

**MEETING OF THE PACIFIC SCIENTIFIC REVIEW GROUP
SOUTHWEST FISHERIES SCIENCE CENTER, LA JOLLA, CA
13-15 DECEMBER 1994**

The second meeting of the Pacific Scientific Review Group (SRG) was held at the Southwest Fisheries Science Center in La Jolla, California on 13-15 December 1994. All current SRG members were in attendance in addition to Carl Benz from the US Fish and Wildlife Service, Jeff Laake from the National Marine Mammal Laboratory, Paul Wade representing the NMFS Office of Protected Resources, and Jay Barlow and other participants and observers from the Southwest Fisheries Science Center (SWFSC). Joyce Sisson (SWFSC) and Michael Scott served as rapporteurs. A list of participants and their affiliations are listed in Appendix 1. The group was responsible for reviewing a number of documents pertaining to the Stock Assessment Reports (SARs). These documents are listed in Appendix 2. A list of the stocks for the Pacific region are in Appendix 3. The agenda for the second meeting is in Appendix 4. The group agreed that this meeting would be open to the public.

SCIENTIFIC REVIEW GROUP MEMBERSHIP

The first topic discussed by the group was the resignation of SRG member, Steve Kaiser. The group compiled a list of potential candidates to be considered by the NMFS. It was agreed that it would be very beneficial to have more expertise in Hawaiian fisheries and marine mammals within the Pacific SRG, although it was suggested that an expert in west coast fisheries would also be helpful. It was also suggested that the SRG could invite experts to their meetings when necessary to provide information.

REVIEW OF REPORT OF JOINT SRG MEETING IN SEATTLE

The group reviewed a report prepared by the NMFS Office of Protected Resources on the first joint meeting of the Regional Scientific Review Groups held in Seattle, WA on 12-13 October 1994.

The Pacific SRG was concerned about the introduction of the use of Traditional Environmental Knowledge into the PBR concept. As it is undefined, it is unclear what Traditional Environmental Knowledge is, who possesses credible Traditional Environmental Knowledge and, more importantly, who does not, and whether it would apply only to subsistence hunting or to other fisheries with long traditions as well. As none of the members of the Pacific SRG recalled this concept being proposed during the joint session of the SRGs, it is suggested that it be removed from the main text and placed in the report of the SRG in which it was discussed.

The group wanted to reiterate its recommendation for research into non-fishery human-caused mortality (see Report of the Pacific SRG, Seattle meeting). Specifically, how to quantify such mortality, and how to incorporate this mortality into the PBR process. Such research

should be given a higher priority as the fishery mortality approaches the PBR.

REVIEW OF REVISED PBR GUIDELINES

Jay Barlow, NMFS, incorporated a number of comments from the Marine Mammal Commission, the public, and the SRG into a revised set of guidelines for estimating potential biological removals and evaluating zero mortality and serious injury rate in MMPA stock assessment reports. Minor changes were made directly to a copy of the draft guidelines and passed on to Dr. Barlow.

Definition of "Stocks"

In the guidelines, biological, ecological, and legal definitions of stocks are provided. From these definitions, it is concluded that stocks be based on the smallest groupings which are biologically reasonable and are practical from a management perspective. The group discussed whether, in the absence of biological stock data, a stock should be defined simply as the animals that live in the area where fisheries interactions take place.

The question was raised as to whether this approach, originally described in the PBR Workshop Report, would be altered by the change recommended by the SRGs that scientific data be used when lumping or splitting stocks, rather than only when lumping. It was the consensus of the group and of the author of the revised guidelines (Barlow) that the principal of starting with the smallest practical units possible has not changed.

PBR Elements

The 1994 amendments to the MMPA provided the essential elements which are to be used to calculate the Potential Biological Removal (PBR). The scientific methods for obtaining these elements are discussed below.

Minimum Population Estimates

There is a need for correction factors to obtain better population estimates. Those stocks should be identified that require further research on determining correction factors. It was suggested that the language be broadened to allow the use of other scientifically reasonable estimates other than direct counts or estimates with a coefficient of variation (e.g., from a pup count of at least n pups, it could be reasonably inferred that there are at least n pups plus n mothers plus at least one tired, but content male). Paul Wade and Jeff Laake volunteered to amend the wording of the guidelines to broaden the criteria.

Three options were listed in the revised PBR guidelines for discounting abundance estimates as they become older and less reliable. Most of the group preferred Option 2, while a minority preferred Option 3.

Maximum Population Growth Rates

The methodology outlined to define the maximum population growth rate was agreed upon. The group also agreed that changes from default values must be made with caution, and only when reliable stock-specific information is available.

Recovery Factors

The group generally agreed that Recovery Factor Options 1 and 2 were not exclusive of one another and could both be used as guidelines for modifying the default recovery factors. One member expressed concern that the recovery factor was being used to account for greater or lesser certainty in the mortality estimate and suggested that this should be factored into the mortality estimate itself. Another member expressed concern that if the PBR could be increased, as would be allowed under Option 1, then mortalities could increase in conflict with the objective of the MMPA of reducing mortality. It was argued, however, that if default values are set conservatively enough initially in the absence of data, collecting more and better information will likely allow the PBR to increase. It was also suggested that the lowest level of coverage that would result in an increase of the recovery factor could be reduced from 20% to 5% as an incentive to collect a minimal amount of data. It was thought that it is unlikely that Option 1 would be often used (see Appendix 5 for a further explanation of these options).

Zero Mortality Rate Goal

Although the group provisionally accepted the definition provided in the guidelines during the Seattle meeting, it recognized that additional work should be done to fine-tune the definition.

REVIEW OF PUBLIC MARINE MAMMAL COMMISSION GENERAL COMMENTS ON ASSESSMENTS AND PBR

Most of the comments on the PBR concept have been addressed in the report of the Seattle meeting and in the revised PBR guidelines, and were not discussed at length by the group. The Marine Mammal Commission suggested that a general description of the fisheries involved with each individual stock be added to the assessments. The group believed, however, that this would be too cumbersome to include in each assessment, but recommended that a document be compiled for each region describing the fisheries. The Commission also recommended including more information of populations and fisheries outside U.S. waters; while this may be appropriate for certain stocks, the group generally appreciated the tight focus (and brevity) of the reports. The group agreed that the stock assessment reports are not intended to be detailed species accounts and that the information contained in them should be relevant to assessing the status of the stocks. Some public comments strongly recommended the use of logbook and stranding data. These sources of data may identify that a problem exists, but their usefulness is very limited in a quantitative sense.

REVIEW OF STOCK ASSESSMENTS

Minor comments to individual assessments were made directly on the draft documents. General comments and more-substantive suggestions for revising stock assessments are summarized here.

Each stock assessment should include the following elements:

- 1) Legal status under the MMPA and the ESA.
- 2) Status relative to OSP.
- 3) Summary of the trends in abundance and mortality.
- 4) Designation of strategic, non-strategic, or unknown (the unknown category is an additional category proposed by the group).

The Other Human-Related Mortality sections should include a statement, when appropriate, that shootings and entanglement in nets have occurred in similar situations for other stocks, even when such mortality has not been documented for the stock in question.

For most Hawaiian stocks, it was suggested the ZMRG be specified as unknown instead of being met because of the lack of mortality and abundance data, and it should be indicated that the fisheries present in Hawaii use gear that has been associated with marine mammal mortalities in other areas.

For those species affected by the California driftnet fishery, it was noted that the effort of the fishery may have changed recently and that the 1994 data could be examined to determine the potential effects on marine mammal mortality. For example, fishing effort has been expanding northward for some time and landings of swordfish will be permitted in Oregon in 1995.

Given the lack of current information about marine mammal mortalities in the west coast squid purse-seine fishery and the previous interactions thought to occur with the southern California pilot whale population that has since declined in the area, the group recommended monitoring this fishery with an observer program.

California Sea Lion

Update the report by using the 1994 pup count and abundance estimates. This will increase the N_{min} from about 67,000 to 84-85,000. The group recommended conducting future research into alternate methods and correction factors to calculate N_{best} and N_{min} .

Pacific Harbor Seal (CA)

The group recommended using a 1.6 correction factor calculated from Oregon and Washington as the best available information for the California stock. The report could be updated the report with 1994 pup count data from California Department of Fish and Game. The group recommended against splitting the California stock into northern and southern stocks.

Pacific Harbor Seal (WA inland)

A recovery factor of 1.0 was chosen instead of 0.5 because the population is known to be increasing with no evidence of changes in the fisheries in the area (this assertion should be referenced in the assessment). It was noted that 1993-1994 observer data may be available from the Puget Sound area.

Sea Otter (WA)

Even though this transplanted population is currently growing, a recovery factor of 0.5 was chosen instead of 1.0 because it is listed as endangered under Washington state law, and because the population is still small and vulnerable.

Northern Elephant Seal

More research should be conducted on calculating a correction factor with an associated variance so as to improve the estimate of N_{min} (currently calculated as twice the pup count). This research currently is not a high priority, however, because the ZMRG is met even with a conservative estimate of N_{min} .

Northern Fur Seal

An explanation should be included in the assessment as to why the stock was designated strategic. The N_{min} should be updated using 1994 data.

Hawaiian Monk Seals

While a strategic stock such as this one would normally trigger the formation of a Take Reduction Team, the group recommended against duplicating the efforts of the Recovery Team already in place under the ESA. Because the ESA would take precedence in this case, it should be noted in the PBR section that this is the case and that take should be zero under the ESA. It should also be noted in the Status of Stocks section that the species is declining and below OSP. The question of setting R_{max} to zero in this case (a small population that is still declining even with little evidence of human-caused mortality) was postponed until the next meeting for a broader discussion of setting R_{max} values for declining populations.

Steller Sea Lion

It was assumed that the Alaska SRG would review this species because the bulk of the distribution is within their region of concern. Robin Brown (Oregon Pacific SRG member) will provide comments to the Alaska SRG and NMFS.

Harbor Porpoise (Central CA)

The group believed that using only the last three years of mortality estimates to calculate an average was appropriate in light of the change in fishing regulations that occurred at that time. Unpublished and preliminary NMFS data suggest that the population has continued to decline, however, at a rate of 9-10% even after the fishery mortality had substantially decreased. Although the average mortality estimate (31) is just below the PBR (34), the group recommended that the stock be designated as strategic because the population is thought to be declining and, if so, could be proposed for listing as threatened under the ESA. Caution should

be taken in interpreting this recommendation because of the preliminary nature of the data indicating a decline, and because the apparent decline could be a result of a population shift associated with environmental changes. The formation of a Take Reduction Team may not be necessary given the current low level of fishing effort and the declining mortality.

Harbor Porpoise (N. CA)

The group recommended that the northern and central California stocks be maintained as separate management units because the fishery interactions are limited to only the central California coast.

Harbor Porpoise (OR/WA)

New data by Steve Osmek (NMML) was reported to suggest that this stock be split into an Oregon-southern Washington stock and a northern Washington stock with a boundary at La Push, WA based on differences in porpoise densities and fishery interactions. The basis for this proposed new stock structure will need to be evaluated when new stock assessments are written. However, the group gave preliminary agreement to this split of stocks.

Dall's Porpoise

NMFS is currently analyzing data on the effects of environmental changes on the apparent abundance in the area of this species that may prove relevant to future assessments of this stock.

Pacific White-Sided Dolphin

The group suggested that greater recognition be given to the distributional, genetic, and morphological evidence that indicates that two stocks are present (a northern and a southern stock). Although it is currently difficult to separate these two stocks geographically because of their movement patterns, the group suggested additional research into the stock structure and boundaries and movements of these dolphins.

Risso's Dolphin

It was suggested that mortality from the squid purse-seine fishery be included.

Bottlenose Dolphin (HI)

Although the Nmin is considered unknown in this report, a count of 430 was cited by one reference. Because the data were unpublished and unavailable for review, the group supported the unknown status of Nmin.

Killer Whales (CA)

The group recommended that Oregon be included in the stock range because of the similarities in whale densities and in fishery interactions. These stock designations should be considered provisional in light of the known difference between resident, transient, and pelagic populations. The group requested that the Alaska SRG review this change to see if it is in accord with the stock structure of Alaska and Washington killer whales. The group recommended including information on the historical take of this species by whalers (Rice 1974).

False Killer Whales (HI)

Although the Nmin is considered unknown in this report, a count of 470 was cited by one reference. Because the data were unpublished and unavailable for review, the group supported the unknown status of Nmin.

Pilot Whales (CA and HI)

The assessment could note that two forms of pilot whale have been identified in the West Pacific that potentially could be present in the East Pacific as well.

Baird's Beaked Whale

A recent mortality to one whale in the driftnet fishery (NMFS unpub. data) results in the following changes: the PBR would now be exceeded, the stock would now be designated as strategic, and the ZMRG is no longer met. The group recommended including information on the historical take of this species by whalers (Rice 1974).

Mesoplodonts

The lumping of several species in this provisional stock is problematic given the difficulties of managing multi-species units and the difficulties in sighting and identifying these whales at sea. Given the mortality in excess of the PBR, research into these problems is recommended (*e.g.*, diving behavior studies, acoustic detection methods, more surveys to increase identified sightings, and genetic sampling). It was recommended that, when fishery mortalities do occur, an effort be made to collect as much biological material as possible to facilitate species identification.

Pygmy Sperm Whales (CA and HI)

Because of the occasional strandings of dwarf sperm whales in California it should be considered as more than a rarity and assessed. Given the difficulties in distinguishing kogiids at sea, it is provisionally recommended that the two species be lumped as one management unit, and that the same problems and research needs as noted for the mesoplodonts be addressed for these whales.

Sperm Whales (CA/OR/WA and HI)

Research should be conducted into the stock structure and movements of this species. The assessment should mention the potential effect of the ATOC experiment to deep-diving animals such as the sperm whale (although noise has not been shown to cause mortality or serious injury to marine mammals).

Blue Whales (CA)

The ZMRG assessment should be qualified with a statement that unobserved mortality could be occurring from entanglement in portions of net picked up when the whales encounter and break through gillnets.

Bryde's Whale (ETP and HI)

Because it is currently not possible to prorate the ETP abundance estimates for the

percentage of the population visiting California waters, the group suggested that the abundance estimate for California waters of 61 be used as the Nbest (Barlow, in press). Because of the unknown status of this species, the recovery factor should be changed from 1.0 to 0.5. It was also suggested that the Hawaii stock should be provisionally included in the ETP stock.

Minke Whale (CA/OR/WA)

It was recommended that the assessment include the statement, "salmon driftnets used in the Puget Sound have the potential to take this species."

PRELIMINARY ASSESSMENT OF PRIORITY STOCKS

From the review of stock assessments, a preliminary assessment of the research priorities for Pacific coast stocks was compiled, although this will be discussed in more detail during the group's next meeting.

1) Harbor Porpoise, Central California stock: Although the almost total closure of the coastal drift net fishery has apparently reduced mortality, recent data by the NMFS suggest that the population still may be declining at a rate of 9-10% per year (these data are still being analyzed). Monitoring of this stock should continue to determine whether it is truly declining, if the decline is a natural one or due to a delayed effect of previous fishery mortalities, and to document the population growth rates in the wake of fishery mortalities.

2) Ziphiid whales and Kogiid whales: Because of the long dives these species make, it is difficult to accurately estimate their abundances. In light of the fishery mortalities in excess of the PBR, research should be conducted into devising correction factors for submerged animals during surveys. Given the undesirability of lumping multiple species into single management units, there should be more focus on species-identification techniques.

3) Hawaiian cetaceans: The paucity of data on fishery interactions and the abundance and status of Hawaiian stocks should be addressed by collecting information on fisheries, instituting observer programs, and conducting surveys. Examining the survey data from the ATOC experiments may provide additional information for these assessments.

4) Pilot whales, California stock: It is unknown whether the virtual disappearance of this species from the California coast is a natural phenomena due perhaps to changing environmental conditions or to fishery interactions. Research into the current distribution and migration patterns on an opportunistic basis may shed light on these questions.

Central to an assessment of the research priorities for marine mammal stocks is a detailed listing of the fisheries of the Pacific coast and Hawaii.

CONCLUDING REMARKS AND DISCUSSIONS

The group decided to schedule its next meeting for 4-6 April 1995 in Hawaii. The offices

of the NMFS Sanctuary Program in Maui was proposed as a meeting site. Based on the issues that have been raised during the first two meetings, the proposed topics for discussion are:

- 1) Research on declining populations and altering default values of R_{max} .
- 2) Effect of large-scale perturbations on populations, such as during El Niño events.
- 3) Research into correction factors for abundance estimates, such as the proportions of pinnipeds hauled-out or of cetaceans that are submerged.
- 4) Research into fishery interactions and status of Hawaiian stocks.
- 5) Problems of combining multiple stocks or species into one management unit.
- 6) Human-caused harm to population other than fisheries interactions (*e.g.*, pollution, noise, habitat degradation).
- 7) Criteria for setting default values and fine-tuning recovery factors to values other than 1.0, 0.5, or 0.1 in a consistent manner.
- 8) Definition of the Zero Mortality Rate Goal.
- 9) Problems associated with assessing populations that cross international boundaries.
- 10) Priority stocks and priority research problems.
- 11) Treaty rights of Northwest Indian tribes.

**MEETING OF THE PACIFIC SCIENTIFIC REVIEW GROUP
SOUTHWEST FISHERIES SCIENCE CENTER, LA JOLLA, CA
13-15 DECEMBER 1994
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List of Documents

Public Comments

- 1) The Marine Mammal Center (7 November 1994)
- 2) The Humane Society (7 December 1994)
- 3) The Center for Marine Conservation (29 November 1994)
- 4) Friends of the Sea Otter (2 December 1994)

Marine Mammal Commission Comments

- 5a) General Comments to NMFS
- 5b) General Comments to USF&WS
- 6) Comments to the Pacific Group

Other Documents

- 7) Report of the First Meeting of the Regional Scientific Review Groups
- 8) Guidelines for Estimating PBR and Evaluating ZMRG and Serious Injury Rate in MMPA Stock Assessment Reports - Barlow
- 9) Updated PBR Calculations used as reference for group only.
- 10) Memo from Vicky Cornish (7 December 1994)

- 11) Stock Assessment Reports (List of Stocks in Appendix 3)

Species	Stock
California Sea Otter	California Stock
California Sea Lion	U.S. Stock
Pacific Harbor Seal	California Stock
Pacific Harbor Seal	Washington Inland Waters Stock
Pacific Harbor Seal	Oregon/Washington Coastal Stock
Northern Elephant Seal	California Breeding Stock
Northern Fur Seal	San Miguel Island Stock
Guadalupe Fur Seal	Mexico/U.S. Stock
Hawaiian Monk Seal	Hawaiian Stock
Harbor Porpoise	Central California Stock
Harbor Porpoise	Northern California Stock
Harbor Porpoise	Oregon/Washington Stock
Dall's Porpoise	California/Oregon/Washington Stock
Pacific White-Sided Dolphin	California/Oregon/Washington Stock
Risso's Dolphin	California/Oregon/Washington Stock
Risso's Dolphin	Hawaiian Stock
Bottlenose Dolphin	California Coastal Stock
Bottlenose Dolphin	California Offshore Stock
Bottlenose Dolphin	Hawaiian Stock
Striped Dolphin	California Stock
Striped Dolphin	Hawaiian Stock
Short-Beaked Common Dolphin	California Stock
Long-Beaked Common Dolphin	California Stock
Northern Right Whale Dolphin	California/Oregon/Washington Stock
Killer Whale	California Stock
Killer Whale	Hawaiian Stock
Short-Finned Pilot Whale	California Stock
Short-Finned Pilot Whale	Hawaiian Stock
Baird's Beaked Whale	California/Oregon/Washington Stock
Mesoplodont Beaked Whales	California/Oregon/Washington Stock
Blainville's Beaked Whale	Hawaiian Stock
Cuvier's Beaked Whale	California/Oregon/Washington Stock
Cuvier's Beaked Whale	Hawaiian Stock

Appendix 3

Species	Stock
Pygmy Sperm Whale	California/Oregon/Washington Stock
Pygmy Sperm Whale	Hawaiian Stock
Dwarf Sperm Whale	Hawaiian Stock
Sperm Whale	California/Oregon/Washington Stock
Sperm Whale	Hawaiian Stock
Humpback Whale	California/Mexico Stock
Blue Whale	California/Mexico Stock
Blue Whale	Hawaiian Stock
Fin Whale	California/Oregon/Washington Stock
Fin Whale	Hawaiian Stock
Bryde's Whale	Eastern Tropical Pacific Stock
Bryde's Whale	Hawaiian Stock
Sei Whale	Eastern North Pacific Stock
Minke Whale	California/Oregon/Washington Stock
Pygmy Killer Whale	Hawaiian Stock
Melon-Headed Whale	Hawaiian Stock
False Killer Whale	Hawaiian Stock
Pantropical Spotted Dolphin	Hawaiian Stock
Spinner Dolphin	Hawaiian Stock
Rough-Toothed Dolphin	Hawaiian Stock

**Agenda for the Second Scientific Review Group Meeting
Held at the SWFSC, La Jolla, CA
13-15 December 1994**

Tuesday, 13 December

2:30 P.M.

Convene meeting, discuss logistics, and coordinate review materials

4:00 P.M.

Adjourn

Wednesday, 14 December

8:00 A.M.

Review report from the first SRG meeting

Address public comments and comments from Marine Mammal Commission

12:00 P.M.

Review each stock assessment report for the Pacific region

4:00 P.M.

Adjourn

Thursday, 15 December

8:00A.M.

Complete review of each stock assessment report

12:00 P.M.

Break for lunch

1:30 P.M.

Discuss future research and uncertainties regarding stock assessments

3:00 P.M.

Adjourn

RATIONAL FOR RECOVERY FACTOR OPTIONS

Both of these options allow modifications to the recovery factor when the accuracy and precision of the mortality estimates are either better or worse than the default assumptions. Option 1 deals with the accuracy or bias of the estimates, while Option 2 deals with the precision or variance of the estimate. These options are not mutually exclusive. Option 2 would be used when the assumptions about the coefficient of variation of the mortality estimate (*i.e.*, that it is 0.30 or less and that mortality is estimated every year) are not met. Although the model is relatively insensitive to the CV of the mortality estimate when it is less than 0.30, it becomes increasingly sensitive to it as the CV increases above this level. In the face of greater uncertainty, the recovery factor would be decreased to maintain an adequate safety factor.

Option 1 would increase the recovery factor when there is greater assurance that there are no serious biases in the mortality estimate. This is in keeping with the PBR approach of setting conservative default values in the absence of data, and allowing the PBR to increase when more and better information indicate that it is appropriate. Unlike past management practices, this provides an incentive for industry to cooperate with management agencies to collect better information. This option would promote fisheries participation in government observer programs and, perhaps in some cases, help fund these programs. Experience has shown that some fisheries are subject to "observer effects," *i.e.*, mortality rates differ between the observed and unobserved boats, which leads to biased mortality estimates. Observer effects can arise, for example, when observed boats fish in different areas or in different ways than unobserved boats. Additionally, increased observer coverage has proved to be advantageous to management agencies by providing more opportunities to collect specimens, to calculate life-history parameters, and to obtain information on the operational causes of mortality necessary to solve these problems.

The coverage levels (20, 33, 50, and 95%) were chosen to facilitate representative sampling schemes in which every vessel is observed every 5th trip, every 3rd trip, every 2nd trip, and nearly every trip. The greater the observer coverage, the greater the assurance that the mortality estimates are free of these potential biases. The recovery factor is designed as a safeguard against bias in estimates of both mortality and abundance. The maximum adjustment to the recovery factor (0.25) is based on the assumption that at least half or the safety margin will remain to account for potential overestimation of abundance or R_{max} , potential underestimation of mortality even on observed trips, or for potential harmful effects that mortality to certain age/sex classes could produce in the population.