Minutes of the Twenty-sixth Meeting of the Alaska Scientific Review Group

13 - 14 March 2013, Seattle, WA

This is a report of the 26th meeting of the Alaska Scientific Review Group (SRG). This document is intended to summarize the main topics of discussion and does not attempt to record everything that was said during the meeting.

Introduction by Robyn Angliss and Lloyd Lowry. Attendees included:

AK SRG Members: Lloyd Lowry, Karl Haflinger, Craig Matkin, Grey Pendleton, Bob Small, David Tallmon, Beth Mathews, Kate Stafford, Robert Suydam, Kate Wynne, Mike Miller

Observers and Invited Participants: Jon Kurland (AKRO), Van Helker (AFSC), Dee Allen (AFSC, NMFS AK SRG Liaison), Robyn Angliss (AFSC), John Bengtson (AFSC), Nicole LeBoeuf (NMFS HQ/PR2), Shannon Bettridge (NMFS HQ/PR2), Kristy Long (NMFS HQ/PR2), Mridula Srinivasan (NMFS HQ/S&T), Sam Simmons (MMC), Steve Ignell (AFSC), Daryl Boness (MMC), Mike Tillman (MMC), Frances Gulland (MMC), Dennis Heinemann (MMC), Doug DeMaster (AFSC, by teleconference), Janice Waite (AFSC), Kym Yano (AFSC), Josh London (AFSC), Phil Clapham (AFSC), Shawn Dahl (AFSC), Erin Richmond (AFSC), John Jansen (AFSC), Mike Cameron (AFSC), Jeremy Sterling (AFSC), Tom Gelatt (AFSC), Jason Baker (AFSC), Peter Boveng (AFSC), Paul Wade (AFSC), Kim Parsons (AFSC/NWFSC), Bridget Mansfield (AKRO, by teleconference)

Alaska SRG 2012 Recommendations and Responses from NMFS

Shannon Bettridge reiterated to the SRG the value of the written recommendations to the Agency following the meeting. NMFS is grateful for these recommendations and we welcome them. She then reviewed the Alaska SRG's 2012 recommendations and the NMFS response (available at: http://www.nmfs.noaa.gov/pr/sars/group.htm).

The Intent of the Marine Mammal Protection Act (DeMaster)

This annual meeting goes back a long time to the first SRG in 94/95 when Bob Small developed the first reports at NMML. This new marine mammal fishery interactions regime started in response to the 1994 amendments to the MMPA, and was designed such that a minimum amount of information could be used to develop an estimate of potential biological removal (PBR) - and therefore evaluate the potential effects of human removals from a stock. At the time, most stocks did not have abundance estimates. The agency began receiving funding of $11-14 million / year, and with that the agency intended to create a reliable estimate of abundance and bycatch for each stock and then classify a stock as strategic if takes from the stock exceeded PBR. However, this approach was based on a need for funding to determine abundance and bycatch estimates. Unfortunately, NMFS has struggled with a lack of funds over so many stocks have not been adequately assessed. Some low-profile stocks that are not considered a funding priority, such as beaked whales, are not thought to be subject to high bycatch; however, some stocks such as the harbor seal and Dall's porpoise have not been adequately funded but need to be assessed.

Alternative sources of funding need to be sought out. In summary, we have a framework that works, but we can't afford to populate that framework with data. This situation isn't likely to change, and we have a few stocks in particular we need to address.

There is a new observer program going into effect in the Gulf of Alaska this January which will place observers on ground fish boats (halibut, sablefish) in the 40-60 foot range which had previously been mostly unobserved. This is paid for by a 1.25 % landing tax. This change will not address our lack of data for category 2 set and drift gillnet and purse seine fisheries, as these still remain mostly unobserved. It takes several years of accumulating funds to pay for just one season of partial observer coverage for these fisheries, and that is the only system we have in place for the state-managed category 2 fisheries. NMFS may have to request assistance from industry or elsewhere to increase observer coverage, as it takes longer than a decade to observe all the category 2 fisheries under the current process. If NMFS does not consider alternative methods or sources of funding, we will not improve bycatch estimates using the current observer program process.

Robert Suydam noted that in dealing with the oil and gas (O&G) industry in the Arctic and struggling with a lack of data on population size and trends for marine mammals, oil companies claim population estimates and trend analyses are not the responsibility of industry, it is the federal government's responsibility. However, the O&G industry expresses frustration with the government for not having stock and trend assessment information available in a timely manner. Companies are willing to contribute if resources can be used or extracted. Are there ways for these collaborations to develop and help with this problem of a lack of or outdated data? Perhaps industry, including O&G companies, shipping, and commercial fisheries, could contribute to research. This concept would be similar to the tax on fish landings previously mentioned.

DeMaster responded that the focus of the PBR regime is pretty narrow for fishery interactions; it wasn't designed for catch limits on subsistence or O&G. Its use has been expanded in some cases; it is assumed that PBR is this magic number that can be used as a comparison for managing all sources of marine mammal mortality and that really is not the case. The agency does have a process for evaluating the impact of the O&G industry through NEPA and ESA. As for marine mammal/fishery interactions: in the 1990s we went from an era of legal shooting of marine mammals to so called 'soft-landing.' There is/was no requirement for vessels to carry fisheries observers under the MMPA; that decision was left to the Agency to make the call based in part, on funding. That provision was part of the mix that allowed the MMPA amendment to be passed. At this point it is hard to imagine any significant change in the MMPA to address that.

Kate Wynne asked whether it is a GAMMS guideline or a legislative mandate to use any data (regardless of age) to provide quantitative information? We keep getting the sense that 22 yr. old quantitative bycatch data is better than a more current alternative approach. Is that a mandate or a guideline to use any data regardless of age? Robyn Angliss responded that there are no guidelines in GAMMS that say anything about the age of the mortality data. The approach AFSC and AK Region have agreed upon is that if there are reliable data (even if those data are old) they should be reflected and used in the SAR. That's why we have continued to reflect those data in the SARs over the long term. The MMPA specifically mentions using the best available science.

Wynne noted that data are going to age further without funding, at what point do we redefine what we consider outdated data, and how? Lowry responded that with 23 yr. old data, too many variables may have changed, so data may not have applicability. Demaster pointed out the underpinning of guidelines was to err on the side of keeping mortality events accounted for. As abundance estimates age, it goes to zero because they become less reliable, however, mortality data, no matter how old, does not age unless new data is acquired to replace it. No one ever anticipated that we would go 22 years without new data, but it just didn't work out that way. We were hoping to keep the mortality data no matter how old, and create an incentive for funding new abundance surveys.

We are always bound by best available information. There is nothing that stops us from adopting new mortality data if it is deemed as best available data, but until we have new 'best available data' we should continue to use current best available data. We could try to better articulate what 'best' in 'best available data' means. When data are 22 years old, we could explain that even though certain data are 'best available' (or most recently available), it may not be accurate. It is not going to get better for stock assessments, so the idea of placing caveats on data may be necessary.

For example, in the case of harbor porpoise in SE AK, there are known interactions with porpoise and drift gillnet fisheries, but nothing was in the SAR mentioning these interactions. The information should stay or be added to the stock assessment report, and if necessary add a disclaimer discussing the data's credibility. This way a complete set of information is provided so people can fully understand what is going on. It is better to keep data in the SAR and disclose that it may no longer be relevant or is of questionable credibility, but at least the history and the thread will remain so that people can fully understand the big picture.

SRG terms of reference (Bettridge)
The 1994 MMPA amendments required the creation of 3 independent regional (Alaska, Pacific, Atlantic) scientific review groups to advise the Secretary of Commerce on marine mammal science and management. The MMPA also envisions a role for USFWS at the SRG meeting pertaining to the species that are under USFWS' jurisdiction. The SRG provides high caliber and independent reviews for these agencies and we rely on these peer reviews of our reports and rely heavily on your recommendations. We are very grateful for the amount of work over the years that you put in. Thank you. We know that you do it out of real passion and devotion.

Recent attention has been given to the processes by which the SRGs operate, and there is a need to develop a transparent process regarding membership requirements, roles, qualifications, etc. Terms of reference need to be developed and should be clear and transparent, as these SRGs have been operating for 19 years without any. Without terms of reference, it seems many outside the agency do not understand the role and purpose of the SRG. Over the last few months NMFS, in consult with SRG chairs, has begun the development of a draft terms of reference; a draft was provided to the SRG as of Monday. The document provides roles and purpose, responsibilities, terms of service, nominations, terminations, etc. A very important part of the terms are the minimum selection criteria for appointing new members and the scientific expectations for the SRGs. Comments will be collected over the next few weeks from all SRGs and one cohesive document will be developed.

The Chair thanked NMFS for moving ahead on this and for consulting with the SRGs and the SRG chairs. It will be a good thing to explain what the SRG does and how. Some of the main concerns have been with term limits, in which up to (3) 3 year terms are to be allowed. Ethics and conflict of interest issues were also of particular concern to SRG members because of how closely some SRG members work with NMFS on other projects.

Update on GAMMS (Bettridge)
While the MMPA specifies what goes into stock assessment reports it does not offer guidelines as to how it is done. In response, the agency first had a workshop on this topic in 1994/1995. The first Guidelines for Assessing Marine Mammal Stocks (GAMMS) was published in 1997, followed by GAMMS II in 2005. There was a follow-up workshop in Feb 2011(GAMMS III), which is not yet in place, so we are still operating under the framework of GAMMS II. We are still addressing the 100+ public comments to GAMMS III. The main topics addressed at GAMMS III were:

1. How to deal with PBR calculations with outdated abundance estimates.
2. Improving stock identification.
3. Assessment of small and very small endangered stocks.
4. Apportioning PBR across feeding aggregations and transboundary stocks, and allocating mortalities in mixed stocks.

Additional topics included: the reporting of injury and mortality incidental to commercial fishing, designation of stocks as strategic based on evidence of decline, assessing stocks without estimates of abundance or PBR, characterizing uncertainty in key SAR elements, and whether to expand the SARs to include non-serious injury and disturbance.

Alaska SRG history (Lowry)
There have been a total of 26 members, with 11 current and 15 alumni. We see an average term of 6.6 years with a range 2-19 years. Over time, we've seen a 90% average attendance at SRG meetings. The SRG's worst attendance was at a meeting held in Juneau in winter. The Alaska SRG worked with NMFS and USFWS to develop the initial SARs and has since reviewed about 400 draft SARs and has additionally provided advice and recommendations to NMFS. The SRG does not speak for NMFS or USFWS, take credit for SARs, or get involved in regulatory or policy issues.

The Chair and Liaison talked to USFWS about their interest in presenting at this SRG meeting - they are working with USGS to get recent stock data published and in turn develop some new SARs and next year we should have SARs for at least polar bear.

PBR calculations under GAMMS III (Wade)
Paul Wade was asked to examine what happens with the PBR calculations for the AK stocks under the proposed GAMMS III guidelines, versus the current GAMMS II guidelines. The issue with the new GAMMS III guidelines is that for an increasing number of stocks, the most recent abundance estimates are more than 8 yrs old. Under GAMMS II the abundance data for these stocks are considered outdated thus Nmin is considered unknown and is not used to calculate PBR. With PBR considered to be undetermined, a number of issues arise, including the

assumption that there is no limit to PBR. So, we agreed to investigate methods to calculate PBRs for stocks with old abundance information. We propose a method that does not have PBRs disappear after 8 years. The PBR will still be calculated and meet the mandate of the law. Nmin would decrease as the future is projected, due to is the greater uncertainty in population trends. There is a provision to allow the inclusion of population trend data, so that we can project any trends (i.e., if the population is increasing or decreasing) into the future.

Under the current guidelines, PBR is determined in year 0 and then remains the same for 7 years. In the 8th year it becomes undetermined. In this new method, we account for uncertainty in the future trend of stocks by increasing the CV of the abundance estimates; that is, increasing the variance of the abundance estimate due to the uncertainty of years having gone by since that abundance estimate occurred. That method followed from one key assumption: we assume a uniform distribution of the potential increase or decrease of the population from the -10% annual decline to a +10% annual increase. The population could be either declining or increasing - both are equally probable – meaning thatthe expectation or mean is 0. The point estimate remains constant, but we are inflating the CV by adding in this variance due to what the trend might be, so the confidence intervals around the estimate are expanding. Then, you can calculate standard deviation and the CV.The CV of abundance at some time in the future is the combination of the CV of the original abundance estimate and the CV of the component due to the projection into the future. Lastly, you can combine the components into a signal CV and use that to calculate PBR.

This is a proposed approach, and is not final. This method does not assume the population is declining. To test the new approach, Wade calculated the PBR of 7 stocks both ways (current guideline and proposed changes) and this is just a 'what if?' scenario. There is one potential issue and that is those stocks where mortality exceeds PBR under the new guidelines and not under the old (this only occurs for Eastern Chukchi beluga and Aleutian harbor seals. The other issue is that we have PBRs for stocks where we did not have them before (total of 8 stocks). Overall, the new proposals do not impact stocks greatly. In some cases the PBR is lowered, really this only matters for the Aleutian harbor seal stock, where mortality will be above PBR if GAMMS III proposed guidelines are adopted.

Lowry asked, regarding the range of possible increase and decrease, is it better to use 4% growth rate for whales, and 12% for pinnipeds? Is that an option? Wade responded that the problem with that approach is that you assume that the population is declining. Assuming a possible range between a 4% growth rate and a 10% rate of decline in a stock creates a mean rate of decline of -3%. People are uncomfortable with that. We want to keep the assumption that it can go up or down with equal probability.

Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) killer whale stock structure (Wade)

Wade presented on non-genetic information on stock structure of killer whales in the BSAI and into the GOA, with a focus on BSAI and transient killer whale predation on Steller sea lions. Kim Parsons will follow up on the genetic work on transient and resident killer whales. Resident type killer whales are primarily fish eaters. Most resident whales don't have a huge range, with an average of 200km, though 10% or so of the total appear to have a range >500km. Holly also

analyzed the resident killer whales' social network and found 4 social networks of resident whales. It seems social network analysis matches reasonably well with the genetic data.

Transient killer whales are becoming known as Bigg's killer whales to honor Mike Bigg. A recent paper suggests that transients have been separated from other types for 700,000 years which deserves new species status, and transient is not a good name for a species. There have been 94 NMML encounters with Bigg's killer whales over the last 10 years. There are many re-sights in Eastern Aleutians/Bering Sea. We don't have much data from the far western Aleutians, though, there is some information. The Pribilofs appear to be rather separate from Bering / eastern Aleutians. At this point the Bigg's killer whales have shown discrete social groups with no connections; this may change as more information becomes available. As a result of tagging a few animals we have documented dramatic and rapid trips south. This may be to regenerate skin, as this is thought to be too demanding in cold water. We also observe animals hanging in the same area for a prolonged period of time (these were possibly feeding on squid over a submarine canyon).

Do we know what killer whales are doing in the western Bering? In particular, the apparent increases in the number of killer whale sightings in the Chukchi and Beaufort Seas. Are they coming from the eastern Bering or western Bering?

Wade responded that this can be partially solved by acoustics, which we are working on. We can compare calls that are showing up in the Chukchi and Beaufort and see if they are associated with calls from the eastern or western Bering Sea. In terms of chemistry, we have dichotomous stable isotope signatures between eastern and western Aleutians. Additionally, there are no shared calls between Pribilofs and central Aleutians. All these data are preliminary but are consistent with population structure.

Killer whale genetics in the North Pacific (Kim Parsons)
We have 3 distinct killer whale types in North Pacific: offshore, residents, and transients. We sampled mitochondrial control DNA (mtDNA) shows that transients diverged about 700,000 years ago. mtDNA sampling produces multiple lines of evidence that shows we are looking at data at a multi-species or subspecies level. We have been able to amass a large number of samples from North Pacific killer whales with 462 samples collected. We have found 3 haplotypes for resident killer whales after analyzing over 300 samples and 7 haplotypes for transients after analyzing a smaller number of samples. There is no evidence of contemporary gene flow between residents and transients. Although movement between neighboring regions is observed, no real long range movement is being detected. Regarding residents, mtDNA analysis shows that eastern Aleutian whales are very different from the central Aleutian, western Aleutian and Russian animals. The Gulf of Alaska has very different populations from the eastern Aleutians. Our statistical analysis indicates a strong break between central and western Aleutians and eastern Aleutians and Gulf of Alaska. In regards to transient / Bigg's killer whales, there is much more genetic diversity with 9 putative populations. It would be helpful to increase the number of samples we have in the western Aleutians to examine what's happening in greater detail.

Are there any plans to sample the Arctic to fill in gaps of data?

Wade responded that we do have people in the Chukchi, and if they encounter killer whales they will get photos and recordings. Having the ability to get close and photograph killer whales, or sample would be helpful. Dedicated surveys do not have a high probability of intercepting killer whales.

Mortality and injury assessment (Dee Allen)
A new policy is being implemented and all records of marine mammal injuries have been reviewed going back 5 years. Stock assessment reports are required to report on estimates of annual human caused mortality and serious injury by source and by commercial fishery. Under this policy, the regulatory definition of serious injury is: any injury that is more likely than not to result in death (i.e., injury will cause death >50% of the time). The process for making determinations has several layers of review. First, injury determination staff work together in each region to make initial determinations once data are acquired. Next, these determinations are exchanged between NOAA science centers, reviewed, and modified as appropriate. Next, the SRG and regional offices review the preliminary determinations, then the determination staffdevelop an annual injury determination report, and those determinations are included in the SARs. Over 500 records from Alaska have been reviewed between 2007 and 2011, and we are still missing some records. Our main sources of data are the Alaska Fisheries Science Center (AFSC) via the observer program, the Alaska Region (stranding network), and Alaska Department of Fish and Game (ADFG), Northwest Fisheries Science Center (NWFSC), and Pacific Islands Fisheries Science Center (PIFSC). Also, many thanks to Jeff Breiwick for compiling observer data, and many thanks to Lauri Jemison from ADFG; she has done a lot of work for us and has been extremely helpful.

The primary observed injury types to Alaska marine mammals are entanglements (fisheries and marine debris) and vessel collisions. A brief summary of the general injuries we're seeing: Steller sea lions (SSL) are the predominant pinniped we're seeing injured. With the eastern SSL, we're observing salmon troll gear ingestion (150 hook and flasher related injuries). With the western SSL, we see more trawl fisheries related injuries, especially for Northern fur. With small cetaceans, we're observing a number of gillnet fisheries interactions, particularly subsistence gillnet. We have a unique case with a Cook Inlet beluga, and I would like input from SRG. It has been sighted entangled for a couple of years and qualifies as an serious injury under the guidelines, but was last seen less than a year ago, still alive. Regarding large cetaceans, most injuries occur primarily to humpbacks and are due to ship strikes, many involving smaller vessels. Many large whale entanglements are considered L10 according to new policy, in which there is not enough information to make a determination, but an entanglement was known to occur, so it is getting a prorated value. More follow up data will be useful in improving injury assessment. Especially in terms of humpback whales, increasing collaborations between researchers and managers working near the breeding grounds with those working near the feeding grounds will be helpful in improving injury assessment (we are fortunate to have data for both).

There are a few injuries/interactions that are unique to Alaska - instances of multiple whales getting entangled in the same net, marine mammal interactions resulting in human safety concerns, such as instances of fishing boats being dragged toward rocks by entangled whales.

We do have further challenges to address such as encouraging communication between photo identification groups, assignment of gear to specific fishery, or even distinguishing gear type. We also have a need for long term data on pinnipeds for improving injury categories. Stock identification is another challenge.

Beth Mathews asked if the gear type is unknown, why is it not prorated with the fisheries distribution? For example: say it is known that 75% of the salmon troll fishery is commercial and 25% is recreational. Can we take all flasher injuries and prorate it at that 75% / 25% ratio?

Mike Miller: The gear is notably different. The line weight could be a determining factor to distinguish commercial vs. a sport fishery. Commercial line is much heavier.

Mathews stated that line should be collected during necropsy if it can be used to determine fishery.

Observer information updates (Jeff Breiwick)
The Alaska Regional Office (AKRO) and our observer program at AFSC produced an 80 page document known as the 2013 Annual Deployment Plan which is different than previous years. The new sampling plan will reduce the chance that a vessel will not receive any observer coverage, particularly in the <60 foot category. It will also increase the number of vessels in the partial coverage category. The only significant change are the length categories ,which could change each year. Although data will be less biased with this new plan, we do not know the direction of the bias. I anticipate that this change should not have a big impact on bycatch information as the smaller vessels do not seem to be a big source of marine mammal bycatch; the 125+ foot vessels seem to have bigger bycatch impact.

Karl Haflinger: One of the biggest differences is that vessels that are pure halibut boats have never had observer coverage. This exemption has been stripped from them, and now there is a whole gear class that has not been covered, but will now be covered. All hauls are recorded, but it is too much work to collect them all, and observers aren't on all vessels, so only hauls sampled are recorded. Electronic logbooks may be the answer, but we're not there yet.

Breiwick noted an issue with the SAR is that we are looking at 5 year time intervals, 2007-2012 has a certain sampling regime. In 2013, the sampling regime will change and the two sampling regimes will have to be presented separately.

Mathews asked how boat size impacts marine mammal bycatch? Breiwick responded that bycatch estimates are (number of animals caught) / (observed effort in a strata) * (total effort). Larger vessels are making larger hauls and more hauls and it turns out there is more bycatch. But the numbers of hauls are not recorded. Only hauls sampled are recorded.

Alaska Marine Mammal Observer Program (AMMOP) update (Bridget Mansfield).
An observer program is being conducted on southeast AK salmon fisheries targets natural salmon runs. Sockeye runs begin in June and run into July. Pinks are targeted in August and chum salmon are caught incidentally. Coho run in September. During the fishery, sockeye were

numbers were about average, pinks and coho were a little below average, and chum numbers were high.

Exclusive of the chinook fishery which takes place in May, there were about 4300 vessel days fished during the salmon season in districts 6 and 8 and 425 vessel days fished during the salmon season in Anita Bay. The AMMOP target of observer coverage was 7.5% of fishing effort. Observers were tasked with data collection priorities in order of importance. These were haul watch, soak watch, set watch, and transit watch.

The AMMOP observed effort from 2012 in total was 338 permit samples in districts 6 & 8 with 1812 observed hauls. In Anita Bay 34 permit samples were observed with 187 observed hauls. We have not completed the analysis yet, but in 2012 the AMMOP observed bycatch consisted of: 1 Dall's porpoise, released alive, 3 humpback blow-throughs with no gear trailing, 1 humpback entanglement, released alive with no gear trailing, and 12 common murres observed dead.

Was it a surprise to you to see no harbor porpoise takes? Mansfield replied that we have observed harbor porpoise takes in some years, and not in others. Perhaps we'll see something next year if they are being taken; we did have low observer coverage. The observers did observe harbor porpoise in the area, but I do not know how many and based on surveys we know harbor porpoise are there. Observers collected data on pingers whenever observed, we have not looked at the data yet, but we will look at that info. The gillnets are 300 fathoms long, except they are 200 fathoms long in Anita.

On another note, we need to attempt to assign a number of serious injuries to fisheries / identify gear type.

Research plans for arctic ice seals (Peter Boveng)
The Polar Ecosystem Program currently has one funded and active project which is large area surveys for abundance estimates of ice associated seals in the Bering and Okhotsk Sea (BOSS). We have not had vessel support since 2010 for the annual work we were doing on movement, habitat use, health, and condition. Additionally, our funding from BOEM to do bearded seal research has also lapsed. BOSS is a joint US / Russian effort covering the western Bering and the Sea of Okhotsk. In April and May of 2012: Russia conducted 4200 miles of survey despite serious logistical challenges. The US conducted 16,500 miles of survey. Thermal video is used to detect warm bodies on ice, which is paired with a high resolution digital camera. The idea is to not have to look at ~1,000,000 images from the digital camera, but just a subset of images that are associated with a hotspot from the thermal video. As I've said, we've gone away from traditional sightings, and now fly higher, which reduces disturbance and now we rely completely on the instruments to detect and identify seals. We seem to have a very high detection rate (95%) with the thermal method vs. manual photo examination, and are accounting for the slight difference. Fog is a problem for thermal and traditional imagery and we need good weather to do these surveys. We have analyzed data from a sample of 10 flights during a one week period last year. We modeled the density and have concluded that spotted & ribbon seals are found at ice edge. Ringed seals are found further north. For bearded seals, better models are needed. Also, unless the subset is biased, we are looking at numbers bigger than previously believed. We've talked with various organizations about the need for this study and we're hopeful for future

funding. The ice is already pretty far south this year, last year was a record ice year. This year is likely to be less extensive. The analysis is a spatial model which can deal with changes in ice distribution within and between years. Bovengs expects that we will have a robust and extensive ice field this year.

Boveng stated that he hopes and thinks that we are surveying all of those ice associated seals that are a part of the breeding population of the Bering / Okhotsk. For spotted and ribbon seals that is essentially everything. If we were to survey the Chukchi and Beaufort we would design it to be additive to the BOSS data. These numbers represent the breeding populations of the Bering Sea and the Sea of Okhotsk.

Humpback interactions with vessels in AK (John Kurland)
For ship strike reports we have a mix of self-reporting and witness reports (from stranding hotline, NOAA Office of Law Enforcement (OLE), and United States Coast Guard (USCG). When input is received, we contact a captain or crew to obtain relevant data such as vessel size or speed. Records are maintained as a part of the Alaska stranding database. A paper was published last year in the Journal of Marine Biology which covered ship strike data from 1978 - 2011 in Alaska. There is also a sighting program in place - the background on this is that NMFS staff met with cruise captains and pilots to reduce ship-strikes in Alaska after 7 possible strikes in 2010. In regards to smaller vessels, such as whale watching vessels, we provide annual presentations to raise awareness and to cover regulations and guidelines. The cruise ship industry was open to using maps of recent sightings in order to be aware of whales and be able to respond appropriately - such maps were compiled and provided on a weekly basis. In 2012 we had 8 ships that provided weekly sighting information which is then made public in order to reduce ship strikes in SE Alaska. Small cruise vessels (tour) are being targeted for the future ship strike prevention efforts.

We are weak on monitoring and enforcement and cannot speak to the effectiveness of the regulations. In general the whale watch companies are pretty good regarding regulations and reporting. There tend to be more reported violations with fishing charters and recreational boats than anything else. In addition, we are seeking public comment developing regulations for vessel interactions with harbor seals. We will be holding 2 public meetings regarding impacts to harbor seals and what sort of measures may be appropriate. ADFG has received money for research on this subject.

Use of pingers to reduce entanglements in fishing gear (Wynne)
As the Central North Pacific humpback whale is increasing rapidly, these animals are increasingly interacting with 1800 foot long salmon setnets and driftnets. Often the whales just blow through the net, but sometimes they cannot. This new low frequency 3 kHz pinger alerts animals to the presence of a net; and seems to preventing fisheries interactions. The pingers have completely eliminated beaked whale bycatch in California. An Australian company has created a pinger that seems effective on humpback whales, which is now being used in Alaska. Fishermen are voluntarily buying pingers at $175 apiece (only about 6-7 per net are required). Unfortunately, pingers may be viewed as harassment and therefore the NMFS may be unable to endorse pingers, even though they are better than the alternative of not using them. We are collecting information on feeding habitat and field performance metrics and will be distributing a

questionnaire to gather more information from fishermen on humpbacks and pingers. Common questions we ask include: Did you see more Steller sea lions? Did you catch more fish? It seems that Steller sea lions are not attracted, and fish yield is not affected.

Another item to note is that when pingers are used on a net and pinger batteries die, these nets will catch marine mammals in those quiet areas, and cause an increase in marine mammal bycatch. Fisherman are going forward and buying these pingers and NMFS has not given them an alternative, i.e., pingers are not authorized to be used under the ESA, but they have not been prohibited either.

Kurland pointed out that we need additional information from the field to better understand the issue.

Miller noted an area of concern is that pingers may reroute whales into ship traffic, especially given the narrow channels found in southeast AK.

Wynne responded that there is lots to be done, but it is very good news that something will keep the whale out of the net. At this point it seems about 10% of gill-netters in Kodiak are using pingers, with more pingers being used in southeast Alaska.

Listing ringed and bearded seals in Alaska under ESA (John Kurland)
NMFS published final rules in December to list ringed and bearded seals in Alaska as threatened under the ESA. For ringed seals, the Arctic, Okhotsk, and Baltic sub-species were listed as threatened, and Ladoga ringed seals were listed as endangered. For bearded seals there were two distinct population segments (DPSs). The Beringia and Okhotsk DPSs were listed as threatened. This was all premised on projected habitat alteration associated with climate change (loss of sea ice and snow depth on sea ice). NMFS is now working on developing critical habitat designations for ringed and bearded seals in the Alaska populations. There will be proposed rules for critical habitat, probably later in spring and finalized by December 2013. For ribbon seals and spotted seals NMFS determined that listing under ESA was not warranted as of 2008, but we are developing a new status review for ribbon seals and will reevaluate whether listing is warranted by June, 2013. The new status will use a different foreseeable future and a threat specific approach to looking at the data and will incorporate additional information on ribbon seals.

NMFS has received a petition to list Iliamna Lake seals under ESA and is supposed to make a finding within 90 days as to whether practical review is warranted. If listing is warranted NMFS will conduct a status review. The principle threats cited in the petition were the development of the Pebble Mine and climate change. NMFS published a proposed rule to remove eastern Steller sea lions from the endangered species list. The proposed rule was published in April of last year and we are working to make a final determination hopefully early this year.

Monitoring the Alaska Native harvest (John Bengtson)
Data availability and quality is a mixed bag with most species that are taken for subsistence. We know the take number for bowhead whales but not for several other stocks. For ice seals, we only have information from certain geographic areas. For harbor seals, previous post hunting surveys and household interviews provided data; however, we lack data for recent years due to a

funding lapse (although there is a subsistence survey occurring currently). For northern fur seals, we have take numbers because the harvest is monitored. Although there is no comprehensive program in NMFS to monitor subsistence harvests, we could do a better job describing the status of the current harvest monitoring to the SRG.

Lowry asked: It's not specified in the MMPA that harvest does not count against PBR, but if you have a PBR that is a legitimate scientifically-based allowable removal from a stock and it is being exceeded by all human removals including subsistence take, then what do you do?

Kurland mentioned that in terms of practical significance, with the recent listings of ringed and bearded seals there has been a lot of concern from the Alaska Native community regarding impacts on subsistence harvest. Suydam said that many people in the subsistence community are mistrustful of actions to regulate subsistence harvest, in light of recent actions by the USFWS following the listing of the polar bear. If SRG does recommend improved record keeping of subsistence harvest (for landed, struck and lost), NMFS should also give this record keeping a higher priority. Having data on the levels of subsistence take may become important to NMFS in the future in several scenarios, including if the populations begin to decline due to habitat change.

Mike Miller: A clearer policy that defines and clarifies use of as Optimum Sustainable Production (OSP), PBR, and Native take would help alleviate current issues due to confusion over how these ideas all fit together in practice.

Bengtson: NMFS is trying to do a better job in having some kind of consistent harvest monitoring effort on these species. We recognize that subsistence monitoring would be helpful, but we do not have the funds to pay for it. Something else would need to be sacrificed in the budget.

Also, when PBR was conceptualized it was mostly applied to fisheries take. However, in intervening years its definition may have changed. We should determine if PBR is the correct metric for accounting for all non-fisheries uses, including takes form science, subsistence, other industrial, and anthropogenic sources

Sam Simmons: When the take of a strategic stock exceeds PBR, the frequency with which you review that stock assessment changes from every three years to one. There is no direct impact on subsistence harvest, as it is managed under 101 (b) in the Act. In the case of Steller sea lions, the stock is designated as depleted and listed under the ESA, and that could invoke management of subsistence harvest, regardless of what's happening with PBR. Whether or not people want to point to PBR as the number that could be used in the co-management process there is actually language in the Act that discourages that and we need to find a novel way to look for that number.

Mathews mentioned that we are missing the data that used to come in through the ADFG's subsistence monitoring program, and it is important to recognize the two broad categories of data that are derived from subsistence monitoring:

1.A compilation of subsistence monitoring data and hunt effort (would be useful to assess populations).
2. Biological samples obtained through subsistence harvest.

Boveng noted that this is an important topic for those of us that work with Alaska Native partners in these co-management arrangements, and who are involved in collaborative research and monitoring projects. Often there is recognition on the part of the Alaska Native partners that more information would be helpful, but there is also a reluctance to participate and recognition that more information may expose some PBRs that are exceeded. It really would be helpful in that context to have a clear and consistent approach with all these different groups on how the agency views this. This has come up in working with the Harbor Seal Commission. His view is that if we have some new information and we are suddenly faced with a situation where Native harvest exceeds PBR or cumulative take exceeds PBR, rather than having that trigger some move to regulate the harvest, it should give us something to look at, so we can ask why is PBR being exceeded here? It may be that take is not too high, but rather that the population estimate is outdated, making the variance high and PBR low In this case, rather than restricting take we need to focus on getting better population estimates and redefine PBR. If, following further analysis, it is still necessary to address a problematic level of subsistence take, then hopefully then we can work with our partners to address any issues that are discovered.

Suydam provided a similar example from the IWC. The IWC is willing to assume more risk in terms of conservation of a marine mammal stock, if the harvest is subsistence rather than commercial harvest. One way to help alleviate some of the concerns that AK Native partners have is for the agency to be very explicit and say that we are willing to accept more risk in Native harvest than compared to bycatch in commercial fisheries, and that PBR is conservative and precautionary. It may be appropriate to be less precautionary for subsistence harvest, so that the co-management partners may become less concerned with how the agency might deal with subsistence, which may result in greater partnership in monitoring efforts.

Cook Inlet (CI) beluga: Dee Allen explained that that the CI beluga does not have a PBR is because it does not meet the criteria for having a PBR. The PBR model is based on the assumption of a surplus production and there is not potential biological removal for a declining population. Bettridge stated that for consistency we may want to set the PBR to zero or undetermined. This was done for the Hawaiian monk seal and should apply to CI beluga. Pendleton said that it would be good to have an indication of how many fisheries have the potential to interact with a stock, and how many of those were monitored (e.g., 10 of 22 fisheries were monitored). This would allow the reader to put an appropriate amount of confidence in fisheries interaction numbers. Suydam said that it would be nice to have a list of fisheries that could interact with belugas, or any other species within each SAR. It would be good if each SAR matched up species with potential impacting fisheries within the body of the SAR. Lowry said that based on Grey's suggestion, the SRG recommends going to the 4.8% net productivity calculation (from 4%).

Matkin called attention to the number of transients that exist from SE Alaska to the Western Aleutians. The manner in which the number is calculated is convoluted. In particular the number of '541' animals is not very accurate. These catalog data are going to be over 10 years old next

year and we will have to reassess this number as the estimate is getting worse and needs to be addressed. Lowry asked if these numbers are generated using your data in catalogs, but also people at the lab, and suggested that a review of stock structure work and population counts be addressed in the next 3 years by the time we review this stock again. Allen said that we can update sooner than every 3 years if we have significant new information. If you have better numbers we'd appreciate incorporating those numbers considering the fisheries takes on this stock.

AT1 killer whales (Matkin). The SAR must identify animals by stock, not haplotype; haplotype should be mentioned additionally. Lowry asked if the maximum net productivity should be zero, since this group hasn't reproduced in 30 years. He said that at some point in time, we will be able to say that AT1 productivity will drop down to zero and that it is a stock that is doomed to extinction.

West coast transient killer whales (Matkin). Regarding the west coast transients, there have been a number of changes made. The catalog contains animals from 1975 - 2012. It may be unjustifiable to use that catalog number given that it is drawn from a 40 year period. Rather than use this dated catalog, it would be better to use Department of Fisheries and Oceans Canada (DFO) mark and recapture technique which estimates the population to be about 260 animals [Lowry concurs]. Also, there are complications with populations because there are inner coast and outer coast animals, although there is a strong separation between the two. Matkin suggested to use the inner population stock and refer to the outer population of animals as unknown animals, and that anything else seems a little premature.

Eastern North Pacific Northern Resident stock (Matkin). There is some inconsistency between killer whale SARs. For this SAR, the Rmax being applied is 3%, which is based on the observed productivity in a limited number of pods. However, because there is a great difference of productivity between pods, in this case the 3% rate may be too low to apply to an entire stock. I suggest using the default (4%) or something from the literatur (3.1% or 3.3% depending on the literature cited). But, we should not beinconsistent and use rates from literature in some cases, and in other cases, rates from other pods or default rates. Interestingly enough, a 3.1 - 3.3% increase has been observed over the years for transients and residents. It is very consistent and if modeled, that appears to be the maximum they can do based on what is seen with calf intervals and all. If we choose to use this rate then we should be consistent over all stocks.

Mathews said that an Rmax of 3.1 / 3.3% is justified, and that the Rmax numbers should get redefined in that case. Lowry suggested using the best data available for all stocks, with a note in transient SARs that the Rmax is derived from resident populations. Kurland said that he thinks that the recovery factor would be 1.0 for this stock since it has doubled over this time period and is continuing to increase. Matkin suggested that they assess transients as well, and that the recovery factor should be revisited for all killer whale stocks here, considering we know a whole lot more about each stock. It is reasonable at this point to consider this stock is no longer 'unknown status.' In conclusion, resident stocks will have their recovery factor changed to 1.0 and transients will be looked at.

Alaska Resident killer whales. Matkin recommends changing the recovery factor from 0.5 to 1.0. My citation is an unpublished catalog, but it is available, I also relied on personal communication - but there will be a final report out in a couple of months. Allen said that ideally, we try to use peer-reviewed publications, but given the continuous process of the SARs, often abundance estimates from things like photo ID catalogs are not peer reviewed. Much of this SRG review process is considered part of the peer-review process as well. Bettridge said that we try to have peer-reviewed documents that are citable. However, sometimes there is a lag, and in the case where a document has not been through a peer review, then we expect the SRG to review it and provide the equivalent of a peer review. Generally, we don't want to rely on 'personal communication' but in some cases we need to rely on personal communication. Sources of data used in the SARs should be made public to the best extent possible.

Steller sea lions (Small). For both Eastern and Western stocks regarding population size, there are a number of correction factors by which counts are multiplied to come up with a robust population estimate. But, for Nmin, counts are used instead of a fairly robust estimate for population size; these counts are much lower than the population estimates. Why are counts used instead of an estimate for these stocks but not others Lowry explained that we had this conversation several meetings ago and Tom Loughlin told us that counts should be good enough. We don't have any trouble justifying them, we don't have to worry about CVs, and we can just take them and use them. Small asked what to do if there is a situation where there is a potential issue with fisheries regarding takes? He said he would be uncomfortable if Nmin is known to be lower than the actual population size, and issues cropped up regarding PBR being exceeded. Lowry responded that if we think we should change this, we could have a discussion about what the best number is at the next meeting.

Small stated that the Eastern population's PBR uses the recovery factor of 0.75 and 1.0. We should probably stick with one recovery factor rather than having both in there. Lowry said that, in this case, we have a lot of data that is 'in prep' and we should exercise some patience and remove it until published. We get so much new data every year and the SARs get more and more complicated every year, but every so often we need to clean house, we would like to get somebody intimately familiar with sea lion work to sort through the data and refine the SAR. We could recommend for next year a major rework due to accumulation of SSL data in the SAR. Perhaps it would be good to have a mini-workshop on SSL SARs and have a discussion on how to determine Nmin.

Small stated that when he read habitat concerns on the Western population, he struggled to understand how much of it relates to habitat concerns and I struggled to understand how this needs to be in the SAR. He suggested that you could write a paragraph that summarizes habitat concerns without going into the unknowns, lawsuits, etc. Lowry agreed that we should make SARs more succinct, by not reusing and repeating historical data from previous SARs unless necessary. In this case, unless someone wants to convince us that those data are good, he thinks they should come out.

Miller: In reference to the Eastern stock SAR (page 6), based on what I've seen, there are many more gunshots that originate outside of traditional harvest in southeast AK. I think there are lot more gunshot wounds that would be attributed to other sources than the Native harvest. I just

wonder why you would exclude them at all. Lowry responded that at a minimum, we don't want to say that shot animals are likely already accounted for under struck and lost. We are talking about an unknown source of shot animals and the likelihood is that they don't come from subsistence. They can't go in the subsistence table, or the fisheries table, but they should be added in at the end.

Allen speculated that the confusion here is because of the way we've consistently been treating gunshots. Historically, unless you have an enforcement case that confirms the gunshot resulted from a source other than struck and lost, it has been considered accounted for under the struck and lost count. We may want to go through all stocks and apply similar treatment of shot animals.

Lowry mentioned that the Society of Marine Mammology (SMM) has begun to recognize these Steller stocks as separate subspecies. He thinks we should go ahead and switch over to be consistent with SMM taxonomy, he believes this might also apply for ringed seals.

Northern fur seals (Pendleton). Our fur seal estimates are based on counts at different places which take place over different years, so we will have issues if we begin discounting data over time and some data are older than others. Also, on page 5, there is an apparent average of 0.1 seals entangled per year, a really low rate, but then it gives a percentage for subadult males that are entangled. If you multiply that out by the number of subadult males out there the number becomes a couple hundred entangled animals and that doesn't match up well. My first impression is that there isn't much entanglement, but when multiplied out it implies there is much more On page 5, table 9b, it talks about an increase in effort to get data beginning in 2011 on 'other mortalities.' It seems a little misleading to see all zeros in 2007 - 2010, so he suggested just putting in 2011 and not put any other years in as this is misleading and averaging entanglement rates over that 5 year period is also not appropriate.

Ribbon seals (Lowry). Ver Hoef et al. (in press) reports some numbers from surveys, but those numbers don't actually get used. We need to review this paper, because it describes the methods that will be used to analyze the ongoing Bering and Chukchi surveys.

Boveng responded Yes, the paper is very methodological and it uses the 2007 surveys from the Healy. When it was written, we felt that our surveys had captured the main breeding area of ribbon seals in the eastern and central Bering Sea. So for that species alone, we considered it a population estimate, rather than the numbers listed in Ver Hoef et al. (in press). However, we now anticipate coming out with higher numbers in the next survey, as recent findings indicate that disturbance factors are much higher.

Lowry askedwhat we think about using this number to determine PBR. In the case of ice seals, or any species, he personally thinks we should be very cautious of putting any extremely low biased Nmin into the SARs. Suydam responded that we need to include it, but explain that the estimate has an extremely biased low. Boveng noted that under the current population trends section there is best estimate of a population of 49,000, but it should be 61,100.

Ringed Seals (Suydam). The last paragraph in the first section needs to be revised to reflect changing sea ice regimes. I also recommend reducing the first paragraph considerably to eliminate a number of details regarding the surveys that took place in the 1970s and 1980s, as the 1999 / 2000 population estimates are old. The SAR should be consistent with what the status review said. For the section on minimum population estimates, even though it is biased low, it would be helpful to incorporate the new estimates for ringed seals from your current survey project in the Bering Sea. Given that ringed seals were listed because of projected population trends, a short description of what was in the status review regarding projected population trends would be helpful to maintain consistency within agency documents. Under 'other mortality and injury' there was a mention of the animals with skin lesions consistent with the unusual mortality event (UME). Additional details and numbers on this UME would be helpful. Lastly, we should define what "forseeable" means in discussion of the status of the stock.

Bearded seals (Suydam). In the last paragraph in the distribution section, we should include the passive acoustic monitoring information as related to distribution, to help explain the point about how bearded seals are moving into the Bering Sea and then back north in late April to June. As with ringed seals, given that there isn't an ice edge in the Chukchi Sea for most of the summer now, it is appropriate to bring some of that information (regarding changes to sea ice) into this paragraph. Some data from aerial surveys exist that can be used and incorporated in upcoming years. We should include a brief summary of what fisheries bearded seals might interact with;. presumably bearded seals are overlapping with the crab fishery in the winter in the Bering Sea. I sent a report to Dee with subsistence information and that can be added into the SAR.

Suydam noted that again, we should define what foreseeable future means under ESA listing status. Mathews suggested we note that the lower estimates for Bering Sea Aleutian Islands (BSAI) pollock trawl are due to new analytical methods. Also, I did not find anything on struck and lost rates. Suydam responded that as far as he knows there are no data - struck and lost information is lacking for just about everything. Mathews stated that whenever we give the results of a survey, the survey date should be provided in addition to the publication date.

Western North Pacific humpbacks (Mathews). There was mention of an unknown and unsampled wintering area and it would be good to have more information on this area. The minimum population estimate looked good and reasonable. Regarding current population trends, could we look at a subset of the newer data that fit the old data? On the fisheries information on page 5 - it would be helpful to have statement such as: "Of the x fisheries that could interact with this fishery, y number has been monitored, and the following z are listed as interacting with fishery." For Table 3, list data by region, emphasize that the data are opportunistic, and indicate that the injury numbers are based on prorated values (because of the fractional serious injury / mortality data). It also may be worthwhile to have an N value so the reader may determine the number of interactions since it is not clear with the new method using prorated values. Mathews noted that we should reference the 2011 paper that summarizes recorded whale-vessel collisions in AK waters, and a 2012 paper that explains how to differentiate inshore from offshore aggregations of humpbacks in the Gulf of Alaska. How does appropriate literature get included? Allen responded that she did put out a request this year for supporting documents. Generally the authors provide literature citations with SAR updates. Lowry asked if

we could put the SRG members on the library literature list (from AFSC).Mathews noted a comment under habitat concerns. As sea ice recedes, humpbacks may expand their habitat into the Arctic, additionally, shipping may increase. Oil & gas is a minor concern for humpbacks, there should be more of a focus on an increase in shipping and fishing further north. In particular, I feel that oil and gas activities in the Chukchi and the Beaufort seas are a minor concern.

David Tallmon: Why are ther two Nmins and two PBRs? Also, we should justifywhy 7% was used for the western stock rather than the SPLASH estimate.

Grey Pendleton: Should the SRG recommend revising the western North Pacific and central North Pacific humpback whale stocks? The SPLASH data is 6-8 yrs old. CVs for population estimates need to be calculated. Also, in the minimum population estimate, a variety of models are used and each one has a range of estimates. One model is considered to be the best model, but a different model's population estimate is used, because it is a lower number. That isn't right. If NMFS is going to use a model, they should use the best model.

Central North Pacific humpback whales (Mathews). We should include a paper by Noble, Hendrix, et al., which uses a Bayesian model for estimating the humpback population in Southeast Alaska. It covers much of Alaska and has a CV. We should also include a paper by Tierlink and another by John Moran , both of which are from SPLASH data. Lowry responded that this looks like the situation with Stellers; so much has been added to these SAR over the years that it could be reviewed and made more succinct.

Mathews stated that we should put yearly data into a table rather than a paragraph, wherever possible.

Matkin explained that these stocks have not been separated yet because the genetics are still being worked up. We should probably say that there is strong evidence of separation of stocks based on resighting data. We still need to calculate the CVs.
Mathews asked about the table on bottom of page 6; how will mortalities that cannot be attributed to a specific fishery be handled? Allen responded that unless we can confirm that an injury or mortality is attributable to a specific fishery, we cannot apply a count against a fishery. If, minimally, we determine that the entanglement came from a commercial fishery, than we can examine commercial fisheries interactions at a greater level under a Tier II analysis. In addition, we'll note that the information is prorated and opportunistic.

Suydam noted that in habitat concerns, we should address what is happening in Alaska, adding in points aboutwhale watching, cruise ships, the herring fishery, etc. We obviously overlap with the Pacific SRG with the gray whales and other SARs. How do we coordinate on the SARs that overlap with other SRGs? Allen responded that we don't have a system for that, but this did come up with our cross science center review and in talking with the Pacific Island Fisheries Science Center staff. We decided to propose that the Alaska SRG will do the primary review of those records and then give the Pacific SRG the opportunity to look at the SAR once your comments are incorporated. The Alaska SRG will still primarily handle the CNP humpback and SAR review. Suydam commented that it would be nice if the Alaska SRG could have the

opportunity to comment on SARs such as the gray whale, so that we can put local Alaska information into a SAR for a species that spends time in Alaska.

Southeast AK harbor porpoise (Mathews). My first point is that in 17 years we added only 11 samples to harbor porpoise genetic library. I was really struck by the fact that this is a species of concern and we have so few samples. We need more effort to collect more harbor porpoise genetic samples. Samples should be taken from every stranded animal. Lowry said that we'll make that recommendation. Mathews noted that in the population size section there is quite a lot of data (22 years of survey data). We should have a table in here showing survey coverage and methodology.

Marilyn Dahlheim: For harbor porpoise, 1991-1993 was line transect and then in 2006 we started line transect again through 2012. From 1991 through 2010 the data show a declining trend, particularly around Wrangell. In fact, numbers were relatively stable elsewhere but declining so severely around Wrangell that the overall trend was negative. The preliminary 2011 data are showing an increase in abundance around Wrangell and 2012 appears to show a possible increase from 2011, which brings the trend to about 0. Hopefully we'll have a publication out next year. We really don't know anything about stock structure inside southeast Alaska and we have a lot of questions.

Mathews would like to see a publication next year. It would be good to rewrite the population section of the SAR, simplify the table that clarifies data sources , and mention climate change impacts under habitat concerns.

Bering Sea harbor porpoise (Haflinger). There is probably a lot of genetic information still to be discovered. In the Bering Sea, the abundance estimates from the last two surveys differ significantly, and so the authors felt that they could not come up with a population size. Thus there is unfortunately no PBR. We have very little fishery data and there are probably other fisheries interacting with these stocks that aren't mentioned, given that there are gillnet fisheries all around the Bering Sea up to Nome. But there is no information on any of the takes.

Suydam suggested that harbor porpoises are being seen more frequently. They never were seen, except for by hunters before, and now they are being seen regularly by ships and surveys. I think it is also an increase in porpoises. Even though in the past people were up there and looking they weren't seen often. Now they are being seen regularly.

Mathews noted 'The Cetacean Distribution and Abundance in Relation to Oceanographic Domains in the Eastern Bering Sea' paper has a very nice table which shows the on-effort and off-effort numbers and their estimates of trend and abundance. I know this is a partial for that area, but I don't think it is mentioned in this SAR. We should include this as a reference, given that it includes some great harbor porpoise data with analysis and modeling.

Lloyd Lowry: In this SAR under fisheries information there is a sentence that refers to the absence of observer placements in several salmon gillnet fisheries. Is there anything from stranding reports that documents these fisheries as takers of harbor porpoise? I do know there have been takes in personal use gillnets in the Bering Sea.

Wynne asked Small if we could we get a biopsy sampling program going for harbor porpoise? Suydam responded that every time we get an opportunity to collect samples we do. For a long time more samples were coming from Barrow than anywhere else.

Bowhead whales (Suydam). We have a preliminary analysis of new data which may give a population estimate of 18,000 bowheads (with small CV) and a there appears to be a continued increase in the population. In the current population trend section within the SAR, there is a sentence about a count of 121 calves from 2001, I suggest we just delete it since it is an old number. Under the current and maximum net productivity rate section there is discussion of the rate of increase of the stock, and it says "Because the population has recovered to population levels where the growth is expected to be significantly less than Rmax." To Suydam that is speculation and only based on one paper that suggests that bowheads may be reaching carrying capacity. To me this is unnecessary. He also thinks it is appropriate to use the default growth rate. Also, if the new estimate remains the same at about 18,000 animals the rate of increase will be 4%. For PBR, the recovery factor we used is 0.5 rather than the default of 0.1. As we talked about earlier with killer whales, this is a situation where we know the population has grown a lot. It may be appropriate to use 1.0 rather than 0.5 considering the population has grown for decades. Maybe leaving the recovery factor at 0.5 is fine for now, but it is worthwhile to think about some more.

Later in that same sentence, there is mention of the quota that was approved by IWC. It is no longer a 5 year block quota, it is a 6 year quota. Under other mortality, I think it would be worthwhile to include a few sentences about increasing ship traffic and O&G activity in the Chukchi and Beaufort and that there could be an increase in ship-strikes because of this. I think the last paragraph prior to the citations which mentions critical habitat should be deleted as it is no longer needed and old information.

North Pacific right whales (Pendleton). This is another example of where there are data accumulated over several years; when we get to the point of discounting old data, the writers of this SAR will have to figure out how to deal with that.

Suydam commented on the current and maximum productivity rate. The SAR states that due to insufficient information, the default was used. For North Pacific right whales we don't have an R or Rmax, but isn't there data for southern Atlantic right whales that their population is growing by 8% per year? Clapham responded that he wouldn't be comfortable using that. This is a population of tens of animals, whereas the southern right whales are increasing rapidly and the population is pretty large, so it isn't a good comparison. Suydam responded that using the default growth rate is appropriate, but perhaps reference that southern right whale growth rates of up to 8% are possible and North Pacific right whales could obtain that at some point. In the'other mortality,' section, we should note that shipping is increasing through the Bering Sea and the Arctic and that there may be increased vulnerability to ship-strikes.

Sperm whales. Pendleton asked about the status of defining new stocks. Clapham responded that there is still some contradiction. Data show that sperm whales move clear across the Pacific. We're seeking more data on sperm whales and Soviet records are being sought. Yulia, Sally, and

I intend to sort through and analyze of the large amount of data available and see what we find regarding stocks. It will probably take a year to come to any conclusions. The data indicate lots of east - west movement in the Pacific over very long distances. The stock issue is still a work in progress.

Fin whales (Wynne). Previously Nmin was defined across a couple of years, in two different areas, and handled additively, and now it seems that this may have led to double counting. New information shows that whales surveyed in the Aleutians could subsequently have migrated to the Bering Sea making it possible that whales were double counted. This was taken into consideration the population was adjusted accordingly, but now the Nmin for this stock has been reduced from 5700 to about 1200. She would like to strike that revision and would rather not see the new population estimate in there - even if we say we don't know, that would be better than listing 1200. Lowry stated that the SRG will request that NMFS not use the new survey data for this stock at this time - at least until we have a chance to review the new paper carefully. Clapham said that although he thinks a recovery factor of 0.1 is low, we don't have the data to increase it. Pendleton said that he thinks that in this case, we shouldn't calculate a PBR, given only a small portion of the range has been surveyed and the Nmin is debatable.

Stafford made two short points on fin whale. First, based on sighting and acoustic data from the Chukchi, and historic records (Japanese and Russia) it appears that fin whales are reoccupying the Chukchi Sea. Second, research is being conducted into whether fin whale stocks can be identified by sound signature. Shannon Rankin is conducting an assessment between genetics and acoustics to determine whether it is possible to determine population difference levels from interpulse intervals. This method is currently in use for assigning geographic range to blue whales. In the next couple of years we may have an idea of acoustic differentiation of fin whale populations in the North Pacific.

Beaked whales (Lowry). For population size for all three stocks, we should tell readers why we do not have a population estimate for these stocks, rather than only state that 'reliable abundance data for this stock is currently unavailable'.

Kate Stafford: We should add data from two recent instances where beaked whales are recorded on time series instruments off of Kiska and in the Gulf of Alaska. We have up to 8 months of data at a time and beaked whales were recorded from November to January. We should also include the interesting point that these whales are estimated to have been within 4km of the instrument when they were recorded, given the high frequency sounds that beaked whales produce.

Overview of the NMML budget and future outlook (John Bengston)

Our operational budget (which does not include labor) is down from over $9 million in 2010 to $5.5 million in 2012. We prioritize the work we do based on the requirements set by the funding source We don't have the luxury of deciding how to divvy up our funding. For example, we receive a funding line from congress (direct appropriation), and we cannot spend that on anything but the seven Alaska pinniped species. Aside for Cook Inlet beluga, which has its own

line of funding, we have zero cetacean budget aside for external, or reimbursable funding. We don't have money to spend on North Pacific right whales. The Bureau of Ocean and Energy Management (BOEM) is a main contributor of outside money, and in FY13 funding from BOEM is a bit more than $2 million. Nearly all internal funds go towards salaries and there is a virtual hiring freeze that is about to be formalized. We did have money from BOEM (about $1 million per year for 3 years) to do work in the southeast Bering Sea in the North Aleutian Basin leases. The current estimate of about 30 individuals for the entire North Pacific right whale stock came out of that BOEM-funded right whale work.

We don't know where we will be in;. we are operating under a continuing resolution and are cutting back where we can without interrupting any major field efforts. Only half of our labor force at NMML is permanent, and the other half is considered non-permanent and vulnerable in a reduced funding situation. The process studies, the behavioral studies, the understanding of ecosystems, are often the first studies to get cut. The assessments for abundance, trends, quotas, and PBR will be the last projects standing. Unfortunately this has ramifications on the process studies that are necessary to answer important questions. Programs such as northern fur seal vital rates or processes studies will be under threat and they are hard to defend unless we can find new sources of money.

John Kurland stated that in regards to the observer program / Alaska Marine Mammal Observer Program (AMMOP), funding remains unknown past 2013. Our definitive plans are to continue the effort to observe southeast Alaska gillnets through this year, but there is nothing planned beyond 2013. Suydam asked what budgets look like for people that deal with permitting issues? Kurland responded that they do not know; it's hard to forecast. He has a few vacancies that he is currently unable to fill.

John Bengtson: There is not enough money and the outlook for congressional direct appropriations is bleak. So, the marine mammal and sea turtle programs at the NMFS Science Centers met last year and decided to develop a process in which the science centers can prioritize the projects they do in a more deliberate way. So we are developing what's called the Protected Resources Science Investment Planning Process. It's not a plan, but a process to plan. Rather than the scientists saying, "We need money", we'll go to decision makers, ask for their "must haves" with regards to funding priorities, and ask them to prioritize their needs. This also applies to Federal partners, such as BOEM. In summary we'll ask: What do decision makers need? What science would it take to produce that information, how would you prioritize, and how much will it cost and, who will pay? We're trying to integrate management needs and science products. The idea is that we're all in this together so let's focus on what's needed down the road, and make sure our science and shrinking budgets work together.

Robert Suydam: I know you can't lobby Congress or take money from industry. Are there other ways to bring funds into the lab? Can the Federal government take foundation money, or industry money through other entities? I am saying this from the perspective of being on the North Slope where there are capacity issues in terms of people and ability to get things done, and it would be nice to have funds to bring extra support from NMFS. Can we get money to NMML for cooperative projects?

John Bengtson: One element I don't think we've done a good job with is messaging why this information is important. Another element to incorporate is an economic dimension in that marine mammal science creates jobs. As far as partnerships with industry, it may not be a closed door to accepting funds from industry in appropriate, legal ways and partnerships with NSB, the State of Alaska, and foundations need to be considered and part of what we have to do a better job at.

Doug Demaster: I want to thank John for being such an optimist. There are new initiatives to allow NMFS to accept direct funding from industry (oil & gas and fisheries) in order to complete congressionally required work (Magnuson-Stevens Act (MSA) & Endangered Species Act (ESA). There is consideration at this point for a new Arctic Research Vessel (FSV-7) with an Arctic research focus. Reimbursables from the Navy, BOEM, and the North Pacific Research Board (NPRB) will become more important. We won't have funding to do much else in the way of marine mammal research aside for Steller sea lions, ice seals, and reimbursable work. Our Science Center discretionary budget is 15%, and 85% is labor and facilities. Most cuts right now are coming out of operations. The policy at the NOAA level is to avoid furloughs. In the long run, our strategy is to cut back on permanent labor through attrition. Unfortunately, our stock assessment process and habitat studies will suffer. This will be the fiscal environment for the next 2-3 years.

Lowry stated that one of the problems with outside funds and initiatives is that they are earmarked, so there will not be money to study things like harbor porpoise. Our task is to figure out how to improve the quality of the data that is going into the SARs and there really isn't a line item for that. So, it's challenging for us to give you suggestions in this environment. This group has hit on a few points -- that we are not getting enough information on some stocks and more than enough on others -- d John's explanation regarding earmarked funds is important to keep in mind as that is a real constraint. Can the incidental take be monitored adequately if there is no money for observer programs? How much further can the system degrade until it chokes?

Wynne asked if maybe it is time for the paradigm shift that some of us were hoping would come along eventually. Why do we have PBRs and SARs and what was the point? The original idea was to identify and deal with problem areas, problem fisheries. Rather than worrying about getting better assessments and mortality estimates we could focus on the actual concerns. If it is a bycatch issue we can address those issues directly by working with fisherman. Rather than focusing on quantifying stocks which is cost prohibitive, let's focus on partnerships and specific problem areas, and we may be able to resolve some issues. Lowry agreed, and stated that the goal was to identify problem areas and reduce takes in those areas, and the system that was specified is very data hungry. Unfortunately a law is still there, so it is hard to make this paradigm shift. Bengston agreed with Lowry, that if we keep going the way we're going, we will have less and less to report to the SRG every year. We need to innovate and source more money from elsewhere.

Lloyd Lowry: It strikes me as odd that fishery management councils manage all bycatch other than marine mammals, such as bird bycatch and fish bycatch, but they are absolved from the responsibility of managing marine mammal bycatch. If they did manage marine mammal bycatch then they would be a strong partner. Right now, they will be unwilling to partner up

because another group is responsible for maintaining marine mammal data. I think marine mammal bycatch should be a responsibility of fishery management council, and if they can't bring bycatch down to PBR, then they'll have to find ways to limit fisheries.

Karl Haflinger: The only good data in the SARs on fishery interactions are coming from Federal Observer programs, which are mandated by the fishery management council. I don't know what you could ask the fishery management council to do in terms of gathering fisheries interaction bycatch information for Federal fisheries that they aren't already doing. Lowry responded that they might need to get the stock assessment data too, or support it in some way.

Finalizing the SRG recommendations (Lowry). We will write draft recommendations and compile everything, then send to the SRG for review before it goes anywhere else. This system has worked in the past.

Beth Mathews: We also would like to see good measure of effort (subsistence hunting effort). This could be done by asking a few questions to subsistence hunters and recording them. The idea here is that if effort is recorded and takes increase or decline it may be possible to determine population trends. Suydam responded that documenting effort complicates the data collection about subsistence hugely. I am struggling to understand how it would be used. I see some valuable uses for it, but it makes the process of collecting subsistence data more time consuming, complicated, and invasive. I wonder if this would actually be a worthwhile early-on investment, instead, we could begin to ask these questions if we see the harvest trend downwards.

Mike Miller: I don't know how everyone goes about it, but when the State of Alaska surveys subsistence users for Chinook fishing in the Yukon, just a simple postcard is sent out. In addition to number of fish caught, the card asks for number of days fished. I don't think it is hard to ask that question. If you are already doing a survey what's the problem with asking an additional question? Suydam responded that mail in surveys don't work for documenting a subsistence harvest. Rather you detailed and complicated interviews which can take an hour or two per household. I don't think we should document effort unless it is a high priority recommendation. If we are trying to document marine mammal harvest across Alaska I think doing a body count is what we are looking for to improve the stock assessment. Attempting to document effort would do the agency a disservice as it would be too invasive. Small agreed abd said that if the harvest decreases significantly, then ask the hunters. The following dialogue would be more valuable than a survey.

Miller commented that one of the things we came up with instead of going into the lengthy interviews was that we just added one question to mail in surveys. That was "Are your needs being met?" If the answer was 'no,' then further questions can be asked to determine the reason. Lowry responded and said that there are so many variables that we could not control for, such as that there was a lot of work in town and that everyone was working rather than hunting.

Recommendation on subsistence takes (Miller). *Let's not try to recreate things. We just need to get better numbers of subsistence takes into the system we already have in place*

Recommendation on a clear and consistent statement from NMFS regarding subsistence (Small). *A higher priority than determining subsistence hunt effort is to have NMFS make a clear and consistent statement on how subsistence takes would be managed in light of the upcoming ESA changes and threatened species listings. Whatever NMFS can do to be as clear as possible would go a long way. Then, when we need to ask for additional information from subsistence users they would be more inclined to respond, especially if it is to document their hunt or needs.*

Mike Miller: Is it wishful thinking that we could ask USFWS to do the same thing? The survey burnout is very real in the communities. If it is viewed as relevant people will stay engaged.

Recommendation on Steller sea lion SARs (Lowry):*We would like to see NMFS complete comprehensive revisions of the SSL SARs for next year. NMFS should be prepared to explain the development of NMin and why they are using their current method to determine NMin.*

Recommendation on killer whale stocks (Lowry): *Revise the killer whale SARs and reanalyze the photo catalogs.*

Recommendation on analyzing killer whale samples (Matkin): *There is a need to set up the photo catalogs that are able to be referenced, or have analysis done on them. My recommendation on killer whale stock structure includes analyzing all samples that are available.*

Recommendation on pingers (Lowry): *Allow the use of pingers and continue with research on pingers. [supported by Wynne]*
Kurland: I recommend that NMFS be involved on the discussion with folks involved with the issue and help to design studies but not necessarily undertake the studies. [supported by Angliss].

Recommendation on humpback whales (Lowry). *Proceed with revisions to the stocks, get on with re-sights, even if the genetic samples aren't analyzed, calculate CVs for abundance estimates, and generally clean up the SAR as its content is rather extended.*

Recommendations on harbor porpoise (Mathews). *I just found out that there are plenty of harbor porpoise tissue samples out there. I think it is important to characterize the Alaska stock structure by analyzing existing samples and by continuing to seek out more samples. There are survey efforts spanning 25 years, but the SARs don't reflect that effort and I would like to see that data compiled in the SAR.*

David Tallmon: It would be helpful to have some sort of dichotomous key or flow chart to accompany the GAMMS. There is some ambiguity regarding when we can use certain pieces of information and when not. It may make the SARs more uniform within and across SRGs.

Lloyd Lowry: We won't put this down as a recommendation, but maybe Shannon could follow up on this. This is something that would be useful for the SRG, we often stumble on the same

question and a 'decision tree' would be quite helpful. It would be nice to see the GAMMS in flowchart form as something we can quickly reference to standardize the SARs.

Recommendation on fisheries interactions in the SAR (Small). *SARs are supposed to be standalone, and each SAR should provide a list of fisheries that MAY interact with a marine mammal stock within each SAR.*

Lloyd Lowry: We just covered what will be the backbone of our recommendations letter. As a reminder, Shannon would like to get comments on her 'SRG Terms of Reference' by March 29. Ideally, one consolidated set of SRG comments would be best, though individual comments will be accepted. Please provide suggestions for Appendix B if possible. Once the Terms of Reference go into effect we'll have to come up with an implementation plan. Also, copies of the gray whale SAR should be provided to Kate, Craig, Robert, and Karl.

Robert Suydam: Are there recommendations we would like to give to USFWS? We should encourage USFWS to use the same approach as NMFS does for editing / revising the SARs from year to year (highlight / strike-out). The other thing that is raising confusion in my mind is about the USFWS obligation to update the SARs every year for strategic stocks and whether they are supposed to or not. It seems kind of odd that there's so much research going on with walrus and polar bear and yet we don't see updated SARs every year.

Lowry responded that it's in the Act, and they are specified to update the SARs on a defined schedule. I'm not sure we can influence the USFWS any more than the law. Suydam commented that personnelhave changed dramatically in that office, so there may be an opportunity to bring this up at the next meeting in Anchorage and see results. Bettridge commented that there is a new person at USFWS headquarters in Arlington, and we've been talking to him about ways to get the USFWS more engaged. This year the Atlantic SRG is devoting a full day to the manatee review, so it is expected that USFWS staff will be there and be engaged.

Next SRG meeting (Lowry). The next meeting needs to be this week next year, or before and this time next year is best for Dave. We've been alternating between Seattle and Anchorage from year to year. Should we plan on meeting in Anchorage next year, costs allowing? We can use USFWS' conference room which should present a good opportunity to put some emphasis on USFWS stocks.

Robyn Angliss: I hope to allocate the same amount for this meeting as last year. In looking at travel expenses over the years, it seems that Seattle and Anchorage are nearly equal in terms of cost. Unless prices go up, or our budget goes down, we should be able to afford Anchorage next year. I did hear you mention the idea of a three day meeting, and a three day meeting does have a cost implication. Wynne suggested that a 3 day meeting would be essential while we are in Seattle. Angliss responded that this adds an appreciable cost to travel. Lowry suggested that we look into 2.5 day meetings, which may not be much more expensive than 2 day meetings. Shannon also mentioned that some SRG's are spending a day other than reviewing SARs and receiving updates. We could have some in-depth presentations on the science. We've done that in the past, and it did give me a little more motivation to get there, because we would learn more than the reader's digest versions that we read. If we meet in Anchorage, we can have folks from

NMML participate remotely. We won't get the full benefit of being at NMML, but we do need to go over USFWS stocks.

Discussion of potential presentation topics: Mathews suggested that Dave speak about using genetic data for population estimation, which may apply to the SARs we review. Suydam suggested that it would be valuable to hear about how and why USFWS is promoting doing a genetic mark / recapture for estimating walrus population size. Small suggested that it would be good to hear about the Cook Inlet beluga recovery plan.
Lloyd Lowry: It sounds like a 2.5 day meeting next year in the second week of March will work well. We won't finalize the dates for a while. Some key topics to cover will include Steller sea lion Nmin estimation procedure, the humpback whale serious injury / mortality determinations, and of course polar bear SARs from USFWS.

Pendleton noted that trying to get through 150 pages of reading material is very tough when you get it the week before, and asked if they could get it any sooner next year? Even a two week lead on the supporting documents will help. Allen responded that one of the major challenges this year was incorporating the serious injury and mortality information. It was a challenge to get 5 years of data reviewed while the SARs were being updated. It won't be such a burden next year. We did request the staff updates earlier this year, but we are still working on developing a timeline.

Robyn Angliss: Having more specific times on the agenda regarding when topics will be discussed would be helpful. I know that people had questions about when they were supposed to be here. I think providing more guidance in the agenda about when things are to be covered would be helpful, especially if the meeting is in Anchorage next year and people are going to be calling in.

Lowry thanked everyone, especially the new members.

Appendix: 2013 Alaska SRG Meeting Agenda

ALASKA Scientific Review Group Meeting Agenda
National Marine Fisheries Service, National Marine Mammal Laboratory
Seattle, WA
13-14 March 2013

13 March, Wednesday **Day 1**

8:30 am I. Welcome and introductions, members and guests—Lowry
II. Adoption of agenda
III. Minutes from previous meetings—Allen
IV. Administration, travel, etc.—Allen

9:00 am V. Scientific Review Group background
A. MMPA intent for MM-fisheries management—DeMaster
B. Role of SRGs, including Terms of Reference—Bettridge
C. GAMMS, history and status—Bettridge
D. History of the AKSRG—Lowry

10:00 am VI. NMFS management and science accomplishments and needs
A. Status of Alaska stocks with and without GAMMSIII provisions—Wade
B. Killer whale genetic work and possible changes to stocks—Parsons (Lead), Wade, Matkin
C. Incidental take in fisheries
1. Mortality and serious injury assessment policy implementation for AK stocks and consistency with other regions—Allen (Lead), Bettridge
2. Update on southeast AK observer program and future AMMOP plans—Mansfield
3. Changes to observer coverage in Gulf of Alaska and Bering Sea trawl and hook and line fisheries—Breiwick
4. Assigning gear entanglements to specific fisheries (e.g., SSLs and salmon troll gear)—Mansfield
D. Humpback interactions with vessels in Alaska and Hawaii (reporting, data accuracy, mitigation, accounting in SARs, research needs)—Kurland (Lead) Allen
E. Use of pingers to reduce cetacean entanglements (concerns, efficacy, and effects)—Wynne
F. Monitoring of Alaska Native harvest, evaluating impacts on stocks, and reporting in the SARs—Bengtson
G. ESA listings (bearded and ringed seals) and potential delistings (humpback whales and eastern SSL)—Kurland (Lead), Bettridge
H. Research plans for Arctic ice seals—Boveng

12:30 pm Lunch

1:30 pm VII. Begin review of draft SARs (see attachment)

5:00 pm Adjourn for the day

14 March, Thursday Day 2

8:30 am VII.
Continue and conclude discussion of SARs

12:00 pm Lunch

1:00 pm VIII. Discussion and SRG recommendations

A. Future (5-10 year) funding outlook and prospects for MM stock assessments and observer programs—Bengtson (assessments), Kurland (Obs. Prog.)
B. Can stock status be measured adequately? (prioritize problem areas)
C. Can incidental take be monitored adequately? (prioritize problem areas)
D. Are there opportunities to: a) improve monitoring of stock status and/or fishery takes, or b) reduce the level of incidental take?
E. Further discussion of topics previously introduced

4:30 pm Other business including plans for 2014 meeting

5:00 pm Adjourn

ATTACHMENT

SRG reviews of revised NMFS Alaska Marine Mammal Stock Assessment Reports (SARs)

All members are encouraged to contribute to each SAR review, but specific reviewers are expected to have carefully reviewed their specific stocks and to lead those discussions. Please submit word-smithing and typographical corrections to Dee on electronic or hard copy. Stock review leaders will bring substantive issues to the attention of the group.

SAR to review	Reviewer 1	Reviewer 2
Pinnipeds:		
Steller sea lion, western U.S.	Small	Haflinger
Steller sea lion, eastern U.S.	Small	Miller
Northern fur seal, eastern Pacific	Pendleton	Miller
Ribbon seal, AK	Lowry	Haflinger
Ringed seal, AK	Suydam	Lowry
Bearded seal, AK	Suydam	Mathews
Cetaceans:		
Beluga whale, Cook Inlet	Small	Wynne
Narwhal, Unidentified	Lowry	Suydam
Killer whale, Eastern North Pacific Alaska Resident	Matkin	Tallmon
Killer whale, Eastern North Pacific Northern Resident	Matkin	Miller
Killer whale, Eastern North Pacific Gulf of Alaska, Aleutian Islands, and Bering Sea transient	Matkin	Tallmon
Killer whale, AT1 transient	Matkin	Lowry
Killer whale, West Coast Transient	Matkin	Pendleton
Harbor porpoise, southeast Alaska	Mathews	Haflinger
Harbor porpoise, Gulf of Alaska	Wynne	Tallmon
Harbor porpoise, Bering Sea	Haflinger	Wynne
Sperm whale, North Pacific	Pendleton	Wynne
Baird's beaked whale, AK	Stafford	Lowry
Cuvier's beaked whale, AK	Stafford	Lowry
Stejneger's beaked whale, AK	Stafford	Lowry
Humpback whale, western North Pacific	Mathews	Tallmon
Humpback whale, central North Pacific	Mathews	Miller
Fin whale, northeast Pacific	Wynne	Stafford
Northern right whale, North Pacific	Pendleton	Suydam
Bowhead whale, western Arctic	Suydam	Small