



NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

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Action Memo

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Dan Hull, Chairman
Chris Oliver, Executive Director

SUBJECT:
Pribilof Canyon Corals

ACTION REQUIRED:
Review report from 2014 Bering Sea slope and canyons survey, determine next steps

BACKGROUND:

In December 2006, the Council reviewed a discussion paper prepared by the AFSC that reviewed scientific information related to the Bering Sea canyons and skate nursery areas in the context of Essential Fish Habitat (EFH) for Habitat Areas of Particular Concern (HAPC) in the Bering Sea (McConnaughey et al. 2006). That paper suggested that EFH/HAPC for skates could be established along the Bering Sea slope and canyons; that action was taken by the Council in February 2013. McConnaughey et al. (2006) also considered whether the information known at the time suggested that protections were necessary for Bering Sea canyons. The authors concluded that although there are extensive geological studies of submarine canyons in the EBS, very little biological information was available to assess the value of canyon habitat for specific species, and the available data did not suggest that EFH or HAPC designation for the canyons was appropriate. The authors further concluded that a thorough assessment of EBS canyon habitats would require a dedicated survey involving a systematic study of habitats and coordinated biological sampling before management decisions could be made regarding the expected vulnerability of those habitats to anthropogenic disturbance.

Miller et al. (2012), partly in response to the recommendation for dedicated surveys, conducted video transects in Zhemchug and Pribilof canyons to evaluate the density of structure-forming corals and sponges and to evaluate the use of corals, sponges, and boulders as habitat by demersal fishes. Miller et al. (2012) concluded that the canyons are dominated by low relief soft substrate, which makes the corals an important habitat element that provides vertical relief. They further concluded that Pribilof and Zhemchug canyons harbor areas of "high densities of slow-growing corals that form the foundation of complex communities" and recommended that conservation of the canyons areas be given priority status in fisheries management decisions although specific recommendations for conservation were not provided.

In April 2012, the Council initiated two discussion papers in response to numerous proposals and public testimony regarding consideration of management measures to preserve representative portions of the slope and canyons habitats in the Bering Sea. Of particular interest to some members of the public were Pribilof and Zhemchug canyons, and their potential as important habitat for deep-sea corals and sponges, and for certain life stages of fish and crab species. The discussion papers were structured to better understand the importance of the canyons as unique habitats for benthic invertebrates and for FMP-managed species, and to

understand the current fishing activities in the canyons. These discussion papers were presented to the Council in June 2013.

In the first discussion paper, Sigler et al. (2013, attached) compiled data from the eastern Bering Sea that included trawl survey data on fish and invertebrate distributions and observations of ocean conditions and benthic habitat and analyzed them using multivariate techniques to determine if major Bering Sea canyons, including the two canyons, Pribilof and Zhemchug, are distinguishable from the adjacent continental slope. They concluded that while Pribilof and Zhemchug canyons do show some distinguishing physical characteristics from the adjacent slope areas (lower O₂ and pH, higher turbidity), they do not show distinguishing biological characteristics (fish, coral and sponge distribution). Sigler et al. (2013) concluded that although the Bering Sea canyons were not, themselves, good predictors for the presence of corals, about 30% of the coral habitat predicted for the eastern Bering Sea slope occurred in Pribilof Canyon (Figure 1). Coral habitat was also concentrated west of Pribilof Canyon. Sigler et al. (2013) note that although it appears that corals are concentrated in Pribilof Canyon, the average density of coral for Pribilof Canyon calculated from the Miller et al. (2012) data is only 0.28 colonies m⁻², which is much less than the density of corals in other areas in Alaska, such as the Aleutian Islands (1.23 colonies m⁻² found by Stone 2006), suggesting that although the Bering Sea slope and canyons appear to be important coral habitat within the Eastern Bering Sea, other areas in the North Pacific may be more important for corals. Sigler et al. (2013) also noted that the physical and biological features of Zhemchug and Pribilof Canyons are spatially heterogeneous, and that coral habitat was predicted to occur more often for some areas of Pribilof Canyon than others. These data were also published in the peer-reviewed literature (Sigler et al. 2015, attached).

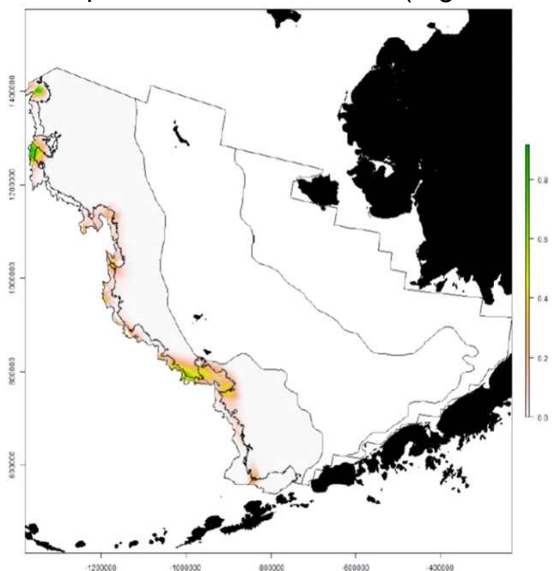


Figure 1. Probability of coral presence along Bering Sea slope and Canyons from original AFSC model.

In the second discussion paper, NPFMC (2013) reported the observed fishing activity in the Bering Sea canyons. From 2004 through 2012, the observed catch was dominated by trawl gear, and catch in Pribilof Canyon dominated catch from the canyons areas (Table 1). However, NPFMC (2013) also noted that the observed catch from either Pribilof or Zhemchug canyon is small when compared to the total Bering Sea catch for each gear type (Table 2).

Table 1. Total observed catch by gear type from Pribilof and Zhemchug Canyons, 2004-2012, all years combined.

FMP Gear	Pribilof Canyon catch (mt)	Zhemchug Canyon catch (mt)
Hook & Line	3,079	14,185
Pot	164	5
Trawl	283,660	34,046

Includes retained catch and some discards

Canyon area as defined by AFSC

Source: NFS AFSC Observer Program sourced through NMFS AKR, data compiled by AKFIN in Comprehensive_OBS. *In* NPFMC (2013)

Table 2. Total observed catch, as a percentage of total Bering Sea catch, by gear type from Pribilof and Zhemchug Canyons, 2004-2012, all years combined.

FMP Gear	Pribilof Canyon catch (% of total Bering Sea catch)	Zhemchug Canyon catch (% of total Bering Sea catch)
Hook & Line	0.44	2.04
Pot	0.35	0.01
Trawl	2.42	0.30

Same conditions and source as Table 1.

In June 2013, the Council requested that NMFS and Council staff: (1) identify and validate, where necessary, areas of coral concentrations on the Bering Sea slope and Pribilof and Zhemchug canyons, (2) initiate a discussion paper that addresses management concerns to be considered for conserving areas of coral concentration and associated fishing productivity, and (3) meet with AFSC and stakeholders to discuss possibilities for collaboration in order to survey areas of coral abundance and identify and develop tools for coral impact reduction.

In response to the Council's first request, NMFS initiated plans to conduct a comprehensive underwater camera-transect survey of the Bering Sea slope and canyons to verify modeled results of coral distribution and abundance. A total of 250 video transects, of the planned 300, were conducted from the chartered FV *Vesteraalen*, during August 10 - September 5, 2014. The results of that survey were published in June 2015 (Rooper et al. 2015, attached), and will be presented to the Council at this meeting. In response to the Council's second and third request, a public workshop was held in February, 2014 in association with the February Council meeting in Seattle, WA. The results of the workshop were presented to the Council in April, 2014 in a discussion paper that also presented a summary of what was then known about the abundance and diversity of corals on the Bering Sea slope and canyons (attached).

Recently, Miller et al. (2015, attached) used a different modeling approach to evaluate the importance of Pribilof and Zhemchug canyons as habitat for corals and sponges. The model they chose, MaxEnt, allows for the use of presence-only data (ignoring absence data) under carefully controlled sampling protocols. This

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model differs from those used in Sigler et al. (2013, 2015) and Rooper et al. (2015) in that models in the latter reports used not only presence data, but also abundance data and in some cases, catch rate data. Miller et al. (2015) conclude that the results from the MaxEnt model indicate that Pribilof Canyon contains more than half of the gorgonian coral habitat along the Bering Sea slope. This is consistent with the results of the AFSC model that indicated that Pribilof Canyon contains approximately 30% of the coral habitat predicted for the eastern Bering Sea slope. This is not surprising considering that most of the presence data for coral used by the Miller et al. (2015) model was from AFSC bottom trawl surveys.

In April 2014 the Council approved a statement of purpose and need (attached) that read:

“this action may identify a discrete area or areas of significant abundance of deep sea corals in, and directly adjacent to, the Pribilof canyon, assess the potential for fishing impacts on the identified area or areas of significant abundance, evaluate the historical and current patterns of fishing effort and fish removals in and adjacent to the Pribilof Canyon, consider the types of management measures that would be appropriate to conserve discrete areas of significant coral abundance while minimizing impacts on establishing fishing activity, and identify the appropriate authority under which the Council may take action”.

In April 2014 the Council also requested that time be scheduled for public scoping to focus on two topics: 1) the general range of alternatives that should be considered under this action; and 2) the best process by which to identify, develop, and refine alternatives. In December 2014 the Council heard from a number of stakeholders regarding both the range of alternatives and proper authority under which to take action. Comments focused on whether the Council should consider a narrow geographic scope for the action (focus on Pribilof Canyon) or maintain a broad geographic scope (consider the whole Bering Sea slope, including Zhemchug and other canyons). Some commenters and Council members stated that a narrow focus to concentrate on known, significant concentrations of corals in Pribilof Canyon was appropriate, while other commenters and Council members stated that it was more appropriate, at this stage, to keep the geographic scope broad and review data from the 2014 Bering Sea slope camera surveys before narrowing the scope of any potential action. In addition to concerns about the area considered, some commenters suggested that the deep-sea coral authority under the MSA was the appropriate authority for any potential action, while other commenters encouraged the Council to consider all authorities at this stage, and not eliminate certain authorities until all available data have been analyzed.

In addition to oral testimony at the December meeting, the Council also received many written comments from various stakeholders and members of the public. Additionally, the Council has received several letters from national seafood wholesalers and retailers (distributed in previous Council mailings) encouraging the Council to continue the regular analysis process to ensure that all relevant data are considered before the Council makes any management decisions regarding the Bering Sea slope or canyons.

At this meeting, the Council will review the results from the NMFS summer 2014 stereo camera survey along the eastern Bering Sea slope and Canyons. The Council will evaluate the new information presented at this meeting, and take action as necessary.