Public Testimony Sign-Up Sheet

Agenda Item ARCTIC FMP ~~Reports~~ C-5

	NAME (PLEASE PRINT)	AFFILIATION
1 ✓	Ukallaysaq Tom Okleasik	Northwest Arctic Borough
2 ✓	John Chase	Northwest Arctic Borough
3 ✓	Tom HANIFAN	NWAB
4 ✓	Barbara MacManus	NWAB
5 ✓	Lester Hadley	NWAB
6 ✓	GLENN GRAY	NWAB
7	Pat Pourchot	Audubon Alaska
8	Dave Benton	MCA
9	Chris Krenz & Jim Ayers	Oceana
10	HENRY MITCHELL	SELF
11	TATJANA GERLINGS / Bubba Cook	WWF
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NOTE to persons providing oral or written testimony to the Council: Section 307(1)(I) of the Magnuson-Stevens Fishery Conservation and Management Act prohibits any person " to knowingly and willfully submit to a Council, the Secretary, or the Governor of a State false information (including, but not limited to, false information regarding the capacity and extent to which a United State fish processor, on an annual basis, will process a portion of the optimum yield of a fishery that will be harvested by fishing vessels of the United States) regarding any matter that the Council, Secretary, or Governor is considering in the course of carrying out this Act.

AGENDA C-5
OCTOBER 2008

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver for DAVID
Executive Director

ESTIMATED TIME
2 HOURS

DATE: September 19, 2008

SUBJECT: Arctic Fishery Management Plan

ACTION REQUIRED

(a) Receive report from Ecosystem Committee
(b) Review draft Arctic FMP and EA/RIR/IRFA and take action as necessary

BACKGROUND

(a) Receive report from Ecosystem Committee

The Council's Ecosystem Committee will meet on September 30, 2008. Their agenda is attached as Item C-5(a)(1). The Committee will be providing recommendations for the Council on the Arctic FMP, as well as receiving a report from the AI Ecosystem Team on the AI Fishery Ecosystem Plan, and receiving an update on the recent Alaska Marine Ecosystem Forum meeting. The AI Ecosystem Team report can be found under the D-3(b) agenda item; the summary from the AMEF meeting is attached as Item C-5(a)(2).

(b) Review draft Arctic FMP and EA/RIR/IRFA and take action as necessary

At its June 2007 meeting, the Council directed staff to prepare a draft Arctic Fishery Management Plan (FMP) and draft amendments to the scallop and crab FMPs (that terminate their geographic coverage at Bering Strait), and to develop an accompanying analysis that considers several options for the Arctic FMP. These options are to close the entire Arctic region to all commercial fishing, or close the entire Arctic region to commercial fishing except for the red king crab fishery that has previously occurred in the southern Chukchi Sea. In October 2007, the Council gave further direction to staff in preparing a draft Arctic FMP and analysis documents.

Development of the Arctic FMP has occurred over several meetings. A preliminary draft EA/RIR/IRFA was sent out in a Council mailing prior to the February 2008 meeting. Staff presented a progress report on the Arctic FMP in February 2008 to the Council's Ecosystem Committee and to the SSC and AP. The Council received a preliminary report on the Arctic FMP at their June 2008 meeting. Throughout this period, Council staff has conducted an outreach program to inform residents of the Alaskan Arctic and other stakeholders and interested parties of the Council's proposed action.

The draft Arctic FMP and an accompanying draft EA/RIR/IRFA were sent out in a Council mailing in mid September 2008. At this October 2008 meeting, the Council is scheduled for initial review of the

draft Arctic FMP and EA/RIR/IRFA, and to approve releasing the documents for public review. The SSC and AP also will review the draft FMP and analysis.

The recommended alternatives for Council consideration as it proceeds with the Arctic FMP are as follows:

Alternative 1: No Action (Status quo). Maintain existing management authority.

Alternative 2: Adopt an Arctic FMP that closes the entire Arctic Management Area to commercial fishing. Amend the crab FMP to terminate its geographic coverage at Bering Strait.

Alternative 3: Adopt an Arctic FMP that closes the entire Arctic Management Area to commercial fishing. Amend the crab FMP to terminate its geographic coverage at Bering Strait. Alternative 3 would exempt from the Arctic FMP a red king crab fishery in the Chukchi Sea of the size and scope of the historic fishery in the geographic area where the fishery has historically occurred.

Alternative 4: Adopt an Arctic FMP that closes the entire Arctic Management Area to commercial fishing. A red king crab fishery in the Chukchi Sea of the size and scope of the historic fishery in the geographic area where the fishery has historically occurred could be prosecuted under authority of the Crab FMP. The Arctic FMP would cover the area north of Pt. Hope for crab and north of Bering Strait for groundfish and scallops.

During the course of preparing the draft FMP and analyses, NMFS staff determined that the Scallop FMP does not need to be amended to meet the purpose and need of this action. The scallop FMP management unit is limited to the Bering Sea at Bering Strait. The State manages the scallop fishery in the Bering Sea under Registration Area Q which extends to Point Hope and is described in an appendix to the Scallop FMP. This descriptive text for registration is provided as a convenience to the reader of the FMP and does not affect the specified scallop FMP management unit. The authority of the scallop FMP ends at Bering Strait, and NMFS staff have determined that no amendment to the scallop FMP is necessary for this action.

The draft Arctic FMP also contains two options for setting the conservation and management measures for fisheries as required by Section 303 of the Magnuson-Stevens Act (MSA). Either Option 1 or 2 must be chosen under Alternative 2, 3, or 4 to meet the MSA required provisions for an FMP to (1) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery and (2) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished or when overfishing is occurring.

Option 1: Specify maximum sustainable yield (MSY), status determination criteria (both maximum fishing mortality threshold (MFMT) and minimum stock size threshold (MSST)), optimum yield (OY), annual catch limits (ACL), and annual catch target (ACT) for the fisheries that the plan is intended to manage. Managed fisheries are those identified as having a non-negligible probability of developing within the foreseeable future.

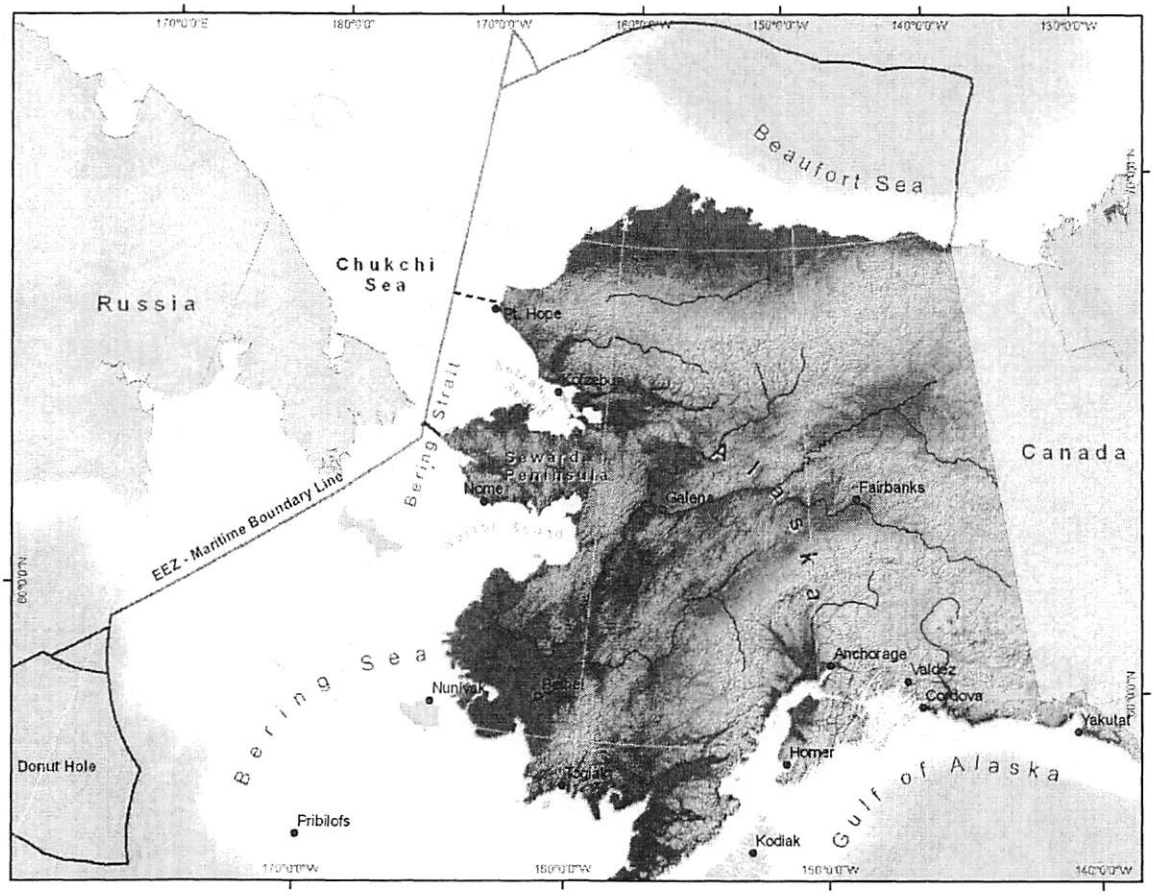
Option 2: Create 4 categories of FMP species, identify species in each category, and create a process for moving species from the Ecosystem Component (EC) category to the Target Species category. Categorize all species of Arctic finfish and shellfish as EC species or Prohibited Species. EC and Prohibited Species are not considered managed fisheries under the FMP and do not require specification of reference points such as MSY, OY, and status

determination criteria; therefore no reference points are provided in this option. Reference points would be developed for a species to move it into the Target Species category.

The attached table (Item C-5(b)(1)) provides the main elements of the alternatives and a second table (Item C-5(b)(2)) provides a summary of the two options for Alternatives 2, 3, and 4. Also attached is the Executive Summary of the EA/RIR/IRFA (Item C-5(b)(3)).

Note: The draft Arctic FMP has been written using language, as an example, that defers a small red king crab fishery in the eastern Chukchi Sea to State management. However, there are two other alternatives for addressing this historic crab fishery the Council could choose, other than *status quo*, which would change the language in the draft FMP. The draft FMP language presented to the Council at this meeting is for illustrative purposes, and would be changed to reflect the Council's final decision.

The Arctic Management Area: all marine waters in the Exclusive Economic Zone of the Chukchi and Beaufort Seas from 3 nautical miles offshore the coast of Alaska or its baseline to 200 nautical miles offshore, north of Bering Strait (from Cape Prince of Wales to Cape Dezhneva) and westward to the U.S./Russia Convention Line of 1867 and eastward to the U.S./Canada maritime boundary.



Ecosystem Committee DRAFT Agenda

Tuesday, September 30, 2008 10am-1pm
Board Room 305, Sheraton Hotel, Anchorage, AK

1. **Arctic FMP**
   Review draft EA/RIR/IRFA and draft FMP
   Discuss issues:
   - Four alternatives
   - Two options for specifying conservation and management measures
   - Outreach program results
   - Ecosystem description – elements of a FEP
   - Crab FMP amendment
   - Schedule

2. **AI FEP**
   Review report from AI Ecosystem Team meeting, September 9-10, Seattle
   Discuss further action

3. **Update on Alaska Marine Ecosystem Forum**
   Meeting summary from July meeting

Alaska Marine Ecosystem Forum

MEETING SUMMARY

August 7, 2008, 1-5 pm
3rd floor conference room, National Park Service, Anchorage, AK

The following member agencies attended the meeting. Underlined participants represented their agency.

North Pacific Fishery Management Council (NPFMC)
Eric Olson, Chair
Diana Evans, Fishery Analyst
Bill Wilson, Protected Resources Specialist

National Marine Fisheries Service (NOAA Fisheries)
Jon Kurland, Acting Deputy Regional Administrator
John Olson, Fishery Biologist, Habitat Division

National Park Service (NPS)
Jeff Mow, Park Superintendant, Kenai Fjords National Park
Vic Knox, Regional Director

US Forest Service (USFS)
Don Martin, Region 10 Fish Program Manager

Bureau of Land Management (BLM)
James Moore, NEPA Coordinator, Anchorage Field Office

Minerals Management Service (MMS)
Cathy Coon, Marine Biologist, Environmental Studies Program

17th Coast Guard District (CG)
LCDR Shane Montoya, District Representative, Anchorage

Alaskan Command (ALCOM)
Jerome Montague, Tribal Affairs / Natural Resources Advisor

U.S. Army Corps of Engineers (COE)
Carl Borash, Chief, Project Formulation Section

Department of Environmental Conservation (DEC)
Larry Hartig, Commissioner
Gary Folley, Environmental Program Manager, Prevention and Emergency Response Program

Department of Fish and Game (DFG)
Stefanie Moreland, Extended Jurisdiction Program Manager

Other participants:

North Slope Science Initiative	John Payne, Director, Denny Lassay, Deputy Director
US Geological Survey	Joy Geiselman, Deputy Chief, Biology/Geography Office A.C. Brown
University of Alaska, Fairbanks	Keith Criddle
Oceana	Quinn Smith

Introductions

Jon Kurland, as Chair of the AMEF, opened the meeting and attendees introduced themselves. Mr Kurland reminded the meeting that the AMEF is primarily a forum for communication, especially for agencies that may not interact frequently. The Forum provides opportunities for better understanding each others activities within our common Alaska marine environment, and consequently for identifying opportunities for collaboration.

Agency briefings

Each agency present at the meeting gave a brief update on activities of interest with respect to the Aleutian Islands or other Alaska marine ecosystems. Some agencies provided handouts, which are attached to this summary.

Jeff Mow, National Park Service

The National Park Service leadership council has been working on their Pacific Ocean Parks Stewardship Plan. The Plan will provide a unified message on ocean stewardship needs, which can be used to communicate with the public, and also within the agency, to seek funding and opportunities for collaboration on ongoing initiatives. Mr Mow also noted that as the NPS has a 'bully pulpit' role, it presented an opportunity to echo and emphasize issues that are important for other agencies also, as appropriate. Mr Hartig asked about NPS' plans for how to acknowledge the anniversary of the Exxon Valdez Oil Spill (EVOS) next spring; Mr Mow noted that they are beginning to talk about ideas. Mr Hartig suggested that it would be good for the agencies to coordinate.

Eric Olson, North Pacific Fishery Management Council (handout attached)

The Council is still working on developing an Arctic Fishery Management Plan, and staff member Bill Wilson has been spearheading an extensive outreach effort to give an overview of the Council's efforts, and incorporate community and stakeholder input into the plan. There are four alternatives, but the intent is to close the Arctic management area to commercial fishing. Mr Olson clarified that the plan would not affect local subsistence activity in the Arctic. Final action is scheduled for December. Also with respect to the Arctic, Senate Joint Resolution 17 was signed into law in June, which calls for the US to enter into international discussions and come to agreements on fishing the stocks of the Arctic. The Council has also been assisting NOAA in their role of contributing to the Arctic Marine Shipping Assessment, which is to examine current and future Arctic shipping, under a variety of scenarios.

Other Council activities include implementation of habitat conservation measures in the Bering Sea, which includes the designation of a Northern Bering Sea Research Area. A research plan will be developed this year, after which experimental fishing in accordance with the plan may begin. In 2009, the Council will undertake a Habitat Areas of Particular Concern proposal cycle, which may look at the Bering Sea canyons (the North Pacific Research Board has identified this as a research priority). Salmon bycatch continues to be a high priority issue with the Council. They are working on an environmental impact statement that evaluates establishing additional caps on salmon bycatch in the pollock fishery, and adjusting bycatch closure areas. The Council is also planning on outreach program for this issue, and intends to send staff and Council members out to affected areas. Council discussions of the Steller sea lion protection measures have been put on hold, as NMFS has recently published a revised Steller sea lion recovery plan, and a Biological Opinion is not expected until late 2009.

LCDR Montoya asked whether there was any indication that other nations, for example Russia and Canada, were interested in starting fisheries in the Arctic. Ms Moreland noted that the issue was going to be discussed at upcoming international meetings with those countries. Following on from the Senate

resolution, the US would be trying to set in place agreements to hold off on establishing fisheries or other types of resource extraction in international waters until more scientific information is available. Additionally, Ms Moreland noted that the US and Russia are going to begin talking about Steller sea lion monitoring, especially of Russian stocks. Mr Kurland noted that similar discussions had also taken place at the bilateral US/Canada discussions earlier in the summer.

Dr Jerome Montague – Alaskan Command

Dr Montague noted that there were changes in leadership at the Alaskan Command in May. Relative to the Arctic and the military, the big strategic question is that there is not a single Arctic combatant command with authority in the area. The world is organized spatially into combatant commands, but at the Arctic pole those areas all come together, and so the Arctic is at the northern portion of Atlantic and Pacific combatant commands. There continues to be lots of discussion at headquarters about how to deal with this issue. With respect to other issues, the community of Newtok is being looked at for a training program, where the military would send personnel and conduct training exercises.

James Moore, BLM

The Ring of Fire management plan has been signed, and the lands will now be open for mineral exploration. The management plan for the Alaska Peninsula is out for review, which will open lands around Lake Iliamna, Lake Clark, and also around Goodnews Bay. The old Goodnews platinum mine (located in Goodnews Bay, and shut down since 1970s, although it was in production before that since the 1930s) has gone back into operation. It is currently processing tailings, and modernizing the operation, but full-scale mining is expected later. At full operation, the mine will affect the environmental refuge in that area, and BLM will discuss with USFWS how to address those impacts when the mine is brought back into operation. There is also a fish processing plant in the bay, which may be affected. But the mine will operate entirely on land, there will be no dredging, and no chemicals involved. The Goodnews platinum site is one of only five or six deposits on the globe, so it is inevitable that it will be developed.

Mr Montaya asked how the material would be transported out, whether it would result in increased shipping. Mr Moore noted that they could ship it, or fly it out, because the platinum is a low bulk – high value commodity. He noted that the biggest concern is for the mining concern to explore how to get at the 125 ft of ore that is currently inaccessible, given that they will not be permitted to dig a pit or use chemicals.

Cathy Coon, MMS (handout attached)

Ms Coon provided a broad overview of MMS lease sales under the 2007-2012 development plan. In February 2008, there was a record-breaking lease sale in Chukchi Sea, which yielded 2 billion dollars to MMS, which also translates into a large research budget. The Chukchi leases are for 30 years. There are proposed lease sales in the Beaufort Sea in 2009 and 2011, and in the Chukchi in 2010 and 2012. Scoping meetings for the lease sale in the North Aleutian Basin could occur as early as 2011. There is also a possibility for two sales in Cook Inlet in 2009 and 2011. There has not been much interest in Cook Inlet so far, but MMS will put out a notice of intent to gauge interest.

Ms Coon also reported on the MMS environmental studies program, and provided a handout of current research projects. The budget for this year is $12 million, which is divided approximately equally between long-term continuing studies and new projects. In the Arctic, a whale study is underway (a collaboration with NOAA), and a study looking at chemical and benthic information in the Chukchi, updating baseline studies from the early 1990s. The focus on the Chukchi will increase as the lease sales approach. The MMS proposal cycle occurs in September, and the agency is looking for nominations for

different collaborative research proposals. The information gathered through these studies encompasses general biology and oceanography, as well as the specific knowledge required for oil impact assessment, and provides many opportunities for broadening ecosystem knowledge for other agencies as well as MMS.

Ms Coon also spoke about the availability Coastal Impact Assistance Program (CIAP) money. Historically, the proportion of this national fund that is given to Alaska is small, but because of the recent lease sale, Alaska will get a larger pool. The CIAP funds are largely passed through the State of Alaska and the Coastal Management Program. Proposals get submitted and reviewed through DEC, and collaboration with the State is required for funding. Mr Hartig added that the State of Alaska's Oceans Subcabinet looks at proposals for the CIAP funding. There was a three year plan as to how to spend the funds (2007-2010), but with additional funds incoming, they plan will be reevaluated. The subcabinet is meeting towards the end of the month to talk about how to spend the additional funding.

Mr Mow noted that, for people in the lower 48, leases for alternative energy projects is a huge new dimension for MMS. He asked whether Ms Coon was seeing anything similar in Alaska. Ms Coon responded that Cook Inlet was evaluated for alternative energy projects a while ago. MMS has changed its name to reflect that broadening from oil and gas to offshore energy, not just oil and gas. The technology is not yet developed yet to utilize some of these forms, for example tidal energy. Projects are being developed on the east coast with wind, but not yet in Alaska.

Jon Kurland, NMFS (handout attached)

Mr Kurland also spoke of NMFS' recent implementation of the Bering Sea Habitat Conservation measures. Regulations that close areas of the Bering Sea to bottom trawling take effect August 25. The measures are part of the Council's overall effort to protect undisturbed habitats. Protection measures were adopted in the Aleutian Islands and the Gulf of Alaska in 2006, and are now in place in the Bering Sea. The Alaska region and the Alaska Fisheries Science Center are providing a lot of assistance to the Council in developing the Arctic FMP. With regard to ESA-related issues, the status of Cook Inlet beluga whales is being reviewed, and a decision on whether to list them under the ESA is expected in October (to factor in the 2008 abundance estimate). Regarding the petition to list the Lynn Canal population of Pacific herring, NMFS determined that it is not a distinct population segment, so the petition is not warranted, but NMFS will conduct a status review of the Pacific herring population in southeast Alaska. With regard to ice seals, there are four species in the Arctic, and petitions have now been received to list all four species. The status review for ribbon seals is underway, and a decision is planned by end of year. A decision for the other three species will be made by March 2009.

In the research arena, NMFS, MMS, the University of Washington, and the University of Alaska are conducting a marine fish survey in the Beaufort Sea. There is currently very little fisheries data available up there. Originally, the intent was to do baseline survey for fish and zooplankton in both the Chukchi and the Beaufort, but they could not get ship time. Hopefully the survey should result in a snapshot of fish for Beaufort. Finally, NOAA has established an Alaska Regional Collaboration Team (ARCTic) which is trying to integrate NOAA services provided by the many divisions, such as Fisheries, Weather, and Satellite divisions. There has been much outreach associated with the establishment of the team, and efforts to pull together an Integrated Services Plan, to call attention to NOAA's capabilities and better integrate them within themselves and with other agencies. Laura Furgione (former head of the National Weather Service for the Alaska Region) has been chair of team, but as she has moved to Washington D.C., Doug DeMaster will be the new chair.

Larry Hartig, DEC (handout attached)

DEC has initiated a risk assessment for oil and gas, which covers the infrastructure on the Trans Alaska Pipeline all the way to the Valdez terminal. The assessment was precipitated by corrosion incidents and the shut down of the pipeline. The agency hopes it will be extended to encompass the Cook Inlet land-based facilities, pending funds. It won't cover offshore oil and gas, which was dealt with in a separate assessment a couple of years ago, and there is a separate plan to do a risk assessment on Cook Inlet water facilities. The North Slope Borough has asked DEC to extend the assessment to look at the outer continental shelf, but there is not time and budget to expand it. The handout explains the status. DEC has engaged a team of contractors to conduct at risk assessment. In the first phase, they will define the scope of project, which is a big task, as the system is huge and integrated system. It is not possible to look at every valve, the assessment will have to highgrade priority areas. The goal is to end with a product that identifies where DEC should target its resources with respect to environmental concerns. Phase one, the scoping process, is scheduled for a year, and will be very open, with a series of public meetings, and outreach to all federal and state agencies to help identify the issues. After that year, the National Academy of Sciences will do a peer review of the scope. The next phase will be to implement the risk assessment, and hopefully that will be on a schedule so that if DEC wants to implement changes, they can still be done under the Palin administration. This is driving the timeline. Dr Montague asked whether climate change would be considered as part of the assessment. Mr Hartig responded that it will be included, but DEC does not want to prejudge, at this stage, whether climate is a major or minor issue.

Following up on an issue from last meeting, Mr Hartig noted that there is no integrated approach in Alaska to contaminants, or mercury levels in fish stocks. He emphasized the need for a more integrated approach among agencies. The long term needs are an ability to do predictive modeling of contaminant levels in fish. He suggested using the February 2009 Alaska Forum on the Environment to invite agencies and indigenous parties together to talk about setting up conference for 2010. The conference purpose would be to talk about what everyone is doing with regard to contaminants, and developing models. At the Forum would be an opportunity to talk about what information subsistence users are interested in getting from the Federal and State governments in terms of contaminant levels. Mr Hartig has the impression that Alaska is behind other Arctic nations in addressing this issue. He asked for AMEF feedback on this idea and approach. Mr Kurland noted that NOAA personnel at the Ted Stevens Marine Research Institute in Juneau would be interested in participating in such discussions. Ms Coon asked whether DEC does research on fish tissue sampling. Mr Hartig responded that the agency does work with ADFG and others who collect fish tissues, which are analyzed during the winter, but that a problem is that the sampling is opportunistic, and there is no overarching plan as where or what type (age, etc.) of fish to collect.

Mr Hartig also noted that the EVOS Trustee Council is still going forward with evaluating the impacts on the Pacific herring populations in Valdez and Cordova, and what to do to restore the herring population. There has been a huge impact on the herring fishery due to EVOS. The Council is investigating the possibility of whether anything can be done economically or biologically to restore population.

Joy Geiselman, USGS

The USGS is involved in lots of research projects in the Arctic. There are studies on polar bears and walrus, and changes in their sea ice environment. Polar bears have already been listed under ESA; in February there was a petition to list walrus, and USGS is helping USFWS to evaluate walrus environment. There was a tagging study this summer, looking at movement and foraging habitats. A new fact sheet is out on walrus and walrus studies, which is available on the USGS website (http://pubs.usgs.gov/fs/2008/3041/). On the north coast of Alaska, studies on Arctic cisco are looking at

otoliths and genetics to identify where stocks originate. USGS is continuing to study waterfowl, along the Arctic coastal plain, and looking at how habitat changes affect their distribution.

USGS does not only have biologists on staff, but also geographers and water resources specialists. They are mapping lake ice and sea ice melt in the Arctic, using radar to help quantify ice. Models are also being developed to look at coastal shoreline and changes. This summer established two new stream gauges, thanks to North Slope Science Initiative funding. There is also a study looking at two species of conservation interest, telemetry studies to evaluate where the species migrate to, which has found that species that are north of Brooks Range migrate to Asia, while others migrate south to the lower 48. Tracking Asian birds is particularly important because of bird flu issues.

Mr Brown also added that geographers are looking at lake drying, north on the slope, for waterfowl habitat. They have also done a lot of work with the black and white imagery from the 1950s, and high altitude pictures from the 1970s, and satellite photography from now. A big concern up there is coastal erosion, identifying old well sites that were there, and encroachment on burial sites.

Don Martin, USFS

The USFS doesn't as much interaction with the marine environment. They are funding stream restoration projects in the Chugach and the Tongass. These projects have developed over last 4 to 5 years, using people with good expertise.

Carl Borash, COE

COE sponsored a conference in February to look at future navigation improvements, and the need for ports of refuge in the Arctic as vessel traffic (cruise ship or other vessels) increases. A report has been published, and a long-term study will result from the report that will be evaluating the Arctic as climate conditions change in the next 5-10 years. Most of current projects are concerned with erosion control in western Alaska and the Arctic, and small boat harbors. Money has been allocated for revetments in Unalakleet and Shishmaref, among other communities. Hopefully, the projects will be awarded by end of September, and the projects will occur over the next couple of years.

Hindcast studies are evaluating 20 years of old NOAA charts on pressure gradients to establish what wind and wave conditions would be in Bering and Chukchi, and hopefully will provide better information on expected wave conditions. There isn't a lot of buoy data in those areas which would otherwise provide predictions. In the marine environment, COE is also doing some follow-on studies. In Sand Point, there are small boat harbor studies on mussels and sediments, and contamination studies, which have taken place this year and will next year. There are also similar studies planned for Akutan and False Pass harbors, when the harbors are finished. Also a study on how fast do the rocks recolonize after you put them there. The COE does environmental impact statements for all their studies, so this is a source of information on the areas in which they do projects.

Mr Lassay wondered whether the COE was considering recolonization studies for places like Unalakleet, for the revetment work. Mr Borash responded that the work at Unalakleet is mostly on rocks that are out of the water, unlike the harbors where 20 feet of rock is under the water. Mr Kurland offered that NOAA divers may be able to help on the Sand Point and other projects. Ms Moreland asked about the availability of the data on the predicitive wind and wave work, and Mr Borasch noted that the data would be housed in the central COE database in Vicksburg Mississippi, when finished, and would be available on the web.

Shane Montaya

LCDR Montaya noted that the Arctic is big news in the Coast Guard. There was a Russian ship stuck up there just recently. The biggest issue is looking at increased use of the area, and how that impacts the infrastructure, and the need for Coast Guard responses. The Coast Guard is evaluating what will be their responsibilities in 20 years, and looking at partnerships. Another big issue for the Coast Guard is marine fisheries enforcement, but there have been no big issues on the border recently. Also, LCDR Montaya is the co-chair on the Arctic session at the Alaska Forum on the Environment, in February 2009, and is looking for presenters for this forum.
The Coast Guard has also temporarily put a number of small boats up in Barrow, as well as stationed a helicopter up there for 2-3 weeks, to get an idea for how, logistically, they could operate up there. It is a test run in that people are temporarily up there, but as soon as there is a Coast Guard presence, they are operating with their full duties, and have already helped out people in need. One of initial problems has been that the vessels are small (25 ft), so more difficult to run in waters up there, than the clear waters down here. Also, there are issues when the weather changes quickly, and vessels can't get back into Barrow, so have to divert, for example, to Deadhorse. The pilot program is trying to gather all that kind of logistical information. Mr Olson asked whether the Coast Guard is contemplating increasing its assets along the Bering Strait, Nome area, or whether vessels would be stopping in that area for refueling. LCDR Montoya responded that that was being considered for commercial vessels as part of the Arctic Marine Shipping Assessment. But the Coast Guard is not looking at fuel stops for its own vessels, as they will either be there part time, or for their aircraft, or large cutters, will have the ability to go elsewhere to refuel.

Stefanie Moreland, ADFG

Ms Moreland introduced herself, and noted that she has just recently assumed her current position, so was at the meeting to assess how ADFG can contribute to the AMEF.

Update on Aleutian Islands Research Plan (Keith Criddle)

As Brian Allee has now retired, Dr Keith Criddle updated the AMEF on progress with the research project. As the research plan is designed to solicit bottom up input, SeaGrant sent out a survey to all available sources (mailing lists, web, advertisement, etc) that might be have ocean interests in the Aleutians, between January and April 2008. Surveys were submitted by 124 individuals and organizations, and 1007 research and information needs were identified. Because of bottom-up process, the research needs are widely divergent in terms of scale – some are very local issues (e.g., sockeye salmon in a particular bay in Unalaska), some are very broad-based (e.g., need better information on stock structure in the Aleutians). At the current time, Dr Criddle and his associates have examined the responses, distributed them according to appropriate themes, consolidated them to avoid redundancies, and set aside responses outside of the scope (mainly those that were recommending management action versus recommending a research or information need). They ended up with 308 unique research and information needs across 6 themes and 27 objectives. He then convened a panel of stakeholder expertise (agency and individual) to use the Analytic Hierarchy Process to sort through the research needs and come up with a research plan. At the two-day meeting, the group did not get through all of the themes and unique research needs, but did get through some. The others will be addressed through email and follow up teleconferences.

Ms Moreland commented on the approach taken to prioritizing the research issues, and noted that it involved a very diverse set of stakeholders. Dr Criddle confirmed that it is a very different approach than is often taken for research plans, and noted that he intends to do sensitivity analyses at the end of the process, to see whether different issues are critical among individuals with different affiliations. The

sensitivity analysis will help to indicate whether the process delivers a good product. Ms Moreland also asked how the composition of the panel to prioritize the research needs was arrived at. Dr Criddle said that they wanted to include agencies that they thought would have a key role in research or management of living marine resources in the AI; they also wanted representatives from communities and local government in the AI, and also representatives from commercial fishing and environmental organizations. Given that as desirable mix, they then approached these organizations to identify someone from to come and participate.

Dr Criddle also noted that the University of Alaska has just received support from the National Science Foundation to start graduate training program in Marine Ecosystem Sustainability, beginning in fall 2009. This would be an interdisciplinary graduate program. Each year for the starting class, the faculty would identify one marine related theme (e.g. operations of living marine resources in Glacier Bay). Then the biological, ecological, management, social science perspectives would all be introduced with respect to that theme. The goal will then be for students to do an interdisciplinary dissertation, with an applied dimension. Dr Criddle is looking for suggestions for these important theme areas.

Update on the Aleutian Islands Risk Assessment (Gary Folley) (handout)

Mr Hartig began the discussion by noting that it is interesting to hear the important theme in all these Arctic discussions about increased vessel traffic, but in fact the first evidence of increased vessel traffic in Alaska is in the Aleutian Islands. He noted that the AI risk assessment should also provide more information on what will be needed as we go north.

Mr Folley explained that the assessment came about due to the settlement for the Selendang Ayu, which included $3 million to be used for an AI risk assessment. The State also had modest funding, and thought better to commission the National Academy of Science for a methodology for the risk assessment, to come up with a framework, before jumping right in. The report from the National Academy is now available. It involves five steps: hazard identification, risk analysis, risk control options, cost-benefits analysis, recommendations for decision-making. The scope of the assessment focuses on spills from vessels in the AI region. The recommendations are that it should be conducted in two phases: a) generalized, b) focused. The report also says that it should include quantitative fate and effect risk analysis, which will be difficult. Under Phase A, an initial traffic study has already occurred (and is on the DEC website). This phase will also require a qualitative assessment. Under Phase B, an in depth evaluation of risk reduction methods, and comprehensive cost benefit analysis will occur.

Some report contains recommendations for management, advisory, and peer review teams. Some immediate action recommendations in the report include: expand the automatic identification system (AIS) tracking network (responsibility of the USCG); have a rescue tug out in Dutch Harbor (DEC starting to look into that now); look at a possible structure and costs of a Vessel Traffic Information Structure; and look at establishing traffic lanes throughout the area. The key principles for success are to keep the assessment focused, involve stakeholders, and apply a phased approach.

LCDR Montaya and Mr Folley clarified that the timeline is to plan the two phase approach, and for DEC and USCG, and funders, to put together the teams, and start drafting the Request for Proposal for the Phase A risk analysis. The National Academy of Sciences put together a 24 month schedule; Mr Folley thinks this schedule is too aggressive, and is unlikely to be met. Mr Hartig added that there are many issues even with implementing the immediate recommendations. A rescue tug costs $3 million a year, and there are issues with where you keep it (the AI is a large area). Can one tug accommodate some of the really large container ships? Re the other recommendations, how can the State go about getting transponders on all ships, when they may not stop at US ports. So the State may need to go through international insurance organizations in order to get that to happen. State has no 'hook' into these vessel

owners. Also, vessel owners do not always call when they first have a problem (e.g., as occurred with the Selendang Ayu). There are lots of logisitical issues to resolve. LCDR Montoya added that the $3 million funding may help with planning the risk assessment, but the cost of implementing many of those recommendations may be much higher.

Alaska Climate Change Strategy (Larry Hartig)

The Governor issued an Administrative Order (AO) on Climate Change, dealing with mitigation needs (how to reduce or capture carbon), adaptation needs (how to better prepare for warming environment). Mr Hartig is the chair of the Governor's climate group, to address the AO. The scope of this action is that 180 people engaged in these workgroups, and processes. People are really looking at Alaska as the leader in this area, and Mr Hartig is getting lots of calls from other states as to how to tackle these issues. The State is getting great partnership from the Federal agencies.

The AO also says to give priority to the most at-risk communities. In response, an immediate action workgroup was formed to deal with priority issues (chaired by Trish Opheen, COE, and Mike Black, Deputy Commissioner of DCCED). The workgroup has made recommendations for six communities (the report is on the DEC website), such as emergency preparedness, for example, against a storm surge, revetments, and specific recommendations for Newtak (which has to be moved). The State funded all the projects/ recommendations for these six communities. $40 million of Federal funds came to Alaska to add to State funding, and that should take care of Shishmarev, Kivalina, and Unalakleet. For Newtok, State is doing emergency planning, to determine what can be done until the community can be moved. A new site has been identified, and the community now has title to the new site. An ad hoc working group is working with the community, but there is no specific funding for the move. What is currently being suggested is to get the Navy to put a road between the barge site and the new community, and build a structure on the new community site which could serve in an emergency, and eventually be turned into a community building. The workgroup is still meeting to figure out how to continue work on the six communities at risk. In the meantime, GAO did a 2003-4 report on villages most at-risk from climate change and flooding, and they are returning to Alaska to update their report, and will suggest criteria for prioritization among these communities. DEC is considering convening a roundtable, perhaps with the Denali Commission, to bring in other State and Federal agencies, e.g. Post Office, to figure out a plan when these agencies should be brought into the process.

Another path under the AO is an overall strategy for mitigation of the effects of climate change. The group is seeking public input through facilitated workgroups, to come up with recommendations for the two advisory groups (for mitigation and adaption), which will then be forwarded to the Oceans subgroup for Governor's action. These recommendations should be ready within a year. All recommendations are also feeding into other groups.

North Slope Science Initiative (John Payne) (handout)

The North Slope Science Initiative is a consortium, generally of management agencies, although some are also regulatory agencies. It is organized by an oversight committee. There is a very small staff which is responsible to them. BLM is the administrative agency for the NSSI, but Mr Payne works for the oversight group/consortium. BLM and USGS formed the idea originally, because much of the data and information on the North Slope was scattered. They were originally interested mainly for oil and petroleum reserve data and impacts. No one had a comprehensive idea of what projects were going on (there are 541 projects going on there right now). There is lots of money being spent on research or studies. So the duty of NSSI is to try to come up with a comprehensive 'handle' on what is going on on the slope, and what are the information needs. Some clear needs are: a 'one-stop shop' for information; a map that isn't agency specific; and north slope hydrology information. One of the biggest challenges for

the NSSI is that each agency has specific mandates, and it is difficult to get past the narrow focus and see the broader perspective. The NSSI was formalized in the Energy Policy Act of 2005; it is good to be formalized, but they have to struggle to maintain a broader focus that just energy. The formalization came with limited funding, and Mr Payne now has a deputy (Denny), and a junior position.

The Mission and Vision for the NSSI is defined in the Business Plan. The Mission includes a context of development activities and climate change. NSSI does go offshore (terrestrial, aquatic, and marine ecosystems). There are eight broad objectives, which include data sharing, inventory of research activities, identify information needs, coordination among agencies. The oversight group is made up of senior employees of member agencies; there is a staff committee (worker bees from member agencies), and a science technology and advisory panel. Some projects the NSSI is working on include hydrologic gauging stations. Such stations are really expensive: there should be 60 on the north slope, and there are currently eight operational (NSSI just put two others in ANWR recently). The NSSI could spend all their budget on gauges, however they are also working on other accomplishments, such as trying to bring closer ties between managers and research. With divergent mandates, this can be a big issue. NSSI conducted an exercise, to figure out information needs, asking for responses in general categories, and identifying specific issues, and data needs, and the timeframe required for information. The process was to approach senior staff for the management questions, then get input from science panel, and then pass on recommendations to the oversight committee. The handout identifies many of the management questions.

As a plan for moving forward, it has been suggested that in order to be effective, NSSI needs a budget on the order of NPRB. But Mr Payne believes that NSSI can still be effective as an organizer of collaborative efforts, and they are still working through ways to make that happen. Particularly, they are still working on ways to use traditional ecological knowledge in those efforts. The website for further information is www.northslope.org.

Election of Officers and Next meeting

The Memorandum of Understanding is structured so that the current Vice-Chair, Larry Hartig, will be the next Chair of the AMEF, and he will be chair for the upcoming year. Jon Kurland suggested Marcia Combes, of EPA, for the next Vice-Chair, and the group concurred. She was unable to attend this meeting, so Mr Kurland and Mr Hartig will be in touch with her to see whether she will accept the position .

The group agreed that we should aim to hold AMEF meetings every six months. January-February 2009 was identified as the timeframe for the next meeting.

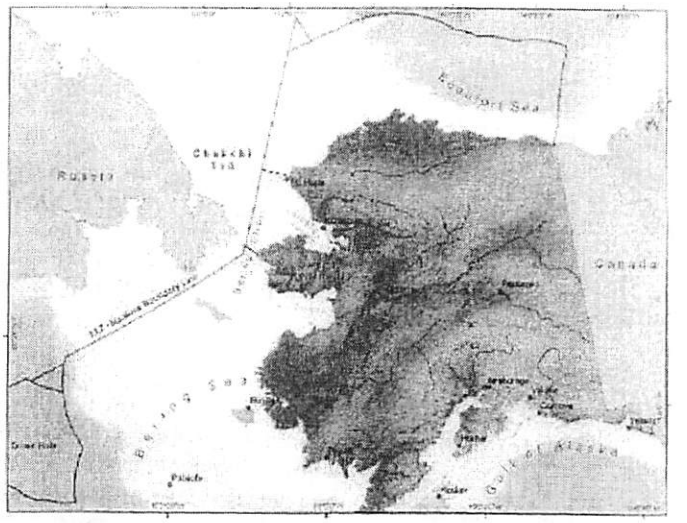
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

Briefing for the Alaska Marine Ecosystem Forum

August 7, 2008

Arctic Marine Ecosystem Area

Arctic Fishery Management Plan



The Council is continuing its development of a Fishery Management Plan (FMP) for the Arctic Management Area (see map below). The Council's FMP would establish a policy framework for potential commercial fishing in the Beaufort and Chukchi Seas, and the Council intends to initially prohibit commercial fishing until data are available with which to make sound fishery management decisions. If adopted, the Arctic FMP would be the sixth FMP authorized by the Council for Alaska's EEZ waters.

Currently, there is no Federal fishery management in the Arctic; with changing climate conditions, there is some indication that commercial stocks may extend their range northwards. Little information is currently available, however, about Arctic stocks or the Arctic ecosystem. Thus, the Council intends to prohibit commercial fishing until adequate scientific information is available on fish stocks and ecological relationships in Arctic marine waters. A draft FMP and accompanying Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) document will be reviewed by the Council in October 2008, and the Council's final decision is scheduled for December 2008. The Council has conducted an extensive outreach program associated with development of the FMP and related documents. Documentation of this outreach will be included in the EA/RIR/IRFA.

A necessary part of the development of the FMP is an analysis of alternatives. The alternatives that will be evaluated in the EA/RIR/IRFA include the status quo (Alternative 1), and an Arctic FMP that closes the entire Arctic Management Area (Federal waters) to commercial fishing (Alternative 2). Two variations of Alternative 2 permit the Council to select an alternative allowing only a historic commercial red king crab fishery in the Chukchi Sea to continue, either under the auspices of the new Arctic FMP (Alternative 3) or, as currently, under the crab FMP (Alternative 4).

Senate Joint Resolution 17 – International Agreement on Management of Arctic Fish Stocks

Senate Joint Resolution 17 was signed into law by President Bush on June 3, 2008 (PL 110-243). Initiated by Senator Ted Stevens, SJR 17 calls on the U.S. to enter into international discussions and take necessary steps with other Arctic nations to agree on management of migratory, transboundary, and straddling fish stocks in the Arctic Ocean and establish a new international fishery management organization(s) for the Arctic. SJR 17 also states that such agreements include mechanisms for establishing catch and bycatch limits, harvest allocations, monitoring, and other elements of traditional and sustainable fishery management. The resolution also recommends consultation with the North Pacific Fishery Management Council and Alaska Native communities of the Arctic.

Arctic Marine Shipping Assessment

The Arctic Council's Protection of the Arctic Marine Environment (PAME) Working Group is preparing an Arctic Marine Shipping Assessment (AMSA). The AMSA examines current and future Arctic marine shipping activity under a variety of scenarios. The scenarios examine projections of how marine shipping may unfold in the future. The AMSA is nearing completion of a draft report, and the NPFMC has been assisting NOAA in writing sections of a chapter on impacts of shipping on the Arctic marine ecosystem and ecosystem resources. The AMSA definition of "Arctic" includes marine waters of the North Pacific along the Great Circle Shipping Route and an "over-the-top" shipping route traversing the Alaskan Beaufort and Chukchi Seas, Bering Strait, and the western Bering Sea.

Council updates related to other marine areas of Alaska

Bering Sea Habitat Research

Northern Bering Sea Research Area

The Bering Sea habitat conservation measures have been implemented. These 'freeze the footprint' of bottom-trawl fishing in the northern Bering Sea, to prevent habitat impacts that might be associated with the changing distribution of commercial stocks due to global climate change. A research plan is being developed over the next two years, until which time the northern Bering Sea will be closed to bottom-trawl fishing. Under the research plan, experimental fishing could occur in the area.

Bering Sea Canyon Research

In 2009, the Council may initiate another proposal cycle for listing Habitat Areas of Particular Concern in Alaskan waters. One of the area types suggested for such consideration is the Bering Sea canyons. In preparation for this work, NPRB is considering including a research priority in the 2009 RFP that would fund at Bering Sea canyon research and habitat mapping.

Salmon bycatch in the Bering Sea pollock fisheries

Salmon bycatch in the Bering Sea pollock fishery continues to be a high priority for the Council. The Council is working on an environmental impact statement for Chinook bycatch, looking at establishing additional caps on bycatch and changes to the bycatch area closure management system, including options for cooperative management within the industry; similar options for chum bycatch will be considered beginning in October. Because the issue of salmon bycatch is very important to western Alaska and Yukon River interior communities, many of whom have been participating in the Council's process Council and NMFS staff will be traveling to various communities in the autumn to provide information on the Council's proposed action.

Steller sea lions

The Council's efforts to adjust the economically restrictive constraints placed on groundfish fisheries because of adverse interactions with Steller sea lions (SSL) have been placed on hold. The Council and NMFS have been involved in a Section 7 consultation under the Endangered Species Act to examine alternative proposals for changing SSL protection measures. Although the consultation process has been ongoing for a year or more, the recently-published Final Revised Steller Sea Lion Recovery Plan prompted NMFS to delay its draft Biological Opinion on fishery interactions with SSLs. A new schedule is forthcoming from NMFS, and it is anticipated the draft BiOp may be available in late 2009.

Minerals Management Service - Alaska Region - Environmental Studies

ESS Home page: http://www.mms.gov/alaska/ess/index.htm

Program Lead	Region	TITLE
		PLANNED NEW STARTS (FY 2008)
MMS	CH	COMIDA: Chemistry and Benthos (CAB)
MMS	CH	COMIDA: Distribution and Relative Abundance of Marine Mammals: Aerial Survey
MMS / NMML	BS	Continuation of Impact Assessment for Cross Island Whaling Activities-Beaufort Sea
MMS	CH	COMIDA: Impact Monitoring for Offshore Subsistence Hunting
MMS / CMI	NAB	Biogeochemical Assessment of the North Aleutian Basin Ecosystem: Current Status & Vulnerability to Climate Change
MMS	NAB	Subsistence Study for North Aleutian Basin
		ONGOING STUDIES
		Biology
MMS / CMI	BS	Recovery in a High Arctic Kelp Community
MMS / NMFS	BS	Beaufort Sea Marine Fish Monitoring: Pilot Survey and Test of Hypotheses
MMS / CMI	BS	Evaluating a Potential Relict Arctic Invertebrate and Algal Community on the West Side of Cook Inlet
MMS / CMI	BS	Foraging Ecology of Common Ravens on Alaska's Coastal Plain and Relationship to C&G Development
MMS	BS + other	Review and Monitoring Ambient Artificial Light Intensity in the OCS and the Potential for Effects on Resident Fauna
	CH	Current & Historic Distribution & Ecology of Demersal Fishes in the Chukchi Sea Planning Area
MMS / BRD	CH / BS	Arctic Fish Ecology Catalogue
		Fates & Effects
MMS / CMI	BS	Assessment of the Direction and Rate of Alongshore Transport of Sand and Gravel in Petroleum Development Region of the North Slope of Alaska
MMS / CMI	BS	Synthesis of Time Interval changes in Trace Metals & Hydrocarbons in Nearshore Sediments of the AK Beaufort Sea: A Statistical Analysis
MMS	CH / BS	Empirical Weathering Properties of Oil in Snow and Ice
MMS / CMI	CH / BS	Sea-Ice-Ocean-Oilspill Modeling System (SIOMS) for the Nearshore Beaufort and Chukchi Seas:Improvement & Parameterization (Phase II)
MMS	CH / BS	Updates to the Fault Tree Approach to Oil Spill Occurrence Estimators for the Beaufort and Chukchi Sea
		Multidisciplinary
MMS	BS	Continuation of Arctic Nearshore Impact Monitoring in Development Area (cANIMIDA)
		Other
MMS	AK	Conference Management and Reports on MMS Results
MMS	AK	Management, Logistics, and Warehouse Storage of Oceanographic Equipment
MMS / CMI	AK	MMS-University of Alaska Fairbanks-State of Alaska Coastal Marine Institute Management
		Physical Oceanography
MMS	BS	Beaufort Sea Mesoscale Meteorology
MMS	BS	Beaufort Sea Nearshore Currents
MMS	BS	Feasibility and Study Design for Boundary Oceanography of the Beaufort Sea
MMS / CMI	BS	Idealized Process Model Studies of Circulation in the Landfast Ice Zone of the Alaskan Beaufort Sea.
MMS	BS	Mapping Sea Ice Overflood Using Remote Sensing from Smith Bay to Camden Bay
MMS	BS	Support of the Collection of Meteorological Data on the North Slope and Beaufort Sea, Alaska
MMS / NOPP	BS + other	Surface Circulation Radar Mapping in Alaskan Coastal Waters: Field Study Beaufort Sea and Cook Inlet
MMS / NASA	CH / BS	Sea Ice Modeling for Nearshore Beaufort and Chukchi Seas
MMS / CRREL	CH / BS	Simulation of Landfast Sea Ice Along the Alaska Coast
MMS	NAB	Modeling of Circulation in the North Aleutian Basin
MMS / CMI	Cook Inlet	Seasonality of Biophysical Boundary Conditions for Cook Inlet, Alaska
MMS / CMI	Cook Inlet	Water and Ice Dynamics in Cook Inlet
		Protected Species
MMS / CMI	BS	Premigratory Movements and Physiology of Shorebirds Staging on Beaufort Littoral Zone
MMS	BS + other	Assessing Reproduction and Body Condition of the Ringed Seal Near Sachs Harbour, Northwest Territory, Canada, through a Harvest-based Sampling Program
MMS / BRD	CH	Monitoring Marine Birds of Concern in the Eastern Chukchi Nearshore Area (Loons)
MMS / NMML	CH	Pinniped Movements and Foraging
MMS / ADF&G / CMI	CH	Satellite Tracking of Walruses in the Chukchi sea: The Planning Phase
MMS / NMFS	CH / BS	Aerial Photography of Bowhead Whales to Estimate the Size of the Bering-Chukchi-Beaufort Population

Program Lead	Region	TITLE
MMS / NMML	CH / BS	Bowhead Feeding Variability in the Western AK Beaufort Sea: A. Satellite Tracking of Bowhead Whales; B. Feeding Observations; C. Oceanographic Measurements & Analysis
MMS / CMI	CH / BS	King and Common Eider Migrations Past Point Barrow
MMS / NMML	CH / BS	Monitoring the Distribution of Arctic Whales
MMS	CH / BS	Population and Sources of Recruitment in Polar Bears
MMS / ADF&G / CMI / BRD	CH / BS	Radio Frequency Identification Tags for Grizzly and Polar Bear Research
MMS / NMML	NAB	Distribution, Abundance, and Habitat Use of North Pacific Right Whales
MMS / NMML	Cook Inlet	Distribution and Abundance of Harbor Seals in Cook Inlet
MMS / NMML	Cook Inlet	Movements and Habitat Use of Harbor Seals in Cook Inlet
		Social & Economic
MMS	BS	Subsistence Mapping of Nuiqsut, Kaktovik and Barrow: Past and Present Comparison
MMS / CMI	CH	Traditional Knowledge Regarding Bowhead Whales in the Chukchi Sea
MMS	CH / BS	Researching Technical Dialogue with Alaskan Coastal Communities: Analysis of the Social, Cultural, Linguistic, and Institutional Parameters of Public/Agency Communication Patterns
MMS (CESU) (UAF) ASF	CH / BS	Study of Sharing Networks to Assess the Vulnerabilities of Local Communities to O&G Development Impacts in Arctic Alaska
MMS	AK	Publication of a Book/Synthesis on the Socioeconomic Effects of Oil &Gas Industry Activity on the Alaskan OCS
MMS	AK	Social and Economic Assessment of Major Oil Spill Litigation Settlement for the Alaska OCS Region
		Other (Research Partnerships)
		MMS Technology Assessment and Research Program (TAR)
Region Codes		MMS-University of Alaska Fairbanks-State of Alaska Coastal Marine Institute (CMI)
Beaufort Sea	**BS**	Cooperative Ecosystem Studies Unit (CESU): University of Alaska Fairbanks (UAF); University of Washington (UW)
BS + Other regions	**BS + other**	USGS/Biological Resources Division (BRD)
Chukchi Sea	**CH**	National Oceanographic Partnership Program: eg. *Comprehensive Modeling Approach Towards Understanding and Prediction of the Alaskan Coastal System Response to Changes in an Ice Diminished Arctic*
Chukchi & Beaufort Sea	**CH / BS**	Federal Inter-agency Agreements: eg. NOAA-National Marine Fisheries Service (NMFS) / National Marine Mammal Laboratory (NMML)
North Aleutian Basin	**NAB**	National Science Foundation (NSF)
Cook Inlet	**C.I.**	North Slope Science Initiative (NSSI)
All	**AK**	North Pacific Research Board (NPRB): eg. Marine Science Symposium co-sponsor
		National Aeronautics and Space Administration (NASA)
		National Fish and Wildlife Foundation
		Cold Regions Research Engineering Laboratory (CRREL) (US Army Corps of Engineers)
		Alaska Ocean Observing System (AOOS)
		Alaska Department of Fish and Game (ADF&G)
		Industry Studies
		Arctic Council (AMAP)
		Canadian Department of Fisheries/Oceans

NOAA / National Marine Fisheries Service
Overview of Issues Related to the Alaska Marine Ecosystem Forum
August 7, 2008

Background

NOAA Fisheries' mission is stewardship of living marine resources through science-based conservation and management and the promotion of healthy ecosystems.

NOAA Fisheries has three major resource management programs:
- Sustainable Fisheries (groundfish, crabs, scallops, halibut)
- Protected Resources (marine mammals and endangered species)
- Habitat Conservation (protection and restoration)

Issues

- **Final rule for Bering Sea habitat conservation measures** – On July 25, 2008, we published a final rule to implement Amendment 89 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. This action included new habitat conservation measures recommended by the North Pacific Fishery Management Council that limit bottom trawling to historically trawled areas of the Bering Sea; close nearshore areas to bottom trawling; and establish a Northern Bering Sea Research Area that would be closed to all fishing pending development of a research and management plan. The new regulations are effective August 25, 2008.

- **Arctic Fishery Management Plan** – We're continuing to assist North Pacific Council staff with development of a new Fishery Management Plan for the Chukchi and Beaufort Seas under the Magnuson-Stevens Fishery Conservation and Management Act. The plan would close the federal waters of the Arctic to all commercial fishing except for traditional fisheries. The Council will review a draft in October 2008.

- **Cook Inlet Beluga Whales** – NOAA Fisheries deferred the final determination on whether to list Cook Inlet beluga whales under the Endangered Species Act (ESA) until October 2008 because substantial disagreement exists regarding the population trend. The additional time will allow inclusion of the 2008 abundance estimate to better inform our final determination.

- **Pacific Herring** – On April 11, 2008, NOAA Fisheries determined that listing Lynn Canal Pacific herring as threatened or endangered under the ESA is not warranted because this population does not constitute a species, subspecies, or distinct population segment (DPS) under the ESA. The Lynn Canal population is part of a larger DPS of Pacific herring that may warrant listing under the ESA, so we will initiate a status review of that larger population.

- **Ice Seals** – In response to a petition to list ribbon seals under the ESA, NOAA Fisheries initiated a status review for ribbon seals and three other species of ice seals: bearded, ringed, and spotted seals. We subsequently received a petition to list bearded, ringed, and spotted seals under the ESA. We will make a finding by December 2008 as to whether ESA listing is warranted for ribbon seals. We have not yet responded to the petition for bearded, ringed, or spotted seals.

- **Arctic Ecosystem Research** – The Alaska Fisheries Science Center is conducting a Beaufort Sea marine fish survey in August 2008 in collaboration with the University of Alaska Fairbanks and the University of Washington. The Minerals Management Service is funding the study. A similar survey for the Chukchi Sea was proposed for 2008 but deferred due to a lack of available ship time. The intent of the surveys is to collect baseline data on the distribution and relative abundance of fish and zooplankton to examine the future effects climate change across three large marine ecosystems (Bering, Chukchi and Beaufort).

- **NOAA Alaska Regional Collaboration Team (ARCTic)** – NOAA continues to implement a regional team to coordinate its programs in Alaska and provide more integrated services to the public. The team includes NOAA Fisheries, NOAA Weather Service, NOAA Ocean Service, NOAA Research, and NOAA Satellite and Information Service. Laura Furgione, who chaired the team and served as Regional Director of the Weather Service, is taking a new position in NOAA headquarters so a new chair for ARCTic will be announced shortly.

Alaska's Risk Assessment of Oil and Gas Infrastructure

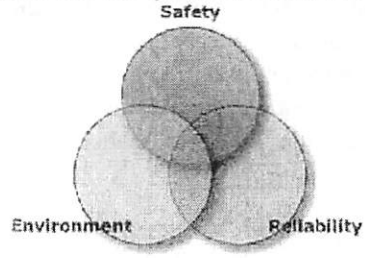
PROJECT STATUS

July 28, 2008

The **Alaska Risk Assessment** project is a comprehensive, engineering-oriented assessment of the status of the existing infrastructure, components, and systems of, or hazards to, Alaska's oil and gas infrastructure. It will result in the identification and ranking of risks based on consequences to safety and the environment, and recommendations for mitigation measures.

Purpose of the Risk Assessment

The purpose of the risk assessment is to determine the baseline condition of Alaska's oil and gas production, storage and transportation system, to evaluate the economic, environmental and safety risks associated with continued operation for another generation, and to recommend measures to mitigate those risks.



Objectives

- Identify safety, environmental, and operational risks,
- Quantify and rigorously evaluate those risks, and
- Recommend measures to mitigate or manage those risks.

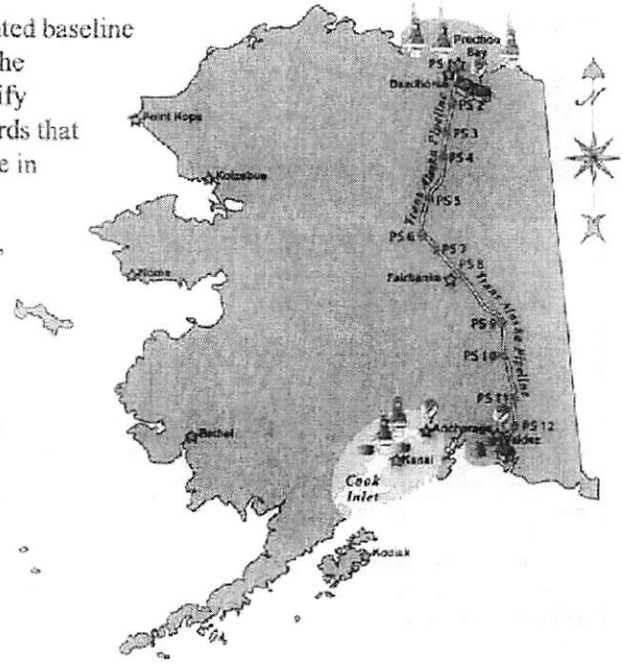
What Is Involved In the Risk Assessment

What is risk? Risk can be described as a function of the probability of an event occurring and the consequences of that event. Risk assessments are a systematic, analytical process, in which potential hazardous events associated with an operation are identified, their frequency of occurrence is estimated, and the consequences of potential adverse events are determined.

The risk assessment will be a one-time engineering oriented baseline analysis involving a thorough, independent appraisal of the condition of the petroleum infrastructure. This will identify those infrastructure items, components, systems, or hazards that have the greatest consequences and probability for failure in environmental, economic and safety terms.

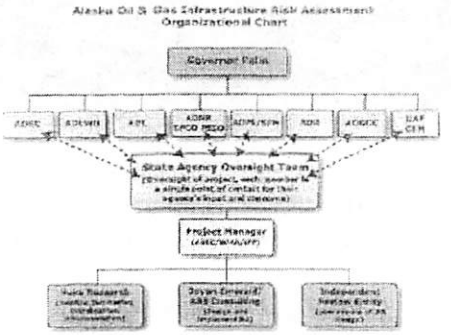
This risk assessment will include the production, storage, and transportation of crude oil and natural gas within the state.

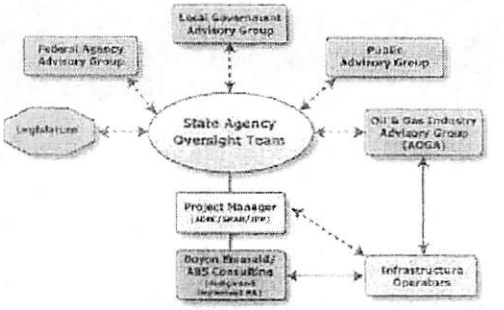
The risk assessment is intended to include the North Slope and Cook Inlet oil field infrastructure, the Trans Alaska Pipeline System and the Valdez Terminal. It will not include marine transportation. A risk assessment was completed by the state, USCG and shippers for crude oil transportation in Prince William Sound in 1997. A separate risk assessment is also being planned for crude oil transportation in Cook Inlet.



Who's Involved

The following organizational charts illustrate the groups involved in this project. The left hand chart shows the administrative organization of the project. The right hand chart depicts external communication links – stakeholder and infrastructure operator involvement.



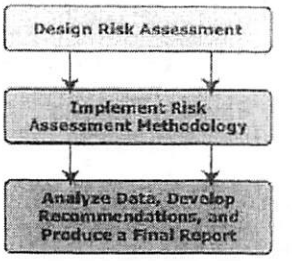


The Department has contracted with the expert firms of Emerald Consulting Group LLC (Emerald) and their subcontractor ABS Consulting Inc. (ABS Consulting) to conduct the Alaska Risk Assessment. Emerald is an Anchorage-based engineering company with extensive experience in risk assessment, process safety management, and integrity evaluation. Emerald personnel have an in-depth knowledge of the Alaska oil and gas infrastructure and associated operating companies. ABS Consulting is a wholly-owned affiliate of the American Bureau of Shipping that provides risk management services to public and private organizations around the world.

How the Risk Assessment will be Accomplished

The risk assessment will have three distinct phases. The first phase consists of development of the risk assessment design. The second phase consists of performing the risk assessment. The third phase consists of analyzing the results and reporting recommendations for risk reduction or risk mitigation to the state.

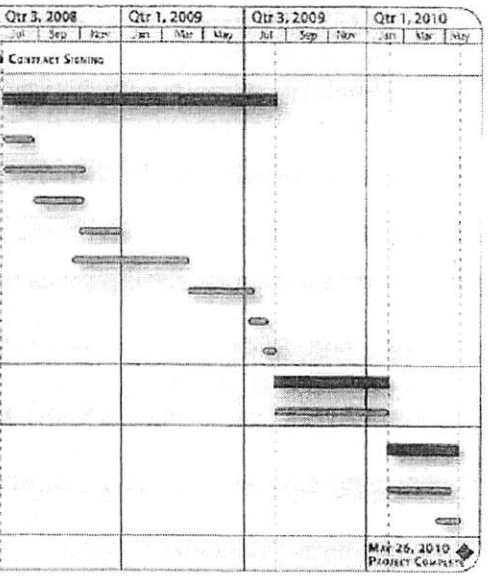
Risk Assessment Process



The Proposed Schedule

Project team members have developed an aggressive schedule for this project:

STATE OF ALASKA OIL & GAS INFRASTRUCTURE RISK ASSESSMENT	DURATION 22.14	START Tue 6/24/08	FINISH Wed 5/26/10
CONTRACT SIGNING	0 days	Tue 6/24/08	Tue 6/24/08
PHASE I: DESIGN RISK ASSESSMENT (RA) METHODOLOGY	13.5	Wed 6/25/08	Tue 8/25/09
Task 1a - Project Plan	1.14	Wed 6/25/08	Tue 7/29/08
Task 1b - Stakeholder Consulation	4.55	Wed 6/25/08	Tue 11/11/08
Task 1c - Existing Data/Information Review	3.41	Wed 7/2/08	Tue 11/11/08
Task 1d - Interim Report	1.25	Wed 11/12/08	Fri 12/19/08
Task 2 - Proposed RA Design	4.55	Wed 10/8/08	Fri 3/6/09
Task 3 - Evaluate RA Design	4.09	Mon 3/9/09	Fri 7/10/09
Task 4 - Proposed Final RA Design	1.14	Tue 7/14/09	Fri 8/7/09
Task 5 - Final RA Design	.68	Mon 8/10/09	Tue 8/25/09
PHASE 2: IMPLEMENT RA METHODOLOGY	5.23	Wed 8/26/09	Thu 2/11/10
Task 6 - Implement RA	5.23	Wed 8/26/09	Thu 2/11/10
PHASE 3: ANALYSIS, RECOMMENDATIONS, AND REPORT	3.23	Fri 2/12/10	Fri 5/21/10
Task 7 - Produce Draft Report	1.73	Fri 2/12/10	Thu 5/6/10
Task 8 - Produce Final Report & Presentation	0.73	Fri 4/16/10	Fri 5/21/10
PROJECT COMPLETE	0 days	Wed 5/26/10	Wed 5/26/10



TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

Risk of Vessel Accidents and Spills in the Aleutian Islands

Designing a Comprehensive Risk Assessment

July 16–17, 2008

Chair
R. Keith Michel

Risk Assessment General
Dennis Bley
Ali Mosleh

Human Factors
Denise McCafferty

Ship Accidents
Hank Marvin

USCG Missions & Accident Response
Robert North

Marine Environmental Protection
Margaret Williams

Safety Regulations
Thomas Leschine

Several vessel accidents and spills in recent years near the Aleutian Islands have focused attention on the potential risks posed by vessels operating in the region:

- *M/V Selendang Ayu*
- *M/V Kuroshima*
- *M/V Cougar Ace*
- *T/B Foss 256*
- *F/V Phoenix*

USA vs. IMC SHIPPING CO. PTE. LTD. Plea Agreement (relevant to this effort):

$3,000,000 be paid to the National Fish and Wildlife Foundation for the purpose of conducting an Aleutian Islands risk assessment of the shipping hazards for that area as well as projects identified by the risk assessment

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Develop a framework and procedure to establish the most appropriate and scientifically rigorous risk assessment approach possible for the Aleutian Islands given available data and modeling capability

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The Committee was tasked to

- examine available data and evidence about the risk of spills from vessels transiting the Aleutian Islands
- determine the information needed to conduct a comprehensive risk assessment
- develop a framework for such an assessment
- identify discrete steps in the assessment that can be conducted as future funding becomes available

Purpose: Ensure independent, objective advice

4 Steps:

- Study definition
- Committee selection and approval
- Information gathering, committee deliberations, and report drafting
- Report review

Local Assets and Their Vulnerability

- Environmental/Ecological Assets
- Economic Assets
- Cultural and Societal Values

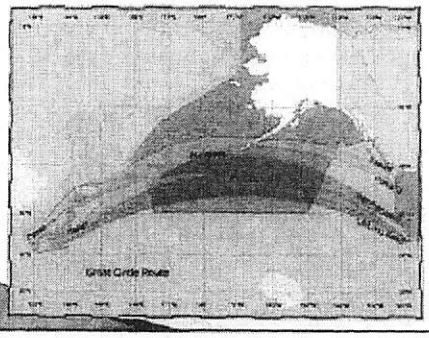
Geology, Oceanography, and Climate

Supporting Maritime Infrastructure

Prevention and Response

Safety Measures include:

- Ship and port practices
- Regulations
- Use of vessel monitoring and tracking systems



- *4,470 large commercial vessel transits through Unimak Pass following the North Pacific Great Circle Route in FY 2007:*
  - *3,580 vessels westbound (85 %)*
  - *890 vessels eastbound (15 %)*
  - *3,130 vessels bound to/from U.S. ports (70 %)*
  - *1,340 vessels bound to/from Canadian ports (30 %)*
- *Number of transits of vessels involved in local trade tracked in and around Unimak Pass in fiscal year 2007: 1,720 (1,435 fishing vessels , or 80 percent of the total)*

Vessels Transiting Unimak Pass Oct 1, 2006 – Sept 30, 2007

Vessel Type	*Number of Vessel Transits*
Container ships	*1,800*
Bulk carriers	*1,550*
Car carriers	*360*
Reefers	*175*
General cargo ships	*175*
Chemical tankers	*125*
Crude and product tankers	*40*
LNG and LPG tankers	*40*
Wood chip carriers	*50*
Roll-on/Roll-off (RoRo)	*50*
Other	*165*
TOTAL	*4,470*

Risk assessment attempts to answer:

- *What can go wrong?*
- *How likely is it?*
- *What are the consequences?*

Primary goal:

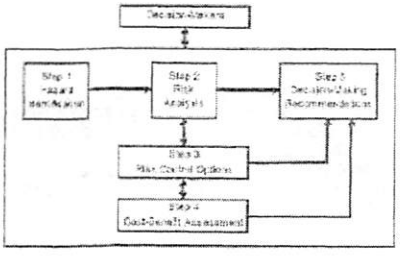
To determine if risk reduction measures are necessary, and then to recommend implementation of effective and efficient risk reduction measures

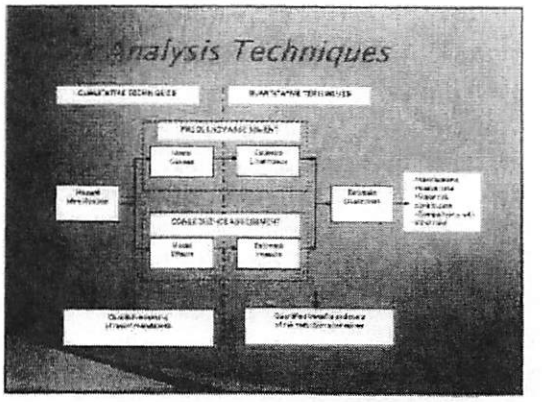
To achieve the goal:

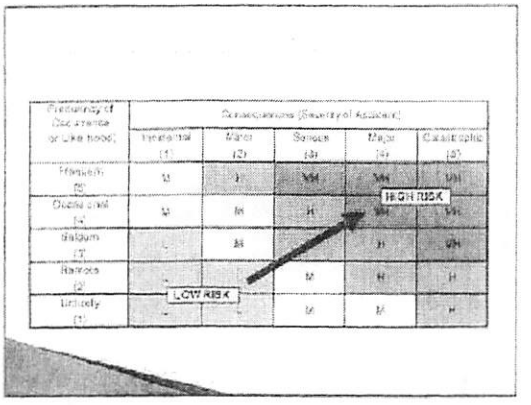
Need to define the types of hazardous substances, types of accidents, geographic region, and time frame to be considered for the study

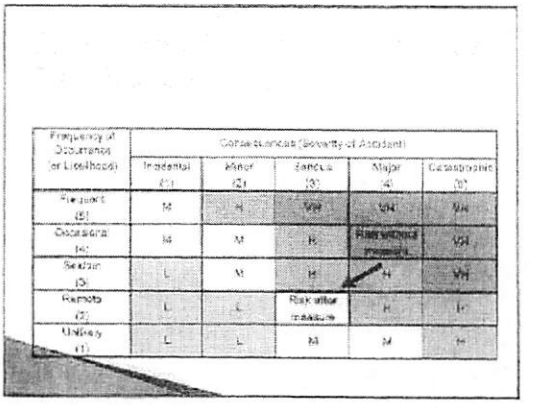
Generally comprised of 5 steps:

- *Hazard identification*
- *Risk analysis*
- *Risk control options*
- *Cost-benefit assessment*
- *Recommendations for decision making*









- Consider spills from vessels: petroleum products, bulk chemicals, and packaged hazardous containerized cargo
- Focus on spills from accidents
- Consider full spectrum of vessel types including commercial shipping, tug and barge operations, and fishing vessels
- Focus on the Aleutian Island region
- Project spill estimates for 25 year period, to allow for consideration of changes to cargo movements, vessel design, and known regulatory changes.

Hazardous substances that need to be addressed:

Type	*Name*	*Examples*
Oil	*Oil cargo*	*Crude oil, asphalt-blending stocks, bunker oil no. 4, fuel oil no. 5, fuel oil no. 6, diesel oil*
	Bunker fuels and base petroleum fuels bunkers	*diesel oil, lube oil, heavy fuel oil*
Chemicals	*Noxious liquids in bulk and noxious liquid substances*	*vegetable oils, oil-like substances*
	Bunker's	*bio diesel, fatty acid methyl esters*
Other hazardous substances	*Dangerous goods in package form, or in other species*	*microorganisms, rats*

A structured risk assessment should be performed with two major phases:

(1) a Phase A Preliminary Risk Assessment
(2) a Phase B Focused Risk Assessment

The Phase A Preliminary Risk Assessment should begin with a broad identification of hazards and a qualitative ranking of selected accident/spill scenarios.

The Phase B Focused Risk Assessment should entail detailed, in-depth assessments of individual risk reduction measures in order of priority.

The risk assessment should include a quantitative fate and effect consequence analysis to yield an understanding of the damage to natural resources and socioeconomic impacts associated with different hazards, sizes of spills, and accident locations.

Traffic study
Spill baseline study
Identification of high-risk accidents
Preliminary consequence analysis
Accident scenario and causality study
Qualitative assessment of risk reduction options

In-depth evaluation of potential risk reduction measures

Biological consequence modeling, as needed

Cost-Benefit and Cost-Effectiveness Analysis

To the extent possible, Phase B should be a quantitative assessment

Phase B should include:

- Use of hybrid modeling methods for risk scenarios
- More detailed causal modeling
- Further consideration of human factors and application of human-error analysis techniques
- Advanced modeling techniques, including use of dynamic system modeling as needed

Rigorous uncertainty and sensitivity analyses

The risk assessment has five main stages:

- Initial organization
- Phase A Preliminary Risk Analysis
- Qualitative risk assessment and prioritization of risk reduction measures
- Phase B Focused Risk Assessment
- Development and reporting of findings and recommendations

The risk assessment should be organized and managed by a team consisting of USCG, its designated fund management organization (the National Fish and Wildlife Foundation), and the State of Alaska.

The Management Team should appoint a Risk Assessment Advisory Panel with a facilitator and members consisting of experts and key parties with an interest in furthering the goals of the risk assessment.

The Management Team should appoint a Risk Assessment Peer Review Panel with a facilitator and members consisting of experts in the techniques and methodologies of risk assessment to ensure that the study will be conducted with sufficient attention to completeness, accuracy, rigor, and transparency.

Members:

- *U.S. Coast Guard*
- *National Fish and Wildlife Foundation*
- *State of Alaska*

Roles:

- *Oversee the use of funds*
- *Refine the study work scope, issue requests for proposals (RFPs), and award contracts for the risk analysis*
- *Provide oversight of the contractor(s) conducting the risk assessment*
- *Control the scope of the effort*
- *Establish the Advisory Panel and appoint its facilitator*
- *Establish the Peer Review Panel and appoint its chairperson*
- *Work collaboratively with the Advisory Panel to establish risk tolerance guidelines and prioritize risk reduction measures*
- *Prepare a final summary of findings, conclusions, and recommendations, written in collaboration with the Advisory Panel*

Members:

- *Facilitator*
- *Experts and key parties and should include representatives from:*
  - *Maritime pilotage*
  - *Environmental organizations, at large*
  - *Subsistence users*
  - *Landowners and managers (e.g., Maritime National Wildlife Refuge)*
  - *Different sectors of the fishing industry*
  - *Industry representatives including tug/tow pilots, mariners, and port authorities*
  - *Government agencies offering special expertise (e.g., NOAA)*
  - *Others with expertise in local weather, habitats, waterways infrastructure*

Roles:

- *Build trust*
- *Clarify the values and goals of the assessment*
- *Provide relevant local knowledge and expertise*
- *Help establish tolerance parameters for risk*
- *Perform an initial prioritization of risk reduction measures*
- *Review and comment on the framing of the study and its conduct at key stages*
- *Help identify and provide input on the risk reduction measures to be evaluated*

Contractors With Expertise in:

- *Maritime transportation and qualitative and quantitative spill risk assessment, including human factors analysis and uncertainty analysis*
- *Marine traffic analysis and modeling*
- *Environmental impact studies*
- *Spill cleanup, and socioeconomic and cultural impact assessments*
- *Human factors*

Roles:

- *Conduct the Phase A Preliminary Risk Analysis*
- *Prepare Phase A Preliminary Risk Analysis Report (includes Phase A Traffic and Spill Likelihood/Size Analysis)*
- *Prepare report on Phase A Consequence Analysis*
- *Ongoing communications with Management Team and other groups as determined by the Management Team*
- *Conduct Phase B Focused Risk Analysis*
- *Prepare Phase B Focused Risk Analysis Report*

Members:

- *Facilitator*
- *Experts in the areas of marine risk assessment, environmental modeling and assessment of socioeconomic impacts, and human factors evaluation*

Roles:

- *Provide technical oversight*
- *Ensure that the study will be conducted with sufficient attention to completeness, accuracy, rigor, and transparency*
- *Perform a peer review of the approaches, methodologies, models, and algorithms used by the Risk Analysis Team*

The USCG should take appropriate action to expand the AIS tracking network along the Aleutian chain and covering the southern North Pacific Great Circle Route.

The USCG and the State of Alaska should be ready and available to investigate funding levels, sources, and mechanisms for an Aleutian Rescue Tug, with the expectation that the Risk Assessment Management Team and Advisory Panel would request this information for early consideration within the risk assessment process.

The USCG should be ready and available to investigate the possible structure and costs of a Vessel Traffic Information System within and near Unimak Pass and Dutch Harbor, with the expectation that the Risk Assessment Management Team and Advisory Panel would request the information thus generated early in the risk assessment process.

Subject to the findings of the Phase A Preliminary Risk Assessment, the committee also recommends early consideration of options for tracking and monitoring vessel traffic in certain congested areas, as well as for employing some common traffic management schemes that have shown merit in similar locations worldwide.

In the final risk assessment report:

- Hazards and risk should be clearly identified
- For risk reduction measures that merit detailed analysis, benefits and costs should be clearly defined
- All sources of data should be documented and assumptions explained; models and methodologies should be explained in sufficient detail to allow a 3rd party to understand the assessment's basic assumptions and limitations

In the final risk assessment report:

- Judgments applied during the assessment should be explicitly stated
- The process for elicitation and analysis of expert opinion should be explained
- Uncertainty and associated sensitivity analyses should be clearly documented and explained; results should be presented in a way that does not create a false sense of precision

In the Phase B final risk assessment report:

- The explanation of the analyses should be in sufficient depth to address the needs and expectations of those with expertise in risk assessment while being understandable to the layperson

- Despite the complexity, a rigorous and comprehensive risk assessment is eminently feasible and the process can justify appropriate safety improvements
- While availability of certain local data are limited, they can be adequately supplemented by relevant worldwide data, local expertise, use of dynamic system modeling and other risk assessment tools, and expert judgment
- The report presents a framework for the risk assessment, explains the underlying principles and provides examples of qualitative and quantitative techniques which should be considered for the analysis

- Key principles for a successful outcome include:
  - Keeping the work focused on a clear definition of boundaries and scope
  - Designing the process to incorporate continuous involvement of local stakeholders
  - Applying a phased approach to set priorities for early action and allocate resources efficiently

QUESTIONS

Emerging Marine Issues/Needs/Challenges

Changing Sea Ice/Ocean Conditions	Increasing Marine Activity (OCS/shipping/transport)	Species of Concern (Marine Mammals & their Prey)
How will changing oceanographic conditions alter marine ecosystems (e.g., ability to produce prey)?	Will increased access enable increased development (e.g., oil, gas, coal, tourism, fisheries, etc.)?	How do we differentiate and assess the separate and combined effects of climate change and development on various species and their interaction?
What is the time span & validity of historic data on temporal and spatial changes in sea ice?	How will infrastructure expand to serve development and what may be the effect of this expansion?	How might a shift in species distribution from sea to land (e.g., polar bears, walrus) affect land management?
How do the timing, duration, and distribution of slush or broken sea ice affect oil spill response?	What are, and how will we measure, the cumulative effects of increases in various marine activities?	How may this shift affect predator/prey relations on land and/or in marine waters?
Is the function of sea ice as habitat changing & what do the models project for the long term (50 yrs out)?	Baseline information is lacking for many categories of information (species, habitats, water quality, ...); to the extent it exists, is there adequate access to the data?	Will changes in ocean currents affect species distribution and recruitment (e.g., nearshore currents and larval drift)?
Is the role of sea ice as a hunting platform for subsistence harvesters changing?	Will the spread of invasive species increase; which ones; by which pathways; and how can we reduce such spread?	Can prey species shifts in distribution and abundance be better modeled; how and with what precision?
How will sea ice changes affect species' onshore vs. offshore distributions?	How will production and transport oil spill risk change?	What will be the ecosystem level effects of shifts in the distribution and abundance of fish and other species?
How will changes in sea ice affect the need for land-based infrastructure (e.g., barge landings)?	How will the 'acoustic ecology' change and what is the comparability of prior studies (Gulf vs. Arctic)?	If fish species shift north, will fishing (incl. commercial fishing) patterns change and what will the effect be on management options, on non-target species, ...?
What will be the effect on wave regime and how will that relate to erosion patterns?	How will shipping interfere with species and their pursuit by subsistence hunters (e.g., will whale migrations be deflected & whaling access thus be altered)?	Will shipping affect whale migration and hunter access?
How will over land weather (precipitation, wind, snowfall) be affected by changing sea ice & how will it effect mgt. decisions (off-road travel, water permits)?	Will increased marine discharges of pollutants affect water quality (e.g., for prey species)?	Can we identify species/habitat conservation refugia?
Will diminished sea ice effect fire regime?	What are the risks from non-ice-hardened cruise ships?	What will be the metric of successful management in the future (for example, under ESA)?
How will a changing ice edge effect specific species?	Will increased activity cause more bird strikes?	See also related species questions in other columns.
Will(has) ice melt cause(d) a pulse of contaminants?	What are the Law of the Sea implications?	
What will the effects of ocean acidification be, for example on marine food chains, and how does it relate to nearshore discharge?	We will need even greater fed/state/local coordination to avoid regulatory uncertainty for activity management.	
Will ocean current patterns change; how?		

Summary of Alternatives

Alternative	MSA Defined Fish Harvest Authorized in Arctic?	Authority	Scallop Harvest Authorized in Arctic?	Authority	Crab Harvest Authorized in Arctic?	Authority	Crab FMP northern boundary	Notes on Chukchi Sea red king crab fishery management
1	no	State regs*	yes	State regs.*	yes	Crab FMP	Pt Hope	Open - Crab FMP defers mgt authority to State
2	no	Arctic FMP	no	Arctic FMP	no	Arctic FMP	Bering Strait	Closed
3	no	Arctic FMP	no	Arctic FMP	Yes-limited to historical RKC in Chukchi Sea	Arctic FMP/State	Bering Strait	Open by State – exempt from Federal management
4	no	Arctic FMP	no	Arctic FMP	yes	Crab FMP	Pt Hope	Open - Crab FMP defers mgt. authority to State

*Authority limited to State registered vessels fishing in Registration Area Q (to Point Hope).

Summary of Options for Alternatives 2, 3, and 4

Option	Identification of FMP fisheries /species	Current FMP Fisheries	MSY	OY	Status Determination Criteria		ACL	ACT
					MFMT	MSST		
1	Creates an algorithm to identify FMP fisheries, which are fisheries with a non-negligible probability of developing as a significant commercial enterprise in the future.	Snow crab Arctic cod Saffron cod	Contains formula for setting MSY and specifies MSY values for the three FMP fisheries.	OY is specified as *de minimis* catch to only allow for bycatch in subsistence fisheries for other species. Provides methods to calculate OY from the MSY.	MFMT= F_{MSY} Specifies values for F_{MSY} for FMP fisheries.	MSST= B_{MSY} Specifies values for B_{MSY} for FMP fisheries.	ACL=OFL $F_{OFL}=F_{MSY}$	ACT=0
2	Creates 4 categories of FMP species, identifies species in each category, and creates a process for moving species from the ecosystem component (EC) category to the Target Species category.	None – all species are either in the prohibited species or EC species categories.	MSY not specified (or required) for EC species. Provides 3 approaches for a system-level MSY.	Not specified but would be developed for a Target Species in parallel with the definitions in the BSAI and GOA groundfish FMPs.	Prescribes a tier system for setting F_{OFL} and F_{ABC} for Target Species based on available information. Not applicable to EC or prohibited species.		Not specified but would be developed for a Target Species in parallel with the definitions in the BSAI and GOA groundfish FMPs.	Not specified but would be developed for a Target Species in parallel with the definitions in the BSAI and GOA groundfish FMPs.

**Council Review Draft Environmental Assessment/
Regulatory Impact Review/Initial Regulatory Flexibility Analysis
for the Arctic Fishery Management Plan
and
Amendment 29 to the Fishery Management Plan for Bering Sea/Aleutian Islands King
and Tanner Crabs**

September 2008

Responsible Official: Robert D. Mecum, Acting Administrator
National Marine Fisheries Service
Alaska Region
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Juneau, AK 99802

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North Pacific Fishery Management Council
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Anchorage, Alaska 99501-2252
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Abstract: The document provides decision-makers and the public with an evaluation of the environmental, social, and economic effects of alternatives and options to manage the fishery resources in the Arctic Management Area. No significant fisheries exist in the Arctic Management Area, either historically or currently. However, the warming of the Arctic and seasonal shrinkage of the sea ice may increase opportunities for fishing in this region. The Council proposes to develop an Arctic Fishery Management Plan that would (1) close the Arctic to commercial fishing until information improves so that fishing can be conducted sustainably and with due concern to other ecosystem components; (2) determine the fishery management authorities in the Arctic and provide the Council with a vehicle for addressing future management issues; and (3) implement an ecosystem-based management policy that recognizes the resources of the U.S. Arctic and the potential for fishery development that might affect those resources, particularly in the face of a changing climate. This document addresses the requirements of the National Environmental Policy Act, Presidential Executive Order 12866, and the Regulatory Flexibility Act.

Note: This document has not been cleared by NOAA General Counsel, Alaska Region

Executive Summary

The North Pacific Fishery Management Council (Council) recognizes emerging concerns over climate warming and receding seasonal ice cover in Alaska's Arctic region, and the potential long term effects from these changes on the Arctic marine ecosystem. Concerned over potential effects on fish populations in the Arctic region, the Council discussed a strategy to prepare for possible future change in the Arctic region, and determined that a fishery management regime for Alaska's Arctic marine waters is necessary.

The Council proposes to develop an Arctic Fishery Management Plan (FMP) that will (1) close the Arctic to commercial fishing until information improves so that fishing can be conducted sustainably and with due concern to other ecosystem components; (2) determine the fishery management authorities in the Arctic and provide the Council with a vehicle for addressing future management issues; and (3) implement an ecosystem-based management policy that recognizes the resources of the U.S. Arctic and the potential for fishery development that might affect those resources, particularly in the face of a changing climate.

The Arctic Management Area is all marine waters in the exclusive economic zone (EEZ) of the Chukchi and Beaufort Seas from 3 nautical miles offshore the coast of Alaska or its baseline to 200 nautical miles offshore, north of Bering Strait (from Cape Prince of Wales to Cape Dezhneva) and westward to the U.S./Russia Convention Line of 1867 and eastward to the U.S./Canada maritime boundary.

Purpose and Need

Chapter 1 describes the proposed action and its purpose and need: to establish federal fisheries management in the Arctic Management Area that complies with the Magnuson-Stevens Act. The action is necessary to prevent commercial fisheries from developing in the Arctic without the required management framework and scientific information on the fish stocks, their characteristics, and the implications of fishing for the stocks and related components of the ecosystem.

Alternatives

Chapter 2 describes and compares four alternatives and two options, summarized as follows:

Alternative 1: No Action (Status quo). Maintain existing management authority.

Alternative 2: Adopt an Arctic FMP that closes the entire Arctic Management Area to commercial fishing. Amend the crab FMP to terminate its geographic coverage at Bering Strait.

Alternative 3: Adopt an Arctic FMP that closes the entire Arctic Management Area to commercial fishing. Amend the crab FMP to terminate its geographic coverage at Bering Strait. Alternative 3 would exempt from the Arctic FMP a red king crab fishery in the Chukchi Sea of the size and scope of the historic fishery in the geographic area where the fishery has historically occurred.

Alternative 4: Adopt an Arctic FMP that closes the entire Arctic Management Area to commercial fishing. A red king crab fishery in the Chukchi Sea of the size and scope of the historic fishery in the geographic area where the fishery has historically occurred could be prosecuted under authority of the Crab FMP. The Arctic FMP would cover the area north of Pt. Hope for crab and north of Bering Strait for groundfish and scallops.

Either Option 1 or 2 must be chosen under Alternative 2, 3, or 4 to meet the MSA required provisions for an FMP to (1) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery and (2) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished or when overfishing is occurring.

Option 1: Specify maximum sustainable yield (MSY), status determination criteria (both maximum fishing mortality threshold (MFMT) and minimum stock size threshold (MSST)), optimum yield (OY), annual catch limits (ACL), and annual catch target (ACT) for the

fisheries that the plan is intended to manage. Managed fisheries are those identified as having a non-negligible probability of developing within the foreseeable future.

Option 2: Create 4 categories of FMP species, identify species in each category, and create a process for moving species from the ecosystem component (EC) category to the Target Species category. Categorize all species of Arctic finfish and shellfish as EC species or prohibited species. EC and prohibited species are not considered managed fisheries under the FMP and do not require specification of reference points such as MSY, OY, and status determination criteria; therefore no reference points are provided in this option. Reference points would be developed for a species to move it into the Target Species category.

Summary of the impacts of the alternatives

The Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) evaluates the alternatives for their effects within the action area. Chapters 4 through 10 of this EA/RIR/IRFA assess the impacts of each alternative for finfish and shellfish, marine mammals, seabirds, ecosystem relationships, society, and the economy.

Finfish and shellfish in the Arctic Management Area

Chapter 4 analyzes the impacts of the alternatives on finfish and shellfish. Many species of marine and anadromous (and amphidromous) fish and shellfish inhabit Arctic waters seasonally or year round. However, no species of finfish or shellfish are known to occur in the Arctic Management Area in sufficient biomass to support commercial fishing, except for red king crab. The Council's objective for Alternatives 2, 3, and 4 is to create an FMP that closes the Arctic region to commercial harvest of all fish and shellfish species. Under these alternatives, salmon and halibut commercial fisheries would remain closed under status quo management and under any of the other three alternatives. The Arctic FMP's Fishery Management Area under Alternatives 2 and 3 would include all federal Arctic waters north of Bering Strait. However, in contrast to Alternative 2, the Arctic FMP under Alternative 3 would exempt from federal management a red king crab fishery in the southeastern part of the Chukchi Sea, of the size and nature of the historic fishery, and which would be managed exclusively by the State of Alaska. Any other crab fishery, or an increase in magnitude of this historic crab fishery, would fall under the management of this Arctic FMP. The Arctic FMP's Management Area under Alternative 4 would include all federal Arctic waters north of Bering Strait for all managed species, except for crab species. The crab FMP management boundary would remain at Pt. Hope, and the crab FMP would not be amended.

If no new fisheries are developed, then no impacts of selecting any of the alternatives are evident other than maintaining essentially the *status quo*. The primary difference in the alternatives is that under Alternative 1, the State of Alaska could open a new or developing fishery under its regulations and the state would not be able to prevent unregistered vessels from fishing in the Arctic, potentially allowing an unknown amount of unregulated fishing. Under Alternatives 2, 3, and 4, the Federal Arctic FMP would need to be amended to manage any new fishery in compliance with applicable Federal law. Differences between the alternatives in how each treats the Chukchi Sea red king crab fishery are described immediately above.

Options 1 and 2 present administrative methods for achieving the same results as intended by Alternatives 2, 3, and 4: to prohibit commercial fishing. Because these options describe an administrative process for scientific assessment that results in prohibiting commercial fishing in the

Arctic, the effects of these options on the environment and on management resources will be the same. Additionally, both options would require an FMP amendment to authorize a fishery and the FMP amendment would need to comply with the MSA and would require a NEPA analysis of the specific measures proposed and alternatives to those measures.

Habitat and Essential Fish Habitat

Chapter 5 analyzes the impacts of the alternatives on habitat and essential fish habitat. Specific areas in the Arctic may be particularly susceptible to potential damage from bottom trawl fisheries. For these reasons, Alternative 1 has the potential to allow significant negative impacts to habitat complexity, benthic biodiversity and habitat suitability and therefore may result in significantly negative impacts on habitat. Overall, Alternatives 2, 3, and 4 are more protective to habitat than Alternative 1 by preventing the occurrence of uncontrolled commercial fishing in the Arctic Management Area. Because Alternatives 2, 3, and 4 would not change the current conditions of habitat present in the Arctic Management Area, including no changes to habitat complexity, benthic diversity, and habitat suitability, the impacts of Alternatives 2, 3, and 4 on habitat are insignificant.

Birds in the Arctic Management Area

Chapter 6 analyzes the impacts of the alternatives on birds. Birds seasonally occur in substantial numbers in the Arctic Management Area. Nearly all Arctic birds are migratory, and large numbers of many species are present between May and November; only a few species remain year round. Arctic bird species that may occur in marine waters include waterfowl, shorebirds, loons, seabirds, raptors, and other species. Bird species listed under the Endangered Species Act that inhabit the areas where commercial fishing could occur include spectacled eider and Steller's eider. Short-tailed Albatross extremely rarely, if ever, inhabit this area. Two other candidate species for listing do inhabit and depend on breeding habitat in this area: Kittlitz's murrelet and the yellow-billed loon.

Interactions between birds and commercial fisheries may occur due to incidental take, reduced prey availability, and habitat disturbance. Since all of the alternatives under consideration that may affect birds, other than status quo, would close commercial fisheries in the Arctic Management Area, none of the alternatives would impact birds. Two alternatives would allow a red king crab fishery to occur in the southeastern Chukchi Sea; birds do not consume crab and such a fishery would not adversely interact with birds, and thus there would be no effects of these alternatives on birds.

Marine Mammals in the Arctic Management Area

Chapter 7 analyzes the impacts of the alternatives on marine mammals. The Arctic is known for its indigenous, and sometimes migratory, marine mammal populations. Fifteen marine mammal species are present in the Arctic Management Area: bowhead whales, gray whales, beluga whales, minke whales, killer whales, fin whales, humpback whales, narwhals, spotted seals, bearded seals, ribbon seals, ringed seals, Pacific walrus, polar bears, and harbor porpoise. Interactions between marine mammals and commercial fisheries may occur due to overlap in important marine mammal prey and the size and species of fish that are harvested in the fisheries, and due to temporal and spatial overlap in marine mammal occurrence and commercial fishing activities. Effects on marine mammals by the fisheries include incidental takes and entanglement, harvest of prey species, and disturbance. By prohibiting commercial fisheries, Alternatives 2, 3, and 4 would be more protective for marine mammals in the Arctic Management Area compared to the *status quo*, which does not restrict commercial fishing by vessels not permitted by the State of Alaska. Alternative 2 is the most protective to marine mammals by prohibiting all commercial fishing in the Arctic Management Area. Alternatives 3 and 4 would allow a red king crab fishery to occur in the southeastern Chukchi Sea. Several marine mammals in this region,

including beluga whales, spotted and bearded seals, and Pacific walrus eat crab. Gray, humpback, and bowhead whales have become entangled in pot fishing gear and may be impacted by a crab fishery in the Kotzebue area, if the whales encounter the crab gear. The scale of the crab fishery would remain very small, so that any potential for entanglement or competition for prey would also remain very small. The potential effects of this limit crab fishery on whales, walrus, and seals are therefore insignificant. Disturbances of marine mammals under Alternatives 2, 3, and 4 are not likely to occur because of the prohibition on fishing; and the small crab fishery is likely to occur in the winter, when marine mammals are not likely present in this area.

Cumulative impacts on marine mammals in the Arctic Management Area are likely to occur from oil, gas, and mineral development and increased shipping activity, including increased potential for introducing invasive species. These activities have the potential to adversely impact marine mammals in the Arctic, but these impacts are likely to be localized and are not expected to result in stock level effects. The continuing fishing activity and continued subsistence harvest are potentially the most important sources of additional annual adverse impacts on marine mammals that range from the Bering Sea into the Arctic Management Area. Both of these activities are monitored and are not expected to increase beyond the potential biological removals for most marine mammals or to greatly increase the total annual human-caused mortality. The extent of the fishery impacts would depend on the size of the fisheries, the protection measures in place, and the level of interactions between the fisheries and marine mammals. However, a number of factors will tend to reduce the impacts of fishing activity on marine mammals in the future, most importantly ecosystem management. Ecosystem-sensitive management and institutionalization of ecosystem considerations into fisheries governance are likely to increase our understanding of marine mammal populations and interactions with fisheries. The effects of actions of other federal, state, and international agencies are likely to be less important when compared to the direct interaction of the commercial fisheries, subsistence harvests, and marine mammals.

The potential direct and indirect impacts from Alternatives 1, 3, and 4 are very limited (for incidental takes and harvest of prey resources) and nonexistent (for disturbance) because no fisheries are allowed at present or are likely to be allowed in the foreseeable future, with the possible exception of a very small historical king crab fishery. Therefore the past, present, and reasonably foreseeable future actions in combination with the direct and indirect impacts of Alternatives 1, 3, and 4 are not likely to result in significant impacts on Arctic marine mammals.

Ecosystem

Chapter 8 analyzes the impacts of the alternatives on the ecosystem. Commercial fisheries can impact systemic relationships between components of the ecosystem by changing predator/prey relationships, energy flow and balance, and biological diversity. Since all of the alternatives under consideration, other than *status quo*, would close commercial fisheries in the Arctic Management Area, none of the alternatives would appreciably impact the ecological relationships between components of the Arctic ecosystem. Two alternatives would allow a red king crab fishery to occur in the southeastern Chukchi Sea; the ecosystem effects of allowing this small localized fishery to continue are not considered to be large, and therefore this document concludes there would be no effects of these alternatives on the ecosystem.

Economic and Social Impacts

The costs and benefits of this action are evaluated in Chapter 9, which provides a Regulatory Impact Review (RIR) of this action. All of the alternatives have the benefit of creating a framework within which future fisheries development may proceed in a sustainable manner. This should benefit a

commercial fishery if one eventually evolves. It will also benefit other users of ecosystem services in the region that might be impacted by a commercial fishery, for example subsistence users of marine mammals. All of the alternatives impose a prohibition on fishing that will create an additional burden for the NOAA Office of Law Enforcement and the U.S. Coast Guard. It is not possible to evaluate the cost of these responsibilities with current information. The alternatives may create some ongoing management and specifications responsibilities for the Alaska Fisheries Science Center, the SSC, the AP, the Council, and the Sustainable Fisheries Division of NMFS. These are believed to be small. Alternative 2 prohibits what may be a small and poorly documented crab fishery in federal waters of Kotzebue Sound. Lost profits in this fishery may create a small cost but lack of information on the fishery makes it impossible to estimate this cost.

An Initial Regulatory Flexibility Analysis was conducted to examine adverse impacts of the alternatives on directly regulated small entities. This analysis, in Chapter 10, was prepared to comply with the Regulatory Flexibility Act (RFA). Alternatives 1, 3, and 4 have no known impacts on directly regulated small entities. Alternative 2 would prohibit crab fishing that may be taking place in a small and poorly documented fishery in Kotzebue Sound. This may have an adverse impact on two to four small entities.

AGENDA C-5
Supplemental
OCTOBER 2008

NORTHWEST ARCTIC BOROUGH

P.O. Box 1110
Kotzebue, Alaska 99752
(907) 442.2500 or (800) 478.1110
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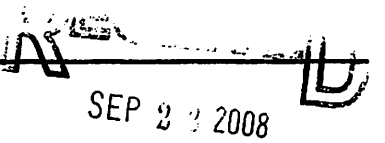

September 17, 2008

Bill Wilson, Protected Resources Coordinator
North Pacific Fishery Management Council
605 W. 4th Ave, Suite 306
Anchorage, AK 99501-2252

Dear Mr. Wilson and North Pacific Fisheries Management Council Members:

On behalf of the Northwest Arctic Borough, taikuu for the opportunity to provide initial comments on the development of the Arctic Fisheries Management Plan. The Borough supports the Council's current action to close the Arctic waters to commercial fishing, encourages the Council to fully engage Arctic residents and communities in the planning process, and supports the effective implementation of a community development quota (CDQ) program for all species if commercial fishing is to be opened.

Major concerns of the Borough regarding the development of an effective management plan are:

(1) the insufficient and lack of current marine and environmental information as baseline data for Arctic waters,

(2) the environmental sensitivity of Arctic waters and marine life particularly with global climate change,

(3) the eco-system risks of cumulative commercial development that would directly impact the sustainability and quality of life of Arctic communities, and

(4) the effective involvement of communities and residents from the Northwest Arctic and North Slope Boroughs in both the planning process and ongoing management implementation including a CDQ.

Lack of Current Information

As you may know, the Borough's economy is dependent on subsistence and responsible natural resource development primarily associated with onshore mineral development. All the 11 communities of the Borough have been and continue to be

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highly dependent on subsistence resources and uses to sustain our economic security and cultural integrity.

Subsistence resources include a rich variety of marine fish and marine mammals that have a wide range to sustain their lifecycles. Because of this strong historical and cultural dependence on, and economic relationship with subsistence marine resources, the Borough encourages commercial development of the Arctic waters to be done responsibly with a full understanding of this productive eco-system and methods to respect local communities' needs and priorities.

However, there is insufficient data and a lack of current marine environmental and social science information for the planning areas near our Borough. These areas have not been subject to much attention in environmental studies and programs during recent years. This is an important reason to close the Arctic waters until comprehensive studies and new research can be completed for baseline data.

Environmental Sensitivity and Eco-System Risks of Cumulative Commercial Development

The residents of the Borough depend heavily on subsistence resources, which include seal, walrus, beluga whale, and fish. The Arctic waters provide food and a connection to the people who permanently inhabit it. Because of the high price of heating and store-bought goods, most residents of the region have an economic reliance on subsistence, and these healthy-cultural foods are a great portion of the average resident and family diet. At the same time, the productivity of the Arctic environment to support the subsistence economy is extremely sensitive. The safe and available harvest on these coastal resources is necessary for survival at a time when the costs of living are continuing to increase.

Gaining a full understanding of the environmental sensitivity is especially important in light of changes to species concentrations and distributions as a result of climate change. Polar bear, whales, walrus, seals, fish and birds are particularly sensitive to climate change and dependent upon healthy stocks of marine life for their survival. The cumulative effects of commercial developments associated with climate change are important considerations that need to be addressed and understood in creating an effective fisheries management plan.

The Borough is also concerned about the cumulative eco-system effects due to the growing global interests in the Arctic marine waters. New marine activity that could

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disturb this historically natural environment includes the outer continental shelf (OCS) oil and gas leasing and development, international Arctic marine transportation, additional mineral and coal production including associated ship/barge transportation, global warming effecting ice and habitat conditions, and commercial fisheries. It is important that the fisheries management plan encompass cumulative commercial development to ensure that fisheries and marine life stocks remain healthy and stable.

Effective Involvement of Communities and Residents

The marine, cultural and economic risks for Borough residents are great because of our dependence on environmental and coastal resources. The Borough requests the North Pacific Fisheries Management Council to schedule community level meetings in Kotzebue, Kivalina and Deering regarding the draft Arctic Fisheries Management Plan and provide the opportunity for public/community input. The Borough planning department is willing to work cooperatively with you in conducting the meetings to ensure the affected residents have an opportunity to learn of the plans and provide their feedback.

Also, if commercial fisheries are to be approved for Arctic waters, the Borough is concerned that the people of the Northwest Arctic Borough and North Slope Borough would be subject to all of the environmental risks with commercial fisheries but practically none of the financial benefits.

The Borough supports and requests the effective implementation of a community development quota (CDQ) program for all species if commercial fishing is to be opened. I would suggest an 80% quota for a new Arctic area CDQ organization for all species to ensure local residents are highly involved in the potential fishery and economically benefit from our own natural resources. This is important as many of our residents and families live at poverty levels with limited opportunities for economic development.

This concludes my remarks. Again, the Northwest Arctic Borough supports the Council's current action to close the Arctic waters to commercial fishing, encourages the Council to fully engage Arctic residents and communities in the planning process, and supports the effective implementation of a community development quota (CDQ) program for all species if commercial fishing is to be opened.

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Sincerely,

Ukallaysaaq Tom Okleasik,
Planning Director

cc: Mayor Siikauraq Martha Whiting
Kill'aq John Chase, Community Planner and Coastal Area Specialist
Inuuraaq Charlie Gregg, Land Specialist
Alagiaq Grant Hildreth, Community Planner and Permit Specialist
Northwest Arctic Borough Planning Commissioners
Senator Donny Olson, Alaska State Legislature
Representative Reggie Joule, Alaska State Legislature
Johnny Aiken, Planning Director North Slope Borough

World Wildlife Fund
Kamchatka/Bering Sea Ecoregion
406 G. Street, Suite 303
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www.worldwildlife.org

September 24, 2008

Mr. Eric Olson, Chair
North Pacific Fishery Management Council
605 W. 4th Street, Suite 306
Anchorage, AK 99501-2252

Mr. Doug Mecum, Acting Regional Administrator
NOAA Fisheries, Alaska Region
709 W. 9th Street
Juneau, AK 99802-1668

Re: Arctic Fisheries Management C-5

Dear Mr. Olson and Mr. Mecum,

On behalf of World Wildlife Fund (WWF), I am pleased to submit comments regarding the North Pacific Fishery Management Council's (Council) further consideration of the Arctic Fishery Management Plan (FMP). We support the Council's proposal to prohibit commercial fishing north of Point Hope and prohibit commercial fishing for forage species north of the Bering Strait as part of the Arctic Fishery Management Plan (FMP), agenda item C-5. Among the highest priorities for our Bering Sea program is achieving and maintaining sustainable management of the productive fisheries in Alaska's waters. We see the Arctic FMP as an important "insurance plan" that will help keep the Bering and Chukchi ecosystems healthy for the future.

Given the rapid changes underway in our marine environment as well as in the Arctic, taking a precautionary approach to managing our nation's fisheries is more important than ever. WWF believes that the Council's development of an Arctic FMP represents such a precautionary step. Setting aside sensitive Arctic areas to allow for solid scientific studies on the resiliency and productivity of the ecosystem prior to commercial fishing activity sets an excellent example for other nations in the circumpolar region, and even in the high seas of the Arctic, to follow should fishing in those areas develop.

We underscore the importance of this action as it relates to the broader international perspective of fisheries in the Arctic. The implementation of the Arctic FMP would be consistent with the bipartisan resolution sponsored by Senators Ted Stevens (R-AK) and Daniel Inouye (D-HI) one year ago that calls for an international agreement to manage and protect fish stocks in the Arctic Ocean. Similar to the Arctic FMP, the resolution (S. J. Res. 17) recommends halting any commercial fishing activity in the Arctic until agreement can be reached on managing migratory, transboundary, and straddling stocks. The action of the Council could provide the basis for entering into discussions at an international level for establishing the kind of leadership and management that the Senate resolution seeks.

The Council's willingness to proactively address this issue is timely. As the United States National Snow and Ice Data Center recently reported, summer Arctic sea ice extent was the second lowest on record in 2008, following the record lowest Arctic summer sea ice extent in 2007. Thus, the Arctic environment may very soon see substantially increased cumulative impacts from shipping and mineral extraction activities in Arctic Seas as a consequence of

diminishing ice cover. The world community is escalating its interest on the Arctic for transportation and natural resource extraction, as evidenced by Russia's recent move to increase its Arctic claims. Thus, it is important for the Council to move forward with the current planned schedule on the Arctic FMP. Moreover, it is important that the Council continue to provide the leadership example to stakeholders nationally and internationally of moving cautiously in the absence of science and great uncertainty with respect to activities that may have significant effects on a fragile ecosystem that is slow to change and slow to recover from disruptions or damage.

Therefore, WWF encourages the Council to continue forward with analysis of alternatives for the Arctic FMP agenda item C-5. Setting aside the Arctic will help protect the resilience of Arctic ecosystems, prevent additional pressure on currently-stressed wildlife and important marine habitat areas, and ensure the continued productivity of the Arctic's bordering seas. More importantly, the implementation of the Arctic FMP would constitute a milestone in the history of fisheries management and exemplify the progressive and proactive reputation of the Council.

Thank you for your time and consideration of these comments.

Respectfully,

Alfred Lee "Bubba" Cook Jr.
Kamchatka/Bering Sea Ecoregion Senior Fisheries Program Officer
World Wildlife Fund

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Juneau, AK 99801 USA www.oceana.org

September 24, 2008

N.P.F.M.C.

Mr. Eric Olson, Chair
North Pacific Fishery Management Council
605 W. Fourth Avenue, Suite 306
Anchorage, AK 99501-2252

Mr. Doug Mecum, Regional Administrator
NOAA Fisheries, Alaska Region
709 West Ninth Street
Juneau, AK 99802-1668

RE: **Agenda Item: C-5 Arctic FMP**

Dear Chairman Olson and Mr. Mecum,

Oceana commends the North Pacific Fishery Management Council for addressing Arctic fisheries management proactively. We urge the Council to move forward with its work to conserve the health of the Chukchi and Beaufort marine ecosystems and maintain opportunities for the subsistence way of life of Arctic peoples by establishing a new Arctic Fishery Management Plan (FMP). At this meeting specifically, we encourage the Council to choose Alternative 3 as its preliminary preferred alterative, complete its initial review of the Draft Arctic FMP and accompanying Environmental Assessment, and begin the public comment process so that final action may be taken in December.

The Arctic is among the most beautiful and most forbidding places on Earth, where temperatures regularly plunge well below zero and the time between sunset and sunrise is sometimes measured in months rather than hours. It is home to vibrant communities of indigenous peoples that have lived in harmony with their surroundings since time immemorial and provides important habitat for 23 species of marine mammals, such as polar bears, whales, seals, and walrus; 100 species of fish including Arctic cod, capelin, and herring; and more than 50 species of seabirds including spectacled Eiders, Arctic terns, and Ivory Gulls.

Climate change is forcing pronounced alterations to Arctic marine ecosystems. In 2007, Arctic sea ice reached a record low, and some scientists now predict that the Arctic could be seasonally ice-free in the next 5-20 years[1]. The loss of sea ice puts the future of many of the Arctic's remarkable animals in doubt[2] and has dramatic impacts on the lives of the millions of people who live in the Arctic.[3]

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[1] Stroeve, J., M. Serreze, S. Drobot, S. Gearheard, M. Holland, J. Maslanik, W. Meier, and T. Scambos. 2008. Arctic sea ice extent plummets in 2007. Eos 89:13-14.; and Bornstein, S., and D. Joling. 2008. Arctic sea ice drops to second-lowest level on record. quoting Jay Zwally (http://www.adn.com/news/alaska/story/508311.html, last accessed September 23, 2008).
[2] Laidre, K. L., I. Stirling, L. F. Lowry, Ø. Wiig, M. P. Heide-Jørgensen, and S. H. Ferguson. 2008. Quantifying the sensitivity of arctic marine mammals to climate-induced habitat change. Ecological Applications 18:S97–S125.
[3] ACIA. 2004. Impacts of a Warming Arctic: Arctic Climate Impact Assessment. Cambridge University Press.

As the Council recognizes, global climate change—particularly the rapid decline in sea ice extent—has created the potential for commercial fisheries in the region north of the Bering Strait. Given the lack of knowledge and potential sensitivity of marine life in the Chukchi and Beaufort seas, it is difficult to anticipate the size and scope of the impacts that might result from commercial fisheries. Accordingly, it is wise and prudent to proactively protect those regions by closing them to new commercial fishing until it can be shown that any such fishing can be conducted without harming the marine ecosystems or opportunities for the subsistence way of life.

The Council's work to protect the Arctic is appropriate given the lack of adequate stock and other critical ecological information necessary to manage fisheries in the region. As highlighted in the draft EA, relatively little is known about the abundance, distribution, and role of fish and other marine species in the Chukchi and Beaufort ecosystems. While recent cruises in the region are providing important new insights into U.S. Arctic marine ecosystems, the only available in-depth surveys useful for calculating abundance and biomass of Arctic fish are more than 15 years old and do not include the Beaufort Sea. Furthermore, the ecology of the region may be driven in large part by factors such as sea ice cover[4] and water temperature,[5] which have changed dramatically since those surveys were conducted and are continuing to change at a rapid pace.[6] The understanding of fisheries and ecology of the U.S. waters north of the Bering Strait pales in comparison to the information available for other places, such as the southern Bering Sea.

While not enough is known at this time to safely conduct new commercial fisheries in the Arctic, the available information about Arctic ecological systems clearly supports the Council's proactive efforts to protect Arctic marine ecosystems from unregulated and unplanned fishing. There are several attributes of Arctic ecological systems that suggest they are likely to be particularly sensitive to disturbance.

- Intensely pulsed primary productivity, caused by the seasonal cycle of sunlight and annual retreat of ice and snow that covers the sea for most of the year;[7]
- Relatively low primary production overall with hot-spots of production over certain shelf regions;[8]
- Polynyas and ice edges, which are particularly important to spring and early summer concentrations of migratory mammals and seabirds;[9]
- Low food web diversity;[10] and
- A predominance of long-lived species with low reproductive rates and multi-annual generation times.[11]

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[4] Stroeve, J., M. Serreze, S. Drobot, S. Gearheard, M. Holland, J. Maslanik, W. Meier, and T. Scambos. 2008. Arctic sea ice extent plummets in 2007. Eos 89:13-14.
[5] Steele, M., W. Ermold, and J. Zhang. 2008. Arctic Ocean surface warming trends over the past 100 years. Geophysical Research Letters 35:L02614, doi:02610.01029/02007GL031651.
[6] ACIA. 2005. Arctic Climate Impact Assessment. Cambridge University Press; Bluhm, B. A., and R. Gradinger. 2008. Regional variability in food availablity for arctic marine mammals. Ecological Applications 18:S77-S96; Laidre, K. L., I. Stirling, L. F. Lowry, Ø. Wiig, M. P. Heide-Jørgensen, and S. H. Ferguson. 2008. Quantifying the sensitivity of arctic marine mammals to climate-induced habitat change. Ecological Applications 18:S97-S125.
[7] ACIA. 2005. Arctic Climate Impact Assessment. Cambridge University Press.
[8] *Id.*
[9] *Id.*
[10] *Id.*
[11] *Id.*

These characteristics are hallmark traits of biological systems which can be easily disrupted and of species which can be easily over-exploited. The declines and impacts facing polar bears, walrus, and ice seals are indicators of both the fragile nature of the Arctic ecosystem and the extraordinary stress climate change is having on the Arctic.[12] To maintain the resilience of Arctic marine ecosystems, it is important to avoid additional stressors on the ecosystems, such as unconstrained or ecologically unsustainable fishing.[13]

Using a precautionary approach by developing a well thought out plan and implementing regulations before allowing commercial fisheries to proceed north of the Bering Strait will help avoid conflicts and impacts with other users of the marine environment in the region. For the coastal villages, the Arctic seas form the centerpiece of life. "We Inupiat are meat eaters, not vegetarians. We live off the sea mammals. . . . The Bering Sea and the Chukchi Sea are our gardens."[14] Coastal people along the Chukchi and Beaufort Seas depend on marine plants and animals for food, clothing, and other necessities of everyday life.[15]

Commercial fishing, especially if unmanaged or inappropriately managed, may impact opportunities for a subsistence way of life. By exporting productivity out of the region, commercial fishing could affect Arctic villages by altering the food web or abundances of fish and other animals at higher trophic levels. In addition, impacts from commercial fishing on seafloor habitat and productivity in the Chukchi Sea may be especially problematic given that several marine mammals that are benthic foragers are also important subsistence species (*e.g.*, walrus and bearded seals). Additionally many of the marine mammals important for subsistence in the region may be harmed by commercial fishing through entanglement, noise disturbance, and ship strikes.

The proactive establishment of an Arctic FMP by the Council is also likely to avoid future conflict with industry and other management bodies. Laying out the ground rules for commercial fishing before that fishing takes place will allow for more effective planning and prevent a situation in which managers are having to catch up with fisheries.

In order to avoid confusion in the review process, Oceana encourages the Council to be clear with the policy it is setting. We recommend that the Council state its intent as follows: "*To protect and conserve the resources of U.S. waters north of the Bering Strait by closing the region to an expansion of commercial fishing unless and until there is a plan in place that shows any such fishing can be conducted without harming the health of the marine ecosystem or opportunities for the subsistence way of life.*"

In addition, we strongly encourage the Council to explicitly include in the Arctic FMP its intent to protect the food web by extending the Gulf of Alaska and Bering Sea-Aleutian Islands ban on

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[12] Moore, S. E., and H. P. Huntington. 2008. Arctic marine mammals and climate change: impacts and resilience. Ecological Applications 18:S157-S165.
[13] Chapin, F. S., M. Hoel, S. R. Carpenter, J. Lubchenco, B. Walker, T. V. Callaghan, C. Folke, S. A. Levin, K.-G. Maler, C. Nilsson, S. Barrett, F. Berkes, A.-S. Crepin, K. Danell, T. Rosswall, D. Starrett, A. Xepapadeas, and S. A. Zimov. 2006. Building resilience and adaptation to manage arctic change. Ambio 35:198-202.
[14] Thomas R. Berger, *Village Journey: The Report of the Alaska Native Review Commission* 48
[15] ACIA. 2004. Impacts of a Warming Arctic: Arctic Climate Impact Assessment. Cambridge University Press.

fishing for forage species into the Arctic. Forage species, such as Arctic cod, play a critical role in Arctic marine ecosystems.[16] Accordingly, any commercial fishing for forage species may result in cascading impacts to seabirds and marine mammals,[17] which could have consequences to opportunities for the subsistence way of life. Because they are so important to the Arctic food web, which, given its low diversity, may be particularly vulnerable to disruption, forage species deserve an explicit reference in the FMP that extends the ban from the GOA and BSAI.

During the preliminary review of the Arctic FMP, we encourage the Council to set a preliminary preferred alternative, which will help the public focus their comments for this action. We support Alternative 3:

> *Adopt an Arctic FMP that closes the entire Arctic Management Area to commercial fishing. Amend the crab FMP to terminate its geographic coverage at Bering Strait. Alternative 3 would exempt from the Arctic FMP a red king crab fishery in the Chukchi Sea of the size and scope of the historic fishery in the geographic area where the fishery has historically occurred.*

This alternative fits the Council's intent to stop the expansion of commercial fishing into the region while allowing for the continuation of the small red king crab fishery out of Kotzebue. Further, as drafted, the specifics of the FMP that would be implemented under this alternative fulfill the mandates of the Magnuson-Stevens Act.

As Oceana has asserted previously, an Environmental Assessment is the appropriate NEPA documentation for the action, particularly given the Council's precautionary approach as well as the lack of economic impact and the non-controversial nature of the proposed FMP. Should a fishery be opened in the future, appropriate NEPA documentation would be required at that time for that action.

We urge the Council to seize this opportunity to proactively and responsibly protect the Arctic by preventing additional pressures from further weakening the resilience of the ecosystems in this already-stressed region. The Council has been recognized internationally for leading the way in the appropriate precautionary management of Arctic commercial fishery resources, and Oceana encourages the Council to maintain this course.

Sincerely,

Jim Ayers
Vice President

[16] Draft Arctic FMP EA/RIR/IRFA.
[17] *Id.*

Ecosystem Committee Minutes

Tuesday, September 30, 2008 10am-1pm
Sheraton Hotel, Board Room 308, Anchorage, AK

Committee: Stephanie Madsen (chair), Jim Ayers, Dave Benton, John Iani, Doug DeMaster, Diana Evans (staff), Bill Wilson (staff)

Others attending included: Lisa Lindeman, Melanie Brown, Chris Krenz, Michele Longo Eder, Julie Raymond-Yakoubian, Jon Warrenchuk, Paul MacGregor

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The Ecosystem Committee discussed the Arctic FMP, the Aleutian Islands Ecosystem Team report on the Fishery Ecosystem Plan, and received updates on other issues. The next Ecosystem Committee meeting is tentatively scheduled for the first Tuesday of the December Council meeting.

Arctic FMP

The Committee received a presentation from Mr Wilson and Ms Brown, reviewing the EA/RIR/IRFA for the Arctic FMP, and the draft FMP itself.

The Committee recommends to the Council that the draft Arctic FMP and its EA/RIR/IRFA be released for public review, subject to some clarifications.

1. Address, insofar as it is possible, the comments of the SSC, in time to release the document for review by the end of October (in time for action at the December Council meeting). The comments are mostly editorial or technical, and Mr Wilson indicated that he should be able to address some of them in this timeframe, although he was not able to speak to the availability of staff from the Alaska Fisheries Science Center.
2. With respect to the SSC's comment about Alternative 3, about regarding more specificity about the historic red king crab fishery's size and scope, the Committee provides the following recommendation:
   - the size of the fishery should be no more than 1000 lbs annually,
   - the geographic scope of the fishery should be limited to the four statistical areas identified in the caption of page 203 of the EA, Figure 9-7: 646701, 646631, 646641, 636631.
3. Under Option 1, the Committee recommends editing the language describing the specifications process. The Committee recommends that annual catch limits be specified for a period of 3 years, and thus the Plan Team process that would support these catch limits would occur on a triennial cycle, unless new information is available, which would trigger a specifications process in that year. (The Committee noted that there is precedent for this procedure under the MMPA's marine mammal stock assessments).
4. Under Option 1, clarify that the procedures under Option 2, describing the criteria for moving a species into the target category, also apply under Option 1. The Committee noted that the procedures are also included in the draft FMP; it is important to clarify that the procedures are the focus of the Council's action at this time, as the fisheries would not open under any of the alternatives.

The Committee discussed the legal question which concerned the SSC, regarding Option 2, with Lisa Lindeman, NOAA GC. She confirmed that there is no legal impediment preventing the Council from sending this document out for public review. The Committee felt strongly that the document was ready for public review, that staff has prepared an excellent document, and that the edits suggested by the SSC

and the Committee can be incorporated without holding up public review. The SSC agreed that both Option 1 and 2 have merit, and the advantage of releasing the document is that the public will have an opportunity to examine and consider these two options, and provide feedback to the Council for their decisionmaking. Releasing the document does not preclude the SSC providing further review or input the next time this issue is in front of the Council.

The Committee also suggested some other minor clarifications to staff. The draft FMP is written assuming that the Council chooses Alternative 3; this should be more clearly noted on the document. The document should put in perspective the calculated snow crab biomass in the Arctic, e.g., compared to the size and biomass of the eastern Bering Sea crabs and biomass. Under Option 2, a further clarification may be required to explain that MSY is calculated for individual species, not just for the ecosystem component as a whole. Under the description in Option 2, adding a heading on page 104 would highlight that the bulleted list represents the Council procedure for initiating a new target fishery, and clarify that the three suggestions of ways of calculating MSY are just examples that could be applied once the Council moves a fish stock into the target fishery category.

Aleutian Islands Fishery Ecosystem Plan

The Committee briefly reviewed the AI Ecosystem Team's minutes from their September 9-10, 2008 meeting. The Committee discussed the Team's membership, and suggested a contact for soliciting a marine mammal expert for the Team. The Committee also discussed the Team's request for an economist, and requested that the Team provide a description of the tasks that the economist would be asked to undertake. The draft FEP was reviewed by an AFSC economist in autumn 2007, and the Committee suggested that examples of his input might help clarify why the Team believes an economic perspective to be a critical gap in the composition of the Team.

Ms Evans noted that further updates on the AI FEP will be provided by Jennifer Boldt in December, during her annual Council presentation on the Ecosystem Considerations chapter of the SAFE. The Committee also discussed the Team's comments on formalizing the process for ecosystem considerations in the specifications process. The Committee suggested a way to move forward on some of these questions could be to convene a workshop that would include participants from all stages of the specifications process, and address the questions of how the FEP and other ecological information, including indicators, comes together in the Council's stock assessment, Plan Team, and SSC and Council review process. The Committee initially suggested that perhaps such a workshop could be convened around the January Marine Science Symposium in Anchorage, but there may not be sufficient time to prepare on that timeframe. A subgroup of the Committee intends to meet before December in order to come up with a more complete proposal for the Council.

Alaska Marine Ecosystem Forum

The Committee received the meeting summary of the Alaska Marine Ecosystem Forum's most recent meeting, which occurred on August 7, 2008. The Committee was pleased to note that the Forum's continuing momentum.

Testimony to North Pacific Fishery Management Council
Pat Pourchot, Audubon Alaska
October 7, 2008

Agenda Item: C-5 Arctic FMP

Audubon Alaska is the state office of the National Audubon Society, a non-profit conservation organization representing over one-half million members. Audubon Alaska has been deeply involved in the resource issues of Arctic Alaska for decades, including those of the Arctic Ocean. We commend the North Pacific Fishery Management Council for proactively addressing Arctic fisheries management. We urge the Council to move forward in adopting a new Arctic Fishery Management Plan (FMP) as put forward in its draft Arctic FMP and Environmental Assessment (EA). We believe this FMP is a prudent management approach to conserve the health of the Chukchi and Beaufort marine ecosystems and the subsistence way of life of Arctic peoples.

Global climate change—particularly the rapid decline in sea ice extent—has created the potential for commercial fisheries in the region north of the Bering Strait. Given the lack of knowledge and potential sensitivity of marine life in the Chukchi and Beaufort seas, it is difficult to anticipate the size and scope of the impacts that might result directly from commercial fisheries as well as the cumulative impacts of commercial fishing, climate change and other activities in the region such as oil and gas development. Accordingly, closing these waters to new commercial fishing until it can be shown that any such fishing can be conducted without harming the marine ecosystems or the subsistence way of life is a forward-thinking, sound, and reasonable management approach at this time.

As highlighted in the draft EA, relatively little is known about the abundance, distribution, and role of fish and other marine species in the Chukchi and Beaufort ecosystems. Much of the data on the ecology of the region and environmental components are decades old. Some things such as sea ice cover, and water temperature, and marine species populations have changed dramatically since those surveys were conducted and are continuing to change at a rapid pace.

Impacts from commercial fishing on seafloor habitat and productivity in the Chukchi Sea may be especially problematic given that several marine mammals that are benthic foragers are also important subsistence species (*e.g.*, walrus and bearded seals). Additionally many of the marine mammals important for subsistence in the region may be harmed by commercial fishing through entanglement, noise disturbance, and ship strikes.

We are particularly concerned about potential commercial activities in the Chukchi Sea. The Chukchi Sea, off the coast of northwest Alaska, is one of the most productive ocean ecosystems in the world. Its vast, shallow sea floor and seasonal ice cover provide nutrients and pristine habitat for a multitude of organisms, ranging from phytoplankton at the base of the food chain to the top predator mammal, the threatened polar bear.

The Chukchi Sea is distinctly different from lower latitude seas and makes direct and important contributions to global ocean and climate systems. Ice in particular is a critical feature of the Chukchi. The ice edge produces a rich profusion of phytoplankton, which is the base of the food chain for all marine and coastal Arctic wildlife and people, especially with a lack of benthic predation by warmer water fish, such as salmon and pollock. The Chukchi's shallow and highly productive sea floor allows bottom-dwelling prey (crustacea, mollusks, etc.) to flourish, creating a buffet for wildlife specialized to feed off the ocean floor, such as walrus, seals, gray whales, and deep-diving sea birds. Many of these species also rely on ice edges for resting, denning, and/or calving.

The most common prey species of the polar bear is the ringed seal, one of the so-called "ice seals" of the Chukchi. Other ice seals include ribbon, bearded, and spotted seals. The National Marine Fisheries Service (NMFS) has recently found sufficient basis to initiate studies of these ice seals for possible listing under the Endangered Species Act (ESA).

The Chukchi is also important for whales. Endangered fin and humpback whales, and formerly endangered gray whales, feed in the Chukchi's shallows, and up to 3,500 beluga whales use Kasegaluk Lagoon near Point Lay for feeding, calving, and molting. In addition, most of the western Arctic Ocean's endangered bowhead whales, the most important subsistence and cultural resource of many Alaskan North Slope residents, migrate along the Chukchi coast.

Near-shore areas of the Chukchi provide breeding, feeding, migrating, and staging areas for millions of shorebirds, seabirds, and waterfowl. At least 15 species on Audubon's Alaska WatchList use the Chukchi, including Steller's and Spectacled Eiders, which are listed as threatened under the ESA, and Yellow-billed Loons, which are under consideration for ESA listing.

There are small populations of Kittlitz's Murrelets in the Chukchi Sea, and murrelets have been found up to 40-50 miles offshore, primarily in the Cape Lisburne area north of Point Hope. Kittlitz's Murrelets have undergone dramatic reductions in population in recent years and are currently under study by the US Fish and Wildlife Service for potential ESA listing.

Twenty-three Important Bird Areas (IBAs) are located along the Alaskan Arctic Ocean coast, plus six more on the Russian side. Eight of these are of global or continental significance. Among these is Ledyard Bay, a globally significant IBA extending 30-40 miles seaward in the Point Lay area of the Chukchi Sea. This IBA is a Critical Habitat Area for ESA-listed Spectacled Eiders. Most of the female Spectacled Eiders that breed on the Arctic Coastal Plain molt in Ledyard Bay. About 33,000 Spectacled Eiders and 500,000 King Eiders feed on mollusks and other bottom prey species in the shallow waters of the Bay. From April into November, nearly all of the breeding King Eiders from the US and Canada, plus many Russian breeding King Eiders, migrate through, stage, and forage in the eastern Chukchi.

Two IBAs, which are also units of the Alaska Maritime National Wildlife Refuge, are located at Cape Thompson and Cape Lisburne. These two major seabird colonies contain nearly 900,000 nesting birds, primarily murres, gulls, guillemots, puffins and cormorants. Extending seaward up to 60 kilometers from these colonies is the globally significant Cape Thompson-Lisburne Marine IBA that provides critical foraging habitat for these nesting birds. A polynya at Cape Lisburne also provides wintering habitat for seabirds.

Obvious concerns with potential commercial fishing in Arctic Ocean waters are its potential impacts on seabirds due to incidental take, reduced prey availability and habitat disturbance. Of particular concern are fishing activities such as bottom trawling and its potential disruption prey species of bottom-feeding seabirds such as threatened Spectacled Eider. This could also include impacts on marine mammals such as seals, walrus and some whale species, and in turn, on local people who rely on these species for subsistence.

As previously stated and acknowledged in the draft EA, there are many things we simply don't know about the Arctic Ocean ecosystem. Removing significant numbers of commercially harvested species may have significant detrimental impacts on other species in the eco-system with, in turn, on still other species that depend on them. Forage fish in particular play a critical role in Arctic marine ecosystems. Many nesting and staging seabirds in the Arctic Ocean depend on forage fish such as Arctic cod. Accordingly, any commercial fishing for forage species may result in cascading impacts to seabirds and marine mammals.

We urge the Council to seize this opportunity to proactively and responsibly protect the Arctic by approving putting the draft Arctic FMP and EA out for public review. Thank you.

Pat Pourchot
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October 7, 2008

Mr. Eric Olson, Chair
North Pacific Fishery Management Council
605 W. Fourth Avenue, Suite 306
Anchorage, AK 99501-2252

RE: **Agenda Item C-5, Arctic FMP**

Dear Chairman Olson,

Oceana, Ocean Conservancy, PEW Environment Group, Audubon Alaska, and World Wildlife Fund thank the Council for its action today releasing the draft Arctic Fisheries Management Plan (FMP) and Environmental Assessment (EA) for public comment and scheduling final action at its February meeting.

By moving forward with the Arctic FMP, the Council has taken another step toward leading the world in protecting Arctic fishery resources. We congratulate the Council for this proactive action. Once the FMP is in place, it can serve as the foundation for continued international discussions as envisioned by the Joint Resolution authored by Senator Stevens and signed by the president.

Further, by releasing the FMP and EA for comment at this time, the Council has taken a commonsense approach that will allow for greater flexibility and public participation. The SSC and Council members will have the opportunity over the next two months to review the MSY options and discuss them with the appropriate scientists, lawyers, industry members, and others. The committees and Council will have the additional value of this input when they consider this item for final action in February.

As the Council has recognized, CO_2 is having profound effects on the Arctic marine environment. The rapid loss of sea ice greatly increases the potential for the development of commercial fisheries north of the Bering Strait. Because relatively little is known about the abundance, distribution, and role of fish and other marine species in the Chukchi and Beaufort ecosystems, it is very difficult to anticipate the degree to which commercial fishing may impact these ecosystems. This is particularly true when fundamental environmental conditions—such as sea ice cover and water temperature--are already in a state of rapid change.

In light of the imminent threats facing Arctic marine ecosystems and the opportunities to for proactive action, we again thank the Council with its action to proceed with the development of the Arctic FMP by releasing the draft plan and EA for public comment and scheduling final action for its February meeting.

Sincerely,

Jim Ayers
Vice President
Oceana

Janis Searles
Vice President for Legal Affairs
Ocean Conservancy

Pat Pourchot
Senior Policy Representative
Audubon Alaska

Steve Ganey
Director, Fisheries Conservation Initiative
PEW Environment Group

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World Wildlife Fund (WWF)