FY15 PROJECT PROPOSAL SUMMARY PAGE

Continuing, Multi-Year Projects

Proposals are due to the EVOSTC office by September 2, 2014. 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 Title: *Genetic stock structure - Herring*

Project Period: February 1, 2015 – January 31, 2016

Primary Investigator(s): Dr. Jeffrey Guyon and Sharon Wildes (NOAA)

Study Location: Prince William Sound, Gulf of Alaska

Project Website (if applicable): http://pwssc.org/research/fish/pacific-herring/

Abstract*:
Understanding if there is one PWS herring stock or multiple stocks is important for proper management of fisheries. We propose to study the genetic uniqueness of herring from PWS to determine if it may be a complicating factor in the recovery process. A previous genetic study of herring in the region indicated that the PWS herring population was genetically distinct from other stocks spawning outside the Sound (O'Connell et al. 1998), providing an impetus for additional work. Several recent studies have made advancements in herring research using microsatellite loci, and have detected fine-scale genetic differentiation among local regions of herring (Beacham et al. 2008; Andre et al. 2011; Wildes et al. 2011). Each microsatellite locus contains multiple alleles making microsatellites ideal genetic markers for analyzing migratory fish with limited stock structure like herring. Based on our experience studying Pacific herring in Southeast Alaska using microsatellite markers (Wildes et al. in 2011), successful completion of this proposal will require (1) increasing the number of genetic samples per collection from the 50 used in the previous analysis (O'Connell et al. 1998) to 150 fish, (2) using an increased number of informative markers (from 5 to 15), (3) analyzing at least two years of collections to examine temporal stability, **and if sampling allows** (4) spatial stability from collections from two different historical locations (east, west). Evaluation of temporal and spatial variation of herring population(s) in and around PWS using updated genetic protocols will provide important information about herring life history that will contribute to improving the application of the ASA model.

Estimated Budget:

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

FY12	FY13	FY14	FY15	FY16	TOTAL
		50,467	**53,083**		**103,550**

Non-EVOSTC Funds to be used:

FY12	FY13	FY14	FY15	FY16	TOTAL

**If the amount requested here does not match the amount on the budget form, the request on the budget form will considered to be correct.*

Date: 8/15/2014

I. EXECUTIVE SUMMARY

Pacific herring, once an important fishery, form a critical part of the Prince William Sound (PWS) ecosystem. Stocks remain depressed over the majority of the last 20 years and reasons for lack of recovery remain complex and unknown. Information about herring stock structure is critical to determining the best management objectives for recovery of Pacific herring (Clupea pallasi) population(s), particularly if a fishery were re-established. It would be important to understand the uniqueness of spawning areas. Results from the genetic analysis outlined in this proposal will help managers understand if multiple sub-stocks are involved in issues such as spawning sites and fidelity, which may contribute to the complexities in understanding their lack of recovery.

While we have obtained a large number of samples from the Eastern Sound, the number of fish from the Montague area was limited in 2014 and no fish were observed to spawn there. Another attempt to sample spawning herring on Montague is planned for 2015.

II. COORDINATION AND COLLABORATION

A. Within a EVOTC-Funded Program

This project is part of the Overall Project Objective 1: Provide information to improve input to the age-structure-analysis (ASA) model, or test assumptions within the ASA model. Evaluation of temporal and spatial variation of herring population(s) in PWS using updated genetic protocols will provide important information about herring life history that will contribute to improving the application of the ASA model. We have been provided samples by the Logistics and Coordination, and Validation of Acoustic Surveys projects in the HRM program.

B. With Other EVOSTC-funded Projects

n/a

C. With Trustee or Management Agencies

This project is being done in partnership with many researchers including the Alaska Department of Fish and Game and others who are providing samples for the analysis. There are no known conflicts.

III. PROJECT DESIGN – PLAN FOR FY15

A. Objectives for FY15

The primary objective of this proposal is to identify genetic uniqueness of herring in Prince William Sound using a group of 15 informative microsatellite markers to:

a. Determine if unique populations exist by sampling within and around PWS;
b. Determine temporal stability by sampling for two consecutive years at each location;
c. Determine if fine-scale structure exists across two age classes at each site -if ample sample size allows (Same, or different? Answer will aid in evaluation of the adopted-migrant hypothesis);
d. Determine spawning site fidelity of herring in PWS by comparing PWS spawners and nearby spawners outside of the Sound.

B. Changes to Project Design

No changes to the design are planned.

IV. SCHEDULE

A. Project Milestones for FY 15

The primary objective of this proposal is to identify genetic uniqueness of herring in Prince William Sound using a group of 15 informative microsatellite markers to:

a. Determine if unique populations exist by sampling within and around PWS;
Sampling complete, Analyses to be met by Jan. 2016.

b. Determine temporal stability by sampling for two consecutive years at each location;
Sampling complete (except collection of Montague samples in spring 2015). Analyses to be met by Jan. 2016.

c. Determine if fine-scale structure exists across two age classes at each site -if ample sample size allows (Same, or different? Answer will aid in evaluation of the adopted-migrant hypothesis);
Adequate samples have been obtained to look at this question. Analyses to be met by Jan. 2016.

d. Determine spawning site fidelity of herring in PWS by comparing PWS spawners and nearby spawners outside of the Sound.
To be met by Jan. 2016.

B. Measurable Project Tasks for FY 15

FY 15, 1st quarter (February 1, 2015 - April 31, 2015)
PCR fragments from each sample of DNA and genotype.

FY 15, 2nd quarter (May 1, 2015-July 30, 2015)
Carry out preliminary analyses and data quality control.

FY 15, 3rd quarter (August 1, 2015 – October 31, 2015)
Complete analyses.

FY 15, 4th quarter (November 1, 2015- January 31, 2016)
Write report.

V. PROJECT PERSONNEL – CHANGES AND UPDATES

No changes.

VI. BUDGET

A. Budget Forms (Attached)

Provide completed budget forms.

B. Changes from Original Proposal

Because of issues hiring new personnel we are requesting that the funding for personnel be moved to the contractual line so that we can contract personnel for sample processing. We also are requesting to reduce the travel by eliminating the trip to Yakutat. That funding has been moved to the commodities line for laboratory expendables associated with sample processing.

C. Sources of Additional Funding

n/a