

**MEETING OF THE PACIFIC SCIENTIFIC REVIEW GROUP
SOUTHWEST FISHERIES SCIENCE CENTER, HONOLULU, HI
30 MARCH - 1 APRIL 1998**

The seventh meeting of the Pacific Scientific Review Group (SRG) was held at the Southwest Fisheries Science Center in Honolulu, HI on 30 March - 1 April 1998. All Pacific SRG members were in attendance. Also participating were Meghan Donahue, Barb Taylor, Sarah Mesnick, and Bob Brownell from SWFSC in La Jolla, Paul Wade of the Office of Protected Resources, and Bud Antonelis from the SWFSC in Honolulu. For the discussion of Hawaiian marine mammal stocks, participants included Whitlow Au, Adam Frankel, Emily Gardner, Bill Gilmartin, Walter Ikehara, Mark Lammer, Tom Lawrence, Naomi McIntosh, Joe Mobley, and Gene Nitta. Meghan Donahue and Michael Scott served as rapporteurs. Participants and observers are listed in Appendix 1, background documents provided to the group are listed in Appendix 2, and the agenda of the meeting is in Appendix 3. The meeting was chaired by Robin Brown.

Robin Brown thanked Hannah Bernard and the staffs of the SWFSC in La Jolla and Honolulu for organizing this meeting and the authors of the sperm whale summary paper (Taylor, Barlow, and Heyning) for providing such a complete background document for the SRG's discussion. The two major topics for this meeting were the sperm whale Recovery Factor and Hawaiian marine mammals.

SPERM WHALES

The SRG has devoted much attention to sperm whales because of the uncertainties surrounding the values needed to calculate PBR and because fishery mortality has exceeded PBR. A series of summary papers have been prepared for the SRG on sperm whales (Hester 1996, Taylor 1997, and, for this meeting, Taylor, Barlow, and Heyning 1998). At the beginning of the PBR process, the SRG considered that abundance estimates and the PBR may have been underestimated for the following reasons:

- 1) The original abundance surveys (CAMMS and PODS) covered only the EEZ off CA. The resulting abundance estimates were thought to be negatively biased because the EEZ off OR and WA had not been covered. However, a subsequent survey of the entire EEZ off CA, OR, and WA (ORCAWALE) produced an abundance estimate that was actually slightly less than the earlier CA-only surveys.
- 2) Sperm whales are known to migrate long distances seasonally and it was thought the stock boundaries extended beyond the EEZ and, thus, abundance was

likely to be underestimated. This question was a major topic of this meeting.

3) Sperm whales are deep divers and it was thought that diving whales would be missed during a survey transect, leading to an underestimate of abundance. However, dive time data were collected and a correction factor for unobserved whales was calculated to adjust the abundance estimates. Subsequent comparisons of visual sighting and acoustic data during the SWAPS cruise corroborated the appropriateness of this correction factor.

4) Sperm whales are legally determined to be endangered and thus the default Recovery Factor has been set at 0.1. Considerable SRG discussion has focused on increasing the Recovery Factor because it has been argued that the species may not truly be endangered and because Nmin may be so conservative that a greater Recovery Factor may be warranted. This question was also a major topic for the SRG's discussion.

5) It was thought that abundance might be underestimated because the survey season did not match the fishing season and may not have matched the season of maximum sperm whale abundance in CA. Subsequent research cruises in February (TTOPS) and more-detailed analysis of whaling data indicated that the original surveys had occurred when sperm whale abundance was at a seasonal peak.

6) Results of the recent SWAPS survey suggests that group sizes may be underestimated for previous surveys. Work is ongoing to determine if this factor indeed has negatively biased previous abundance estimates.

7) Mortality estimates may be biased to an unknown degree. Whales that entangle but tear free carrying net fragments may die later, while whales that are thought to be seriously injured and counted as mortalities may, in fact, survive. Questions have also been raised whether the mortality estimation procedures correctly model the occurrence of rare events such as sperm whale entanglements. These topics were not discussed during this meeting.

As indicated above, many of the uncertainties about negative bias have been addressed by NMFS research during the last 2-3 years. Two major questions remain, however: Are sperm whales truly endangered and should a greater Recovery Factor be applied? Is the current stock area too small and should either Nmin or the Recovery Factor be adjusted upward.

Bob Brownell reviewed the history of the sperm whaling industry, with emphasis on the effects of the large-scale under-reporting of USSR catches. He reviewed data for Soviet factory ships operating in the North Pacific between 1949 and 1979. Catch records for two of the five North Pacific pelagic operations for six years

between 1963 and 1973 were available and were compared to the officially reported catches for this period. The main areas of operation for these two factory ships between 1963 and 1973 include the Bering Sea, the Gulf of Alaska, and off the west coast of North America. During these years, a total 66,950 sperm whales were taken in the North Pacific by the two Soviet factory ships, however, only 37,275 of these catches were officially reported. Females were vastly under-reported (by a factor of 9.6x), and males were under-reported as well (by a factor of 1.8x). If one applies the same proportion of unreported sperm whales catches to the remaining three Soviet factory ships operating in the North Pacific during these years, the true catches of sperm whales would be 40% higher than those officially reported. The conservation implications of Soviet sperm whale catches in the North Pacific include the following: 1) populations must have been greatly reduced from their pre-exploitation levels; 2) the reduction in the number of breeding males may have reduced the pregnancy rates; 3) the removal of both sexes may have increased mortality of surviving whales and their calves as the family units lost important pod members. Brownell stressed the need to obtain original catch records (including information on size, sex, and location of catches) for all the Soviet pelagic operations. He feels some of these data must still exist and that they are necessary to better understand the current status of sperm whales, especially in the eastern North Pacific.

Barb Taylor reviewed the SWAPS abundance estimates using both visual and acoustic data. Barlow and Taylor (see background document) estimated 39,200 sperm whales in the study area from acoustic data and 24,000 whales from sightings data. There was no indication of hiatuses in distribution that would suggest an east-west stock boundary. Group size estimates appear to be a potential source of negative bias for the abundance estimates. The SWAPS cruise results suggested that at least an hour is required observing the group to accurately estimate its size. This suggests that group-size estimates from previous cruises (CAMMS, PODS, and ORCAWALE) could have been biased low. It is interesting that the typical subgroup size of 7-10 seen in large groups during the SWAPS survey is the same as the typical group size seen off CA during previous cruises. Taylor will be re-examining previous cruise data to see if group size and abundance should be re-estimated. She will be looking at the length of time spent with the animals, behavioral observations, and whether the ship was in passing or closing mode to evaluate the accuracy of the estimates and use the SWAPS data to calibrate the group-size estimates if necessary. The SRG supported this approach and recommended that NMFS devote sufficient resources to complete this study rapidly.

Sarah Mesnick reviewed some preliminary genetics analyses that included biopsy data from the SWAPS cruise. She found genetic differences using two different molecular markers that suggested that there was east-west stock structure. While the data are preliminary, they suggest that the whales outside the US EEZ (offshore) may

be different than those off CA and in the Gulf of California. To date, no significant differences have been found between CA, the Gulf of California, and the Galápagos Islands, but the sample size from CA is very small. Two caveats were given that may bias the results: 1) many samples were taken from the same group which may be comprised of closely related individuals, and 2) differences were primarily found between sampling periods almost 20 years apart and may be influenced by temporal changes in gene frequencies. Barb Taylor pointed out that photo-identification studies have found no matches between the Gulf of CA and the Galápagos Islands.

Barb Taylor also reviewed Discovery tag recoveries that indicate whales wintering off CA move NW (offshore) in the summer. No evidence from the tagging data indicate movements to the south or directly offshore. To advance our knowledge about sperm whale stock structure, more samples will need to be examined, particularly off CA, OR, and WA in the Gulf of Alaska, and outside the EEZ. The SRG recommends increasing these sample sizes by obtaining and analyzing Japanese historical data, advancing methods for analyzing formalin-preserved specimens, and collecting biopsy samples from sperm whales that may be encountered by observers of fisheries in the Gulf of Alaska. The SRG also recommends that more information on seasonal movements be collected from telemetry studies that would also help differentiate stocks.

Paul Wade discussed the mathematical bases for the default Recovery Factors. The simulation study predicts that setting a Recovery Factor of:

0.1	will cause <5% delay in recovery time	and reach equilibrium at >95% of K
0.15	will cause <10% delay in recovery time	and reach equilibrium at >91% of K
0.5	will cause <40% delay in recovery time	and reach equilibrium at >75% of K
1.0	will cause >>100% delay in recovery time	and reach equilibrium at >50% of K

The Alaska SRG has recommended a Recovery Factor of 0.15 (rather than 0.1) for the endangered western stock of Steller sea lions based on the above analysis.

The SRG believed that there is currently no reason to change the current stock boundaries or the estimates of N_{min} , although it supports a study to show whether group-size estimates can be improved for past and future surveys. The SRG could give no recommendation regarding changing the Recovery Factor. One argument against changing it for sperm whales is that there are no guidelines for changing the Recovery Factors of endangered species that could lead to a consistent management system. The SRG recommended that the NMFS develop a classification of endangered species that would categorize them by level of risk of extinction and suggest different Recovery Factors for each category.

HAWAIIAN MARINE MAMMALS

The Pacific SRG previously recommended a comprehensive survey of the Hawaiian archipelago to fill the large gap in our knowledge about the abundance and status of Hawaiian cetacean stocks, but such a survey is unlikely for the next three years. The SRG recommended that smaller-scale research projects be initiated to assist in monitoring dolphin mortality and trends in abundance, such as:

- 1) Initiate a comprehensive stranding program to recover marine mammals from the Hawaiian Islands. This would allow trained personnel to examine carcasses for evidence of gunshots or fishery interactions, and to collect life history data.
- 2) Conduct photo-identification studies of bottlenose dolphins and other species that would be good indices of the effects of fishery interactions. Such studies could allow monitoring for evidence of non-lethal gunshots or fishery interactions, to monitor abundance using mark-resight methods to detect potential declining trends, and to take biopsy samples for genetic analysis. Photographs and biopsy samples could also be collected opportunistically during surveys conducted for other research purposes.
- 3) Conduct radio- or satellite-tracking studies of bottlenose, spinner, and spotted dolphins to determine home ranges and to infer population structure.
- 4) Update assessments of fisheries interactions with marine mammals. This could be aided by coordination with the monk seal program to obtain observer mortality data from domestic and foreign fisheries operating near Hawaii.
- 5) The SRG also supported the recommendation of the Hawaiian monk seal Recovery Team to increase observer coverage of longline fisheries from 4-5% to a statistically significant level.

The SRG wanted to review current marine mammal programs in Hawaii at this meeting and to suggest further research studies and management actions. Seven presentations on Hawaiian marine mammal programs were given at the meeting and included the following topics: 1) Hawaii survey results regarding ATOC and LFA projects (Mobley/Frankel); 2) State Marine Mammal Program of the Hawaii Department of Land and Natural Resources (Gardner); 3) review of the Hawaiian Islands bottomfish fishery (Ikehara); 4) review of marine mammal-fishery interactions (Nitta); 5) update on the Hawaii marine mammal stranding program (Nitta); 6) summary of the Hawaii humpback whale sanctuary program (McIntosh); 7) and an update on the Hawaiian monk seal recovery program (Antonelis).

Acoustic Thermometry of Ocean Climate (ATOC) Project

Joe Mobley presented the results of the aerial surveys flown throughout the main Hawaiian Islands as part of the Marine Mammal Research Program (MMRP) of the ATOC project, which was designed to determine average water temperatures on an ocean-wide basis. The MMRP investigates the potential effects of the low frequency ATOC sound on humpback whales and other marine mammals. The main goal of the line-transect aerial surveys are to assess the densities of marine mammal in the research area. Visibility biases will also be determined. Four complete surveys are required as part of the MMRP. The 1998 survey has not yet been completed. The other three surveys were conducted annually between 1993 and 1995 and serve as a baseline because the ATOC source was not operational during those surveys. The survey area covers all the main Hawaiian Islands out to 25 nm offshore. Humpback whales were generally aggregated in shallower water while odontocetes were more widely scattered throughout the research area. Sperm whales were seen near the outer perimeter of the survey area mostly off northern Kauai where there was high effort. Abundance estimates from the surveys should be published by late Fall 1998.

Adam Frankel summarized the preliminary results of the Hawaii playback experiments being conducted under the MMRP. In 1993 and 1994, MMRP scientists observed baseline whale behavior and distribution off the northern shore of Kauai, the site of the Hawaii ATOC sound source. In 1996 the MMRP conducted a series of playback experiments off the Kohala coast of Hawaii to determine the reactions of whales to an ATOC-like sound source. The playback signal, called an m-sequence, consisted of a computer-generated rumble that is essentially identical to that used in the ATOC oceanographic experiment off California. The primary objective of the playback experiment research is to determine the response of humpback whales to the m-sequence and to determine the relationship between the sound level and the level and type of response in the whale. In 1996, 84 playback trials (50 m-sequence and 34 control) were conducted. Preliminary findings indicate no apparent difference in whale tracks between the m-sequence and control experiment sessions, but subtle behavioral changes may be revealed by more-exhaustive statistical analysis currently being conducted.

Frankel also gave a brief synopsis of the Low Frequency Active (LFA) project, which is a Navy-sponsored anti-submarine warfare project that uses low frequency active sonar. There are three research phases to the project, the third of which involves acoustic and visual observations of humpback whales off Hawaii. This phase of the research project will attempt to determine the potential effects of low frequency sound signals on the behaviors, vocalizations, and movements of humpback whales. The acoustic source level for the marine mammal experiments has been 195 dB, but actual operational source levels may apparently be as high as 240dB. No significant responses by humpback whales were detected at a source level of 198dB and received levels of 150-155dB.

Hawaii Department of Land and Natural Resources Marine Mammal Program

Emily Gardner reviewed the State of Hawaii's marine mammal program. Gardner serves as a liaison between the State, federal agencies, universities, and other research groups. The Dept. issues research permits for marine mammals and sea turtles, develops management plans and public outreach programs. This program is not well funded or staffed, however. Gardner is seeking funding to 1) maintain 6-10 monk seals in captivity to study reproduction, behavior, physiology, and disease (in conjunction with Dr. Shannon Atkinson at the Hawaii Institute of Marine Biology), 2) rehabilitate sick or injured sea turtles, 3) educate the public about these protected species.

Hawaiian Bottomfish Fishery

Walter Ikehara of the Hawaii DLNR briefed the group on the status of the Hawaiian Islands Bottomfish Fishery. The hook-and-line fishery targets 12 major species, which consist mainly of jacks, snappers, and groupers. The fishing depth ranges from 10 to 150 fm with the main species being caught between 50 and 120 fm. New rules recently issued by the Board of Land and Natural Resources govern bottomfish fishing in Hawaiian waters and limit the number of fish that can be caught, the areas where fishing for these species is allowed, and the type of gear that can be used. Ikehara relayed that fishermen have complained about dolphins stealing fish and bait, but no data exist to indicate if or how often these interactions may be occurring. There has been anecdotal information that dolphins have been caught in this fishery and interactions are thought to occur primarily with bottlenose dolphins (*Tursiops truncatus*) and rough-toothed dolphins (*Steno bredanensis*). The State does not collect marine mammal interaction data and fishermen do not report such interactions because the State's interpretation of a "take" is very strict, making reporting of interactions potentially self-incriminating. It was noted by the group that this situation conflicts with federal regulations, specifically the Marine Mammal Protection Act, which requires fishermen to report interactions with marine mammals.

Review of Hawaii Marine Mammal-Fisheries Interactions

Gene Nitta of the NMFS reviewed the available information on marine mammal-fisheries interactions in Hawaiian waters. He reiterated that interactions apparently occur with the bottomfish fishery in both the Main and Northwestern Hawaiian Islands. In the Northwestern Hawaiian Islands (NWHI), monk seals are probably less involved in such interactions than bottlenose dolphins. Fishermen say that only a few animals are responsible for the interactions. There is anecdotal information that dolphins interact with the pelagic handline fishery as well. More solid data on marine mammal interactions is available for the federally-regulated longline fishery. This fishery has approximately 4% observer coverage. Observers are primarily concerned with documenting sea turtle interactions although they do collect some information on marine mammal interactions. Nitta presented marine mammal

entanglement and mortality data from this fishery's observer program from 1994 through 1997. Encounters (hookings or entanglements) occurred for five identified marine mammal species (data presented by Nitta and subsequently updated by Dr. Pierre Kleiber).

Species	1994	1995	1996	1997	
Risso's dolphin	0	2	1	1	
Spinner dolphin	0	0	0	1	
Bottlenose dolphin	0	1	0	0	
False killer whale	0	0	0	1	
Pilot whale	0	0	1*	0	*mortality
Unid. whale	0	0	1	0	
Unid. cetacean	0	0	1	0	

Although extrapolated mortality and entanglement estimates have not yet been made for these data, scientists at the NMFS Honolulu Laboratory saw no reason why such estimates could not be produced. The extrapolated estimates for mortality and entanglement would likely be on the order of 20 times the observed interactions. On the basis of this information, the fishery's classification could be changed from Category III to a Category II.

Hawaii Marine Mammal Stranding Network

Currently the Hawaii Marine Mammal Stranding Network is run on the federal level and consists of state, county, and federal agencies, and a few authorized veterinarians. There are no volunteers involved in the network. The average annual number of stranding incidents is twelve. Fiscal and human resources are currently the most limiting factors for the network.

Hawaiian Islands Humpback Whale National Marine Sanctuary

Naomi McIntosh presented information on the National Marine Sanctuary Program's education and research efforts in the Hawaiian Islands. Education and research are the program's main priorities and sanctuary-funded projects generally focus on humpback- and habitat-related research. The Sanctuary recently established an advisory council with members from various governmental and public organizations who provide advice and recommendations to the National Oceanic and Atmospheric Administration (NOAA) and the State of Hawaii regarding the Sanctuary's management plan.

Hawaiian Monk Seal Recovery Program

Bud Antonelis of the NMFS reviewed the Hawaiian monk seal recovery and research efforts. Field work continues to evaluate the status and trends of the monk seal populations, the natural history traits such as survival, reproduction, growth,

behavior, and feeding habits, and the success of various activities designed to facilitate population growth. The total mean beach counts have declined by an average of approximately five percent per year since 1985 at all the main sites. During the last three years, population estimates have remained stable at about 1300-1400 seals. However, future declines are likely due to the high mortality rate of juveniles at French Frigate Shoals (FFS). In 1997, high mortality of pups appears to be a major factor limiting the recovery of the populations at FFS and Laysan Island. The number of pups born at the main reproductive sites continues to be variable. In 1997, field studies were conducted at all of the main reproductive sites in the NWHI.

In addition, three management activities were conducted by the NMFS's Honolulu Laboratory to enhance the recovery of the species. These activities included: 1) removal of marine debris from study sites and entangled seals; 2) removal of debris from sections of reef at FFS, and Pearl and Hermes Reef, assessment of the extent of reef fouling, and determination of the feasibility of large scale debris removal; 3) and translocation of weaned pups within FFS to increase their probability of survival. The seals currently in captive care continue to be monitored although an active search for new housing is underway. Investigations regarding the eye disease found in the captive seals continue. Research priorities identified by the Monk Seal Recovery Team include continued island-specific demographic and management activities, relocating the captive seals as soon as possible, removing aggressive males at FFS to reduce the risk of pup mortality, continue efforts to remove marine debris from beaches, seals, and coral reefs at major reproductive sites, refine island-specific population models to facilitate management efforts, investigating the potential shark problem at FFS, completing the three-year research plan, completing the foraging ecology plan, recovering the population at Midway Island, and assessing the level of human interaction on the main Hawaiian Islands. The SRG reviewed and discussed the latest recommendations for monk seal recovery efforts made by the Hawaiian Monk Seal Recovery Team and supports those recommendations.

POSSIBLE TOPICS FOR A JOINT SRG MEETING

The Atlantic SRG has proposed a joint meeting of the SRGs in the fall of 1998 to discuss topics of mutual interest. The Pacific SRG suggested the following items for the agenda of a joint meeting:

- 1) Review NMFS draft plan, recommended by this SRG, to fine-tune the Recovery Factor defaults for endangered species.
- 2) Review transboundary issues so that stocks and fisheries (and even marine debris) that extend beyond the US EEZ can be better managed.
- 3) Relationship of SRGs and NMFS –standardize the recommendation process and the relationships between NMFS and the different SRGs, and discuss the future role

of the SRGs

- 4) Review new proposed ZMRG definition
- 5) SAR revision schedule update.

For the normal meeting of the Pacific SRG, the suggested topics are:

1) Harbor porpoise stock structure and fishery mortality. It would be useful to invite experts on this species from the other SRGs for this discussion.

2) Review killer whale stock structure, perhaps in conjunction with the Alaska SRG.

3) Sea otter population decline and potential mortality in gillnets in Monterey Bay.

4) Review 1997 mortality for the CA drift net fishery.

5) Update on Makah grey whale harvest.

6) Update on NMFS recommendations to Congress on pinniped-human interactions, studies on pinniped predation on salmonids, and studies on pinniped life history.

7) Review appropriate SARs. Based on priorities listed during the SRG's previous meeting, 1997 mortality data from the CA driftnet fishery, and the species of special interest for the fall 1998 meeting, revised SARs would be reviewed for all harbor porpoise stocks, all killer whale stocks, other stocks shared with the Alaska SRG (gray whales, humpback whales, eastern Steller sea lions), sperm whales, pilot whales, monk seals, and, if new abundance estimates become available from the ATOCS surveys, Hawaiian stocks.

**PACIFIC SCIENTIFIC REVIEW GROUP RECOMMENDATIONS
APRIL, 1998**

Despite the intensive sperm whale research efforts conducted by NMFS in recent years, significant questions remain. New research should be focused on:

- 1) improving sperm whale group size estimates from past and future surveys;
- 2) determining stock structure and boundaries by:
 - a) increasing tissue sample collection for genetic analysis (particularly in the waters off California, Oregon, and Washington and in the Gulf of Alaska);
 - b) expanding future surveys offshore and northward through the Gulf of Alaska;
 - c) examining movements via telemetry studies.

No recommendation can be made at this time regarding changing the recovery factor for sperm whales from the default value of 0.1. The SRG agreed that the sperm whale is not currently in danger of extinction. However, the lack of guidelines for choosing an alternate Recovery Factor that could be applied consistently by all SRGs was identified as a concern. Therefore, the SRG recommends that:

- 1) NMFS develop criteria to categorize all endangered marine mammal species to differentiate those species that are at very low abundance levels and in imminent danger of extinction from those that are less at risk;
- 2) different recovery factors for each category be developed so that consistent guidelines can be applied for all U.S. marine mammal stocks;
- 3) these guidelines be developed by the NMFS and reviewed by a joint meeting of the SRGs in the fall of 1998.

Observer data from the Hawaiian longline fishery indicate that there is more than a remote likelihood of serious injury and mortality (Category III) for cetaceans in this fishery. The SRG recommends that:

- 1) mortality estimates for the entire fleet be extrapolated from the observed entanglement and mortality;
- 2) this estimated fishery mortality data be incorporated into the next SAR revisions;
- 3) this Hawaiian fishery, and the California offshore longline fishery which has overlapping fishing grounds and the same fishing methods, be reclassified as Category-II fisheries.

Appendix 1

Scientific Review Group - Pacific Region

Hannah Bernard (Hawaii Wildlife Fund)

Robin Brown (Oregon Department of Fish and Wildlife, Marine Region)

Mark Fraker (Terramar Environmental Research)

Doyle Hanan (California Department of Fish and Game, Marine Resources Div.)

John Heyning (Natural History Museum of Los Angeles County)

Chuck Janisse (Federation of Independent Seafood Harvesters)

Steve Jeffries (Washington Dept. of Fish & Wildlife, Marine Mammal Investigations)

Katherine Ralls (National Zoological Park, Smithsonian Institution)

Michael Scott (Inter-American Tropical Tuna Commission)

Terry Wright (Enhancement Services, Northwest Indian Fisheries Commission)

Invited Participants and Observers:

Bob Brownell

Meghan Donahue

Sarah Mesnick

Barb Taylor

Southwest Fisheries Science Center - La Jolla

Bud Antonelis

Southwest Fisheries Science Center - Honolulu

Paul Wade

NMFS Office of Protected Species

Gene Nitta

NMFS SW Regional Office - Honolulu

Emily Gardner

Walter Ikehara

Hawaii DLNR

Bill Gilmartin

Hawaii Wildlife

Joe Mobley

Tom Lawrence

University of Hawaii

Adam Frankel

Cornell University

Naomi McIntosh

HI Marine Sanctuary Program

Whitlow Au

Mark Lammer

HI Institute of Marine Biology

Appendix 2

WORKING PAPERS FOR SCIENTIFIC REVIEW GROUP MEETING
HONOLULU, HI
30 MARCH - 1 APRIL 1998

Abundance of sperm whales in the northeastern temperate Pacific estimated from a combined visual and acoustic survey.

J. Barlow and B.L. Taylor

Sperm whale interactions with longline vessels in Alaska waters during 1997.

S. Hill and E. Mitchell

Observations of harbor porpoise in the vicinity of acoustic alarms on a set gill net.

J. Laake, D. Rugh and L. Baraff

Deaths and entanglements of humpback whales, *Megaptera novaeangliae*, in the Main Hawaiian Islands, 1972-1996.

L. Mazzuca, S. Atkinson and E. Nitta.

Population structure of sperm whales in the eastern temperate North Pacific:
Preliminary findings.

S.L. Mesnick, B.L. Taylor, B. Nachenberg, A. Rosenberg, S. Peterson and A.E. Dizon

A review of information about sperm whales relating to setting an appropriate recovery factor. B.L. Taylor, J. Barlow and J. Heyning

Appendix 3

AGENDA SEVENTH PACIFIC SCIENTIFIC REVIEW GROUP SOUTHWEST FISHERIES SCIENCE CENTER, HONOLULU, HI 30 MARCH - 1 APRIL 1998

Monday, 30 March

- 0900: Sperm Whales
USSR pelagic whale catches; conservation implications (Brownell)
Abundance surveys (Taylor)
Stock structure (Mesnick)
- 1300: Sperm Whales
Review and discussion of background paper
Fisheries issues and TRT
Recovery factor considerations
Review of Fr in PBR model (Wade)
SRG recommendation regarding sperm whale Fr

Tuesday, 31 March

- 0800: Hawaiian Marine Mammals
Hawaii survey results and ATOC/LFA summary (Mobley/Frankel)
Hawaii DLNR state marine mammal program (Gardner)
Hawaii marine mammal - fishery interactions
Bottom fishery status - HI DLNR (Ikehara)
- 1300: Hawaiian Marine Mammals
Hawaii marine mammal - fishery interactions (continued)
Review of interactions - NMFS (Nitta)
Hawaii stranding program status (Nitta)
Hawaii Humpback whale sanctuary program (McIntosh)
Monk seal program update (Antonelis)

Wednesday, 1 April

- 0800: Unfinished business

Review and development of final recommendations

Identify topics, requested participants, location for next meeting
- 1200: Adjourn