



**Exxon Valdez Oil Spill Trustee Council**

**Long-Term Research and Monitoring, Mariculture, Education and Outreach**

**Annual Project Reporting Form**

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**Project Number:** 23160111-F

**Project Title:** Herring surveys and age, sex, and size collection and processing

**Principal Investigator(s):** Jennifer Morella, Alaska Department of Fish and Game

**Reporting Period:** February 1, 2022 – January 31, 2023

**Submission Date:** March 1, 2023

**Project Website:** <https://gulfwatchalaska.org/>

<https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareapws.herring>

Please check all the boxes that apply to the current reporting period.

**Project progress is on schedule.**

**Project progress is delayed.**

**Budget reallocation request.**

**Personnel changes.**

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**1. Summary of Work Performed:**

The Alaska Department of Fish and Game (ADF&G) was funded for this project to conduct herring aerial surveys and to sample herring for age, sex, size, and sexual maturity (ASL). In addition to these two over-arching objectives, this project plays a central role in coordinating and collaborating survey and sampling efforts with all Herring Research and Monitoring (HRM) component projects within the Gulf Watch Alaska Long-term Monitoring Program (GWA-LTRM). We provide the *R/V Solstice* as a research platform, collect herring samples for multiple projects, provide logistical support for field work, travel, and sample shipment, and disseminate aerial and vessel survey observations in a timely manner. Spring aerial herring surveys and ASL sampling have been conducted by ADF&G in Prince William Sound (PWS) since the early 1970s. These two datasets are the longest continuous time-series records of herring in PWS and as such are critical inputs to age structured modeling and stock assessment efforts, and provide a basis for understanding the population dynamics, changing biomass, and biological processes



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that are happening in the population. Funding provided by the *Exxon Valdez* Oil Spill Trustee Council (EVOSTC) allows ADF&G to continue to conduct these surveys and collections and provides continuity for these two long-term datasets. Overall, this critical project serves as a foundation to the HRM component and directly assists, coordinates, or provides data and/or samples to every project within the HRM component.

We conducted 50 hours of spring aerial surveys of PWS during 21 flights from March 20 to May 2, 2023 (Fig 1). The number of survey flights and total flight hours in 2023 were above 2003-2022 averages. Herring data collected included location and linear extent of herring milt by flight, classification of herring milt (intensity), and herring school biomass. Data collected on other species included observations on the distribution and abundance of birds, sealions, and other marine mammals. The 2023 PWS aerial spawn estimate of 26.1 statute mile-days-of-milt is less than the 2022 estimate but 29.2% above the 10-year average (2013–2022) of 20.2 mile-days-of-milt. Mile-days-of-milt in 2023 were well below levels observed in the 1980s and early 1990s (Fig. 1). Spawn distribution and timing are displayed on the map below for reference (Fig. 2).

We conducted *R/V Solstice*-based herring sampling surveys in 2023 and collected ASL samples from Red Head, Cedar Bay, Rocky Bay, Canoe Pass, and Port Etches. The weighted age composition from 1,545 ages for the 2023 PWS spawning biomass was 38% age-3, 33% age-4, 6% age-5, 7% age-6, 14% age-7, <1% age-8, and <1% age-9+ (Fig. 3).

This work is performed by ADF&G commercial fisheries research and management personnel. The results of both the aerial surveys and age/size structure are critical to the management of herring commercial fisheries in PWS. The estimates of aerial biomass and age structured assessment model outputs are central in evaluating the population in relation to regulatory thresholds set in the PWS Herring Management Plan (5 AAC 27.365). Results of these surveys are disseminated to all relevant ADF&G commercial fisheries management and research staff.



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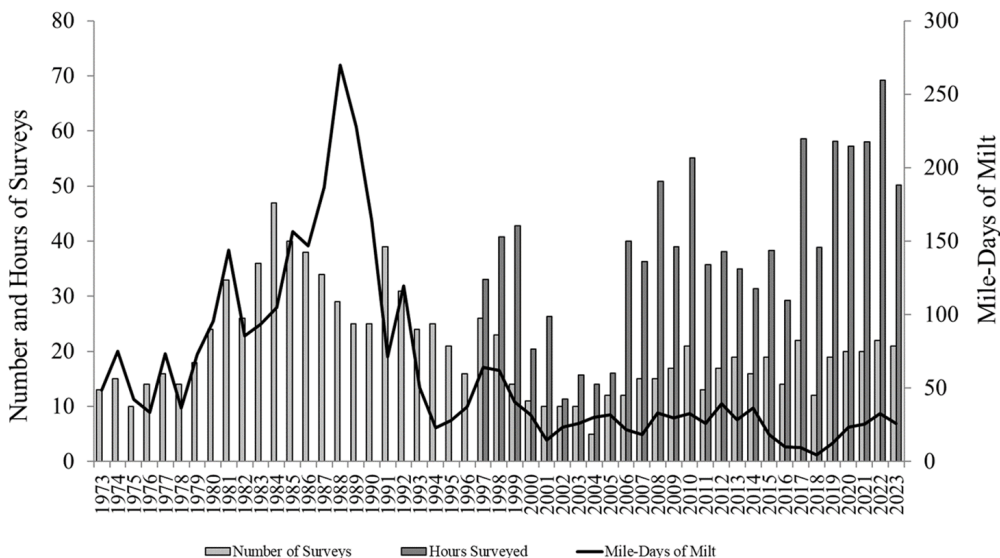


Figure 1. Prince William Sound herring aerial surveys, 1973-2023. Bars indicate the number and hours of surveys (left axis) and the line indicates mile-days of milt (right axis).

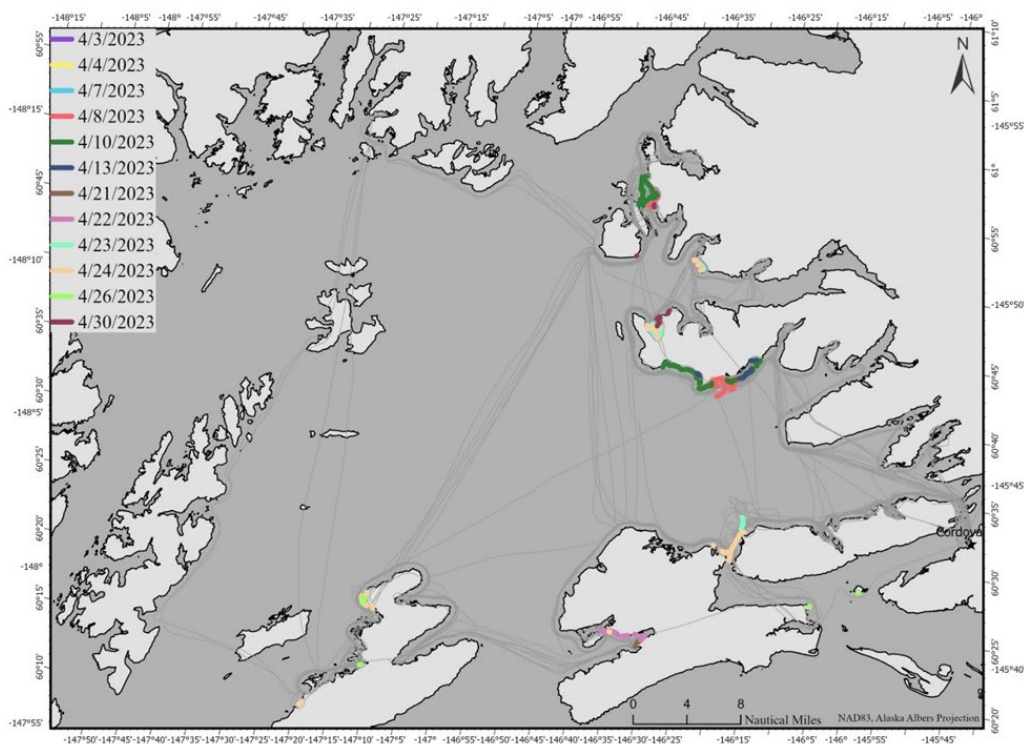


Figure 2. Prince William Sound herring spawn distribution by aerial survey date for 2023. Gray lines represent aerial track lines.



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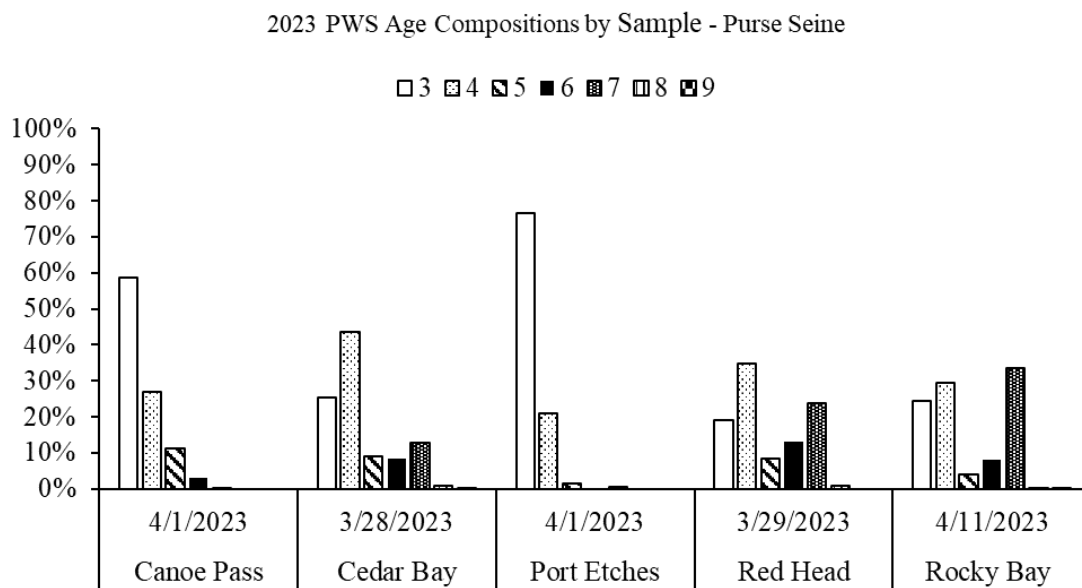


Figure 1. Prince William Sound (PWS) herring spawn age (year-3 through year-9) distribution by purse seine sample date in 2023.

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## 2. Products:

### Peer-reviewed publications:

No new contributions for this reporting period.

### Reports:

Morella, J., W. S. Pegau, and J. Zhaner. 2023. Prince William Sound herring. Pages 202-204 in B. E. Ferriss, editor. Ecosystem Status Report 2023: Gulf of Alaska, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, Anchorage, Alaska.

Olson, M., H. Scannell, J. Botz, J. Morella, S. Haught, and R. Ertz. 2023. 2022 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 23-13, Anchorage, Alaska.



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Popular articles:

Morella, J. 2023. ADF&G Launches PWS herring portal. Delta Sound Connections, 2023-2024.  
<https://pwssc.org/wp-content/uploads/2023/05/DSC-2023-FINAL-LR.pdf>.

Conferences and workshops:

No new contributions for this reporting period.

Public presentations:

Morella, J. 2023. Prince William Sound herring spawn and ASL, 2023. Oral presentation, Salmon Harvest Task Force 2023 meeting, October, Anchorage, Alaska.

Data and/or information products developed during the reporting period:

ADF&G Prince William Sound Aerial Surveys Interactive Web Map.  
<https://experience.arcgis.com/experience/53d54699cbf54e72aa1a4daf405076b7>.

2023 individual aerial survey maps (distributed to herring list serve within 24hrs of survey)

Data sets and associated metadata:

Morella, J. 2023. Aerial survey observations of Pacific herring biomass, marine birds, and marine mammals in Prince William Sound, Alaska, 2008-2023. Gulf of Alaska Data Portal: [https://gulf-of-alaska.portal.aos.org/#metadata/35fd35d8-f6f1-4762-9cf0-8e2e970755c4/project/folder\\_metadata/41851163](https://gulf-of-alaska.portal.aos.org/#metadata/35fd35d8-f6f1-4762-9cf0-8e2e970755c4/project/folder_metadata/41851163).

Morella, J. 2023. Aerial survey observations of Pacific herring spawn in Prince William Sound, Alaska, 1973-2023. Gulf of Alaska Data Portal: [https://gulf-of-alaska.portal.aos.org/#metadata/35fd35d8-f6f1-4762-9cf0-8e2e970755c4/project/folder\\_metadata/41851171](https://gulf-of-alaska.portal.aos.org/#metadata/35fd35d8-f6f1-4762-9cf0-8e2e970755c4/project/folder_metadata/41851171).

Morella, J. 2023. Age-sex-length-weight data for Pacific herring in Prince William Sound, Alaska, 2014-2023. Gulf of Alaska Data Portal: [https://gulf-of-alaska.portal.aos.org/#metadata/35fd35d8-f6f1-4762-9cf0-8e2e970755c4/project/folder\\_metadata/41851174](https://gulf-of-alaska.portal.aos.org/#metadata/35fd35d8-f6f1-4762-9cf0-8e2e970755c4/project/folder_metadata/41851174).



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Morella, J. 2023. Scales as growth history records for Pacific herring in Prince William Sound. Gulf of Alaska Data Portal: [https://gulf-of-alaska.portal.aos.org/#metadata/35fd35d8-f6f1-4762-9cf0-8e2e970755c4/project/folder\\_metadata/3115471](https://gulf-of-alaska.portal.aos.org/#metadata/35fd35d8-f6f1-4762-9cf0-8e2e970755c4/project/folder_metadata/3115471).

*Additional Products not listed above:*

Morella, J., and M. Olson. 2024. Prince William Sound Herring Announcement #1, January 17, 2024. Alaska Department of Fish and Game, Division of Commercial Fisheries. <https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1555372420.pdf>.

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**3. Coordination and Collaboration:**

*The Alaska SeaLife Center or Prince William Sound Science Center*

This project coordinates with Prince William Sound Science Center on a regular basis to attend meetings and hear updates from other projects and to coordinate with other HRM projects through the HRM component lead.

*EVOSTC Long-Term Research and Monitoring Projects*

This project coordinates and collaborates with all HRM component projects within the GWA-LTRM program. We provide daily aerial survey results and boat-based observations to all herring field programs. We provide the *R/V Solstice* (as well as ADF&G personnel) as a research platform for disease sampling (project 23120111-E). We age ~400 herring, collect organ samples, and provide transport logistics for the disease project (23120111-E). Additionally, we collect Kayak Island herring samples for disease analysis. Finally, we provided 2023 herring ASL results and aerial survey and ASL results to the modeling and stock assessment project (project 23120111-C).

*EVOSTC Mariculture Projects*

N/A

*EVOSTC Education and Outreach Projects*

This project contributes content to the Herring Watch Facebook page. Contributions include maps from each survey, photos and descriptions of ASL sampling efforts, and updates such as



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mile-days of milt season totals, etc. Additionally, this project provided an article for 2023-2024 edition of Delta Sound Connections.

*Individual EVOSTC Projects*

This project coordinates with the Data Management program to post data to the Gulf of Alaska data portal annually within required timeframes.

*Trustee or Management Agencies*

This work is performed by ADF&G commercial fisheries research and management personnel. The results of both the aerial surveys and age/size structure are critical to the management of herring commercial fisheries in PWS. The estimates of aerial biomass as well as age structured assessment model outputs are central in evaluating the population in relation to regulatory thresholds set in the PWS Herring Management Plan (5 AAC 27.365). Results of these surveys are disseminated to all relevant ADF&G commercial fisheries management and research staff.

*Native and Local Communities*

This project regularly engages with native and local communities. The Native Village of Tatitlek receives herring survey maps after each survey and much of the community accesses survey maps through the ADF&G interactive map or the herring watch Facebook page. Herring are an important subsistence resource, and ADF&G's aerial observations are utilized by native and local communities to guide timing and location of subsistence harvest efforts. The Native Village of Tatitlek regularly shares their herring observations with us. Additionally, many PWS commercial herring permit holders live in Cordova and have interest in PWS herring. PI Morella regularly meets with the local fisherman's organization to discuss herring; provide informational presentations at fishermen's meetings. In 2023, several community members aided in sample collection in collaboration with ADF&G staff.

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**4. Response to EVOSTC Review, Recommendations and Comments:**

No comments for FY23.

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**5. Budget:**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL  
PROJECT BUDGET PROPOSAL AND REPORTING FORM**

Budget Category:		Proposed FY 22	Proposed FY 23	Proposed FY 24	Proposed FY 25	Proposed FY 26	5- YR TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel		\$72,526	\$80,489	\$82,397	\$84,302	\$80,055	\$399,768	\$149,557
Travel		\$1,560	\$1,599	\$2,139	\$2,180	\$1,722	\$9,200	\$367
Contractual		\$67,000	\$85,063	\$91,165	\$94,093	\$78,479	\$415,800	\$80,787
Commodities		\$2,600	\$2,665	\$6,732	\$2,800	\$2,870	\$17,666	\$22,088
Equipment		\$0	\$38,775	\$25,000	\$0	\$0	\$63,775	\$2,209
Indirect Costs	Rate = 0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>SUBTOTAL</b>		<b>\$143,686</b>	<b>\$208,590</b>	<b>\$207,432</b>	<b>\$183,375</b>	<b>\$163,125</b>	<b>\$906,209</b>	<b>\$255,007</b>
General Administration (9% of subtotal)		\$12,932	\$18,773	\$18,669	\$16,504	\$14,681	\$81,559	N/A
<b>PROJECT TOTAL</b>		<b>\$156,617</b>	<b>\$227,363</b>	<b>\$226,101</b>	<b>\$199,879</b>	<b>\$177,807</b>	<b>\$987,768</b>	
Other Resources (In-Kind Funds)		\$55,030	\$56,405	\$57,815	\$59,261	\$60,742	\$289,253	

EVOSTC approved a request to reallocate \$54,744 from the pollock-herring interactions project (22220203) that was cancelled by ADF&G to this project to collect pollock eggs for the herring disease program project (23120111-E). See highlighted cells.

This project is behind on spending, in part because the research vessel required maintenance in mid-April 2023, limiting vessel trips, and poor weather impacted aerial surveys. Also, spending in personnel was reduced because of vacant positions.