

Alaska Predator Ecosystem Experiment: Annual Project Report

Project Number 99163 O Statistical Review

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WEST biometricians have been involved in a range of consulting activities from March 1998 through March 1999. Activities have included collaborations with William Ostrand developing statistical sampling designs for ground truthing hydroacoustic surveys for bottom type classification at 25 near shore sites in Prince William Sound and development of a bootstrapping technique for analyzing resource selection data. These hydroacoustic data are also being used to estimate biomass density and total biomass over the same 25 near shore areas. In addition to statistical design, WEST used discriminant analysis techniques to develop a classification scheme based on indices developed from biosonics visual bottom typing software. Additionally, WEST consulted with William Ostrand and Tracey Gotthardt on geostatistical methods for development of maps of bottom type within the 25 nearshore sampling areas in Prince William Sound. Additional work in the upcoming year will include development of geostatistical models of bottom type for use in investigations of resource selection by sandlance.

WEST finalized a manuscript with Kenneth Coyle (Kern and Coyle 1999) documenting development of new statistical methods for analysis of non-randomly sampled hydroacoustic data. These methods will be presented in a poster session at the 10th anniversary symposium of the Exxon Valdez Oil Spill. The new methods will be used to make estimates of biomass density in the nearshore areas and to investigate temporal trends and to compare total biomass. These methods were based on the geostatistical methods known as Kriging but were modified to allow analysis of large data sets common to hydroacoustic surveys. The new methods allow statistically valid comparisons of mean biomass densities over spatial and temporal ranges.

WEST also worked with Dave Roseneau and Arthur Kettle at the Alaska Maritime Refuge in Homer Alaska reviewing existing monitoring protocols and discussing statistical analysis of those data. Additional consultations with APEX principal investigators has included interactions with: Greg Golet regarding diagnostic measures in logistic regression and analysis of capture-recapture data, Robert Suryan developing preliminary design of analyses to investigate the influence of prey availability on nest attendance for Black-legged Kittiwakes, Kathy Kuletz in analysis of marbled murrelet distribution data, and David Irons for general analysis of seabird data arising

from the APEX program.

WEST has attended and participated in the Annual EVOS Symposia.

References

Kern, J.W., K. O. Coyle. 1999. Estimation of the global block kriging mean with large sample sizes on irregular polygonal regions: Applications to acoustic surveys for zooplankton in the Western Aleutian Islands. *Canadian Journal of Fisheries and Aquatic Sciences* (Submitted).