of heavy duty rain gear jackets and pants @ \$200/each = \$800; 16 pairs of gloves @ \$30/each = \$480)

GPS units (1 @ \$150/each) = **\$150**

Two-way radios (4 sets @ \$75/each) = **\$300**

Net pens (2 @ \$100/each) = **\$200**

Factory calibration of Smith Root VVP-15B or GPP 5.0 (3 @ \$280 each) = **\$840**

Maintenance of boats and trailers, excluding fuel (per Chuck's Marine,

Marine Max, and Mercs and More) = **\$7,372** (includes

replacement, repair, and maintenance of boat and trailer parts: (6

tune-ups @ \$100/ each = \$600; 6 spare jet sleeves/liners @

\$42/each = \$252; 3 spare impellers @ \$450/each = \$1,350; 9 spare

water pumps and kits @ \$60/each = \$450; 1 spare jet drive pump

@ \$3,000; 6 spare throttle and steering cables @ \$45/each = \$270;

motor oil and grease @ \$800; 2 spare batteries @ \$50/each =

\$100; 6 trailer bunks @ \$50/each = \$300; trailer lights and

bearings = \$250)

Boat fuel (3 @ \$1400/each) = **\$4200**

Maintenance of generators (oil and fuel) = **\$850**

Maintenance of electrofishing gear = **\$900:**

(Spare anodes, cathodes, plugs, booms, wiring, and hardware)

Total = \$48,516

Task 3.

Labor =

Four seasonal technicians (Technician I):

Salary (14, 40 hour weeks @ \$13.505/hour = \$7,563) + Benefits

(11.69% = \$884) + Indirect costs (34.8% of \$8,447 = \$2,940) =

\$11,387 x 4 positions = **\$45,548**

Lodging (8 nights/trip @ \$65.00/night = \$520/trip x 5 trips =

\$2,600/pos. x 4 positions = **\$10,400**

Per diem (10 days/trip @ \$420/trip x 5 trips = \$2,100/pos. x 4

positions = **\$8,400**

Four Wildlife Manager IIIs:

Lodging (8 nights/trip @ \$65.00/night = \$520/trip x 5 trips =

\$2,600/pos. x 4 positions = **\$10,400**

Per diem (10 days/trip @ \$420/trip x 5 trips = \$2,100/pos. x 4 positions = **\$8,400**

Total = \$83,148

Task 4.

Labor =

Four seasonal technicians:

Salary (2, 40 hour weeks (@ \$13.505/hour = \$4,322) + Benefits (11.69% = \$505) + Indirect Costs (34.8% = \$1,679) = **\$6,506**

Lodging (8 nights/trip @ \$65.00/night = \$520.00) x 4 positions = **\$2,080**

Per Diem (10 day trip @ \$420.00/trip) * 4 positions = **\$1,680**

Wildlife Manager III's

Lodging (8 nights/trip @ \$65.00/night = \$520.00) x 4 positions = **\$2,080**

Per Diem (10 day trip @ \$420.00/trip) * 4 positions = **\$1,680**

Total = \$14,026

Task 5.

Labor =

Four seasonal technicians (Technician Is):

Salary (4, 40 hour weeks @ \$13.505/hour = \$2,161) + Benefits (11.69% = \$253 + Indirect costs (34.8% of \$2,413 = \$840) = \$3,554 x 4 positions = **\$14,216**

Total = \$14,216

Grand Total = \$161,874

IX. Changes in Number of Removal Passes and Distribution of Effort

Based on the 2007 capture probability (P) of $P = .23$ for northern pike along the portion of the Yampa River covered by project 98a and 120, it is estimated that four to five removal passes will be needed to reach the target of a 65% Exploitation Rate. In 2007 three removal passes were conducted in all reaches except South Beach to Round Bottom, where 5 removal passes were conducted. Based on these estimates the CDOW has been close to the target for northern pike removal.

The same estimates for smallmouth bass suggested that a more substantial increase in effort was needed for the 2008 field season; the 2008 effort will be repeated in 2009 and will include the addition of three reaches (i.e. Reach 2, Reach 4, Reach 5) for smallmouth bass removal.

For the 2008 field season, it was estimated that in the South Beach to Round Bottom reach, 15 removal passes would be needed to achieve the goal of a 65% exploitation rate. However, FY08 results suggest that our level of effort may have been sufficient

in reducing smallmouth bass numbers. The 2008 effort of 6 removal passes in Reach 1 will be repeated for 2009. The 2008 effort of 6 to 7 removal passes in Reach 3 will also be repeated in 2009. Smallmouth bass removal will commence for the remaining three reaches (i.e. Reach 2, Reach 4, Reach 5), and removal effort will consist of three passes.

The following summarizes 98a planned effort in 2009:

- Reach 1: 6 removals for NPK and SMB
- Reach 2: 3 removals for NPK and SMB
- Reach 3: 6 removals for NPK and SMB
- Reach 4: 3 removals for NPK and SMB
- Reach 5: 3 removals for NPK and SMB

Additional Costs to Scope of Work

The additional costs associated with 98a level of effort in the FY09 scope of work are a result of adding smallmouth bass removal to three additional reaches. These costs are a function of the need for additional fuel, oxygen, and time needed to hold and transport smallmouth bass.

X. Budget Summary:

FY 2009: \$149,014

FY 2010: \$161,874

XI. Reviewers:

Biology Committee

XII. References:

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