EVOSTC FY17-FY21 INVITATION FOR PROPOSALS
FY18 CONTINUING PROGRAM PROJECT PROPOSAL SUMMARY PAGE

Proposals requesting FY18 funding are due to shiway.wang@alaska.gov and elise.hsieh@alaska.gov by August 23, 2017. Please note that the information in your proposal and budget form will be used for funding review. Late proposals, revisions or corrections may not be accepted.

Project Number and Title

18170111-F Surveys and age, sex, and size collection and processing.

Primary Investigator(s) and Affiliation(s)

Stormy Haught, Alaska Department of Fish and Game

Date Proposal Submitted

7-26-2017

Project Abstract

This proposed project will conduct spring aerial surveys to document Pacific herring *Clupea pallasii* milt distribution and biomass as well as the distribution and abundance of sea lions, other marine mammals, and birds associated with herring schools or spawn. This proposed project will also provide a research platform (R/V Solstice) for an adult herring acoustics survey and disease sample collection and processing. Finally, this proposed project will collect and process age, sex, and size samples of herring collected by the acoustics survey, spawning surveys, and the PWS Herring Research and Monitoring Program disease sampling. Aerial survey and age, sex, and size data have been collected since the early 1970s and are an essential part of the age-structured model used by the Alaska Department of Fish and Game to estimate the historical and future biomass for fisheries management. Acoustics surveys have been conducted consistently since 1995 and the age-structured model is also tuned to acoustics biomass estimates. This project will be help to meet the overall program goal to **improve predictive models of herring stocks through observations and research** by providing necessary inputs to the age-structured assessment models of the Alaska Department of Fish and Game and the *PWS Herring Research and Monitoring Program* Bayesian model.

EVOSTC Funding Requested* *(must include 9% GA)*

FY17	FY18	FY19	FY20	FY21	TOTAL
166.3	166.3	166.3	166.3	166.3	831.5

Non-EVOSTC Funds to be used, please include source and amount per source:

FY17	FY18	FY19	FY20	FY21	TOTAL
54.5	54.5	54.5	54.5	54.5	272.5

1. EXECUTIVE SUMMARY

This project will be help to meet the overall goal to **improve predictive models of herring stocks through observations and research** by providing necessary inputs to the age-structured assessment models of ADF&G and the *PWS Herring Research and Monitoring Program – Population Modeling.*

There are no proposed hypotheses to be tested directly from this project; however, this project will continue long-term monitoring programs to 1) conduct aerial surveys to collect data associated with spring Pacific herring

Clupea pallasii spawning events, 2) collect and process age, sex, and size (ASL) samples from prespawn and spawning aggregations of Pacific herring, and 3) provide vessel support for spring acoustics surveys, disease sampling, and collection and processing of age, sex, and size samples for target strength assessment.

Spring aerial survey data have been collected since 1972 (Funk 1994), and spring acoustics surveys have been consistently conducted since 1995 (Willette et al. 1999). ASL data are available since 1973 (Sandone 1988); however, collections of both data sets have been more extensive since the early 1980s. Herring age data were collected in 1971 and 1972 also, but only published frequency plots (no individual fish data) are available (Pirtle et al. 1973).

Aerial surveys were used to document spring herring biomass and were the primary management tool prior to the development of the first statistical catch-at-age model or age structured assessment model (ASA) in 1988 (Brady 1987, Funk and Sandone 1990). Biomass is estimated as school surface area converted to biomass from a few paired observations of aerial observers and vessel harvests (Brady 1987, Fried 1983, Funk and Sandone 1990). Surface area and biomass conversion methods are as described in Brady (1987) and Lebida and Whitmore (1985). Prior to 1988, the aerial survey program's primary objectives were to collect biomass data for an annual index, document the distribution and linear extent of milt, document herring temporal movements, and document the distribution of commercial fishing boats, fishing tender boats, and processor boats (Brady 1987). Additionally, the locations of large aggregations of Stellar sea lions *Eumetopias jubatus* and other marine mammals were often noted on paper maps.

Brady (1987) described how herring arrive on the spawning grounds over time and may be available to document on multiple aerial surveys. Therefore, the biomass over several days of surveys cannot be summed to estimate the total or peak biomass. Consequently, peak biomass was calculated as the largest biomass observed in all areas on a single survey (Brady 1987). Additional biomass with a discrete time separation would also be added, but these conservative methods were required to estimate the peak biomass because the amount of time herring were available to observation by aerial surveys was unknown and likely variable (Funk and Sandone 1990).

Brady (1987) also detailed how the variable bathymetry of herring spawning areas in Prince William Sound has a large influence on the observer's ability to see herring schools. Herring may spawn in shallow bays (e.g., Rocky Bay, Montague Island), shallow beaches (e.g. Hells Hole beach), or deep bays (e.g., Fairmont Bay on the North Shore). The influence of bathymetry on observer efficiency suggests a biomass index will probably not be comparable across years. Although Funk and Sandone (1990) indicated that peak biomass values may be a useful relative abundance, issues with biomass observations described by Brady (1987) and Funk and Sandone (1990) caused the department to investigate the use of an index of spawn from observations of milt.

Two indices considered for spawn documented from aerial surveys were 1) discrete miles of milt over the season and 2) the sum of miles of milt for all survey days (mile-days of milt). The advantages of milt observations compared to school biomass observations are 1) herring schools likely spawn a single time e.g., a single day, but a herring school may be observed for several days prior to, or after spawning, 2) milt is relatively easy to observe from the air and observation efficiency is generally not influenced by ocean bathymetry (Brady 1987).

Discrete miles of milt do not account for multiple spawning events in the same area, so are unlikely to be a good index of total abundance in areas with multiple days of spawning on the same beach (Brady 1987). Mile-days of milt probably provide a better index to abundance because they account for multiple spawning days on the same beach, but may be biased if the number of surveys varies significantly across years (Funk 1994).

Additionally, although bathymetry probably will not influence observation of milt, it is likely one factor that will influence the biomass of spawning fish for each linear mile of milt observed. Willette et al. (1999) collected paired spawn deposition survey estimates from dive surveys and aerial survey estimates of miles of milt; the short tons (dive survey) per mile of milt (aerial survey) were much larger on Montague Island beaches when compared to short tons per mile of milt in northern or northeastern PWS beaches. Montague Island shoreline typically has large shallow, subtidal areas with complex kelp structure while the northern and northwestern beaches tend to have a steeper gradient to deep waters and less complex kelp structure.

Funk (1994) used the discrete miles of milt index in his ASA model rather than the mile-days of milt index because there were fewer surveys flown in the early years (1970s). However, subsequent runs of the ASA model have excluded the earlier years and use of the mile-days of mile index.

In 2008 the department began using a tablet computer and a geographic information system (GIS) application to collect aerial survey data (Bochenek 2010). Because digital maps are scalable and allow much more data to be added to a small area (contrast with the 25 paper maps used prior to 2008), and because of interest in herring predators distribution and abundance, additional effort was employed in documenting numbers and locations of predators such as Stellar sea lions, humpback whales *Megaptera novaeangliae*, killer whales *Orcinus orca*, Dall's porpoises *Phocoenoides dalli*, and bird aggregations (mostly gulls) associated with herring schools or spawn.

Age, sex, and size data from Pacific herring have been collected from commercial fisheries and fishery independent research projects since the early 1970s. The department currently has an archive containing approximately 210,000 scales paired with size and sex data (most of the archive has been collected since 1979). Summaries of many of these data have been published (e.g., Sandone 1987, Funk and Sandone 1990, Willette et al. 1999). Processing methods are similar those described by Baker et al. (1991); however, electronic fish measuring boards have been used to enter sample summary data and individual fish data (standard length in mm, whole body weight in grams, and sex) at the time of processing since 1989. Gonad weights have been collected from prespawning fish (both sexes) in most years since 1994 (n = 8,500).

Scales are used to estimate age for PWS collections rather than otoliths because they are much easier to collect and prepare for examination. Additionally, Chilton and Stocker (1987) reported that Chi-square tests of age compositions from paired otoliths and scales collected off the British Columbia coast could not refute the null hypothesis that they were from the same population. Interpretation of age from otoliths indicated that there were older fish than interpreted from scales; however, few fish older than age 10 are found in PWS, so fish interpreted at age 9 and older are combined into an age category 9+. No age validation or tests of paired age structures have been completed for PWS herring.

Aerial survey, acoustics estimates, and ASL data sets are essential parts of the current ASA model the Alaska Department of Fish and Game (ADF&G) uses to estimate the historical biomass and project pre-fishery run biomass a year ahead for management (e.g., Hulson et al. 2008). Additionally, the mile-days of milt and ASL data are part of the Bayesian formulation of the ASA model (Muridan 2015), and the scales collected from this archive were used in an EVOS funded project titled "PWS Herring Program - Scales as growth history records".

This project will conduct aerial surveys to collect data related to spring herring spawning events, provide vessel support for acoustics surveys and disease sample collections; and capture and process herring to generate age, sex, and size summaries and mean target strength. The overall goal of the aerial survey, acoustics survey, and ASL project components is meet the overall program goal to **improve predictive models of herring stocks through observations and research**.

Literature cited – Includes citations for the remainder of the document.

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Jones, E.L., III, T.J. Quinn, II, and B.W. Van Alen. 1998. Observer accuracy and precision in aerial and foot survey counts of pink salmon in a southeast Alaska stream. North American Journal of Fisheries Management 18:832–846.

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Willette, T.M., G.S. Carpenter, K. Hyer, and J.A. Wilcock. 1999. Herring natal habitats, *Exxon Valdez* Oil Spill Restoration Project Final Report (Restoration Project 97166), Alaska Department of Fish and Game, Division of Commercial Fisheries, Cordova, Alaska.

2. COORDINATION AND COLLABORATION

A. Within an EVOTC-Funded Program

Provide a list and clearly describe the functional and operational relationships with other EVOSTC-funded program projects. This includes any coordination that has taken or will take place and what form the coordination will take (shared field sites or researchers, research platforms, sample collection, data management, equipment purchases, etc.).

B. With Other EVOSTC-funded Projects

Indicate how your proposed project relates to, complements or includes collaborative efforts with other proposed or existing projects funded by the EVOSTC that are not part of a EVOSTC-funded program.

C. With Trustee or Management Agencies

Please discuss if there are any areas which may support EVOSTC trust or other agency work or which have received EVOSTC trust or other agency feedback or direction, including the contact name of the agency staff. Please include specific information as to how the subject area may assist EVOSTC trust or other agency work. If the proposed project requires or includes collaboration with other agencies, organizations or scientists to accomplish the work, such arrangements should be fully explained and the names of agency or organization representatives involved in the project should be provided. If your proposal is in conflict with another project, note this and explain why.

A. *PWS Herring Research and Monitoring Program –Acoustics Survey*.
This proposed project will share the R/V Solstice vessel research platform with a Prince William Sound Science Center staff member to conduct the adult acoustics survey. ADF&G acoustics equipment will be

shared with the Acoustics Survey project if necessary. This proposed project will also capture and process age, sex, and size samples to calculate mean target strength by time or area strata for use in acoustics echo integration. Aerial surveys conducted by this proposed project will provide additional location information on herring aggregation for acoustics surveys.

PWS Herring Research and Monitoring Program – Outreach and Education.
This proposed project will assist public outreach through public presentations of methods and results.

PWS Herring Research and Monitoring Program – Herring Disease Studies
This proposed project will provide research platform vessel support (R/V Solstice) for Herring Disease Studies staff to capture and process adult herring for disease sampling similar to past years. Additionally, this project will help collect scales for fish age and interpret the scales for age.

PWS Herring Research and Monitoring Program – Age at Maturity
This proposed project will assist with collection and processing of herring scales for the proposed age at maturity project.

PWS Herring Research and Monitoring Program – Population modeling
This proposed project will collect mile-days of milt, provide vessel support for the acoustics survey, and provide age, sex, and size data to update the time series of data required for the Bayesian population dynamics model.

B. *Data Management Program*
This proposed project will provide additional herring aerial survey and herring age, sex, and size data for use by other PWS Herring Program projects. Past funding and ADF&G funding has allowed us to provide aerial survey GIS data files for linear extent of spawn (1973–2015), survey routes (1997–2015), sea lion distribution and abundance (2008–2015), other marine mammals distribution and abundance (2008–2015), and bird aggregations (2008–2015).

C. *ADF&G Fisheries Management*
Aerial survey, acoustics estimates, and ASL data sets are essential parts of the current ASA model the Alaska Department of Fish and Game (ADF&G) uses to estimate the historical biomass and project pre-fishery run biomass a year ahead for management (e.g., Hulson et al. 2008). Additionally, the mile-days of milt and ASL data are part of the Bayesian formulation of the ASA model (Muridan 2015), and the scales collected from this archive were used in an EVOS funded project titled "PWS Herring Program - Scales as growth history records".

3. PROJECT DESIGN – PLAN FOR FY18

A. Objectives for FY18

Identify the primary objectives for your project for FY18 as submitted in your original proposal.

B. Changes to Project Design

If the project design has changed from your original proposal, please identify any substantive changes and the reason for the changes. Include any information on problems encountered with the research or methods, if any. This may include logistic or weather challenges, budget problems, personnel issues, etc. Please also include information as to how any problem has been or will be resolved. This may also include new insights or hypotheses that develop and prompt adjustment to the project.

A. These data will be collected to meet the overall goal to **improve predictive models of herring stocks through observations and research** by providing necessary inputs to the age-structured assessment models of ADF&G

and the *PWS Herring Research and Monitoring Program – Population Modeling.* These data will add to data collected since 1972 (aerial surveys) and 1973 (age, sex, and size data).

Objectives of this proposed project are as follows:

1.) Conduct spring aerial surveys to collect data on survey routes, location and linear extent of herring milt, classification of herring milt, herring school biomass; distribution and abundance of sea lions, other marine mammals and bird aggregations associated with herring or herring spawn; and other relevant environmental or anthropogenic observations.

2.) Collect, process, summarize, and distribute age, sex, and size data from herring collected during acoustics surveys, spawning grounds surveys, *PWS Herring Research and Monitoring Program* disease surveys, or other relevant collections.

   a. Estimate age composition in each fishery and spawning escapements by gear type for time and area strata with sample sizes sufficient to simultaneously estimate all age proportions to within ± 5% at the 90% level of precision.

   b. Estimate mean standard length and whole body weight for each fishery and spawning escapements by gear type for time and area strata with sample sizes such that the relative error is ±5% at the 95% level of precision.

   c. Estimate the mean gonad weight of prespawning fish for time and area strata with sample sizes such that the relative error is ±5% at the 95% level of precision.

   d. Estimate sex composition of each fishery and spawning escapements by gear type for time and area strata with sample sizes sufficient to estimate proportions to within ±5% at the 95% level of precision.

3.) Provide a vessel (R/V Solstice) as a research platform for an adult acoustics survey, disease sampling, and collection of pre-spawn and spawning Pacific herring samples. Mean length from pre-spawn samples will be used to estimate Pacific herring target strength for the acoustics work.

4. SCHEDULE

A. Program Milestones for FY18

For each project objective listed, specify when critical project tasks will be completed, as submitted in your original proposal. Please identify any substantive changes and the reason for the changes.

B. Measurable Project Tasks for FY18

Specify, by each quarter of each fiscal year, when critical project tasks (for example, sample collection, data analysis, manuscript submittal, etc.) will be completed, as submitted in your original proposal. Please identify any substantive changes and the reason for the changes.

A. Objective 1.

Complete all aerial surveys of spring herring assessment.

To be met by June 2018

Summarize, edit, and combine all spring 2016 aerial survey shape files into yearly totals.

To be met by August 2018

Provide all raw and summarized data and metadata to AOOS Workspace.

To be met by June 2018

Objective 2.

Finish processing all herring samples for age, sex, and size

To be met by August 2018

Distribute final age data and summaries.

To be met by August 2018

Provide all raw and summarized data and metadata to AOOS Workspace

To be met by June 2018

Objective 3.

Complete spring acoustics, disease vessel support trip

To be met by June 2018

Complete spawning ASL collection trip

To be met by June 2018

Distribute final age data and summaries for acoustics target strength and disease sampling

To be met by August 2018

Provide all raw and summarized data and metadata to AOOS Workspace

To be met by June 2018

B. FY 18, 1st quarter (February 1, 2018 - April 31, 2018)

1 March:	*Annual Report due*
March:	*Start Aerial surveys*
March or early April:	*Start Acoustics and disease support survey*
April:	*Start herring ASL sample processing*

FY 18, 2nd quarter (May 1, 2018-July 30, 2018)

May:	*Finish Aerial surveys*
June:	*Provide previous years data and metadata to workspace*
June:	*Quality control work on ASL data*
July:	*Quality control and editing of aerial shape files*

FY 18, 3rd quarter (August 1, 2018 – October 31, 2018)

August:	*Finish analysis of aerial survey data.*
August:	*Combine aerial survey shape files into historical version*
August:	*Finish herring ASL sample processing*
August:	*Finish ASL analysis and distribute ASL sample summaries*
1 September:	*Submit proposal Request for FY18*

FY 18, 4th quarter (November 1, 2018- January 31, 2019)

November:	*PIs meeting with Gulf Watch Alaska*
January:	*Write summary reports.*

5. PROJECT PERSONNEL – CHANGES AND UPDATES

If there are any staffing changes to Primary Investigators or other senior personnel please provide CV's for any new personnel and describe their role on the project.

Steve Moffitt retired from state service May 2017, PWS Area Research Biologist replaced by Stormy Haught.

Stormy B. Haught
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Cordova, Alaska 99574

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Cell: (907) 253-6878
stormy.haught@alaska.gov

SELECT WORK HISTORY

Fisheries Biologist III, PWS Area Research Biologist, Alaska Dept. Fish & Game 5/2017-Present
Cordova, AK Supervisor: Jack Erickson, jack.erickson@alaska.gov, (907) 267-2376
Develop, implement, and evaluate research projects on Pacific herring, Pacific salmon, and eulachon in Prince William Sound and the Copper River. Specific duties include directing salmon otolith laboratory, setting spawning escapement goals, preseason forecasts, evaluation of harvest policies, assessment of runs inseason, and local area network supervision. Supervise one seasonal Fishery Biologist I and two seasonal Fisheries Technician Crew leaders.

Fisheries Biologist II, Assistant Research & Management Biologist, Alaska Dept. Fish & Game 5/2015 – 5/2017
Cordova, AK. Supervisor: Jeremy Botz, jeremy.botz@alaska.gov, (907) 424-3212
Assist in all aspects of research and management of Prince William Sound (PWS) and Copper River (CR) salmon and herring fisheries. Fly aerial surveys for PWS and CR districts salmon escapements and herring spawn, manage Miles Lake Sonar and Coghill River weir escapement projects. Direct AWL commercial catch and escapement sampling crew. Assist in deploying Eshamy video weir. Manage budgets and apply for external funding for stock assessment projects. Draft area management reports, project operational plans, and pre-season forecasts. Hire seasonal field and office technicians. Supervise 1 Fisheries Biologist I, 1 Fish & Wildlife Technician III, 8 Fish & Wildlife Technician IIs and1 Office Assistant I. Assist in the maintenance and repair of equipment. Attend public and corporate meetings and interact with the public as a department representative.

Habitat Biologist III, Alaska Dept. Fish & Game 5/2012 – 5/2015
Palmer, AK. Supervisor: Mike Bethe, mike.bethe@alaska.gov, (907) 861-3202
Review proposals and issue permits pursuant to AS Title 16 and 5 AAC for activities in fish-bearing waters and/or within state refuges. Conduct fish distribution investigations using backpack and boat based electro-fishing and minnow trapping. Conduct field inspections and monitoring to enforce and ensure compliance with the Anadromous Fish and Fish Passage Acts (AS Title 16) and 5 AAC (refuge and critical habitat regulations). Serve as primary contact for Mat-Su Region Legislatively Designated Areas (State Refuges and Critical Habitat Areas). Provide information to the public regarding refuge access, recreational opportunities, and regulations. Participate in multi-agency technical working groups for large development projects and management plans. Conduct press interviews when contacted. ArcGIS mapping and analysis.

Endangered Species Biologist, U.S. Fish & Wildlife Service 2/2012 – 5/2012
Anchorage, AK. Supervisor: Ellen Lance, Ellen_Lance@fws.gov, (907) 271-1467
ArcGIS mapping and spatial analyses of ESA species habitat use. Endangered Species Act Section 7 consultations. Coordinate with national institutions to acquire Kittlitz's Murrelet genetic material from historical ornithological collections.

Habitat Biologist II, Alaska Dept. Fish & Game 3/2011 - 2/2012
Anchorage, AK. Supervisor: Ron Benkert, ronald.benkert@alaska.gov, (907) 267-2261
Project review and Title 16 permitting, inspection, and enforcement. Fish distribution investigations using boat-based and backpack electro-fishing in upper Susitna watershed, Talkeetna and Chugach Mountains. Design and implementation of biomonitoring and habitat assessment programs for large development projects including juvenile salmonid, water quality, macroinvertebrate, periphyton, and geomorphological sampling and analysis. Oil spill response and planning.

Research Technician, University of Alaska 6/2010-2/2011
Toolik, Fairbanks, & Anchorage, AK. Supervisor: Dr. Loren Buck, loren@uaa.alaska.edu, (907) 786-4607
Capture, ear tag, collar, blood draw, pit tag, and assist in surgical implant/explant of abdominal temperature monitors in Arctic ground squirrels for investigations into the physiology and timing of hibernation as a component of UAF PhD program. Mark recapture and establishment of study plots for long-term food addition experiment using GPS/GIS and traditional survey methods. Evaluation of several makes of light measuring collars and construction/maintenance of various collars and associated electronics and software. Lab work including care of multiple colonies of hibernators, surgery assistance, and vivarium maintenance.

Habitat Biologist I, Kachemak Bay Research Reserve 9/2009-6/2010
Homer, AK. Supervisor: Jessica Ryan, jessica.ryan@alaska.gov, (907) 226-4657
Developing and coordinating invasive green crab, invasive tunicate and harmful algal bloom citizen science monitoring programs in Kachemak Bay. Program tasks included volunteer monitor recruitment and field training for marine invertebrate sampling and coordinating statewide early detection/rapid response efforts through communication and collaboration with other state and national organizations. Educational duties included developing and teaching at "Discovery Labs" (topical marine science educational events for all ages-open to the public), developing and delivering invasive species presentations to K-12 classroom and community groups and developing accredited continuing education workshops for K-12 teachers in conjunction with UAA Kachemak Bay Campus (Instructor of record ED A583: Alaskan Citizen Science for K-12 Classrooms).

Graduate Research Technician, University Alaska Anchorage 7/2009-9/2009
Anchorage, AK. Supervisor: Frank von Hippel, affvh@uaa.alaska.edu, (907) 786-4783
Design and construction of relational database for managing fish collections, water quality data, and chain of custody information for the von Hippel freshwater fish research lab at UAA.

Teaching Assistant, University Alaska Anchorage 8/2006 –6/2009
Anchorage, AK. Supervisor: Fran Pekar, affap@uaa.alaska.edu, (907) 786-4791
Teaching two lab sections per semester (Biol A103L,18-25 students each, 6 semesters total). Topics cover introductory biology and biochemistry, evolution, and ecology. Field labs focus on macroinvertebrate sampling, identification and indicator value, water quality assessment methods, and local stream and wetland ecology. Additional responsibilities include grading (lab reports, papers, tests), collaborating with other instructors to write exams and quizzes, entering final grades, and holding weekly office hours.

Biological Science Technician, U.S. Fish & Wildlife Service 5/2008 – 2/2009
Cold Bay & Anchorage, AK. Supervisor: Ellen Lance
ArcGIS mapping and spatial analysis of ESA species habitat use. Field work investigating effects of hovercraft operations and tower structures on marine mammals and seabirds, including geo-referenced behavioral observations and carcass scavenging study to estimate bird strike mortality. Section 7 Endangered Species Act consultations.

Graduate Research Assistant, University Alaska Anchorage 7/2007- 9/2008
Anchorage, AK. Supervisor: Frank von Hippel
Developing research plan and experimental design, field work, data analysis and preparing publications. Research involved diet analysis of invasive northern pike, GIS analysis of rate and extent of pike invasion in south-central Alaska and effects of invasive pike predation on the morphology and population dynamics of threespine stickleback. Fish sampling remote field work in support of various freshwater fish projects in Prince William Sound, Montague Island, and Susitna Basin.

Research Technician, University Alaska Anchorage 8/2005 - 9/2005
Anchorage, AK. Supervisor: Jeff Welker, (907) 786-6110
Classifying vegetation plots by identifying alpine/tundra plants to species and sorting them in preparation for isotopic analysis.

Lab Assistant, University Alaska Anchorage 12/2004 - 5/2005
Anchorage, AK. Supervisor: Frank von Hippel
Preparing and maintaining lab equipment, mostly aquaria, for several studies investigating effects of contaminants on freshwater fish.

Commercial Fisherman, Peter Pan Seafoods 6/1997 - 8/1999
Nushagak, AK. Supervisor: Jon Jensen
Three seasons of set and drift gillnetting in Nushagak Bay, Nushagak River, and Wood River.

Guides Assistant, Alaska Wilderness Expeditions 8/1996 - 9/1998
Stoney River, AK. Contact: Ken Powers
Assist in all aspects of commercial hunting guide operation.

SELECT PUBLICATIONS/REPORTS

Haught, S. & Shepherd, S. 2017. Miles Lake Sonar Project Operational Plan, 2017-2021. Alaska Dept. of Fish and Game, Division of Commercial Fisheries, Regional Operational Plan ROP.CF.2A.2017.02.

Haught, S., J. Botz, S. Moffitt & B. Lewis. 2017. 2015 Prince William Sound Area Finfish Management Report. Alaska Dept. of Fish and Game, Division of Commercial Fisheries, Fishery Management Report No. 17-17, Anchorage.

Haught, S. 2016. Coghill River adult weir salmon escapement project, 2016. Alaska Dept. of Fish and Game, Division of Commercial Fisheries, Regional Operational Plan ROP.CF.2A.2016.13.

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6. Budget

A. Budget Forms (Attached)

Provide completed budget forms.

B. Changes from Original Proposal

If your FY18 funding request differs from your original proposal, provide a detailed list of the changes and discuss the reason for each change.

C. Sources of Additional Funding

Identify non-EVOSTC funds or in-kind contributions used as cost-share for the work in this proposal. List the amount of funds, the source of funds, and the purpose for which the funds will be used. Do not include funds that are not directly and specifically related to the work being proposed in this proposal.

A. Budget Forms

See attached for detail.

Budget Category:	Proposed FY 17	Proposed FY 18	Proposed FY 19	Proposed FY 20	Proposed FY 21	TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel	$54.5	$54.5	$54.5	$54.5	$54.5	$272.5	$23.4
Travel	$1.4	$1.4	$1.4	$1.4	$1.4	$6.8	
Contractual	$94.6	$94.6	$94.6	$94.6	$94.6	$473.0	$48.9
Commodities	$2.1	$2.1	$2.1	$2.1	$2.1	$10.5	$2.0
Equipment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	
SUBTOTAL	$152.6	$152.6	$152.6	$152.6	$152.6	$762.8	$74.3
General Administration (9% of subtotal)	$13.7	$13.7	$13.7	$13.7	$13.7	$68.7	N/A
PROJECT TOTAL	$166.3	$166.3	$166.3	$166.3	$166.3	$831.5	
Other Resources (Cost Share Funds)	$54.5	$54.5	$54.5	$54.5	$54.5	$272.5	

B. Changes from Original Proposal

No changes in budget are requested

C. Sources of Additional Funding

ADF&G will provide an in-kind contribution of 2.4 months (0.17 FTE) of Fishery Biologist III time ($33.4 K) to provide overall supervision of the project, conduct boat and aerial surveys, analyze data, provide data to other program projects, and write reports. ADF&G will provide and in-kind contribution of 2.1 months (0.18 FTE) of Fishery Biologist II time ($20.7 K) to supervise FB I, FWT III, and FWT II, conduct boat and aerial survey, analyze data, provide data to other program projects, and write reports (*Objectives 1–3*).