ATTACHMENT C ***EVOSTC Annual Project Report Form***

Form Rev. 10.3.14

*Please refer to the Reporting Policy for all reporting due dates and requirements.

1. Program Number: *See*, Reporting Policy at III (C) (1).

14120111-R

2. Project Title: *See*, Reporting Policy at III (C) (2).

PWS Herring Program – Aerial Survey Support

3. Principal Investigator(s) Names: *See*, Reporting Policy at III (C) (3).

W. Scott Pegau

4. Time Period Covered by the Report: *See*, Reporting Policy at III (C) (4).

February 2014 through January 2015

5. Date of Report: *See*, Reporting Policy at III (C) (5).

February 2015

6. Project Website (if applicable): *See*, Reporting Policy at III (C) (6).

http://pwssc.org/research/fish/pacific-herring/

7. Summary of Work Performed: *See*, Reporting Policy at III (C) (7).

Flights were conducted in late March through mid-April to observe herring spawn, install remote cameras to detect spawn, and to support the collection of fish for the genetics project.

In June there were 11 flights designed to follow the coastline in Prince William Sound (PWS) and enumerate the number of schools of age-1 herring and other forage fish. We also worked with the forage fish group in the design of a stratified-random sampling design to be used in July. The protocols to be used in July were tested during June. The estimated number of schools observed during recent surveys are provided in table 1.

Table 1. The number of schools of age-1 herring observed during aerial surveys conducted in June.

	Number of schools				
Year	Small	Medium	Large	Xlarge	Total
2010	291	181	95	12	579
2011					75*
2012	143	104	28	4	279
2013	1904	187	27	0	2118
2014	151	19	0	0	170

* A significant portion of Eastern Prince William Sound was not flown. About 50 schools are normally observed in that area.

The proportion of small schools observed increased starting in 2013 when there was a change in one of the two observers. We are using a sighting tube to ensure this reflects a change in the school structure and not an observation error. Since we use the number of schools as the index instead of area or volume estimates a misclassification in size will not impact the results.

We flew 14 days in July to support the forage fish project and to work with them on validation. The sampling design was based on a stratified-random selection of survey sites (Figure 1) instead of the systematic sampling designed used to provide an index of age-1 herring. A 5' by 5'grid was placed over PWS and the aerial observations from 2010-2012 used to establish areas with high, medium, and low numbers of fish observations. Blocks were then selected to minimize the variance of the population mean.

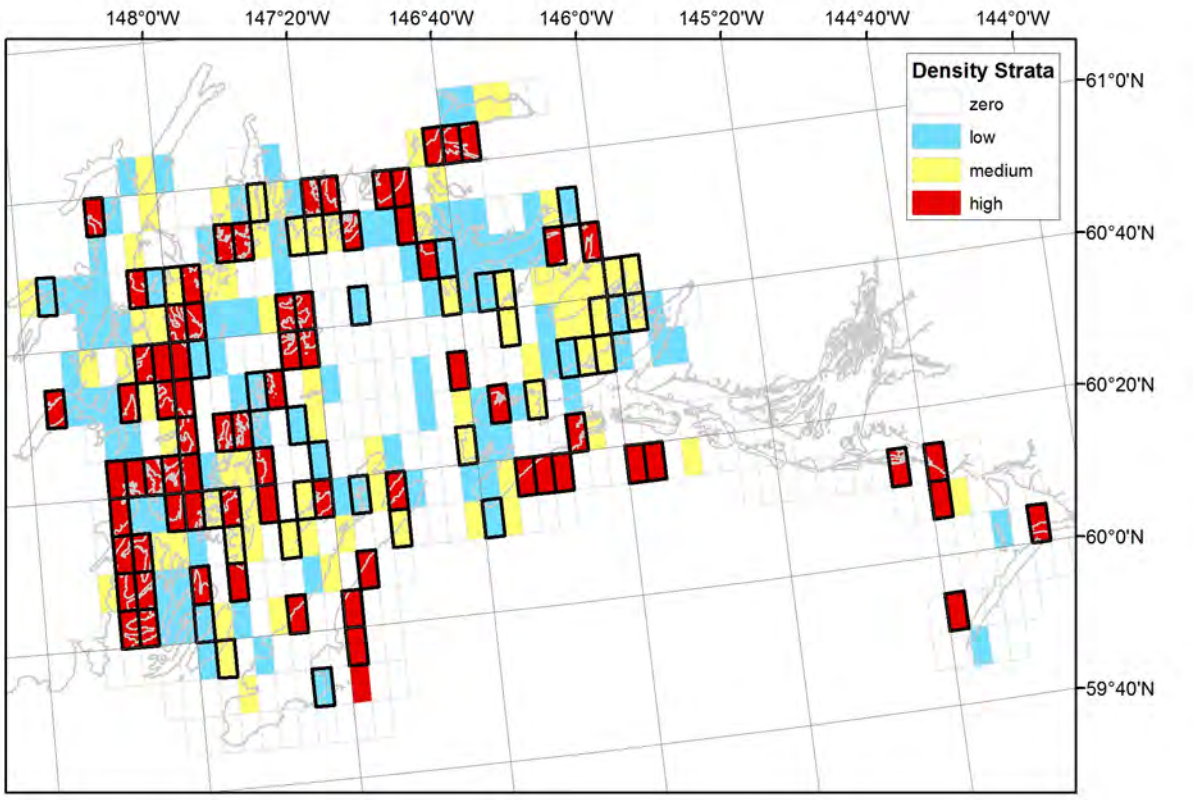

Figure 1. Blocks selected for surveying are marked with bold outlines. The school density as calculated using number of schools per kilometer of flight multiplied by a persistence factor is shown in the colors.

During each survey day one block was selected for a repeated survey. When the forage fish vessel was at sea the aerial project would identify schools near the vessel for validation of the identification and to establish acoustic biomass estimates associated with the school size categories. Preliminary analysis of the identification indicates very good classification of age-2+ herring (5 correct in 5 observations). Validation of age-1 herring classification only occurred twice. Once was age-0 herring that started to become visible midway through July. The other time it was sandlance. More effort will need to be placed on validation to get a large enough sample to determine observer identification accuracy. A difficulty is that typically only one or two schools can be validated during a day because of the distance between schools the boat must travel.

8. Coordination/Collaboration: *See*, Reporting Policy at III (C) (8).

a) This project is a close collaboration between the Herring Research and Monitoring coordination project and the forage fish project in the Gulf Watch Alaska program. Logistics and surveys are conducted by the HRM coordination project. The forage fish project provides field computers and other recording devices. They also provide ground truth of the aerial identifications. The projects work together to determine sampling priorities and protocols. Both projects also share data analysis.

Flights were also used to guide sample collection of fish used in the genetics project and deployment of remote cameras to watch for spawn on Montague Island.

b) No collaboration with other Trustee Council funded projects

c) All herring spawn information was shared with Steve Moffitt at the Alaska Department of Fish and Game (ADF&G) office in Cordova. We have been working with Steve to identify what information is needed for non-ADF&G observations to be of value to ADF&G. The fish collected at Kayak Island were provided to ADF&G for age-sex-length analysis. We also share information about potential approaches to guide the use of aerial surveys, such as the remote cameras.

9. Information and Data Transfer: *See*, Reporting Policy at III (C) (9).

a) Publications – none

b) Presentations - A poster on the aerial survey effort was presented at the January 2015 Alaska Marine Science Symposium. Two videos were produced that describe the aerial survey effort. They can be seen at https://vimeo.com/108856208 and https://www.youtube.com/watch?v=OU6PVlk0Pjc&noredirect=1#t=174. The first was part of a project by a journalism class from the University of Oregon. The second was produced by the pilot that has been working on the project the last five years.

c) Data products – The number of age-1 herring schools observed in June was determined. This number is the index that we are testing as a predictor of age-3 recruitment to the spawning population.

d) The raw data collected during the flights as recorded on the Recon hand-held computer and the paper logs of observations have been loaded on the Ocean Workspace. The index of age-1 herring schools was updated to include the 2014 observations. A file with that data and metadata have been uploaded to the workspace. The sampling protocols and initial analysis of survey effort for the July work with the forage fish project have been uploaded.

10. Response to EVOSTC Review, Recommendations and Comments: *See*, Reporting Policy at III (C) (10).

No comments require a response.

11. Budget: *See*, Reporting Policy at III (C) (11).

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
PROJECT BUDGET PROPOSAL AND REPORTING FORM FY 12-FY16

Budget Category:	Proposed FY 12	Proposed FY 13	Proposed FY 14	Proposed FY 15	Proposed FY 16	TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	
Travel	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	
Contractual	$0.0	$0.0	$50,000.0	$50,000.0	$0.0	$100,000.0	$ 50,000
Commodities	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	
Equipment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	
Indirect Costs (*will vary by proposer*)	$0.0	$0.0	$15,000	$15,000	$0	$30,000.0	$ 15,000
SUBTOTAL	$0.0	$0.0	$65,000.0	$65,000.0	$0.0	$130,000.0	$65,000.0
General Administration (9% of subtotal)	$0.0	$0.0	$5,850.0	$5,850.0	$0.0	$11,700.0	
PROJECT TOTAL	$0.0	$0.0	$70,850.0	$70,850.0	$0.0	$141,700.0	
Other Resources (Cost Share Funds)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	

Spending is consistent with the budget.

We appreciate your prompt submission and thank you for your participation.