Exxon Valdez Oil Spill
Long-Term Herring Research and Monitoring Program Final Report

Outreach and Education

Exxon Valdez Oil Spill Trustee Council Project 16120111-H
Final Report

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Study History: This outreach and education effort supported the projects within the Herring Research and Monitoring Program (project 16120111).

Abstract: The Education and Outreach element of this program was designed to enhance the Herring Research and Monitoring (HRM) Program research by showcasing its relevance, broadening its applicability and extending i's impact to community members in the spill effected area and beyond. Involvement in outreach activities extend the reach of this research and inform the public of the program's findings. This report contains a description of the outreach materials that were generated to support the Herring Research and Monitoring Program (project 16120111). The main outreach objectives included the dissemination of lessons learned in the program to the spill affected area and beyond as well as integrating community involvement through workshops and citizen science opportunities. Several different approaches were used to meet the outreach objectives. These included print, radio, community education and web materials. Print materials included Delta Sound Connections, Breakwater e-newsletter and Project Profiles. Radio outreach was achieved through *Field Notes*. Community education included Discovery Room herring centric lessons, summer programs and community lectures. Web outreach was achieved by keeping the Prince William Sound Science Center web page up to date.

Key words: *Clupea pallasii*, education, outreach, Pacific herring

Project Data: This project did not collect any data.

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EXECUTIVE SUMMARY

The *Outreach & Education* project was designed to enhance the Herring Research and Monitoring (HRM) Program activities by showcasing their relevancy, broadening their applicability and extending their impact to people in the community. Prince William Sound Science Center (PWSSC) educators worked with HRM principal investigators (PIs) and project collaborators to prepare public education materials that communicate the purpose, goals and results of the research program to "non-scientist" audiences and stakeholders in communities in and beyond the spill affected area.

Outreach and education products extended Pacific herring and marine ecosystem information to inform the public of local research activities and improve their ecological and ocean science literacy.

The specific objectives of this project, which includes the outreach and education components of the PWS Herring Research and Monitoring Program, were to:

1) Disseminate PWS herring research information and lessons learned in this program to individuals, groups, policy makers, resource managers and institutions in PWS, including the effected fishing community.
2) Extend and transfer PWS herring research-based outreach and education products to general audiences in and beyond the spill affected areas of PWS.
3) Integrate community involvement into the planning and sampling programs through citizen science opportunities and public workshops

In order to accomplish the outreach objectives of communicating research findings from the HRM program to Prince William Sound communities and beyond several different approaches were used. These included print, radio, community education and web materials. Print materials included Delta Sound Connections, Breakwater e-newsletter and Project Profiles. Radio outreach was achieved through *Field Notes*. Community education and involvement included Discovery Room herring centric lessons, summer programs and community lectures. Web outreach was achieved by keeping the Prince William Sound Science Center web page up to date.

INTRODUCTION

The crash of the Pacific herring (*Clupea pallasii*) stocks in the 1990s has had a lasting impact to the community of Cordova, Alaska. Members of the fishing fleet and community are interested in learning about herring, their recovery, and the research that is taking place. The Herring Research and Monitoring (HRM) program therefore decided it was important to have a dedicated outreach effort designed to reach the people of Prince William Sound (PWS) through a variety of methods.

The outreach efforts focused on print, radio, elementary school programs, community lectures as well as web materials. Print outreach was accomplished in a few different ways. Articles on the

research were published in Delta Sound Connections, an annual newspaper that the Prince William Sound Science Center (PWSSC) produces. Other print materials include Project Profiles and the Breakwater. Project Profiles are handouts that summarized each principal investigator's (PIs) project within the HRM program. The Breakwater was an e-newsletter quarterly sent out to the PWSSC's email list. The *Field Notes* program accomplished radio outreach. *Field Notes* is a summary of a PIs work condensed into a 3 to 5-minute segment broadcasted weekly on Alaska Public Radio and can also be found on the PWSSC's web site. Community outreach was accomplished in several ways as well. PIs presented their research at community lectures held in Cordova. Herring-centric lessons were delivered to the Cordova school district through PWSSC's Discovery Room program. Each project also has a web page on the PWSSC website.

OBJECTIVES

The specific objectives of this project, which includes the outreach and education components of the PWS HRM Program, were to:

1) Disseminate PWS herring research information and lessons learned in this program to individuals, groups, policy makers, resource managers and institutions in PWS, including the effected fishing community.
2) Extend and transfer PWS herring research-based outreach and education products to general audiences in and beyond the spill affected areas of PWS.
3) Integrate community involvement into the planning and sampling programs through citizen science opportunities and public workshops.

METHODS

Outreach objectives were met by the following methods.

Print

Outreach delivered by way of print had several methods. The first was an annual publication produced by PWSSC titled "Delta Sound Connections". Each winter PWSSC staff sought 3-4 article submissions from PIs. Articles were 200-300 words with a graphic or picture. Novel information was delivered each year. As the articles were received staff made edits and then submitted the articles to the main editor of the publication for final review. The second print outreach method was the Breakwater. This was an e-newsletter highlighting current projects accomplished at PWSSC. The e-newsletters were sent out the PWSSC's email list quarterly, which included members of the public, stakeholders, *Exxon Valdez* Oil Spill Trustee Council staff. Updates included a 3-5 sentence highlight of each new program. The highlights linked to the PWSSC web site where more detailed information about each program could be found. The third print method was Project Profiles. These were handouts summarizing each project within the HRM program. A template was generated on the Adobe program InDesign to keep each

summary consistent. Each summary was framed by introduction, methods and results sections. One or two photos or graphics were included as well.

Radio

Radio outreach was delivered by the *Field Notes* program. *Field Notes* was initially a summary created by staff interviewing PIs and reading papers published by the program. Information gathered was then summarized into a story recorded by one voice. The format of the program changed in 2014. Instead of a summary created by staff an interview approach was adopted. Staff recorded interviews with PIs at annual meetings and at the Alaska Marine Science Symposium in Anchorage. Interviews conducted took 15 to 30 minutes with each PI. The interviews were framed with fairly basic questions. In this way the material generated stayed consistent and appropriate for lay audiences. Once the interviews were conducted the material was mixed down from raw 20-minute interviews to 3-5-minute sound bites fit for radio using the Apple program GarageBand. Several sets of recording equipment were tried until 2016 when shotgun mics and a quartet mixing board were found to be the appropriate sound equipment for the task. After production was complete the episodes were sent to the local National Public Radio station, KCHU, where they were aired weekly.

Community lectures

The Community Lecture series occurred every Tuesday night at the Cordova Forest Service office. This program gave a wide variety of presentations from PI lectures to National Audubon Society updates, Alaska Department of Fish and Game management meetings and local travel summaries by community members. Each year the aim was to get four HRM PIs to present on their most recent findings. Travel costs were offered in attempt to make this outreach option more accomplishable and attractive to PIs. The lectures were filmed and uploaded on the PWSSC's web page as well as on YouTube.

Education activities

Discovery Room is an educational program delivered monthly at the Cordova Elementary School as supplementary science lessons. The program aimed to help the Cordova school district meet Science, Technology, Engineering and Math (STEM) standards while delivering herring-centric curriculum. 4th graders met with PWSSC staff once a month to learn about the biology of herring. The year began with lessons and games about the herring life cycle and culminated in a herring dissection.

Community education and involvement was achieved through coordination with Cordova Fishermen United. Through presentations and meetings with herring permit holders, information generated by the HRM program has been delivered. Fishermen were involved in collection of herring in years 2 (2013) and 3 (2014) of the program. Gillnets and trawls were used to collect samples for of herring for PIs.

RESULTS

A complete list and details of products can be found in Table 1.

Every year 10,000 copies of Delta Sound Connections were printed and delivered at locations in Anchorage, Girdwood and Cordova. Each year 2-6 herring articles were featured. Over time the HRM presence in this publication increased from a few articles each year to a full two page spread summarizing that year's findings. Delta Sound Connections was also published on the PWSSC web site. Other print methods reached different audiences. The Breakwater e-newsletter was sent to members of the PWSSC email list. Three e-newsletters featured the HRM program, once in 2013 and twice in 2014. The third print method consisted of 18 Project Profiles. These summaries were printed and available to the public at the PWSSC's entrance. They were also available on the HRM section of the PWSSC's web page. Each project had a corresponding Project Profile connected to its summary.

To connect to those who may not have been interested in reading about the HRM program, radio was used as another platform to expand the research's reach. Since Hayley Hoover's hire in 2014, the *Field Notes* radio program was a priority. After some experimenting the execution of this deliverable was refined. Interviews were conducted with Kevin Boswell, Paul Hershberger, Scott Pegau, Kristen Gorman, Trevor Branch, Pete Rand and Sharon Wildes. These audio files were put on the PWSSC's web and on the air with KCHU (http://pwssc.org/education/field-notes/).

We also worked with PIs to have them present their results to the general public in Cordova through the PWSSC community lecture series. In the last five years 2-4 HRM PIs each year presented their findings to the community. This setting gave community members the opportunity to ask questions of each researcher directly. In this way stakeholders were able to put faces to the research. Attendance was tracked every week with a sign in sheet at the door. For a time, the lectures were broadcasted to a community college in Valdez, but logistics and lack of attendance ended this effort. The lectures were also published on the PWSSC website to widen the reach of the presentations.

Lessons based on the herring research were developed and delivered each year through the Discovery Room program of PWSSC. The curriculum started with an intro to oceans, next went into the herring life cycle and ended with a herring dissection. Pre and post assessment questions were asked at the beginning of each lesson to evaluate content retention. With each year students retain more as the program refines its methods according to this form of evaluation.

Much of the effort has been focused on the HRM portion of the PWSSC web page. Web pages were built for each of the HRM projects. Each project within HRM had its own page that included an intro, methods and results section. The corresponding Project Profile and *Field Notes* program were linked as well. PWSSC's web page has undergone two major revisions, first in 2014 and then again in 2016. PWSSC teamed up with the company Ideaville on the latest

website revision in an attempt to increase the aesthetic and ease of use of the site. The appearance of the HRM section has changed, but the content remained consistent.

CONCLUSIONS

Several incidents impacted the delivery of outreach materials. In 2013 the initial PI resigned in November 2013. Other members of the education department left or reduced their hours at the same time which led to a search for new education personnel and a decision about how to meet the deliverables. Hayley Hoover was brought on in 2014 to complete the outreach deliverables. Despite high employee turnover most of the original objectives were met. Going forward, outreach methods need to be reevaluated for effectiveness. With a changing social environment, novel outreach techniques should be considered including emphasis on social media presence and new listening platforms for *Field Notes.*

There has been a shift away from print in general over the last five years. Current print methods of outreach (Delta Sound Connections, Breakwater, and Project Profiles) are useful in delivering information about the program in a concise and clear way. However, evaluating these methods reach can be difficult. Perhaps outreach efforts should focus on developing a stronger web presence in order to stay contemporary and relevant. Establishing consistent features in the e-newsletter, Breakwater, could be beneficial. An additional method could be to increase the presence of the HRM program on social media platforms.

Another modification that could generate more awareness to the program would be to take a look at the way the *Field Notes* program is delivered. In an effort to stay contemporary the radio segment could be put into a podcast platform. A podcast page could be developed on the PWSSC web site. On this page all the *Field Notes* episodes could be centrally located. Introductory pieces would be recorded with the HRM Program Lead, Scott Pegau, telling the audience what to expect to hear when tuning into the program; what researchers they would hear from and about the topic. A variety of sound equipment was purchased before determining the appropriate gear for Field Notes. Shotgun mics are small and convenient for travel instead of the bulky condenser mics that were originally used. The quartet mixer has four inputs enabling up to four voices to be recorded at once. The quartet also has a much higher quality condenser built into it then previous mixers that were employed. The current equipment streamlined the interview process.

The Community Lecture Series as currently implemented runs smoothly as is and has high attendance numbers. The lectures are well publicized and the community of Cordova continues to be grateful for the opportunity stay updated and interact with researchers. It is one of the more effective ways in delivering content due to the face-to-face nature of the program. One thought to increase attendance numbers would be to take the program beyond Cordova. Broadcasting remotely in Valdez was a way to broaden the programs reach for a time but was not successful due to low attendance numbers. This could have been due to a few factors. Staffing issues at PWSSC led to inconsistencies in communication with the community college that hosted the broadcast. With the current stable staff at PWSSC remote airing of these lectures in Valdez might be more consistent leading to higher attendance numbers in the future.

Educational successes were prevalent in the Discovery room. The current education programs are very well received by the Cordova School District and the community as a whole. The

herring-centric Discovery room programs helped the teachers reach STEM standards and introduce science to students in an interesting way. These lessons break up the day for students making science lessons a treat instead of a chore. This outreach method gets information about the HRM program into the homes of every 4th grader in Cordova. In this way this might be the most effective way to reach those who wouldn't ordinarily seek information out about the HRM program.

With the most recent update of the PWSSC web page the HRM web materials are positioned for success. Previous versions of the web page were hard to navigate and information got lost in the disorganization of the design. Information about herring research is easier to access and more visually appealing with the new web design that PWSSC has adopted. As long as communication between outreach staff and PIs stays consistent keeping the new web page current shouldn't be difficult. As the social climate shifts towards being paperless there will only be more and more traffic through this outreach method. Keeping the web page aesthetically pleasing and navigationally logical as the project moves forward is critical in the success of HRM outreach.

Moving into the next five years of the program (FY17-21) the HRM outreach will longer a stand-alone project, but instead be a component of the coordination effort. By joining the outreach and coordination efforts, we are combining the aspects of the program that interact directly with all projects. The HRM and GWA programs are distinct with specific deliverables defined in each program, but we collaborate on TEK aspects of the proposed outreach.
http://pwssc.org/research/?research_topic=herring

Table 1. The informal or formal education approaches (**bold**) used to meet objectives, specific products (*italics*), and schedule and frequency/number of outreach and education products developed/delivered by our staff.

1. Written project profiles and articles for public information and use; appropriate for lay audiences for inclusion in newsletters or other science/education publications.		
Delta Sound Connections	10,000 copies distributed annually to residents and visitors to PWS	Contribution of articles by herring researchers FY12-16. Sponsorship and herring program feature FY13, FY15, FY16
PWSSC Breakwater *newsletter*	emailed to 325 households/businesses in and outside of Alaska	1-2 articles per year FY13, 14
Project Profiles	Distribution points: PWSSC, and website, AMSS	Three profiles per year developed or updated FY12-16

2. Public presentations to general public audiences.		
Community Lecture Series	(live in Cordova)	Three presentations delivered by Herring researchers per year FY12-16
Field Notes radio program	(aired and archived KCHU public radio, pwssc.org)	Three radio programs produced based on Herring projects per year FY12-16
3. Advertise and involve community members in opportunities to participate in herring research as "citizen scientists."		
Citizen Science Opportunities	Provide and promote opportunities for the public to become involved in research project activities	Citizen science opportunities promoted on web and during community presentations
4. Develop and advertise web-based materials to communicate the basis, goals and results of the herring research project, and provide access to outreach and education products.		
Herring Program webpage: http://pwssc.org/research/?research_topic=herring	Basic information about each herring project can be found and links to the annual reports on the EVOSTC website.	Continued to use this as a place to make documents associated with the herring program accessible FY12-16
PWSSC YouTube channel: http://www.youtube.com/user/PWSSC	Podcasts (based on *Field Notes* radio programs) and video clips posted on YouTube	Continued to use popular social media to outreach information associated with the herring program FY12-16
5. Educate targeted groups in the application of research information and sampling methods.		
Discovery Room	5th Grade Oceanography and Herring curriculum	6 2-hour classroom sessions/monitoring field trips delivered

		Oct-Apr FY12-16
Outreach Discovery	Stand-alone, hands-on herring and ocean science education programs for students in grades 3-12	1 program delivered to school group outside of Cordova per year FY12-14
Summer Field Programs	Field-based, hands-on herring and ocean science activities for participants in science and environmental camps and day programs	1 program delivered in PWSSC or partner summer program per year FY13, 14

ACKNOWLEDGEMENTS

Outreach is an important part of all research projects, but it wouldn't be possible without collaboration with the PIs. Specifically, Scott Pegau. Scott is always there to answer any and all questions as they arise. His leadership is invaluable. PI participation in all outreach activities is appreciated. The views expressed here are our own and do not necessarily represent those of the *Exxon Valdez* Trustee Council.

OTHER REFERENCES

Delta Sound Connections: http://pwssc.org/about/#publications
Breakwater: http://pwssc.org/about/#publications
Project Profiles: http://pwssc.org/wp-content/uploads/2013/03/HRM-proj-profile-1.pdf
Field Notes: http://pwssc.org/education/field-notes/
Lecture Series: http://pwssc.org/education/lecture-series/