

The first SEBSCC Pribilof Island Synthesis workshop was held Thursday and Friday September 20-21 in Seattle Washington

Present:

Ken Coyle -UAF

Jim Ianelli - AFSC

Jeff Napp -AFSC

Bruce Robson - NMML

Beth Sinclair - NMML

Phyllis Stabeno -PMEL

Gordie Swartzman – UW APL

Andreas Winter - UW

Absent:

Kevin Bailey - AFSC

Ric Brodeur - NWFSC

Lorenzo Ciannelli - UW

Mickle Flint – OINRO (Russia)

George Hunt - UCI

Patty Livingston - AFSC

Sigrid Salo - PMEL

Robert Schabetsberger -NWFSC

Lucy Vlietstra –UCI

The workshop focussed on three questions, gleaned from reading a group of synthesis papers, supporting literature and follow-up discussion at the workshop.

The questions are:

- I. Can an index for pollock year class strength be developed based on measurements of age-0 pollock abundance and distribution and perhaps other trophic information near the Pribilof Islands?

To this end there are two other important questions:

- II. Are the Pribilof Islands representative of EBS shelf-slope dynamics for pollock, their prey, and trophic dynamics?

--and--

- II. Are ocean conditions around the Pribilof Islands especially conducive to consistently high production?

Schedule and accomplishments of the workshop:

September 20

9:30 – 12:30 Overview of data matrix showing relevant data taken around the Pribilof Islands

We discussed and filled in a data matrix for available data by trophic level, region and year including SEBSCC data and a wide range of other literature, data product and gray literature sources. Our goal is to have this matrix and supporting references available as a web page to be completed by the SEBSCC meeting at PICES October 12, 2001.

We also discussed six candidate questions for inclusion and decided that the above three questions were cross-disciplinary, challenging and potentially addressable, to wit, we limited further discussion to them.

1:15 - 5 P.M. Introduction to relevant data and findings to date.

We had presentations and informal discussion on how the information relates to our focal questions. The presentations included:

- Acoustic Data Synthesis near the Pribilofs – Swartzman
- Trophic relationships from acoustic and net data - Winter
- Fur seal diving behavior, feeding distribution and diet – Robson
- Inner Front acoustic survey zooplankton-juvenile pollock dynamics - Coyle
- Why the Pribilof Islands have consistently high production - Stabeno

9:00 A.M. - 12:30 A.M. – Discussion

Discussion of how we can address the major questions suggested several other question-related action items to be addressed. These include:

1. How important is the Pribilof Islands as a source of pollock to contribute to pollock year-class-strength? None of us knew what percentage of recruitment could be said to be due to young-of-the-year pollock in the Pribilof Islands. This spawned the following action items:
 - a) Jim Ianelli will look at the acoustic estimates of juvenile pollock from the tri-annual pollock acoustic survey to see what percentage of it is in the Pribilof region and how variable this was from year to year.
 - b) Jeff Napp will look at summer survey net samples for pollock larvae and juveniles from the Oyosho Maru annual surveys to see what percentage of the overall sampled pollock (adjusted for sampling intensity) came from the Pribilof Islands.
2. Does pollock abundance around the Pribilof Islands, as measured acoustically in the SEBSCC acoustic project, improve the 'prediction' of pollock year class strength?
 - a) Gordie Swartzman will provide Jim Ianelli with an index of overall pollock abundance near the Pribilof Islands for 1994-1999, which Jim will put into the stock assessment program to see how it impacts the prediction of year class strength.
3. Do changes in pollock abundance near the Pribilof Islands affect the diet of pollock predators including fur seals, piscivorous birds (murre and puffins) and adult fish?
 - a) The idea is to use the large scat-based diet data set for fur seals, for bird stomach content data collected near the Pribilof Islands and for stomach content data for large piscivorous fish collected by the bottom trawl surveys and acoustic surveys near the Pribilof Islands.
 - b) Gordie Swartzman and Andreas Winter will produce indexes of acoustic abundance for various habitat regions, separated by fronts and bathymetric thresholds, along repeatedly sampled transects surrounding the Pribilof Islands.
 - c) Beth Sinclair will relate these data to scat-based diet information collected from rookeries on St. Paul and St. George, which are known to have different foraging distributions, to see if year-to-year changes in the percentage of age-0 pollock in the scats is related to age-0 pollock abundance and distribution around the Pribilof Islands (Although fur seals feed over a much larger area, scat data are likely to heavily represent the final feeding before hauling out, which will be near the Pribilof Islands for many seals).
 - d) We would like to do similar work to relate this abundance to diets of larger predator fish. We hope for help from Pat Livingston on the fish diets and from Robert Schabesberger for diets of larger fish collected on a SEBSCC cruise and possibly his help to work up stomachs from larger predator fish captured in the bottom trawls near the Pribilof Islands and not yet processed (1997-1999). We hope that Lorenzo Ciannelli, who has already looked at some of the groundfish diet data before 1997, will work on synthesizing those data with pollock abundance information.
 - e) We hope for ideas and help from George Hunt and Lucy Vlietstra on piscivorous bird diet information in attempting to relate this to age-0 pollock abundance and distribution around the Pribilof Islands. Another relevant question is whether pollock abundance around the Pribilof Islands is related to fledging success of piscivorous birds nesting on the Pribilof Islands? In other words, can bird fledging success be used as a surrogate for age-0 pollock abundance? We will explore this question at the PICES SEBSCC meeting.
4. Regarding comparison of the Pribilof Island production to other regions (Question II), Ken Coyle will work with Andreas Winter to compare acoustic pollock abundance and distribution (i.e. relative distribution in different habitats) between the SEBSCC Pribilof Island transects and Inner front project transects at Port Moller, Cape Newenham, Nunivak Island and Slime Banks for 1997-1999. These

appear to be the only available acoustic survey transects that overlap the SEBSCC Pribilof Island transects in time.

5. What conditions influence age-0 pollock abundance and distribution near the Pribilof Islands? Several aspects of this question are already being addressed as part of the habitat and acoustic survey projects. There is available information to shed light on this question including information about potential larval drift, food availability and depletion by pollock, proximity of pollock to their prey, diel migration patterns, and the effect of and importance of predators on pollock behavior and abundance. The following action items relate to these aspects:
 - a) Phyllis Stabeno and Sigrid Salo will look at drifter data to ascertain what percentage of the drifters released near pollock spawning areas actually drift toward and are entrained around the Pribilof and how this changed from year to year. We will try to relate this to age-0 pollock abundance.
 - b) Swartzman, Ciannelli and Winter will look at evidence for and amount of food depletion by age-0 pollock by i) comparing survey densities in 1996 and 1997 with densities from acoustic surveys in August of the same year ii) this will be integrated with pollock diet data and a modeling approach (Ciannelli) will compare model-predicted depletion with acoustic-derived zooplankton abundance estimates.
 - c) Winter will look at proximity of pollock to zooplankton using a measure of possible clustering of zooplankton patches around pollock schools. Earlier work, based on two years of data, suggested clustering is associated with lower density of prey.
 - d) Swartzman will relate diel migration patterns of pollock to strength and depth of the thermocline, condition and size of the pollock, abundance of prey (i.e. diel migration as a mechanism for increasing prey availability) and of age-0 pollock (i.e. importance of diel migration as a predator avoidance mechanism). Winter will compare regions where large schools of predators are encountered with predator free areas to see whether the proximity of predators affects pollock abundance, schooling and diel migration.
 - e) We hope to use survey-derived estimates of fur seal, piscivorous bird and piscivorous fish abundance near the Pribilof Islands along with diet data to estimate how much age-0 pollock near the Pribilofs is eaten by predators and how this changes from year to year. This might help provide a yearly index of predation effect on Pribilof Island pollock.