

# PACIFIC SCIENTIFIC REVIEW GROUP

A Regional Advisory Group to the National Marine Fisheries Service

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Dear Dr. Schwaab,

We would like to provide you with the minutes and recommendations from the most recent meeting of the Pacific Scientific Review Group held 3-5 November 2009. The SRG commends the NMFS for its long-delayed formation of a Take Reduction Team to deal with the take of false killer whales. It is critical that the TRT focus not only on the pelagic deep-set longline fishery, but on shallow-set and inshore fisheries as well. The SRG continues to note that the lack of funding and available shiptime continues to plague NMFS, such that there will be no usable abundance, mortality, and PBR estimates for many stocks. Surveys have been cut back or postponed for cetaceans and monk seals near the Hawaiian Islands, and harbor seals and harbor porpoises in Washington and Oregon waters.

Once again, the SRG compliments your NMFS staff for their excellent presentations, outstanding research, and support of the SRG.

Sincerely,

  
Michael Scott  
Chairman, Pacific Scientific Review Group

cc: Distribution list (attached)

## **Minutes for the Pacific Scientific Review Group Meeting La Jolla, California, 3-5 November 2009**

The 20th meeting of the Pacific Scientific Review Group (SRG) was held at the Marriott Hotel in Del Mar, California from 3-5 November 2009. All SRG members were present except for Robin Brown. Jim Carretta and Karin Forney served as rapporteurs. Michael Scott served as chairman of the SRG. The SRG members and other participants are listed in Appendix 1, review documents are listed in Appendix 2, and the agenda of the meeting is in Appendix 3.

### **General Topics**

*MMPA update:* Tom Eagle reported that there was not likely to be any MMPA activity in Congress in the current session (2009-2010) of Congress. Rep. Abercrombie introduced a \$25M bill for marine mammal research funding in Hawaii, which would send the funding to MMC for a competitive grants program for assessment-based research. Senate staff was interested in evaluating an alternative that would include funding going to NMFS for a combination of in-house funding for assessment and competitive grants program to enhance partnerships between NMFS and external expertise.

*List of Fisheries:* Melissa Andersen reported that the 2010 Final List of Fisheries (LOF) is expected to be published in December 2009, and presented the changes from 2009. The American Samoa longline fishery was reclassified from Category III to Category II, the California pelagic longline fishery from Category II to Category III, and the Hawaii shortline fishery was added as Category II. High-seas fisheries with expired permits have been removed from the LOF. The California spiny lobster trap/pot fishery was proposed to be elevated to Category II, but NMFS did not finalize the elevation in the final rule due to uncertainty over the attribution of a humpback whale entanglement to a specific fishery. The SRG discussed how to assess the effectiveness of disentanglement efforts, and how to provide probabilities of mortality after entanglement injuries.

*Serious Injury Working Group Process:* Melissa Andersen provided updates on the development of NMFS' policy for distinguishing serious from non-serious injury. The report of the 2007 Serious Injury Technical Workshop (Andersen *et al.* 2008 NOAA Tech Memo) provided suggestions for updating the existing guidance. To promote consistency, NMFS' policy will include NMFS' interpretation of the regulatory definition of a serious injury ("any injury that is likely to result in mortality") as an injury that is more likely than not to result in death (*i.e.*, a >50% likelihood). NMFS' policy will also include clarification that entangled marine mammals will be considered at their injury level prior to a successful disentanglement event for the purposes of the LOF and associated fishery management efforts. Three working groups have been formed to develop official NMFS policy on serious injury determination: a Process Working Group to discuss policy issues, a Determination Working Group to evaluate injury criteria in practice, and a Veterinarian & Pathologist Working Group. A final serious injury policy is expected in 2011. SRG members noted that the decision process seems overly complex and perhaps less precautionary in the face of uncertainty than would be

advisable, and debated whether or not they should play a role in serious injury determination once a NMFS process for determination is in place. It was agreed that the SRG should provide input and review during the policy development process and evaluate performance for 1-2 years.

*Magnuson-Stevens Reauthorization Act confidentiality issues.* Kristy Long reviewed the development of regional and national guidelines to address confidentiality. NMFS has interim guidelines that outline data aggregation and summarization techniques consistent with NOAA recommendations and the Trade Secrets Act. Aggregation must be from at least three fishery participants at temporal and spatial levels that protect the identity of individual vessels and fishing companies. Guidelines also specify who can use fishery information for conservation and management purposes.

*IWC Climate Change Workshop.* Lisa Ballance provided an update on the collaborative International Whaling Commission review of climate change impacts on the ETP ecosystem, with a focus on cetaceans and biodiversity issues. There are insufficient data in this region to make specific recommendations. The focus was on proactive issues related to climate change.

### **U.S. West Coast Fisheries Management**

*Pacific Offshore Cetacean TRT.* Tina Fahy reviewed discussions and recommendations made during the last TRT meeting, held in May 2009. Data on depredation by sea lions was presented by NMFS. The TRT had recommended that the small-mesh drift gillnet fisheries be added to the TRT during its meeting in 2007, but representatives from these fisheries were not interested in adding pingers to their nets due to cost, feasibility and potential increase in seal depredation. The Team discussed testing pingers with different frequencies that may be out of the hearing range of pinnipeds. Compliance and enforcement issues in the large-mesh driftnet fishery continue to be a concern. Currently there are 8 vessels (26% of fishing effort) that are 'unobservable.' Most sets had a full complement of pingers. Electronic and video monitoring has been field tested in this fishery, but challenges remain with pinger detection and marine mammal species identification. Fahy described a hydrophone system currently used in the Atlantic by enforcement that the Southwest Region has field-tested to detect pingers. Given the positive results and the recommendation by the TRT, the Southwest Region purchased one pinger receiver location system for use by enforcement agencies. The TRT was also informed that once the 2009 Stock Assessment Report is finalized, the CA/OR driftnet fishery will have achieved the long-term goal of reducing takes to <10% of PBR for all species. The TRT decided not to convene regularly in the future, unless: (1) the 5-year average mortality and serious injury exceeds 10% of PBR, (2) information becomes available to address opening or reducing the leatherback closure area, (3) information becomes available on new pingers/new technology to reduce take, or (4) observer coverage drops below 10%.

*Fishery and observer program.* Tina Fahy noted that the white seabass driftnet fishery was observed in 2007 at 17%, and the one deep-set tuna longline vessel was observed at 100%. The CA/OR driftnet fishery coverage was 16.4% in 2007-08 and 13.8% in 2008-

09, and is targeted for 20% coverage in 2009-2010. The halibut set gillnet fishery is also targeted for 20% coverage. The proposed shallow-set longline swordfish fishery, if it goes forward, will be observed at 100%, but the issuance of an Exempted Fishing Permit is still pending.

Fahy reviewed the pot/trap fisheries that were elevated to Category II in 2008 and Monica DeAngelis discussed pot/trap fishery entanglements of humpback whales. The SWR will use GIS to examine overlap of entanglements, fishing effort, and humpback sightings, and will develop a gear inventory for these fisheries, with a goal of identifying gear to specific fisheries. The recovery plans for fin and sperm whales were submitted by SWR to headquarters and are in review. Once the review process is complete they will be finalized and issued by headquarters.

*2008 CA/OR driftnet fishery bycatch estimates.* Jim Carretta reviewed 2008 bycatch estimates and TRT issues relating to pinger efficacy and pinniped depredation on catch. Results show that the area fished may be a more important variable than pingers.

*Pinniped management.* Sarah Wilkin and Monica DeAngelis reviewed the status of conflicts related to harbor seals at La Jolla Children's Pool. There are several recent legal developments that will play out in the near future and may allow the seals to stay by designating Children's Pool as a marine mammal park. South Casa Beach has had the first harbor seal pups born there, and the rookery appears to be expanding.

*Large whale management.* Sarah Wilkin reviewed ship strikes of fin, gray, and blue whales during 2009. John Calambokidis noted that there have been changes to the routes used by ships in southern California due to changes in air emissions standards requirements.

*Delisting of eastern Steller sea lions.* Tom Eagle reported that NMFS received letters from the North Pacific Fishery Management Council and Washington State and Oregon State to delist the eastern stock of Steller sea lions. These are not formal requests to delist, so there is no one-year review timeline, but information for a status review is now being compiled. A biological opinion on the groundfish fishery, which occasionally takes Steller sea lions, is also in preparation in the Alaska Region.

*Research takes of marine mammals.* There have been a number of fisheries research (i.e., not directed marine mammal or marine turtle research) takes of marine mammals in recent years, and Jeremy Rusin provided an update on the status of ongoing analyses of research takes and mitigation measures required by the NEPA, MMPA, and ESA. During 2005-2009, northern fur seals, CA sea lions, Pacific white-sided dolphins, northern right whale dolphins, and harbor seals have been taken in mid-water trawls, bottom trawls, and longlines related to shark, groundfish, sardine, salmon, and rockfish surveys. During the next two years, there will be an Environmental Assessment for research takes by all Fisheries Science Centers.

### **CA/OR/WA Research and SARs**

*SPLASH update.* Jay Barlow and John Calambokidis presented an overview of SPLASH

results. The North Pacific mark-recapture estimate is 20,800 whales, but this is probably an underestimate. The Aleutian/Bering Sea humpbacks are underrepresented in the known breeding areas, suggesting there is an unsampled breeding population. Hawaiian humpbacks make up about half of the total. Pre-whaling estimates from IWC are ~15,000 but these are rough estimates which did not take illegal catches into account. Geographically stratified estimation procedures gave similar results. There are probably 5-6 stocks of humpbacks in the N. Pacific. Genetics, contaminants, isotopes all showed similar isolation patterns and a high degree of fidelity to feeding areas.

*ORCAWALE 2008 abundance estimates.* Jay Barlow noted that Beaufort sea states were relatively high during the survey and that a multi-covariate line-transect analysis was used to estimate abundances. Blue whale distribution was farther north than in recent years and fin and sei whale abundances were higher than previous estimates.

*Blue and humpback whale mark-recapture estimates.* John Calambokidis presented mark-recapture estimates that show the humpback population continues to grow. There are dramatic differences in haplotype frequencies by region, with spatial gradients along the coast from CA-OR to Southeast AK. There appears to be a stock boundary at the Columbia River.

For blue whales, the latest mark-recapture estimates are 2,497 whales, which include 2005-2008 photographic data. The three most recent line-transect estimates of blue whales have been ~25% of the mark-recapture estimates over the same time period. Distributional shifts in blue whales could be responsible for the differences observed between the line-transect and mark-recapture estimates in CA/OR/WA. Blue whales are being seen further north recently, which may be related to changes in oceanographic conditions and/or krill productivity. There are 7 feeding stocks based on haplotype data: Russia, Bering Sea, eastern Aleutians, western Gulf of Alaska, northern Gulf of Alaska, southeast Alaska, southern British Columbia/Washington, and CA/OR.

The SRG discussed how best to define management stocks for humpbacks given the clear genetic differences among different feeding areas and among breeding areas but without a one-to-one connection among individual feeding and breeding areas. The SRG thought that the feeding and breeding areas should be considered separately, with PBRs and takes calculated and apportioned among feeding areas and separately among breeding areas in such a way that it insures protection of each of these areas individually.

*CA/OR/WA Cetacean SARs.* Jim Carretta reviewed changes to the US West Coast SARs. He noted that the continued takes of long-beaked common dolphins in unidentified fisheries were of concern, but there will be an observer program for the setnet fishery (one possible fishery for these takes) during the next season.

It was noted that blue whale abundance/PBR calculations do not seem to accurately reflect the proportion of the population that uses US waters, as only about 500-600 whales use CA/OR/WA waters, and not the total population of about 2500. A two-level assignment could be used based on the percentage of time spent in US waters, and the

fraction of the population in US waters when they are here (~600/2400).

$$\text{PBR} = N_{\min} * \frac{1}{2} R_{\max} * F_R * T_{\text{US}} * P_{\text{US}} = 1.30$$

where  $N_{\min} = 2046$  (based on  $N = 2497$  and  $\text{CV} = 0.24$ ),

$R_{\max} = 0.04$  (default value)

$F_R = 0.3$  (for an endangered-listed species with an increasing population >1500)

$T_{\text{US}} = 0.5$  (6 months spent in US waters)

$P_{\text{US}} = 0.2125$  (proportion of population in US EEZ = 604/2842, 2005-2008 data)

For humpback whales, the SAR can now include updated mark-recapture abundance estimates and a new trend figure.

*WA sea otter research.* Deanna Lynch reported recent information on WA sea otters. The annual population growth has been ~8% since 2002, with about 1,125 otters in the most recent survey. The estimated mortality rate is 10% per year, with mortality generally being caused by infectious disease (78%) or trauma (8%). Protozoal encephalitis seen in animals is the most consistent source of mortality.

*CA sea otter research.* Lilian Carswell reported recent information on CA sea otters. No SAR was prepared for 2009 as there was insufficient new information available to warrant a revision. The USFWS plans to revise the SAR in 2010. The population count was 2,760 in 2008 and 2,654 in 2009, with a three-year average of 2,813. The San Nicolas Island count is 42 animals. The population is currently ~200-300 animals below the threshold (~3,090 for 3 years) for downlisting the species under the ESA. The population appears to be stable at the center of the range and growing fastest along the southern edge of the range. Predation by great white sharks, however, appears to be retarding growth along the northern edge.. . There is high mortality among prime-age animals; the number of recovered carcasses is 8-10% of spring count. A large proportion of the mortality is due to parasitic infections. The fall census has been discontinued in order to conduct focal surveys for reproduction information.

*Northern fur seal and harbor seal SARs.* Marcia Muto reviewed (via telephone) changes in the SARs. For the northern fur seal on San Miguel Island (SMI), a new default  $R_{\max}$  of 12% is used in this year's SAR, based on emigration into rookery. The previous  $R_{\max}$  (8.6%) was based on data from the Pribilofs, so the rationale was to go back to the default value in the absence of data for SMI. The SRG debated whether or not  $R_{\max}$  can be based on something other than reproductive increases within a stock (such as immigration). This also opened questions about the discreteness of this island stock, if animals are immigrating to the island and inter-breeding. They are not genetically distinct, and San Miguel Island has a history of immigration from the northern colonies. The SRG is interested in parsing out immigration and reproduction for next year.

For the harbor seal stocks,  $N_{\min}$  and PBR could not be calculated because abundance estimates are over 8 years old. The SRG requested that human-caused mortality data be updated in the harbor seal SARs, despite the absence of a current abundance estimate. The SRG discussed how old fishery mortality data needed to be before it is no longer

relevant for the SARs, even if it is the only bycatch data available. The SRG suggested that old mortality estimates could be included in the total (minimum) mortality for those fisheries that have not changed markedly since being observed. The SRG stressed the need for monitoring of these stocks, particularly because they would be good indicators of the effects on the ecosystem due to climate change.

*Southern resident killer whales.* Brad Hanson summarized (via telephone) new information on the SAR and recent tagging research. The minimum population estimate remains at 85 animals, with 3 deaths and 3 births in 2008. Some females are several years overdue for calf production. As recommended by the SRG, 4 additional biopsy samples were collected in 2009. Satellite tags have been deployed on 9 transient killer whales. In 2010, an application for a permit to satellite tag SRKWs will be submitted, however the lack of shiptime is proving to be a problem for conducting tagging and tracking research along the outer coast. A proposed vessel-approach rule has been published and the public comment period has been extended.

### **Pacific Islands Protected Species Management**

*False killer whale TRT.* Michelle Yuen summarized the progress that has been made toward establishing a TRT for the Hawaii-based longline fishery. A TRT coordinator (Nancy Young) has been hired and Kristy Long will assist in the process. A pre-TRT meeting will be held in Nov. 2009 at the HI Islands Humpback Sanctuary, and the first TRT meeting is likely to be in Feb. 2010. Three additional TRT meetings are planned over the following six months. It was suggested that the TRT focus on the geographic components of the FKW interactions as well as gear issues.

*PIRO observer program.* Michael Marsik reviewed takes for insular stock, pelagic stock, Palmyra, and American Samoa False killer whale stocks in the HI deep-set, HI shallow-set, and American Samoa albacore longline fisheries. During 2009, there were 9 observed false killer whale interactions: 8 in the HI deep-set, 1 in the HI shallow-set, and none in the American Samoa fisheries. The SRG again expressed concern about separating the two HI longline fisheries when these vessels can fish deep-set or shallow-set longlines and when differences in cetacean bycatch rates are primarily driven by area of operation, not by gear differences.

*Hawaiian monk seal management.* Michelle Yuen noted that a monk seal recovery coordinator has been hired (Jeff Walters, formerly HI Dept. of Lands and Natural Resources and the HI Humpback Whale National Marine Sanctuary). A revised recovery plan has been completed, with emphasis on improving female survivorship, maintaining NWHI field presence, promoting MHI population growth, and reducing the probability of infectious disease. Management actions include monitoring and preventing recreational fishing interactions, protecting mother-pup pairs, and creating volunteer, outreach, and education programs. NMFS is revising the monk seal's critical habitat.

*Hawaiian spinner dolphin.* Michelle Yuen reviewed NMFS concerns over harassment due to people attempting to swim with wild spinner dolphins. A research grant has been awarded to study human impacts on spinner dolphins (Lars Bejder and Dave Johnston).

Lisa Van Atta mentioned that there currently isn't enough scientific data to implement regulations on this activity. Recent actions include consideration for listing spinners as a species of concern under the ESA promotion of the Dolphin SMART program, and training for hotel-based operators. Many vessel operators are shifting to other species that are farther from shore where interactions are less likely to be detected.

### **Pacific Islands Research and SARs**

*Monk seal research and SAR.* Jason Baker reported that for the first time there were insufficient funds for field camps in NWHI last year, but funding was restored this year. NMFS has initiated a roving MHI assessment team. Genetics research continues, with two articles completed: one showing that monk seals have the lowest genetic variability for any marine mammal and another on population structure. Life history data show that juvenile monk seals have considerably higher survival in the MHI compared to the NWHI. The intrinsic growth rate is ~5% for MHI and negative for all other areas. Most of the MHI growth was due to reproduction and not immigration. Galapagos shark-monk seal interactions continue with 198 of 801 pups born at French Frigate Shoals from 1997-2008 being involved in shark interactions. Obtaining permits to remove sharks has been a problem due to the island's National Monument status, and because of rules that require shark removal be restricted to cases where actual depredation is witnessed. Parasite control in young animals is being tested at Laysan Island with 0-2 yr old animals, with control and treatment groups, fecal sampling, anti-helminth treatments, and examination of animal weight response by experimental category. Translocations of weaned pups from low survival areas to higher survival areas are problematic, as permits restrict translocations to within NWHI. Nonetheless, 12 weaned pups were translocated in 2008-09.

*2005 Palmyra/Johnston cetacean abundance estimates.* Jay Barlow presented preliminary estimates from this survey. Survey effort was dominated by rough sea states (>95%), which results in negative biases in cryptic species sightings. Sample sizes were small, and stratification by EEZ area was therefore difficult. Identification of geographic forms of spinner dolphins in this region is difficult and Jay currently recommends pooling all spinner dolphin sightings for the purposes of abundance estimation. It is unlikely that there are sufficient sightings to establish whether there are multiple stocks in the Palmyra EEZ.

*Hilborn Report - Bayesian abundance estimate for HI.* Jay Barlow first provided a review of Bayesian methods and emphasized the importance of selecting appropriate prior assumptions. Barlow then summarized an analysis conducted by Ray Hilborn and provided to the SRG. Hilborn calculated higher population sizes for false killer whales around HI than previous estimates by assuming that the density estimates from the eastern tropical Pacific (ETP) could be used as priors to calculate estimates for HI stocks. Barlow disagreed with this assumption, arguing that 1) differences between ETP and HI cetacean densities are too large for data from one area to be used to model the other; 2) false killer density in particular, is ten times higher in the ETP than in HI; 3) these differences in densities of delphinids would be expected because the waters around HI are less productive than those in the ETP; and 4) if a more similar latitude range is used



(Ferguson and Barlow 2003) as a prior, the false killer whale density in the ETP is very similar to that in HI.

The SRG believed that the Bayesian analyses would be a useful approach but the biology of the whales and the oceanography of their habitat should be taken into account. The SRG suggested that the table with densities would be more helpful if it was explicit about the habitat and latitude differences. The SRG noted that the process of debating stock assessment information and stocks was similar to that for the Pacific Offshore Take Reduction Team.

*Hawaii false killer whale mark-recapture and telemetry research.* Robin Baird presented preliminary mark-recapture estimates based on photo-identification. In 2008, there were 61 individuals identified for the insular population, the largest annual number to date. From 2004 through May 2009 there were 107 individuals identified. It is thought that about 75% of individuals are marked well enough to identify them. Excluding Kauai animals (which do not appear to associate with other inshore animals), the estimate is 146 (CV = 0.20); it is 164 (CV=0.20) if Kauai is included. Take home message is that population estimate is below 150-170 animals, with CVs in the neighborhood of 0.25. This estimate includes unmarked individuals. Overall, range of different mark-recapture estimates is 151-178 (CV=0.20-0.25), similar to 2000-2004 using the same methods. If one used the highest estimate (178, CV=0.25), then  $N_{\min}$  would be 145. These estimates are preliminary and unpublished. These analyses will be re-done utilizing additional photos obtained since May 2009; Baird expects to complete the analyses during the coming year.

Satellite-telemetry data from a 56-day animal track of an individual showed short-term fidelity to certain areas, followed by rapid movements between islands. Five false killer whales were tagged off Oahu in Oct. 2009, with four still transmitting and showing movements as if they were four distinct groups. The whales are spending more time off Kauai, Niihau, and Oahu, moving rapidly among islands; they also spend time off Big Island. They seem to favor the shelf-edge around islands (500-1000m) and use both the leeward and windward sides. They range farther offshore on the leeward side.

*Main Hawaiian Islands cetacean survey.* Erin Oleson presented information on a line-transect and acoustic survey conducted in February 2009, with coverage intended to mimic the inshore stratum of HICEAS 2002 survey. A multiple covariate approach was used to estimate the detection function for each species, owing to small sample sizes (116 total sightings). Of the 6 total sightings, 3 were linked to the insular stock through photo-identification. Four on-effort false killer whale sightings, yield a preliminary estimate of 635 (CV=0.77) animals in the study area, though this estimate likely includes both insular and pelagic false killer whales, as not all animals could be identified and the stocks are known to overlap. Observations of vessel attraction suggest there may be an upward bias to the survey estimate which should be evaluated before this estimate is considered for use in SARs. Alternative methods of estimation should be evaluated for assessing the pelagic stock, perhaps using acoustic methods for detection of groups and for assessing

group size and spread.

*Pacific islands cetacean acoustics research.* Erin Oleson explained the daunting task it would be to fully survey all the Pacific Island EEZ areas (700+ sea days) and presented alternative acoustic methods. Long-term acoustic monitoring devices are in place at Palmyra, Pearl and Hermes Reef, and Kona and additional devices will be placed off Wake Island, Guam, and the Northern Marianas in 2010-2011. There is probably a new species of beaked whale at Palmyra Atoll, *M. hotuata*, which has been recorded acoustically. There is also an unidentified beaked whale at Kona, which has also been recorded at Cross Seamount, which may end up being a Longman's beaked whale. New acoustic survey methods, such as wavegliders, are able to provide presence data, but new analysis methods will have to be developed in order to estimate density. These free-ranging units are able to travel at up to 2 kts. Other acoustic initiatives include acoustic monitoring of the HI longline fishery, acoustic tag deployments on false killer whales, and reanalysis of HICEAS and PICEAS false killer whale acoustic detections in an effort to estimate group size.

*Cetacean bycatch in American Samoa longline fishery.* Erin Oleson reported that there were three takes (1 seriously injured and 1 dead false killer whale, and 1 seriously injured rough-toothed dolphin) in 2008 in the American Samoa longline fishery. The number of hooks fished/year has increased dramatically in the last decade. Observer coverage by trip is approx 6-8% (about 8% of all sets). In 2008, the estimated take of false killer whales was 23.5 animals (2 observed), with a 3-year average of 7.8/yr. Depredation appears to be a larger problem in American Samoa than in Hawaii, with entire 40-nmi sets being depredated.

*Longline bycatch and depredation correlate re-analysis.* Karin Forney reported that a reanalysis is underway, with a new dataset that excludes experimental sets that were part of the original database but not originally classified as such. The new sample sizes will include 22,503 sets (17,770 deep and 4,773 shallow).

*Cetacean serious injury determinations, HI longline fisheries.* Karin Forney compared the new methods for determining serious injuries developed at the 2007 Serious Injury Technical Workshop with previous serious injury determinations. Determinations are now based on a quantitative measure of how much gear remains on the animal. Using the 2008 dataset, Forney found the new method to be generally more precautionary, with more determinations of serious injury and fewer undetermined categorizations.

*Cetacean bycatch in Hawaii-based longline fisheries.* Marti McCracken pointed out that for bycatch estimates of sea turtles, seabirds, sharks, and fish, only the total number of interactions is of interest, while for marine mammals additional information on mortalities vs. serious injuries are required. Brian Manley was contracted to review the methods used to estimate bycatch and his suggestions are being incorporated into her estimates. McCracken has generated estimates for six areas: 1) HI islands; 2) Johnston Atoll; 3) Palmyra Atoll; 4) Howland and Baker Islands, 5) Jarvis Island and 6) Baker Island. Trip sampling is based on vessel call-ins 72 hr prior to departure. The shallow-

set longline fishery has 100% coverage while the deep-set longline fishery has 20% coverage. McCracken reviewed the details of her random-systematic plus sampling method being used for the deep-set fishery.

The SRG agreed with the new analysis methods, but requested a more reader-friendly and more transparent explanation of the methods. For example, observed takes and details on intermediate steps such as allocation proportions, variances, and the history of bycatch estimation process should be included, and date and location conventions should be clearly identified. The SRG agreed with the apportioning for dead and seriously injured animals, but requested that apportionment of bycatch identified as blackfish should be included in the next SAR, taking into account latitude and perhaps observer sightings data. The SRG suggested that these allocation methods be compared with those used for the Atlantic longline and AK demersal longline fisheries to promote national consistency.

*Bottlenose dolphin stock structure and SAR.* Karen Martien and Karin Forney presented a revised stock structure for bottlenose dolphins. After a discussion, the SRG agreed with the new stocks.

*Spinner dolphin stock structure and SAR.* Erin Oleson presented the spinner dolphin SAR. The next SAR will have more-complete stock structure.

*False killer whale stock structure and SAR.* In response to last year's SRG recommendation to revise Hawaiian false killer whales to recognize an overlap zone between the insular and pelagic stocks, Erin Oleson presented three alternate stock structure options, developed in collaboration with Robin Baird and Karin Forney. Following a discussion on the sample size of satellite-tagged animals and implications for identifying appropriate stock boundaries, the SRG reached consensus that an overlap zone between 40 km and 140 km offshore of the main Hawaiian Islands was most consistent with the available data. They also agreed that takes should be apportioned to the two stocks based on the relative density estimates of each stock within the overlap zone. A request was made to Marti McCracken and Karin Forney to re-run the bycatch analyses with these boundaries and prorating methods, and to send a revised Draft 2010 SAR back to the SRG for review.

There was also some additional discussion about the shortline fishery, which operates primarily at Cross Seamount. The Council has considered regulating this fishery because there is potential for fishermen to switch to this gear type if the bigeye tuna quota is reached by the longline fishery. The shortline fishery is currently a Category II fishery managed by the State of Hawaii. There are few permit holders, although Robin Baird noted that there appears to be some fishing off Maui, Oahu and the Big Island that is not currently captured in the Council's analysis.

*Other Hawaiian Islands cetacean SARs.* Erin Oleson reviewed the remaining Hawaiian SARs. The SRG suggested that abundances for Japan and the ETP be omitted when not relevant. It also suggested that the SAR should not state that ZMRG has been achieved when not all significant fisheries within the species' range have been monitored. In such

cases it can be stated that ZMRG cannot be determined, and accompanied by an explanation why it cannot. There were several editorial comments and suggestions, additional citations, and evidence of take mentioned for bottlenose dolphins, rough-toothed dolphins, pygmy killer whales, pilot whales, spotted dolphins, and dwarf sperm whales. The sperm whale recovery factor should be adjusted from 0.1 to 0.2 (the default value for an endangered species with  $N_{min} > 1500$  and  $CV > 0.5$ ).

*American Samoa SARs.* Erin Oleson presented the American Samoa SARs. The SRG had only minor comments.

### **Topics, Timing and Location for Next Meeting**

It was tentatively decided that the next meeting would be in November 2010 in Hawaii.

Topics would include:

- 1) Review of false killer whale research, management, and SAR.
- 2) Humpback whale stock boundaries.
- 3) New Pacific Islands research and SARs.
- 4) Spotted dolphin genetics research.
- 5) Fin and sperm whale stock structure.
- 6) Hawaii spinner dolphin harassment issue.

## **Review of Previous Research and Management Recommendations**

The SRG recommends the Pacific Islands Fisheries Science Center (PIFSC) Protected Species program continue to build its small cetacean research program. The SRG notes that a cetacean survey should be conducted in Hawaiian waters by 2010, and that planning for such a survey should be initiated soon, given the complex planning and extensive resources required for such a survey.

*Declining resources and shiptime has delayed the cetacean survey of Hawaiian waters until at least 2011.*

The SRG urges continued studies of movements, abundance, and genetics of false killer whales and other cetaceans around Hawaii and in the Central and Western Pacific to better understand stock structure, population trends, and potential fisheries takes.

*Valuable studies have been conducted to provide new information on movements, stock boundaries, and abundance.*

Beaked whales are notoriously difficult to study and census, but small-scale studies in favorable localities have been successful. The SRG recommends that studies utilizing photo-identification, radio- and satellite tracking, and biopsies for genetic analysis be conducted where possible on beaked whales. This is particularly important given evidence that naval sonar exercises have had negative impacts on beaked whales, the U.S. Navy plans to expand its activities at Guam, and the recent unexplained strandings of beaked whales at Palmyra.

*Satellite tagging has been conducted on Mesoplodon in Hawaii. Funding is being sought by NMFS for additional tagging and tracking.*

The SRG recommends that the division of takes between insular and pelagic stocks of false killer whales in Hawaii be done in a manner that recognizes that there is likely an area of overlap between these two stocks and that both stocks likely occur in areas of potential long-line takes. The satellite tag data can be used to establish, and refine over time, the boundary and area of overlap based on the farthest distance from shore the insular stock has been detected and the closest distance to shore the pelagic stock has been detected. Additional tagging should be focused to determine differences in ranging patterns on windward and lee sides of the islands and more information is needed about near-shore fisheries that may potentially take false killer whales to determine whether fishery mortality has played a role in the apparent decline in the insular population.

*Much work has been done to help determine the extent of the apparent overlap area between insular and pelagic false killer whales. Options were presented to the SRG for allocating mortality between the two stocks in the overlap area, and the SRG reached consensus that an overlap zone between 40 km and 140 km, with bycatch allocated according to each stock's density, was most consistent with the available data and associated uncertainties.*

SRG recommends that NMFS develop SARs for Pacific Islands Territories where they currently do not exist. Priority for research and SAR development should be given to those areas and stocks where there is concern about potential human impacts.

*SARs have been completed for American Samoa. SARs for Palmyra and Johnston Islands will be drafted next.*

The SRG recommends that continued investigations be conducted on the causes of large whale ship strikes and effective ways to mitigate them. For Southern California where there have been an increase in ship strikes of blue whales, efforts should be pursued to work cooperatively with local governments and the shipping industry to take advantage of potential ways to partner air-pollution control efforts that provide incentives for reducing ship speeds to also provide a potential benefit to reducing ship strikes in the Santa Barbara Channel.

*Ship routes are being altered as a result of air-pollution control efforts and NMFS has been engaged with interested parties and stakeholders (e.g., shipping industry) regarding the effects of alternate routes and potential solutions, through research and analysis, to reducing the threat of ship strikes with large whales.*

The SRG recommends that harbor porpoise assessment surveys be conducted off Oregon and Washington and in Washington inland waters in light of the long duration since the last surveys, the Unusual Mortality Event that occurred in this region since the last surveys, and the evidence for recent ecosystem changes and shifts in distribution of harbor porpoise into Puget Sound.

*No progress has been made.*

The SRG recommends that a brief statement should be added to the SARs that indicates the level of certainty about the key elements (abundance estimate, stock structure, human-caused mortality) used for determining the status of the stock) together with a prioritized list of information or research needed to improve the assessment for that particular stock.

*Uncertainty is being identified in the SARs reviewed by the Pacific SRG, but not in a separate section.*

## **RESEARCH AND MANAGEMENT RECOMMENDATIONS**

### **Pacific Scientific Review Group – 3-5 November, 2009**

The SRG recommends the Pacific Islands Fisheries Science Center (PIFSC) Protected Species program continue to build its small cetacean research program. The SRG notes that a cetacean survey should be conducted in Hawaiian waters by 2010, and that planning for such a survey should be initiated soon, given the complex planning and extensive resources required for such a survey.

The SRG recommends continued studies of movements, abundance, genetics, and depredation behavior on fishing gear of false killer whales and other cetaceans around Hawaii and in the Central and Western Pacific to better understand stock structure, population trends, and potential fisheries takes. Additional tagging should be focused to determine differences in ranging patterns on windward and leeward sides of the islands and more information is needed about near-shore fisheries that may potentially take false killer whales to determine whether fishery mortality has played a role in the apparent decline in the insular population.

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The SRG recommends that the stock structure of humpback whales be revised to reflect the mixed stock structure revealed by the SPLASH study. There are clear genetic differences among different feeding areas and among breeding areas but without a one-to-one connection among individual feeding and breeding areas. The SRG recommends that PBRs be calculated and all takes be apportioned among feeding areas and separately among breeding areas in such a way that it insures protection of each of these areas individually.

The SRG recommends that NMFS safely mark entangled cetaceans (*e.g.*, PIT tags, genetic sampling, visual tags, VHF/UHF tags, photo-identification) before they are disentangled to assist with identifying individuals, to help assess the effectiveness of

disentanglement efforts, and to provide probabilities of mortality after entanglement injuries.

There are no current abundance estimates, and thus no PBRs, for harbor seal stocks in Oregon and Washington and the SRG recommends that new surveys be conducted. If regularly monitored, these stocks could serve as good indicators of environmental change (such as from global warming or anthropogenic causes).

The SRG recognizes the need for NMFS to address conflicts between spinner dolphins and human swim-with-wild-dolphin activities off Hawaii. The SRG recommends more resources for enforcement of regulations. The SRG supports ongoing development of new more-enforceable regulations to better protect spinner dolphins and, where possible, recommend these also address the threat of harassment on other Hawaii cetaceans especially because restrictions related to spinner dolphins may result in increased targeting of other species.

The SRG recommends NMFS conduct regular surveys of Necker, Nihoa and the Main Hawaiian Islands to obtain abundance and trend information of monk seals on those islands. These populations appear to be increasing and now substantially influence the total abundance trend.



## Appendix 1

### Attendees at the 20<sup>th</sup> Meeting of the Pacific Scientific Review Group

#### Scientific Review Group - Pacific Region:

|                   |   |
|-------------------|---|
| Hannah Bernard    | Hawai'i Wildlife Fund   |
| Robin Brown       | Oregon Department of Fish and Wildlife ( <i>Not attending</i> ) |
| John Calambokidis | Cascadia Research   |
| Mark Fraker       | Terramar Environmental Research                                 |
| Doyle Hanan       | Hanan & Associates, Inc.  |
| Jim Harvey        | Moss Landing Marine Laboratories                                |
| Chuck Janisse     | Fisheries expert  |
| Steve Jeffries    | Washington Department of Fish and Wildlife                      |
| Katherine Ralls   | Smithsonian Institution   |
| Michael Scott     | Inter-American Tropical Tuna Commission                         |
| Terry Wright      | Northwest Indian Fisheries Commission                           |

#### Invited Participants and Observers:

|  |  |
|--|--|
| <i>NMFS Southwest Fisheries Science Center</i> | <i>NMFS Pacific Islands Fisheries Science Center</i> |
| Lisa Ballance                                  | Bud Antonelis  |
| Jay Barlow                                     | Jason Baker  |
| Bob Brownell                                   | Marti McCracken                                      |
| Jim Carretta                                   | Erin Oleson  |
| Susan Chivers                                  |  |
| Karin Forney                                   | <i>NMFS Pacific Islands Region</i>                   |
| Siri Hakala                                    | Jami Marchetti                                       |
| Mary Grady                                     | Michael Marsik                                       |
| Aimee Lang                                     | Lisa Van Atta  |
| Karen Martien                                  | Michelle Yuen  |
| Sarah Mesnick                                  |  |
| Jeff Moore                                     | <i>NMFS Northwest Fisheries Science Center</i>       |
| Jessica Redfern                                | Brad Hanson ( <i>via telephone</i> )                 |
| Jeremy Rusin                                   | Marcia Muto ( <i>via telephone</i> )                 |
| Barb Taylor                                    |  |
| <i>NMFS Southwest Region</i>                   | <i>NMFS Office of Protected Resources</i>            |
| Monica DeAngelis                               | Melissa Andersen                                     |
| Tina Fahy                                      | Tom Eagle  |
| Dan Lawson                                     | Kristy Long  |
| Elizabeth Petras                               | <i>USFWS</i>   |
| Lauren Saez                                    | Deanna Lynch   |
| Sarah Wilkin                                   | Lilian Carswell                                      |
| Chris Yates                                    |  |

*Marine Mammal Commission*  
Bob Gisiner  
Sam Simmons

*Cascadia Research*  
Robin Baird

*Hawaii Longline Association*  
Svein Fougner  
Ryan Steen

*Portland State University*  
Sarah Courbis

*Makah tribe*  
Jon Scordino

*Western Pacific Fisheries Management  
Council*  
Asuka Ishizaki

*California Dept. of Fish & Game*  
Dale Sweetnam

*Hanan & Associates, Inc.*  
Barbara Curry

## Appendix 2

### FINAL DOCUMENT LIST Pacific Scientific Review Group – 3-5 November, 2009

| <b>Review Papers</b>     |  | <b>Contributor</b>          |
|--------------------------|--|-----------------------------|
| PSRG-2009-01             | CA/OR/WA cetacean SARs   | Carretta                    |
| PSRG-2009-02             | OR/WA harbor seal and northern fur seal SARs   | Muto                        |
| PSRG-2009-03             | Southern resident killer whale SAR   | Hanson                      |
| PSRG-2009-04             | Pacific Islands Cetacean SARs  | Oleson/Forney               |
| PSRG-2009-05             | Hawaiian monk seal SAR   | Baker                       |
| PSRG-2009-06             | Proposed 2010 LOF  | Andersen                    |
| PSRG-2009-07             | Blue/humpback photo-ID abundance estimates   | Calambokidis                |
| PSRG-2009-08             | CA Current cetacean abundance 2008   | Barlow                      |
| PSRG-2009-08<br>Appendix | Appendix to CA Current cetacean abundances document<br>Table with 2005-2008 estimates and average abundance for SARs | Barlow                      |
| PSRG-2009-09             | HI longline serious injury determinations  | Forney                      |
| PSRG-2009-10             | HI longline bycatch estimates  | McCracken                   |
| PSRG-2009-11             | HI false killer whale stock boundary revision & Draft SAR  | Oleson /<br>Forney / Baird  |
| PSRG-2009-12             | HI spinner dolphin stock boundary revision & Draft SAR   | Chapla/Oleson               |
| PSRG-2009-13             | HI bottlenose dolphin stock boundary revision & Draft SAR  | Martien /<br>Forney / Baird |
| PSRG-2009-14             | American Samoa fishery analysis & bycatch summary  | Oleson                      |
| PSRG-2009-15             | CA/OR DGN fishery bycatch estimates  | Carretta                    |
| PSRG-2009-16             | Hilborn report to HLA  | Fougner                     |
| PSRG-2009-17             | PICEAS 2005 abundance estimates  | Barlow                      |
| PSRG-2009-18             | Review of false killer whales in Hawaiian waters   | Baird                       |
| <b>Background Papers</b> |  |                             |
| PSRG-2009-B1             | Andrews 2009 Dissertation Ch. 3 - Hawaiian spinner genetics  | Oleson                      |
| PSRG-2009-B2             | Baird et al - FKW sat tagging manuscript   | Baird                       |
| PSRG-2009-B3             | Blue whale distribution shifts   | Calambokidis                |
| PSRG-2009-B4             | IWC Climate Change Workshop Report   | Forney                      |
| PSRG-2009-B5             | NRDC Petition to list Insular false killer whales under ESA  | Forney                      |
| PSRG-2009-B6             | Krahn_2009_Marine-Pollution-Bulletin   | Hanson                      |
| PSRG-2009-B7             | Herman et al. - Killer whale age distributions from fatty acids  | Hanson                      |

## Appendix 3

### AGENDA Pacific SRG Meeting, November 3-5, 2009 Marriott Del Mar, Del Mar, CA

**Welcome & Introductions** - *Michael Scott, Pacific SRG Chair*

#### **General Topics**

- MMPA update – *Tom Eagle*
- List of Fisheries - *Melissa Andersen*
- Serious Injury Working Group Process – *Melissa Andersen*
- Magnuson Confidentiality Guidelines – *Kristy Long*
- IWC Climate Change Workshop Report – *Lisa Ballance*

#### **CA/OR/WA Fishery and Management**

- Pacific Offshore Cetacean TRT – *Tina Fahy*
- Fishery and Observer Program – *Tina Fahy/ Monica DeAngelis*
- 2008 CA/OR driftnet fishery bycatch – *Jim Carretta*
- Large whale management - *Sarah Wilkin*
- Pinniped management (Children's Cove, deterrence) - *Tina Fahy*
- Delisting of eastern Steller sea lions - *Tom Eagle*
- Research takes of marine mammals – *Jeremy Rusin*

#### **CA/OR/WA Research and SARs**

- SPLASH update - *Barlow/Calambokidis*
- ORCAWALE 2008 abundance estimates - *Barlow*
- Blue/humpback whale mark recapture estimates - *Calambokidis/Barlow*
- CA/OR/WA Cetacean SARs - *Carretta*
- WA Sea otter research - *Lynch*
- Southern sea otter - *Carswell*
- Northern fur seal and harbor seal SARs - *Muto (by phone)*
- Southern resident killer whales - *Hanson (by phone)*

#### **Pacific Islands Protected Species Management**

- False killer whale TRT – *Yuen / Long*
- PIRO Observer Program - *Marsik*
- Hawaiian monk seal management - *Yuen*
- Hawaiian spinner dolphin - *Yuen*

## **Pacific Islands Research & SARs**

- Monk seal research and SAR - *Baker*
- 2005 Palmyra/Johnston cetacean abundance estimates – *Barlow*
- Hilborn report – Bayesian abundance estimation for HI - *Barlow*
- Hawaii false killer whale mark-recapture and telemetry research – *Baird*
- 2009 Main Hawaiian Islands cetacean survey – *Oleson*
- Pacific Islands cetacean acoustics research - *Oleson*
- Cetacean bycatch in American Samoa longline fishery - *Oleson*
- Longline bycatch and depredation correlate re-analysis - *Forney*
- Cetacean Serious Injury Determinations, HI longline fisheries - *Forney*
- Cetacean bycatch in Hawaii-based longline fisheries - *McCracken*
- Bottlenose dolphin stock structure & SAR - *Martien/Forney*
- Spinner dolphin stock structure & SAR - *Oleson*
- False killer whale stock structure & SAR - *Oleson*
- Other Hawaiian Islands cetacean SARs - *Oleson*
- American Samoa SARs - *Oleson*

## **Discuss recommendations**

**Topics, timing, and location for next meeting**

**Adjourn meeting**