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North Pacific Fishery Management Council
Steller Sea Lion Mitigation Committee Meeting
May 16-18, 2006
Alaska Fisheries Science Center, Seattle

Minutes

The Steller Sea Lion Mitigation Committee (SSLMC) convened at the Alaska Fisheries Science Center on May 16-18, 2006. Committee members present were: Larry Cotter (Chairman), Jerry Bongen, Julie Bonney, Sam Cotten, Ed Dersham, Kevin Duffy, John Gauvin, John Henderschedt, Dan Hennen, Sue Hills, Frank Kelty, Terry Leitzell, Dave Little, Steve MacLean, Max Malavansky, and Mel Morris (alternate for Art Nelson). Also present were Bill Wilson (Council staff), Doug DeMaster (NMFS AFSC), Melanie Brown (NMFS SF), Kaja Brix and Shane Capron (NMFS PR), John Lepore (NOAA GC), Kristin Mabry and Scott Miller (NMFS AK Region staff), and several other NMML and AFSC staff.

Committee members were introduced and members of the public attending the meeting were acknowledged. Mr. Cotter introduced Dr. Daniel Hennen from the Alaska Sea Life Center who has been appointed to the committee by NPFMC Chair Stephanie Madsen. Mr. Cotter also noted that Frank Kelty has been appointed to replace Dustan Dickersen.

Chairman Cotter reviewed the agenda (attached), the work schedule for the coming several days, and Bill Wilson reviewed the handout materials provided to each committee member. The minutes from the last meeting were approved. Kristin Mabry presented a CD that contains the presentations, reports, and links to other information from the last SSLMC meeting as well as the interactive maps of SSL protection measures and the software required to view the maps. Ms. Mabry noted that this information also will be available through a SSLMC web site maintained at NMFS Alaska Region and linked through the Council's web site. New CDs will be issued to SSLMC members as new information is obtained; each will be marked with a version number. Kristin is available to answer questions at kristin.mabry@noaa.gov.

Mr. Cotter noted that he has appointed a subcommittee to work on an impact evaluation tool; this group will meet June 26 to work on the tool. The tool will be a way to mathematically express the effects of fishing activity on SSLs by gear type, season, and geographic location using weighting factors for each variable. Another option would be a tool using a zonal approach for weighing potential effects. Development of a straw man tool will be started by the subcommittee but will be fully developed by the entire SSLMC. The SSLMC discussed alternative approaches to evaluating tradeoffs and the kinds of data that may be required. The next meeting of the full SSLMC is June 27-29 at the AFSC in Seattle. Agendas for both meetings were handed out.

The remainder of the meeting largely consisted of presentations related to the work of the Committee. Presenters handed out documents, copies of their PowerPoint presentations, or referenced publications that might be of interest to the Committee. Those documents will be added to the CD and will be posted on the SSLMC's web site. That web site is under construction and will be tied to the Council's web site and housed on the NMFS web site server.

Melanie Brown provided an overview and update to the FMP consultation process. Ms. Brown noted that the consultation on sea otters is proceeding with the U.S. Fish & Wildlife Service and on salmon with the NMFS Northwest Region. Ms. Brown also reported that the Council's contractor recently completed work on a table that NMFS will use to identify endangered salmon ESUs in the salmon bycatch in Alaskan groundfish fisheries.

SSL Literature Compendium

Dr. Tom Loughlin presented a summary of the recently-completed compendium of SSL literature. Drs. Loughlin and Jack Tagart were contracted by the Council to produce an annotated bibliography and summary of research completed since the last FMP level consultation. Dr. Loughlin summarized the kinds of literature that has been published since 2000 in the following theme areas:

1. SSL life history (physiology/anatomy, genetics, reproduction and behavior, and miscellaneous studies)
2. SSL foraging (diet, searching for prey, models and hypotheses)
3. SSL vital rates
4. Fish assessment and fisheries
5. Ecosystems
6. Other anthropogenic effects
7. Predation
8. Disease
9. Contaminants
10. Management (no papers are in this category – not part of the contract)
11. Communications

The compendium will be available on the Council's web site, the SSLMC web site, and the next version of the SSLMC's informational CD. Dr. Loughlin went through the main issues covered in each theme area and answered questions. Mr. Cotter noted that the SSLMC might wish to provide comments on the compendium to the Council.

SSLMC Proposal Process

Mr. Wilson provided the SSLMC with a draft outline of the proposal process that might be used to obtain proposals for change in fishing regulations that might affect SSLs. The Call for Proposals would involve asking the public to suggest changes in regulations and to provide a clear rationale for the proposed change as well as potential impacts, alternatives, supporting data, and other information. The SSLMC generally felt that we should not ask for suggestions for offsetting measures foe each proposal although that would be an option on the Call for Proposals form.

Later in the SSLMC meeting, the committee agreed that a Call for Proposals should be issued soon. The Committee recommended to the Council that at their June meeting the Council approve calling for proposals to change regulations related to SSL protection measures. Proposals would be due in early August. Copies would be sent to Committee members as soon as possible for their review prior to the next meeting. The recommended schedule is presented at the end of these minutes.

Public Comment

Mr. Cotter invited the public to ask questions or comment on the information presented at this meting so far. Discussion focused on the recent Council actions on Pacific cod fishery management and how those changes in future regulations would be considered in the consultation. Shane Capron reported that the agency would not consider future regulations for changes in the FMPs as part of the proposed action since they have not been put into effect yet. Only those management measures that are in effect at the time the draft Biological Opinion is prepared would be considered part of the proposed action.

National Marine Mammal Laboratory SSL Program

Dr. Brian Fadely summarized the information collected by NMML SSL research programs involving SSL telemetry and movement and dive patterns. He also summarized recent SSL diet studies. The telemetry program has gathered information on SSL movements relative to rookeries and haulouts and to the nearest land, by season (summer or winter), and by region. Data were provided to the committee in handouts. Approximately 14,400 data points are available for analysis. The data have been analyzed to show differences in SSL movement and diving behavior by region, SSL age class, season, and correlation with oceanographic features.

New diet data from scat sampling has now been added to previous data for an analysis completed for the consultation (covering the years 1999-2005). The more recent data are very similar to the previous data. However, in recent scat samples halibut has been observed, capelin and sand lance are more prevalent in the GOA, and salmon also appear more frequently. Primarily adult pollock and Atka mackerel, as well as adult Pacific cod, are consumed when these dietary items appear in scat samples.

Alaska Sea Life Center SSL Program

1. Dr. Jo-Ann Mellish provided an overview of the Sea Life Center's SSL programs. These include studies of prey and predation, instrument development, long term captive animal research, disease and pollution studies, studies of SSLs in Russia, forage fish studies, the Chiswell remote site program, and the transient juvenile research program. Dr. Mellish provided details on the transient juvenile study program. This program involves capture of wild SSLs, short-term studies of body condition and other parameters in a quarantine facility, and release of these animals (with transmitters) back to the wild.

2. Dr. John Maniscalco presented the Sea Life Center's remote monitoring program on the Chiswell Islands. Remote cameras allow individual and group SSL monitoring in real time continuously during spring through fall months during daylight hours. Video is transmitted to the Center in Seward and technicians monitor SSLs for information on pupping, foraging, maternal care, predation, and disturbance. Dr. Maniscalco also presented data from Dr. Craig Matkin's transient killer whale studies. These data indicate that the diet of transients along the U.S. west coast includes up to 15% SSLs; transients in the western Aleutians have no recorded SSLs in their diet during spring months while transients in this area in summer have about 14% SSLs in their diet. Dr. Matkin concludes based on current data that transients in the areas he has studies consume few SSLs.

Discussion continued on the apparent disparity in data from various SSL and killer whale researchers. Some research suggests that transient killer whales potentially consume large numbers of SSLs while other researchers indicate SSLs form but a small proportion of their diets. Although diets vary considerably by season, area, and transient killer whale group, SSLMC members indicated their confusion about the apparent conflicting data.

3. Dr. Dan Hennen presented an overview of several studies at the Sea Life Center or from his former work at Montana State University. Much of this work focuses on the nutritional aspects of the junk food hypothesis for the SSL decline. Captive SSL studies of diet and body condition suggest SSLs eat more if the food item is of lower quality. SSLs appear to be plastic in their feeding; they will consume a variety of prey items and feed opportunistically.

Dr. Hennen also reported on studies of pollock proportions in SSL diets and effects on growth and condition; these data suggest no differences in body condition from a 100% pollock diet versus a mixed diet.

Finally, Dr. Hennen presented some of his work on the SSL decline and potential effects from the BSAI groundfish fisheries. These data are presented in his PhD thesis. Prior to 1991, there is a negative correlation between the SSL decline and fishing activity, and a positive correlation after 1991 suggesting appositive effect of increasing protection measures implemented after that year.

Discussion included the likely major effect on the SSL population from the prohibition of shooting imposed in 1992.

4. Sarah Norberg presented studies of SSL prey and the energy used by SSLs to capture prey. She also noted that the Sea Life Center is involved in studies of killer whale predation on SSLs. Ms. Norberg reported on SSL research techniques used at eh Center including body acceleration meters, foraging videography, capture buoys, captive SSL studies in Russia, and surgically implanted tags (that will stay with the SSL after molting).

5. Matt Meyers discussed SSL contaminants studies which focus on uptake and concentration of PCBs and DDT in SSL body tissues. He reported that some SSLs have fairly high levels of PCBs suggesting these animals obtained these body loads from prey items that have accumulated PCBs and that SSL PCB levels are high enough to suggest some potential concern over effects on SSL health. PCB levels are higher in Russian SSLs. Mr. Meyers discussed potential effects of higher PCB levels on SSL vital rates, reproduction, etc.

6. Jason Waite presented information on SSL abundance and trends in Russia. Some areas are currently in decline, while other areas show increasing trends in SSL abundance. The Sakhalin area has experienced a particularly steep rate of increase in recent years. Mr. Waite noted possible effects on SSL abundance in the Russian population including past Japanese harvest, incidental take in Russian herring fisheries, and natural causes. He also reported on biosampling, migration and movement studies using branding techniques, and diet studies using scat analyses.

University of British Columbia and NPUMMRC

Dr. Andrew Trites from UBC presented a suite of research summaries focusing on the various hypotheses for the SSL decline. The North Pacific Universities Marine Mammal Research Consortium, administered at UBC, includes UBC, UA, OSU, and UW. Dr. Trites presentation focused don two main areas of investigation: a summary of knowledge of the hypotheses for the SSL decline, and some ongoing and new research initiatives.

Dr. Trites noted that the junk food hypotheses, which initiated much of the SSL research in the past years, has evolved over time. Currently, that hypothesis suggests that pollock are a poor diet for yearling SSLs, less poor for older juveniles, and have little to no effect on adult SSLs. SSL diets vary, but in some areas SSLs have diet preferences. Dr. Trites also reported on his population viability analyses (PVAs) that model potential for extinction; PVA studies suggest that the western Aleutians continue to be of concern for future viability if trends continue into future decades while other areas such as the eastern Aleutians do not show these trends.

Dr. Trites reported on the captive SSL research at the Vancouver Aquarium including studies of the nutritional value of various dietary elements, effects of pregnancy and lactation on SSL condition, and weaning studies. Dr. Trites reported on a recent paper submitted for publication that suggests that a changing climate regime in the North Pacific since the late 1970s could be a major reason for a change in ocean conditions and in turn effects on SSLs and other marine organisms. Bottom-up forcing mechanisms may have had a large effect on SSLs and, in a declining trend, making the SSL populations more susceptible to larger effects of killer whale predation. Dr. Trites notes that this area is where he intends to continue research.

Discussion continued on the role of predation in the SSL decline. Dr. Trites suggests that when the SSL population is high, killer whale predation may not be particularly significant, but at low population size, such predation may be significant. He recanted that ocean climate is likely the driving force behind the SSL decline. Discussion also focused on the effects of shooting on the SSL decline. While this is an important part of a PVA, Dr. Trites noted that obtaining reliable data is difficult but that perhaps this could be re-examined and new analyses conducted.

Dr. Trites reported on some new areas of investigation. For example, SSL haulouts appear to be used for copulation and thus may merit closer study and be considered areas susceptible to disturbance during the early breeding season. Other areas that the Consortium is studying or focusing research effort on include:

- Stress hormones (e.g. cortisol in SSL feces)
- Energy density of diets over time
- Fine scale foraging
- At-sea behavior using real time telemetry
- Observational work (e.g. UBC Steller Watch program)
- Killer whale diet specialization
- Captive SSL studies of prey quality, blood chemistry, thermoregulation
- Open water SSL bioenergetics
- Blubber fatty acid analysis
- DNA in SSL scats to identify diet preferences
- Focused studies of fishery overlap with SSLs and modeling of competition for prey, effects of fishery management alternatives, economic effects of management alternatives
- SSL tag development
- Information dissemination, publications

Alaska Department of Fish and Game SSL Program

Dr. Lorrie Rea presented an overview of ADF&G's SSL monitoring and research programs. ADF&G's work concentrates in southeast Alaska and the eastern SSL stock. Dr. Rea presented program overviews on SSL population dynamics, physiology, and foraging ecology.

The State's SSL population studies include aerial surveys and brand resighting. Site-specific research focuses on Lowrie, Forrester, and other islands that are habitat for the eSSL. Dr. Rea presented data for eSSLs on reproduction rates, weaning, pup survival, and other information including entanglement observations. Overall, these data suggest that the eSSL population is healthy and may be reaching carrying capacity of its habitat. Dr. Rea noted that in Glacier Bay there is some overlap of the eSSL and wSSL and some interbreeding of these stocks has occurred there.

Dr. Rea noted that the physiological studies have focused on body condition, health, and diet to help understand what constitutes nutritional stress. Studies include age determination, fatty acid analysis (blubber), stable isotope studies of diet elements and SSL tissues, and other physiological measures of SSLs nutrition.

SSL diving studies include SSL telemetry work and investigations of diving physiology (blood chemistry). Foraging trip duration studies involve measurement of time at sea, frequency of diving, dive depths, day/night foraging differences, and individual SSL variation in these parameters.

Dr. Rea also reported on studies of contaminants and diseases, primarily in the eSSL population, including work on heavy metals, PCBs and DDT. Work also includes SSL immune responses to contaminants exposure, and necropsy studies for disease agents and parasites. Hookworms are highly

prevalent in SSL pups under 5 months of age. While hookworm prevalence is high in the eSSL population, there are little data for the wSSL; future work will include more sampling in the wSSL population.

SSLMC Discussion

The Committee took a break and during a working lunch discussed initial impressions of the information heard so far. The following comments were made:

- Some suggested that much SSL research since 2000 has been in some areas where the concerns over SSL declines are not as prevalent, such as in southeast Alaska, Prince William Sound, and Russia. Reasons for this work include the ease of permitting in Russia, the need for comparative data between the eSSL and wSSL populations, and the Exxon Valdez oil spill. Some suggest more emphasis in current and future SSL research should be in the western Aleutians or other sub areas where the decline continues.
- It seems that there is increased importance to SSLs in the close-to-shore zones around rookeries and haulouts. Areas further away seem to be viewed as less critical, although there is seasonal variability. Dr. Hennen noted that in his work commercial fishing in the 10 to 20 n mi zones had the strongest correlations to the SSL decline.
- Data seem to show that SSLs in the western area are healthy, at least as healthy if not more healthy than animals in the eSSL area, but yet productivity of the wSSL is lower. This raises a question – how to craft protection measures appropriate to each area.
- Some suggest that a review of the archeological record for ancient SSL harvests in Native middens could shed helpful light on the SSLMC's work process. The Aleutians East Borough is dong such work, and will contact the SSLMC for a possible future presentation. Herb Mischener will be the contact. It was noted that the Aleut word "cod" means the fish that were not there – suggesting variability in abundance of this species in historic times.
- How will the SSLMC use the large amounts of information that is now available. And what will be the process for judging how the conclusions that will be presented in the upcoming draft Biological Opinion are in line with this information. The SSLMC will work to craft SSL protection measures using this new information, but how will the Committee use the draft BiOp in concert with this new information. Perhaps some feedback or synthesis of this information could be obtained from experienced researchers – ad guidance to this Committee. Some believe that a senior SSL scientist would be helpful in guiding the Committee's future work.
- Mr. Cotter noted that the new information we receive will form the basis and justification for the recommendations this Committee develops. He also noted, however, that it would be helpful if NMFS PR could provide some feedback at this stage in the process as to how this new information may affect future decision making.
- Dr. DeMaster provided some summary comments:

1. The draft SSL Recovery Plan will have a synthesis of information and will be helpful in informing the Committee on the agency's view of the new information
2. The draft BiOp will integrate new information as it re-examines existing fisheries and appropriate SSL protection measures
3. The Fishery Interaction Team studies have provided valuable information on fishery effects on the SSL prey fields
4. New information on SSL weaning suggests that it occurs over a 2 to 3 year period of time, and coincides with the pup's birthday, and thus the seasons of weaning is now viewed as the May-July period as opposed to the previous concerns over the January-March period. Perhaps this will affect our view of what seasons may be more stressful to weaning pups.

5. Available information suggests that the eSSL may be near carrying capacity of its habitat. The draft SSL Recovery Plan will recognize this and provide criteria for possible down listing or delisting of the eSSL and wSSL.
6. The 2003 BiOp Supplement evaluated the effects of SSL conservation measures with data on zonal catch rates. Updating these data may be helpful in developing the tradeoff tool (impact evaluation tool).
7. New publications from the Consortium on chronic nutritional stress, and the Springer et al. model, collectively provide alternative models or mechanisms for the SSL decline.
8. The Loughlin and Tagart SSL literature compendium provides a synthesis of scientific publications since 2000 in the 11 theme areas that correspond to the hypotheses for the SSL decline; this review will help inform the Committee as it proceeds with its work.

The Committee discussed how to deal with the ESA required burden of proof issue, and how this might guide the Committee's future work. John Gauvin suggested that the Committee should focus its efforts on defining fishery effects on localized prey fields; the focus should be to determine to what extent fishing disadvantages SSLs as opposed to more broad attempts to determine what caused the SSL decline.

The Committee also suggested including temporal effects of fishing in the tradeoff tool (so that the seasonal split issues might be revisited).

Terry Leitzell noted that the Committee may be able to change the mix of SSL protection measures yet retain the same level of protection. Seasons might be shifted, splits changed, etc. in such a manner as to maintain a level of protection necessary for SSLs based on the new scientific information.

The Committee also discussed whether economic information might be needed.

Fishery Interaction Team Study Update

Dr. Libby Logerwell, AFSC, presented an overview of the Fit program. Her presentation summarized several studies of fishing effects on SSL prey – Pacific cod, pollock, and Atka mackerel.

The pollock studies have occurred near Kodiak in Chiniak and Barnabas Troughs. One area is a control area (no fishing) and the other a treatment area (fishing allowed). The experimental design requires pollock surveys before and after fishing in both areas to determine if fishing has caused reductions in pollock biomass. Previous studies resulted in equivocal findings, and the experiment will be repeated in three future years to obtain additional data.

Dr. Logerwell reported on the opportunistic pollock acoustic data collection efforts by commercial fishing vessels in the southeastern Bering Sea. For the years 2002 – 2006, vessels will collect acoustic data on pollock schools before and after fishing. The data will be evaluated by AFSC scientists to determine if any localized depletion can be observed in these data sets.

The FIT has conducted a Pacific cod study near Cape Sarichef. This was to study the effects of trawling on abundance of cod and the effectiveness of trawl closures around SSL rookeries in the area. The work involved tagging cod and then recapture of tagged cod inside and outside closed areas before and after commercial cod fishing. The findings suggest there is no effect of fishing. The tagging study also showed cod move considerable, and this is likely the reason for no fishery effect noted. This study will shift to work on cod movement patterns.

The FIT also studies Atka mackerel movement and trawl exclusion zones in the Aleutians. The issue was whether such exclusion zones were effective in maintaining Atka mackerel prey fields for SSLs. The study involved tagging mackerel and recapturing fish inside and outside exclusion zones in several areas

in the Aleutians. Results showed Atka mackerel moved into and out of these zones with no distinct patter noted. In some areas movement in was higher than movement out; yet in other areas the reverse was noted. Bathymetric features in these areas may have an effect. This study will continue with tag releases to study Atka mackerel reproduction and feeding behavior.

Testing the Sequential Megafaunal Collapse Hypothesis

Dr DeMaster presented an overview of the DeMaster et al. (2006) paper that refutes some of the assumptions and findings in the Springer et al. (2005) megafaunal collapse paper. Dr. DeMaster pointed out the key assertions in the paper, and then summarized data that were counter to some of these assumptions. He and his coauthors noted that the Springer et al paper made some assumptions not supported by available data: whale biomass during the decline was reported from catch data, not biomass data; many species of large whales did not decline but rather increased in that period or were stable; available data suggest that large whales do not constitute a large proportion of killer whale diets; data on harbor seal declines are very minimal and possibly incorrectly reported; the decline of harbor seals, SSLs, and fur seals was not sequential but rather concurrent and sequential mixed; SSLs have shown signs of nutritional stress during the period reported by Springer et al. which is inconsistent with a predation-caused decline. DeMaster et al. suggest alternative hypotheses: perhaps the impacts of killer whales on pinnipeds and sea otters was initiated from the recovery of gray whales which offered a new large food source that induced the killer whale populations to increase in numbers and expand their predation behavior; or perhaps the carcasses from whaling offered an abundant food source for killer whales with consequent effects as noted above; or perhaps multiple factors were involved.

State of Alaska Groundfish Fishery Management Program

Herman Savikko from ADF&G reviewed the State's groundfish fishery management program. The State manages fisheries in four management areas (three areas currently have fisheries) and uses such measures as logbooks, catch accounting, biomass estimation, tag return awards, and other regulatory measures to aid in managing these fisheries. Most areas have Guideline Harvest Limits (GHLs), trip limits, bycatch caps, and reporting requirements. Some fisheries are under limited entry systems; some have observer requirements.

SSLMC Discussion of Schedule and Future Work

Mr. Cotter reviewed a suggested approach for the Committee's future work. This would involve the following steps:

- Recommend to the Council during their upcoming June meeting that a Call for Proposals be issued. Proposals would be due in early August.
- The SSLMC meets August 22-24 to review and categorize proposals. Proposal makers would present their proposal and substantiating data if they prefer to do so although this would be optional to the proposal makers. The Committee would make an initial review of each proposal and identify additional information it will need; request information as needed from the proposal makers or from the AFSC or other data source. If the draft BiOp is available, conduct an initial review.
- The SSLMC meets September 20-22 to make a detailed review of proposals including the additional data requested. Draft a package of recommended proposals for Council review. Review the draft BiOp if not available until now; prepare comments and recommendations for the Council.
- The SSLMC meets October 24-26 to consider the recommendations from the Council and further refines proposals. Prepare the preferred package for NMFS review (PR).

- After NMFS PR review, SSLMC meets to consider NMFS comments, modify the proposal package, or make other recommendations for Council action in December. This SSLMC meeting could occur the day before the Council's December meeting.

The Committee discussed the need for defining the overall goals of the Committee's work – the "rules of engagement" that will guide its work. What can the Committee do or not do; what are the constraints. Mr. Cotter suggested the Committee do this at their June meeting.

Dr. Sue Hills noted that she intends to communicate with her fellow SSC members. She will obtain some initial feedback and guidance from the SSC on the tradeoff tool; she will do this prior to the June 26 tradeoff tool development subcommittee meeting. Dr. Hills will seek advance thoughts and concerns that will help the Committee prepare the tradeoff tool.

Adjourn

The Committee adjourned at 4:30 PM Thursday May 18. The next meeting will be at the AFSC on June 27-29, although June 30 will be included in the schedule in case additional time is needed by the Committee. The subcommittee of the SSLMC working to develop a straw man tradeoff tool will meet June 26 at the AFSC.

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