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September 30, 2014

Acting Chair John Henderschedt
North Pacific Fishery Management Council
605 W. 4th Avenue, Suite 306
Anchorage, Alaska 99501

RE: Bering Sea Fishery Ecosystem Plan, Agenda Item D-4

Dear Mr. Henderschedt and Council members:

World Wildlife Fund (WWF) commends the Council on its efforts to understand the complex Bering Sea ecosystem and fishing and non-fishing effects on that ecosystem. The Bering Sea is an abundant, diverse, dynamic and complex marine ecosystem, and the Council is in a unique position to shape its future.

WWF identified the Bering Sea, in our Global 200 conservation assessment, as “one of the most outstanding yet endangered marine environments, whose protection is essential for the preservation of the world’s biodiversity.”¹ Within the Bering Sea ecoregion, WWF, in collaboration with The Nature Conservancy and others, identified priority areas for biodiversity conservation, including the Bering Strait, St. Lawrence Island & Polyna, Yukon-Kuskokwim Delta and Nunivak Island, the “Golden Triangle” from Bogoslof Island to Pribilof Islands to Izembek Lagoon, Bristol Bay, eastern and northern Norton Sound, the Aleutian Basin, and the Bering Sea shelf break.² These areas were identified for their biodiversity richness and importance for specific indicator species. Many of the same areas were identified in a recent Rapid Assessment of Circumarctic Ecosystem Resilience (RACER) conducted by WWF. In addition to the areas listed above, the Pribilof Domain, Unimak Pass, Bering Submarine Canyons, Bering Sea Greenbelt High Productivity Area, Continental Shelf Break and Slope, and Aleutian Islands were identified as key features in the Eastern Bering Sea that are now main drivers of productivity and diversity and are likely to remain so in the future.³

The Council’s Ecosystem Committee, in a public and transparent process, asked stakeholders to assist with scoping the Bering Sea Fishery Ecosystem Plan (FEP). A WWF response for each scoping question is provided below.

- *What should be the objectives of the Bering Sea FEP? What questions should the FEP answer?*

In February of this year, the Council adopted an Ecosystem Approach Vision Statement that places value on ecosystem biodiversity and resilience. The Bering Sea FEP should be one avenue for implementation of the Council’s stated Ecosystem Approach for all federally managed fisheries. In addition, the FEP should summarize the best available science for the Bering Sea, define non-fishery related values, services and impacts, identify areas that require additional protection from fishery or other impacts (such as protection from development to protect a fishery

¹ Olson, D. M., Dinerstein, E. 2002. The Global 200: Priority ecoregions for global conservation. *Annals of the Missouri Botanical Garden* 89(2):199-224.

² The Bering Sea Ecoregion: A call to action in marine conservation. 2000. World Wildlife Fund and Beringia Conservation Program.

³ WWF. Rapid Assessment of Circumarctic Ecosystem Resilience (RACER) in the Eastern Bering Sea. In review.



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resource or habitat) and ensure protection of those areas, and develop an action plan for ensuring ecosystem resilience and productivity in the face of climate change.

Arguably, the Council is further along in implementing ecosystem-based approaches to fisheries management than most other areas of the world. In the Bering Sea, NOAA Fisheries and the Council have invested a significant effort in the development of indicators of the status of the Bering Sea ecosystem and impact of fishing, and made considerable progress in recent years. Examples of these efforts include a number of partial strategies that have been implemented such as mass-balance food web modeling,⁴ multi-species stock population-dynamics models, and annual stock assessment reports which include a standard formatted ecosystem consideration section.⁵ These are important steps towards ecosystem-based fishery management, and these steps should be identified and fully implemented through the Bering Sea FEP.

One objective of the Bering Sea FEP should be to assess the progress to date and status of ecosystem-based fishery management in the Bering Sea, with a comprehensive list of actions or activities that are conducted to ensure ecosystem considerations contribute to management decision. To aide this effort, it may be useful to take a step-wise approach to this self-evaluation. WWF examined case studies and developed 12 operational components for implementing ecosystem-based management in fisheries⁶: 1) identify the stakeholder community, 2) prepare a map of the ecoregions and habitats, 3) identify partners and their specific interests, 4) establish the ecosystem values, 5) determine the major factors that could affect the ecosystem values, 6) conduct an ecological risk assessment, 7) establish objectives and targets for specific elements of ecosystems, 8) establish strategies within the fishery for achieving targets, 9) design an effective information system, including monitoring, 10) establish research and information needs and priorities, 11) design a performance assessment and review process, and 12) prepare an education and training package for outreach to fishers and other stakeholders. It would be useful to external stakeholders if the Council would methodically document whether and how these stapes have been fully or partially completed in the Bering Sea ecoregion. For those steps that remain undone, the Bering Sea FEP should provide the roadmap for completion of ecosystem-based management planning and implementation.

- *What kind of actions should be considered in the FEP? Should the FEP provide specific or general guidance for fishery management?*

The Bering Sea FEP should provide specific guidance for fishery management. The use of ecosystem indicators is a good example of information that could and should be utilized and acted upon. Ecosystem indicators show us where we are and where we are going, help to define the need for action and guide that action, and provide a basis for measuring progress and evaluating risks.⁷ The collection and accessibility of ecosystem indicators and other information reflects favorably on the management system, yet there is still a wide gap between noting ecosystem effects and implementing ecosystem-based management measures.

⁴ Aydin, K., S. Gaichas, I. Ortiz, D. Kinzey, and N. Friday. 2008. A comparison of the Bering Sea, Gulf of Alaska, and Aleutian Islands large marine ecosystems through food web modeling. NOAA NMFS Tech Memo. 233 p

⁵ NMFS. 2013. Ecosystem Considerations Chapter, Status of Stocks and Fishery Evaluation Report.

⁶ WWF. Implementation of Ecosystem-based Management in Marine Capture fisheries. 2007. Eds. Chris Grieve and Katherine Short. Page 6.

⁷ WWF Living Planet Report, 2014. Page 64.



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- *Would the FEP provide added value over existing Council documents, and if so, how?*

The Bering Sea FEP should provide a cross-cutting approach to implementing ecosystem-based fishery management without requiring the substantial amendment of every Fishery Management Plan in the Bering Sea. The federal commercial fisheries in the Bering Sea are managed using a single species management approach and as such do not explicitly take into account the needs of the larger ecosystem. The Bering Sea FEP could rectify this by defining and executing explicit strategies to ensure that fisheries do not pose a risk of serious or irreversible harm to ecosystem structure and function. For example, the depleted status of several keystone Bering Sea predator species is cause for concern that the single species management approach could have a negative outcome on the larger ecosystem. A possible alternative strategy that would explicitly take into account the needs of the ecosystem might entail building an additional margin of safety into the fishing mortality rate rules or stipulating a more stringent threshold on the total allowed depression of equilibrium biomass (such as the limit adopted in the Commission for the Conservation of Antarctic Marine Living Resources Convention).

In summary, the Bering Sea FEP should synthesize information and report on the state of the ecosystem, including connectivity of different processes; identify clear objectives and priority uses for the Bering Sea involving both fishing and non-fishing activities; utilize ecosystem indicators to define actions recommended in the Bering Sea FEP and implement those actions to achieve management goals/objectives; identify ways to improve Council incorporation of ecosystem information into single species stock assessments and other management decisions; illustrate cumulative effects of management actions; and identify immediate and future actions, including outreach, that will be taken to implement the Bering Sea FEP with a clear timeline and a transparent annual progress review process.

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in cursive script that reads "Heather V. Brandon".

Heather Brandon
Senior Fisheries Officer
WWF US – Arctic Field Program



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September 30, 2014

Mr. Eric Olson
Council Members
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501-2252

RE: D4 - Bering Sea FEP

Dear Chairman Olson and Council Members,

Greenpeace commends the North Pacific Fishery Management Council (the Council. NPFMC) for considering the development of a Fishery Ecosystem Plan (FEP) for the Bering Sea – in keeping with the recommendations of the report to Congress of the Ecosystem Principles Advisory Panel.¹ We appreciate the opportunity to provide these comments on the scope of this potential project.

There is much good guidance for the Council to draw on in considering what a FEP should provide for the management and conservation of fishery resources. We think special consideration should be given under a FEP to management guidance that helps sustain the broad range of ecosystem services above and beyond food production and recreation. We suggest NMFS and the NPFMC adopt goals for this FEP effort as ascribed in the following statement delivered in the report of an NRC-sponsored committee on ecosystem management (Sustaining Marine Fisheries):

*“The committee recommends the adoption of an ecosystem-based approach for fishery management whose goal is to rebuild and sustain populations, species, biological communities, and marine ecosystems at high levels of productivity and biological diversity, so as not to jeopardize a wide range of goods and services from marine ecosystems, while providing food, revenue, and recreation for humans”.*²

¹ NMFS, 1999. Ecosystem-based fishery management. A report to Congress by the Ecosystem Principles Advisory Panel, National Marine Fisheries Service

² NRC. 1999. Sustaining Marine Fisheries, Executive Summary. National Academy Press, Washington, D.C. 164 pp.

Additionally, guidance should be taken from Grumbine (1994)³ as it identifies the general goal of maintaining ecological “integrity,” which should be an overarching goal of a successful FEP, following these five specific objectives:

- *Maintaining viable populations of all native species in situ.*
- *Representing, within protected areas, all native ecosystem types across the natural range of variation.*
- *Maintaining ecological and evolutionary process (e.g., disturbance regimes, hydrological and nutrient cycles)*
- *Managing over time periods long enough to maintain evolutionary potential of species and ecosystems.*
- *Accommodating human use in light of the above points.*

Greenpeace further submits the primary overarching objective of this FEP should be to bring Ecosystem-Based Management fully on line for the Bering Sea. Congress initiated this process in the late 1990’s when convening the Ecosystem Principles Advisory Panel to recommend how ecosystem principles could be further implemented to improve our Nation’s management of living marine resources. That idea has actionable management at its core and this process must also be designed in such a way that it leads to the real world implementation of management measures that will realize the Council’s Ecosystem Vision. To be bold, we hope the best ecosystem-management available within US fisheries, as we have come to expect for our nation’s most valuable waters.

The Bering Sea FEP should follow the instructions provided by the Ecosystem Principles Advisory Panel:

“The FEP, to be developed for each major ecosystem under Council jurisdiction, is a mechanism for incorporating the Principles, Goals and Policies into the present regulatory structure. The objectives of the FEPs are to:

- *Provide the Council members with a clear description and understanding of the fundamental physical, biological, and human institutional context of ecosystems within which fisheries are managed;*
- *Direct how that information should be used in the context of FMPs; and*
- *Set policies by which management options would be developed and implemented.*

At least eight action items are identified for implementation of FEPs:

1. Delineate the geographic extent of the ecosystem(s) that occur(s) within Council authority, including characterization of the biological, chemical and physical dynamics of those ecosystems, and “zone” the area for alternative uses.
2. Develop a conceptual model of the food web.

³ Grumbine, Edward. 1994. What is Ecosystem Management? Conservation Biology, Vol. 8, No. 1, March 1994.

3. Describe the habitat needs of different life history stages for all plants and animals that represent the “significant food web” and how they are considered in conservation and management measures.
4. Calculate total removals – including incidental mortality – and show how they relate to standing biomass, production, optimum yields, natural mortality, and trophic structure.
5. Assess how uncertainty is characterized and what kinds of buffers against uncertainty are included in conservation and management actions.
6. Develop indices of ecosystem health as targets for management.
7. Describe available long-term monitoring data and how they are used.
8. Assess the ecological, human, and institutional elements of the ecosystem which most significantly affect fisheries, and are outside Council/Department of Commerce (DOC) authority. Included should be a strategy to address those influences in order to achieve both FMP and FEP objectives.

A Bering Sea FEP that is designed to achieve the overarching goal and objectives described above would be an excellent and worthwhile achievement of NMFS and the NPFMC, reinforcing the role of the North Pacific as the national leader on this front.

It is important to note that FEPs, as such, are not actionable for Councils and can, therefore, result in informational and advisory documents only. **Probably one of the most valuable signals the NPFMC can send to the scientists and agency staff, as well as the conservation community and other stakeholders who are investing in this process is to state your explicit goals and objectives for this FEP, and your clear plan for its utility into the never-ending future.** This expensive and substantial undertaking should produce a living document and systems that are put into practical use routinely to inform, support, and, most importantly, implement ecosystem-based approaches within individual fishery management plans. For example, the FEP could lay out explicit criteria and processes that the Council plans to use to evaluate proposed fishing activity, or conservation measures, in order to balance trade-offs and achieve ecosystem-based management comprehensively, across all FMPs.

There will always be information gaps, more to learn, and uncertainty in fisheries management but, this project can go a long way towards making the best use of what we already know, which is a considerable amount. The FEP provides an opportunity to finally include Local and Traditional Knowledge in the mix of data to provide a more comprehensive picture of the ecosystem through time. Ultimately, the FEP should provide a framework for ecosystem-based management decisions that are made with the best available science at hand, with the objective of protecting the resources that support productive fisheries and provide for a resilient Bering Sea ecosystem. The Ecosystem Principles Advisory Panel concluded in their report to Congress fifteen years ago:

A great deal of education about this new approach will be required, and all involved must be prepared to learn. The two hardest lessons are likely to be shifting the burden of proof to the fishery to demonstrate that the ecosystem will not be damaged by fishing, and to develop a truly precautionary approach to fishery management. (NMFS 1999)

The Bering Sea FEP should realize this vision by providing a framework of explicit goals, policies, *and* practical management protocols at the ABC- and TAC-setting level that enable managers to incorporate ecosystem considerations explicitly into decisions about how much fish to catch, when and where to catch it, appropriate gear to catch it with, appropriate areas to set aside for the protection and enhancement of habitat, and so on.

Building upon the guidance above, a successful FEP framework should, eventually, be capable of answering, addressing, and informing the following (and more) ecosystem-based management needs and questions, for decision makers:

- Describe the structure and function of the Bering Sea ecosystem, including important habitats and species interactions
- Assess the full range of healthy ecosystem processes and services, including wild capture fisheries
- Include all available baseline information on community structure and faunal domains to evaluate the effects of fishing over time
- Describe all Bering Sea forage species (including pollock and squid) and their relationship to North Pacific food webs
- Provide an analysis of what is known about foraging habitats and North Pacific food webs
- Identify alternatives for ecosystem-based management of Bering Sea forage species
- Evaluate and address concerns for food web competition, and cascading effects on North Pacific food webs
- Address the impacts of fisheries on indigenous subsistence uses of living resources
- Assess the cumulative impacts and benefits of management actions undertaken within FMPs
- Identify gaps in ecosystem information, and recommend research needed
- Describe and address the uncertainties and levels of risk associated with FMPs
- Include a mechanism to evaluate the changing impacts of fisheries on managed species, non-target species, habitats, community structure, and food webs
- Explore models and other analytical approaches to evaluate fishing impacts and outcomes of management alternatives on the ecosystem
- Include a mechanism to inform the annual setting of precautionary catch limits, informed by the FEP
- Evaluate historical trends in PSC/bycatch and discards, and identify the amount of bycatch and waste contributed by individual fisheries and gear types
- Identify and propose alternatives to avoid bycatch
- Measure the impacts of trawling and other bottom contact fisheries on the habitat, community structure, and benthic food webs
- Include a plan to address the impacts of bottom-contact gears on habitat, community structure, and benthic food webs
- Examine management alternatives for networks of marine protected areas to protect meaningful amounts of representative habitats
- Provide recommendations for how NMFS can best address the underlying conflicts in mandates and priorities between single-species goals for the fisheries and multispecies goals for

management in an ecosystem context, including meeting mandates under the MMPA and ESA and other relevant authorities

Public testimony at the FEP hearing held in Seattle noted the oft cited reality of dwindling resources, the ever-shrinking capacity and funds with which Councils and the agency can draw on to accomplish an equally ever-growing list of priorities. One participant emphasized the need to manage expectations for the public.

At the same hearing, though, we heard testimony from a member of the Ecosystem Sciences and Management Working Group. At the request of the National Oceanic and Atmospheric Administration Science Advisory Board this working group recently completed a report to assess progress toward implementation of Ecosystem-Based Fishery Management in United States regional fisheries management council system since 1999. I found the testimony from a member of this working group, with such a full context of the subject in mind, to bear repeating in summary: the NPFMC is acknowledged as a leader on ecosystem-based management and this is an opportunity to cement that reputation. Be bold in your thinking of what you want the FEP to be. Stay out in front, learning all the past lessons from the Aleutian FEP as well as learning from what is being done not just around the US but around the entire globe, the things people are doing that are providing innovations that show management processes in a new light, which can distinguish this FEP process from the EBM sorts of things that are already at work in FMPs. Think big, and look as broadly as possible to see the menu of possibilities.

We agree with this advice, and that is why we have attempted to provide a relatively robust list of items we believe a Bering Sea FEP should, over time, be able to address. We also acknowledge, though, that this bold vision will not be realized overnight. Here, again, we must emphasize the precautionary approach. A lack of capacity, should not result in status quo fishing, with ecosystem-based management implementation put off indefinitely, when there are known impacts from fishing and vulnerable habitat identified. Where such concerns exist - such as the lack of management measures to protect vulnerable canyon and shelf-break habitat along the Greenbelt – precautionary action should be taken now until an FEP running at full capacity may inform a more comprehensive EBM outcome.

Thank you for your consideration of these comments.

Respectfully,



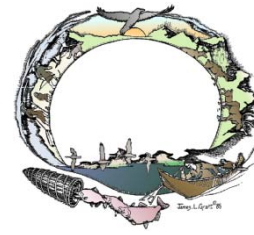
Jackie Dragon
Greenpeace



Association of Village
Council Presidents



Kawerak, Inc.



Tanana Chiefs Conference



September 30, 2014

North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501

RE: Agenda item D-4 Bering Sea Fishery Ecosystem Plan

Dear Chairman and Council members:

We are submitting these comments on behalf of the Association of Village Council Presidents (AVCP), Kawerak Inc., Tanana Chiefs Conference (TCC) and the Yukon River Drainage Fisheries Association (YRDFA). AVCP is an ANCSA regional non-profit and tribal consortium of the 56 tribes of the Yukon-Kuskokwim Delta region. Kawerak is an ANCSA regional non-profit and the tribal consortium in the Bering Strait region of Alaska, where there are 20 federally recognized tribes. Tanana Chiefs Conference (TCC) is ANCSA regional non-profit and tribal consortium of the 42 villages of Interior Alaska in the Yukon and Kuskokwim watersheds. YRDFA is an association of commercial and subsistence fishers on the Yukon River.

The Bering Sea is one of the most biologically productive marine ecosystems on the planet, and the marine resources of the Bering Sea support the subsistence way of life and the cultures, economies and spiritual and physical well-being of our peoples across Western Alaska.

The North Pacific Fishery Management Council is currently considering the development of a fishery ecosystem plan (FEP) for the Bering Sea. An FEP could provide a roadmap for the Council to implement ecosystem-based fishery management that could guide and facilitate the incorporation of ecosystem science, incorporate and consider subsistence needs, and include traditional knowledge into the fishery management process. Subsistence fishermen and hunters should be accounted for as part of the rich Bering Sea ecosystem. Indigenous people are an integral part of the Bering Sea ecosystem and should be included within the Bering Sea fishery ecosystem plan itself, and in the development of the plan.

Bering Sea communities are experiencing great changes including species moving into new areas and increased Arctic shipping going through the Bering Strait which impacts the environment, economy, infrastructure, safety/security and natural resources in the ocean. These changes are rapid and primarily caused by climate change.

Ecosystem-based fishery management is a way to sustain the health of marine ecosystems by accounting for the interconnections between fisheries and fishing communities, marine life of all kinds, and an ocean that is constantly changing. An FEP can enable the Council to account for fishery impacts to higher trophic level species like seals, walrus, sea birds and whales, halibut and salmon that are important to Bering Sea communities. It could also help ensure the availability of prey for these species; or provide a framework for adapting to the impacts of climate change or ocean acidification. **The current single-species approach to management does not always consider the interconnections among marine organisms; we need to look at the bigger picture.** Recognizing this interconnectedness will enable federal fishery managers to make decisions that sustain our oceans, our fisheries and our cultures.

Indigenous peoples in the Bering Sea region have a historic connection that has spanned millennia and have accumulated a wealth of traditional knowledge about this region. Traditional knowledge is a way of understanding which indigenous people have about the environment, natural resources and biology of local species. While advances in science and technology have increased western science perspectives about ecosystem functioning in the Bering Sea, it is equally important to recognize the traditional knowledge perspective. The Bering Sea FEP represents a unique and appropriate place to incorporate traditional knowledge into fisheries management in the North Pacific.

Overall, an ecosystem-based scientific and management tool can provide a clear mechanism for making decisions on an ecosystem scale, and can provide a place for balancing decisions beyond single species management and optimum yield. An FEP may help reduce bycatch, conserve important habitat, protect marine food webs, monitor ecosystem health, and evaluate the long-term impacts of management actions on our fisheries and communities. This process could offer a formal mechanism and process for bringing ecosystem information and traditional knowledge into the current decision-making framework. An FEP framework would communicate the Council's ecosystem goals and objectives in a way that is transparent and provides for public accountability.

The undersigned groups support the creation of an ecosystem plan that establishes clear statements about how the Council will weigh competing ecosystem values; considers subsistence needs and uses; provides regular points in management processes to integrate information from the region's traditional knowledge holders; ensures the protection of species that are important to subsistence fishing and hunting; and effectively manages the Bering Sea ecosystem's health for the benefit of all users.

Sincerely,



Myron P. Naneng, Sr., President
Association of Village Council Presidents



Melanie Bahnke, President
Kawerak



Victor Joseph, President
Tanana Chiefs Conference



Rebecca Robbins Gisclair, Sr. Fisheries Policy Advisor
Yukon River Drainage Fisheries Association



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September 30, 2014

North Pacific Fishery Management Council (NPFMC)
605 West 4th, Suite 306
Anchorage, Alaska 99501-2252

RE: October 2014 NPFMC Meeting Agenda Item D4 – Bering Sea Fishery Ecosystem Plan

To the Council:

Thank you for the opportunity to provide comments on the development of the Bering Sea Fishery Ecosystem Plan (BS FEP). The New England Aquarium (Aquarium) applauds the North Pacific Fishery Management Council's (Council) continued leadership in pursuing an ecosystem approach to fisheries management. We strongly encourage the Council to move forward with its BS FEP development process, starting by drafting a statement of purpose and needs and establishing formal goals and objectives for the FEP. The Bering Sea ecosystem boasts immeasurable ecological, economic, and cultural value. By implementing an FEP, the Council can further enhance its own management of the fisheries resources under its purview, continue to serve as a model of ecosystem-based management (EBM) for other fisheries management bodies and agencies worldwide, and help ensure the long-term health and sustainability of this invaluable region. To help realize these outcomes, we offer the following recommendations for the FEP, which are discussed in greater detail below:

1. **Identify clear FEP goals and objectives**
2. **Develop an integrated synthesis of ecosystem information with management context**
3. **Incorporate ecosystem status indicators into FEP**
4. **Establish strong connection between FEP and management process**
5. **Develop strategy for local and international outreach**
6. **Outline process for regular evaluation and revision**

As one of the preeminent aquariums in the United States, the New England Aquarium is a global leader in ocean exploration and marine conservation. In addition to our exhibit halls, which educate over a million visitors a year on marine and aquatic ecosystems and their inhabitants, the Aquarium is a leading ocean conservation organization with research scientists and experts working around the globe for the preservation and sustainable use of ocean resources. Central to the Aquarium's conservation work is our Sustainable Seafood Program, through which we have partnered with major seafood buyers like Ahold USA, Darden Restaurants, Sea Port Products, The Fresh Market, and Gorton's, Inc. to advance the sustainability of aquaculture operations and wild-capture fisheries globally. As an active stakeholder with diverse institutional expertise in marine ecology and fisheries science and management, we offer the following comments and suggestions for the Council to consider.



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The East Bering Sea Large Marine Ecosystem (LME) represents one of the most productive and ecologically important marine ecosystems in the world. The geological components of the ecosystem consist of shelf, slope, and deep basin features, which are highly interconnected by currents that induce upwelling of nutrient-dense water from the basins along the slope and outer shelf and that generate the primary productivity that is vital for supporting higher trophic levels¹. The unique ecological connectivity of these features contributes to the exceptionally high productivity and biodiversity of the 'Green Belt' area along the shelf break. In total, the Bering Sea ecosystem provides breeding and foraging habitat for over 450 species of fish, crustaceans, and mollusks, 50 species of seabirds, and 25 species of marine mammals². This includes several endangered and protected species, such as the northern fur seal, which utilizes the Bering Sea as its main breeding and summer feeding grounds³. The productivity of the Bering Sea supports not only the health of the ecosystem itself, but also the health and vitality of the numerous communities of Alaska that greatly depend on these resources.

Bering Sea fisheries are also of critical importance to the US and international seafood industry and to global food security. According to a recent report, the Bering Sea/Aleutian Islands region produced \$2.4 billion worth of seafood in 2011 and, accounting for multiplier effects, supported jobs for over 16,000 workers⁴. Bering Sea fisheries for groundfish and flatfish species compose over 40% of the entire annual US commercial fisheries harvest by volume and regularly yield between 1.5-2.2 million tons of fish⁵. This includes the lucrative walleye pollock fishery, the single largest fishery in the US by volume. The Bering Sea ecosystem also boasts valuable shellfish fisheries, including the crab fishery that produced an average of \$188 million in ex-vessel value from 2002-2012⁶. In the southeastern corner of the Bering Sea, the Bristol Bay salmon fishery supplies on average nearly half of the world's wild sockeye salmon and constitutes roughly a third of the total Alaska salmon harvest value⁷. From both an ecological and economic perspective, the Bering Sea ecosystem is unquestionably extraordinary. As an engaged stakeholder with a vested interest in the sustainability of Bering Sea resources, we

¹ Skjoldal, H.R., and Mundy, P. (2013). Large Marine Ecosystems (LMEs) of the Arctic area: Revision of the Arctic LME map. Protection of the Arctic Marine Environment (PAME) and the Arctic Council.

² Committee on the Bering Sea Ecosystem, Polar Research Board, Commission on Geoscience, Environment, and Resources, National Research Council. (1996). The Bering Sea Ecosystem. National Academy Press: Washington, D.C.

³ Skjoldal, H.R., and Mundy, P. (2013). Large Marine Ecosystems (LMEs) of the Arctic area: Revision of the Arctic LME map. Protection of the Arctic Marine Environment (PAME) and the Arctic Council.

⁴ McDowell Group, Inc. (2013). Economic Value of the Alaska Seafood Industry. Report to the Alaska Seafood Marketing Institute.

⁵ Fissel, B., Dalton, M., Felthoven, R., Garber-Yonts, B., Haynie, A., Himes-Cornell, A., Kasperski, S., Lee, J., Lew, D., Pfeiffer, L., and Seung, C. (2013). Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Islands Area: Economic Status of the Groundfish Fisheries Off Alaska, 2012. Economic and Social Sciences Research Program, Resource Ecology and Fisheries Management Division, AFSC, NMFS, NOAA. Seattle, WA.

⁶ McDowell Group, Inc. (2013). Economic Value of the Alaska Seafood Industry. Report to the Alaska Seafood Marketing Institute.

⁷ Knapp, G., Guettabi, M., Goldsmith, S. (2013). The Economic Importance of the Bristol Bay Salmon Industry. Institute of Social and Economic Research, University of Alaska Anchorage, Anchorage, AK.



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believe it is imperative to maintain a healthy, resilient ecosystem to support the continued productivity of this region.

Fisheries management is increasingly and necessarily transitioning from a single-species approach to an ecosystem-based approach. This holistic approach, which seeks to account for ecosystem functions, variability, and uncertainty in the management process, is critical to better ensuring the sustainability and vitality of the ocean and its resources. Further, EBM is expected to contribute to the stability of the fishing industry and associated economic activity⁸. As such, we commend the Council for adopting its *Ecosystem Approach Vision Statement* this February and for being a leader in the constantly evolving field of EBM. The Council has already done substantial work towards incorporating the ecosystem approach into its management, including adopting an ecosystem-based policy in the fishery management plans (FMPs) of the groundfish fisheries under its jurisdiction following the Programmatic Supplemental Environmental Impact Statement (PSEIS) analysis^{9,10}. More recently, the Council has also shown leadership on the concept of fishery ecosystem plans through its development of the Aleutian Islands (AI) FEP. FEPs have been identified as important tools for managers to use to better understand and explicitly account for the impacts of their decision-making on the ecosystem and, conversely, the impacts of ecosystem components on fisheries¹¹.

Council development of the Aleutian Islands (AI) FEP, which was completed in 2007, has offered numerous benefits to enhance management at all levels of the Council process. Though ecosystem knowledge of the Bering Sea is more advanced than that of the Aleutian Islands, the Aquarium believes a BS FEP would still offer the Council substantial value as a vehicle by which the Council could explicitly and transparently articulate how it intends to execute its *Ecosystem Approach Vision Statement* through current and future management actions in the Bering Sea. An FEP also offers the opportunity to approach decision-making processes from a more comprehensive, cross-FMP and cross-ecosystem perspective and provides a framework through which management bodies can conduct tradeoff analyses of various policy alternatives, which is one of the stated goals of the Council's *Vision Statement*¹². While several Council documents already feature EBM components, an FEP will serve to coordinate these various components and integrate all appropriate information for ecosystem-based decision making into one process.

⁸ Ecosystem Principles Advisory Panel. (1999). *Ecosystem-based Fishery Management*. A Report to Congress by the National Marine Fisheries Service Ecosystem Advisory Panel.

⁹ NPFMC. (2014). *Fishery Management Plan for Groundfish of the Gulf of Alaska*. Anchorage, AK.

¹⁰ NPFMC. (2014). *Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area*. Anchorage, AK.

¹¹ Ecosystem Principles Advisory Panel. (1999). *Ecosystem-based Fishery Management*. A Report to Congress by the National Marine Fisheries Service Ecosystem Advisory Panel.

¹² NPFMC. (2014). *Ecosystem Approach Vision Statement*. Council Motion on Agenda Item D-1. February 2014 NPFMC meeting. Seattle, WA.



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Recognizing the considerable value of an FEP, the Aquarium urges the Council to move forward in this process and offers the following recommendations on minimum components that the Council should incorporate into the final FEP:

1. **Identify clear FEP goals and objectives:** The Council has previously outlined ecosystem-based goals and objectives in several Council documents, including the groundfish FMPs, the Stock Assessment and Fishery Evaluation (SAFE) reports (including the Ecosystem Considerations section of the groundfish SAFE), and, most recently, the *Ecosystem Approach Vision Statement*. In crafting the FEP, it will be ideal to identify clear goals and objectives that are in line with those established in the aforementioned documents but that come from a perspective that crosses FMP and non-FMP species and associated habitats. These goals and objectives should be developed for both the FEP itself and for the Bering Sea ecosystem as a whole.

Discussion on the BS FEP generated several possible non-mutually exclusive objectives: (1) to synthesize and integrate the wealth of existing Bering Sea ecosystem information across FMPs given a fishery management and decision-making context (which may also help improve identification of ecosystem indicators and research priorities for collaborating scientific bodies); (2) to help build upon existing EBM work and express Council values; (3) to develop management strategies to better understand and mitigate impacts of non-fishing activities, climate change, ocean acidification, and other changes in oceanic conditions; (4) to establish a more formal and explicit framework for analyzing management policies and tradeoffs utilizing the ecosystem perspective; (5) to improve communication of ecosystem science to relevant scientific and management bodies and to the public; (6) to evaluate management strategies to inform future action; and (7) to establish a process to direct specific Council management actions^{13,14,15}. The Aquarium supports these objectives and recommends prioritizing the objectives related to tradeoff analysis, integration of information across FMPs and the ecosystem, and a process for directing Council action. The Pacific Fishery Management Council's (PFMC) Pacific Coast FEP provides an exceptionally valuable and prudent example of the purpose, needs, and objectives of an FEP that may be translatable to the BS FEP¹⁶.

2. **Develop an integrated synthesis of ecosystem information with management context:** The Bering Sea ecosystem is the most well studied ecosystem under the Council's purview. Even though a plethora of ecosystem information exists in other documents, synthesizing this information in one place and framing it within a fishery management

¹³ NPFMC Ecosystem Committee (EC). (2014). EC Minutes. February 4, 2014. Seattle, WA.

¹⁴ Evans, D. (2014). Bering Sea Fishery Ecosystem Plan Discussion Paper. Agenda Item D-2. February 2014 NPFMC meeting. Seattle, WA.

¹⁵ NPFMC EC. (2014). Synthesis of Bering Sea FEP considerations. Prepared for the September 2014 EC meeting. Seattle, WA.

¹⁶ PFMC. (2013). Pacific Coast Fishery Ecosystem Plan for the U.S. Portion of the California Current Large Marine Ecosystem. Portland, OR.



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context would add great value to the Council process. The ecosystem description can build upon the information available in the FMPs, SAFE reports, Essential Fish Habitat (EFH) documents, Ecosystem Considerations report, PICES special publication¹⁷, and from the Bering Sea Integrated Ecosystem Project and Alaska Integrated Ecosystem Assessment (IEA) Program, among other resources. Particular focus should be placed on including the human/subsistence community elements of the ecosystem and identification of key ecosystem interactions through all trophic levels and between species and habitats. An integrated synthesis of ecosystem information will serve as a strong base for the Council to be able to better understand the ecosystem components that might be affected under various scenarios of change. Therefore, we recommend that the Council strive to include such an ecosystem description in the FEP, as we believe it offers value, rather than redundancy, to the Council.

3. **Incorporate ecosystem status indicators into FEP:** The Council has an advantage having already developed and refined several Bering Sea status indicators related to the physical environment, habitat, primary production, zooplankton, finfish, benthic communities, non-target fish species, seabirds, marine mammals, the ecosystem, and EBM¹⁸. These indicators are updated annually and shared with the Council through the Ecosystem Considerations report. A user-friendly synthesis of these indicators may be useful to incorporate into the FEP. Alternatively, the full Ecosystem Considerations report may be best incorporated into the FEP as a standalone module component of the FEP that continues to be updated and incorporated into the decision-making process on an annual basis. The Aquarium also recommends continuing to identify and establish a broader range of indicators for the ecosystem and all of its components, including for habitat, forage fish, marine mammals, climate change, ocean acidification, and cumulative impacts. Beyond these ecological indicators, the Council should also place special emphasis on better incorporating indicators related to social and economic factors. All of these indicators should be as congruent as possible with the Council's ecosystem goals.
4. **Establish strong connection between FEP and management process:** The most important component of the BS FEP will be the measures the Council develops to implement the FEP in its regular management process. Though the FEP will likely be designed as a guidance document versus a regulatory document, it is imperative to establish a clear path for incorporating the FEP into the management process (as the

¹⁷ Hunt, G.L. Jr., Allen, B.M., Angliss, R.P., Baker, T., Bond, N., Buck, G., Byrd, G.V., Coyle, K.O., Devol, A., Eggers, D.M., Eisner, L., Feely, R., Fitzgerald, S., Fritz, L.W., Gritsay, E.V., Ladd, C., Lewis, W., Mathis, J., Mordy, C.W., Mueter, F., Napp, J., Sherr, E., Shull, D., Stabeno, P., Stepanenko, M.A., Strom, S., Whitledge, T.E. (2010). Status and trends of the Bering Sea region, 2003-2008. In *Marine Ecosystems of the North Pacific Ocean, 2003-2008*. PICES Special Publication 4. As identified in the NPFMC BS FEP discussion paper, January 2014.

¹⁸ Zador, S. (2013). Ecosystem Considerations. Resource Ecology and Fisheries Management Division, AFSC, NMFS, NOAA. Prepared for the NPFMC.



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Council has acknowledged through its analysis of the AI FEP¹⁹) so that it can consistently inform and, when appropriate, initiate direct management action. In this respect, the Pacific FEP again serves as an informative model for the Council to consider for the BS FEP through its Ecosystem Initiatives Appendix, which explicitly outlines EBM initiatives intended to address issues affecting multiple FMPs and coordinate PFMC policies across FMPs to fulfill FEP needs and objectives²⁰. The PFMC has also established an annual process to review initiatives and a bi-annual process to solicit input on new initiatives²¹. Taking such an approach to the BS FEP would allow the Council to initiate action on its key ecosystem science priorities whilst allowing for public input and providing further focus for and coordination between relevant research programs (e.g., AFSC, Alaska IEA, etc.). Alternatively, the Council may also establish a link between the FEP and management action through developing indicator thresholds or reference points that, when triggered, prompt the Council to consider of a range of alternative management actions. The Aquarium suggests climate change impacts, ocean acidification, and establishment of a more comprehensive suite of habitat protections to build off of existing Bering Sea protections as a few initial areas of focus to prioritize through such a process.

5. **Develop strategy for local and international outreach:** Engagement in and understanding of the FEP by the fishing industry, Alaska Native communities, scientists, NGOs, and other stakeholders is important to its success. An outreach strategy for disseminating the information in the FEP and making it user-friendly would greatly enhance its relevance to the Council process and for Bering Sea stakeholders. Further, developing a strategy for sharing FEP best practices with other management bodies nationally and globally could contribute greatly to EBM adoption, and ultimately ocean health, worldwide.
6. **Outline process for regular evaluation and revision:** The FEP will not be useful unless it is a living, adaptive document that is evaluated and updated on a regular basis. As such, the FEP should include a process by which adjustments can be made as new ecosystem information becomes available. It is imperative to establish such a process so that managers can act proactively and expeditiously in light of new information, following the precautionary approach, rather than acting reactively after negative impacts may have already occurred. Measures should also be put in place to monitor and evaluate the progress and impact of the FEP, a process that could be facilitated by linking status indicators to ecosystem goals. Since revising the entire document on a frequent basis would likely be too cumbersome, the Council may wish to consider conducting whole-

¹⁹ Evans, D. (2014). Bering Sea Fishery Ecosystem Plan Discussion Paper. Agenda Item D-2. February 2014 NPFMC meeting. Seattle, WA.

²⁰ PFMC. (2013). Ecosystem Initiatives Appendix to the Pacific Coast Fishery Ecosystem Plan for the U.S. Portion of the California Current Large Marine Ecosystem: Appendix A. Portland, OR.

²¹ *Ibid.*



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document reviews after no longer than 5 years or on a more section-by-section basis (e.g., updating the ecosystem indicators annually through the regular Ecosystem Considerations chapter revision, but only updating the ecosystem description bi-annually, etc.). Updates may also be initiated on an ad hoc basis in addition to the regular revision timeline, such as when the guidance on FEP best practices is released by the Lenfest Ocean Program Fishery Ecosystem Task Force in 2016.

Given the substantial gains to be made from continuing to push forward with EBM in the Bering Sea, it is clear that a BS FEP, with careful design and execution, would add great value to the Council process. In addition, the importance of the Bering Sea to Alaskan communities, the seafood industry, global food security, and ocean health cannot be understated. This combined with the unprecedented changes occurring in ocean ecosystems and the necessity to manage for these changes further supports the need for an FEP. As such, we urge the Council to prioritize the FEP process and move ahead with its development, starting with adopting a statement of purpose and needs and drafting FEP goals and objectives.

Once again, we appreciate this opportunity to comment on the Bering Sea Fishery Ecosystem Plan and look forward to staying engaged as the process continues. We are hopeful that the BS FEP will serve as a valuable addition to the suite of ecosystem-based management tools utilized by the Council to ensure that the ecologically, economically, and culturally significant resources in the Bering Sea are conserved and managed in a sustainable manner in perpetuity.

Sincerely,



Meghan Jeans
Director of Conservation



Erin Taylor
Wild Fisheries Specialist



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September 15, 2014

North Pacific Fishery Management Council
Ecosystem Committee
605 West 4th, Suite 306
Anchorage, Alaska 99501-2252

RE: Public input on the development of a Bering Sea Fishery Ecosystem Plan

Ocean Conservancy¹ is writing to provide input on the North Pacific Fishery Management Council's efforts to develop a Fishery Ecosystem Plan (FEP) for the Bering Sea. We thank the Council and its Ecosystem Committee for initiating this action and urge continued work on this important issue.

The Bering Sea faces significant and numerous stressors, such as the impacts of global climate change, ocean acidification, invasive species, oil and shipping contaminants, and the potential for degraded water quality from pollution sources on land. The impacts of these stressors are becoming more apparent—both in the Bering Sea and nationally—demonstrating that a broader approach to management is required to ensure ocean ecosystems can support healthy fish populations into the future.

Fishery management typically focuses on the most important commercial and recreational species, with an emphasis on the annual quota that can be caught and brought to shore. FEPs are critical to consider the health of the ecosystems that support target species, the dynamic interactions among target, species and non-target species, marine mammals, birds and humans, and the quality of the habitat they all require. The development of a Bering Sea FEP will help to sustain the long-term use of North Pacific fisheries and the conservation of ecosystems the Bering Sea supports.

Shifting to such an approach has been recommended by numerous experts for more than a decade,² and the North Pacific Council has long been a leader in the field of ecosystem fishery management.³ Congress has acknowledged the importance of FEPs and an ecosystem-based fishery management approach, requiring the Secretary of Commerce in the last two Magnuson-Stevens Act (MSA) reauthorizations to develop recommendations and identify needs for a successful transition.⁴ In 1996,

¹ Ocean Conservancy is a non-profit organization that educates and empowers citizens to take action on behalf of the ocean. From the Arctic to the Gulf of Mexico to the halls of Congress, Ocean Conservancy brings people together to find solutions for our water planet. Informed by science, our work guides policy and engages people in protecting the ocean and its wildlife for future generations.

² Pew Oceans Commission, *America's Living Oceans: Charting a Course for Sea Change, A Report to the Nation* (2003); U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century* (2004); White House Council on Environmental Quality, *Final Recommendations of the Interagency Ocean Policy Task Force* (2010).

³ NOAA Science Advisory Board Report, *Exploration of Ecosystem Based Fishery Management* 30 (July 2014).

⁴ 16 U.S.C. § 1882.

Congress called for the establishment of an ecosystem advisory panel, which in 1999 recommended that each regional fishery management council develop FEPs.⁵ An agency study authorized as part of the 2006 MSA amendments found that tools already exist for transitioning to a system that better considers the complexities of the marine environment.⁶ Ocean Conservancy commends the North Pacific Fishery Management Council for its past work on the Aleutian Islands FEP, and supports the Council and Ecosystem Committee's work to develop the Bering Sea FEP.

Ocean Conservancy supplies the following comments in response to the Council's specific request for stakeholder input:⁷

- *What should be the objectives of the Bering Sea FEP? What questions should the FEP answer?*

The goals and objectives of the Bering Sea FEP should be to protect and restore species diversity, habitat diversity and integrity, and food web structure and function. The FEP should provide Council members with a clear description and understanding of the fundamental physical, biological, and human and institutional context of ecosystems of the Bering Sea. The FEP should direct how that information is to be used in the context of FMPs and cross-jurisdictional coordination, and should set policies by which management options would be developed and implemented.⁸

- *What kind of actions should be considered in the FEP? Should the FEP provide specific or general guidance for fishery management? (for example, strategies to respond to climate change, preserve subsistence fishing and hunting resources, maintain healthy populations of top level predators, etc.)*

The examples listed are all appropriate, and specific guidance is needed for all three. Additionally, the FEP should facilitate the use of decision support tools, spatial management tools, and trade-off analysis models such as Management Strategy Evaluation. The FEP should allow managers to explicitly consider trade-offs between the various ecological, economic, and social objectives—a key requirement for ecosystem based management. Ideally, the FEP should allow managers to explicitly assess and consider ecological factors such as limiting nutrients, migration, predation, recruitment, habitat dependency and environmental change; and economic and social factors such as fleet dynamics, fuel prices, and fishing effort.⁹

The FEP should also contain a monitoring and evaluation plan to describe available data sources and specify information gaps for assessing the performance of management in achieving ecosystem-level

⁵ 16 U.S.C. § 1882(a); Ecosystem Principles Advisory Panel Report to Congress, *Ecosystem-Based Fisheries Management* (1999), available at <http://www.nmfs.noaa.gov/sfa/EPAPrpt.pdf>.

⁶ National Marine Fisheries Service, *The State of Science to Support an Ecosystem Approach to Regional Fishery Management*, NOAA Tech. Memo. NMFS F/SPO-96 (April 2009), available at http://www.nmfs.noaa.gov/msa2007/docs/tm_96_repto_congress_final.pdf.

⁷ North Pacific Fishery Management Council, Notice of proposed outreach meetings, "The North Pacific Fishery Management Council is Considering Objectives for a Bering Sea Fishery Ecosystem Plan" (August 2014).

⁸ See e.g., Ecosystem Principles Advisory Panel Report to Congress, *Ecosystem-Based Fisheries Management*, at 2 (1999), available at <http://www.nmfs.noaa.gov/sfa/EPAPrpt.pdf>.

⁹ Elizabeth A. Fulton, et al., *Lessons in modelling and management of marine ecosystems: the Atlantis experience*, 12 *Fish and Fisheries* 171, 172-174 (2011).

goals and objectives. The Ecosystem Committee should develop standards and performance measures based on indicators of ecosystem health. In addition, the FEP should contain mechanisms to consider stressors on the fishery environment that are outside of the jurisdiction of the Council and NMFS.

- *Would the FEP provide added value over existing Council documents, and if so, how? (for example, annual SAFE reports, essential fish habitat descriptions, etc.)*

Yes, the FEP has the potential to add a great deal of value beyond existing Council documents. For example, an FEP should describe and analyze the biological, physical, chemical, and socioeconomic aspects of the ecosystem; the goods and services provided by the ecosystem; the structure and function of the food web, including key predator-prey relationships and the habitat needs of different life history stages of key species that make up the food web; the indicators of ecosystem health; and the impacts of activities on the ecosystem and on indicators of ecosystem health, including direct, indirect, and cumulative impacts of activities within and outside the Council's jurisdiction. Further, the FEP can provide a mechanism to assess the level of uncertainty in ecosystem structure, function, data and reasonably foreseeable responses to management action and specify how this uncertainty is accounted for in conservation and management measures that achieve the goals and objectives of the FEP and related FMPs.

In short, an FEP is a long-term planning tool that considers all facets of the ecosystem and helps stakeholders know what to expect and plan accordingly. FEPs provide a transparent guide to the Council's plan to evaluate and achieve optimum yield, protect the broader ecosystem, and maintain sustainable fisheries.

In conclusion, we thank you for your work on this important issue.

Sincerely,



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September 30, 2014

John Henderschedt, Acting Chair
North Pacific Fishery Management Council
605 West 4th Avenue, #306
Anchorage, AK 99501

RE: Agenda Item D4, Bering Sea Fishery Ecosystem Plan

Dear Acting Chairman Henderschedt and Council Members,

We write to express our strong support for the North Pacific Fishery Management Council's (Council) development of a fishery ecosystem plan (FEP) for the Bering Sea. Specifically, we ask that the Council take action at this meeting to initiate development of a draft set of goals and objectives for the Bering Sea FEP. The Council is recognized as a global leader in the management of sustainable fisheries, utilizing a precautionary approach, and incorporating ecosystem considerations into many of its decision-making processes. By developing a comprehensive FEP for the Bering Sea, the Council can further cement its leadership role by establishing a transparent, science-based plan for managing sustainable fisheries and maintaining a healthy and productive ocean ecosystem for all who depend on it.

In regards to fishery ecosystem planning, we note that a discussion of FEPs should be differentiated from the broader discussion of ecosystem-based fishery management (EBFM). The need and justification for EBFM is widely recognized.¹ Councils already have the authority to implement EBFM in their respective regions and a mandate to manage fisheries in a manner that protects the marine environment.² Further, as many experts have noted, the transition to EBFM will not occur overnight, but rather will be an evolutionary process that builds upon existing successful single-species approaches to ensure proper consideration of all factors important to the protection and maintenance of healthy ecosystems.

An FEP on the other hand, outlines a particular Council's plan for implementing EBFM in a specific ecologically-defined region, for a specific set of fisheries. Different regions will have different management needs, and an FEP should be tailored to address the specific issues and concerns faced in that region. However, one overarching concept that should remain constant across all FEPs, regardless of the regionally specific issues, is a focus on maintaining healthy, productive and resilient ecosystems able to support the achievement of optimum yield from

¹ NMFS. 2009. Report to Congress: [The State of Science to Support an Ecosystem Approach to Regional Fishery Management](http://www.compassonline.org/science/EBM_CMSP/EBMconsensus). U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-96, 24 p.; McLeod, K. L., et al., *Scientific Consensus Statement on Marine Ecosystem-Based Management* (2005), available at http://www.compassonline.org/science/EBM_CMSP/EBMconsensus.

² 16 U.S.C. § 1853(b)(12)-(14); 16 U.S.C. § 1802(5)

Council managed fisheries. Ultimately, an FEP should provide a forum and the decision-support tools necessary to identify and evaluate the social, economic and ecological factors relevant to the determination of optimum yield as defined by the Magnuson Stevens Fishery Conservation and Management Act (MSA).³ Achieving optimum yield is the goal of the MSA, and identification and evaluation of relevant optimum yield factors is required from regional councils.⁴ An FEP can help a council meet this requirement through an open and transparent process that engages stakeholders and establishes a science-based plan for managing fisheries with an ecosystem-based approach.

Bering Sea FEP Public Scoping

We appreciate the Council's commitment to engaging fishery stakeholders at the outset of the FEP development process. Ensuring that diverse perspectives and priorities are properly considered and incorporated into the development process will be critical to the success of the FEP. Bering Sea fisheries impact, and are impacted by, communities and people in the region and they should have a voice in defining the scope and focus of the FEP.

In particular, the Bering Sea supports a subsistence way of life for indigenous people across Western Alaska. These communities have an historic connection to the ocean that has spanned millennia and have accumulated a wealth of traditional knowledge about how humans interact with the marine ecosystem. The traditional knowledge held by indigenous people in the Bering Sea region is an important asset that should be accounted for in fisheries management and should be an important component of the Bering Sea FEP. Furthermore, ensuring that Council managed fisheries do not negatively impact the ability of indigenous people to meet their subsistence needs should be one of the Council's ecosystem goals for fisheries management in the Bering Sea, established through the FEP.

We greatly appreciate the Council conducting public scoping hearings in Nome, Seattle and Anchorage to solicit input prior to consideration of next steps in the FEP development process. We were able to attend the most recent hearing in Seattle where we offered some initial comments. Below please find our detailed comments in response to the questions presented in the public scoping document:

1) What should be the objectives of the Bering Sea FEP?

The FEP should include the Council's broader ecosystem goals for fisheries management in the Bering Sea, as well as its objectives for the plan itself and how it should be incorporated into the existing Council process. Through policy guidance, the identification and assessment of relevant ecosystem factors, monitoring, and evaluation, the FEP can help the Council achieve its ecosystem goals for the Bering Sea. We suggest consideration of the following goals:

³ 16 U.S.C. 1802 § 3(33)(B)

⁴ 16 U.S.C. 1853 § 303(a)(3)

- Maintain ecosystem structure and function within natural variability
- Mitigate the potential negative impacts of climate change.
- Provide adequate buffers to account for uncertainty
- Avoid negative impacts to ecosystem components. (Seabirds, mammals, etc.)
- Protect and restore species diversity, richness and age structure.
- Protect and restore habitat diversity and integrity.
- Protect and restore marine resources critical to subsistence users.

With regard to the FEP document, corresponding processes, and decision-support tools, we suggest consideration of the following objectives:

- Improve and incorporate ecosystem information into the existing Council decision-making process.
- Identify and assess tradeoffs among relevant ecological, social and economic factors for determination of optimum yield.
- Provide for the analysis of the cumulative effects of Bering Sea fisheries within the context of climate change and other human activities.
- Synthesize ecosystem science for use in the decision-making process and for the public.
- Identify and monitor indicators of ecosystem status and trends.
- Incorporate traditional knowledge and consideration of subsistence needs into the Council's decision making process.
- Provide a mechanism to evaluate Council management against established ecosystem goals.

2) *What questions should the FEP answer?*

What are the relevant optimum yield factors? The FEP should identify all of the relevant ecological, social and economic factors for the Council to consider in reducing catch from the Maximum Sustainable Yield (MSY) level. Yet because optimum yield is defined in the MSA as an "amount of fish," relevant factors have traditionally been expressed in terms of tonnage. However, there are many factors essential to the determination of optimum yield that can't be expressed in terms of tonnage. For example, considerations related to incidental catch, habitat protection, temporal and/or spatial management, or size/age diversity within managed species are all important to providing maximum benefit to the nation and to the protection of marine ecosystems, which is part of the definition of optimum yield. However, because these factors do not address an "amount" of fish, they are not necessarily incorporated into the annual specifications process or into establishing status determination criteria for managed species. An FEP should identify and describe those factors so that all stakeholders are informed as to what the Council will be considering when making decisions.

What are the tradeoffs between those factors and how does the Council intend to evaluate them?

The FEP should also make explicit and transparent to the public how it evaluates those factors when determining optimum yield catch levels and other management measures intended to achieve the Council's fisheries management goals. Various stakeholders and user groups will place different values on respective ecological, social and economic considerations, and often those will be in competition with each other. Councils are required to carefully document the choice of a particular optimum yield catch level to show that it will produce the greatest overall benefit to the nation.⁵ An FEP can provide the forum and the tools to identify, assess, and balance those competing interests in a way that is transparent and that is tied to the Council's goals for the Bering Sea ecosystem.

What are the likely impacts of climate change and what management measures might be needed to mitigate negative impacts?

Climate change and related phenomena such as ocean acidification are beginning to have significant impacts on the North Pacific Ocean. Those impacts, and the challenges they bring with them, will become increasingly evident in the coming years.⁶ An FEP provides the opportunity to put in place a comprehensive, long-term plan for how the Council intends to manage fisheries in the face of the challenges we know are coming, and to prepare for those challenges that are as yet unknown. End-to-end ecosystem models are coming on-line that would allow the Council to analyze potential climate scenarios and evaluate the performance of alternative management strategies – including control rules, uncertainty buffers, temporal/spatial measures, habitat protection, etc. Information from these climate scenario analyses and other modeling efforts should be an important component of the FEP. A Bering Sea FEP also provides the opportunity to better incorporate traditional and local knowledge held by indigenous people into the Council's ecosystem planning and decision making processes. Indigenous communities in the Bering Sea are first responders to climate change impacts, and the knowledge they hold should be an essential component of the Council's approach to fisheries management.

What is the process and criteria for the development of new fisheries?

With warming waters and climate induced changes to ecosystem structure, scientists expect that ocean ecosystems will experience changes in species distribution and composition.⁷ As these changes occur, opportunities for new and/or expanded commercial fisheries may arise. As a precautionary action, and in-line with its policy for potential Arctic fisheries, the Council should establish a clear process and a set of criteria for evaluating proposals for new and/or expanded fisheries. As a related interim measure, or potential FEP action, the Council should also consider amending

⁵ 50 C.F.R. § 600.310(e)(3)(ii)

⁶ Mathis *et al.* 2014. [Ocean acidification risk assessment for Alaska's fishery sector](#). Progress in Oceanography. doi: 10.1016/j.pocean.2014.07.001

⁷ Pinsky *et al.* [Marine taxa track local climate velocities](#). *Science* 13 September 2013: **341** (6151), 1239-1242. doi:10.1126/science.1239352

the “Commercial Fishery (Non-FMP)” category from its List of Authorized Fisheries and Gear to ensure that it is at least notified prior to the development of any new commercial fishery.⁸

3) *What kind of actions should be considered in the FEP?*

The FEP should provide policy guidance and scientific support for the consideration of ecosystem-based management actions to be implemented through the Council’s existing fishery management plans (FMPs), which have regulatory authority. Management actions developed and considered through the FEP process should be directly tied to the Council’s goals for the Bering Sea ecosystem, and may be implemented under the authority given by the MSA⁹, the National Environmental Policy Act (NEPA)¹⁰, the Endangered Species Act¹¹, and other associated laws.

One way that an FEP can inform management action is through the monitoring of ecosystem status and trends, such as the Council currently does for the groundfish fishery through its annual Ecosystem Considerations report. By establishing a suite of indicators that track not just ecological, but social and economic status and trends for the Bering Sea ecosystem, fisheries and communities, the FEP can provide the Council and its advisory bodies with a context within which to make decisions on annual specifications and other potential management actions. While awareness of ecosystem status and trends may not necessarily lead to specific management measures, it can provide information to decision makers that may potentially lead to decisions that would not otherwise be made.

Additionally, the FEP can help develop potential management actions through establishing an ecosystem-based initiative process, as was done through the Pacific Fishery Management Council’s FEP. Such a process would identify ecosystem needs, issues or concerns, and include them as specific initiatives in an appendix or ancillary module to the actual FEP. The Council, at its discretion, could then select a particular initiative that it would like to pursue based on priority, and assign an *ad hoc* team or working group to research the initiative and develop a range of alternative management actions for Council consideration. For example, the Aleutian Islands FEP includes a list of potential management actions relative to that specific ecosystem in Table 6-1¹², and many of those proposed management actions could become initiatives for the Council to consider undertaking for the Bering Sea.

Finally, an FEP can lead to Council action by establishing reference points or thresholds for the indicators of ecosystem status and trends that it monitors, and that are linked to the Council’s goals for the Bering Sea ecosystem. This is a widely recognized, though not widely

⁸ 50 CFR § 600.747.; 64 Fed. Reg. 4030, 4033 (Jan. 27, 1999)

⁹ 16 U.S.C. 1853 § 303(b)

¹⁰ 42 U.S.C. § 4321; 42 U.S.C. § 4332(2)(C).

¹¹ 16 U.S.C. § 1531(b); 16 U.S.C. § 1536(a)(2).

¹² NPFMC. December, 2007. [Aleutian Islands Fishery Ecosystem Plan](#). p. 141-145

implemented, approach to implementing EBFM.¹³ Under this approach, if/when an indicator reaches a certain threshold, a Council review could be triggered and a range of potential management alternatives could be considered. In order for such a management process to be implemented, ecosystem indicators must be robust to uncertainty, and thresholds should be established through an open public process and be supported by the best available science.

4) *Should the FEP provide specific or general guidance for fishery management?*

The FEP should provide guidance to both the Council as decision makers and to the public as fishery stakeholders. By soliciting input and cataloging how user groups and fishery stakeholders value the ecological, social and economic factors relevant to the determination of optimum yield catch levels and associated management measures, the FEP can inform and guide the existing decision making process to ensure the Council is appropriately considering all relevant factors and is able to document and justify its policy choices.

Through monitoring indicators of ecosystem status and trends that are not focused on a specific fishery, species or species complex, but that capture the broader ecological, social and economic factors relevant to the Bering Sea ecosystem, the Council is provided with guidance regarding how its management actions impact not just the fishery and target species directly, but the broader ecosystem including non-target species, biological productivity, and fishing communities. This guidance will enable the Council to properly balance the competing values associated with those factors in a way that is responsive to stakeholders and helps maintain a healthy ecosystem.

Through the use of end-to-end, environmentally driven ecosystem models, the Council is able to analyze the cumulative impacts of the fisheries it manages - including control rules and other management measures – within the context of climate change and other human activities such as shipping and energy development. Such models are currently being developed by NOAA Fisheries Science Centers to be used exactly for this purpose. This ability to analyze alternative scenarios and management strategies can help ensure that the decisions the Council makes are consistent with its ecosystem goals, in particular the goal of mitigating the negative impacts of climate change.

The use of ecosystem indicators in conjunction with end-to-end models can provide the Council with guidance regarding the progress it is making toward achieving its goals for the ecosystem. Linking indicators directly to the Council's ecosystem goals creates performance metrics by which the Council can evaluate the effectiveness of its management approach. By creating a feedback loop where progress towards goal achievement is assessed through monitoring

¹³ FAO. 2003. [The ecosystem approach to fisheries. FAO Technical Guidelines for Responsible Fisheries](#). No. 4, Suppl. 2. Rome, FAO. 2003. 112 p.; Livingston *et al.* 2005. [A framework for ecosystem impacts assessment using an indicator approach](#). ICES J. Mar. Sci. (2005) 62 (3): 592-597 doi:10.1016/j.icesjms.2004.12.016

indicators, the Council can detect when its strategies and/or tactics are not being effective and can reevaluate and change its approach when needed.

The FEP should also provide the public with guidance as to how the Council intends to achieve its goals for the Bering Sea ecosystem. As stated above, the MSA requires Councils to set catches at levels that achieve optimum yield and provide maximum benefit to the nation. The MSA also requires Councils – and gives them the authority - to enact measures designed to protect and conserve the broader marine ecosystem.¹⁴ The FEP should explain and justify how the Council intends to use this authority to address the following issues, among others:

- Habitat – Council are required to identify and designate essential fish habitat (EFH) for managed species, and to minimize adverse impacts to EFH to the extent practicable. The FEP should outline the Council’s priorities for future 5-year reviews, and should explain and justify how it intends to define “practicable,” whether by effort displacement or other metrics. The FEP should also outline how and whether the Council intends to enact conservation measures to protect deep-sea corals, and/or identify and protect representative habitat for scientific or conservation reasons.
- Spatial / Temporal measures – Councils are given the authority to restrict fishing activity in certain times and/or certain places. Such regulations can be implemented for ecological, social or economic reasons, or to make progress toward an established ecosystem goal. The FEP should make clear to the public how the Council intends to use this authority, and explain to the public the justification for enacting such measures.
- Size / age diversity – Fishing can impact the natural size and age structure within managed species. Truncation of age and size diversity can negatively impact a species’ reproductive potential and population stability, thereby reducing ecosystem resiliency.¹⁵ Maintaining size and age diversity for managed stocks should be a goal for the Bering Sea ecosystem, and through the FEP the Council could consider management measures related to gear selectivity, slot limits, or time/area closures.
- Bycatch – National Standard 9 requires Councils to minimize bycatch and bycatch mortality to the extent practicable. In developing measures to do so, National Standard 9 states that Councils should consider, among other factors, the ecological impacts of bycatch, impacts to other ecosystem components such as marine mammals and birds, and the “economic, social and cultural value of fishing activities.”¹⁶ The FEP should make

¹⁴ 16 U.S.C. 1853 § 303(b)

¹⁵ Hsieh *et al.* 2006. [Fishing elevates variability in the abundance of exploited species](https://doi.org/10.1038/nature05232). *Nature* 443, 859-862 (19 October 2006), doi:10.1038/nature05232; Hsieh *et al.* 2010. [Fishing effects on age and spatial structures undermine population stability of fishes](https://doi.org/10.1007/s00027-009-0122-2). *Journal of Aquatic Sciences*. (2010) 72:165–178, doi 10.1007/s00027-009-0122-2

¹⁶ 50 C.F.R. 600.350(d)(3)(i)

explicit to the public how the Council intends to consider these factors when developing measures designed minimize bycatch.

5) *Would the FEP provide added value over existing Council documents, and if so, how?*

As noted above, the Council is widely recognized as a global leader in the management of sustainable fisheries and incorporating ecosystem science in to its decision making process. In particular, the monitoring and reporting of ecosystem status and trends through the annual Ecosystem Considerations report, and the 2004 programmatic supplemental environmental impact statement (EIS) are great examples of incorporating ecosystem considerations into fisheries management. A Bering Sea FEP can build upon these efforts and others to add value, clarity and cohesiveness to the Council's existing processes.

First, to the extent that the FEP is tied to the Bering Sea Integrated Ecosystem Assessment (IEA) program and related modeling efforts, it can provide the cumulative impact analyses discussed above. Such analyses are often done in order to meet NEPA requirements, and without the use of end-to-end models. We suggest that the models being developed for use through the FEP can be used to create efficiencies for the Council in meeting NEPA requirements by providing cumulative impact analyses in a manner that is not duplicative of existing efforts and that reduces workload burden on Council and agency staff.

Second, the FEP can add value to existing Council documents by synthesizing the vast amount of literature and research on the Bering Sea in a way that efficiently and effectively informs decision makers and that is accessible to the public. The Bering Sea is well known as a highly dynamic and productive ecosystem that is home to some of the largest fisheries in the world, and that supports a subsistence way of life for indigenous people. The FEP should provide interested members of the public further information regarding the structure and function of this ecosystem, including a food web model, key predator-prey relationships, known habitat types and species associations at different life stages. By making this information available and accessible to decision makers and the public, the FEP provides increased value to the Council by encouraging and facilitating public engagement.

Last, making explicit how the Council intends to balance the competing values associated with relevant ecological, social and economic factors, and by establishing stakeholder-driven ecosystem goals that are based on the best available science, the public is provided with a mechanism by which to hold the Council accountable for balancing those factors and achieving established goals. Knowing upfront what to expect when the Council is faced with evaluating competing tradeoffs also allows the public to plan accordingly, and may create efficiencies by reducing the time it takes through the Council process to identify and evaluate tradeoffs on an *ad hoc* basis as issues arise. In some ways, the FEP can be viewed as a social contract between the Council and all the various fishery stakeholder groups. Having a long-term, comprehensive plan

in place for the Bering Sea ecosystem allows the Council to focus on its ultimate goal of achieving optimum yield, maximizing benefit to the nation, and protecting the marine ecosystem.

Conclusion

Everyone involved in federal fisheries management in the North Pacific—including fishermen, seafood processors, environmental organizations, and subsistence communities—has a stake in ensuring healthy and productive ecosystems for future generations. As global population increases, so too will the demands on our oceans to provide food. And as the effects of climate change are seen firsthand in the Arctic and around the world, we must take proactive, precautionary action to ensure that we are managing our marine resources sustainably and are prepared to address the challenges that the future will bring.

Tools and approaches to aid in EBFM are available to reduce bycatch; conserve important habitat; protect marine food webs; monitor ecosystem health; and evaluate the ecological, social, and economic trade-offs of different management actions. In the Bering Sea many of these tools are being applied. Yet more will be needed to steward this ecosystem in the years ahead. The Council has and will continue to face controversial fishery issues where the decisions it makes will have significant implications for the broader ecosystem. These discussions can and should be informed by an FEP that clearly explicates the Council's goals and objectives for the Bering Sea ecosystem and puts in place a comprehensive plan to achieve them.

We look forward to continuing to participate in this process, and we appreciate all that you do to maintain sustainable fisheries and healthy, productive marine ecosystems.

Thank you in advance for your time and consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "Steve Marx", written in a cursive style.

Steve Marx
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