

Exxon Valdez Oil Spill
Restoration Project Annual Report

Youth Area Watch Program

Restoration Project 99210
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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March 2000

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Youth Area Watch Program

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Study History: The project effort was initiated as part of a detailed study plan in 1996 and is in its fourth year. The objective of the project is to involve the youth of Prince William Sound, Kenai Fjords and Lower Cook Inlet in research funded by *Exxon Valdez* Oil Spill Trustee Council.

Abstract: Students from Chenega Bay, Cordova, Nanwalek, Port Graham, Seldovia, Seward, Tatitlek, Valdez and Whittier in current research and restoration projects funded by the *Exxon Valdez* Oil Spill Trustee Council in Prince William Sound (PWS), Resurrection Bay and Lower Cook Inlet. The restoration projects that students were involved with included: (1) 99195: Pristane Monitoring in Mussels, (2) 99245: Community-Based Harbor Seal Management and Biosampling, (3) 99012A-BAA: Comprehensive Killer Whale Investigation in PWS, (4) 99273: Surf Scoter Life History and Ecology. To meet the diverse needs of nine groups of students involved in the project, the responsibilities of project coordinator were divided into two half-time positions. The coordinators supervised students and coordinated activities between scientists and students. The projects increased the awareness of youth regarding the effects of the oil spill and encouraged their involvement in subsistence, research and the initial restoration processes. The guiding principle of this project is that the success of long-term effective restoration is dependent on youth involvement. The leadership of today's youth will be integral to restoration and subsistence for the future. The support of students within PWS and other spill-impacted areas is needed to insure that adequate subsistence and restoration are continued in the future.

Key Words: Alaska SeaLife Center, blue mussel, Chenega Bay, Cordova, *Exxon Valdez* oil spill, harbor seal biosampling, Lower Cook Inlet, meteorology, Nanwalek, oceanography, Port Graham, Prince William Sound, pristane hydrocarbon, restoration, Resurrection Bay, scoter, Seldovia, Seward, subsistence, Tatitlek, Valdez, Whittier.

Project Data: (will be addressed in final report.)

Citation:

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EXECUTIVE SUMMARY

The Chugach School District involved community youth with local (especially site specific) research, subsistence, and restoration. They provided the youth with the scientific skills and knowledge necessary to conduct individual and community research. The students participated in various research projects associated with, and funded by, *Exxon Valdez* Oil Spill Trustee Council. This included cooperative work with various research agencies and principal investigators. Students were given the opportunity to participate in all projects identified within this report. The coordinators facilitated training and communication for involved youth. The coordinators also served as day-to-day liaisons between the scientists that served on the bigger projects and the students that provided, or helped provide, information and data to those larger projects. The students took the skills that were learned through their involvement with these projects and incorporated them into restoration activities for their school, community and region.

INTRODUCTION

The program entitled "Youth Area Watch" is comprised of school enrolled youth (grades 6-12) of the Prince William Sound, Kenai Fjords and lower Cook Inlet region. Through the Trustee Council's efforts and funding, these students have gained an increased knowledge and responsibility for the North Gulf Ecosystem. The Alaska SeaLife Center in Seward has provided increased local involvement in these and related projects. The students in Youth Area Watch have been given the opportunity by the Trustee Council to become more involved with scientific research in their communities. These experiences will help prepare them for assuming more active roles in subsistence and the restoration effort.

The Prince William Sound Science Center, the Alaska Native Harbor Seal Commission, the North Gulf Oceanic Society, Alaska Department of Fish and Game, Alaska SeaLife Center, and the Auke Bay Laboratories conducted by NOAA in Juneau, have been involved with the Chugach School District to insure continued successful implementation of the Youth Area Watch program. These agencies allowed students from Cordova, Chenega Bay, Nanwalek, Port Graham, Seldovia, Seward, Tatitlek, Valdez and Whittier to be a part of their current research projects.

The students have continued to develop an awareness, during the 1998/99 school year, of many of the research projects in the oil impacted region of Prince William Sound, Resurrection Bay and Lower Cook Inlet. They also have 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

Twenty-six students and nine site coordinators were chosen from the Chugach School District, Cordova, Nanwalek, Port Graham, Seldovia, Seward and Valdez. They participated in training and the subsequent research that was identified by the grant and is listed below. Each of the sites involved had students help collect data that was used by the on-going research projects. This data 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 which are summarized as follows:

1. Pristane Monitoring in Mussels, Restoration Project 99195.

This project was conducted by Alaska Fisheries Science Center, Auke Bay Laboratory, 11305 Glacier Highway, Juneau, AK 99801-8626. The principal investigators were Jeff Short and Pat Harris, both from the Auke Bay Laboratory.

Blue mussels were collected by Pat Harris and the Youth Area Watch students throughout Prince William Sound, Lower Cook Inlet and Resurrection Bay to measure their pristane concentration levels. Pristane is a hydrocarbon made by *Neocalanus* and *Calanus* copepods. It is thought that 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 the copepods 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 web. 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 web. 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 through the ecosystem. Analyses of pristane in mussels is a way to see how much of this energy flows through the lower levels of the food web.

2. Community-Based Harbor Seal Management and Biosampling, Restoration Project 99245.

This project was conducted by the Alaska Native Harbor Seal Commission, and the Alaska Department of Fish and Game. The principal investigators were Vicki Vanek (Alaska Department of Fish and Game) and Monica Riedel (Executive Director of the Alaska Native Harbor Seal Commission).

Seals in certain geographic areas of Alaska appear to be healthy, and their numbers are stable or growing. But in several areas of Alaska, especially the Prince William Sound and Kodiak regions, there are far fewer harbor seals now than there were 20 years ago. The principal investigators are making an attempt to determine the cause of the declines and possible methods for promoting recovery. They are collecting data to determine factors contributing to the decline. Possible factors include disease, inadequate food supply, high pup mortality rate, and low birth rates. Comparison of seals in different areas gives a better understanding and offers possible conclusions to the hypotheses set forth.

Seal hunters from various communities in the Aleutians, Bristol Bay, Kodiak area, 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 Fish & Game, and the University of Alaska) working together could study and compare the health of harbor seals around the state. Youth Area watch students were paired with hunters in each community to assist in the collection of samples.

Samples from different parts of the seal were collected for different reasons. The skin was used for genetic studies to determine stock identity and to understand how closely related harbor seals are in different parts of the state. The blubber was used for fat analysis. This helps to learn about a seal's diet and the health of their energy stores. Also, testing was done to determine if certain contaminants were present. The teeth were used to learn exact age. The whiskers were used for stable isotope studies. This provides information about large scale changes in the diet. The stomach contents were sampled to determine recent diet. The skull was used for morphometric studies. The liver, heart, and kidney were used to determine the health of the seal and certain contaminant levels. The measurements and weights were used to study growth and body condition.

3. Surf Scoter Life History and Ecology, Restoration Project 99273.

This project is conducted by Dan Rosenberg of Alaska Department of Fish and Game.

This project was designed to study the life history and ecology of surf scoters that overwinter in Prince William Sound. Scoters are among the least studied of North American waterfowl. Relatively little is known about their life history and ecology or the links between their breeding, wintering, and molting distributions. The surf scoter is the most abundant of the three scoter species in Prince William Sound. Other species include the black scoter and the white winged scoter. Native inhabitants of PWS have used scoters (locally known as black ducks) as an important food source for centuries. Since the oil spill, the health of the scoter population in Prince William Sound and Lower Cook Inlet may be in jeopardy. Additionally, concerns exist about the safety of this traditional food resource. The susceptibility of sea ducks to oil spills and other contaminants is a significant concern of resource managers.

Identifying the location of breeding grounds, migration routes, wintering areas, and the timing of migration is an essential first step if we are to identify the effects of habitat alterations, and causes of population changes in these migratory species. These goals are being accomplished by capturing birds in the spring and implanting them with light-weight radio transmitters. These transmitters allow the birds to be tracked by satellite for up to one year. During fieldwork this year, approximately 20 scoters were selected to receive transmitters. A larger number of birds were captured and processed through various health and growth evaluations and banded.

In conjunction with the collection of scientific data related to scoter life history and ecology, the gathering of traditional ecological knowledge about scoters and other sea ducks has been undertaken. This knowledge is gathered through various methods including personal interviews, literature research and forum discussions.

4. Comprehensive Killer Whale Investigation in Prince William Sound, Restoration Project 99012A-BAA.

This project is conducted by Craig Matkin and Eva Saulitas of the North Gulf Oceanic Society.

The principal investigator and associated researchers spend approximately 100 days per year collecting data on individual killer whales in Prince William Sound and Kenai Fjords. Each whale is photographed and cataloged based on identifying markings and family relationships. Through many years of study, all the whales that frequent the northern Gulf of Alaska have been identified and cataloged. Genetics studies have been very helpful in determining breeding habits and familial relationships within groups.

Distinctive markings on the killer whale's dorsal fin and saddle patch make it possible to identify and study individual whales. Whales are consistently photographed from their left side so that comparisons between images are possible. By spending an extensive number of days on the water, the researchers are able to photograph all the whales residing or transiting the Prince William Sound area during the summer. Through this regime of photography, the killer whale population can be tracked at the level of the individual.

Regular observation of the whales leads to reasonable assumptions about family relationships between specific animals. These assumptions are supported by DNA studies. DNA from individual whales is obtained after a positive identification of a whale is established. A small dart is used to obtain a sample of skin and blubber. The skin sample is used for the DNA analysis. (The blubber samples taken from whales are analyzed to determine the level of contaminants that exist in the bodies of specific whales.) The darting process seems to have no effect on the whales. DNA testing of the whales in a pod can establish the relationships between individuals. Whale pods tend to be made up of a dominant female and her offspring. Males disassociate from the pod for brief periods of time to seek out a mate. After mating, the males seem to return to their original pod.

METHODS

The project coordinators were Jennifer Childress and Joshua Hall. The coordinators developed a protocol in conjunction with the research project scientists: Pat Harris, Jeff Short, Monica Riedel, Vicki Vanek, Craig Matkin, Eva Saulitas and Dan Rosenberg. The protocol established data collection, analysis and sampling techniques, cruise schedules, training sessions and lab visitations.

An application process determined which 26 students within Prince William Sound, Seward and Lower Cook Inlet would be selected by the Chugach School District. The selectees participated in the complete year, which was the fourth year for the Youth Area Watch project. There were two students selected from Chenega Bay, three from Cordova, two from Nanwalek, two from Port Graham, two from Seldovia, six from Seward, two from Tatitlek, four from Valdez, and three from Whittier. Detailed training was provided to develop and satisfy 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 Chenega Bay, Cordova, Nanwalek, Port Graham, Seldovia, Seward, Tatitlek, Valdez, and Whittier throughout the year. Offshore research was undertaken during strategic times of the 1998-1999 school year based on schedules of times and locations specified by the principal investigators.

The Youth Area Watch project assisted the students in developing sound research and analytical skills. 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, Alaska Department of Fish and Game, Alaska SeaLife Center; The North Gulf Oceanic Society, and the Auke Bay Laboratory (NOAA).

The student participants were involved in a multi-day training session at the Alaska SeaLife Center as part of an overall ecosystem research training session. Students also participated in three days of offshore research cruises in cooperation with the Killer Whale Identification and Tracking project. Small boats or skiffs from local communities were utilized for local restoration projects throughout the year.

The original memorandum of understanding was continued between each research principal investigator and the Chugach School District. A new memorandum of understanding was established with the North Gulf Oceanic Society. 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 data into a spreadsheet or database format. The scientists and coordinators involved with 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 were also required to use the knowledge and skills gained from working with the project scientists to design and initiate local research/restoration projects.

Written reports of the results of local restoration projects were submitted by each site group upon completion of their projects. The reports were generated in standardized format to facilitate comparison.

RESULTS AND DISCUSSION

Students and site coordinators were selected during the last week of September, 1998. They received protocol training during two sessions held at the Alaska Sealife Center the second and third weeks of October. Training also occurred at different times during the school year based on need and time allotted, to correspond with the principle investigator's agenda. All sites participated in daily or weekly data collections. The *Misty*, *Maria*, and *Sound Access* were the vessels chartered by Project 99210 funding. These vessels were used for protocol training of students and coordinators as well as site restoration activities.

Aircraft were chartered from Fishing & Flying out of Cordova for the training received from Pat Harris for the blue mussel collection. This was designed as an introduction into mussel collection techniques. Pat Harris made every attempt from that training session forward to include any student(s) from all sites that were on her collection route during the months of March through May. The students and coordinators attended one of two laboratory sessions at Auke Bay Laboratories in Juneau. These sessions took place Feb 12 and March 16. The 8-hour involvement at the lab included instruction in gas chromatography, qualitative and quantitative analysis of the hydrocarbon pristane (from the blue mussels they had collected), age class determination of mussels through shell cross section analysis and field training at a local mussel bed. The lab exercises equaled or went beyond what the students would have experienced in many of the better universities. Jeff Short and Pat Harris also gave presentations on their hypotheses regarding pristane through the food web and its relationship to other population and energetic studies.

Blue mussels were also collected at all sites, frozen, and stored until shipment to the Auke Bay Laboratories. The sampling did not start until mid-February, 1999, and students collected at their sites for the remainder of the school year. Several students collected throughout the summer to assure meaningful data for the principal investigators. Students collected mussels along a 20 meter transect once or twice per month during the spring and summer (depending on a schedule established by the principal investigator). Twenty mussels were collected during each collection and were placed in a Ziplok bag. They were then labeled, frozen, and stored until picked-up or shipped. The students were provided Ziplok bags and labeling tags. All samples were recorded on a chain of custody sheet.

Weather records (barometric pressure, maximum and minimum temperatures, wind speed, and precipitation) were maintained daily during the school days. These records were distributed to the project coordinators for posting on the Youth Area Watch web site.

Students and coordinators from Chenega Bay, Cordova, Nanwalek, Port Graham, Seldovia, Seward, Tatitlek, Valdez, and Whittier attended one of two harbor seal biosampling trainings occurring in Seldovia and Anchorage during the fall and winter of 1998/1999. The training in Seldovia took place on November 16-17, 1998. The training in Anchorage took place on January 11-12, 1999. The objectives of the project and the biosampling procedures were presented by Vicki Vanek (Alaska Department of Fish and Game) and Monica Riedel (Alaska Native Harbor Seal Commission). Tatitlek, Cordova, Chenega Bay, Nanwalek, Seldovia, Port Graham and Valdez had hunters who provided seals for biosampling at different times throughout the year. Hunters and the respective students were provided with a seal sampling kit which included one set of spring scales, data forms, small bag labels, magic markers, measuring tape, Ziplok bags, rulers, and a very sharp knife. Sampling generally occurred about once a month if subsistence

hunting was taking place in the community. Students in Seward were unable to locate a hunter who was able to provide them with samples. The results of the data are being compiled by Vicki Vanek.

Dan Rosenberg (Alaska Department of Fish and Game) presented the scope and sequence of his surf scoter project to the students in Tatitlek. Students interviewed elders in their community to ascertain traditional ecological knowledge about scoters and other sea ducks. Information gathered through this interview process was compiled by the project coordinators and forwarded on to the principal investigator. Students were able to participate in a cruise in April with Dan Rosenberg during the week of April 26. The students spent a day on board the charter vessel *Discovery* working with Dan Rosenberg and his team to capture and process surf, black and white wing scoters. They assisted in mist net deployment and monitoring. Monitoring activities were accomplished with coordinated efforts between individuals in skiffs and onshore. Birds were captured and transported by skiff to the *Discovery* where they were processed for possible transmitter implantation. Students took an active role in the collection of data on individual birds including taking and recording size and weight measurements and caring for birds during the surgery recovery and release period. Students were transported to and from the *Discovery* by float plane. Charters were handled through Cordova Air. Students conducted interviews with elders in their communities to gather traditional ecological knowledge about scoters. Reports from these interviews were forwarded to the principal investigator.

A memorandum of understanding was established with Craig Matkin of the North Gulf Oceanic Society to include students from Chenega Bay, Cordova, Nanwalek, Port Graham, Seldovia, Seward, Tatitlek, Valdez, and Whittier in the killer whale monitoring program. This involvement included several hours of training in the tracking and photographic techniques employed to monitor the whales. Students learned to identify whales by comparing their dorsal fin/saddle patch configurations with those recorded in previous years. The training occurred in conjunction with three days of whale identification cruises based out of Seward. Students participated in several whale monitoring activities while aboard the research vessel. Those activities included: hydrophone monitoring of whales, photographic recording of individual animals, and darting to obtain blubber and skin samples. Through this process students were able to gain a wealth of current information about the local population of killer whales and killer whales in general.

Students from Chenega Bay, Seward, Tatitlek, and Whittier designed and implemented local research or restoration projects. These projects were chosen based on their alignment with Trustee Council goals and student interest. The projects varied from site to site. Students in Chenega Bay built a community greenhouse and worked to educate the community on ways to use compost. Seward students worked in conjunction with the newly opened Alaska SeaLife Center to rearticulate a harbor seal skeleton. The finished skeleton was then put

on the exhibit floor as an example of a local contribution to the Seward center. Tatitlek students initiated a plan to get an incinerator for their community to reduce the amount of waste material going into their landfill. Students in Whittier continued a long-term project monitoring the black-legged kittiwake colony on Passage Canal. These students made weekly trips to the colony aboard the *Sound Access* to record the numbers of birds at the colony during April and May. The students plan to continue this project in future years.

CONCLUSIONS

The identified agencies (the Chugach School District, the Alaska Department of Fish and Game, the University of Alaska, Fairbanks, the NOAA Auke Bay Laboratories, The North Gulf Oceanic Society, the Prince William Sound Science Center, the Alaska SeaLife Center, the Alaska Native Harbor Seal Commission, Chugachmiut and the Chugach Regional Resources Commission) will continue to take an active role in the continuation of this project. They have shown commitment to the future of Prince William Sound through the education of local youth. Without the participation of all parties, this project, as a whole, would not have been the success it was.

Youth Area Watch has involved students with current scientific research and acquainted them with chief scientists in Alaska. Involvement with these projects and individuals has allowed youth in oil impacted communities to become an important link between community elders and the scientific community. Youth Area Watch has emphasized the need for meaningful involvement by oil impacted community youth in the research and restoration occurring as a result of the *Exxon Valdez* oil spill.

It has been the intent through this project to combine and leverage current research funds with the aforementioned participating organizations' resources. With the Chugach School District administering the Youth Area Watch Program through a contract with the Alaska Department of Fish and Game, the program will continue to sustain itself in subsequent years through the assistance of alternative funding sources.

