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April 1, 2014

Mr. Eric Olson, Chair
North Pacific Fishery Management Council
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RE: C9 – Bering Sea Canyons

Dear Chairman Olsen, Dr. Balsiger, and Council members:

Thank you for taking time to discuss the management of the Bering Sea slope, shelf-break, and canyons. We appreciate the considerable time and resources the North Pacific Fishery Management Council (NPFMC), National Marine Fisheries Service (NMFS), staff, and public stakeholders have invested thus far in this issue. Now is the time to establish clear objectives to move forward. Our recommendations, which are intended to be consistent with, and largely incorporate, the recommendations of our NGO partners, are described below. We urge the Council to adopt these objectives at this meeting and begin a process to solicit proposals from the public, the scientific community, and the Alaska Fisheries Science Center for spatial management and other measures to ensure protection of the Bering Sea slope, shelf-break and canyons.

Along Bering Sea slope, shelf-break, and canyons, the NPFMC and NMFS should seek to accomplish the following objectives:

- Provide scientific control areas;
- Fully protect representative habitats;
- Protect 'hotspot', sensitive, and important areas; and
- Avoid impacts to Essential Fish Habitat (EFH), including corals, sponges, and emergent epifauna

These objectives are not novel. In 2004, NMFS contracted with the Center for Independent Experts (CIE) to peer review the agency's assessment of fishing impacts to Essential Fish Habitat. The CIE panel consisted of six international scientists with expertise in stock assessment, seafloor habitat, and marine fisheries.[1] Their recommendations for establishment of scientific research closures, protected areas, and addressing localized impacts are yet to be implemented along the Bering Sea slope:

> *Because of the large **uncertainty** in our understanding of the processes linking habitat and life history stages of fish, in the habitat reduction model and the factors influencing stock productivity, a precautionary approach needs to be applied to the evaluation of fishing effects on EFH. **Research closures or other precautionary management measures should be utilized** to protect potential EFH while research is carried out to assess these habitats, their ecological role, and the impacts of fishing*. Summary Report pg. 24.
>
> ***Additional protected areas** could be very useful in terms of potentially enhancing adjacent fisheries and ensuring healthy ecosystem functioning. Establishing protected habitat may be*

[1] Drinkwater, K. Summary Report Review on Evaluation of Fishing Activities That May Adversely Affect Essential Fish Habitat (EFH) in Alaska, *available at* https://alaskafisheries.noaa.gov/habitat/cie/reports/Drinkwatersummary.pdf. (hereinafter "Summary Report").

> *much easier to achieve if there are areas that are not currently fished and fishermen are involved in the process.* Summary Report pg. 21-22.
>
> *It was the unanimous opinion of the panel that adequate consideration was not given to* ***localized habitat impacts*****.** Summary Report pg. 20

We recognize that the NPFMC is considering several issues that may have some overlap including a review of the Programmatic Supplemental Environmental Impact Statement for the groundfish fishery management plans, a Bering Sea Fishery Ecosystem Plan, and the mandated 5-year review of Essential Fish Habitat. Even so, the Council should move forward with the objectives identified for Bering Sea slope, shelf-break, and canyon management in its own process, noting that analyses and background materials developed for this issue will be advantageous for the other assessments.[2]

Further, there is no reason to wait for the completion of this process to protect areas for which there is already sufficient information to warrant action. We are pleased that NMFS is planning seafloor habitat research along the Bering Sea slope and canyon regions. The results of that research can inform adaptive management in the future and are an important part of a comprehensive approach to protections and fishing. Given the considerable expense of this type of research it would be unacceptable if the observations were compromised by fishing impacts before, or shortly after, the research commenced. Scientific control areas that are largely 'no-fishing' zones could be established now to authenticate a time-certain baseline for describing the habitat and investigating the presence/absence/size distribution/ condition of corals, sponges, and other habitat features.

These areas could be identified and protected as control areas prior to the commencement of research. The Council may wish to recommend that NMFS hold a public workshop to design the areas since multiple objectives could be accomplished by strategic sizing and spacing.

The Council's previous management actions have shown that it is possible to balance the interests of industry, Alaska Native communities, and conservation interests. We hope that progress can be made at this meeting to further the commitment to move toward ecosystem-based management and address diverse stakeholders concerns.

Sincerely,

Susan Murray
Deputy Vice President, Pacific
Oceana

[2] We could not comment on updated information regarding the EFH 5-year review because materials were not made available by the briefing book public comment deadline (April 1).

CENTER *for* BIOLOGICAL DIVERSITY *Because life is good.*

April 1, 2014

Submitted via Electronic Mail

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RE: C9 - Bering Sea Canyons

Dear Mr. Olson:

Thank you for the opportunity to comment on the North Pacific Fishery Management Council (Council) decision regarding the development of clear management objectives around protections for the important ecosystems of the Bering Sea Canyons. We urge the Council to utilize the precautionary principle and to initiate a National Environmental Policy Act (NEPA) process at this April 2014 meeting by drafting a Purpose and Need statement that includes as an alternative the creation of an ecologically connected network of no-take Marine Managed Areas (MMAs). These MMAs must be adequate to preserve the resiliency and biodiversity of the unique Bering Sea Canyon ecoregion in the face of ocean acidification and climate change.

I submit the following comments on behalf of the Center for Biological Diversity (the Center). The Center is a nonprofit corporation with offices throughout the western United States, including Anchorage, Alaska. Its 675,000 members, activists, and staff have researched, studied, observed and sought protection for marine habitat and numerous marine species.

In the following comments we emphasize the importance of MMAs for the protection of ecosystems biodiversity and resilience. MMAs are especially critical for resilience against the impacts of ocean acidification and climate change. We discuss the importance of establishing MMAs despite incomplete scientific information, citing the Precautionary Principle. We also discuss the ecological importance of MMAs for the Bering Sea Canyons and shelf break, not only to protect living structural benthic habitat such as coral and sponges, but to protect and conserve the eastern Bering Sea's distinct ecoregion and its ecosystem processes that support blue king crab, rockfish, Pacific Ocean perch and numerous fish, marine mammal, and invertebrate species. We urge the Council to make use of ecosystem-based management policies and the precautionary principle to move forward with establishing protections for the Bering Sea canyons and shelf break that are

not simply based on single-species (e.g., cold-water coral) protections, but that consider the ecosystem as a whole.

1. Introduction

The Center urges the Council to immediately start the process of establishing a series of connected and permanent MMAs that ensures the biological diversity and healthy ecological function of the Bering Sea "greenbelt." MMAs are a form of ecosystem-based management where all elements—ecological, anthropogenic, and institutional—of a system are considered holistically. This type of integrated approach is especially important considering the subsistence resources present in the area.

Critical reasons for establishing MMAs in Bering Sea canyons and along the shelf break include: the success of the precautionary principle (Andorno 2004, Stirling 2007) in making marine policy decisions to protect special marine areas; Section 408 of the Magnuson-Stevens Fishery Conservation and Management Act (16. U.S.C. 1884); the importance of retaining pristine marine areas in which to study the impacts of climate change and ocean acidification; the need to ensure that protections be permanent rather than short-term; widespread threats to cold water coral-sponge communities from bottom-tending fishing gear; and—of highest importance—the brief and quickly closing window of opportunity to create an ecosystem reserve that would increase species' resilience to climate change in the North Pacific. As described below, there is a strong scientific case for the Council to act in an urgent, decisive manner to create large-scale, permanent, no take MMAs in the Bering Sea, despite the current lack of detailed scientific data, and prior to complete collection or analysis of such data.

2. The Precautionary Principle

The precautionary principle should be the overarching basis for policy decisions and protections for vulnerable marine areas such as the Bering Sea Canyons and the shelf break.

Worldwide, scientific understanding of population biology, taxonomy, reproductive biology, functional role, and resilience of coral and sponge communities is minimal to non-existent (Foley et al. 2010). Some coral species are known only from a single location. Twelve new cold coral species have been described in Alaska waters only in the past few years (Cairns and Bayer 2005, Cairns and Baco 2007, Cairns and Lindner 2011). Habitats containing high density "coral gardens" in the Aleutians were only discovered in 2002 (Stone 2006), with high density coral-sponge assemblies in the Bering Sea described only in the past couple of years (Miller et al. 2012).

Significant damage to soft coral and sponge communities may occur with a single pass of mobile fishing gear (Freese 1999, Rooper et al. 2011), as well as from static gear including benthic longlines and traps (Krieger 2001). This information can be used to

predict and differentiate the potential for significant adverse impacts to cold coral and sponge habitat from different types of fishing gear.

According to Smithsonian cold-water coral expert Dr. Steven Cairns, a precautionary approach to protecting coral and sponge communities in the Bering Sea is a "logical assumption; if you don't know what's there . . . protect the unknown" (Pers. Comm. 2014).

The precautionary principle consists of three basic elements:

1. Cautiousness before acquiring enough scientific evidence and in the face of uncertainty of environmental changes predictions due to a lack of scientific data and accurate models. The precautionary approach should be taken so long as there are potential risks to the environment or resource conservation, despite the costs.
2. Reserving definite ecological space, to cope with the neglect of the environment and resource management such as ocean acidification and climate change.
3. Strict management policy, because the results of environmental decisions cannot be predicted. Rigorous control on possible dangerous activities.

(Chu 2011).

The precautionary principle is widely used by fishery managers worldwide, and is advocated by the United Nations. The non-binding Rio declaration singles out the precautionary principle as a key resource management theme: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."[1] Similarly, the precautionary principle is used to protect cold water coral habitat areas under the International Standards for Responsible Fisheries set out by the Food and Agriculture Organization (FAO) of the United Nations(Aqorau 2001): "the precautionary approach should be taken cautiously when the information is uncertain, unreliable, or inadequate. And conservation and management measure must not be postponed or not adopted due to lack of scientific data."[2] In addition, "[t]he [fishery management] organizations should not postpone or not adopt protecting measures on target species, the species associated or dependent on target species, and non-target species and environment, despite lack of scientific data" (FAO 1995).

Thus, the precautionary principle is a guiding premise of the European Commission for environmental policy, and is used as a basis for protection of cold coral in European Union waters (European Commission 2007, The Pew Environment Group 2012). Canada similarly utilizes the precautionary principle in the nation's 2010- 2015 Coral and Sponge Conservation Strategy (Fisheries and Oceans Canada 2010). United Nations General Assembly (UNGA) has supported the protection of vulnerable marine areas with UNGA resolutions 61/105 and 64/77, following a precautionary approach (Auster et al. 2010).

[1] Principle 15 of Rio Declaration adopted in 1992 by the United Nations Conference on Environment and Development.
[2]United Nations Fish Stocks Agreement adopted in 1995, Article 6.

The precautionary principle is advocated by the United Nations to protect deep-sea habitat in all participating nations, including cold water coral areas (FAO of the United Nations 2009), and is also advocated for in the United State's policy for protection of cold coral in Alaska, as a reason for creating Aleutian Island Habitats of Particular Concern (HAPCs).

The precautionary principle should be the overarching principle used regarding policy decisions and protections for vulnerable marine areas such as the Bering Sea Canyons and shelf break ecosystems. There are many uncertainties and unknowns regarding the biology and distribution of cold-water corals and sponges in the Bering Sea, ecosystem processes, and the link between fishing efforts and adverse impacts to coral and sponge habitat.

The Council must consider using the precautionary principle approach when determining when and how to implement protections for the Bering Sea Canyons and shelf break ecosystem. Postponing protections for lack of scientific data poses major environmental risks, and fails to meet international standards for sustainable fisheries management.

3. Climate Change

The greatest challenge facing fishery managers today is adapting management policies in order to limit the destructive impacts of a changing global climate on important fish and invertebrate species. The evidence is overwhelming that the marine environment worldwide is facing serious threats from anthropogenic greenhouse gas emissions including serious and lasting changes in productivity due to ocean acidification processes, increasing water temperatures, and changes in seawater circulation patterns (Guinotte and Fabry 2008). Alaskan waters are already showing evidence of ocean acidification and increased upwelling (Mathis et al. 2011). Human actions over the next ten years will be critical in determining the fate of fisheries and marine ecosystems throughout the world.

Recent studies show that some regions of the North Pacific have been drastically altered by climate change and are undergoing rapid changes in ocean chemistry (Yasuhara et al. 2012, Feely et al. 2012, Evans et al. 2013b, 2013a, Mathis et al. 2013). The pH levels are dropping, and aragonite and calcite saturation horizons are rising, with increasingly widespread areas of the Bering Sea shelf undersaturated with respect to aragonite for much of the summer (Cross et al. 2012, Mathis et al. 2013).

While the Council has little control over global greenhouse gas emissions, it can and should manage fishing activities in order to avoid adverse impacts on Alaska's marine ecosystem. An ecosystem-based approach allows for ecosystem resilience, by establishing habitat protections and considering commercially and recreationally important species and the effect of fishing activities on these species.

4. Importance of Managed Marine Areas

a. Resilience

Significant ecosystem and fisheries benefits can be achieved through the establishment of MMAs, especially resilience to climate change impacts (Côté and Darling 2010, Mumby et al. 2011). As defined in the study of ecology, resiliency is the capacity of an ecosystem to absorb disturbance without shifting into an alternative state and losing function and services (Holling 1973, Folke et al. 2004).

First, MMAs provide a "baseline" or reference area where the effects of climate change and ocean acidification can be monitored and differentiated from natural variability or the effects of other human activities like bottom-trawling. In the broader context of United States fisheries, the Bering Sea has only been commercially fished for a brief period of time, and some areas still exist in a relatively pristine state. These areas provide scientists the chance to understand how species and ecosystems respond to environmental change. When destructive human activities, such as bottom-contact fisheries, are limited in an MMA, this reduces the number of variables that scientists need to monitor or consider.

Second, MMAs increase species and ecosystem resilience to climate change and ocean acidification by reducing or eliminating stresses from human activities (Micheli et al. 2012, Ling and Johnson 2012). While climate change and ocean acidification will continue to impact environmental conditions in an MMA, other ecosystem stressors, such as fishing and resource extraction, are limited or eliminated, giving species the ability to withstand environmental changes. MMAs that are of sufficient scale, and that are ecologically connected into networks, can encompass and protect key ecological processes and all life stages of an ecological community.

Bottom-contact fishing gear is one of the single biggest threats to the resiliency of cold-water coral ecosystems (Foley et al. 2010). While data on the positive implications of MMA no-take zones on long-lived, sessile invertebrates such as the gorgonian octocorals of the Bering Sea canyons and Aleutian Islands is limited, studies in other areas show that no-take MMAs are especially important to the recovery and survival of cold-water coral communities (Babcock et al. 2010, Linares et al. 2012), and a growing body of scientific evidence shows the importance of individual density on long-lived, slow-growing, and slowly reproducing sessile invertebrates, such as cold water coral and sponges.

b. Biodiversity

Cold corals are "keystone" species, and hotbeds of biodiversity. Many commercially harvested fish and invertebrate species depend on cold-water corals as spawning and brooding habitat, protection against predation and refuge from currents, sheltered resting spots, and a roost from which to feed (Witherell and Coon 2000, Heifetz 2002, Krieger and Wing 2002). Indeed, fisheries data shows that areas with intact cold-water coral

ecosystems support much more abundant fisheries than where cold-water corals are removed through trawling or other destructive anthropogenic activities (D'Onghia et al. 2010).

c. International Backing for Bering Sea MMAs

There is a great deal of international backing for MMAs in the Bering Sea. Rio+20 (2012) reaffirmed the that many parties care greatly about protecting biodiversity and "the importance of area-based conservation measures, *including marine protected areas*, consistent with international law and based on best available scientific information, as a tool for conservation of biological diversity and sustainable use of components."[3]

A 2006 United Nations General Assembly Resolution called upon

> States to take action immediately, individually and through regional fisheries management organizations and arrangements, and consistent with the precautionary approach and ecosystem approaches, to sustainably manage fish stocks and protect vulnerable marine ecosystems, including seamounts, hydrothermal vents and *cold water corals*, from destructive fishing practices, recognizing the immense importance and value of deep-sea ecosystems and the biodiversity they contain.[4]

The resolution required that States and Regional Fishery Management Organizations manage fisheries to prevent significant adverse impacts to areas identified as vulnerable marine ecosystems (VMEs) by Dec. 31, 2008.

The United Nations Food and Agriculture Organization (FAO) finalized "International Guidelines for the Management of Deep-sea Fisheries in the High Seas" in 2009 (FAO of the United Nations 2009). Guidelines apply to fisheries where "(a) the total catch (everything brought up by the gear) includes species that can only sustain low exploitation rates, and (b) the fishing gear is likely to contact the seabed during the normal course of fishery operations."

d. Importance of a Bering Sea Ecoregion MMA

Fisheries of the continental shelf margins have been greatly depleted worldwide, and many scientists do not believe such fisheries are sustainable unless conservation measures, such as the creation of connected MMAs, are implemented (Norse et al. 2012). Rather than rejecting no-take MMAs as it has in the past (Witherell and Coon 2000), the Council should apply the precautionary principle and create Bering Sea Canyon MMAs despite a lack of detailed scientific data on coral distribution.

[3] Resolution adopted by the General Assembly, July 27, 2012.
[4] UNGA Resolution 61/105, 2006 (emphasis added).

The relatively small no-take and partially-protected coral areas currently found in Alaska are not sufficient to contribute to robust ecosystem functioning in the Bering Sea, as they occur in the Aleutian Islands and Gulf of Alaska. Protections of these areas do not affect ecosystem processes of the Bering Sea, because the Aleutian Islands constitute a separate ecoregion in Alaska waters (Spalding et al. 2007). An ecoregion is the smallest scale unit used in the Marine Ecoregions of the World (MEOW) system, defined as:

> Areas of relatively homogeneous species composition, clearly distinct from adjacent systems. The species composition is likely to be determined by the predominance of a small number of ecosystems and/or a distinct suite of oceanographic or topographic features. The dominant biogeographic forcing agents defining the ecoregions vary from location to location but may include isolation, upwelling, nutrient inputs, freshwater influx, temperature regimes, ice regimes, exposure, sediments, currents, and bathymetric or coastal complexity (Spalding et al. 2007).

According to Spalding et al. (2007) an ecoregion is "sufficiently large enough to encompass ecological or life history processes for most sedentary species." Large levels of endemism are not important, and are not a key determinant of ecoregion identification in the marine environment (Spalding et al. 2007). Thus, protections for the Bering Sea Canyons and shelf break must be made without consideration of other protections that are currently in place for the Aleutian Islands. Protections there do not apply or protect this unique and distinct ecoregion. In their own right, and due to the high productivity, density of benthic habitat, and susceptibility to bottom-contact fishing gear, the Council should approach protections of the Bering Sea canyons using an ecosystem-based management approach, rather than deciding the merit of protections based on a comparison to the Aleutians.

In light of the canyon's high productivity and important role as fish habitat, the Council should move forward with protections for the canyon areas. This would allow for continued development of science and understanding of the canyons, while limiting destructive fishing impacts on this ecologically important area. Currently, very little of the Bering Sea canyon or Bering Sea shelf break area has been intensively surveyed.

There is growing scientific evidence showing conservation benefits from no-take MMAs (Halpern 2003, Lester et al. 2009), and evidence that no-take MMAs have significantly greater ecological benefits over partially protected sites. The size, design and connectivity of no-take MMAs is also critically important (Halpern 2003, Gaines et al. 2010, Halpern et al. 2010). Larger MMAs constitute oceanic wilderness areas, and greatly increase the resiliency, biodiversity, and ecological function of a marine area (Graham and Mcclanahan 2013).

Numerous tools by which the Council can manage for ecosystem based management are already in place. In 1996, the U.S. Commission on Ocean Policy called for fishery managers to begin moving toward an ecosystem-based approach to look beyond fisheries and consider interactions with other resources and activities. Protections of the Bering Sea canyons from harmful bottom-contact fishing gear through the creation of no-take MMAs is an important first step for the Council to meet these goals.

5. Magnuson-Stevens Act

Protections of cold-water coral and sponge ecosystems are also warranted under section 408 of the Magnuson-Stevens Act (MSA), with the 2007 MSA Amendment specifically calling for more research into cold-water coral and sponge ecosystems as facilitated through the Deep-water Coral and Sponge Technology Program and in Alaska through the Alaska Coral and Sponge Initiative (AKCSI) (NOAA 2007, 2010, Palsson et al. 2013).

a. Current Research in Alaska

In FY12, three cruises were conducted in Alaska by AKCSI researchers to (a) collect bathymetry and backscatter information for three study sites in the Southeast and one in the Gulf of Alaska; (b) look at the ecology and production of commercial fishes from coral and non-coral habitats, including collection of underwater video along transects inside and outside of coral habitat, collection of rockfish from coral and sponge habitat in four bottom trawl hauls, and collection of oceanographic information and zooplankton samples; and (c) groundtruth a coral and sponge distribution model using underwater camera drops at 106 locations in the central and eastern Aleutian Islands and Bowers ridge and Bowers bank (this cruise observed corals at 53 of the 106 sites and sponges at 69 of 106 sites) (Palsson et al. 2013).

Additional studies included (a) the recovery and recruitment of cold gorgonian corals following disturbance, with annual observations funded through 2014; (b) two sensors to collect dissolved oxygen, turbidity, and pH measurement deployed on bottom trawls used to conduct annual stock assessment surveys; (c) long-term monitoring of dissolved oxygen, pH, salinity and temperature deployed into Tracy Arm in January 2013; (d) a project to construct a camera system to be attached to longline fishing gear in Alaska to document effects on benthic habitats, with testing continuing into 2013; (e) collection of 120 sponge specimens for morphological taxonomic study; (f) deployment of settlement plates and rocks to serve as potential substrate for Primnoa coral recruits, deployed in Primnoa thickets in summer 2013; (g) laboratory studies on genetic markers for Primnoa corals at the U.S. Geological Survey (USGS) (Leetown Science Center, West Virginia) to support analysis of genetic population connectivity among Alaska and west coast populations planned for 2012 and 2013 at the Alaska Fisheries Science Center and USGS; and (h) the compilation of bathymetry and sediment maps for the Aleutian Islands and Gulf of Alaska in anticipation of completing a substrate map for these regions in 2013 (Palsson et al. 2013).

None of the planned, continuing, or already conducted research to date is on how cold-water coral and sponge ecosystems of Alaska are or will respond to rapidly increasing anthropogenic greenhouse gas emissions, specifically changes in ocean chemistry and climate change. Studies on other species of cold-water corals, especially reef building corals (e.g., *Lophelia* spp.), set precedents for how such studies might be conducted in situ or in the laboratory (Maier et al. 2009, Naumann et al. 2013). Studies on cold-water gorgonian corals—the most common taxa of coral in deep-sea Alaska—in other areas of the world have also been conducted to monitor these corals' responses to ocean acidification and climate change (Ferrier-Pagès et al. 2009). Calcification may be just one process affected by climate change, and a "holistic" approach to evaluating organism affects should be used when determining study design (Findlay et al. 2009, Byrne et al. 2009). Coral and sponge food sources and "phase shifts," changes in ecological structure, altering current flows and shifts in the exchange of nutrients between trophic levels must also be considered (Riebesell et al. 2000, Hare et al. 2007). Continued failure to monitor these important ecosystems' response to climate change means there is no established baseline, and any losses that have already occurred are not recorded. As part of its management objectives, the Council must consider climate change, and establish research methodologies by which to evaluate impacts of climate on cold-water coral and sponge ecosystems.

b. Ecosystem-based Management

The Council already has authority under the MSA to employ an ecosystem-based approach to habitat and wildlife. The law's definition of conservation and management recognizes the importance of protecting marine ecosystems and avoiding long-term adverse effects on fishery resources and the marine environment. 16 U.S.C. § 1802(5). In 2006, new language under the MSA strengthened the Council's authority to address ecosystem concerns by adding new language on habitats and authorizing the Council to protect cold-water coral ecosystems and restrict the use of destructive gear types within known areas of cold-water coral habitat. This means that the Council can now protect vulnerable marine habitats and species in their own right as important components of the marine ecosystem, even without a determination of essential habitat for a fishery (Senate Report 109-229 on S 2012 (April 4, 2006)).

Evidence from other formerly productive fisheries demonstrates a strong correlation between loss of cold-water coral-sponge habitat and collapse of major fish and invertebrate stocks (Watling and Norse 1999). Twenty years after the Newfoundland cod fishery was completely closed, this once highly productive fishery has shown no evidence of recovery. The collapse of the Atlatnic cod fishery been linked to trawling damage to cold-water corals of the North Atlantic (Watling and Norse 1999). In Norway, Ireland and other areas of Northern Europe, researchers have found that species diversity and fishing success is many times lower in areas with heavily damaged corals than in areas where corals are intact (Lindeboom and de Groot 1998). Seamounts in the Pacific, where corals have been stripped bare by trawling gear, have transformed from rich fishing grounds to deserts, with unfished seamounts having double the benthic biomass and 46% more species than fished areas (Roberts 2002). Because benthic communities of

corals and sponges are unlikely to recover, and may have strong linkages to fish and invertebrate stock and to ecosystem processes, it is critical to prevent initial destruction from fishing activities, rather than attempting to protect cold-water coral areas after they have already been devastated by trawling.

c. Coral and sponge habitat should be protected under the MSA

According to Shester and Ayers (2005), all corals and sponges have already been designated as Habitats of Particular Concern (HAPCs) and qualify for special protection by the National Marine Fisheries Service (NMFS) and the Council (67 FR 2343, 2002). According to NMFS (2006),

> Corals are generally considered to be very slow growing organisms. . . [and] coral habitat is likely very sensitive to human-induced environmental degradation from both fishing and non-fishing activity. . . .
>
> Alaskan corals would likely take much longer to re-colonize following similar disturbances. For example, given the growth rate of 1 cm/year for Primnoa, a colony of 1 m high would require at least 100 years to return to the condition it was in before a major disturbance.

Currently, there are no coral and sponge bycatch limits. The best estimates of the amount of damage to coral and sponge ecosystems in Alaska is through observer bycatch data for corals and sponges. This data underestimates total damage because damaged corals and sponges that remain on the seafloor or those that are dropped out of the net are not included. From 1990-2002, the extrapolated total coral bycatch for Alaska was 537,063 kg (Shester and Ayers 2005). Combined, coral and sponge extrapolated total bycatch was 4,170,008 kgs (Shester and Ayers 2005). NMFS estimates that 87% of coral bycatch and 91% of sponge bycatch is brought up by bottom-contact trawl gear (NMFS 2002).

Given NMFS's own estimates of a 100-year recovery—and then only if there are no subsequent disturbance events over that time period—this means that an unsustainable amount of coral and sponge habitat is being destroyed each year, with serious and lasting impacts on benthic ecosystems. Legally, NMFS is required to take action if the adverse effects of fishing on essential fish habitat (EFH) are more than minimal and not temporary (NMFS 2002).

The establishment of MMAs is widely supported as a management tool to protect "biodiversity, benthic habitats, viable populations, and ecosystem processes" (Witherell and Coon 2000). In 2002, the Council tabled a proposal to protect cold-water corals in Alaska by establishing six MMAs totaling over 7,000 nautical square miles (Witherell and Coon 2000). The Council should revisit this proposal and enact a similar measure to create MMAs around important benthic habitats in the Bering Sea Canyons and eastern

Bering Sea shelf break. By doing so, the Council would fulfill its mandate to protect coral-sponge HAPCs from adverse impacts related to fisheries and anthropogenic greenhouse gas emissions.

6. Conclusion

The Council has a brief and rapidly closing window of opportunity to enact meaningful protections for the critically important eastern Bering Sea shelf break and canyons. The creation of ecosystem reserves in the form of no-take MMAs is accepted, wordwide, as the best way to achieve ecosystem resilience in the face of climate change in the North Pacific. We urge the Council to utilize the precautionary principle and to initiate the NEPA process, at this meeting (April 2014), by drafting a Purpose and Need statement, that includes, as an alternative, the creation of an ecologically connected network no-take MMAs that are adequate enough to preserve the resiliency and biodiversity of this unique ecoregion in the face of continued anthropogenic greenhouse gas emissions.

The Center urges the Council to make protections of the Bering Sea Canyons and eastern Bering Sea shelf break a priority and to use ecosystem-based management polices supported by the MSA to ensure that vulnerable habitats in the canyons are protected from destructive fishing activities.

Thank you.

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April 1, 2014

Mr. Eric Olson
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RE: C9 - Bering Sea Canyons

Dear Chairman Olson and Council Members,

We wish to thank the Council for convening the Bering Sea Canyons Workshop which informed the discussion paper being presented at this meeting. The Council has received numerous proposals and comments urging protections for the highly productive Bering Sea shelf-break and slope, including Zhemchug and Pribilof canyons, going back more than a decade.

A 2004 HAPC proposal noted protections for Zhemchug and Pribilof Canyons would "benefit future research, fisheries health, and the conservation of several sensitive species including long-lived and slow-reproducing fish such as rougheye and shortraker rockfish, rare marine mammals such as the harbor seal, and rare seabirds such as the short-tailed albatross."[1] A 2006 EFH proposal designed to protect Bering Sea habitat stated the fisheries do not exist independently in the ocean, but rather are part of a complicated and little understood food web, and indiscriminate destructive fishing practices in delicate living seafloor habitat like corals, sponges, seawhip groves, and other living substrates is unnecessarily harming the Bering Sea ecosystem.[2] In 2010 another HAPC proposal proposed protecting Bering Sea canyons for their importance as skate nursery habitat and "to allow for affects of global warming, in keeping with the precautionary approach advised by the first MSA national standards guideline, NSG1, due to lack of data available".[3] While the Council did designate four skate nursery sites as HAPCs in 2013 no measures have been implemented to protect this vulnerable habitat.

Preserving coral habitat is one of numerous science-based reasons to justify creating protections for the canyons and shelf-break slope. Additional good reasons include: protecting habitat for long-lived, slow maturing rockfish species; protecting foraging grounds for endangered species and culturally important yet declining northern fur seals; creating a refuge for Bering Sea marine life including salmon, halibut and other fish and invertebrates including some that might escape capture as bycatch; and providing a buffer

[1] Balliet, K. (2004). *Habitat areas of particular concern (HAPC) proposal*. Anchorage, AK. The Ocean Conservancy

[2] Oceana. 2006. *Bering Sea Essential Fish Habitat: Conservation Alternative*. North Pacific Fishery Management Council, Anchorage, AK.

[3] Walker, P. (2010) *HAPC Proposal Application*. Anchorage, AK. Coalition to Protect Ocean Diversity

against the significant uncertainty that exists in scientific data available to inform fishery management decisions. Yet, today, the discussion paper highlights: "Although large areas of the Bering Sea and Aleutian Islands have been protected from the effects of FMP fisheries, none of those areas encompass the Bering Sea slope or canyon areas."

Some proposed justifications for canyons and shelf-break protections, which have been expanded upon in previous documents submitted to this Council include:

- To mitigate the damage and destruction of coral and sponge habitat from fishing gear
- To conserve and enhance essential fish habitat in the Bering Sea
- To reduce bycatch of commercially important fish and keystone species e.g., salmon, halibut, coral
- To protect a representative portion of shelf-break slope habitat as a buffer against uncertainty
- To protect deepwater species with life history traits that make them vulnerable to fishing
- To protect spawning and nursery areas for Bering Sea species
- To protect habitat for pelagic species, allowing marine mammals and seabirds foraging areas without threat of mortality or disturbance from fishing
- To provide scientists with control areas that can provide baselines comparisons and increase understanding of fishing impacts and climate change
- To protect large-scale ecosystem processes responsible for the productivity and functional integrity of the ecosystem

Since the Council began receiving requests to provide protections for the Canyons and shelf-break additional studies, in situ research, and data modeling by scientists at the AFSC and U.C. Santa Barbara have confirmed that the shelf-break is unique. Both Pribilof and Zhemchug canyons stand out as areas of high coral and sponge concentration. One has only to look at the maps generated by these models to see that the shelf-break – dubbed the Green Belt by Springer et al in 1996 – is where the coral habitat in the eastern Bering Sea is located, not on the shelf and not in the deep basin.

The Canyons Workshop included some discussion of the various models used to predict coral habitat and their differences and limitations. NOAA's GAM model includes both presence and absence data. This is problematic because the survey method (trawl survey) is not designed for sampling corals and sponges. This bias results in an under-prediction of coral and sponge habitat. By contrast, the Maximum Entropy model employed by Miller of U.C. Santa Barbara relies on presence only data, removing that source of bias. The Miller model included all available coral and sponge data, including the trawl survey data, which means it is informed by more than ten times as many coral records as the NOAA model.

Both models predict that corals and sponges occur predominantly along the eastern Bering Sea slope, both inside and outside the canyons. The Sigler et al model estimates that about 30% of the coral habitat in the eastern Bering Sea occurs in Pribilof Canyon. Given the fact that 17% of Zhemchug canyon, approximately 25 km, is "too steep and bumpy" and has not been included in trawl surveys, the percentage of EBS coral and sponge habitat contained in these two canyons combined is likely even higher than predicted by Sigler et al's model.

The shelf break is clearly unique. No other area under the Council's jurisdiction is similar. This is why protections put in place in the Aleutians or the northern Bering Sea, for example, while useful, have minimal benefit for many of the core fisheries in the Bering Sea. The Council should consider what changes to the ecosystem and our fisheries might result if we degrade or destroy a substantive amount of the coral and sponge habitat in the EBS. It is difficult to imagine habitat that took hundreds of years to develop returning in time to benefit any generations in near centuries.

The recently adopted Ecosystem Approach for the NPFMC re-confirms this Council's commitment to ecosystem management as stewards of a public resource intended to sustain future generations. This recognition of the need for ecosystem management carries within it an understanding that the Council must consider the impacts of fishing on other species and ecosystem components above and beyond the target species covered by Fishery Management Plans. A healthy, biodiverse, and resilient ecosystem is one that maintains an intact complex food web, including whales, seabirds, fur seals, subsistence communities, fish, crabs, corals and many more species. Protecting Pribilof and Zhemchug canyons and representative shelf-break habitat would serve to offset the impact of fisheries and promote a healthy resilient ecosystem at the same time. This would appear practicable for Pribilof and Zhemchug canyons based on the relatively low amount of fishing effort in the area.

Fishery managers and scientists alike do not have all the information to make fully informed choices. With uncertainty comes the need for more conservative and precautionary choices as articulated in the NPFMC's Groundfish FMP: "As part of its policy, the Council intends to consider and adopt, as appropriate, measures that accelerate the Council's precautionary, adaptive management approach through community-based or rights-based management, ecosystem-based management principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints."[4]

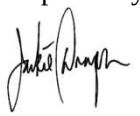
Actions that promote a healthy, resilient ecosystem are expected to be good for the fisheries but, conversely, habitat impacts from unconstrained fishing are not likely to benefit the ecosystem and could result in long-lasting and irreversible damage. Continuing to leave the shelf-break canyons and slope - critical to the ecology of the Bering Sea - fully unprotected, while knowing that these areas contain vulnerable seafloor habitat would be irresponsible.

We agree that this is an appropriate time to clearly state objectives for the conservation of this area. The Council's previous June 2013 motion initiating this discussion paper appeared to narrow the focus to coral protection alone. To move forward in that vein would fall short of the ecosystem-based approach to management that considers what actions can best provide for "healthy, productive, biodiverse, resilient marine ecosystems that support a range of services," envisioned by the Council.

We implore the Council to exercise progressive leadership on ecosystem management by creating an explicit Purpose and Need Statement with language that is inclusive, and not exclusive. Preserving coral habitat should clearly be one objective of this action, but the Council should consider other ecosystem benefits that can be achieved as well.

Thank you for your consideration of these comments.

Respectfully,



Jackie Dragon
Greenpeace

[4] NPFMC. 2014. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. Anchorage, AK 2014

March 31, 2014

Mr. Eric Olson
Council Members
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
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RE: C9 - Bering Sea Canyons

Dear Chairman Olson and Council Members,

The groups signed on to this letter represent millions of public stakeholders. We are writing to remind you of the enormous public mandate to protect the Bering Sea canyons in order to conserve highly vulnerable essential fish habitat, and for their value to the ecosystem that supports our nation's most productive fisheries. This sentiment has been set before you now in numerous public comment letters since March of 2011, echoed by this NGO coalition, by Native communities, by some of our nation's largest supermarket chains, by Seattle businesses, and in hand-written letters and petitions from over 125 thousand individual stakeholders across this country and abroad.

The development of management measures to protect the Bering Sea canyons provides this Council and NMFS with a keen opportunity to demonstrate global leadership in ecosystem management that will support sustainable fisheries and vibrant communities. We commend this Council for your previous actions which established precedent for your continued leadership in ecosystem management. Some of these actions include the preparation and development of Fishery Ecosystem Plans, the adoption of an ecosystem approach and vision, implementation of the Arctic Fishery Management Plan, limiting the expansion of bottom trawling, and protecting endangered Steller sea lions.

An ecosystem-based approach to fisheries involves moving beyond considerations for single commercially important species towards addressing how fishing activities affect biodiversity, food web interactions, and habitats in the service of healthy ecosystems that sustain fisheries. We applaud this Council for recently adopting as Council policy an ecosystem approach, and vision statement that foresees the need for precautionary management.

The Council's Ecosystem Vision statement is consistent with numerous international agreements, including the Convention on Biological Diversity, which exhorts fisheries management organizations around the world to move to an ecosystem-based approach to protect biodiversity and vulnerable habitats. The Convention recognizes that the conservation of biodiversity is "a common concern of human kind" and offers decision-makers guidance based on the precautionary principle. Lacking full scientific data, and recognizing the potential for a false prediction that human activity will not result in significant environmental harm to be especially harmful to society, this principal guides policy makers to anticipate, avoid, and mitigate threats to the environment.

The "ecosystem services" provided by the "Green Belt" canyons make the phenomenal productivity of the Bering Sea fisheries possible, and we should treat this area with care. Protecting a portion of this representative habitat, including the highly vulnerable coral and sponge essential fish habitat identified in the Pribilof and Zhemchug canyons, would be consistent with MSA mandates, international treaties and the Council's stated interests in advancing ecosystem-based and adaptive management for the fisheries. Additionally, supermarkets and consumers committed to purchasing and selling sustainable seafood will have more assurance that America's "fish basket" will continue to provide.

Last December, during staff tasking, the Council discussed its intent to draft a Problem and Need Statement for the Bering Sea Canyons issue and begin the scoping of alternatives at this April meeting. This action will allow for the public scoping of alternatives that will be analyzed as to their potential benefits and costs to the environment, Native communities and the fishing industry, consistent with the National Environmental Policy Act, which "is intended to help public officials make decisions that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment." 40 C.F.R. § 1500.1(c).

We urge you to craft a problem and need statement at this meeting that allows for the full analysis of a wide range of alternatives, and that can most effectively realize the Council's Ecosystem Vision. Protecting Bering Sea canyons and slope should naturally consider what is needed to safeguard long-lived rockfish species, vulnerable coral and sponge habitats, and the health and resiliency of the ecosystem more broadly. The biology of deep sea corals and sponges (i.e., longevity, fragility, growth rates) makes it unlikely that impacts from fishing gear can be mitigated with gear modifications. Closures are the only means to avoid contact and thus significant impacts to these highly vulnerable communities. Additionally, while the analysis may show that fishing impacts on some particular coral species can be reduced by certain management measures, there are greater ecosystem benefits to consider from other alternatives if this Council is committed to demonstrating its continued leadership in this area.

Thank you for your consideration of these comments.

Sincerely,

Heather Brandon
Senior Fisheries Officer
World Wildlife Fund

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President
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John Hocevar
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March 31, 2014

Mr. Eric Olson
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RE: Bering Sea Canyons

Dear Chairman Olson and Council Members,

Marine Conservation Institute would like to applaud the Council for adopting as Council policy, the ecosystem approach to management developed by the Council's Ecosystem Committee and Science and Statistical Committee in February 2014. We agree with the Vision Statement stating that the Council *envisions sustainable fisheries that provide benefits for multiple users that are maintained by healthy, productive, biodiverse, resilient ecosystems that support robust populations of marine species* ***at all trophic levels****, and are managed using a* ***precautionary****, transparent, and inclusive process.* Marine Conservation Institute believes a step in the right direction towards the Council's stated vision would be to create a network of fully protected representative areas along the entire shelf-break of the Bering Sea, not limited to, but including Zhemchug and Pribilof Canyons.

The value, both financially and ecologically, of the Bering Sea region cannot be overstated, but yet no protected areas exist along the shelf. Marine Conservation Institute believes such a network of protected areas (including the water column) would be a shining example of Ecosystem Fishery Management in action. While conservation of deep-sea coral areas and associated fish productivity is a critical component of the ecosystem-based protection approach we'd like to see take place in the Bering Sea's slope and canyon habitats, it is not the sole one. Scientific reports clearly show the benefits of protected areas for both sustainable fishing and biodiversity, and we encourage the Council to strongly protect representative areas along the Bering Sea slope from Navarin Canyon in the North to Bogoslof Canyon in the South.

Thank you for your consideration of these comments.

Sincerely,

Dr. John M. Guinotte, Marine Biogeographer

Dr. Lance Morgan, President and CEO

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Mr. Eric Olson
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RE: Bering Sea Canyons, Agenda Item (C-9)

Dear Chairman Olson and NPFMC Members,

As Washington-based businesses we all have a strong connection to the ocean, and a deep respect for the invaluable services the ocean provides. We support the growing campaign to protect the Bering Sea Canyons, the largest underwater canyons in the world.

These extraordinary canyons occur in the heart of the most productive of Bering Sea waters where the shelf plunges into depths that were once out of reach to fishermen. But today, technology and ever bigger boats can reach fish even in these depths. Zhemchug and Pribilof canyons contain high concentrations of deep sea corals and sponges, forming havens for commercially important fish, crab and other marine life. We are concerned about the potential long-term effects to the Bering Sea ecosystem if we continue to destroy in minutes habitat that took decades or even hundreds of years to form.

Our oceans are under pressure from climate change, overfishing, habitat loss, acidification, and pollution. According to NOAA scientists climate change is having a profound impact on ocean ecosystems, and marine protected areas are being increasingly recognised as a key tool for maintaining and restoring ecosystem resilience in a changing climate.[1] We must safeguard ocean productivity today, and not wait until a combination of stressors undermines the sea's ability to support thriving ecosystems. Seafood must be caught in ways that maintain the diversity, structure, and function of ecosystems while minimizing adverse impacts such as the destruction of essential fish habitat and the wasteful bycatch of marine life.

While we all recognize the value of healthy oceans, some of us are in the business of providing Washington's well-known quality seafood to local patrons and visitors and we are directly invested in supporting sustainable fisheries. We want to ensure that the Bering Sea, "America's Fish Basket", continues to provide the seafood products and jobs that sustain our businesses, our economy, and the broader health of our planet.

We appreciate the important work you do to manage our invaluable Bering Sea resources. With so much uncertainty and change to consider it makes good sense to protect some of the most valuable parts of our "fish basket" as an insurance policy against costly miscalculations. Securing some places for scientific research and ecological recovery will give us the best chance of maintaining resilient fisheries throughout these changing times. We urge you to act quickly to adopt protections for vulnerable coral and sponge habitats in the Bering Sea canyons.

Sincerely,

[1] http://marineprotectedareas.noaa.gov/sciencestewardship/climatechangeimpacts/

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LT Nails
Seattle, WA

Ben Knudsen
Digs
Seattle, WA

Lexy Ashley
Lucca Great Finds
Seattle, WA

Ameer Radwan
Couch Seattle
Seattle, WA

Marjorie Miller
Moxie Nutrition
Seattle, WA

Sam King
Phom Don Noodles
Seattle, WA

Ian Michael Smith
Secret Sausage
Seattle, WA

Tony Lau
Foundation Cross Fit
Seattle, WA

Caitlin Daly
Remedy Teas
Seattle, WA

Tamara Berringer
The Ballroom
Seattle, WA

Lindsey Johnson
Beyond the Ink Tattoo
Seattle, WA

Martha Davis
City Lights Sign Co.
Seattle, WA

Vivian Little
Dance Fremont
Seattle, WA

Matt Lincoln
Fremont Brewery
Seattle, WA

Jeff Carnell
Hidden Hand Tattoo
Seattle, WA

Renee Steen
Pie
Seattle, WA

Andrew Clark
Andrew Clark Photography
Mill Creek, WA

Martin Roberts
Stone Wood-fired Bagel Café
Seattle, WA

Stephanie Baz
Cracker Jack Crafts
Seattle, WA

Leon Hussel
Keep It Simple
Redmond, WA

Fernis Banen
Blazing Bagels
Redmond, WA

Julie Schuster
Lucky Jacks Tattoo
Redmond, WA

Linda Elliott
Redmond Floral
Redmond, WA

George DePasquale
Essential Bakery
Seattle, WA

Taryn Motts
The Octopus Bar
Seattle, WA

Andrew Forke
Sea Monster Lounge
Seattle, WA

Joan Shaw
RoRo BBQ & Grill
Seattle, WA

Farah Ismail
Bananas Grill
Seattle, WA

Nancy Joyner
Soulfood Café
Redmond, WA

Mike Jomla
India Bistro
Seattle, WA

Rachel Yang
Joule
Seattle, WA

Ben Smith
Stoneway Hardware
Seattle, WA

Lisa Jane Boyner
Wayward Vegan Café
Seattle, WA

Hans Zarato
Pierced Heart Tattoo
Seattle, WA

Brian Peters
Eco Elite Pest Control
Kent, WA

Dione Laurent
Airways Brewing Co.
Kent, WA

Island Soul
Theo Martin
Seattle, WA

Shahzad Raja
Caravan Kebab
Edmonds, WA

Fran Lumm
Arnie's Restaurant
Edmonds, WA

Jesus Martinez
Las Brisas, Mexican Family Restaurant
Edmonds, WA

Jamy Owens
Bill the Butcher
Edmonds, WA

Jenn Metcalf
Lemon Drop Skin Care
Kent, WA

My Hanh
Mynt Salon
Kent, WA

Jessica Duran
Haley's Corner
Kent, WA

Sarah Stewarts
Cutters Point Coffee
WA

Mike Jones
Zimp Carpet
WA

Naamden Sharaha
Aladdin Falafel
Seattle, WA

Karla Curry
Occasions Catering
Olympia, WA

Shandie Motts
Always Safe and Block
Olympia, WA

Kwanjai
Kwanjai Thai Cuisine
Seattle, WA

Sabrina Shane
Wish
Seattle, WA

Lara Hamilton
Book Larder
Seattle, WA

James Steener
Broadcast Coffee
Seattle, WA

Karyn Schwartz
The Sugar Pill
Seattle, WA