Exxon Valdez Oil Spill
Restoration Project Annual Report

Youth Area Watch Program

Restoration Project 96210
Annual Report

This annual report has been prepared for peer review as part of the *Exxon Valdez* Oil Spill Trustee Council subsistence program for the purpose of assessing project progress. Peer review comments have not been addressed in this annual report.

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Prince William Sound Youth Area Watch Program

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Study History: This first year contract was a pilot project, proposed by the Chugach School District, to involve youths of Prince William Sound in restoration projects funded by the *Exxon Valdez* Oil Spill Trustee Council.

Abstract: This pilot project involved students from the Chugach School District in restoration projects funded by the Trustee Council in Prince William Sound (PWS). Five projects were identified in which to involve students: (1) Restoration Project 96195: blue mussel collection and pristane hydrocarbon analysis, (2) Restoration Project 96064: harbor seal biosampling, (3) Restoration Project 96320M: oceanographic water testing and meteorological data recording and (4) Restoration Project 96320T: juvenile herring age/weight/length analysis. Students were from Tatitlek, Chenega Bay, Whittier, and Hinchinbrook Island and projects encompassed Evans Island, Tatitlek Narrows, Boulder Bay, Jacks Bay, Port Fidalgo, Hinchinbrook Island, and Passage Canal. A project coordinator employed by Chugach School Districut supervised students and coordinated activities between scientists and students to bridge the gap between hard scientific research and meaningful application of project activities. These projects increased the awareness of youth regarding the effects of the oil spill and encouraged their involvement in subsistence, research and initial restoration processes. The guiding principle of this project is that the success of long-term effective restoration is dependent on youth involvement; therefore, with the support of students within PWS, the future responsibility of adequate subsistence and restoration can be carried on under their ownership.

Key Words: Blue mussel, Chenega Bay, *Exxon Valdez* oil spill, harbor seal biosampling, Hinchinbrook, juvenile herring AWL (age-weight-length), meteorology, oceanography, Prince William Sound, pristane hydrocarbon, restoration, subsistence, Tatitlek.

Project Data: (will be addressed in final report)

Citation:

Hemming, M. 1996. Youth Area Watch Program, *Exxon Valdez* Oil Spill Restoration Project Annual Report (Restoration Project 96210), Alaska Department of Fish and Game, Habitat and Restoration Division, Anchorage, Alaska.

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EXECUTIVE SUMMARY

The Chugach School District involved community youth with local research and provided the necessary skills and responsibilities to conduct research at their individual sites. The students participated in various research programs associated with, and funded by, *Exxon Valdez* oil spill restoration projects. These included the cooperative work with research agencies in an attempt to develop a database of information. Students were given the opportunity of participating in all such projects identified within this report. The coordinator served as the day-to-day liaison between the scientists that served on the bigger project and the students that provided information to those larger projects. The students took the skills that were learned from these projects and made plans to incorporate them into restoration activities for their school, community and region during the 1996-97 school year.

INTRODUCTION

The Youth Area Watch is comprised of school enrolled youth (grades 6-12) of the Prince William Sound region that have gained, through the *Exxon Valdez* Oil Spill Trustee Council's efforts and funding, a knowledge and responsibility for the Sound's ecosystem to ensure that an adequate subsistence lifestyle continues. The projects can be designated as a promotion of interest in long-term projects such as the Alaska SeaLife Center in Seward, the clam propagation restoration, and the oyster rearing plants in various communities and will ensure increased local evolvement. The Trustee Council has given the opportunity for the Youth Area Watch to become more involved with scientific research and their community to prepare the region for assuming more active roles in the restoration effort.

The Auke Bay Laboratories conducted by NOAA in Juneau, the Alaska Native Harbor Seal Commission, the University of Alaska Fairbanks SEA Grant program, and the Prince William Sound Science Center have been involved with the Chugach School District for successful implementation of this program by allowing the students from Tatitlek, Chenega Bay, Whittier, and Hinchinbrook Island to be a part of their current research projects.

The students were made aware, during the 1995-96 school year, of many of the research projects in the oil impacted region of Prince William Sound. They also had the opportunity to work in conjunction with the principal investigators of the above mentioned agencies on research projects dealing with identified injured or endangered resources.

OBJECTIVES

The selected students (8) from the Chugach School District participated in training and research that was identified by the NOAA and Sound Ecosystem Assessment (SEA) Programs' principal investigators as current research programs that require increased data to conclude various hypotheses developed by various experts in each field. Students were an integral part of the Youth Area Watch project which was initiated by the identified objects listed below. Each of the sites involved had students collect data that was used to funnel into the larger research projects, and was also used to provide a base of understanding that allowed students to draw their own conclusions on the information that was gathered. The

involvement was limited to the projects specified in the approved grant: Project Number 96210, which are summarized as follows:

1. Restoration Project 96195: Pristane/blue mussel analysis.

This project was conducted by the Prince William Sound Pristane-Mussel Monitoring Program at the Alaska Fisheries Science Center, Auke Bay Laboratory, 11305 Glacier Highway, Juneau, AK 99801-8626. The Principal Investigators were Pat Harris and Jeff Short, both from the Auke Bay Lab.

Blue mussels were collected by Pat Harris and the Youth Area Watch students throughout the Sound to measure their pristane concentrations. Pristane is a hydrocarbon made by Neocalanus and Calanus copepods. The copepods use pristane to help maintain their buoyancy in seawater. When these copepods are abundant in the spring, many fish and birds feed on them. The pristane in the copepods transfers to the predators when they are eaten. Pristane is also released in feces of predators into the water. Mussels may then ingest the pristane in these feces as they filter water during feeding. It is Jeff Short's hypothesis that areas in Prince William Sound which contain mussels with high pristane concentrations are near important feeding habitats for many marine animal species, especially juvenile pink salmon and herring. By sampling mussels and measuring their pristane concentrations, the investigators can identify the timing, locations and intensity of plankton blooms in the Sound.

The scientists are also trying to understand the transfer of energy in the food web through the Prince William Sound ecosystem. The copepods are near the bottom of the food chain. A plentiful zooplankton supply helps insure healthy populations on the higher trophic levels. More copepods means more energy available for fish, birds and mammals. Hatcheries monitor plankton abundance to help decide when to release fry, and knowing the pristane levels in mussels can help that effort.

The only biological sources of pristane in Prince William Sound are the Neocalanus and Calanus copepods. Since pristane is a chemically stable compound that concentrates in fat deposits, it is easily transferred through all of the levels of the food chain. Therefore, pristane can be used as a "tracer" of energy from the copepods through the ecosystem. The ultimate goal of this research is to understand some of the natural factors which control the fish, mammal and bird populations in Prince William Sound by studying the energy flow throughout the ecosystem. Analyses of pristane mussel beds is a way to see how much of this energy flows through the lower levels of the food web.

Students collected mussels along a 20 meter transect once or twice per month (depending on the minimum tides and a schedule established by Pat Harris). Twenty collected mussels, per collection period, were placed in a collection bag with water, froze, labeled, and stored until picked-up or shipped. The students were provided Ziplok bags and labeling tags.

2. Restoration Project 96244F: Harbor seal management and biosampling.

Conducted by the Alaska Native Harbor Seal Commission, the Alaska Department of Fish and Game, the National Marine Fisheries Service, and the University of Alaska Sea Grant. The Principal Investigators were Kate Wynne, University of Alaska Sea Grant, and Monica Riedel, President of the Alaska Native Harbor Seal Commission .

Seals in parts of Alaska, like Southeast and maybe Bristol Bay, seemed to be healthy and their numbers were stable or growing. But in some parts of Alaska, especially the Chugach and Kodiak regions, there were far fewer harbor seals now than there were 20 years ago. The investigators made an attempt to determine what caused those declines or what would help them recover (for example: were they diseased? was there not enough food? were they having fewer pups? would the decline spread? could help be available for them to recover?). By comparing seals from 'healthy' areas to seals from areas where they were declining, a better understanding could be made to determine what was causing the seal's problem.

Seal hunters from various communities in the Aleutians, Bristol Bay, Kodiak area, Chugach Prince William Sound, and the Southeast were working with researchers to answer questions about the health of Alaska's harbor seals. They collected measurements and samples from subsistence harvested harbor seals so that researchers (from National Marine Fisheries, Alaska Department of Fish and Game, and the University of Alaska) working together could study and compare the health of harbor seals around the state.

Samples from different parts of the seal were collected for different reasons.

Skin - for genetic studies to pick stock identity and to understand how closely related harbor seals are in different parts of the state.

Blubber - for fat analysis. This helps to learn about a seal's diet and how good are their energy stores. Also, testing is done to determine contaminant testing such as DIOXIN.

Teeth - to learn exact age. Teeth are sectioned and there are rings inside that can tell the exact age.

Whiskers - for stable isotope studies. This helps to learn the changes in the diet.

Stomach - to learn about what they are eating.

Skull - for morphometric studies. This helps to determine types of seals, their sizes relations, etc.

Liver, Heart, and Kidney - to help determine health of the seal and certain contaminants.

Measurements & Weight - to study growth and body conditions.

Each village or sampling site had one set of spring scales to weight the seal, data forms, small bag labels, magic markers, measuring tape, Ziplok bags, rulers, and a very sharp knife. The hunts were best performed once per month and the seals delivered to the school where sampling could take place.

3. Restoration Project 96320M: Oceanographic and meteorologic data collection.

Conducted by Shari Vaughan, physical oceanographer for the Prince William Sound Science Center, the students learned the basic essentials of physical oceanography and meteorology.

Physical oceanography activities included the basic oceanographic features such as semiweekly readings of temperature, salinity, alkalinity, conductivity, carbon dioxide content, pH, and dissolved solids from various depths and the same location. The numerical data was determined calibrated analysis using LaMotte's Oceanographic Kits. Students also collected a few zooplankton samples, but were not used as part of the on-going SEA biological oceanographic research. The meteorologic data consisted of temperature minimums and maximums, relative humidity, barometric pressure minimums and maximums, wind direction and speed, and rainfall accumulation. The numerical data was read from digital weather stations set up at each site.

4. Restoration Project 96320T: Juvenile herring monitoring.

Conducted by Evelyn Brown, Chief Scientist, Juvenile Herring Project, IMS/University of Alaska, Fairbanks.

The Youth Area Watch students were present with Kevin Stokesbury, Evelyn Brown, and Malcolm MacEwen during a herring cruise in and around the Valdez Channel. Fish monitoring was also accomplished at Tatitlek in Boulder Bay. The students learned about the hypotheses set forth by various principal investigators working on the juvenile herring project. Data was collected from March 1996 until the middle May 1996, and allowed the students to perform AWL processing and arrive at conclusions concerning the age classes and the hypotheses concerning the herring depletion in the Sound.

Because of time allocations for other studies, the students monitored the herring by variable mesh gill net takes on an average of once every three weeks. The students also attempted to use hoop nets, but had little success. The data included species composition, number of fish caught, age, weight, length, stomach contents and analysis of scales.

The older Youth Area Watch students from Chenega Bay and Two Moon Bay left the school district before the gill nets were used. The involved students that remained at the sites were too young, and thus not physically able to pull the gill net. Therefore, no data was collected from these sites.

METHODS

The Chugach School District hired a project coordinator which worked out of that office. The coordinator developed a protocol in conjunction with the research project scientists: Evelyn Brown, Shari Vaughan, Pat Harris, and Kate Wynne. The protocol established data collection, analysis techniques, cruise schedules, and lab visitations.

Eight students were selected from the Chugach School District within the Prince William

Sound through an application process. They participated in the complete year which was the first year of the Youth Area Watch project. There were four students selected from Tatitlek, two from Chenega Bay, one from Hinchinbrook, and one from Whittier. Detailed training was provided in developing the protocol which was necessary for the research involved in each project, both onshore and offshore. The onshore data collection was conducted near the respective community sites of Tatitlek, Chenega Bay, Whittier, and Hinchinbrook Island throughout the year as specified by the protocol of each project. Offshore research was undertaken during strategic times of the 1995-1996 school year. The onshore times and locations were determined by convenience and availability to the students and their teacher. The offshore times and locations were determined in collaboration with the research project staff.

The Youth Area Watch project developed sound research and analytical skills for the students. To insure the proper training, the students were given guidance throughout the project period. Intensive training periods were provided by the Alaska Harbor Seal Commission; the University of Alaska, Fairbanks; the Prince William Sound Science Center; The Auke Bay Laboratory (NOAA). All participating students came together on two cruises as part of an overall ecosystem research training session, one at the beginning of the Youth Area Watch project, and the other at the end. Both were conducted on board the Kenai Explorer. Small boats or skiffs from local communities were not utilized because of insurance liabilities.

A Memorandum of Understanding (MOU) was developed between each research principal investigator and the Chugach School District, written by the project coordinator. The MOU's served as the work plan and as an agreement of expectations between the investigators and the students, with the roles and responsibilities of each.

The Chugach School District coordinated the efforts of the students with that of the science research centers mentioned above to provide an intensive training period during which the students, the coordinator, and the teachers became familiar with the data collection protocols specified by the principal investigators. The Youth Area Watch students compiled their information into a spreadsheet or database format. The scientists involved with the Youth Area Watch reviewed the data and conclusions filed by the students at the end of the collecting period. At that time, the student's work was analyzed, and feedback was given to reinforce potential findings and explanations.

Students made final presentations (as oral and written reports) on their individual or site research, data collection, procedures, analysis, and conclusions. This was done not only for accountability reasons, but also for increasing the exchange of information.

The information gathered is now being used to help guide the sites to implement restoration plans at the local level. These plans will be developed this 1996-1997 school year by the participating sites and will be consistent with the *Exxon Valdez* oil spill restoration plan.