

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

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

14120111-G

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

PWS Herring Program – Intensive Surveys of Juvenile Herring

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

Michele Buckhorn and Dick Thorne

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

1 February 2014 to 31 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/](http://pwssc.org/research/fish/pacific-herring/)

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

The fall series was conducted October 1-4, 16-19, 28-31, and December 3-6, 2013. The spring series was conducted February 21-24, March 5-8, 16-18, and April 2-6, 2014. Each of the two bays (Simpson and Windy) were surveyed in three consecutive nights per survey. A sweeper mid-water trawl (14 X 11 X 22 m with a mesh size of 38 mm dropping down to a 12 mm mesh liner at the codend) was deployed to ascertain size and species composition of selected areas of acoustic transects. Trawls were performed after the completion of acoustic transects and locations chosen to target biomass observed during the transects.

Acoustic data was collected using a Biosonics DTX 120 kHz split-beam echosounder mounted on a towfin that was lowered 2-3 meters in the water alongside the survey vessel. Data was collected using Biosonics Acquisition program and Myriax ECHOVIEW was used for post processing for echo integration and analysis. Survey tracks were both binned into 20m horizontal x 10 m vertical cells as well as running the School Detection algorithm. Target strength characteristics of herring and other common fishes captured in the trawl (when available) used for the analysis are from Parker-Stetter et al (2013). The acoustic analysis determines the biomass density of the fish. These densities are extrapolated to the appropriate area based on the GPS information that is automatically written to the acoustic data files.

Preliminary Results

The analysis of the acoustic data is currently underway, but the general observations were the acoustic surveys were highly variable between each survey for each bay. There were differences in the acoustics and fish catches between Simpson and Windy. In Simpson there was typically more biomass on the echograms and we caught more herring. When we caught herring, we rarely caught just herring, they were often mixed with walleye pollock, capelin, and sandlance. In Windy there was typically less biomass on the echograms and the majority of the fish catches consisted of walleye pollock. In the fall series, scyphozoans comprised the

majority of the catch by weight in both Simpson (91-99%) and Windy (85-95%). In the spring series, the percentage dropped to 7-39% in Simpson and 0-15% in Windy.

During the spring series, ice covered the entire inner third of Simpson Bay, which prevented us from accessing that portion of the bay. Acoustic tracks were run along the ice edge and indicated potential sign of age-0 herring (Figure 1). On the last night of the last spring survey (April 4, 2014) the ice had broken up and we deployed the midwater trawl where the ice edge had previously been and caught over 3000 age-0 herring. This indicates that age-0 herring may be using the ice edge as a refuge from predators.

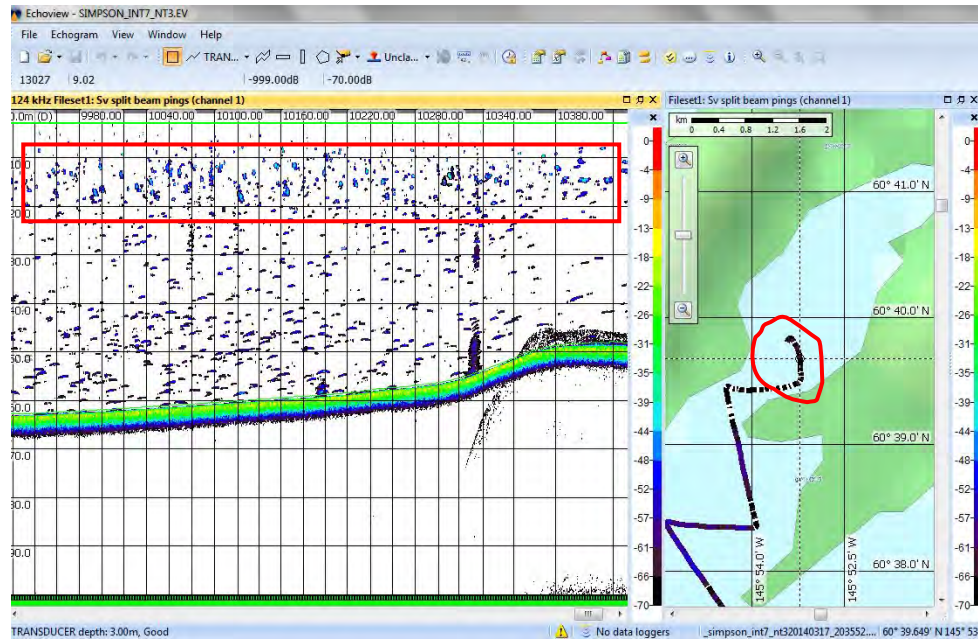


Figure 1. Echogram (left) next to survey track (right) in Simpson Bay. The red circle on the survey track indicates the portion of the survey conducted along the ice edge. The red box in the echogram indicates potential sign of age-0 herring along ice edge.

Table 1. Status of project deliverables for this reporting period

Deliverable/Milestone	Status
Post-process acoustic data from 2013-2014	Completed August 2014
Collate trawl data with acoustic data from 2013	Completed November 2014
Analysis and biomass estimates	Ongoing
Submit FY 15 Work Plan for review	Work Plan submitted in August 2014
Alaska Marine Science Symposium	Attended January 2015
Submit annual report	February 2015

8. Coordination/ Collaboration: See, Reporting Policy at III

C

(C) (8).

- a) This project works closely with the validation project that collects samples for acoustic validation. Coordination occurred with the non-lethal sampling project to test for juvenile herring under the ice.
- b) No collaboration with other Trustee Council funded projects
- c) No collaboration occurred with Trustee agencies.

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

Presentations on the HRM research program were given at the EVOSTC fall meeting. A poster titled “**Intensive concurrent acoustic and trawl surveys of overwintering juvenile herring (*Clupea pallassii*) in two potential nursery bays in Prince William Sound**” was presented at the 2015 Alaska Marine Science Symposium. Raw hydroacoustic data prior to November 2014 has been uploaded to the AOOS workspace. Data upload is ongoing as processing and analysis continues.

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

The comments provided appear to be more related to project 14120111-F, the juvenile index project. This project is examining the assumption that the acoustic surveys provide an index that is constant over short time periods. The ability to provide a measure of survival is dependent on the accuracy and precision of the acoustic surveys. The preliminary results indicate that it may be difficult to use the existing acoustic information to determine survival.

With Dr. Buckhorn’s departure we are examining the status of data and working with Dr. Boswell to provide technical support in catching up on processing. We will work with Drs. Thorne and Boswell to ensure Michele’s replacement has a senior collaborator to work with.

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

Budget Category:	Proposed FY 12	Proposed FY 13	Proposed FY 14	Proposed FY 15	Proposed FY 16	TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel	\$0.0	\$21,000.0	\$30,100.0	\$4,700.0	\$0.0	\$55,800.0	\$ 24,570
Travel	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$ 9
Contractual	\$0.0	\$0.0	\$1,000.0	\$100.0	\$0.0	\$1,100.0	\$ 485
Commodities	\$0.0	\$0.0	\$2,000.0	\$0.0	\$0.0	\$2,000.0	\$ 1,376
Equipment	\$46,000.0	\$0.0	\$0.0	\$0.0	\$0.0	\$46,000.0	\$ 45,886
Indirect Costs (will vary by proposer)	\$0	\$6,300	\$9,600	\$1,400		\$17,300.0	\$ 7,634
SUBTOTAL	\$46,000.0	\$27,300.0	\$42,700.0	\$6,200.0	\$0.0	\$122,200.0	\$79,960.0
General Administration (9% of	\$4,140.0	\$2,457.0	\$3,843.0	\$558.0	\$0.0	\$10,998.0	
PROJECT TOTAL	\$50,140.0	\$29,757.0	\$46,543.0	\$6,758.0	\$0.0	\$133,198.0	
Other Resources (Cost Share Funds)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	

COMMENTS:
 This summary page provides an five-year overview of proposed funding and actual cumulative spending. The column titled 'Actual Cumulative' should be updated each fiscal year to provide information on the total amount actually spent for all completed years of the project. On the Project Annual Report Form, if any line item exceeds a 10% deviation from the originally-proposed amount; provide detail regarding the reason for the deviation.