

## **Project Number 98163 I Project Leader**

This project provides coordination and scientific oversight for the APEX project. It produces the summary document for the APEX annual report and the detailed project description each year. It also identifies research needs or gaps within APEX and liases with other EVOS projects and marine research programs with interests similar to those of APEX.

Project 97163 does not directly conduct field work. It is involved in three projects, a collaborative one with 97064 to compare forage fish distribution with dive distribution and behavior of harbor seals (details of this may be found under 97064), and a project developing electronic cover layers of the distribution of seabird colonies in Prince William Sound for an ArcInfo Geographic Information Systems, for modelling. Finally, Project 99163 I has been developing the APEX web page which can be found at: <http://www.uaa.alaska.edu/enri/apex/index.html>.



## **Alaska Predator Ecosystem Experiment**

### **Who?**

In 1989 the Exxon Valdez spilled 11 million gallons of crude oil into Prince William Sound. Seabird species possibly affected by the spill were Kittlitz's murrelets, marbled murrelets, common murrelets, black legged kittiwakes, puffins, and pigeon guillemots. Marine mammals and for age fish species such as Pacific herring, capelin, and sand lance may have also been affected.

### **How?**

Some of these seabirds, marine mammals, and forage fish are either not recovering or recovering slowly. Forage fish comprise the majority of some seabird and marine mammal diets. A documented decline in some forage fish species in the northern Gulf of Alaska has occurred. This change in the food web may affect species that depend on forage fish as a main food source.

### **What?**

Alaska Predator Ecosystem Experiment, APEX, is an interdisciplinary and interagency effort of biologists, ecologists, oceanographers, and statisticians from federal, state, private, and university entities. APEX will test the general hypothesis that low food abundance contributes to the decline of seabird and marine mammal populations in Prince William Sound. APEX researchers are sampling the stomach contents of forage fish to see if they are being affected by a lack of food. In addition, researchers are monitoring where the seabirds are feeding and what effect diet has on their reproductive success.

### **Why?**

APEX researchers have three major objectives: 1) to develop a long-term monitoring effort for the spill area, 2) to determine the relative abundance of forage species, and 3) to understand the relationship between forage fish and seabird populations. Some seabird species have been declining since the 1970s, with the Exxon Valdez Oil Spill exacerbating the problem. Should the documented decline of certain forage fish species continue, an entire food source could be eliminated and potentially devastate already threatened seabird and marine mammal populations.

## **Where?**

Fieldwork for the APEX project is being conducted in Prince William Sound (Naked, Jackpot, and Eleanor islands) and the Gulf of Alaska (lower Cook Inlet and Barren Islands). Analysis of data will occur at universities and facilities in Alaska, Washington, Texas, and Oregon.

## **When and for how long?**

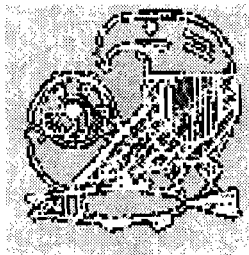
The APEX project began in 1994 through a project funded by the Exxon Valdez Oil Spill Trustee Council. Data collection and analysis started in the summer of 1995. The project is slated to continue for five years, with sampling and data collection occurring each summer and analysis and interpretation occurring during the fall and winter.

## **Why is APEX research significant?**

The results from APEX research are expected to help explain changes occurring in the northern Gulf of Alaska ecosystem. Some of these fluctuations are changes in species composition, such as those that have occurred with some species of fish, seabirds, and marine mammals. More importantly, the APEX project is designed to enable researchers to better understand why these changes have occurred and to, ultimately, help them to predict future ecosystem fluctuations.

## **Projects**

<b>APEX Overview - 1996 Field Season</b>	<b>Duffy</b>
<b>98163A Fish Population Sampling</b>	<b>Haldorson</b>
<b>98163B Seabird Interactions</b>	<b>Ostrand</b>
<b>98163C Fish Diet Overlap</b>	<b>Sturtevant</b>
<b>98163E Kittiwake Foraging and Reproduction</b>	<b>Irons/Suryan</b>
<b>98163F Guillemot Foraging and Reproduction</b>	<b>Golet</b>
<b>98163G Seabird Reproduction and Energetics</b>	<b>Roby</b>
<b>98163I Project Leader and Synthesis</b>	<b>Duffy/Gotthardt</b>
<b>98163J Barrens Nesting Study</b>	<b>Roseneau</b>
<b>98163K Large Fish as Samplers</b>	<b>Roseneau</b>
<b>98163L Historical Data Analysis</b>	<b>Anderson</b>
<b>98163M Cook Inlet Studies</b>	<b>Piatt</b>
<b>98163N Kittiwake Controlled Feeding Experiment</b>	<b>Romano</b>
<b>98163O Statistical Support</b>	<b>McDonald</b>
<b>98163Q APEX Modeling</b>	<b>Ford, et al</b>
<b>98163R Marbled Murrelets</b>	<b>Kuletz</b>
<b>98163S Jellyfish</b>	<b>Purcell</b>



For information about other EVOS projects,  
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