

Alaska Sustainable Salmon Fund Statement of Work

I. Project Title: Invasive Northern Pike Suppression – Phase 1

II. Project Number: 44617 **PCSRF Objective:** HP&R

III. Principal Investigator

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IV. Project Period: 4/1/11 – 3/31/14

V. Project Description

1. Synopsis

Northern pike is an invasive predatory fish in central Alaska that is responsible for the loss of several fisheries across the region. Alexander Creek in the Susitna River basin is one of the most heavily impacted systems. This project will attempt to restore the quality of salmon rearing habitat in Alexander Creek by annually reducing the number of northern pike spawners in its slow backwaters. Reducing the density of northern pike will increase salmon production in this system by reducing the mortality rate of juvenile salmon. Research will also be conducted to better understand movement patterns of northern pike in Alexander Creek and to evaluate the success of the suppression effort in order to inform and enhance pike suppression efforts. *See related AKSSF project 44910.*

2. Introduction

Invasive northern pike pose a significant threat to salmon habitats in central Alaska. Northern pike are native throughout much of the state but do not naturally occur south and east of the Alaska Range. They were illegally introduced to the Yentna River drainage in the late 1950s and subsequently spread throughout the Susitna Basin through flood events and further illegal stocking. It is believed that northern pike were introduced to Alexander Lake in the late 1960s, although there is no harvest record of them prior to 1985. Anecdotal accounts from Alexander Creek residents suggest that dispersal of northern pike from the lake to the lower section of Alexander Creek occurred slowly over 10-20 years. Anglers began to catch them there in the mid-1990s. Today, northern pike are widespread throughout the system. Most of the drainage is shallow and densely vegetated, making it ideal pike habitat.

Northern pike have reduced multiple fish species in the Alexander drainage. Aerial indices have shown a downward trend in Chinook salmon escapements over the past decade and a change in the distribution of Chinook spawners. The sustainable escapement goal for Chinook salmon is 2,100-6,000 fish, but the escapement counts have been below 900 fish for the last five years and the Chinook sport fishery has been closed. Harvests of coho salmon have been dramatically below the historical average as well, and the once abundant rainbow trout and grayling fisheries were closed to harvest in 1996.

ADF&G will begin a long-term suppression effort in side channel sloughs of Alexander Creek to reduce northern pike abundance and increase salmonid productivity. This will be accomplished by intensively gillnetting side channel sloughs each year until seasonal catch rates of northern pike decrease by 85%. Feasibility studies have demonstrated that such an annual goal is possible. This project will also conduct a radio telemetry study to describe movement patterns of northern pike in the Alexander system, and initiate a monitoring protocol for juvenile salmonid populations to evaluate the long-term success of the northern pike suppression efforts.

The mission of the ADF&G, Sport Fish Division is to “protect and improve the state’s recreational fisheries resources,” and an objective of the division’s strategic plan is to “minimize impacts of invasive species on fish stocks, recreational fisheries, and fish habitat.” Removing northern pike from vital salmon rearing habitat directly serves this objective. ADF&G has an aquatic nuisance species management plan and an invasive northern pike management plan. Goals and objectives in these plans address the need to remove invasive northern pike where possible and improve salmon populations that have been impacted by northern pike. Alexander Creek is recognized as the division’s highest priority for invasive northern pike control, and the Matanuska-Susitna Basin Salmon Habitat Partnership includes invasive northern pike control as an objective in their Strategic Action Plan. Project activities are clearly aligned with several recognized plans and initiatives. The Alaska State Legislature has provided complementary funding for a portion of this work.

3. Location

Alexander Creek

Latitude: 61.444122 N

Longitude: 150.593891 W

4. AKSSF Objective

Central: 1D-3

VI. Objectives

1. Project Objectives

This project will lay the foundation needed to fulfill ADF&G’s long-term goal of increasing salmon abundance and restoring fisheries in the Alexander Creek drainage by suppressing the invasive northern pike population. Specific objectives of this project are to

- initiate an annual, large-scale gillnetting protocol in side channel sloughs of Alexander Creek to remove spawning northern pike such that there is an 85% reduction in inseason catch rates in the targeted sloughs,
- document the spatial and temporal movement patterns of northern pike in the Alexander Creek drainage, and
- begin a salmonid monitoring protocol in the Alexander Creek drainage for long-term evaluation of the northern pike suppression effort.

2. Methods

Northern Pike Suppression: In May 2011, a large-scale gillnetting operation will begin in side channel sloughs of Alexander Creek. Northern pike will be targeted with 75 gillnets while congregated for spawning. Three field camps will be set up along Alexander Creek. One will be located in lower Alexander Creek between the mouth of Alexander Creek and Sucker Creek, and two will be located between Sucker Creek and Alexander Lake. Field staff assigned to each field camp will be responsible for gillnetting their corresponding creek section. In each section, 12 side channel sloughs will be targeted for a total of 36 sloughs in all. Sloughs remaining hydrologically connected with the mainstem will be targeted until either an 85% reduction in northern pike catch is achieved or the end of the netting period is reached. For long-term reductions in catch rates, the sloughs will need to be gillnetted annually.

Radio Telemetry Study: The second major component of this project will be to quantify the movement patterns of northern pike in the Alexander Creek drainage with a radio telemetry project. This information will help define and strengthen the northern pike suppression efforts and will also identify how northern pike utilize open systems in general within their invasive range. Little is presently known about the degree to which northern pike move between Alexander Lake and the mainstem of Alexander Creek and between the sloughs and the mainstem. If substantial movement between Alexander Lake and the mainstem is observed, it is likely that ADF&G will propose targeted northern pike suppression in Alexander Lake at a future date. This would be an expensive and controversial endeavor which is why this project focuses on suppression in side channel sloughs while a determination is made about the need to expand suppression work to the lake.

For this study, 150 northern pike will be fitted with radio transmitters and ID tags; 75% of the tagged northern pike will be released into the middle of Alexander Lake and 25% will be released into each of two side channel sloughs that have permanent connections with Alexander Creek. Radio transmitters will have a two year life span. Radio-implanted northern pike will be released in July 2011 and tracked through the fall of 2013 using five stationary receivers installed one mile below Alexander Lake, at the confluence of Alexander Creek and Sucker Creek, at the outlets of the two permanently connected sloughs, and a mile above the confluence of Alexander Creek and the Susitna River. Data from the receivers will be downloaded every two months. Aerial and ground telemetry surveys will also be conducted to detect fine-scale northern pike movements. Northern pike movements will be mapped using GIS.

Salmonid Monitoring Protocol: The third component of this project will collect baseline data needed for long-term monitoring of salmon abundance to evaluate the success of the northern pike suppression efforts. This will be accomplished through annual minnow trap surveys of juvenile salmonids and an investigation of temporal shifts in northern pike diets. To begin building a long-term data set, two minnow trap sampling events will take place annually in concert with the northern pike suppression schedule. Alexander Creek will be divided into the three sections discussed in the northern pike suppression section above. Field crews responsible for gillnetting those sections will also be responsible for minnow trap surveys in their assigned areas. Sampling locations will be fixed. Each of the three creek sections will contain twelve sample sites: six in Alexander Creek and six in side channel sloughs. Five minnow traps will be set in each of the sample sites. Therefore, each field crew will be responsible for 60 minnow traps for a total of 180 traps per overall sampling event. Traps will be fished for 24 hours. Trends in catch per unit effort (CPUE) and relative abundance will be monitored over time. Northern pike suppression will be considered successful if large, significant increases in salmonid CPUE and relative abundance can be observed within five years. Activities beyond the term of this project will be funded separately; the focus of this project will be on gathering the initial monitoring data set from which the northern pike suppression initiative will eventually be evaluated.

Another compliment to the juvenile salmonid minnow trap monitoring will be to investigate shifts in northern pike diet over time as the suppression efforts continue. Approximately 50% of the northern pike that are removed in gillnets during the suppression project will be dissected to enumerate prey species in their stomach contents. Shifts in northern pike diet will be evaluated by observing changes in the relative abundance of prey species over time.

Prior to commencement of project activity, PI will obtain ADF&G Fish Collection, Fish Resource, Fish Transport, and/or other required permits, as appropriate.

VII. Benefits

This project will initiate efforts to reduce the northern pike population in the Alexander drainage. Over time, this will improve habitat quality for rearing salmonids by reducing the density of invasive northern pike and increasing salmon productivity. Eventually, the once-popular salmon sport fisheries will be restored to a harvestable level, providing recreational and economical benefits to the area's residents and businesses. The radio telemetry and monitoring portions of the project will provide information that will assist fisheries managers with future northern pike suppression efforts.

VIII. Products, Milestones, and Timelines

- April-May 2011: Purchase equipment and field camp gear
- May 2011: Establish field camps; begin gillnet suppression and northern pike stomach content analysis
- Mid-May, 2011: Begin minnow trap sample event.

- June 2011: Conclude gillnetting and minnow trap sample event; construct and install stationary radio receivers in Alexander Creek
- July 2011: Implant radio transmitters and release tagged northern pike
- August 2011: Conduct two radio telemetry tracking events
- September 2011: Conduct one radio telemetry tracking event; order replacement gillnets
- October 2011 - February 2012: Conduct monthly radio telemetry tracking flights
- March 2012 and 2013: Conduct two radio telemetry tracking events
- April 2012 and 2013: Purchase equipment and field camp gear; perform weekly radio telemetry tracking events
- May 2012 and 2013: Establish field camps; begin gillnet suppression and stomach content analysis; conduct weekly radio telemetry tracking events
- Mid-May 2012 and 2013: Conduct minnow trap sample event
- June 2012 and 2013: Conclude gillnetting and minnow trap sample event; conduct two radio telemetry tracking events
- July 2012 and 2013: Conduct two radio telemetry tracking events
- August 2012 and 2013: Conduct two radio telemetry tracking events
- September 2012: Conduct radio telemetry tracking event; order replacement gillnets
- October 2012 - February 2013: Conduct monthly radio telemetry tracking event
- September 2013: Conclude radio telemetry project; remove stationary receivers
- October - December 2013: Analyze preliminary data and write project report (Fishery Data Series)

PI will submit PCSRF performance metrics, semiannual, and project completion reports according to the AKSSF schedule, as well as copies of any other report/product/deliverable produced with this funding.

All invoices will be submitted for payment within 30 days of the project end date in accordance with the current AKSSF invoicing P&P.

Any report or product distributed as a result of this funding will include the following language: *This [report/video/website] was prepared by [recipient/author name] under award #NA10NMF4380428 from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce, administered by the Alaska Department of Fish and Game. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the National Oceanic and Atmospheric Administration, the U.S. Department of Commerce, or the Alaska Department of Fish and Game. Any displays produced (e.g., signs, interpretive displays, posters) must include logos from both the National Oceanic and Atmospheric Administration and the Alaska Department of Fish and Game (please contact AKSSF staff for graphics).*

IX. Partners

N/A

X. Project Budget

ADF&G	FY11	FY12	FY13	FY14	Total
100 Personnel	\$29,576	\$102,939	\$106,930	\$44,244	\$283,689
200 Travel	\$0	\$0	\$0	\$0	\$0
300 Contractual	\$7,400	\$28,600	\$31,950	\$5,130	\$73,080
400 Supplies	\$85,748	\$30,212	\$31,421	\$4,088	\$151,469
500 Equipment	\$12,000	\$18,000	\$0	\$0	\$30,000
Subtotal	\$134,724	\$179,751	\$170,301	\$53,462	\$538,238
MTDC	\$122,724	\$161,751	\$170,301	\$53,462	\$508,238
600 Indirect @ 14% (excludes equipment)	\$17,181	\$22,645	\$23,842	\$7,485	\$71,153
Total	\$151,905	\$202,396	\$194,143	\$60,947	\$609,391

Budget Narrative:

Note: PAF-only REV#1 (8/23/13) approves the purchase of a project computer at approximately \$1,500.

Line 100: Personnel (All salaries were calculated with the state salary calculator.)

A Fishery Biologist (FB) II will plan, coordinate, and supervise all field logistics, prepare project reports, and give presentations to the public:

- FY11: 3 months @ \$6,584/ month = \$19,752
- FY12: 12 months @ \$6,848/month = \$82,168
- FY13: 12 months @ \$7,111/month = \$85,329
- FY14: 6 months @ \$7,373/month = \$44,244

Two Fish and Wildlife Technicians (FWTs) will assist with northern pike gillnetting and salmonid minnow trapping:

FY11

- 1.5 months @ \$6,549/month including 40 hours OT = \$9,824

FY12

- 1.5 months @ 7,036/month including 50 hours OT = \$10,554
- 1.5 months @ 6,811/month including 40 hours OT = \$10,217

FY13

- 1.5 months @ \$7,318/month including 50 hours OT = \$10,975
- 1.5 months @ \$7,084/month including 40 hours OT = \$10,626

Total FY11 Personnel: \$29,576

Total FY12 Personnel: \$102,939

Total FY13 Personnel: \$106,930

Total FY14 Personnel: \$44,244

Line 300: Contractual

FY11

- Property lease for field camp on the main stem of Alexander Creek: \$1,000
- Outboard motor maintenance and repair: \$1,000
- Freight for radio telemetry equipment: \$700
- Air charters to fly field supplies in and out of the remote camps: 6 hours @ \$500/hour = \$3,000
- Radio tag programming fees: \$300
- Radio receiver bench tests: \$1,400

Total FY11 Contractual: \$7,400

FY12

- Property lease for field camp on the main stem of Alexander Creek: \$1,040
- Air charters to fly field supplies in and out of the remote camps: 6 hours @ \$520/hour = \$3,120
- Freight for supplies: \$728
- Outboard motor maintenance and repair: \$1,040
- Air charters to conduct aerial radio telemetry surveys: 60 hours @ \$353.6/hour = \$21,216
- Radio receiver bench tests: \$1,456

Total FY12 Contractual: \$28,600

FY13

- Property lease for field camp on the main stem of Alexander Creek: \$1,080
- Air charters to fly field supplies in and out of the remote camps: 6 hours @ \$540/hour = \$3,240
- Freight for supplies: \$757
- Outboard motor and equipment maintenance: \$1,082
- Air charters to conduct aerial radio telemetry surveys: 66 hours @ \$367.83/hour = \$24,277
- Radio receiver bench tests: \$1,514

Total FY13 Contractual: \$31,950

FY14

- Air charters to fly field supplies in and out of the remote camps: 1 hour @ \$560/hour = \$560
- Air charters to conduct aerial radio telemetry surveys: 12 hours @ \$380.83/hour = \$4,570

Total FY14 Contractual: \$5,130

Line 400: Supplies

Note: PAF-only REV#1 (8/23/13) approves the purchase of a project computer at approximately \$1,500 (change not reflected the narrative detail below).

FY11

- Radio tags for telemetry project: 150 tags @ \$180/tag = \$27,000
- Reference tags: 3 tags @ \$500/tag = \$1,500

- Supplies to build stationary telemetry receivers (3 solar panels, 3 battery boxes, lumber, cables, tools, etc.): \$6,000
- Surgical supplies to implant radio transmitters (suture kits, scalpels, holding boxes, cradle, gill shower, gloves): \$1,500
- FLOY tag guns: 2 guns @ \$200/gun = \$400
- FLOY tags: 300 tags @ \$2/tag = \$600
- Parts for equipment repair: \$6,000
- Gillnets: 75 nets @ \$230/net = \$17,250
- Minnow traps: 200 traps @ \$10/trap = \$2,000
- Sampling supplies (measuring equipment, knives, bait, field books, etc.): \$3,000
- Supplies for field staff (waders, rain gear, PFDs, float coats, etc.): \$7,148
- Garmin GPS units: 2 units @ \$500/unit = \$1,000
- Snow sleds for winter field work: 2 sleds @ \$500/sled = \$1,000
- Field camp supplies (food, cell phones, satellite phone, propane, etc.): \$6,350
- Boat and vehicle fuel: \$5,000

Total FY11 Supplies: \$85,748

FY12

- Replacement gillnets: 50 gillnets @ \$239/net = \$11,960
- Replacement minnow traps: 20 traps @ \$10.40/trap = \$208
- Parts for equipment repair: \$1,040
- Sampling supplies (measuring equipment, field books, bait, knives, etc.): \$3,120
- Supplies for field staff (waders, rain gear, PFDs, etc.): \$2,080
- Field camp supplies (food, cell phones, satellite phone, propane, etc.): \$6,604
- Boat and vehicle fuel: \$5,200

Total FY12 Supplies: \$30,212

FY13

- Replacement gillnets: 50 nets @ \$248.76/net = \$12,438
- Replacement minnow traps: 20 traps @ \$10.80/trap = \$216
- Parts for equipment repair: \$1,082
- Sampling equipment: \$3,245
- Supplies for field staff (waders, rain gear, PFDs, etc.): \$2,164
- Field camp supplies (food, cell phones, satellite phone, propane, etc.): \$6,868
- Boat and vehicle fuel: \$5,408

Total FY13 Supplies: \$31,421

FY14

- Field camp supplies (food, cell phones, satellite phone, propane, etc.): \$1,288
- Boat and vehicle fuel: \$2,800

Total FY14 Supplies: \$4,088

Line 500: Equipment

FY11

- Stationary receivers: 2 receivers @ \$6,000/receiver = \$12,000

FY12

- Snow machines: 2 machines @ \$9,000/machine = \$18,000

Line 600: Indirect

ADF&G's federally negotiated indirect rate for FY11 is 15.44%; however, indirect will be recovered at a reduced rate of 14% total modified direct costs (TMDC; excluding equipment) for this project.

Budget adjustments between line items are allowed for amounts equal to or less than 10% of the total award without prior AKSSF approval; any amount above 10% requires prior AKSSF approval. All costs in lines 100-500 must represent actual cash expenditures.

All direct and match expenses shall be adequately documented and filed.

All invoices will be submitted for payment within 30 days of the project end date in accordance with the current AKSSF invoicing P&P. Invoices submitted after that deadline will not be reimbursed. Expenses incurred after the project end date will not be reimbursed.

Entities are required to provide current federally negotiated indirect cost rate agreements (NICRAs) throughout the life of the project. Indirect costs will not be reimbursed if NICRAs have expired or if documentation (i.e., the federally approved rate letter) is not provided. Complete AKSSF indirect requirements are available at <http://www.adfg.alaska.gov/index.cfm?adfg=akssf.policies>.

XI. Match Budget

ADF&G	FY11	FY12	FY13	FY14	Total
100 Personnel	\$46,982	\$62,873	\$61,237	\$20,397	\$191,489
200 Travel	\$0	\$0	\$0	\$0	\$0
300 Contractual	\$0	\$0	\$0	\$0	\$0
400 Supplies	\$0	\$0	\$0	\$0	\$0
500 Equipment	\$0	\$0	\$0	\$0	\$0
Subtotal	\$46,982	\$62,873	\$61,237	\$20,397	\$191,489
600 Indirect @ 14%	\$6,577	\$8,802	\$8,573	\$2,856	\$26,808
Total	\$53,559	\$71,675	\$69,810	\$23,253	\$218,297*

*Match budget shows more match than is required for this project.

Total required ADF&G match (35%): \$213,287

Match Budget Narrative:

Line 100: Personnel

An FB I will order and organize project supplies, regularly supply field camps, assist with field duties, and collect radio telemetry data:

- FY12: 1 month @ \$6,053/month including 6.5 hours of OT = \$6,053
- FY13: 2.5 months @ \$6,296/month including 2.5 hours of OT = \$15,740
- FY14: 3 months @ \$6,799/month including 30 hours of OT = \$20,397

Four FWT II positions will assist with the gillnetting, minnow trapping, and radio telemetry study:

FY11

- 1.5 months @ \$6,172/month including 50 hours of OT * 3 positions = \$27,771
- 1.5 months @ \$6,042/month including 50 hours of OT = \$9,063

One FWT will assist with northern pike gillnetting and salmonid minnow trapping:

FY11

- 1.5 months @ \$6,765/month including 50 hours OT = \$10,148

FY12

- 1.5 months @ \$6,418/month including 50 hours of OT = \$9,624
- 1.5 months @ \$6,284/month including 50 hours of OT = \$9,426
- 3 months @ 6,295/month including 50 hours of OT * 2 positions = \$37,770

FY13

- 1.5 months @ \$6,536/month including 50 hours of OT = \$9,804
- 1.5 months @ \$6,675/month including 50 hours of OT = \$10,013
- 2 months @ \$6,421/month including 50 hours of OT * 2 positions = \$25,680

Total FY11 Personnel: \$46,982

Total FY12 Personnel: \$62,873

Total FY13 Personnel: \$61,237

Total FY14 Personnel: \$20,397