

*Exxon Valdez* Oil Spill Trustee Council



FINAL Work Plan for  
Federal Fiscal Year 2011

*Issued February 26, 2014*



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**FISCAL YEAR 2011**

**DRAFT WORK PLAN**

**February 26, 2014**

Prepared by:  
*Exxon Valdez* Oil Spill Trustee Council

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## *Notice*

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**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Not Available

**Public Advisory Committee Recommendation:** Fund

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Priority Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100132-F  
**Project Title:** PWS Herring Survey: Sound Wide Juvenile Herring, Predator, and Competitor Density via Aerial Surveys, submitted under the BAA AB133F-09-RP-0059  
**Principal Investigator:** Evelyn Brown  
**Affiliation:** Flying Fish Ltd.  
**Co-PIs/Personnel:** None  
**Disbursing Agency:** NOAA  
**Project Location:** PWS  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$160,140.60	<b>FY11:</b> \$153,055.60	<b>FY12:</b> \$153,055.60
<b>FY13:</b> \$35,001.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$501,252.80

**Abstract:**

As a component of the integrated PWS Herring Survey (Pegau, P.I.), this project provides 1) a sound-wide, spatially-explicit map of juvenile herring densities, 2) synoptic distributions of herring predator and competitors, and 3) builds on 5 years of previous PWS surveys. June-August surveys map age 1 overwinter survivorship, the timing, spatial extent, and density of age 0 recruiting to nursery habitat, summer mortality of age 1 herring, as well as associated changes in predator/competitor densities. Validation sampling will be provided by a shared vessel with the PWS Herring Survey monthly zooplankton cruises (Campbell, P.I.). Combined with data from other projects within and outside of the PWS Herring Survey, this project's data provides 1) inputs, outputs, and validation for overwinter survival and density-dependent models of predation, growth and disease, 2) an initial estimate of age 2 immature herring recruitment, and 3) spatial information needed to plan, initiate, and evaluate intervention actions.

**Science Panel Comments:**

The objectives, while good, are probably not achievable with the proposed level of effort suggested. Consequently the results could fall short of the objectives. Regardless some of the results could be very useful, even with inherent limitations. The main technical issues noted by the panel concern species identification from the air: it is not sufficient that the observer is convinced of the species identity – there must be a validation process that is transparent and convincing. Some form of ground-truthing is required. The Science panel also wondered about limitation of quantitative estimates of fish schools and why there was no explicit reference to analysis of photographic records. Although the Science panel was highly skeptical of many of the claims made in the proposal it recognized that interest and dedication of the researchers, and acknowledges that areal work could provide a valuable support for the herring Survey team. Therefore the recommendation was to fund the project for one year and re-evaluate the proposal before further support.

**Science Panel Recommendation:** Fund Reduced

**Science Coordinator Comments:**

While I concur with several of the science panel's comments on this project, I do believe that this work will provide valuable data for the Council's herring restoration efforts. The researcher is experienced in this type of data collection and will be coordinating closely with the other members of the PWS Herring Survey team to ground-truth the aerial observations.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Possible reduction as a function of the recommended overall 10% decrease of the 10100132 PWS Herring Survey - see 10100132.

**Public Advisory Committee Recommendation:** Fund Reduced

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100624  
**Project Title:** Measuring Interannual Variability in the Herring's Forage Base from the GOA - Submitted Under the BAA  
**Principal Investigator:** Alexander Bychkov  
**Affiliation:** PICES  
**Co-PIs/Personnel:** Sonia Batten  
**Disbursing Agency:** NOAA  
**Project Location:** Shelf waters SW of PWS, Cook Inlet, northern GOA  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$61,900.00	<b>FY11:</b> \$63,600.00	<b>FY12:</b> \$65,100.00
<b>FY13:</b> \$15,000.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$205,600.00

**Abstract:**

Herring from Prince William Sound feed on zooplankton, some originating within the Sound and some from the Gulf of Alaska (GOA) introduced to PWS via a variety of processes. Additionally, adult herring almost certainly forage outside of the Sound, feeding on zooplankton over the wider Alaskan shelf. Understanding the sources of variability in the herring forage base is essential to efforts to understand the herring recovery process and to address basic resource management questions. Direct measurements inside PWS do not explain how the interannual variation in ocean food sources creates interannual variability in PWS zooplankton, nor when changes in ocean zooplankton are to be seen inside PWS. A ten-year time series of seasonal zooplankton data from the Alaskan shelf and northern oceanic GOA has been maintained through support from a variety of agencies including the EVOS TC. The Continuous Plankton Recorder (CPR) survey is a cost-effective, ship-of-opportunity based sampling program that includes community involvement and has a proven track record. The existing time series shows considerable interannual variation in GOA zooplankton abundance and is essential baseline data to underpin herring restoration efforts. EVOS TC support is now requested to maintain the sampling in this region at the current resolution while we examine the linkages between PWS and GOA zooplankton.

**Science Panel Comments:**

This project provides the only long-term record of plankton abundance and species composition important to understanding the inter-annual variation in herring food from the Gulf of Alaska. This information is necessary to understand herring mortality and long-term trends in herring abundance. The proposers are global leaders in the field and have successfully maintained a time series of such information for a decade using a consortium of funders, including the EVOSTC. The approach using vessels of opportunity and continuous plankton recorders has provided information of the highest quality for the lowest costs for over 50 years. This is the longest plankton time series in the Pacific.

**Science Panel Recommendation:** Fund

**Science Coordinator Comments:**

I concur with the science panel recommendation.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Not Available

**Public Advisory Committee Recommendation:** Fund

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100132-A  
**Project Title:** PWS Herring Survey: Plankton and Oceanographic Observations, Submitted Under the BAA  
**Principal Investigator:** Robert Campbell  
**Affiliation:** Prince William Sound Science Center  
**Co-PIs/Personnel:** None  
**Disbursing Agency:** NOAA  
**Project Location:** Prince William Sound  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$201,500.00	<b>FY11:</b> \$197,300.00	<b>FY12:</b> \$200,100.00
<b>FY13:</b> \$64,400.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$663,300.00

**Abstract:**

Herring stocks collapsed in the years following the Exxon Valdez Oil Spill. The cause of the collapse remains highly controversial, and several empirical and theoretical studies have implicated different factors, including the spill, disease outbreaks, fishing activity, and ecosystem productivity. Herring stocks have not rebounded since the collapse in the early 90's and show no signs of recovery; similarly controversial, varied, and not necessarily mutually exclusive. The work described in this proposal is part of several collaborative proposals to survey herring in PWS, and seeks to monitor the environmental and food climate experienced by herring in order to address the hypothesis that carrying capacity can be limiting the recovery of herring. Observations of environmental conditions and plankton abundance over time will be integrated with observations of herring distributions and energetics, in order to assess how the food climate in Prince William Sound may structure herring populations in space and time.

**Science Panel Comments:**

The science panel endorsed this project because it addressed fundamental issues related to the role of food availability and the decline or lack of recovery of herring. Food limitation over the winter is seen to be a credible explanation as a factor affecting the survival of age 0+ herring over the winter. This project will address a basic part of the hypothesis. The work also could have implications for factors affecting other species, including competitors and predators of herring. The reviews were positive and the PI appears to be productive. Also the proposal is connected and coordinated with other concurrent projects in the herring survey.

**Science Panel Recommendation:** Fund

**Science Coordinator Comments:**

I concur with the science panel recommendation.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Possible reduction as a function of the recommended overall 10% decrease of the 10100132 PWS Herring Survey - see 10100132.

**Public Advisory Committee Recommendation:** Fund Reduced

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100290  
**Project Title:** The Exxon Valdez Trustee Hydrocarbon Database  
**Principal Investigator:** Mark Carls  
**Affiliation:** NOAA/NMFS Auke Bay Laboratory  
**Co-PIs/Personnel:** Marie Larsen  
**Disbursing Agency:** NOAA  
**Project Location:** Auke Bay Laboratories – TSMRI, Juneau, AK  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$9,300.00	<b>FY11:</b> \$9,300.00	<b>FY12:</b> \$9,300.00
<b>FY13:</b> \$9,300.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$37,200.00

**Abstract:**

This is an on-going service project that provides data and sample archiving services for all samples collected for hydrocarbon analysis in support of Exxon Valdez Oil Spill Trustee Council projects. These data represent samples collected since the oil spill in 1989 to the present and include National Resource Damage Assessment (NRDA) studies (environmental and laboratory) and Restoration and Recovery data. This project serves as an archive for chemical analyses and sample data and storage of physical samples that have not been analyzed and provides copies of the ACCESS database to interested parties. The project also responds to several Freedom of Information Act (FOIA) requests each year for information associated with these data. Interpretative services for these data are available.

**Science Panel Comments:**

This proposal provides ongoing support for maintaining, updating, and serving hydrocarbon data that are critical to future evaluations of recovery and restoration.

**Science Panel Recommendation:** Fund

**Science Coordinator Comments:**

I concur with the science panel recommendation.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Not Available

**Public Advisory Committee Recommendation:** Fund

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Fund



**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100132-E

**Project Title:** PWS Herring Survey: Physical Oceanographic Characteristics of Nursery Habitats of Juvenile Pacific Herring, submitted under the BAA AB133F-09-RP-0059

**Principal Investigator:** Shelton Gay

**Affiliation:** Prince William Sound Science Center

**Co-PIs/Personnel:** None

**Disbursing Agency:** NOAA

**Project Location:** Prince William Sound, Alaska

**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$88,400.00	<b>FY11:</b> \$83,100.00	<b>FY12:</b> \$90,000.00
<b>FY13:</b> \$91,500.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$353,000.00

**Abstract:**

The objectives of this research are to build upon a physical oceanographic data base started during the SEA project and continued under a recent EVOS funded project: Physical Oceanographic Factors Affecting Productivity in Juvenile Pacific Herring Nursery Habitats. The rationale of this project is based upon past research of juvenile Pacific herring in PWS, which has shown that recruitment is highly influenced by conditions within nursery sites affecting survival within the first year. Important among these conditions is the pre-winter condition of juvenile (age-0) herring and the effects of water temperatures on metabolism and hence over-winter survival. Past studies of the physical oceanography of nursery fjords has indicated that each site has a unique set of hydrographic conditions that are influenced by both local processes and water exchange between the GOA and PWS. These factors vary significantly depending on geographic location, basin morphometry, watershed topography and proximity to tidewater glacial fjords. The proposed study will continue monitoring the physical properties within the four SEA nursery fjords and additional sites as determined by future herring surveys, and collect time-series data on temperature, salinity and fluorescence to determine the variation among nurseries in factors such as ocean climate, stratification, mixing, phytoplankton biomass, and energy constraints imposed on juvenile herring by seasonal changes in water temperatures. The data will also assist in evaluating potential sites for future supplementation efforts in restoring the herring population.

**Science Panel Comments:**

This project will continue to make key hydrographic and circulation measurements in PWS. Such measurements are critical to other studies, like that of Kline, and to constructing a synthetic population model for herring.

**Science Panel Recommendation:** Fund

**Science Coordinator Comments:**

I concur with the science panel recommendation.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Possible reduction as a function of the recommended overall 10% decrease of the 10100132 PWS Herring Survey -

see 10100132.

**Public Advisory Committee Recommendation:** Fund Reduced

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100132-D  
**Project Title:** PWS Herring Survey: Value of Growth and Energy Storage as Predictors of Winter Performance in YOY Herring from PWS  
**Principal Investigator:** Ronald Heintz  
**Affiliation:** NOAA/NMFS Auke Bay Laboratory  
**Co-PIs/Personnel:** JJ Vollenweider  
**Disbursing Agency:** NOAA  
**Project Location:** Eaglek, Simpson, Whale and Zaikof and other bays  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$99,000.00	<b>FY11:</b> \$99,000.00	<b>FY12:</b> \$99,000.00
<b>FY13:</b> \$9,600.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$306,600.00

**Abstract:**

This proposal examines the reliability of fall growth rates as an indicator of over-winter performance among YOY herring in Prince William Sound. The Trustee Integrated Herring Restoration Program cites the need for identifying parameters that reliably indicate condition. Parameters such as size or energy density can provide misleading results. While size is a good predictor of over-winter survival in a given year, there is no critical size that predicts survival across years. Similarly, changes in energy density may not reflect the severity of winter. We propose that fall growth rate predicts performance because herring acquire the bulk of their lipid in fall. Individuals experiencing high growth in fall are likely to obtain disproportionately large energy reserves. We propose using models relating RNA/DNA ratios to growth obtained under another Trustee study to estimate growth in field specimens collected during the survey period. In addition we will examine how energy is partitioned between structural and storage compartments. Combining these data with those of other projects being proposed under the PWS Herring Survey will allow us to test the hypothesis that growth in fall is the most consistent indicator of over winter survival because fall growth provides for the greatest provisions of stored energy.

**Science Panel Comments:**

The science panel noted concern that ongoing work by the PI should be brought to completion before starting a new project. Further there was concern that the proposed sample size was too small and not random enough to provide convincing results.

**Science Panel Recommendation:** Do Not Fund

**Science Coordinator Comments:**

This project will provide information that will be important in understanding over winter performance of young of the year herring in PWS.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Possible reduction as a function of the recommended overall 10% decrease of the 10100132 PWS Herring Survey - see 10100132.

**Public Advisory Committee Recommendation:** Fund Reduced

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Do Not Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100132-I  
**Project Title:** PWS Herring Survey: Herring Disease Program (HDP)  
**Principal Investigator:** Paul Hershberger  
**Affiliation:** US Geological Survey  
**Co-PIs/Personnel:** Maureen Purcell, Jim Winton  
**Disbursing Agency:** USGS  
**Project Location:** Prince William Sound, Sitka Sound, Puget Sound, USGS - Marrowstone Marine Field Station  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$81,800.00	<b>FY11:</b> \$284,100.00	<b>FY12:</b> \$295,800.00
<b>FY13:</b> \$313,500.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$975,200.00

**Abstract:**

The Herring Disease Program (HDP) is part of a larger integrated effort, the PWS herring survey: Community Involvement, Outreach, Logistics, and Synthesis submitted under the BAA (outlined in a separated proposal by Dr. Scott Pegau), that is intended to identify juvenile rearing bays, measure factors limiting the success of juvenile herring, and provide recommendations for spatial and temporal coverage of future monitoring efforts. Within this integrated effort, the HDP is intended to evaluate the impact of infectious and parasitic diseases on the failed recovery of the PWS herring population by placing special emphasis on disease processes affecting juvenile cohorts. The framework for the 2010 - 2013 HDP involves a combination of field surveillance efforts and laboratory-based empirical disease process studies. Field surveillance efforts will provide continued and expanded infection and disease prevalence data for herring populations in Prince William Sound (PWS), Sitka Sound, and Puget Sound. Additionally, samples from field surveillance efforts will be processed using newly-developed disease forecasting tools to provide annual risk assessments that quantify the potential for future disease epizootics. Empirical disease process studies will provide an understanding of cause and effect epidemiological relationships between the host, pathogen, and environment; understanding of these relationships represents a first step towards developing additional disease forecasting tools. Specific emphasis will be placed on refining our understanding disease processes specific to viral hemorrhagic septicemia (VHS) and ichthyophoniiasis, two primary diseases of herring in PWS.

**Science Panel Comments:**

This proposal describes continuation of herring disease monitoring and research into its role in combination with other interacting stressors in suppressing herring recovery in PWS. This is done in coordination with the broader Herring Survey program proposed by Scott Pegau. Although a continuation of an ongoing project, this proposal clearly identifies a set of new objectives that are appropriate and compelling. Specifically, the laboratory experiments evaluating the cause-effect epidemiology of how host, parasite, and environmental factors interact to dictate disease impacts is especially promising. The survey work also focuses on disease effects on YOY herring in ways that may lead to much improved understanding of disease impacts on herring because of the complex role of historical exposure and immunity in determining impacts later in the life history. Hershberger and colleagues have been exceptionally productive in their past EVOS work. Although this project is expensive over its 4 years, the costs are appropriate for the type of research required, involving sophisticated lab assessments of multiple diseases.

The Science Panel recommends FUND – even if the entire Herring Survey is not funded or slow to be funded because this project can stand on its own merits (although needs field ship platforms for collections of herring).

**Science Panel Recommendation:** Fund

**Science Coordinator Comments:**

I concur with the science panel recommendation.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Possible reduction as a function of the recommended overall 10% decrease of the 10100132 PWS Herring Survey - see 10100132.

**Public Advisory Committee Recommendation:** Fund Reduced

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Priority Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100839  
**Project Title:** Evaluating Injury to Harlequin Ducks - Amendment  
**Principal Investigator:** Tuula Hollmen  
**Affiliation:** Alaska SeaLife Center  
**Co-PIs/Personnel:** Kathrine Springman  
**Disbursing Agency:** ADFG  
**Project Location:** Prince William Sound  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$218,300.00	<b>FY11:</b> \$32,400.00	<b>FY12:</b> \$0.00
<b>FY13:</b> \$0.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$250,700.00

**Abstract:**

Evaluation of harlequin duck (*Histrionicus histrionicus*) population trends, survival measures, and biomarker indicators of exposure suggests that the species is recovering, but has not fully recovered from the effects of the 1989 Exxon Valdez oil spill (EVOS) in the Prince William Sound (PWS). In areas oiled by the EVOS, elevated cytochrome P4501A biomarker induction has been observed in harlequin ducks as recently as March 2007, providing evidence of continued exposure. The magnitude of injury and its implications for populations of harlequin ducks caused by chronic oil exposure and long-term induction of central enzymatic processes is unknown. This study applies a panel of in vitro harlequin duck and surrogate cell line bioassays for a species-specific toxicological assessment of site-specific hydrocarbons from PWS. A combination of bioassays that measure direct effects on cell viability and DNA damage provide a new method to assess and quantify injury. Also, a battery of laboratory bioassays provides a method to link P4501A biomarker induction with other measures of cellular injury, and a comprehensive assessment of potential short- and long-term toxicity.

**Science Panel Comments:**

Not Applicable

**Science Panel Recommendation:** Not Reviewed

**Science Coordinator Comments:**

Not Applicable

**Science Coordinator Recommendation:** Not Reviewed

**Public Advisory Committee Comments:**

Not Applicable

**Public Advisory Committee Recommendation:** Not Reviewed

**Executive Director Comments:**



Not Available

**Executive Director Recommendation:** Priority Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100751  
**Project Title:** Prince William Sound Marine Bird Surveys, Synthesis and Restoration  
**Principal Investigator:** David Irons  
**Affiliation:** U.S. Fish and Wildlife Service  
**Co-PIs/Personnel:** Kathy Kuletz  
**Disbursing Agency:** USFWS  
**Project Location:** Prince William Sound  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$254,499.70	<b>FY11:</b> \$39,240.00	<b>FY12:</b> \$0.00
<b>FY13:</b> \$0.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$293,739.70

**Abstract:**

We propose to conduct small boat surveys to monitor abundance of marine birds in Prince William Sound, Alaska, during March and July 2010. Ten previous surveys have monitored population trends for marine birds and mammals in Prince William Sound after the Exxon Valdez oil spill. We will use data collected in 2010 to examine trends from summer and from winter to determine whether populations in the oiled zone are increasing, decreasing, or stable. We will also examine overall population trends for the Sound. Continued monitoring of marine birds and synthesis of the data are needed to determine whether populations injured by the spill are recovering. Data collected from 1989 to 2007 in the oiled area indicated that common loons (*Gavia immer*), and cormorants (*Phalacrocorax* spp) are increasing. Numbers of all other injured species are either not changing or are declining in the oiled area. Populations of harlequin ducks (*Histrionicus histrionicus*), black oystercatchers (*Haematopus bachmani*), Kittlitz's Murrelets (*Brachyramphus brevirostris*), and common murrelets (*Uria aalga*) are showing no trend in the oiled area; pigeon guillemots (*Cephus columba*) and marbled murrelets (*Brachyramphus marmoratus*) are declining in the oiled areas of Prince William Sound. We have found high inter-annual variation in numbers of some bird species and therefore recommend continuing to conduct surveys every two years. These surveys are the only ongoing means to evaluate the recovery of most of these injured marine bird species. A survey in 2010 would also benefit the ongoing Pigeon Guillemot Restoration Research Project by providing a Sound-wide pigeon guillemot population trend estimate through 2010, facilitating a comparison to the population trend on Naked Island.

**Science Panel Comments:**

The proposal is to continue one of the most valuable studies on long-term trends of marine populations in Prince William Sound. It includes multiple populations of sea birds as well as sea otters. The proposed work is a straightforward continuation of a well-proven and valuable survey method. Previous surveys have recently been conducted at about 3 year intervals. The P.I.s have used sophisticated statistical approaches to analyzing the data in various parts of PWS and reported their work in the scientific literature periodically. The project is cost-effective for the spatial and species extent for which data will be obtained.

**Science Panel Recommendation:** Fund

**Science Coordinator Comments:**

I concur with the science panel recommendation.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Not Available

**Public Advisory Committee Recommendation:** Fund

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100132-C  
**Project Title:** PWS Herring Survey: Pacific Herring Energetic Recruitment Factors  
**Principal Investigator:** Thomas Kline  
**Affiliation:** Prince William Sound Science Center  
**Co-PIs/Personnel:** None  
**Disbursing Agency:** NOAA  
**Project Location:** Prince William Sound  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$258,700.00	<b>FY11:</b> \$256,600.00	<b>FY12:</b> \$265,000.00
<b>FY13:</b> \$218,300.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$998,600.00

**Abstract:**

This project is one component of the greater integrated study titled PWS herring survey: Community Involvement, Outreach, Logistics, and Synthesis (Pegau, P.I.). This proposed effort seeks to improve understanding of habitat utilization by juvenile herring, especially age 0, and to help identify candidate sites that could be potentially used for supplementation efforts. This particular proposal builds on 15 years of experience in assessment of juvenile herring in PWS using isotope and energetic techniques. We propose to measure energy levels of juvenile herring and other fishes in 8 juvenile herring nursery areas. Four of these areas, Simpson Bay, Eaglek Bay, Whale Bay and Zaikof Bay, were the focus of earlier investigation by the Sound Ecosystem Assessment (SEA) program in 1995-96 as well as a current Council-funded "PWS Herring Forage Contingency" project. Four additional sites will be selected based on historical data and community input and the 'blitz' sampling program. We propose to conduct surveys three times per year, pre- and post-winter and summer, for three years (including a planning year). The pre- and post-winter series will complement other studies that propose to examine overwinter change in energetics. The pre- and post-winter periods have been examined for the past three years. The summer period will provide a link between a more dispersed age 0 herring distribution following larvae drift and the subsequent overwintering locations. The fourth year of the project will focus on data analysis, synthesis and reporting.

**Science Panel Comments:**

The science panel recognized that although highly specialized, past work has made a substantial contribution to the scientific literature on herring in PWS and elsewhere. The reviews were positive and the only negative comment concerned the high costs of sample analysis. Now there is increasing recognition that herring research in PWS must be coordinated with other projects, both conceptually and operationally. The Science panel would have preferred to see how this proposal would be connected and integrated with other concurrent work.

**Science Panel Recommendation:** Fund

**Science Coordinator Comments:**

I concur with the science panel recommendation.

**Science Coordinator Recommendation:** Fund

**Public Advisory Committee Comments:**

Possible reduction as a function of the recommended overall 10% decrease of the 10100132 PWS Herring Survey - see 10100132.

**Public Advisory Committee Recommendation:** Fund Reduced

**Executive Director Comments:**

Not Available

**Executive Director Recommendation:** Fund

**Trustee Council Comments:**

Not Available

**Trustee Council Decision:** Fund

**Project Number:** 10100132-H  
**Project Title:** PWS Herring Survey: Seasonal & Interannual Trends in Seabird Predation on Juvenile Herring  
**Principal Investigator:** Katherine Kuletz  
**Affiliation:** US Fish & Wildlife Service  
**Co-PIs/Personnel:** Mary Anne Bishop  
**Disbursing Agency:** USFWS  
**Project Location:** Prince William Sound  
**Project Type:** Continuing

**Funding Approved by Fiscal Year:**

<b>FY10:</b> \$147,200.00	<b>FY11:</b> \$163,900.00	<b>FY12:</b> \$150,900.00
<b>FY13:</b> \$102,900.00	<b>FY14:</b> \$0.00	<b>FY15:</b> \$0.00

**Total Funding Approved:** \$564,900.00

**Abstract:**

Predation pressure on juvenile Pacific herring has been identified by the 2008 Integrated Herring Restoration Plan as one of five potential factors limiting recovery of Prince William Sound herring. Juvenile herring are heavily preyed upon by multiple species of seabirds, including six species initially injured by the Exxon Valdez oil spill and three species that have not yet recovered (Marbled Murrelet, Kittlitz's Murrelet and Pigeon Guillemot). This study will investigate the spatial and temporal abundance of seabird predators in and around juvenile herring schools during three time periods: August, November and March. We will also examine the physical and biological characteristics of the fish schools seabirds feed on. Our project is a component of the integrated, multi-project PWS Herring Survey program and relies on seabird surveys being performed on vessels associated with hydroacoustic juvenile herring surveys. Our bioenergetic models will provide estimates of juvenile herring consumption by the most important seabird predators, including inter- and intra-annual variability in consumption rates. This study will improve understanding of the role of seabird predation on herring recruitment and will help to identify candidate sites for herring supplementation efforts.

**Science Panel Comments:**

This study will investigate the spatial and temporal abundance of seabirds around juvenile herring schools during three time periods: August, November and March. It will also examine the physical and biological characteristics of the herring schools on which seabirds feed. This is a fairly well conceived and systematic approach to evaluating one source of predation pressure on Pacific herring. However, the project is strongly oriented towards herring as a source of nutrition for seabirds rather than as predators of herring. The most important objective of this study should be to quantify the amount of juvenile herring consumed by sea birds rather than the importance of herring to the diet of sea birds. Sea birds are likely important predators on juvenile herring, but it should not take 3 or 4 years to make a rough estimate of how important seabirds are as juvenile herring predators relative to other predators, i.e. marine mammals. A first order estimate might even be reasonably done with the data at hand.

**Science Panel Recommendation:** Do Not Fund

**Science Coordinator Comments:**

While I agree with some of the science panel's concerns, only five surveys have been completed to date and more data will be needed to make an educated estimate of the effect of seabird predation on herring. The addition of night surveys will allow the team to relate seabird densities concurrent with Dr. Richard Thorne's nighttime herring hydroacoustic surveys.























































