AGENDA D-2
APRIL 2012

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
Executive Director

DATE: March 21, 2012

SUBJECT: Staff Tasking

ESTIMATED TIME
4 HOURS

ACTION REQUIRED

(a) Review tasking and committees and provide direction.
(b) Receive IFQ Implementation Committee report and provide direction.

BACKGROUND

Committees and Tasking

The list of Council committees is attached as **Item D-2(a)**. **Item D-2(b)** is the three meeting outlook and **Item D-2(c)** provides a summary of current projects and tasking. An updated work plan for implementing the programmatic groundfish management policy is attached as **Item D-2(d)**. The Council may wish to discuss priorities for completing ongoing projects, as well as any new tasks assigned during the course of this meeting.

In February, the Council requested that the IFQ Implementation Team meet to review the status of four discussion papers tasked by the Council in 2010. The committee will meet on Monday evening, March 26, to review the status of these issues and make recommendations on whether to proceed with their further development. A January 2012 preliminary discussion paper is attached as **Item D-2(e)**.

NPFMC Committees & Workgroups
(Revised March 21, 2012)

Council/Board of Fisheries Joint Protocol Committee

Updated: 3/19/2012 Staff: Jane DiCosimo	Council: Dave Benson Ed Dersham Eric Olson	Board: John Jensen Mike Smith Sue Jeffrey

Council Coordination Committee
[Designated and renamed by Magnuson Act reauthorization April 2007]

Appointed: 4/05 Updated: 7/23/09 Staff: Chris Oliver	CFMC: C: Carlos Farchette ED: Miguel Rolón GMFMC: C: Robert Shipp ED: Steve Bortone MAFMC: C: Richard Robins ED: Chris Moore NEFMC: C: Rip Cunningham ED: Paul Howard	NPFMC: C: Eric Olson ED: Chris Oliver PFMC: C: Dan Wolford ED: Don McIsaac SAFMC: C: David Cupka ED: Bob Mahood WPFMC: C: Manuel Deunas ED: Kitty Simonds

Council Executive/Finance Committee

Updated: 8/10/07 Status: Meet as necessary Staff: Chris Oliver/Dave Witherell/Gail Bendixen	Eric Olson (Chair) Jim Balsiger (NMFS) Dave Hanson (PSMFC) Cora Campbell (ADFG) Roy Hyder (ODFW) Bill Tweit (WDFW)

Bering Sea Crab Advisory Committee

Appointed 4/25/07 Revised 11/15/07 Staff: Mark Fina	Sam Cotten (Chair) Jerry Bongen Steve Branson Florence Colburn Linda Freed Dave Hambleton Phil Hanson Tim Henkel	Lenny Herzog Kevin Kaldestad Frank Kelty John Moller Rob Rogers Simeon Swetzof Ernest Weiss

NPFMC Committees & Workgroups

(Revised March 21, 2012)

Bering Sea Salmon Bycatch Workgroup

Appointed: 3/07 Staff: Diana Stram	Stephanie Madsen (Co-chair) Eric Olson (Co-chair) Becca Robbins Gisclair John Gruver Karl Haflinger	Jennifer Hooper Paul Peyton Mike Smith Vincent Webster (BOF)

Comprehensive Economic Data Collection Committee

Appointed: 12/07 Updated: 2/9/09 Staff: Mark Fina	John Henderschedt (Chair) Bruce Berg Michael Catsi Dave Colpo Paula Cullenberg	Brett Reasor Glenn Reed Ed Richardson Mike Szymanski Gale Vick

Charter Management Implementation Committee

Appointed: 6/11 Staff: Jane DiCosimo	Gary Ault Seth Bone Ed Dersham (Chair) Ken Dole Tim Evers	Kent Huff Stan Malcolm Andy Mezirow Richard Yamada

Crab Interim Action Committee

[Required under BSAI Crab FMP]

Jim Balsiger, NMFS Cora Campbell, ADF&G Phil Anderson, WDF

Ecosystem Committee

Updated: 10/22/07 Status: Active Staff: Diana Evans	Stephanie Madsen (Chair) Jim Ayers Dave Benton Doug DeMaster/Bill Karp Dave Fluharty John Iani Jon Kurland

NPFMC Committees & Workgroups
(Revised March 21, 2012)

Enforcement Committee

Updated: 7/03 Status: Active Staff: Jon McCracken	Roy Hyder (Chair) Nicole Kimball, ADF&G Lisa Lindeman/Garland Walker, NOAA-GC Martin Loefflad, NMFS Sherrie Meyers/Ken Hansen, NMFS-Enforcement Glenn Merrill, NMFS CAPT Greg Sanial, USCG Jon Streigel, AK F&W Protection

Golden King Crab Arbitration Workgroup

Appointed: 1/12 Staff: Mark Fina	Larry Cotter Duncan Fields (Chair) Mark Johahnson Joe Sullivan	Brett Reasor Dick Tremaine Greg White

Halibut Charter Stakeholder Committee

Appointed: 1/06 Updated: 3/29/10 Status: Idle, pending direction Staff: Jane DiCosimo	Seth Bone Robert Candopoulos Ricky Gease John Goodhand Kathy Hansen Dave Hanson (Chair) Dan Hull	Chuck McCallum Larry McQuarrie Scott Meyer Rex Murphy Peggy Parker Charles "Chaco" Pearman Greg Sutter

IFQ Committee

Reconstituted: 7/31/03 Updated: 2/17/12 Staff: Jane DiCosimo	Bob Alverson Rick Berns Julianne Curry Tim Henkel Dan Hull (Chair) Jeff Kauffman	Don Lane Dave Little Kris Norosz Paul Peyton Jeff Stephan Phil Wyman

Non-Target Species Committee

Appointed: 7/03 Updated: 8/10/07 Staff: Jane DiCosimo, NPFMC/ Olav Ormseth, AFSC	Dave Benson (Chair) Julie Bonney John Gauvin Ken Goldman Karl Haflinger Michelle Ridgway	Janet Smoker Paul Spencer Lori Swanson Anne Vanderhoeven Jon Warrenchuk

NPFMC Committees & Workgroups
(Revised March 21, 2012)

Observer Advisory Committee

Reconstituted: 1/20/11 Updated: 2/12 Status: Active Staff: Chris Oliver/ Diana Evans	Bob Alverson Jerry Bongen Julie Bonney Kenny Down Dan Falvey Kathy Hansen Dan Hull (Chair) Michael Lake	Todd Loomis Paul MacGregor Brent Paine David Polushkin Joe Rehfuss Darren Stewart Ann Vanderhoeven

Pacific Northwest Crab Industry Advisory Committee

Appointed: 12/10 Staff: Diana Stram	Keith Colburn Kevin Kaldestad Garry Loncon Steve Minor (Chair) Gary Painter Kirk Peterson Rob Rogers (Vice Chair)	Vic Sheibert Dale Swartzmiller Gary Stewart Tom Suryan Elizabeth Wiley Arni Thomson, Secretary (non-voting)

Rural Outreach Committee

Appointed: 6/09 Staff: Steve MacLean	Eric Olson (Chair) Paula Cullenberg Duncan Field Tim Andrew Tom Okleasik Ole Olsen Pete Probasco

Steller Sea Lion Mitigation Committee

Appointed: 2/01 Updated: 11/09 [formerly SSL RPA Committee; renamed February 2002] Staff: Steve MacLean Advisor: Dan Hennen	Larry Cotter (Chair) Jerry Bongen Julie Bonney Kenny Down John Gauvin Pat Hardina Sue Hills Frank Kelty	Steve MacLean Stephanie Madsen Max Malavansky, Jr Gerry Merrigan Mel Morris Art Nelson Glenn Reed Beth Stewart

AGENDA D-2(b)
MARCH/APRIL 2012

DRAFT NPFMC THREE-MEETING OUTLOOK - updated 3/20/12

March 26 - April 3, 2012 Anchorage, AK	June 4 - 12, 2012 Kodiak, AK	October 1-9, 2012 Anchorage, AK
AFA Pollock Cooperative and IPA Reports		
Amendment 80 Cooperative Reports	SSL EIS scoping (T)	SSL EIS scoping (T)
CGOA Rockfish Cooperative Reports		
SSL: ***Review Notice of Intent***		Observer Deployment Plan: ***OAC report; action as necessary***
EFH Consultation Process: ***Update***		
SOPP: ***Review and Approve***	Halibut workshop report: ***Review***	
Observer Program: ***Update***		
Halibut CSP: ***Review and action as necessary***	GOA Halibut PSC: ***Final Action***	
Halibut Area 4B Fish-up: ***Final Action***	GOA comprehensive halibut bycatch amendments: ***Disc paper***	BSAI Chum Salmon Bycatch: ***Final Action (T)***
Joint Protocol Committee: ***Report***	BSAI halibut PSC limit: ***Discussion paper (T)***	
GOA Pacific cod A-season opening dates: ***Discussion paper***		GOA Chinook Bycatch All Trawl Fisheries: ***Initial Review (T)***
P.Cod Jig Management: ***Revised Discussion Paper***	Halibut/Sablefish IFQ Leasing prohibition: ***NMFS Discussion paper***	
Limit Other Gear on Jig Vessels: ***Discussion Paper***	Halibut/sablefish IFQ changes: ***Discussion paper (T)***	
	H&S IFQ Implementation Committee Report	
	BSAI Greenland turbot allocation: ***Discussion paper***	
BS Habitat Conservation Area Boundary: ***Review***		BSAI Crab active participation requirements: ***Initial Review***
		BSAI Crab Cooperative Provisions for Crew : ***Discussion paper***
BSAI Chum Salmon Bycatch: ***Initial Review***	BSAI Crab Binding Arbitration - GKC: ***Workgroup report***	
	Binding Arbitration Issues (lengthy season, publishing decisions, IPQ Initiation): ***Discussion Paper***	
GOA Flatfish Trawl Sweep Modifications: ***Final Action***		Northern Bering Sea Research: ***Discussion paper***
BSAI Crab ROFR Workgroup: ***Report; action as necessary***	Revise BS FLL GOA cod sideboards: ***Discussion paper (T)***	AFA Vessel Replacement GOA Sideboards: ***Initial Review (T)***
	FLL Vessel Replacement: ***Initial Review/ Final Action***	
Scallop SAFE: ***Approve harvest specifications***		
BS Tanner crab model: ***SSC review***	BSAI Flatfish specification flexibility: ***Discussion Paper***	Groundfish Catch Specifications: ***Adopt proposed specficiations***
BSIERP Management Strategy Evaluation: ***Report***	Crab Plan Team Report: ***Set Catch Specifications for 4 stocks***	
Groundfish PSEIS: ***Stakeholder workshop***	Pribilof BKC Rebuilding Plan: ***Final Action***	BSAI Tanner Crab rebuilding plan: ***Initial Review***
	BSAI Tanner Crab rebuilding plan: ***Revise Alternatives***	
HAPC - Skate sites: ***Initial Review***	HAPC - Skate sites: ***Final Action***	
		ITEMS BELOW FOR FUTURE MEETINGS
VMS Use and Requirements: ***Discussion paper***	5-Year Research Priorities: ***Review and Approve***	Crab PSC numbers to weight: Discussion paper
	PSEIS: ***Review comments & reports; action as necessary***	Crab bycatch limits in BSAI groundfish fisheries: Disc paper
PSEIS status review: ***SSC only***	Total catch and ACLs: ***Discussion paper - SSC only (T)***	AI P.cod Processing Sideboards: Initial Review
	Grenadiers: ***Discussion paper***	BBRKC spawning area/fishery effects: Updated Disc paper (Dec)
	GOA pollock EFP: ***Review (T)***	MPA Nominations: Discuss and consider nominations

AI - Aleutian Islands
AFA - American Fisheries Act
BiOp - Biological Opinion
BSAI - Bering Sea and Aleutian Islands
BKC - Blue King Crab
BOF - Board of Fisheries
CQE - Community Quota Entity
CDQ - Community Development Quota
EDR - Economic Data Reporting
EFP - Exempted Fishing Permit
EIS - Environmental Impact Statement
EFH - Essential Fish Habitat
FLL - Freezer longliners
GOA - Gulf of Alaska

GKC - Golden King Crab
GHL - Guideline Harvest Level
HAPC - Habitat Areas of Particular Concern
IFQ - Individual Fishing Quota
IBQ - Individual Bycatch Quota
MPA - Marine Protected Area
PSEIS - Programmatic Suplimental Impact Statement
PSC - Prohibited Species Catch
RKC - Red King Crab
ROFR - Right of First Refusal
SSC - Scientific and Statistical Committee
SAFE - Stock Assessment and Fishery Evaluation
SSL - Steller Sea Lion
TAC - Total Allowable Catch

Future Meeting Dates and Locations

March 26-April 3, 2012 - Hilton Hotel, Anchorage
June 4-12, 2012 - Best Western, Kodiak
October 1-9, 2012 - Hilton Hotel, Anchorage
December 3-11, 2012 - Anchorage
February 4-12, 2013, Portland
April 1-9, 2013, Anchorage
June 3-11, 2013, Juneau
September 30-Oct 8, 2013 Anchorage
December 9-17, 2013, Anchorage

(T) Tentatively scheduled

NPFMC/NMFS Action

Updated 3/20/12

Action	Status	Staffing	2012: Mar – Dec (Mar, Apr, May, June, July, Aug, Sep, Oct, Nov, Dec)
Blue = Post Council Action, Rulemaking			
Halibut Catch sharing plan	Preparation of Final Rule	NMFS 80% Council 20%	See NMFS Management Report
BSAI crab C-shares	Preparation of rulemaking package	NMFS 80% Council 20%	See NMFS Management Report
Litigation workload	Ongoing	NMFS 90% Council 10%	See NMFS Management Report
Am 80 lost vessel replacement	Proposed and Final Rule	NMFS 90% Council 10%	See NMFS Management Report
12 month 20% halibut sablefish QS	Proposed and Final Rule	NMFS 100% Council 0%	See NMFS Management Report
Tanner crab bycatch in the GOA	Preparation of rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
BSAI Arrowtooth Flounder MRAs	Preparation of rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
Observer Program restructuring	Preparation of SOC draft and rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
BSAI Crab Emerg relief	Preparation of rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
CQE changes: communities, Use caps, 3A D class, 4B	Preparation of rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
Salmon FMP Revisions	Preparation of rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
Halibut/sablefish Hired Skipper	Preparation of rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
BSAI Crab IFQ/IPQ application	Preparation of rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
Chinook salmon bycatch in GOA pollock fishery	Preparation of rulemaking package	NMFS 90% Council 10%	See NMFS Management Report
BSAI Crab EDR	Proposed and Final Rule	NMFS 90% Council 10%	See NMFS Management Report
Remove inactive Halibut/ Sablefish QS	Preparation of Final Rule	NMFS 100% Council 0%	See NMFS Management Report

AGENDA D-2(c)
MARCH-APRIL 2012

Action	Status	Staffing	2012									
			Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Green=project underway												
Outreach activities	Committee meetings; ongoing projects	NMFS 10% Council 90%										
Prib BKC rebuilding	Final Action in June	NMFS 50% Council 50%										
BSAI Chum Salmon Bycatch	Initial Review in April	NMFS 50% Council 50%										
GOA halibut PSC limits	Final Action in June	NMFS 20% Council 80%										
BS Tanner Crab Rebuilding Plan	Initial Review in Oct	NMFS 50% Council 50%										
GOA Flatfish Trawl Sweeps	Final Action in April	NMFS 50% Council 50%										
Skate Egg Concentrations HAPC	Initial Review in April	NMFS 50% Council 50%										
BSAI Freezer longliner replacement	Final Action in June	NMFS 20% Council 80%										
Halibut CSP amendment	Discussion paper in March	NMFS 20% Council 80%										
Chinook salmon bycatch in the GOA - all fisheries	Initial Review in June	NMFS 20% Council 80%										
AFA vessel replacement sideboards	Initial Review in Oct	NMFS 20% Council 80%										
SSL EIS	EIS being prepared	NMFS 90% Council 10%										
Halibut IFQ Issues - 4A halibut retention, GOA sablefish pots, A sablefish use caps, unharvested area 4 halibut	Discussion paper in June	NMFS 20% Council 80%										
GOA P. cod jig management	Update in April	NMFS 50% Council 50%										
GOA P. cod jig limit gear onboard	Discussion paper in April	NMFS 50% Council 50%										

Action	Status	Staffing	2012									
			Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Yellow = Project initiated but not yet fully underway												
Grenadiers	Discussion paper in June	NMFS 50% Council 50%										
Groundfish ACL uncertainty	Future Analysis	NMFS 90% Council 10%										
MPA nomination process	Discuss in future	NMFS 40% Council 60%										
4A halibut retention with sablefish	Discussion paper	NMFS 0% Council 100%										
Pots for GOA sablefish	Discussion paper	NMFS 20% Council 80%										
Unharvested halibut in Area 4	Discussion paper	NMFS 20% Council 80%										
Increase use caps for A sablefish	Discussion paper	NMFS 20% Council 80%										
Crab bycatch limits in BSAI groundfish fisheries	Discussion paper for future meeting	NMFS 20% Council 80%										
NBSRA Research Plan	Report in October	NMFS 90% Council 10%										
BSAI flatfish specification flexibility	Discussion paper in June	NMFS 90% Council 10%										
BB RKC Spawning Area	Discuss in December	NMFS 60% Council 40%										
Greenland turbot allocation	Discussion paper in June	NMFS 20% Council 80%										
BS FLL GOA cod sideboards	Discussion paper in June	NMFS 20% Council 80%										
VMS Requirements	Discussion paper in April	NMFS 20% Council 80%										
GOA Comprehensive halibut PSC Amendment	Discussion paper in June	NMFS 10% Council 90%										
BSAI Halibut PSC limit	Discussion paper in June	NMFS 20% Council 80%										
GOA P.cod A-season dates	Discussion paper in April	NMFS 20% Council 80%										

Action	Status	Staffing	2012 Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Purple=Potential new project												
PSEIS Review	Receive update in Feb	NMFS 30% Council 70%										
BSAI crab control rules and uncertainty	Ongoing evaluation	NMFS 33% ADF&G 33% Council 34%										
BSAI Crab PSC to Weight	Discussion paper in future	NMFS 70% Council 30%										
AI processing sideboards	unscheduled	NMFS 10% Council 90%										
BSAI Crab 5-year review changes	Discussion paper/ workgroup report	NMFS 20% Council 80%										

Groundfish Workplan

Priority actions revised in February 2007, status updated to current

General Priority (in no particular order)		Specific priority actions	Related to management objective	Status (updated 3-24-12)	2012 Apr	2012 Jun	2012 Oct	2012 Dec
Prevent Overfishing	a.	continue to develop management strategies that ensure sustainable yields of target species and minimize impacts on populations of incidentally-caught species	5	*Aggregate ABC/OFL for GOA 'other species' in Apr 08 BSAI skates TAC breakout in Oct 2009 remaining other species mgmt addressed under ACLs; final action in Apr 10*				
	b.	evaluate effectiveness of setting ABC levels using Tier 5 and 6 approaches, for rockfish and other species	4	*AFSC responding to CIE reviews as part of harvest specifications process*				
	c.	continue to develop a systematic approach to lumping and splitting that takes into account both biological and management considerations	5	*report from non-target species committee in Dec 09*				
Preserve Food Web	a.	encourage and participate in development of key ecosystem indicators	10	ecosystem SAFE presented annually; GOA indicator synthesis for 2012; *EBS and AI indicator syntheses begun in 2010, 2011*				
	b.	Reconcile procedures to account for uncertainty and ecosystem considerations in establishing harvest limits, for rockfish and other species	11	*report from non-target species committee in Dec 09 AFSC discussion paper Jun 2011, considered during harvest specifications*				
	c.	develop pilot Fishery Ecosystem Plan for the AI	13	*FEP brochure published Dec 07 AI ecosystem assessment for Dec 2011*				
Manage Incidental Catch and Reduce Bycatch and Waste	a.	explore incentive-based bycatch reduction programs in GOA and BSAI fisheries	15	*partially addressed in BSAI salmon bycatch EIS. Tanner crab Kodiak closures (C action Oct 2010); GOA pollock / Chinook final action Jun 2011* GOA Chinook non-pollock PSC limits - init rev Oct 12 BS chum initial review Apr 2012				
	b.	explore mortality rate-based approaches to setting PSC limits in GOA and BSAI fisheries	20	*partially addressed in BSAI salmon bycatch EIS* analysis of BSAI crab bycatch limits in 2012				
	c.	consider new management strategies to reduce incidental rockfish bycatch and discards	17	*partially addressed in rockfish program*				
	d.	develop statistically rigorous approaches to estimating bycatch in line with national initiatives	14, 19	*National Bycatch Report revised in 2011*				
	e.	encourage research programs to evaluate population estimates for non-target species	16	~~*Part of research priorities, adopted in June 2007*~~				
	f.	develop incentive-based and appropriate biomass-based trigger limits and area closures for BSAI salmon bycatch reduction, as information becomes available	14, 15, 20	*bycatch limit for Chinook adopted Apr 09;* initial review chum bycatch analysis in Apr 2012				
	g.	assess impact of management measures on regulatory discards and consider measures to reduce where practicable	17	*partially addressed by arrowtooth MRA analyses (Council action: GOA - Oct 07, BSAI - Oct 10)*				

Groundfish Workplan

Priority actions revised in February 2007, status updated to current

General Priority (in no particular order)		Specific priority actions	Related to management objective	Status *(updated 3-24-12)*	2012 Apr	2012 Jun	2012 Oct	2012 Dec
Reduce and Avoid Impacts to Seabirds and Marine Mammals	a.	continue to participate in development of mitigation measures to protect SSL through the MSA process including participation in the FMP-level consultation under the ESA	23	*RPA from final NMFS Biological Opinion implemented by Secretarial action for Jan 2011* SSL EIS initiated, discussion of NOI Apr 2012				
	b.	recommend to NOAA Fisheries and participate in reconsideration of SSL critical habitat	23					
	c.	monitor fur seal status and management issues, and convene committee as appropriate	24, 25					
	d.	adaptively manage seabird avoidance measures program	22	*Council action, seabird avoidance measures in 4E in Jun 08*				
Reduce and Avoid Impacts to Habitat	a.	evaluate effectiveness of existing closures	26	part of Bristol Bay red king crab paper Dec 2012				
	b.	consider Bering Sea EFH mitigation measures	27	*Council action on measures in June 07* *BS flatfish trawl sweep mods required in Oct 09* *EFH 5-year review/omnibus amds approved Apr 2011* discussion on Bristol Bay red king crab Dec 2012 Northern BS Research Plan white paper June 2012				
	c.	consider call for HAPC proposals on 3-year cycle	27	*HAPC cycle changed to 5 years, adopted Apr 2011* HAPC skate nurseries initial review Apr 2012				
	d.	request NMFS to develop and implement a research design on the effects of trawling in previously untrawled areas	27	*Part of research priorities, adopted in June 2007* Also part of NBSRA research plan development				
Promote Equitable and Efficient Use of Fishery Resources	a.	explore eliminating latent licenses in BSAI and GOA	32	*Council action on trawl LLP recency in Apr 08* *GOA fixed gear latent licenses in Apr 09*				
	b.	consider sector allocations in GOA fisheries	32, 34	*Final action GOA Pcod sector allocations Dec 09* *Reauthorization of GOA rockfish program, Jun 2010* part of comprehensive GOA halibut - discuss Jun 12				
Increase Alaska Native and Community Consultation	a.	Develop a protocol or strategy for improving the Alaska Native and community consultation process	37	*protocol presented in Jun 08* annual review of protocol				
	b.	Develop a method for systematic documentation of Alaska Native and community participation in the development of management actions	37	*outreach plan for chum salmon in Feb-Mar 2011* periodic Outreach Committee meetings				
Improve Data Quality, Monitoring and Enforcement	a.	expand or modify observer coverage and sampling methods based on scientific data and compliance needs	38, 39	*improvements Apr 08, restructuring approved Oct 10* update on implementation of restructuring Apr 2012 continuing work with electronic monitoring				
	b.	explore development programs for economic data collection that aggregate data	40	*final action, salmon bycatch data collection Dec 09* *partially addressed in BSAI Amd 80*				
	c.	modify VMS to incorporate new technology and system providers	41	*Council action, VMS exemption for dinglebar gear, Jun 08*				

STATUS REPORT ON
FOUR DISCUSSION PAPERS FOR 2009 HALIBUT/SABLEFISH IFQ PROPOSALS
January 18, 2012

The North Pacific Fishery management Council (Council) called for commercial halibut/sablefish Individual Fishing Quota (IFQ) proposals during Summer 2009. The IFQ Implementation Committee convened in November 2009 to review IFQ proposals and recommended that several be advanced for consideration by the Council[1]. The committee reconvened in February 2010 to consider late proposals. In February 2010 the Council recommended that five proposed actions be developed into analyses. These were completed by the Council in 2011 and 2012. Three have been submitted to NMFS for approval and implementation. One was considered by the Council but no action was taken. A preferred alternative was scheduled for final action at the February 2012 meeting for a fifth proposed action.

In February 2010 the Council also recommended that four proposals be developed into discussion papers before it would consider initiating further action. The Council directed that staff prepare the discussion papers as time was available after other higher Council priorities. Development of charter halibut analyses and new commercial IFQ analyses were identified as higher priorities over these discussion papers.

Some preliminary coordination between Council staff and other agency staff and assembling background information has begun on these proposals.

1. Develop a discussion paper to allow the retention of 4A halibut incidentally caught while targeting sablefish in the Bering Sea and Aleutian Island regulatory areas. Included in the discussion paper is the premise that this action has the objective of not increasing halibut bycatch levels.

2. Develop a discussion paper to explore the implications of using pots for the Gulf of Alaska sablefish fishery, and address the following issues:

- 1) restrictions to gear usage
  - a) single vs longline pots
  - b) pots retained on grounds for long soaks vs retrieved during deliveries
  - c) pot storage
  - d) gear configuration requirements
  - e) gear conflicts
  - f) use the 200 fathom depth contour to mark open areas
  - g) pot soak time
- 2) area management (SE vs GOA)
- 3) exacerbation of halibut mortality
- 4) dynamic (social/economic) effects
  - a) safety issue related to use of pots by small vessels
  - b) crew employment
  - c) QS prices
  - d) ongoing acoustic research for avoiding whale depredation

Following development of the discussion paper, the Council may consider forming a gear committee composed of affected stakeholders to discuss the findings of the paper and make recommendations to the Council prior to proceeding to analysis.

3. Develop a discussion paper to assess whether the problem of unharvested halibut IFQ in Area 4 is attributable to the current vessel IFQ cap or are there other factors that could be identified as contributing to unharvested halibut in Area 4.

4. Initiate a discussion paper for removal of the block system for sablefish A shares and increase in the sablefish A share only cap. The A share exemption, would be from the overall sablefish use cap (no catcher vessel QS onboard) and regardless of whether the sablefish harvest was processed. The discussion paper should explore adding a use cap increase to the BSAI.

[1] http://www.alaskafisheries.noaa.gov/npfmc/halibut/sablefish-ifq-program.html

1. **Develop a discussion paper to allow the retention of 4A halibut incidentally caught while targeting sablefish in the Bering Sea and Aleutian Island regulatory areas. Included in the discussion paper is the premise that sablefish pot tunnel regulations will not change in the BS/AI regulatory area.**

Mr. Hebert submitted a proposal on October 22, 2008 to the IPHC. While the IPHC has the authority to regulate fishing gear in the halibut fisheries it chose to consult with the Council before considering the proposed action. The Council included this proposal under its 2009 call for IFQ proposals.

The proposer intends for a regulatory amendment for an experimental period to determine the results of allowing the retention of halibut caught as bycatch in pots in the sablefish fishery by IFQ holders of both halibut and sablefish in the area that overlaps with IPHC Area 4A. The proposer notes that the intent of the proposal is to allow similar action as was allowed in Area 2B (British Columbia) that allows coincident harvest of halibut and sablefish in pot gear. Three primary objectives of the proposal are:

1) Increase the area of harvest of halibut in Area 4A. The proposer reports that there is a large portion of Area 4A that is not fished due to whale predation using longline gear. Pots can be used to more successfully harvest halibut.
2) Reduce halibut bycatch mortality from killer whale predation and handling. Halibut bycatch mortality would be reduced eliminating mortality due to handling to release halibut prohibited to be retained from pot gear and sue to whale predation.
3) Reduce concentrated halibut harvest in traditional "whale-free" areas as a result of increased presence (time and space) of whales. The proposal would reduce pressure on the halibut resource and competition between vessels in limited area of successful halibut fishing.

The *IFQ Implementation Committee* determined that this issue had a higher priority than most others. This is a conservation and utilization issue. As noted in the proposal whale depredation has increased in the area due to discarding halibut caught as bycatch. There is concern that the bycatch mortality rate of halibut is increasing due to whales. Recognizing the potential for this provision to be misused, the paper should explore mechanisms that would ensure that the halibut bycatch be kept to a minimum and that the intent to allow only for incidental catch is captured.

An *interagency staff group* reviewed the proposal. "This proposal was forwarded to the Council by the IPHC after its 2009 annual meeting because the proposal would affect the Council's sablefish IFQ fisheries. A regulatory amendment would be required with respect to the differences in the VMS clearance requirements for Area 4 halibut (as found in the Annual IPHC regulations) and BSAI sablefish (as found in Section 679). Halibut fishermen have to call the data clerks "within 72 hours before fishing," while sablefish fishermen have to call the data clerks "at least 72 hours prior to fishing." For enforcement purposes, staff recommends developing a new figure that identifies where halibut retention would be allowed (area that overlaps Area 4A with the BS and AI sablefish management areas); new regulations would identify the latitude and longitude where halibut retention would be allowed.

A small amount of sablefish pot fishery data is available from observer and logbook data, and is included in the SAFE Report. If the Council recommends that this proposal be analyzed, staff recommends that the proposed alternative require halibut to be retained if IFQs are held by fishermen on the vessel. Staff noted that regulations would be difficult to craft to avoid targeting of halibut in pots in this area; however, the sablefish pot configurations could reduce catchability of halibut."

The *Advisory Panel* took no action on this proposal.

In February 2010 *the Council* requested a discussion paper as noted above.

STATUS: The above information was assembled.

2. Explore the implications of using pots for the Gulf of Alaska sablefish fishery.

Mr. Michael Douville of Craig, Alaska submitted a proposal on March 31, 2006 to allow the use of pots in the sablefish fishery in southeast Alaska. He identified that his proposal can address several problems which the Council is working on: a) seabird by-catch and b) interaction with whales. He identified that there would be no negative impact on anyone under his proposal. As an allowable gear type, fishermen could choose to use pots, but would not be required to invest in new gear, if they are happy with long line gear. He identified potential positive outcomes of a decline in seabird by-catch, including albatross, and a decrease in fishing gear/whale activity. Bycatch of rockfish would also be reduced, with less bait and effort to catch the same amount of fish. He suggested that the use of bird deterrent lines is cumbersome and unnecessary for many areas in Southeast Alaska and that research has demonstrated that whales will continue to take fish from longline gear.

The *IFQ Implementation Committee* in November 2009 forwarded this proposal for Council consideration due to changes in the conditions on the fishing grounds. The IFQ Implementation Committee noted that while seabird interactions are no longer a serious concern, there have been extreme sperm whale interactions with the fleet in the GOA. Allowing pot gear in this fishery could mitigate challenges, but there are a number of implications that must be considered, such as gear conflicts, gear loss, and changes in crew jobs. The Team adopted the following motion.

"Recommend that the proposal has merit for Council review and analysis. If the Council adopts this proposal for analysis the team recommended that the proposal be expanded to the GOA, and the analysis should address the following issues: 1) restrictions to gear usage (a) single v longline pots, b) pots retained on grounds for long soaks v retrieved during deliveries, c) pot storage, d) gear configuration requirements; e) gear conflicts, f) use the 200 fathom depth contour to mark open areas, g) pot soak timeslot; 2) area management (SE v GOA); 3) exacerbation of halibut mortality; 4) dynamic (social/economic) effects, including a) small vessels could not safely use pots, b) crew employment, c) QS prices; d)ongoing acoustic research for avoiding whale depredation." Passed 10:1.

An *interagency staff group* reviewed the proposal to allow retention of sablefish in pots in the GOA Southeast Outside management area. "This would require a regulatory amendment to Section 679 (plan amendment too?) to allow a new gear type for sablefish. USCG staff recommends defining areas by lat/long where the new gear type would be allowed, and not by the 200 fathom contour. Enforcement of Proposal 2 is within the scope of the Joint Enforcement Agreement, it's not currently addressed in the Annual Operations Plan. If this proposal is implemented in regulations, NOAA would likely discuss the issue with Wildlife Troopers and possibly include it in the annual operations plan, as well as rely heavily upon the USCG for enforcement. If the Council recommends that this proposal be analyzed, staff recommends expanding the proposed action to require distinctive marking of buoys by gear type for all groundfish fisheries. This proposal would affect the EEZ only, and would be outside the scope of the joint enforcement agreement with the State of Alaska."

The *Advisory Panel* concurred with the Team recommendation in February 2010. The AP unanimously recommended that the Council initiate a discussion paper on the use of pots in the GOA and/or SE sablefish fishery and establish a gear committee to identify possible gear conflicts and grounds preemption issues. The motion passed 17:0.

In February 2010 *the Council* adopted the AP motion and identified an extensive list of issues that the paper should discuss. No progress has been made on those issues, although some of the gear issues were previously addressed in the sablefish assessment several years ago.

Background

GOA Amendment 12 Pot Gear Prohibition for Sablefish (withdrawn)

<u>**Dates:**</u> Amendment 12 was adopted by the Council in July 1982. No record of a proposed or final rule was available, as the amendment was withdrawn after adoption of Amendment 14.

<u>**Purpose and Need:**</u> Amendment 12 addressed two potential problems in the Southeast sablefish fishery:

(1) conservation and restoration of the depressed sablefish fishery; and
(2) fishing grounds preemption and wastage of the existing sablefish resource.

Regulation Summary: Amendment 12 prohibited the use of pot longline gear for sablefish between 140°W longitude and Cape Addington.

Analysis: A 21-page RIR (draft dated April 1983) analyzed three alternatives: 1) the status quo; 2) make sablefish an exclusive hook and line fishery between 140°W longitude and Cape Addington (preferred action); and 3) do not include trawl gear in the proposed management measure. Pot gear was identified as less suitable for the area, given the bottom topography. Lost pot gear entangles hook and line gear, making both irretrievable and leading to ghost fishing. This situation led to a grounds preemption problem that resulted in pot longline gear being prohibited in southeast Alaska. Pot longline gear was used extensively in the mid-1970s, but was used to harvest less than one percent of sablefish between 1980 and 1982. Since there was no existing or anticipated trawl fishery for sablefish in this area, a restriction on the use of trawl gear for sablefish was not adopted. However, later trawl gear was limited to sablefish bycatch in other directed groundfish trawl fisheries.

Results: Hook and line is the only allowed gear in the directed sablefish fishery. Amendment 14 prohibited the use of all pot gear in this fishery. An individual fishing quota program for sablefish was approved in 1988 and implemented in 1995 in both the GOA (Amendment 20) and BSAI (Amendment 15). Pot longline gear continues to be permitted for sablefish in the Bering Sea and Aleutian Islands.

GOA Amendment 14 Sablefish Gear, Area and Seasonal Allocation, Demersal Shelf Rockfish Management, Optimum Yield Reductions, Halibut Prohibited Species Catch Framework, Habitat Policy, Catcher/Processor Reporting Requirements

Dates: GOA Groundfish FMP Amendment 14 was adopted by the Council in May 1985. NMFS published the proposed rule on July 26, 1985, and a final rule on October 24, 1985, effective November 18, 1985 (50 FR 43193).

Purpose and Need: The sablefish fishery traditionally had been a foreign longline fishery off Alaska, but in the eastern Gulf of Alaska in the early 1980s, domestic longliners had increased their harvests rapidly as markets developed. With improvements in the market for sablefish, two new gear types, pots and sunken gillnets, entered the fishery in 1984. In addition, trawling by foreign joint ventures in the Central and Western Gulf also took sablefish. All these gears created an overcapacity problem in the domestic sablefish fishery, as well as gear conflicts between longliners and pot fishermen. This amendment was designed to address these excess capacity and grounds preemption problems. They decided that gear and area restrictions and apportionments to gear types would be most effective.

In the early 1980s, all Sebastes species other than Pacific ocean perch and four associated slope rockfish species were managed as "other rockfish" on a Gulf-wide basis, and yet a domestic fishery harvesting demersal shelf rockfish in the southeastern area was expanding very rapidly by 1984. Yelloweye and quillback rockfish were the primary targets of this longline fishery. Amendment 14 was designed to separate out and protect demersal shelf rockfish from the more general "other rockfish" category.

Other parts of Amendment 14 were designed to establish revised optimum yields for several species of groundfish; to establish a mechanism for timely reporting of catches by domestic catcher-processors which could stay at sea for long periods, and thus did not report as frequently as catcher vessels that landed their catch ashore and submitted fish tickets; to give more flexibility to managers in controlling halibut bycatch in the timely manner in the face of rapidly changing joint venture and domestic fisheries; to respond to a new habitat conservation policy of NMFS requiring more emphasis on habitat concerns in developing fishery management plans and amendments; and last, to delay the sablefish season opening to address resource allocation, fishermen safety and fish quality concerns.

Regulation Summary: The amendment made the following changes:
1. Established gear/area restrictions and OY apportionments to gear types for sablefish;
2. Established a Central Southeast Outside District with 600 mt OY for demersal shelf rockfish;
3. Changed OYs for pollock, Pacific ocean perch, other rockfish, Atka mackerel, and other species;
4. Established catcher/processor reporting requirements;
5. Implemented framework procedure for setting and revising halibut PSC limits;
6. Implemented NMFS habitat policy; and
7. Set seasons for hook and longline and pot sablefish fisheries.

<u>Analysis</u>: A 44-page environmental assessment, 75-page regulatory impact review (RIR) for sablefish management measures, and 65-page RIR for the remaining measures, were completed on this amendment. The most contentious issue was the allocation of sablefish to the longline fleet, one of the most heated decisions the Council had up until then. Longliners had taken the vast majority of the sablefish harvest of all gear types, particularly in the Eastern Gulf. The OY for sablefish was expected to increase in coming years, and prices and markets were good, so considerable additional capacity was expected to enter the fishery. The alternative chosen slowed the growth in capacity and diminished the possibility of gear conflicts and grounds preemption more than the other alternatives analyzed. The other measures in the amendment allowed for more flexibility in managing the groundfish fishery which was undergoing tremendous growth in domestic fisheries and displacement of foreign fleets in the Gulf of Alaska.

<u>Results</u>: This omnibus amendment provided for the first allocations of a species among domestic fishermen, a management approach that would be used in other major species later on. Longliners were allocated 95% of the sablefish in the Eastern Area and trawlers received 5% for bycatch purposes. Pots were excluded the first year. In the Central Gulf, longliners were phased into an 80% allocation over two years, pots were phased out by the second year, and trawlers ended up with 20%. In the Western Gulf, pots were all phased out over four years, and longliners and trawlers split the harvest 80/20 after a 4-year phase-in. In approving the sablefish allocations, NMFS offered to publish a control date of September 26, 1985, the day of final approval, announcing that anyone entering the fishery after that date would not be guaranteed future participation should the Council develop an effort control regime. As it turned out, it took the Council and NMFS another ten years to develop and implement the individual fishing quota system by which the sablefish and halibut longline fisheries were managed starting in 1995. The sablefish season was changed from January 1 to April 1. The sablefish IFQ season is now tied to the start of the halibut IFQ season, which since implementation in 1995 has been March 15 - November 15.

Rockfish management was changed with the separation of the demersal shelf rockfish (DSR) species from other rockfish. Additionally, a new Central Southeast District was established for managing DSR and the State of Alaska was placed in charge of managing the area. The State regulations applied only to vessels registered under the laws of the State.

Prohibited species catch limits for halibut in the Gulf were placed in a framework procedure for setting limits for domestic and joint venture trawl fisheries. Plan amendments would no longer be needed to change PSC limits and the limits would be by area and by specific trawl group (domestic, joint venture, and foreign), rather than domestic and joint venture trawlers combined, so each fishery, not all, would suffer the consequences of taking too much bycatch. When the PSC limit is reached there would be a closure just to on-bottom trawling, not all trawling as under previous regulations. The limits would apply all year, not just from December 1 through May 31.

The new reporting requirements were applied to catcher/processors and motherships that keep their catch or fish received for 14 days or more. Those vessels were required to report every week, and also to report their position 24 hours before starting or stopping fishing in a regulatory area. A definition of "directed fishing" also was established.

STATUS: The above information was assembled on the history of the prohibition on the use of pot gear in the Gulf of Alaska. Additional information has been compiled in a previous GOA SAFE Report.

3. **Develop a discussion paper to assess whether the problem of unharvested halibut IFQ in Area 4 is attributable to the current vessel IFQ cap or are there other factors that could be identified as contributing to unharvested halibut in Area 4.**

A proposal to increase the halibut vessel IFQ cap in Area 4 was submitted by CBSFA and APICDA. From *IFQ Implementation Team* minutes,

"*Heather McCarty (Central Bering Sea Fishermen's Association) spoke to this proposal. Jane DiCosimo summarized staff comments on this proposal; she clarified some issues related to the proposal (see Appendix 1). Bob Alverson requested clarification on some points of the proposal. Jane distinguished between use (AKA "ownership") caps and vessel caps, and that easing either restriction could result in additional consolidation of QS. Other members expressed some concerns about the proposal because Area 4 now has the most affordable halibut QS and provides entry level opportunities. Mr. Kauffman provided additional information in support of the proposal. Mr. Peyton identified that the use cap is constraining. Mr. Wyman reported that ALFA was neutral but expressed concerns about further consolidation. Mr. Hull readdressed some comments previously heard about the inability for some crew to get on a vessel to harvest their QS. Mr. Alverson commented that high lease fees (40 -60 percent) may contribute to why fish are not being caught. There is a struggle in the industry over lease fees. CDQ groups can finance a crew which does not show up as a lease. Nicole Kimball reported that RAM prepared a Transfer Report dated January 2009 that contains data from 1995 through 2006 on lease fees. Some committee members had concerns about the proposal but were supportive of a discussion paper to address questions as to why the TACs have not been taken in Area 4.*

Consensus to not forward this proposal to the Council for analysis, but to recommend a discussion paper to address the problem of unharvested IFQs in Area 4 and to determine if the vessel cap is contributing to the problem of the IFQs not being fully harvested, incorporating socio-economic data to address concerns about consolidation and crew jobs."

An *interagency staff group* reviewed the proposal to increase the halibut vessel cap in Area 4. Jessie Gharrett noted that the proposal does not accurately describe the current QS caps (see current vessel caps below). Vessel caps apply simultaneously; that is, a vessel must meet BOTH caps for halibut. This also means that a cap applicable to Area 4 (only) could either be 1) a new, third vessel cap; 2) a modification to the existing vessel cap; or 3) an exemption to the existing "ALL" area cap. If a new additional cap is envisioned, another question is whether, and if so, how, the 'ALL" cap might be modified. Staff noted that an effect of increasing vessel caps may be to consolidate further the number of vessels in the fishery, which may conflict with the stated need for the proposal (i.e., a lack of vessels in Area 4); however the proposal would allow for more use of the vessels that are active in the area.

Staff did not identify any legal, enforcement, administrative issues with this proposal.

Halibut vessel IFQ caps

Vessel Use Cap %	2008 IFQ TAC	Vessel Use Cap	2011 IFQ TAC	Vessel Use Cap
1% of 2C IFQ TAC	6,210,000 net lb	62,100 net lb	2,330,000 net lb	23,300 net lb
.5% of All IFQ TAC	48,040,800 net lb	240,204 net lb	30,382,000 net lb	151,910 net lb

The *Advisory Panel* recommended that the Council initiate a discussion paper to increase the halibut IFQ vessel use cap in Area 4. The motion passed 17:0.

In February 2010 *the Council* modified the AP motion as noted above.

STATUS: To date Council staff coordinated with IPHC staff on this proposal, received data from the RAM Division, and assembled the above information.

4. **Initiate a discussion paper for removal of the block system for sablefish A shares and increase in the sablefish A share only cap. The A share exemption, would be from the overall sablefish use cap (no catcher vessel QS onboard) and regardless of whether the sablefish harvest was processed. The discussion paper should explore adding a use cap increase to the BSAI.**

From *IFQ Implementation Team* minutes,

"Dave Little, Clipper Seafoods, presented his proposal to remove Category A shares from the block program and allow an exception to the sablefish vessel? cap for A category shares. The intent of the proposal is to address stranded QS, which can not be transferred by interested parties due to the cap and is not being fully harvested under the current program. Dave suggested that the use cap for sablefish could be set at 5% for Category A shares.

Kris Norosz observed that increasing the cap fivefold would be a significant departure from the original program.

a) Motion: Recommend that the Council consider removing the block program for sablefish A shares.

Failed 3:7:1

Bob recommend that the Council consider exempting Category A shares for the all area use cap at a range between 1.25% and1.5% of the existing cap for vessels upon which ONLY A shares are fished and regardless of whether harvest was processed. His proposal was for another $400K gross. Paul supported the motion; he observed that it would take 2 ¾ percent of the limits to make CDQ vessels economical. He noted that only about 50% of the sablefish (Category A?) TAC has been harvested under current program.

b) Motion: Recommend that the Council consider exempting A shares from the overall sablefish use cap and apply a use cap at between 1.25% to 1.5% of the current use cap for vessels that ONLY fish A shares (no catcher vessel QS onboard) and regardless of whether the sablefish harvest was processed.

Passed 9:2"

An *interagency staff group* commented that enforcement of use caps is problematic.

The *AP* took no action on this proposal.

In February 2010 *the Council* adopted motion as noted above.

STATUS: RAM Division provided data for analyses at staff's request, but a data analysis has not yet begun.

Attached is one copy of a form letter the Council received by email regarding Zhemchug and Pribilof canyons.

By the deadline Tuesday at 5:00 pm, 28,511 individual comments were received.

Subject: RE: D2, staff tasking
From: Alan Clark <aandkclark@yahoo.com>
Date: 3/21/2012 7:06 AM
To: npfmc.comments@noaa.gov

Mar 21, 2012

Mr. Eric Olson
605 West 4th Avenue #306
Anchorage, AK 99501-2252

Dear Mr. Olson,

Zhemchug and Pribilof canyons - two of the largest canyons in the world - and the vital "Greenbelt" zone of productivity along the shelf break in the Bering Sea are in need of protection now.

The canyons contain a high density of habitat-forming corals that are essential for commercially important fish and other marine life, and also extremely vulnerable to damage from fisheries. The pelagic waters associated with the canyons are rich foraging habitat for a great variety of fish, birds, and marine mammals including declining populations of Northern fur seals and endangered short-tailed albatross and Steller sea lions. This highly productive marine zone is known to Alaska Native communities as a source of their native foods which are growing scarce today, threatening thousands of years of culture.

Despite the ecological and commercial importance of the Bering Sea shelf break (where the canyons are located), there are currently no protected areas along this entire Greenbelt. Given how little we understand about deep sea ecosystems or the connections between seafloor habitats and commercially important species, it is extremely risky not to set aside representative portions of the shelf break as a buffer against uncertainty. Additionally, the 2006 amendments to the Magnuson-Stevens Act give the Council new authority to protect deep-sea corals and other species and habitats, considering the variety of ecological factors affecting commercially important fish populations.

Please take action at your April 2012 Council meeting to begin a process to protect these invaluable canyons and ensure the continued productivity of the Greenbelt.

Thank you for considering my views.

Sincerely,

Alan Clark
804 Perkins Ln
Nokomis, FL 34275-2750

SAFEWAY

March 13, 2012

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

RE: Staff Tasking Request, April 2012

Dear Chairman Olson and Council Members,

As one of the nation's largest food retailers, Safeway Inc. has a responsibility to help safeguard marine resources and ensure the availability of seafood for generations to come. We are fully committed to realizing the long-term sustainability of America's fisheries, supporting thousands of quality fishing industry jobs, and to bringing the healthiest products to the marketplace. Safeway Inc. is proud to be a leader in the seafood industry as demonstrated by our ongoing commitment to provide only the highest quality products that are caught in compliance with best practices and standards of sustainability. Such practices should absolutely maintain the diversity, structure and function of healthy ecosystems and seek to minimize adverse effects, such as interactions between fishing gear and habitats critical to the stability of our oceanic resources.

We have become aware of growing concern over lacking protections for a unique and extremely productive region in the Eastern Bering Sea – the Greenbelt zone occurring along the shelf break. The Bering Sea shelf break is among the most ecologically and economically productive stretches of ocean in the world, yielding on the order of a million tons of seafood each year. The pollock, crab, halibut, sole, and other species harvested on the Greenbelt generate a billion dollars annually, and provide food for people across the globe.

Due to the importance of the shelf break to seafood businesses, it seems important to protect portions of this habitat in order to provide a buffer against uncertainty. Our understanding of the workings of marine ecosystems is understandably incomplete. We rarely have a full picture of how each of the many species are interdependent. Without knowledge of which sponges, corals, or other habitat-forming invertebrates are utilized by commercially important fish and crab at each stage of their life cycles, for example, there is the risk that we could inadvertently make an extremely costly mistake. There is too much at stake to take risks with these fisheries, which could occur despite careful and consistent use of stock assessments and state of the art models.

Two vast deep water canyons, Pribilof and Zhemchug, appear to be shelf break areas of particular importance. The canyons are areas of enhanced physical dynamics owing to unique oceanographic conditions that transport nutrient-rich waters from the deepest ocean up to surface waters, making the area up to 60% more productive than the adjacent shelf area. These canyons have been identified by NOAA as providing essential fish habitat for a number of commercially important species, including several species of crab, rockfish, and groundfish (such as pollock). More recently, the canyons have also been reported to contain relatively high densities of deep sea corals and sponges, which were shown to provide habitat for fish and other species.

The arguments for protecting representative portions of distinct habitat types are strong economically, ecologically, and scientifically. In the Bering Sea, cultural issues are also

Safeway Inc.
5918 Stoneridge Mall Road
Pleasanton, CA 94588-3229

important, as indigenous communities have depended upon these waters for more than 8,000 years. For the Aleuts who live on the Pribilof Islands, the closest islands to the canyons, the value of these areas as foraging and nursery habitat for many of the species they harvest has long been understood. When a new species of sponge was discovered in the canyons recently, Aleuts named it *kanuux*, after their word for "heart," to emphasize that the canyons are the heart of the Bering Sea.

While we have much to learn about the intricacies of ecosystem functions in the Bering Sea canyons, Safeway Inc. is committed to a precautionary management approach that can ensure the integrity of such productive ecosystems upon which we all depend. Safeway Inc. commends the Council's previous actions in support of protecting vulnerable habitat and to maintain the productivity of fishery resources. Consistent with standards of sustainability, our own company's values, and the Council's ecosystem-oriented management mandate, we encourage the Council to fully investigate the options available to secure adequate protections for vital Greenbelt habitat in Zhemchug and Pribilof Canyons. Providing protection for representative portion of Greenbelt habitat will provide us with an invaluable safeguard against uncertainty. It will also serve as a scientific reference area to help us better understand the impacts of our industry, as well as the full implications of climate change and ocean acidification on the resource going forward.

Sincerely,

Phil Gibson
Group Director, Corporate Seafood
Safeway Inc.

TANANA TRIBAL COUNCIL

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Fax (907) 366-7195

Post Office Box 130
Tanana, Alaska 99777

RECEIVED
MAR 20 2012

MARCH 20, 2012

MR. ERIC OLSON
COUNCIL MEMBERS
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
605 WEST 4TH AVENUE, SUITE 306
ANCHORAGE, AK 99501-2252

RE: PROTECTION AND PROMOTION OF ZHEMCHUG AND PRIBILOF SUBMARINE CANYONS

DEAR CHAIRMAN OLSON AND COUNCIL MEMBERS,

ON BEHALF OF TANANA TRIBAL COUNCIL AND ALONG WITH SEVERAL MILLION GREENPEACE MEMBERS AND SUPPORTERS, WE COLLECTIVELY URGE YOU TO REVIEW THE AVAILABLE SCIENCE AND DEVELOP CONSERVATION MEASURES THAT PROTECT PRIBILOF AND ZHEMCHUG CANYONS ON THE BERING SEA SHELF BREAK.

THESE SUBMARINE CANYONS ARE UNIQUE MARINE AREAS FROM A GLOBAL PERSPECTIVE, OCCURRING IN ONLY 4% OF THE WORLD'S OCEANS AND CONTAINING UNIQUE SPECIES ASSEMBLAGES. ZHEMCHUG AND PRIBILOF SUBMARINE CANYONS HAVE THE ADDED DISTINCTION OF BEING TWO OF THE LARGEST SUBMARINE CANYONS IN THE WORLD, BOTH LARGER THAN ARIZONA'S GRAND CANYON. IN THE BERING SEA THE ZHEMCHUG AND PRIBILOF SUBMARINE CANYONS PROVIDE ESSENTIAL BENEFITS, FUELING THE HIGHLY PRODUCTIVE GREENBELT ECO-REGION BY AIDING THE TRANSPORT OF NUTRIENTS UP TO THE CONTINENTAL SHELF.

THE TRIBAL COMMUNITIES OF ALASKA HAVE RELIED ON THIS VITAL GREENBELT ZONE TO SUSTAIN OUR COASTAL COMMUNITIES FOR MILLENNIA, BUT TODAY WE ARE SEEING OUR TRADITIONAL AND CULTURAL FOODS DISAPPEAR, THREATENING OUR TRADITIONS, OUR CULTURES AND WAYS OF LIFE. AT THE ANNUAL CONVENTION OF ALASKA'S TRIBAL GOVERNMENTS IN 2006 AI-TC RESOLUTION 2006-05 WAS ADOPTED TO SUPPORT AN ECOSYSTEM BASE MANAGEMENT OF THE GULF OF ALASKA AND THE BERING SEA, SEE ATTACHED.

NATIONAL STANDARDS DIRECT FISHERY MANAGERS TO USE THE BEST AVAILABLE SCIENCE, TO MINIMIZE BYCATCH, TO DETERMINE THE ECONOMIC VALUE OF FISHING COMMUNITIES, AND TO REDUCE ADVERSE IMPACTS ON SUCH COMMUNITIES.

DEEP SEA CORALS AND SPONGES PROVIDE VALUABLE HABITAT FOR FISHES INCLUDING SHELTER AND RESTING PLACES, PROTECTION FROM PREDATORS AND STRONG CURRENTS, NURSERIES FOR YOUNG FISH, FEEDING AND SPAWNING AREAS, AND ALSO PROVIDE BREEDING AREAS FOR A HOST OF OTHER MARINE LIFE.

TRAWLING REDUCES THE STRUCTURAL COMPLEXITY AND DIVERSITY OF HABITAT IN THE BERING SEA. THE MAGNUSON STEVENS ACT ENCOURAGES THE CONSERVATION AND ENHANCEMENT OF ESSENTIAL FISH HABITAT AND ECOSYSTEM-BASED MANAGEMENT, AND REQUIRES POLICY MAKERS TO IDENTIFY CORAL HABITATS UNDER THEIR JURISDICTION AND REPORT TO CONGRESS REGARDING EFFORTS MADE TO PROTECT THEM.

TO DATE, THE COUNCIL HAS CITED A LACK OF INFORMATION TO COMPEL CONSERVATION OF SUBMARINE CANYONS OR GREENBELT HABITATS, AND HAS RESOLVED THAT THE SUBMARINE CANYONS SHOULD BE A PRIORITY FOR RESEARCH. NEW RESEARCH FINDINGS MAKE IT CLEAR THAT THE SUBMARINE CANYONS CONTAIN HIGH DENSITIES OF CORALS AND SPONGES, WHICH PROVIDE IMPORTANT HABITAT FOR

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Greenbelt zone. We must ensure the resilience of the dynamic Bering Sea marine system and take steps that give our oceans the best chance of adapting to rapidly changing conditions like climate change and ocean acidification. The Greenbelt is too important, both ecologically and economically, for us not to set aside a portion of this vital eco-region as a buffer against uncertainty.

We are committed to protecting the environment including safeguarding and restoring the health of our oceans and the invaluable services they provide – from the seafood we eat to the oxygen we breathe. Protecting America's Grand Submarine Canyons of the Sea will help ensure the sustainability of the Bering Sea fisheries, and the health of the ecosystem which sustains them. We urge you to act now and begin developing new conservation measures for these unique and critically productive Submarine Canyons that have been used and relied on for millenia.

Sincerely,

Curtis Sommer

Curtis Sommer

GREENPEACE OCEANA WWF

March 20, 2012

RECEIVED
MAR 20 2012

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

Dr. Jim Balsiger
Regional Administrator
NOAA Fisheries, Alaska Region
709 W. 9th Street
Juneau, AK 99802-1668

Re: Staff Tasking, Agenda Item D-2

Dear Mr. Olson and Dr. Balsiger,

On behalf of Greenpeace, Oceana, and World Wildlife Fund (WWF), we submit this request for the Council review the available science on Bering Sea deep sea canyons as a first and essential step in the development of conservation and management measures for Pribilof and Zhemchug Canyons.

The U.S. Exclusive Economic Zone off Alaska is unique in having some of the largest submarine canyons in the world. These submarine canyons are globally significant, as they occupy less than four percent of the earth's seafloor and contain rare habitats and unique assemblages of species (McConnaughey and McGovern 2009).[i] In the Bering Sea, there are at least 15 distinct canyon systems along the continental shelf, including three of the largest canyons in the world.[ii] Zhemchug Canyon, 80 miles northwest of the Pribilof Islands, is the largest of these, spanning some 60 miles in width and reaching depths of2,730 m(9,000 ft.) with a volume of 8,500 cubic kilometers (km^3) (Scholl *et al.* 1970).[iii] Pribilof Canyon, whose canyon head starts just 20 miles south of the Pribilof Islands, is much smaller but still far larger than most submarine canyons and is one of the world's longest at 90 miles in length, reaching depths of 1,800 m (6,ooo ft.) with a volume of 1,300 km^3. By contrast, the better-known Monterey Canyon off central California has a volume of only 450 km^3 (Scholl et al. 1970).

These shelf-edge canyons play a crucial role in circulation and transport of nutrients in the eastern Bering Sea as the northwestward-flowing Bering Slope Current interacts with canyon topography, creating eddies and entraining nutrient-rich slope waters (J.M. Napp *et al.* 1998; Kinney *et al.* 2009).[iv,v] In this way the canyons act as conduits for organic nutrients moving between deep basins and the continental shelf, and the resulting fluxes support diverse communities with high biomass compared to non-canyon regions at similar depths (AFSC 2006, McConnaughey and McGovern 2009).[vi] The pelagic habitat zones associated with these submarine canyons are characterized by predictable water column properties of elevated primary and secondary production that concentrate prey and attract a wide variety of mobile fish, mammal and bird predators (Springer et al. 1996; NRC 1996). Some species, such as the endangered short-tailed albatross, appear to utilize the canyon pelagic zones preferentially as foraging habitat (Piatt *et* *al.* 2006)[vii] while others, such as skates (*Bathyraja* spp.), utilize the canyon benthos as preferred reproductive habitat (Hoff 2009, Hoff 2010).[viii,ix]

The Bering Sea, of course, provides economic benefits to Alaskans and many other Americans, and feeds millions of people in the U.S. and far beyond, thanks to the remarkable productivity of this region. Commercial fisheries benefit from the congregation and abundance of species that gather at the shelf break and above the canyons, and that in turn fuels a vibrant fishing economy. This highly productive marine zone additionally supports the subsistence culture of Alaska's indigenous peoples. The canyons are known to Alaska native communities, especially communities on the Pribilof Islands, as a source of sustenance for subsistence species.

The connection between these unique canyons, the shelf break zone, and commercial fisheries in the eastern Bering Sea is clear; this is one of the most biologically productive large marine ecosystems in the world, and also one of the biggest fishing grounds in the world (NRC 1996, 2002).[x,xi] The 1,200 km margin of the outer continental shelf and slope in the eastern Bering Sea, referred to as the "green belt" because of its elevated primary and secondary productivity (Springer *et al.* 1996, NRC 1996, Buck and Bruland 2007),[xii,xiii,xivxv] contribute to the sustainability of targeted groundfish fisheries, including pollock, Pacific cod, Greenland turbot, and rockfish (Fritz et al. 1998) taken with trawl and fixed gear.[xvi]

As part of Essential Fish Habitat (EFH) plan amendments in 2005 and 2007, the Council adopted new measures to mitigate the adverse impacts of bottom trawling in the deeper slope and basin waters of Aleutian Islands and Gulf of Alaska and to "freeze the footprint" of bottom trawling in the eastern Bering Sea. However, the shelf break/slope habitat along the Green Belt continues to be fished by other bottom-tending gear types (including pelagic pollock nets)[xvii] with no seasonal or permanent protection from bottom contact or pelagic biomass removals. Given the important role of the shelf break and canyon ecosystems in harboring ecological processes that support the rich Bering Sea food web – and therefore support the commercial fisheries – it is our view that an ecosystem-based approach to protection of areas important for ecosystem function and food web resilience is needed, starting with important features of the Bering Sea Greenbelt, such as representative canyon habitats.

Numerous proposals have been made to NMFS and the Council since 2001 to establish Habitat Conservation Areas (HCAs) in representative portions of the Green Belt. These proposals have focused on Pribilof and Zhemchug canyons as candidates for measures to provide EFH protection for deep-sea corals, sponges and other benthic habitat important to managed species as well as refuges from directed fishing and/or bycatch of deepwater species whose life history and habitat preferences rely on the stable, relatively unchanging environment afforded by these canyons. In 2006-2007, the Council reviewed information from the Alaska Fisheries Science Center summarizing current knowledge of Pribilof, Pervenets and Zhemchug canyons and considered HAPC designation for submarine canyons but ultimately postponed action, pending more information.

Since then, new information has become available from several sources that merit re-examination of the importance of the Green Belt canyons and possible habitat conservation measures. In 2007, a research expedition to Pribilof Canyon and Zhemchug Canyon conducted video surveys of seafloor habitat in the canyons and provided new information on their coral and sponge fauna, including new species records and northern range extensions for a number of corals and sponges as well as discovery of a new sponge species, *Aaptos kanuux* (Lehnert et al. 2008, Miller et al. in press).[xviii,xix] In addition, new research describes the importance of Zhemchug and Pribilof canyons in the circulation exchange between the Bering Sea shelf and basin (Hunt et al. 2008, Kinney et al. 2009)[xx] and provides new details on the diversity, stock structure, and ecology of deepwater fauna typically found in the canyons (e.g., Stevenson et al. 2008, Hoff 2009, Heifetz et al. 2009, Hoff 2010, Stevenson and Lewis 2010, Palof et al. 2011, Stone et al. 2011)[xxi]. In 2009, the first comprehensive mapping of Pribilof Canyon was also completed using high-resolution multi-beam echo sounders, providing a clearer picture of the canyon environment and its important features (AFSC 2009). Finally, the 2006 amendments to the Magnuson-Stevens Act give Councils new authority to protect deep-sea corals[xxii]and other species and habitats, considering the variety of ecological factors affecting fishery populations.[xxiii] Taken together, these new sources of information and strengthened legislative mandates compel a fresh look at options for protecting representative portions of the shelf break and slope canyon habitats.

Therefore ***we request that the Council initiate a staff review of new and existing information, including relevant fisheries data in preparation for the process of developing a fishery management plan amendment that would implement conservation and management measures for important habitat areas in the Pribilof and Zhemchug Canyons.***

This analysis should include the option of establishing Habitat Conservation Areas (HCAs) that will achieve multiple goals for the conservation of EFH of managed species, minimization of bycatch of vulnerable non-target species, refuges from bottom fishing in sensitive deepwater coral and sponge habitats, and protection of the associated pelagic habitat utilized by mobile fish, seabird and marine mammal predators. The staff's analysis of HCAs should also consider Local and Traditional Knowledge and the cultural importance of traditional Alaska Native subsistence uses of fish and other marine wildlife that depend upon these areas.

Thank you,

Jackie Dragon
Senior Oceans Campaigner, Greenpeace
75 Arkansas Street
San Francisco, CA 94107

Heather V. Brandon
Senior Fisheries Officer, World Wildlife Fund
419 6th Street, Suite 317
Juneau, AK 99801

Jon Warrenchuk
Ocean Scientist , Oceana
175 South Franklin
Juneau, AK 99801

[i] Bob McConnaughey and Meghan McGovern (2009), AFSC Quarterly Report, April-June 2009: 8-9.
[ii] AFSC (2006), *A Review of Scientific Information Related to Bering Sea Canyons and Skate Nursery Areas*, NPFMC Agenda Item D-3(a), December 2006. 43 p.
[iii] David W. Scholl *et al.* (1970), *The Structure and Origin of the Large Submarine Canyons of the Bering Sea*, Marine Geology, 8: 187-210.
[iv] J.M. Napp *et al.* (1998), *Biophysical processes relevant to recruitment dynamics of walleye pollock in the eastern Bering Sea*, *In*: S. Allen Macklin (editor), Bering Sea FOCI Final Report, NOAA/Pacific Marine Environmental Laboratory, December 1998, pp. 71-102.
[v] J. Clement Kinney *et al.* (2009), *On the processes controlling shelf-basin exchange and outer shelf dynamics in the Bering Sea*, Deep-Sea Research II 56: 1351-1362.
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[vii] J.F. Piatt *et al.* (2006), *Predictable hotspots and foraging habitat of the endangered short-tailed albatross (Phoebastria albatrus) in the North Pacific: Implications for conservation*, Deep-Sea Research II 53, 387-398.
[viii] G.R. Hoff (2009), Embryo developmental events and the egg case of the Aleutian skate *Bathyraja aleutica* (Gilbert) and the Alaska skate *Bathyraja parmifera* (Bean), Journal of Fish Biology 74, 483-501.
[ix] Gerald R. Hoff (2010), Identification of stake nursery habitat in the eastern Bering Sea, MEPS v403: 243-254.
[x]National Research Council (1996), *The Bering Sea Ecosystem*, National Academy Press, Washington, D.C.
[xi] National Research Council (2002), *Effects of Trawling and Dredging on Seafloor Habitat*, National Academy Press, Washington, D.C. 136 pp.
[xii] Alan M. Springer *et al.* (1996), *The Bering Sea Green Belt: shelf-edge processes and ecosystem production*, Fisheries Oceanography 5: 205-223.
[xiii]National Research Council (1996).
[xiv]Kristen N. Buck and Kenneth W. Bruland, (2007), *The physicochemical speciation of dissolved iron in the Bering Sea, Alaska*, Limnol. Oceanogr. 52: 1800-1808.
[xv] For purposes of delineating the boundaries of this ecoregion, the area encompassing the shelf break and slope between the 100 to 1000 m isobaths is used. The approximate total area within these bounds is 191,648 km^2.
[xvi] L. Fritz *et al.* (1998), *Catch-per-unit-effort, length, and depth distributions of major groundfish and bycatch species in the Bering Sea, Aleutian Islands, and Gulf of Alaska regions based on groundfish fishery observer data*,NOAA Technical Memorandum NMFS-AFSC-88.179 p.
[xvii] Although the massive pollock fishery has exclusively deployed pelagic trawl nets since 1999, there is a strong incentive for fishing pelagic nets near or on bottom. See NPFMC Agenda Item C4(a), *HAPC Initial Review*, February 2012, p. 10.
[xviii] Helmut Lehnert *et al.* (2008), *A new species of Aaptos (Porifera, Hadromerida, Suberitidae) from Pribilof Canyon, Bering Sea, Alaska*,Zootaxa 1939: 65-68.
[xix] Robert J. Miller *et al.* (2012), *Structure-forming corals and sponges and their use as fish habitat in Bering Sea submarine canyons*, PLoS ONE *in press*.
[xx] Hunt, G. Jr., et al. 2008.Patterns of spatial and temporal variation in the marine ecosystem of the southeastern Bering Sea, with special reference to the Pribilof Domain. Deep Sea Research Part II 55:16-17, 1919-1944
[xxi] Palof, Katie J., *et al.* 2011. Geographic structure in Alaskan Pacific ocean perch (Sebastes alutus) indicates limited lifetime dispersal. Mar. Biol. 158: 779-792.
[xxii]MSA § 303(b)(2)(B) (16 U.S.C. § 1853(b)(2)(B)).
[xxiii] MSA § 303(b)(12) (16 U.S.C. § 1853(b)(12)).

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March 20, 2012

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

Dr. James Balsiger, Regional Administrator
NOAA Fisheries, Alaska Region
709 West Ninth Street
Juneau, AK 99802-1668

RE: D-2 Staff Tasking - Unmanaged Grenadier Bycatch

Dear Mr. Olson, Dr. Balsiger, and Council members:

We request NMFS and the NPFMC take action to manage the harvest and bycatch of the deep-sea grenadiers (family Macrouridae) in Alaska. We understand that presentation of a 'discussion paper' on grenadiers has been moved from the March to the June meeting agenda; this timeline should not be further prolonged. The bycatch of grenadiers has long been recognized as significant issue by the Council and we urge timely development of management alternatives for consideration.

At least seven species of grenadiers live in the deep waters off Alaska. Three species: giant grenadier (*Albatrossia pectoralis*), Pacific grenadier (*Coryphaenoides acrolepis*), and popeye grenadier (*Coryphaenoides cinereus*) are caught by the groundfish fisheries. The bulk of the grenadier catch is comprised of giant grenadiers.[1] Bycatch of grenadiers in Alaska is significantly large, in some years approaching and exceeding the total harvest of sablefish and Greenland turbot. Annual discards of up to **46 million pounds** (21,000 mt) of grenadiers occurred between 1997-2010.[1]

Despite their perceived abundance in Alaska, the life history of giant grenadiers makes them susceptible to overfishing. Giant grenadiers grow to relatively large sizes and are long lived. Also of concern is that nearly all giant grenadier bycatch is comprised of female fish. Male and female giant grenadier are segregated by depth in their habitat; female grenadier occur at shallower depths and thus their habitat overlaps with the commercial fisheries. In the North Atlantic, two species of grenadiers, the roundnose grenadier *Coryphaenoides rupestris*, and the onion-eye grenadier, *Macrourus berglax* have declined severely as a result of both directed fisheries and bycatch, enough that the species could qualify as endangered.[2]

Fortunately, NMFS scientists and Groundfish Plan Teams are well equipped to give harvest and management recommendations for grenadiers in Alaska. Stock assessments for grenadiers have

[1] Clausen, D.M., and C.J. Rodgeveller. 2010. Assessment of Grenadier Stocks in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands. NPFMC Gulf of Alaska, Bering Sea, and Aleutian Islands SAFE

[2] Devine, J. A., K. D. Baker, and R. L. Haedrich. 2006. Deep-sea fishes qualify as endangered. Nature 439: p. 29.

been in development since 2005, and there is an informative time series of longline survey data available.

We urge that NMFS and the NPFMC extend its management authority to grenadiers so that harvests can be sustainably managed.

Sincerely,

Jon Warrenchuk
Oceana
Juneau, Alaska

Audubon ALASKA

441 West 5th Avenue – Suite 300
Anchorage, Alaska 99501

March 20, 2012

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

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MAR 20 2012

Re: D-2 Staff Tasking

Dear Chairman Olson and Council Members,

It has come to our attention that the Council will be considering the possibility of initiating a review of new and existing information, at the request of World Wildlife Fund, Oceana, and Greenpeace, concerning Pribilof and Zhemchug canyons along the Bering Sea shelf break. Audubon Alaska commends this proposed effort to the Council.

The shelf break and associated upwelling is important to various seabirds that feed in this area. We support the proposed review and would strongly encourage explicit consideration of information regarding avian fauna that may benefit from influences the canyons have in terms of proving nursery habitat for bird prey species and on currents that may help concentrate food resources for pelagic birds.

We appreciate this opportunity to comment.

Sincerely,

Eric F. Myers
Policy Director
emyers@audubon.org

March 20, 2012
Mr. Eric Olson
Council Members
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501-2252
RE: D2-Staff Tasking

Dear Chairman Olson and Council Members,

On behalf of our several million members and supporters, we collectively urge you to review the available science and develop conservation measures to protect Pribilof and Zhemchug canyons, on the Bering Sea shelf break.

Submarine canyons are unique marine areas from a global perspective, occurring in only 4% of the world's oceans and containing unique species assemblages[1]. Zhemchug and Pribilof Canyons have the added distinction of being two of the largest canyons in the world, both larger that Arizona's Grand Canyon. In the Bering Sea the canyons provide essential benefits, fueling the highly productive Greenbelt[2,3] ecoregion by aiding the transport of nutrients up from the deep to the continental shelf[4,5].

Alaska Native communities have relied on this vital Greenbelt zone to sustain their coastal communities for millennia, but today they are seeing their native foods disappear, threatening their culture and way of life. National Standards direct fishery managers to use the best available science, to minimize bycatch, to determine the value of fishing communities, and to reduce adverse impacts on such communities.

Deep-sea corals and sponges are essential to ocean health and provide valuable habitat for fishes including shelter and resting places, protection from predators and strong currents, nurseries for young fish, feeding and spawning areas, and also provide breeding areas for a host of other marine life. Trawling reduces the structural complexity and diversity of habitat in the Bering Sea. The Magnusen Stevens Fishery Management Act (MSA) encourages the conservation and enhancement of essential fish habitat and ecosystem-based management, and the reauthorized MSA additionally acknowledges the important habitat that corals and sponges provide for marine life, and thus requires policy makers to identify coral habitats under their jurisdiction and report to Congress regarding efforts made to protect them.

To date the Council has cited a lack of information to compel conservation of canyon or Greenbelt habitat, and has resolved that the canyons should be a priority for research. New research findings make it clear that the canyons contain high densities of corals and sponges, which provide important habitat for commercially important fish species and other marine life[6]. The canyons are also important foraging habitat for a number of protected species, including northern fur seals, Steller sea lions, and endangered short-tailed albatross.

We commend the Council for previous actions taken to protect important habitat, such as the coral gardens in the Aleutian Islands. Similar measures are needed to protect the vulnerable seafloor habitat in the canyons and the pelagic habitat of the Greenbelt zone. We must insure the resilience of the dynamic Bering Sea marine system and take steps that give our oceans the best chance of adapting to rapidly changing conditions like climate change and ocean acidification. The Greenbelt is too important, both ecologically and economically, for us not to set aside a portion of this vital ecoregion as a buffer against uncertainty.

We are committed to protecting the environment including safeguarding and restoring the health of our oceans and the invaluable services they provide – from the seafood we eat to the oxygen we breath. Protecting America's Grand Canyons of the Sea will help insure the sustainability of the Bering Sea fisheries, and the health of the ecosystem which sustains them. We urge you to act now and begin developing new conservation measures for these unique and productive areas.

Sincerely,

Alfredo Quarto,
Executive Director,
Mangrove Action Project

David Helvarg,
President,
Blue Frontier Campaign

John Hocevar,
Oceans Campaign Director,
Greenpeace

John Kaltenstein,
Marine Program Manager,
Friends of the Earth

Lance Morgan, PhD,
Vice President for Science,
Marine Conservation Institute

Leda Huta,
Executive Director,
Endangered Species
Coalition

Michael F. Hirshfield, PhD,
Senior Vice President, North
America, and Chief Scientist
Oceana

Dave Raney,
Chair, Marine Action
Team,
Sierra Club

Rebecca Noblin,
Alaska Director,
Center for
Biological Diversity

Dr Sylvia Earle,
Founder, Sylvia Earle
Alliance,
Mission Blue

Shawna Larson,
Alaska Program Director,
Pacific Environment

Teri Shore,
Program Director,
Turtle Island
Restoration Network

Tobias Aguirre,
Executive Director,
Fishwise

Vicki Nichols Goldstein,
Founder, Colorado
Ocean Coalition

Karla Dutton,
Director, Alaska Program
Defenders of Wildlife

Betsy Beardsley,
Environmental Justice
Program Director,
Alaska Wilderness League

[1] Bob McConnaughey and Meghan McGovern (2009), AFSC Quarterly Report, April-June 2009: 8-9.
[2] Alan M. Springer et al. (1996), The Bering Sea Green Belt: shelf-edge processes and ecosystem production, Fisheries Oceanography 5: 205-223.
[3] National Research Council (1996).
[4] J.M. Napp et al. (1998), Biophysical processes relevant to recruitment dynamics of walleye pollock in the eastern Bering Sea, In: S. Allen Macklin (editor), Bering Sea FOCI Final Report, NOAA/Pacific Marine Environmental Laboratory, December 1998, pp. 71-102.
[5] J. Clement Kinney et al. (2009), On the processes controlling shelf-basin exchange and outer shelf dynamics in the Bering Sea, Deep-Sea Research II 56: 1351-1362.
[6] Robert J. Miller et al. (2012), Structure-forming corals and sponges and their use as fish habitat in Bering Sea submarine canyons, PLoS ONE in press.

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March 16, 2012

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

RE: <u>D2-Staff Tasking: Conservation Measures to Protect Pribilof and Zhemchug Canyons</u>

Dear Chairman Olson and Council Members:

Ocean Conservancy[1] urges the North Pacific Fishery Management Council to develop conservation measures to protect Pribilof and Zhemchug canyons. Located on the Bering Sea shelf break, these features are two of the largest underwater canyons in the world.

Available research indicates that the canyons have important effects on ocean circulation and nutrient transport to the continental shelf. The canyons also contain vulnerable corals and sponges, and are important foraging habitat for a number of protected species, including northern fur seals and endangered short-tailed albatross. In addition, they serve as habitat for many vulnerable benthic and pelagic species, are highly sensitive to fishing disturbances, and are subject to significant fishing impacts.

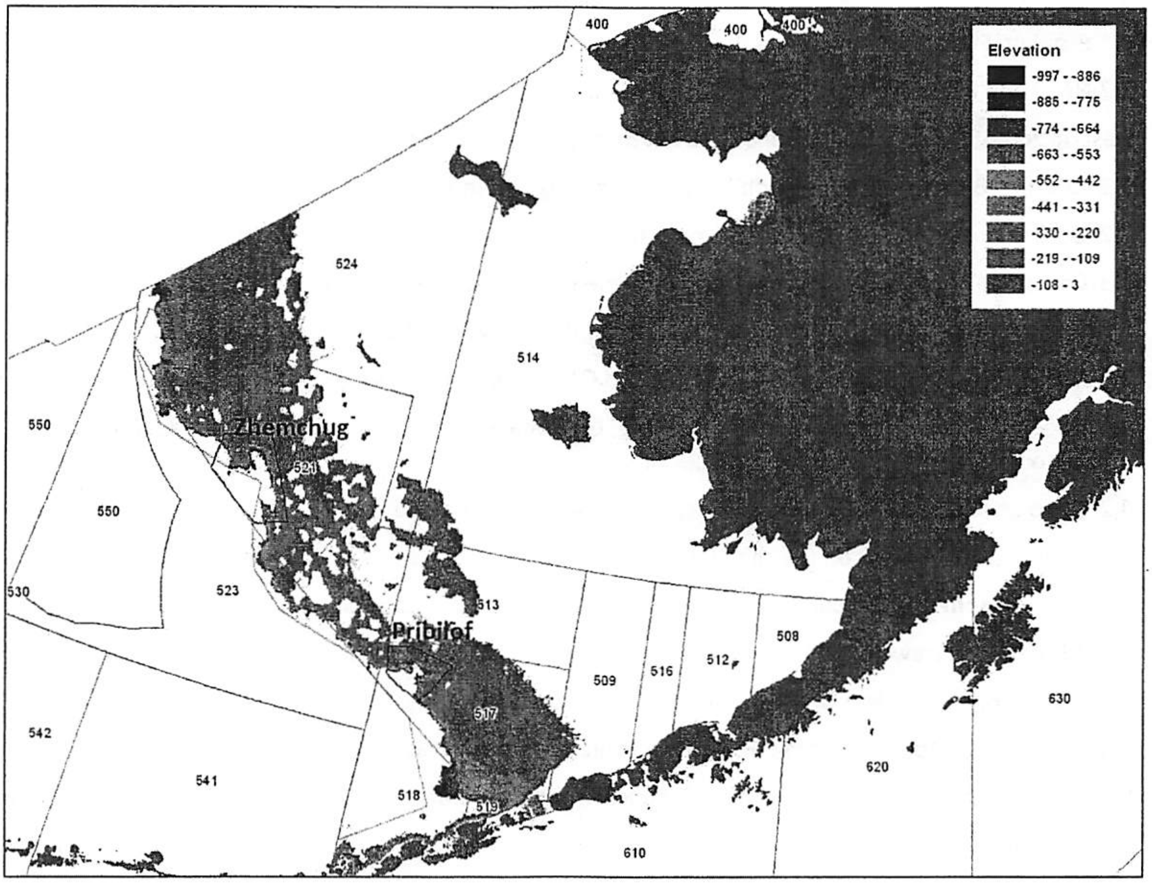
We commend the Council on its previous actions to protect important habitat and urge you to develop conservation measures to protect the submarine canyons of the Bering Sea shelf.

Sincerely,

Andrew Hartsig
Arctic Program Director
Ocean Conservancy

[1] Ocean Conservancy is a nonprofit organization with over 150,000 members committed to protecting ocean environments and conserving the global abundance and diversity of marine life. Through science-based advocacy, research and public education, Ocean Conservancy informs, inspires and empowers people to speak and act for wild, healthy oceans.

PRIBILOF AND ZHEMCHUG CANYON HABITAT CONSERVATION AREAS: AN UPDATED REVIEW WITH IMPLICATIONS FOR MANAGEMENT



SUBMITTED TO THE NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
IN REFERENCE TO AGENDA ITEM D-2

MARCH 20, 2012

PREPARED BY

K.D. Stump, Bering Sea Canyons Project Consultant

For Greenpeace

TABLE OF CONTENTS

1. Introduction: Problem Statement, Need and Purpose

1.1 Problem Statement

The eastern Bering Sea is one of the most biologically productive large marine ecosystems in the world, and also one of the biggest fishing grounds in the world (NRC 1996, 2002). Some of the most intensive fishing has occurred along the 1,200 km margin of the outer continental shelf and slope in the eastern Bering Sea (Fritz *et al.* 1998, NMFS 2004), referred to as the "Green Belt" because of its elevated primary and secondary productivity (Springer *et al.* 1996, NRC 1996, Macklin and Hunt 2004, Okkonen *et al.* 2004, Buck and Bruland 2007, Hunt *et al.* 2008). Groundfish target fisheries in this ecoregion have included walleye pollock, Pacific cod, Greenland turbot, sablefish and rockfish (Fritz et al. 1998). The vast majority of the groundfish catch is taken with trawl gear, although fixed gears account for a significant portion of the Pacific cod and Greenland turbot catch as well as all of the directed fishery catch of sablefish and halibut.

Historical management actions that addressed fishing gear impacts on habitat in the Bering Sea were focused on protection of nearshore crab and sea lion habitat, consisting mainly of closures to trawling in relatively shallow waters with sand substrates along the coasts (NMFS 2004). Until very recently there were no habitat protections of any kind in the deeper waters that encompass the continental shelf break and upper slope of the eastern Bering Sea, Aleutian Islands or the Gulf of Alaska. As part of essential fish habitat (EFH) plan amendments in 2005 and 2007, the Council adopted new measures to mitigate the adverse impacts of bottom trawling in the deeper slope and basin waters of Aleutian Islands and Gulf of Alaska and to "freeze the footprint" of bottom trawling in the eastern Bering Sea, but other bottom-tending gear types (including pelagic pollock nets)[1]were not addressed in the Bering Sea and the shelf break/slope habitat along the Green Belt remains unprotected – no year-round or seasonal benthic habitat protection or other protection from fishing has been provided to date.

This ecoregion is unique in having some of the largest submarine canyons in the world, which play a major role in ocean circulation to the shelf and serve as vital habitat for a diverse assemblage of benthic and pelagic fauna. In 2006-2007, the Council considered HAPC designation for submarine canyons but delayed action pending more information. Currently the Council is considering designation of six areas of known skate egg concentration situated within a number of deepwater canyons along the Green Belt as skate HAPC. The localized nature of these skate egg concentrations within the canyons and their vulnerability to fishing disturbance makes them logical choices for HAPC designation and protection,[2] but the limited, site-specific approach to HAPC is not designed to address the wider impacts of fishing on this vulnerable deep-sea ecosystem and the diverse fauna that inhabit its complex system of submarine canyons, valleys and slopes.

The absence of habitat protections for representative areas of the deepwater benthic and pelagic zone along the 1,200 km extent of the Green Belt is difficult to justify given its ecological importance to the region's diverse fish, mammal and bird fauna, its value as a source of replenishment that sustains fisheries, and its cultural significance to indigenous communities. A wider, ecosystem-based approach to habitat protection is needed to address all the important features of the Bering Sea Greenbelt, including representative canyon habitats.

---

[1] Although the massive pollock fishery has exclusively deployed pelagic trawl nets since 1999, there is a strong incentive for

[2] See NPFMC Agenda Item C4(a), *Skate HAPC Initial Review*, February 2012.

1.2 Need and Purpose

Numerous proposals have been made to NMFS and the Council since 2001 to establish Habitat Conservation Areas (HCAs) in representative portions of the Green Belt. These proposals have focused on Pribilof and Zhemchug canyons as candidates for measures to provide EFH protection for deep-sea corals, sponges and other benthic habitat important to managed species as well as refuges from directed fishing and/or bycatch of deepwater species whose life history, habitat preferences and reliance on the stable, relatively unchanging environment afforded by these canyons make them especially vulnerable to the impacts of fishing. In 2006-2007, the Council reviewed information from the Alaska Fisheries Science Center summarizing current knowledge of Pribilof, Pervenets and Zhemchug canyons and considered HAPC designation for submarine canyons but ultimately postponed action, pending more information.

Since then, new information has become available from several sources that merit re-examination of possible habitat measures for the Green Belt canyons. In 2007, a research expedition to Pribilof Canyon and Zhemchug Canyon conducted video surveys of seafloor habitat in the canyons and provided new information on their coral and sponge fauna, including new species records and northern range extensions for a number of corals and sponges as well as discovery of a new sponge species, *Aaptos kanuux* (Lehnert *et al.* 2008, Miller *et al.* 2012). In addition, new research describes the importance of Zhemchug and Pribilof canyons in the circulation exchange between the Bering Sea shelf and basin (Hunt *et al.* 2008, Kinney *et al.* 2009) and provides new details on the diversity, stock structure, and ecology of deepwater fish fauna typically found in the canyons (e.g., Stevenson *et al.* 2008, Hoff 2009, Heifetz *et al.* 2009, Hoff 2010, Stevenson and Lewis 2010, Stone *et al.* 2011, Palof *et al.* 2011). In 2009, the first comprehensive mapping of Pribilof Canyon was also completed using high-resolution multibeam echosounders, providing a clearer picture of the canyon environment and its important features (AFSC 2009). Finally, the 2006 amendments to the Magnuson-Stevens Act give Councils new authority to protect deep-sea corals[3] and other species and habitats, considering the variety of ecological factors affecting fishery populations.[4]

Taken together, these new sources of information and strengthened legislative mandates compel a fresh look at options for protecting representative portions of the shelf break and slope canyon habitats that have, until now, received no protection. Although the importance of these canyons as EFH of commercially important managed species is clear, they play a larger role in the eastern Bering Sea ecosystem. The absence of habitat protection measures for this distinct ecoregion and the rare and unique fauna found within it calls for remedial action designed to avoid long-term or irreversible environmental damage while research continues. Protections afforded to representative canyons within this ecoregion would achieve multiple goals for habitat conservation and ecosystem-based management under the BSAI FMP, and are critical to the long-term sustainability of the fisheries.

[3] MSA § 303(b)(2)(B) (16 U.S.C. § 1853(b)(2)(B)).
[4] MSA § 303(b)(12) (16 U.S.C. § 1853(b)(12)).

2. Description of the Concept: Pribilof and Zhemchug Canyon HCAs

The 1,200 km upwelling and mixing zone along the margins of the outer continental shelf and slope of the eastern Bering Sea has been widely referred to as the "Green Belt" because it is an area of greatly enhanced primary and secondary productivity. The outer continental shelf break and slope of the Bering Sea is also unique in having several of the largest submarine canyons in the world, which play crucial roles in the physical transport of nutrients from deep basin waters to the eastern Bering Sea shelf and provide essential habitat to vulnerable deep-sea fauna as well as many top predator fish, seabirds and marine mammals that utilize the pelagic zone associated with the canyons. For purposes of delineating the boundaries of this ecoregion, the area encompassing the outer shelf and slope between the 100 and 1000 m isobaths is used as a first approximation, encompassing a total area of 191,648 km^2(Fig. 1).

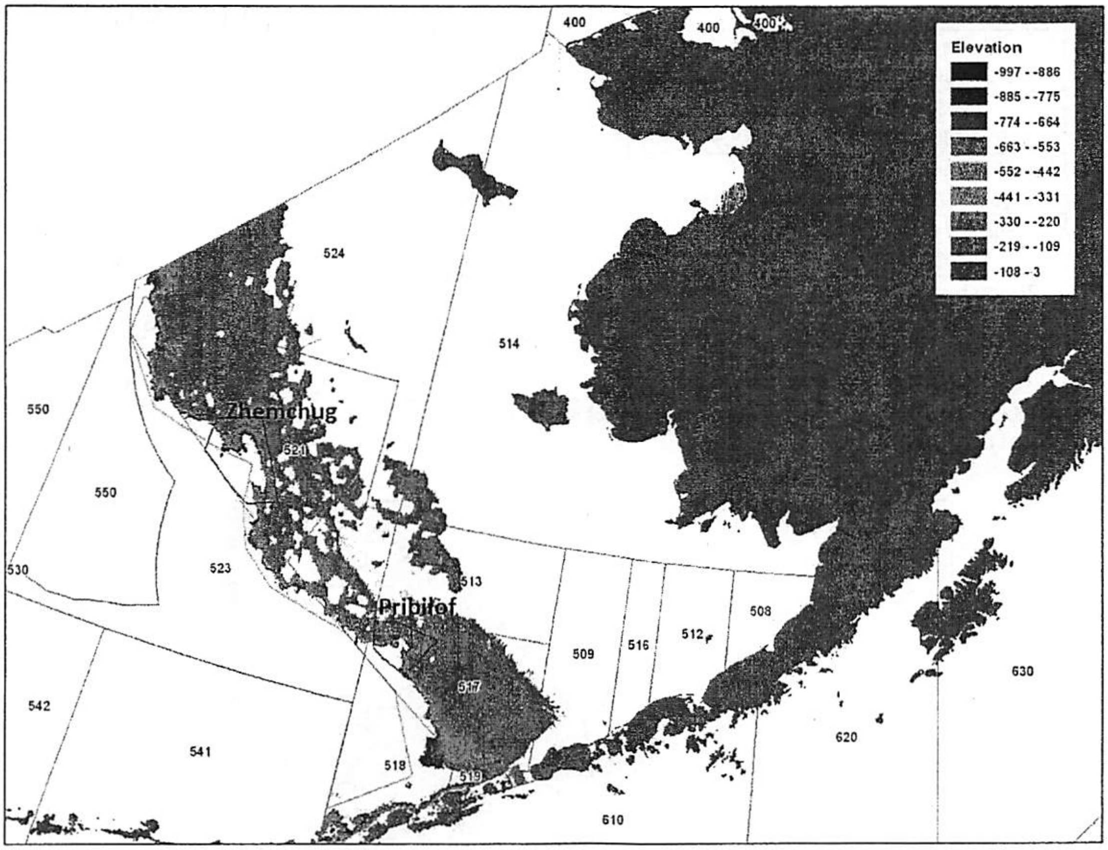


Figure 1. Area encompassing the outer shelf and slope between the 100 and 1000 m isobaths, courtesy of NMFS AKRO.

To remedy the absence of habitat protection measures for this vital ecoregion, this paper reviews the benefits of establishing habitat conservation areas (HCAs) encompassing the full extent of Pribilof Canyon and Zhemchug Canyon, which occupy positions in the central-southern and central-northern sections of the Green Belt.

2.1 Example Boundaries for Pribilof and Zhemchug Canyon HCAs

To illustrate this concept, example boundaries were drawn for canyon HCAs. The Pribilof Canyon HCA encompasses an area of 5,974 km^2 and the Zhemchug Canyon HCA encompasses an area of 12,999 km^2, for a combined area of 18,973 km^2. To put this in context, Table 1 and Fig. 2 provides a comparison of the proposed HCA areas to other management units. Overall, the combined area of the proposed canyon HCAs is **1.9%** of Bering Sea subarea (including the Bering Sea HCA but not the international waters of the Donut Hole), **2.3%** of EBS Shelf subarea (0-1000 m, excluding the Bering Sea HCA), and **9.9%** of Outer Shelf/Slope (100-1000 m).

Table 1. Comparative scale of example canyon HCAs in relation to other management units.

Units	Area (km^2)	% Bering Sea Subarea	% EBS Shelf (0-1000 m)	% Outer Shelf/ Slope (100-1000 m)
Bering Sea Subarea/a	1,002,076 km^2			
EBS Shelf (0-1000 m)/b	815,547 km^2	81%		
Outer Shelf/Slope (100-1000 m)	191,648 km^2	19%	23%	
Pribilof Canyon HCA	5,974 km^2	<1%	<1%	3.1%
Zhemchug Canyon HCA	12,999 km^2	1.3%	1.5%	6.8%
Pribilof/ Zhemchug Combined	18,973 km^2	1.9%	2.3%	9.9%

a/ Includes the Bering Sea HCA (159,119 km^2) but not international waters of the Donut Hole.
b/ Does not include the Bering Sea HCA.

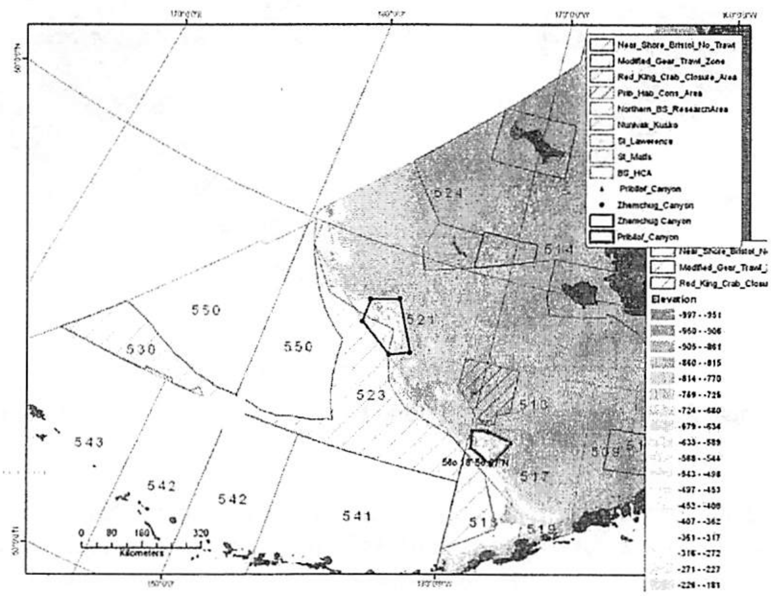


Figure 2. Example canyon HCAs in relation to other management units, courtesy of NMFS AKRO.

2.2 Unique Importance of the Deepwater Canyons Within the Bering Sea Green Belt

From a global perspective, submarine canyons are considered rare habitats, occupying less than four percent of the earth's seafloor and containing unique assemblages of species (McConnaughey and McGovern 2009). In the Bering Sea, there are reported to be at least 15 distinct canyon systems along the continental shelf, including three of the largest in the world (NMFS 2006). Zhemchug Canyon, 80 miles northwest of the Pribilof Islands, *is* the largest submarine canyon in the world, spanning some 60 miles in width and reaching depths of 2,730 m (9,000 ft.) with a volume of 8,500 cubic kilometers (km^3) (Scholl *et al.* 1970). Pribilof Canyon, whose canyon head starts just 20 miles south of the Pribilof Islands, is much smaller but still far larger than most and it is one of the world's longest at 90 miles in length, reaching depths of 1,800 m (6,ooo ft.) with a volume of 1,300 km^3. By contrast, the better-known Monterey Canyon off central California has a volume of only 450 km^3 (Scholl et al. 1970).

These shelf-edge canyons play a crucial role in circulation and transport of nutrients in the eastern Bering Sea as the northwestward-flowing Bering Slope Current interacts with canyon topography (Napp et al. 1998, Macklin and Hunt 2004, Okkonen *et al.* 2004, Kinney *et al.* 2009).Because they intersect the shelf break, the canyons act as conduits for organic nutrients moving between deep basins and the continental shelf, and the resulting fluxes support diverse communities with high biomass compared to non-canyon regions at similar depths (NMFS 2006, McConnaughey and McGovern 2009). A recent study indicates that the largest on-shelf flux of warmer, saltier oceanic water from the Bering Slope Current passes through Zhemchug Canyon (Kinney *et al.* 2009).The interaction of nutrient- and plankton-rich slope waters from the slope with the submarine topography of the canyons generates eddies and frontal zones on either side of the shelf break. These hydrographic features concentrate zooplankton and prey fish such as squids and juvenile walleye pollock and support a diverse assemblage of higher trophic level predators (Springer et al. 1996, Brodeur *et al.* 1997, Stabeno *et al.* 1999, Moore *et al.* 2002, Macklin and Hunt 2004, Okkonen *et al.* 2004, Hunt *et al.* 2008, Call *et al.* 2008).

The Pribilof Island Archipelago is known as the "Galapagos of the North" because the islands have supported some of the largest breeding colonies of marine birds and mammals in North America historically (Macklin *et al.* 2008).The largest colonies of fish-eating kittiwakes (*Rissa* spp.), murres (*Uria* spp.) and puffins (*Fratercula* spp.) in Alaska are found on the Pribilof Islands, drawn to the productive shelf-edge habitat where squids, juvenile pollock and other forage fish are most often found in high concentrations. More than half of the northern fur seal population gathers on the Pribilof Islands breeding and pupping grounds during the summer half of the year, feeding over a wide area of the shelf break, canyons and slope on pollock, squids, and deepsea smelts (Lowry *et al.* 1982; Kajimura *et al.* 1984; Sinclair *et al.* 1994; Springer *et al.* 1996, NRC 1996, Robson *et al.* 2004, Call *et al.* 2008, Call and Ream 2012). The major reason for this abundance is close proximity to the shelf break where slope waters are transported through Pribilof Canyon, providing a steady supply of new nutrients to the Pribilof Islands that sustain high productivity throughout the summer months (Napp *et al.* 1998, Hunt *et al.* 2008). Based on these distinctive bathymetric, hydrographic and ecological features, Hunt *et al.* (2008) defined a unique "Pribilof Domain" in the southeastern Bering Sea.

The canyons are also spawning, nursery and foraging habitats for commercially important species such as pollock and halibut, among many others. Pollock are known to spawn in predictable locations such as sea valleys and canyons along the outer margin of the continental shelf (Bailey 1998, Bailey *et al.* 2000), including areas in Pribilof Canyon and Zhemchug Canyon (Bacheler *et al.* 2010, Quinn *et al.* 2011).Tagging studies have shown that adult halibut migrate from summer feeding grounds on the Bering Sea shelf to winter spawning grounds that are concentrated near the edge of the southeastern Bering Sea shelf between 180-550 m depth, and spawning is known to occur as far north as the Pribilof Canyon(Gilbert St-Pierre 1984, Andrew C. Seitz *et al.* 2007).The canyons almost certainly serve as spawning habitat for other groundfish species that frequent the canyons, including Pacific cod, Greenland turbot, and sablefish. They are EFH for all life stages of resident rockfish from birth to adulthood. They harbor a diverse but poorly understood assemblage of deepwater skates and grenadiers, and they are preferred egg-nesting sites for skates (Hoff 2009, Hoff 2010). They provide important foraging habitat for managed groundfish species such as cod, pollock, flounders, rockfish, and sablefish as well as State-managed salmon and herring stocks that feed on the euphausiids, squids, smelts, and juvenile pollock that are found in the Bering Sea Canyons.

Lastly, new research and *in situ* observations indicate that Pribilof and Zhemchug canyons harbor a much more diverse community of deep-sea corals, sponges and other epibenthic fauna than was previously believed. The Bering Sea Canyons expedition documented the presence of previously unknown coral habitat in the canyons and includes new species records, northern range extensions, and possibly the discovery of coral species new to science as well as a new sponge species, *Aaptos kanuux* (Lehnert et al. 2008, Miller *et al.* 2012).Studies of submarine canyon sponge fauna elsewhere have found that canyons harbor a rich diversity of species and unique species assemblages that may rival the diversity of sponges found on seamounts (Schlacher *et al.* 2007). Given the enormous size of these canyons and the lack of systematic surveys, it is likely that many species and concentrations of coral and sponge habitat are still unknown to science in Pribilof and Zhemchug canyons.

In summary, the Pribilof and Zhemchug canyons are major bathymetric features of the Green Belt seascape with persistent and predictable hydrographic properties that have great ecological, economic and cultural significance. The fact that the long-term effects and consequences of fishing in the canyons is highly uncertain is all the more reason to provide comprehensive protection to representative portions of these vulnerable canyon habitats and species *now*, while research continues, in order to avoid unintended or irreversible harm and ensure that that there will be a multiplicity of options available with respect to future uses of these resources.[5]

2.3 Canyon HCAs as Tools to Accomplish Multiple Management Objectives and Promote the Application of Ecosystem Principles in Fisheries

The final report to Congress of the U.S. Commission on Ocean Policy (USCOP 2004) noted that the offshore area of the U.S. Exclusive Economic Zone (EEZ) is the largest in the world and larger than the combined land area of all fifty states. In managing the public trust resources of this vast territory for the benefit of all Americans, the USCOP called for a coordinated national ocean policy guided by overarching principles of stewardship for present and future generations based on an ecosystem-based approach to management of activities and uses (USCOP 2004).

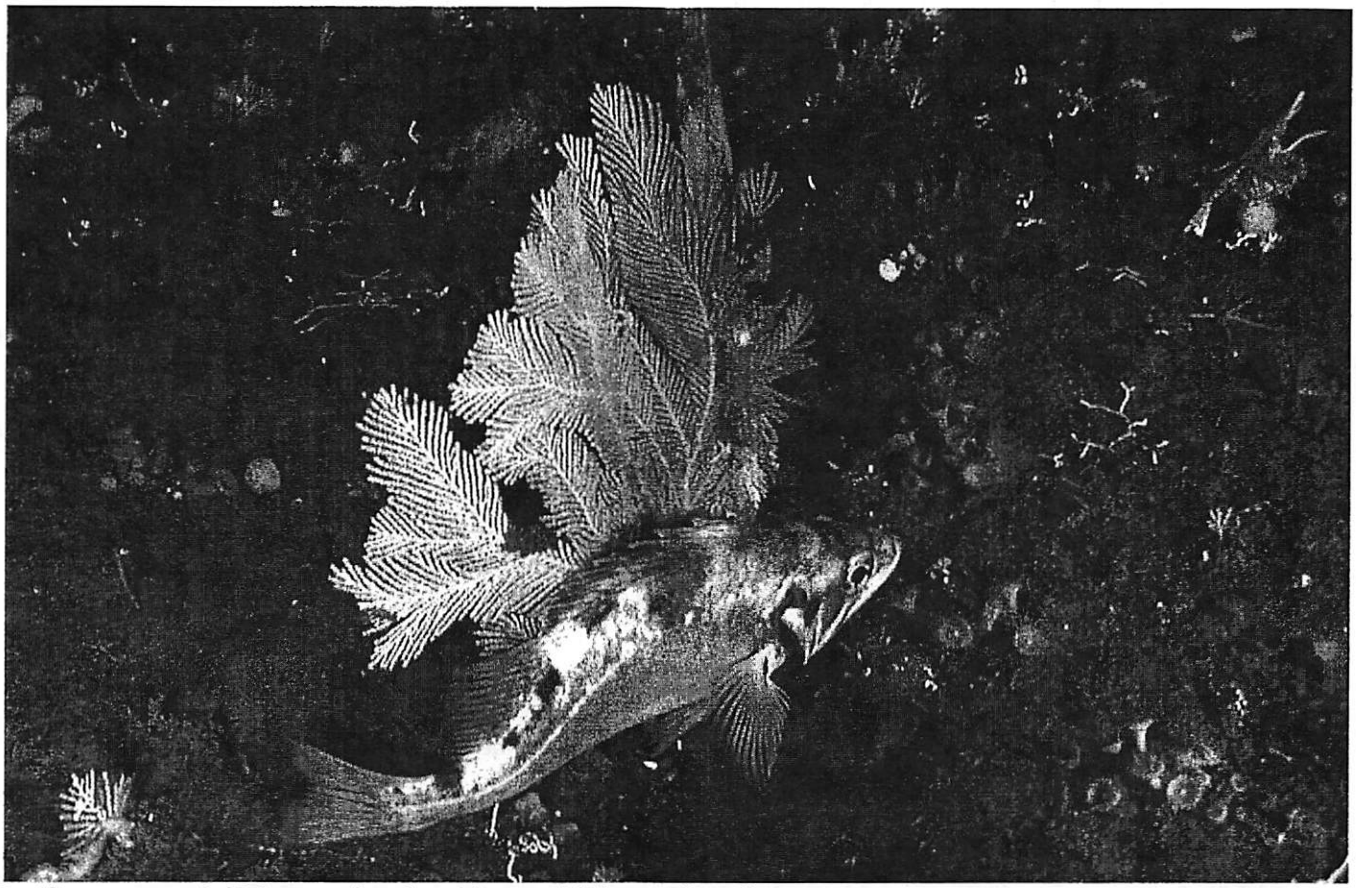
An ecosystem-based approach to fisheries involves considering not only a relative handful of commercially important species but addressing how fishing activities affect biodiversity, food web interactions, and habitats in order to maintain the health of the ecosystems on which sustainable fisheries (NMFS 1999, Pikitch *et al.* 2004, Heltzel *et al.* 2011). Addressing the need for effective, meaningful habitat protections along the Bering Sea Green Belt requires consideration not only of the EFH of single species or interactions with individual protected species but a wider, ecosystem-based perspective that reflects the ecological, economic and cultural importance of this ecoregion and achieves multiple management objectives. Habitat Conservation Areas (HCAs), also known as marine protected areas (MPAs), provide the most effective tool for achieving that goal.

By *building in* refuges from fishing, the Council could provide buffers against the considerable scientific and management uncertainties associated with managing these resources sustainably for present and future

[5]MSA 3(5) (16 U.S.C. § 1802(5)).

generations. A system of fully protected canyon HCAs along the as-yet unprotected Bering Sea Green Belt would accomplish multiple objectives for conservation and management under the MSA, ESA, and MMPA, including:

- Minimizing adverse effects on benthic and pelagic EFH.
- Protecting deep-sea corals and other structure-forming benthic epifauna.
- Conserving ecologically important non-target species and habitats.
- Reducing bycatch of ecologically and economically important benthic and pelagic species.
- Protecting marine mammal and seabird foraging habitat.
- Providing buffers against scientific and management uncertainty.
- Establishing control areas to foster adaptive learning.
- Achieving of the MSA's ultimate goal, Optimum Yield (OY).



Pacific ocean perch (*Sebastes alutus*) and fan coral (*Plumarella sp.)*,Greenpeace

3. Overview of Fishing Impacts in the Proposed Pribilof and Zhemchug Canyon HCAs

In the 2010 Eastern Bering Sea Slope trawl survey, approximately 145 fish species and 334 invertebrate species were identified along the continental slope and canyons from 200-1200 m (Hoff and Britt 2011). The giant grenadier (*Albatrossia pectoralis*) represented the largest biomass, followed by Pacific ocean perch (*Sebastes alutus*) and arrowtooth flounder (*Atheresthes stomias*). The most abundant fish species was the popeye grenadier (*Coryphaenoides cinereus*). The deep-sea papillate cucumber (*Pannychia moseleyi*) had the largest estimated biomass for invertebrates and the brittle star (*Ophiacantha normani*) was the most abundant. In Pribilof Canyon and Zhemchug Canyon, significant concentrations of managed groundfish species included walleye pollock, Pacific cod, rockfish, sablefish, halibut, turbot, and other flounders), crabs (Tanner, snow, and golden king crab), as well as diverse species of squids, octopods, eelpouts, skates, sculpins, grenadiers and sleeper sharks.

Nearly all of these species or families also appeared in the observer-reported catch data for groundfish vessels fishing within the boundaries of the proposed Pribilof and Zhemchug canyon HCAs during 1990-2011. Catch records for a subset of representative target and non-target fish species were analyzed to evaluate the overall magnitude of commercial fishing in the canyons as well as the potential for adverse impacts to the benthic and pelagic habitats and fauna found within the canyons.[6] Detailed spatial, temporal and depth distributions of fishing were not provided, but this information should be evaluated by the Council. Overall, the North Pacific Groundfish Observer Program catch database indicates that nearly 1.2 million tons of observed catch of groundfish and other marine life were reported within the proposed canyon HCA boundaries from 1990 to the present, representing about 3.3% of the total EBS groundfish catch of all species for the same period. Pribilof Canyon catches totaled 785,908 mt (66% of the combined catch from both canyons), while Zhemchug totaled 412,711 mt (34%). Although Pribilof Canyon catches were nearly double the amount for Zhemchug Canyon over the period, the amount of observed fishing effort was considerably higher in Zhemchug Canyon (Table 2).

Table 2. Observed commercial groundfish fisheries catch from vessels fishing in the proposed closure areas of Pribilof and Zhemchug Canyons, summed for each area, all gear types, 1990-2011./a

Area	Total Observed Catch (metric tons)	Duration Gear Deployed (minutes)	Number of Observed Hooks/Pots	Number of Observed Hauls/Sets
Pribilof Canyon (all observed hauls/sets)	785,908	7,544,655	46,289,920	16,211
Zhemchug Canyon (all observed hauls/sets)	412,711	16,640,970	171,803,085	23,027

a/ Data provided by the NOAA/NMFS North Pacific Groundfish Observer Program (NPGOP). Data were aggregated by area, calendar year, and gear type for the period 1990-2011. For confidentiality purposes, data were provided only for observed hauls/sets within statistical cells with more than three fishing vessels. Fishing location data were omitted.

Overall, pollock and cod catches accounted for more than two-thirds of the total observer-reported catch from both canyons during 1990-2011:

[6] Data provided by the North Pacific Groundfish Observer Program (NPGOP). Extrapolated numbers (n) and or weight (kg) were used. The values represent the expansion from the sampled catch to the total catch (effort in the case of longliners) for that haul or set. They do not account for any unsampled sets or vessels which were unobserved. Official estimates of the catch in the Catch Accounting System (CAS) may be higher in some cases due to accounting for unobserved catches.

- Combined pollock catches of 818,348 mt accounted for 68% of all observed catches from both canyons (Fig. 3) but only about 3% of the EBS-wide pollock catch. Pollock catches accounted for 80% of all observed groundfish catches in Pribilof Canyon, but only 46% of all groundfish catches in Zhemchug Canyon (Fig. 4). Nearly all pollock was caught with pelagic trawls (Fig. 5) and 81% of the catch came from Pribilof Canyon during 2000-2011 (Fig. 6).
- Combined Pacific cod catches totaled nearly 101,000 mt, representing ~8% of the total catch within both canyons but less than 3% of the EBS-wide cod catch. 82% of the cod was taken from Zhemchug Canyon (Fig. 7) and 81% of that catch was taken with longline gear (Fig. 8).
- Combined catches of skates, sculpins, grenadiers, rockfishes, sablefish, halibut, Greenland turbot, sleeper sharks, and squids accounted for 56,611 mt, nearly 5% of the total observed catch from both canyons.
- Observer-reported bycatch of benthic invertebrates was rarely identified to the species level and was mainly informative in documenting presence and identifying relative contribution from each gear type. Bycatch of benthic infauna and epifauna occurred in all gears, although a quantitative analysis of the relative contribution of each gear type has not been completed. Clearly there is extensive interaction with the seafloor by all gear types, including pelagic trawls.

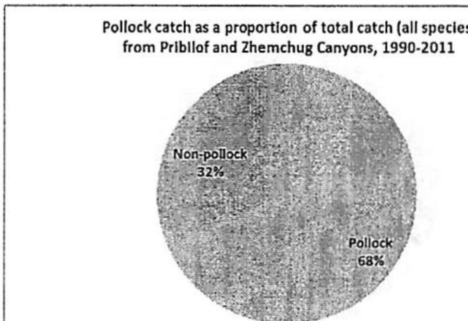


Fig. 3

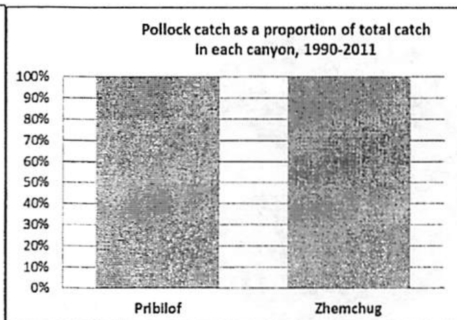


Fig. 4

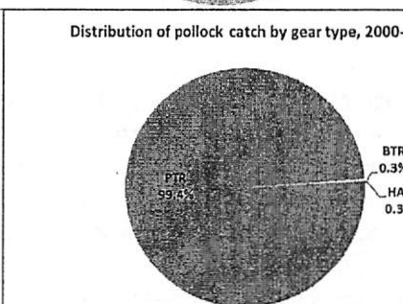
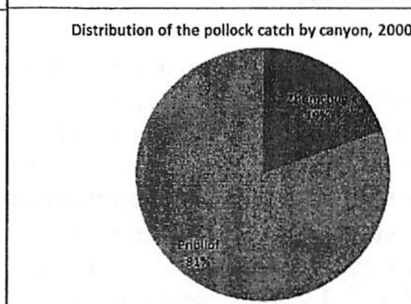


Fig. 5



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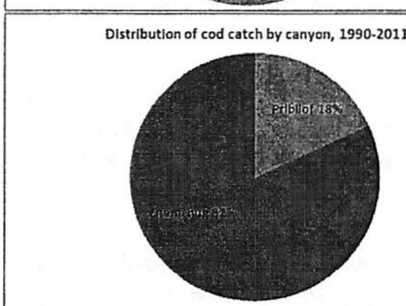


Fig. 7

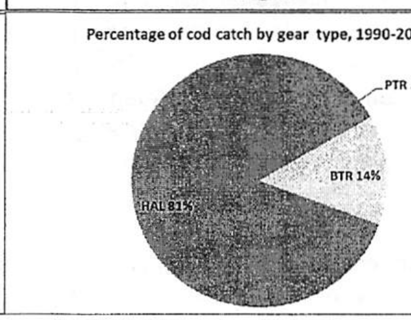


Fig. 8

- Combined halibut and Greenland turbot catches totaled 14,546 mt, representing 1.2% of the total catch from both canyons. 69% of the halibut catch and 64% of the turbot catch came from Zhemchug Canyon (Figs. 9, 10). Longline gear accounted for slightly more than 90% of the catch of both species, with bottom trawl and pelagic trawl gears accounting for the remainder (Figs. 11, 12). The 2010 halibut catch in the canyons (273 mt) was about 10% of the 2010 commercial catch of halibut in the Bering Sea (5.892 million lb., ~2,707 mt).

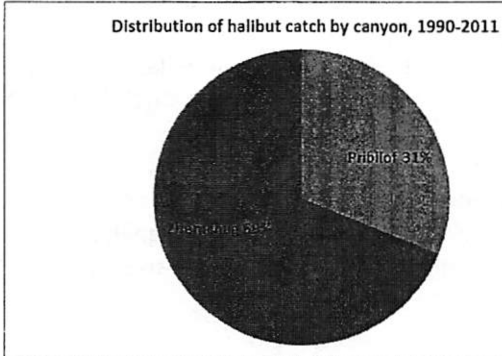


Fig. 9

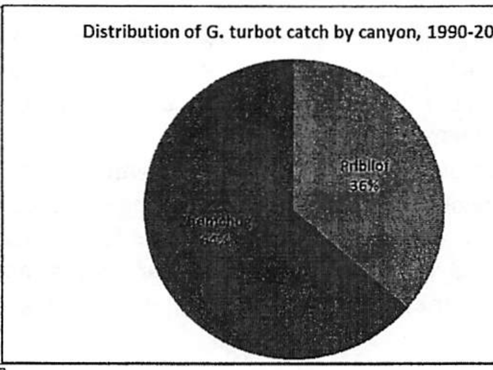


Fig. 10

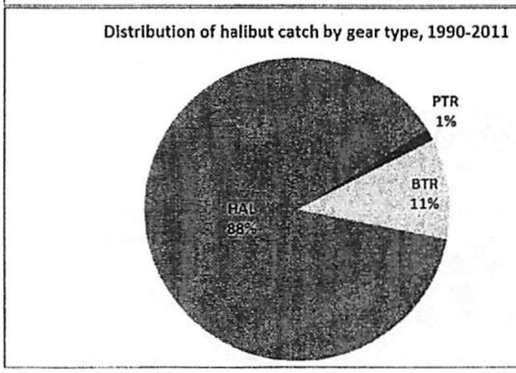


Fig.11

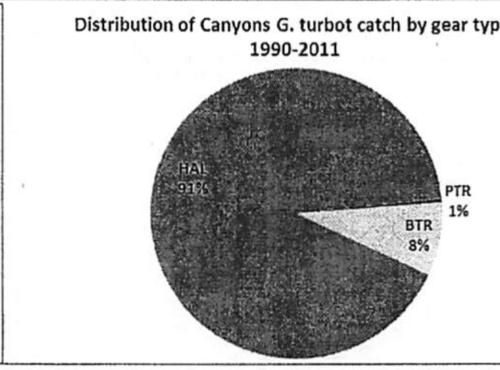


Fig. 12

Although the catches of skates and other non-target species associated with the outer shelf and slope are small in comparison to the pollock catch, they represent a diverse assemblage of poorly understood deepwater and pelagic species with life histories and habitat preferences that make them highly vulnerable to fishing mortality and associated habitat damage or disturbance from fishing. A number of them were previously managed together as the "Other Species" stock complex, including skates, sculpins, sharks, squids and octopus. Skates and sculpins comprised the vast bulk of the estimated bycatch of Other Species in the BSAI, mainly in trawl fisheries for yellowfin sole, Pacific cod, walleye pollock, Atka mackerel and flathead sole, and in the Pacific cod longline fishery (Ormseth and TenBrink 2010). In addition, grenadiers are ecologically important deepwater species associated with the continental slope that occur frequently in some fisheries, and concerns about their vulnerability to fishing impacts has prompted efforts to document bycatch in the fisheries since 2003 (Tribuzio *et al.* 2008). In 2010, the Council passed amendments to the BSAI and GOA FMPs which separated the "Other Species" stock complex into its constituent species groups and removed grenadiers from the FMP. The fishery observer data indicate that all of these species and their habitats are significantly affected by fishing in Pribilof and Zhemchug canyons:

- Skates were vulnerable to all fishing gears but longlines accounted for the vast majority (97%) of skate bycatch in the canyons (Fig. 13 below) and 79% of the bycatch occurred in Zhemchug Canyon (Fig. 14).

Deepwater species (e.g., Commander, roughtail, and whitebrow skates) occurred almost exclusively in longline gear. Significant quantities of skate egg cases (weighing tens to hundreds of kilograms) were reported in all gears and in nearly all years, but fishing effort distribution data were not available to determine their locations within the canyons.

- Grenadier bycatch occurred mainly in longline gear (Fig. 15) and 91% of it was taken in Zhemchug Canyon (Fig. 16). For the period 2004-2011, when observers began reporting grenadiers to the species level, the only species reported was giant grenadier. Giant grenadier accounted for the bulk of grenadier bycatch in most years, but "grenadier unidentified" accounted for a larger portion share of the bycatch in most years.
- Sculpin bycatch was divided almost evenly among longline and bottom trawl gears (Fig. 17), and more than three-quarters of the bycatch (78%) came from Zhemchug canyon (Fig. 18)
- Squids, smelts, and herring occurred primarily caught in pelagic trawl gear, although bycatch in bottom trawl gear was sometimes significant. Squids were the dominant biomass of forage fish other than pollock reported in pelagic trawls and most of it was taken from Pribilof Canyon in most years, but the combined catch of 2,843 mt during 1991-2011 was <1% of the total catch of all species from the canyons over the entire period. Eulachon was the most commonly reported smelt species in most years but was reported in far lower quantities than squids, while herring rarely occurred at more than trace levels.
- Significant numbers of chinook and chum salmon were reported as bycatch in some years (mainly in pelagic trawls), but their occurrence was highly variable. In some years, the combined canyons chinook bycatch represented a large percentage of the total number of fish taken as bycatch in the EBS-wide pollock fishery – *as much as 20-30% of all observer-reported chinook in 1999-2000 and 12% in 2003, but generally <10% in other years.*

Distribution of skate bycatch by gear, 2003-2011

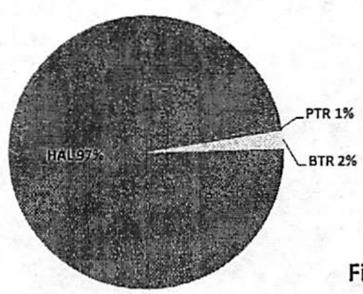


Fig. 13

Distribution of skate bycatch by canyon, 1990-2011

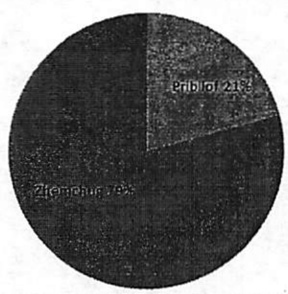


Fig. 14

Distribution of combined grenadier bycatch by gear type, 2004-2011

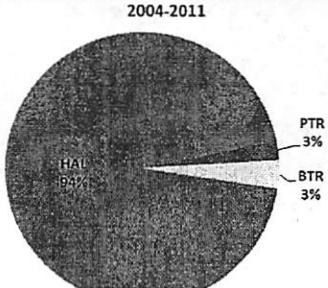


Fig. 15

Distribution of grenadier bycatch by canyon, 2004-2011

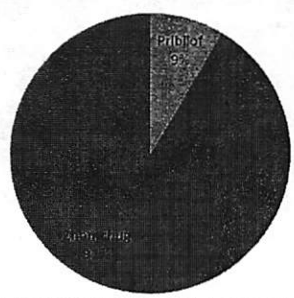


Fig. 16

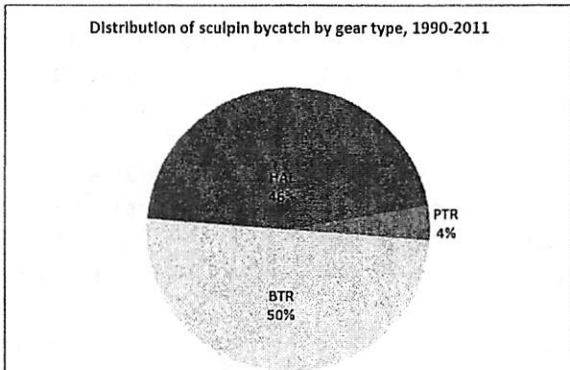


Fig. 17

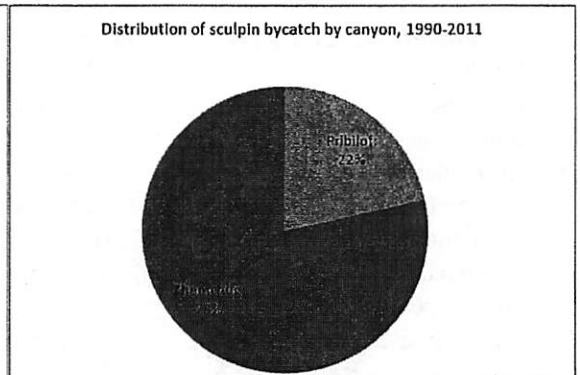
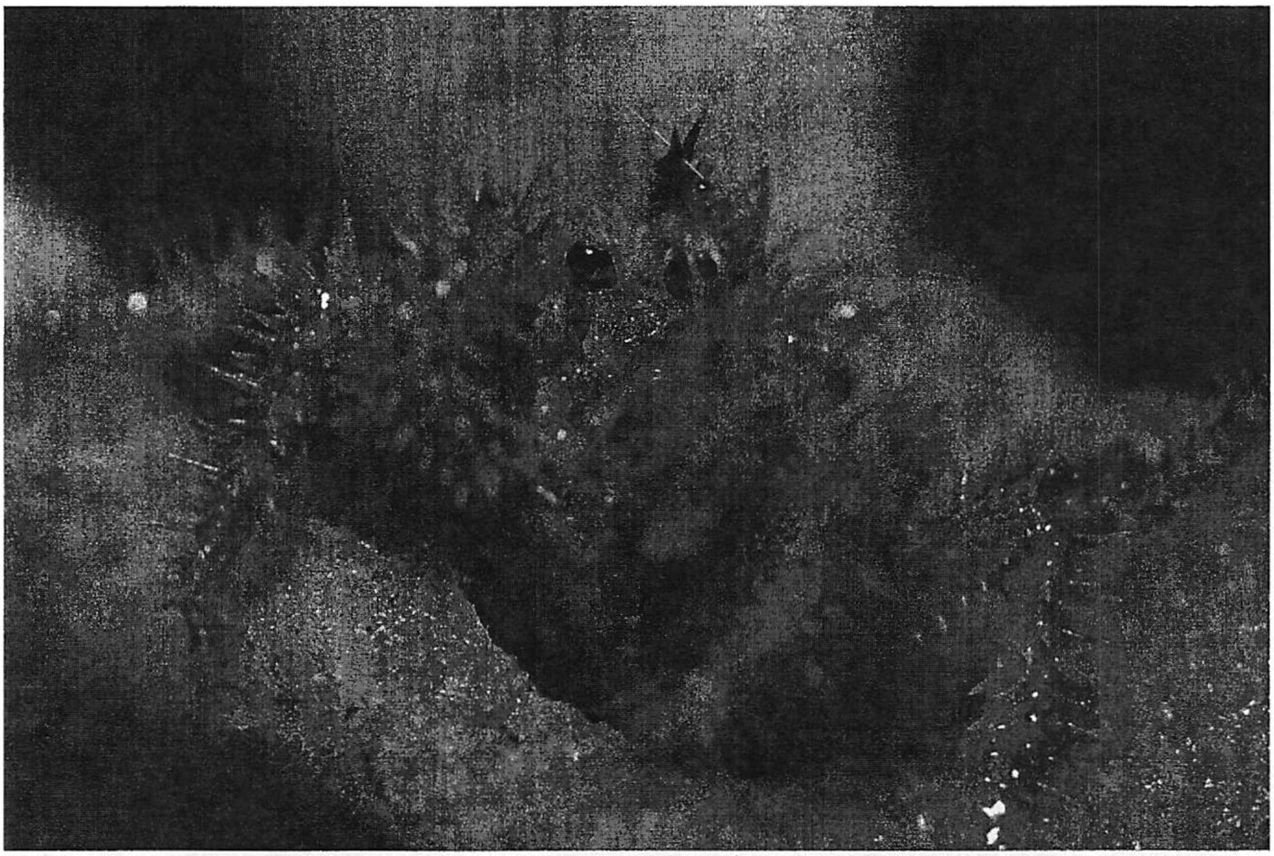


Fig. 18



Juvenile golden king crab (*Lithodes aequispinus*), Todd Warshaw/Greenpeace USA

4. Benthic Habitats: Deep-Sea Corals, Sponges and Other Benthic Epifauna

Epibenthic organisms that create habitat structure in Alaska waters include soft and stony corals, sponges, bryozoans, sea pens, anemones, and tunicates (NPFMC 2010). Analyses of NOAA trawl survey data and *in situ* observations have found that most FMP species in the Alaska groundfish fishery (approximately 85%) are associated with these living substrates during some or all of their lives, including many rockfish (*Sebastes, Sebastolobus* spp.), greenlings such as Atka mackerel (*Pleurogrammus monopterygius*), various flatfish (*Pleuronectidae* spp.), cod and pollock (*Gadidae* spp.), sculpins and crabs (Heifetz 2002, Krieger and Wing 2002, Stone 2006, Stone and Shotwell 2007, Stone *et al.* 2011). *In situ* observations by Krieger and Wing (2002) further subdivided faunal groups that associate with deepwater corals into predators (sea stars, sea snails, nudibranchs), suspension-feeders (crinoids, basket stars, anemones, and sponges), and protection seekers (rockfish, crab, shrimp). The Council has identified deep-sea corals as EFH habitat areas of particular concern (HAPC) because they are important habitat for many managed fish species, and because they are long-lived, slow-growing and highly vulnerable to damage by fishing gear.

4.1. Deep-Sea Corals (Alyconacea, Antipatharia, Gorgonacea, Pennatulacea, Scleractinia, Stolonifera)

Deepwater corals are widespread throughout Alaska, but most information on coral distribution has been based on observer-reported fisheries bycatch and analyses of NOAA trawl surveys. Major taxonomic groups of corals found off Alaska include Alyconacea (soft corals), Gorgonacea (tree corals, sea fans, bamboo corals), Scleractinia (cup corals, stony corals), Stylasterina (hydrocorals), Stolonifera (stoloniferan corals) and Antipatharia (black corals) (Heifetz 2002), representing 141 unique coral taxa (Stone and Shotwell 2007). Common gorgonian corals off Alaska include red tree coral (*Primnoa willeyi* and *P. resedaeformis*), bubblegum coral (*Paragorgia arborea*), bamboo corals (Family Isididae) and sea fans (*Calligorgia sp.* and *Plumarella* sp.). Large *Primnoa* colonies may be many hundreds of years old and analysis of growth rings of red tree coral specimens from Southeast Alaska indicated that growth occurs very slowly (mm/year), meaning that recovery from damage by fishing gear could take many decades or centuries (Heifetz 2002, Andrews et al. 2002). Removal and disturbance of these slow-growing corals could have lasting impacts on associated deepwater fauna, including many commercially important managed species (Krieger and Wing 2002).

In general, coral fauna have been poorly documented in the Bering Sea (Stone and Shotwell 2007). Based on fishery bycatch data, trawl survey data and a single ROV study of the upper reaches of Pribilof Canyon, deepsea corals are known to be patchily distributed along the shelf and slope, representing sixteen species or subspecies: three species of soft corals, six species of gorgonians, four species of pennatulaceans, and three species of stylasterids (Stone and Shotwell 2007). In 2007, a collaborative research expedition to Pribilof Canyon and Zhemchug Canyon conducted video surveys of seafloor habitat in the canyons and provided the most extensive *in situ* observations of the seafloor habitat along the Bering Sea slope to date. The Bering Sea Canyons expedition documented the presence of coral habitat in the canyons and includes new species records, northern range extensions, and possibly the discovery of coral species new to science as well as a new sponge species, *Aaptos kanuux* (Lehnert et al. 2008, Miller et al. 2012). Several fish species, including rockfish, sculpins and poachers, were commonly associated with corals and sponges in both canyons. The expedition's findings on coral taxa are summarized in Table 3.

Table 3. Taxonomic groups and species of deep-sea corals identified in Pribilof and Zhemchug canyons during the 2007 Bering Sea Canyons expedition.

Taxa	Pribilof Canyon	Zhemchug Canyon
Order Scleractinia *Caryophyllia alaskensis*		Present; new record depth and range extension
Order Antipatharia *Lillipathes wingi*		Present; range extension
Order Alcyonacea *Anthomastus* sp.		Present; possible range extension
Suborder Stolonifera *Clavularia* sp.		Present; new record
Order Gorgonacea *Plumarella superba* sp.	Common; range extension	
Isidella sp.		Present; range extension
Paragorgia arborea.		Present; possible range extension
Plumarella echinata	Common; range extension	
Primnoa pacifica		Present; possible range extension
Primnoa wingi		Present; new record
Swiftia pacifica	Present; new record	Common; new record
Order Pennatulacea *Anthoptilum* sp.	Present	Present; possible range extension
Halipteris willemoesi	Locally abundant	Present
cf. *Pennatula* sp.		Present; possible new species (not collected)
Protoptilum sp.	Common	Common

4.2 Deep-Sea Sponges (Calcarea, Demospongiae, and Hexactinellida)

Sponges (Porifera) also play a critical role in shaping benthic habitats and new research in the Aleutian Islands indicates that sponges often play a dominant role, providing important habitat refuges for many species of fish and invertebrates including juvenile rockfish (*Sebastes* spp.) and king crabs (*Lithodes* sp.) (Stone *et al.* 2011). At least 125 species or subspecies of sponges have been identified in the Aleutian Islands and examination of video footage from submersible observations indicate that there are likely hundreds of species still uncollected, many as yet unknown to science.

In the Bering Sea, even less is known about the extent of sponge diversity. Twenty different sponge specimens were collected during the Canyons Expedition's *in situ* exploration of Pribilof and Zhemchug in 2007, representing all three classes of Porifera (Calcarea, Demospongiae, and Hexactinellida). Many were new records for the Bering Sea – two-thirds of the species identified were reported for the first time, including a new sponge species, *Aaptos kanuux* (Lehnert *et al.* 2008, Miller *et al.* in press). Studies of submarine canyon sponge fauna elsewhere have found that canyons harbor a rich diversity of species and unique species assemblages that may rival the diversity of sponges found on seamounts (Schlacher *et al.* 2007), and it is likely that many sponge species are still uncollected and unknown to science in Pribilof and Zhemchug canyons.

4.3 Fishing Gear Impacts to Benthic Habitats

Disturbance from fishing activities is the greatest present threat to deepwater coral and sponge habitats in Alaska, particularly (but not only) from bottom trawl gear (Stone and Shotwell 2007). The National Marine Fisheries Service (NMFS) has estimated that 82 metric tons of coral is removed by commercial groundfish fisheries each year (NMFS 2004), and more than 90% of this incidental bycatch is reported in the waters of the Aleutian Islands and Bering Sea (Stone 2006). This bycatch undoubtedly understates the true magnitude of fishing impacts because it does not account for damaged benthic organisms that were not retrieved with the gear and it does not account for the unseen damage and loss of habitat due to scraping and plowing of seafloor habitat (NMFS 2004).

4.3.1 Bottom trawl impacts to the benthos

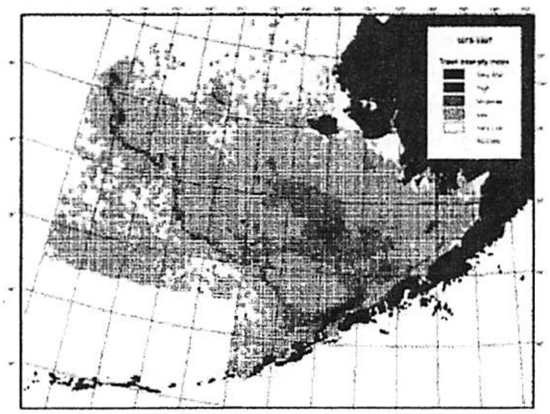


Fig. 19. Location and intensity of bottom effort in the Bering Sea, 1973-1997. Source: http://www.afsc.noaa.gov/groundfish/hist.trawldata.htm.

Three main fishing gears used in the Alaska groundfish fisheries: otter trawls, longlines, and pots (NMFS 2004). The vast majority of the Bering Sea groundfish catch (~90%) is taken with pelagic and bottom trawl gear, although fixed gears account for a significant portion of the Pacific cod catch as well as all of the directed catch of sablefish and halibut. Bottom trawling is considered the highest threat to coral habitat in Alaska (Stone and Shotwell 2007). Virtually all areas of the Bering Sea have experienced some degree of exposure to bottom trawls. However, the intensity of exposure varies, reflecting the non-random behavior of fishing fleets, which is based on historical patterns of effort and regulatory restrictions. Relatively heavy trawling has concentrated in several regions, including the highly productive upwelling zone along the western edge of the continental shelf and slope in the Green Belt (Fig. 19) (NRC 1996 Fritz *et al.* 1998, NMFS 2004). Studies have shown that chronic bottom trawling reduces structural complexity and diversity of benthic species in the soft-bottom habitats of the eastern Bering Sea (McConnaughey *et al.* 2000), and a single pass of bottom trawl gear over structurally complex seabed habitats comprised of deep-sea corals and sponges can inflict extensive and long-lasting damage (Freese *et al.* 1999, Krieger 2001, Andrews *et al.* 2002, Stone and Shotwell 2007, Heifetz *et al.* 2009, Stone *et al.* 2011). Krieger (2001) used a submersible to observe the effects of bottom trawl gear on *Primnoa* coral during a resource trawl survey and found that 27% of the original volume of coral was removed by a single pass of trawl gear in a site that was closed to commercial trawling. These findings were used in the 2005 EFH EIS to conduct the analysis of coral sensitivity to fishing gear impacts, with a range of 22-35% (NPFMC 2011). Sponges are also easily damaged by contact with bottom fishing gear, and high rates of fishery bycatch as well as *in situ* observations indicate that interaction with the existing fisheries is extensive and disturbance is widespread (Heifetz *et al.* 2009, Stone 2006, Stone *et al.* 2011).

Despite Council actions to limit the expansion of the bottom trawl footprint and set six small areas off-limits to bottom-tending gear in central Aleutian Island coral gardens (377 km^2 total), new research indicates that disturbance and damage to corals and sponges is widespread in open areas of the central Aleutians where bottom fisheries still operate. Video surveys with the *Delta* submersible and *Jason* ROV found that 14% of corals and 21% of sponges were damaged overall. Disturbance was widespread on most video transects (Heifetz et al. 2009). The Bering Sea Canyons expedition also found evidence of fishing disturbance on 13 occasions (nine in Pribilof Canyon, four in Zhemchug Canyon) at depths ranging from 154-966 meters. Most observations were trawl scars caused by gouging of soft sediment, but damage to corals was also evident. In Pribilof Canyon, at 280 m depth, researchers observed trawl scars on the seafloor and numerous gorgonians and sea pens were toppled and lying in the same direction on the seafloor.

4.3.2 Pelagic trawl impacts on the benthos

Although the massive pollock fishery has exclusively deployed pelagic trawl nets since 1999, there is a strong incentive for fishing pelagic nets near or on bottom (NPFMC 2012).[7] Bycatch of benthic species in pelagic nets confirms that pelagic trawl nets regularly come in contact with, or very close to, the seabed (Stevenson and Lewis 2010). Observer-reported bycatch data for Pribilof and Zhemchug canyons indicates that pelagic gear regularly hauled up benthic infauna as well as epifauna, including corals, sponges, bryozoans, tunicates, sea urchins, sand dollars, crinoids, bivalves, sea snails, anemones, nudibranchs, polychaete worms, sea cucumbers, brittle and basket stars, cephalopods and crabs. The reported quantities of these species generally appear to be much less than for bottom trawls, but they appeared consistently over time and they are consistent with the findings of the North Pacific groundfish EFH EIS (NMFS 2005), which estimated that pollock "pelagic" trawl gear contacts the seafloor approximately 44% of the time it is deployed.[8] Because many benthic organisms will drop out of the large mesh panels in the forward sections of the pelagic net before it is hauled up (NPFMC 2011),[9] whatever comes up in the net likely understates the true extent of interaction with the seafloor and benthic organisms. Like bottom trawls, pelagic trawl nets that come in contact with the seabed are capable of inflicting extensive damage to benthic substrates and epibenthic structures such as deep-sea corals.

4.3.3 Longline impacts on the benthos

Longline gear is fished on bottom in Alaska, mainly for Pacific cod, Pacific halibut, Greenland turbot, sablefish and some rockfish. In the Bering Sea, bottom longlining (principally targeting cod) has been intensely concentrated along the western edge of the continental shelf and slope, including Pribilof and Zhemchug canyons. Average set length ranges from 4-10 miles depending on the fishery (NMFS 2004). Longlines are often deployed in habitats that are too rough for trawling and some vessels attach weights to the groundline, especially on rough or steep bottoms so that the gear stays in place on the bottom. During the retrieval process, the groundline sweeps the bottom for considerable distances before ascending and can snag objects in its path, dislodging rocks and breaking off upright corals (NMFS 2004, Stone 2006, Stone and Shotwell 2007). In addition, observations of halibut gear during submersible dives off Southeast Alaska have shown that hooked fish can move the groundline for distances of 50 feet or more on either side as they attempt to free themselves, which can disturb objects in their path (NMFS 2004). Although longlines are considered a moderate threat to coral habitat in Alaska, there have been no directed studies of the effects of bottom longline gear on benthic habitat in Alaska and bycatch of corals and other benthic fauna are common in some areas (Stone and Shotwell 2007). During the 2007 Bering Sea Canyons Expedition, researchers also observed evidence of bottom longline damage and derelict fishing gear, including tangles of line and netting (Miller *et al.* 2012). Observer data for Pribilof and Zhemchug canyons indicates that longline gear often accounted for significant quantities of benthic invertebrates, including unidentified corals, bryozoans, sea pens or sea whips, anemones, and crabs, in addition to sometimes large quantities of skate egg cases. Longline gear was responsible for the majority of skate and grenadier bycatch in the canyons as well as a variety of lesser-known deepwater fish species from eelpouts to sleeper sharks.

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[7] See NPFMC Agenda Item C4(a), *HAPC Initial Review*, February 2012, p. 10.
[8] NMFS (2005), Final Environmental Impact Statement (EIS) for Essential Fish Habitat (EFH) Identification and Conservation in Alaska, Appendix B, Table B.2-4.
[9] NPFMC (2011), FMP for the Bering Sea and Aleutian Islands, Appendix F.

4.4 Measures to Address Fishing Gear Impacts on Benthic Habitat

While bottom trawl gear has the most extensive and destructive impacts on deep-sea corals, sponges and other epibenthic structures in the canyons, the evidence clearly indicates that measures aimed at prohibiting bottom trawling in sensitive benthic habitats do not address the potential for widespread and lasting impacts of other fishing gears that frequently make contact with the seabed, including pelagic nets.

Observer data from Pribilof and Zhemchug canyons corroborates the extensive interaction with the seafloor by *all* gear types, as evidenced by the benthic invertebrates retrieved in each gear type, including: corals, sponges, bryozoans, tunicates, sea urchins, sand dollars, crinoids, bivalves, sea snails, anemones, nudibranchs, polychaete worms, sea cucumbers, brittle and basket stars, cephalopods and crabs. Observer-reported bycatch of corals and other benthic invertebrates was rarely identified to the species level and detailed information on locations and depth distributions of fishing was lacking, therefore the observer data are mainly informative in documenting presence and identifying relative impact of each gear type. The Bering Sea Expedition's *in situ* exploration of the canyons with submersibles and ROVs sheds additional light on the taxonomic groups that are likely to be impacted by bottom-tending fishing gears, including deepwater corals in six taxonomic Orders (Alyconacea, Antipatharia, Gorgonacea, Pennatulacea, Scleractinia, Stolonifera) and species from all three classes of sponges (Calcarea, Demospongiae, Hexactinosida) (Miller *et al.* 2012).

The benthic and pelagic species taken as bycatch by each gear type in the fishery represent the collateral damage of fishing in the canyons, but the reported bycatch does not account for the unseen habitat damage to fauna and structures on the seafloor that are not retrieved with the gear. The observer-reported bycatch of benthic fauna in longlines and pelagic trawl nets probably understates their full impacts considerably. In general, the analysis of the fishery observer data for Zhemchug and Pribilof canyons shows that each of the gears in the fishery contributes significantly to the overall impact of fishing on the canyon seabed habitats and epifauna.

Given how little is known about the true extent of the biodiversity in the Bering Sea Canyons or the cumulative, long-terms impacts of fishing on deepwater corals, sponges and other epibenthic fauna in the canyons, the Council's policy should be to manage explicitly for habitat diversity and complexity *now*, while research on "essential" habitats continues:

> *"Management for habitat complexity and diversity is an alternative to species-based management for 'essential' habitat. It is a precautionary approach that takes into account our limited knowledge of fishing gear impacts and the ecology of recently settled fishes. It allows for variable timing and location of settlement. Its premise is that maintaining habitat complexity increases the survivorship of all species. Numerous uncertainties surround fisheries management, and managers should accompany their calls for more data with precautionary measures that will prevent long-term damage to ecosystems while scientific theories are being tested"* (Auster *et al.* 1997).

This habitat policy should encompass representative habitat types in all ecoregions, including the outer continental shelf and slope of the Bering Sea Green Belt. Designation of habitat conservation areas (HCAs) for Pribilof and Zhemchug canyons that prohibit fishing with bottom-tending gears would be consistent with the stated intent of NMFS and the Council to reduce and avoid impacts to essential fish habitat of managed species by the use of management tools that include marine protected areas and no-take marine reserves in order to maintain the abundance, diversity and productivity of these habitats (NMFS 2004, NPFMC 2010).[10] HCAs that prohibit the use of all bottom-tending fishing gears (including pelagic trawls) would provide significant protection to representative areas of this ecoregion that are currently unprotected while research continues to expand our understanding of the true extent, diversity and ecological importance of coral and sponge habitats in the Bering Sea Canyons.

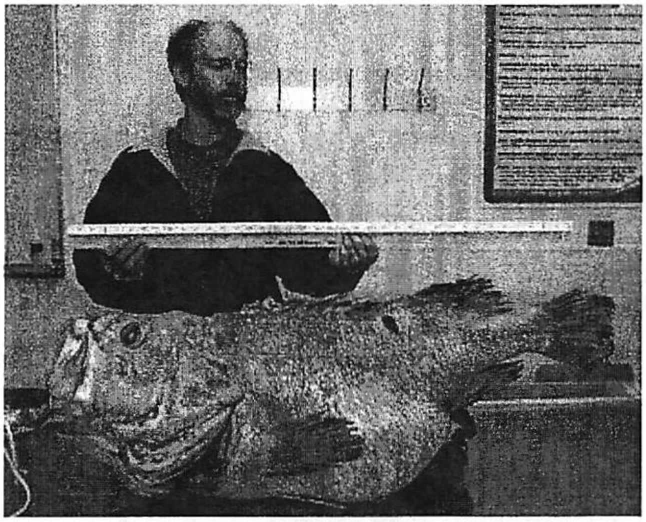
Deep-sea coral (*Swiftia pacifica*) in Zhemchug Canyon, Greenpeace

[10] See: NMFS (2004), Alaska Groundfish Fisheries Final Programmatic Supplemental EIS, Executive Summary, and NPFMC (2011), Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area, Executive Summary and Chapter 2.

5. Benthic Fish Species: Rockfish, Skates, Grenadiers, and Sculpins

Many deepwater fish species that are found along the outer continental shelf and slope of the eastern Bering Sea are highly vulnerable to fishing disturbances and mortality as a consequence of life history traits that include slow growth, delayed maturation, low fecundity and extreme longevity (Koslow *et al.* 2000, Devine *et al.* 2006, Garcia *et al.* 2008, Norse *et al.* 2012). Rockfish (*Sebastes, Sebastolubus* spp.), sablefish (*Anoplopoma fimbria*), deepwater skates (*Bathyraja* spp.), grenadiers (*Albatrossia, Coryphaenoides* spp.), sculpins (*Hemilepidotus* spp., *Myoxocephalus* spp., *Hemitripterus* spp.), sleeper sharks (*Somniosus pacificus*) and deepwater flatfishes such as Greenland turbot (*Reinhardtius hippoglossoides*) are just some of the inhabitants of the Bering Sea canyons whose life histories and habitat preferences make them especially vulnerable to fishing mortality and associated habitat disturbance from fishing gears. Most are considered "data-poor" stocks and their status with respect to overfishing and overfished thresholds is unknown or highly uncertain. The great diversity of species found in some of these families of deepwater fishes (e.g., Sebastidae, Cottidae, Rajidae, Macrouridae) further compounds the difficulty of managing a relative handful of commercially important species so as not to overfish and deplete the less abundant or less productive members of these deepwater communities. A system of canyon HCAs along the Bering Sea Green Belt that provides refuges from fishing would provide buffers against all these uncertainties by reducing bycatch mortality, minimizing the risk of inadvertent overfishing, and protecting sensitive deep-sea habitats on which these species rely.

5.1 Rockfish (Scorpaenidae)



Shortraker rockfish (*Sebastes borealis*), caught at 2,100 ft. depth in Pribilof Canyon by the pelagic pollock trawler Kodiak Enterprise.

At least 41 rockfish species in 2 genera (*Sebastes, Sebastolobus*) are known in the North Pacific. Pacific ocean perch (*Sebastes alutus*) is the dominant species along the outer continental shelf and upper slope regions of Bering Sea and Aleutian Islands and is widely distributed at depths of 100-500 m, but the highest concentrations of fish are found in patchy, localized aggregations. Four other species of slope rockfish are commonly found together with POP – northern rockfish (*S. polyspinis*), shortraker rockfish (*S. borealis*), rougheye rockfish (*S. aleutianus*), and sharpchin rockfish (*S. zacentrus*), although sharpchin is not as common in the eastern Bering Sea. Many of the species in the slope rockfish assemblage are of limited economic value and catches of "other slope rockfish" are frequently discarded by fishermen. All have life history characteristics typical of other deepwater species: slow growth, late maturity, low fecundity, extreme longevity. POP can live up to 100 years, shortraker to 120-140 years, and rougheye to more than 200 years (Love *et al.* 2002).

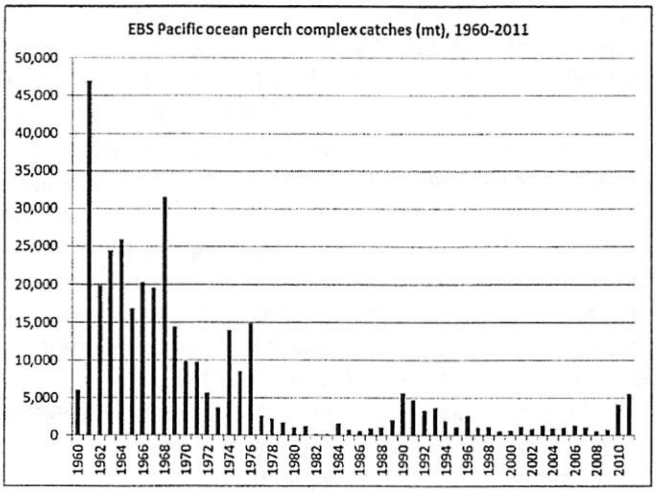


Fig. 20. Historical catches of Pacific ocean perch (POP) and other slope rockfish in the eastern Bering Sea, 1960-2011. Source: NPFMC BS/AI SAFE 2011.

All these species were managed as a single stock complex until 1991, when POP was separated for management purposes in recognition of the fact that POP is the largest rockfish biomass in this assemblage and the prime fishing target. Historically, Soviet and Japanese trawlers rapidly depleted the POP/red rockfish complex in the 1960s, when some 236,000 tons of POP catch were mined from the eastern Bering Sea slope (in addition to even larger rockfish catches in the Aleutians and Gulf of Alaska). POP abundance rapidly plummeted under this fishing pressure and the fishery crashed (Fig. 20). As a slow-growing, long-lived species that bears live young, POP recovery has been slow over the past three decades, but with limited fishing and strong recruitment from 1990s year classes the population is beginning to show signs of rebuilding in recent years (Spencer and Ianelli 2010).

In Pribilof and Zhemchug canyon over the period 1990-2011, POP and other slope rockfish comprised 98% of the observed catch (dominated by POP),with small contributions coming from pelagic shelf rockfish such as dusky (*S. variabilis*, commonly found at depths of 100-200 m) as well as thornyheads (*Sebastolobus* spp.), and trace amounts (10s to 100s of kg) of rarer rockfish species: harlequin (*S. variegatus*), red-banded (*S. babcocki*), red-striped (*S. proriger*), dark (*S. ciliatus*), darkblotched (*S. crameri*), yelloweye (*Sebastes ruberrimus*)and Bocaccio(*S. paucispinis*) (Fig. 21). Although the frequency of occurrence of less abundant or rare species in the assemblage may be low overall, the number of individuals caught when the species is encountered may be quite high relative to local abundance (Sinclair *et al.* 1999). Most (90%) of the observed rockfish catch from Pribilof and Zhemchug canyon was taken in bottom trawls (Fig. 22), but much of the catch was simply discarded – discard rates of EBS rockfish averaged 33% during 1990-2009, far higher than in the Aleutians fishery (Spencer and Ianelli 2010).

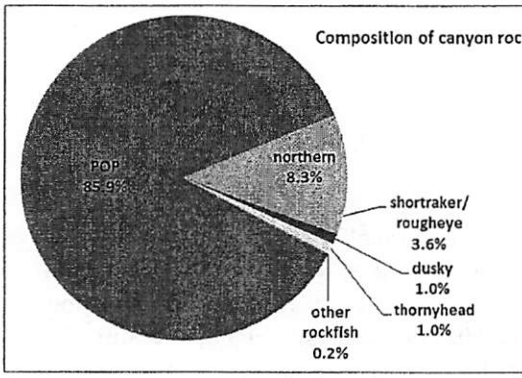


Fig. 21

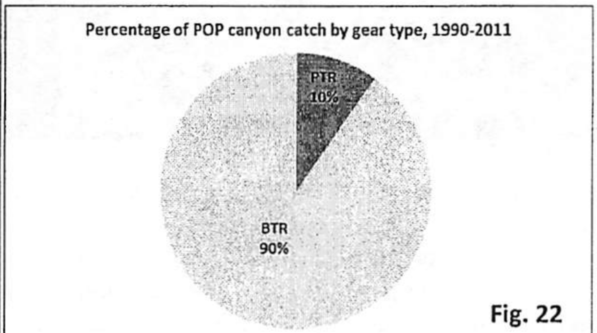


Fig. 22

As a consequence of sharply increased EBS Pacific ocean perch ABCs and TACs in 2010 and 2011, a directed fishery has developed at the end of year (after the Aleutian fishery has ended) and catches reached the highest level seen in more than 20 years in 2011 (Table 4). The observer catch database for Pribilof and Zhemchug canyons indicates that 50-70% of this recent EBS rockfish catch has occurred in the canyons, concentrated in Pribilof Canyon.

Table 4. EBS catch (mt) of Pacific ocean perch compared to observer-reported POP catch/bycatch in Pribilof and Zhemchug canyons, 1990-2011.

Year	EBS POP ABC	EBS POP TAC	EBS POP catch/a	Prib-Zhem total catch/b	Prib-Zhem % of EBS POP catch
1990/c			5,639	1,624	29%
1991	4,570	4,570	5,099	184	4%
1992	3,540	3,540	3,254	416	13%
1993	3,300	3,300	3,764	999	26%
1994	1,910	1,910	1,688	552	33%
1995	1,850	1,850	1,210	475	39%
1996	1,800	1,800	2,854	761	27%
1997	2,800	2,800	681	64	9%
1998	1,400	1,400	1,022	255	25%
1999	3,600	1,900	421	65	15%
2000	3,100	2,600	451	86	19%
2001	2,040	1,730	896	97	11%
2002	2,620	2,620	641	96	15%
2003	2,410	1,410	1,145	293	26%
2004	2,128	1,408	732	28	4%
2005	2,920	1,400	879	163	18%
2006	2,960	1,400	1,042	293	28%
2007	4,160	2,160	870	228	26%
2008	4,200	4,200	513	161	31%
2009	3,820	3,820	623	422	68%
2010/c	3,830	3,830	3,547	2,556	72%
2011/d	5,710	5,710	5,599	2,905	52%

a/ Spencer and Ianelli (2010), BS/AI Pacific ocean perch assessment, p. 1057, Table 2, In: NPFMC Bering Sea/Aleutian Islands SAFE, Dec. 2010. Includes retained and discarded catch.
b/ Combined observed catch and bycatch of POP from Pribilof and Zhemchug canyons for all gears. Source: NPGOP.
c/ Total for 1990 includes POP, northern, shortraker, rougheye, and sharpchin rockfish. NPFMC Bering Sea/Aleutian Islands SAFE 2011, Introduction, Table 2.
d/ NMFS AKRO CAS total catch through 12/17/2011: Additional fishing totaling 3,547 tons occurred between Nov. 5 and Dec. 17.

Although POP in the eastern Bering Sea and Aleutian Islands management areas have been assessed and managed as a single stock due to the paucity of data in the EBS (Spencer and Ianelli 2010), many slope rockfish populations are known to exhibit little geographic movement as adults and to represent "a mosaic of small, localized stocks" (Love *et al.* 2002). One study of trawl survey data in Alaska found that variability in rockfish abundance and species composition within a given area is related to local habitat features, and that higher habitat heterogeneity and the presence of epibenthic structures such as corals is correlated with higher diversity of species and abundance (Rooper 2008). Recently published research by Palof *et al.* (2011) using DNA analysis of POP sampled along the continental shelf break of the Gulf of Alaska and Bering Sea indicates significant geographically related stock structure at small spatial scales: adults appear to belong to "neighborhoods" at geographic scales less than 400 km and as little as 70 km. Therefore genetic interchange, movement to new areas, and boundaries of discrete stocks may depend largely on pelagic larval dispersal and juvenile life-history stages (Love *et al.* 2002, Spencer and Ianelli 2010).

Well-known life history features and the new research confirming that POP populations are highly localized and genetically differentiated has profound implications for the management of the POP and other rockfish, elevating the concern that spatially concentrated fishing could decimate discrete reproductive populations, eliminate genetic diversity within the POP population, and undermine the sustainability of the fishery. Concerns about disproportionate harvesting in the Aleutian Islands have prompted some action to subdivide BS/AI POP allowable biological catch (ABC) and total allowable catch (TAC) into four large management subareas in the EBS and AI based on the weighted averages of the biomass estimates from the three most recent groundfish surveys (Table 5).

Table 5. Apportionment of POP ABC and TAC based on proportion of stock abundance by large management subareas, 2011-2012

	Bering Sea/Aleutian Islands Subareas			
	EBS	EAI	CAI	WAI
Proportion of biomass by area:	23.1%	22.8%	20.2%	33.9%

However, the new genetics research indicates that these management units are still too large to address the relevant spatial scale of stock structure found in POP. Evaluation of more appropriate spatial management units should be a high priority for these rockfish species,[11] and the stock assessments themselves should also provide better spatial analyses of effort distribution to evaluate the risk of serial depletion of distinct, localized populations (Babcock *et al.* 2005). In the face of these considerable uncertainties and risks, marine protected areas have been proposed as an effective tool to reduce bycatch and the risk of serial overfishing of substocks of shortraker and rougheye rockfish in the Gulf of Alaska – without reducing current catch levels (Soh *et al.* 2000). Rooper (2008) suggested that MPAs could be designed for specific depth and geographic locations to protect portions of rockfish populations as part of a more explicit spatially based management approach.

In Pribilof and Zhemchug canyons, the spatial distribution of rockfish catches (all rockfish species, all gears) showed a striking shift over two decades: during 1990-2000, 83% of the observed catch occurred in Zhemchug canyon whereas, from 2001-2011, 86% of the catch came from Pribilof canyon (Fig. 23). The reason for the dramatic shift in rockfish catches between these two periods is unknown, but the patchy, localized distribution of rockfish species makes localized populations vulnerable to depletion and this possibility should be investigated in considering how to protect the canyons.

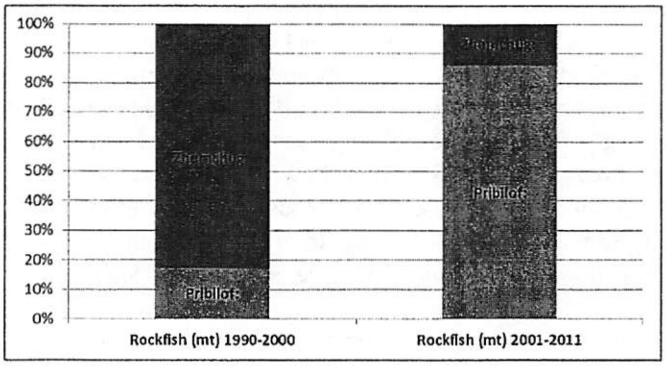


Fig. 23. Percentage of observer-reported rockfish catches in Pribilof and Zhemchug canyons for the periods 1990-2000 and 2001-2011.

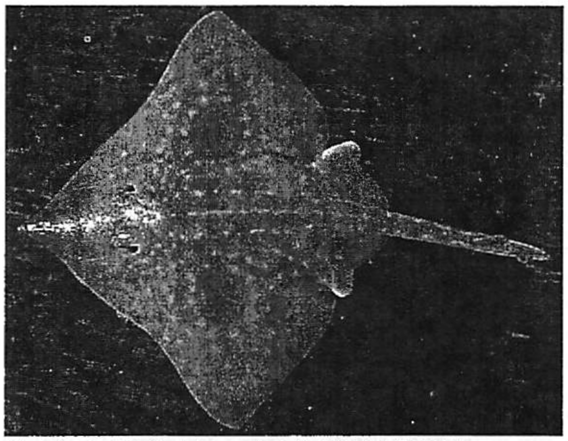
The BSAI directed rockfish fisheries are conducted almost exclusively by factory trawlers in the H&G fleet, using bottom trawl gear. The prospect of significantly increased fishing for POP and other rockfish along the EBS shelf edge and slope is especially concerning because increased bottom trawl effort in the canyons will mean increased damage to benthic invertebrates in the region. From 2003-2008, the BSAI rockfish fisheries (concentrated in the Aleutian Islands) accounted for 31% of the coral and bryozoan bycatch, 18% of the sponge bycatch, 8% of the red tree coral bycatch, and 7% of the polychaete bycatch (Spenser and Ianelli 2010).

Expanded bottom trawling for POP and other rockfish in the canyons would violate the principle of "freezing the footprint" of bottom trawling in the Bering Sea. Many rockfish species are found in high-relief benthic habitat composed of boulders, corals and other structures, hence they are not only vulnerable to bycatch and overfishing but to habitat destruction from fishing gear that diminishes their preferred habitat or renders it unusable. If these substrates are damaged or lost due to disturbance from bottom-tending gear, there is the potential that survival and growth of these species may be compromised (NPFMC 2010). Juvenile red rockfish are strongly associated with complex habitat structures such as epibenthic corals, sponges, and anemones and non-living rocky habitat features, which serve as refuges from predators (Rooper and Boldt 2005, Rooper *et al.* 2007, NPFMC 2010). Adult POP observed by ROV in Pribilof Canyon along the Bering Sea slope were closely associated with dense groves of epibenthic sea pens and sea whips (Brodeur 2001). This was confirmed by analysis of *in situ* data from the 2007 Bering Sea Canyons Expedition (Miller *et al.* 2012). Adult shortraker, rougheye, redbanded, sharpchin, and yelloweye rockfish were observed in close association with red tree coral in the eastern Gulf of Alaska, using the manned submersible *Delta* (Krieger and Wing 2002, Stone and Shotwell 2007). It is possible that corals such *Primnoa* serve multiple functions for these species (NPFMC 2010).

[11] Currently, assessment scientists are considering subdividing the northern rockfish ABC and TAC by management subareas in 2012. Paul Spencer, NMFS/AFSC, pers. comm.

Canyon HCAs along the eastern Bering Sea shelf break and slope could be an integral part of an explicitly spatial management strategy that provides rockfish refuges from directed fishing and bycatch. Canyon HCAs that prohibit the use of bottom-tending gear would provide protection for vulnerable habitats associated with rockfish as well as buffers against the considerable uncertainty associated with localized population structure and dynamics of POP and other slope rockfish species. The establishment of protected areas would also serve as controls to evaluate how unfished rockfish populations and their habitat quality compare to fished areas, thereby fostering learning within an adaptive management framework.

4.2 Skates (Rajidae)



Big Skate (*Raja binoculata*), NOAA/AFSC

At least 14 species of skates in the family Rajidae are known to occur in the Gulf of Alaska, Aleutian Islands, and Bering Sea in two genera: *Raja*, commonly known as the "stiff-snout" skates because they have a robust rostral cartilage, and *Bathyraja*, also known as the "soft-snout" skates due to their flexible rostral cartilage. Most of Alaska's skate species are included in the genus *Bathyraja*, which tend to be smaller and inhabit deeper waters than species of *Raja*.[12] The skate fauna of the eastern Bering Sea consists of at least 13 species, but populations are dominated by the Alaska skate (*Bathyraja parmifera*) on the continental shelf (0-200 m) and the Aleutian skate (*B. aleutica*) on the upper continental slope (200-1200 m). Both species possess nursery sites along the shelf-slope interface and evidence suggests that they depend on the stable environment provided by this habitat for successful reproduction (Hoff 2009).Skate life history is generally characterized by low fecundity and slow growth rates, and recent research on the deepwater whitebrow skate (*B. minispinosa*) indicates that, while smaller than species found in shallower shelf waters, this species has a longer lifespan than most Alaskan *Bathyraja* species documented in the published literature which makes it (and possibly others in the deepwater complex, Ebert 2005) especially vulnerable to overfishing (Ainsley *et al.* 2011).

While skate biomass is higher on the EBS shelf than on the slope, skate diversity is substantially greater on the EBS slope (Ormseth *et al.* 2010). Data from bottom-trawl surveys in the eastern Bering Sea indicate that species diversity is greatest in the deeper waters of the shelf-slope break at 250-500 m depth, where a total of ten skate species have been reported. Some species, including Aleutian skate (*B. aleutica*), Bering skate (*B. interrupta*), mud skate (*B. taranetzi*), and whiteblotched (*B. maculata*), are encountered from the shelf break

[12] See: http://www.afsc.noaa.gov/species/Skates.php.

down to >1000 m while another group of species, characterized by a dark ventral surface – Commander skate (*B. lindbergi*), whitebrow skate (*B. minispinosa*), and roughtail skate (*B. trachura*) – begin to appear at depths of 300-400 m and are more common in deeper waters. Stevenson et al. (2008) found that species richness was approximately 50% higher in canyons and northern gentle slope habitats than in intercanyons and southern gentle slope habitats. Table 6 (below) shows generalized species depth distributions for skates that were identified in the Pribilof and Zhemchug canyon groundfish fisheries, based on observer-reported catch data.

Table 6. Common depth ranges and min-max depth occurrence in the NMFS Eastern Bering Sea Slope Survey (2010) for skate species reported as bycatch in Pribilof and Zhemchug canyon fisheries from 2003-2011

	EBS Shelf (<50-200 m)	Shelf Break/ Upper Slope (200-1200 m)	Min-Max Depth Occurrence in 2010 EBSS Survey (m)	Occurrence in Pribilof/Zhemchug Canyon Fisheries
Big skate (*Raja binoculata*)	X			minor
Longnose skate (*R. rhina*)	X			trace
Alaska skate (*Bathyraja parmifera*)	X	X	206-416	significant
Aleutian skate (*B.aleutica*)	X	X	202-1149	significant
Bering skate (*B. interrupta*)		X	201-1065	significant
Mud skate (*B. taranetzi*)		X	202-965	trace
Commander skate (*B. lindbergi*)		X	215-1149	trace
Whiteblotched skate (*B. maculata*)		X	214-1059	minor
Whitebrow skate (*B. minispinosa*)		X	214-1149	trace
Roughtail skate (*B. trachura*)		X	597-1149	trace
Deepsea skate (*B. abyssicola*)		X	687-1014	

Numerous skate nurseries (i.e., egg-nesting sites) have been identified on the upper slopes of deepwater canyons along the Bering Sea Green Belt, particularly canyon heads (Hoff 2010). Nursery sites for the Alaska skate, the Aleutian skate and the Bering skate have been identified in the canyons at depths of 145-380 m in relatively flat sandy to muddy bottom habitat, including Pribilof and Zhemchug canyons. It appears that they are dependent on the unchanging, stable environment afforded by these nesting sites for reproductive success (Hoff 2009). Based on the observer-reported data in Pribilof and Zhemchug canyons from 1990-2011, significant quantities of skate egg cases (weighing tens to hundreds of kilograms) were commonly reported as bycatch in most years, most often in bottom trawl and longline gear, but fishing effort distribution data were not available to determine their locations within the canyons.

For all these reasons, skates are highly vulnerable to habitat disturbances and increased fishing mortality (Hoff 2009). Prior to 2011, skates were managed as part of the "Other Species" complex and skates accounted for the largest portion of the catch for the complex as a whole (NMFS 2004). The Other Species complex has now been disbanded and skates are managed separately as a stock complex with their own ABC and TAC, but life history and distribution information remain limited for most species. Persistent cumulative adverse fishing impacts to habitat could be occurring for species such as skates, but baseline conditions are unknown (NMFS 2004). Skates are caught incidentally as bycatch in nearly all of the commercial groundfish fisheries off Alaska, including fisheries targeting Pacific cod, walleye pollock, and yellowfin sole, among others (Stevenson and Lewis 2010).The walleye pollock fishery in the Bering Sea employs pelagic trawl gear, but adult pollock of the size and age targeted by the fishery are often found very close to the bottom during the daylight hours when fishing occurs and catches often include a variety of benthic species, including skates. Therefore it is likely that at least a large proportion of the skate catch in pelagic trawls is the result of the net contacting, or at least coming very close to, the seafloor (Stevenson and Lewis 2010).This is consistent with the conclusions of the Final North

Pacific groundfish EFH EIS (NMFS 2005), which estimated that pollock "pelagic" trawl gear contacts the seafloor approximately 44% of the time it is deployed (NMFS 2005).[13]

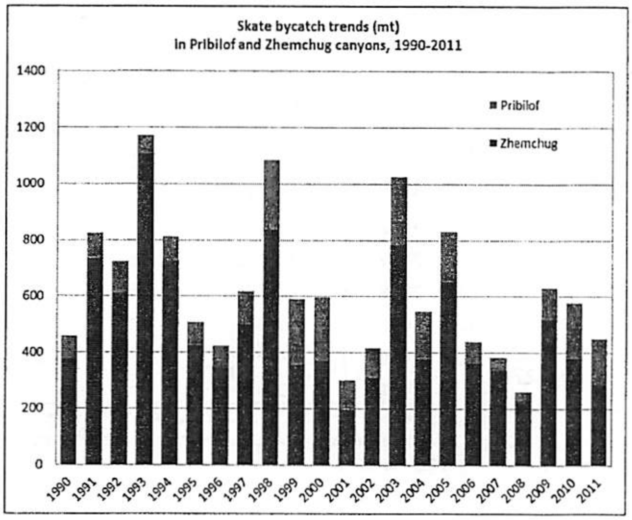


Fig. 24. Trends in Pribilof and Zhemchug canyons skate bycatch (mt), 1990-2011.

Observer-reported catch data from Pribilof and Zhemchug canyons indicate that skate bycatch averaged about 650 mt/year during 1990-2011 with considerable year-to-year variability (Fig. 24).Over this period, 79% of the reported skate bycatch came from Zhemchug Canyon (Fig. 25) and the vast majority of it (97%) occurred in longline gear (Fig. 26). From 2003-2011, the combined bycatch of canyon skates averaged about 3% of the EBS-wide skate bycatch (Table 7).

Although observer identification of skates to the species level has improved in recent years, the taxonomy of skates in the eastern Bering Sea is still not well defined (Ainsley *et al.* 2009) and the vast majority of the observed skate bycatch is still reported at the genus level (Stevenson and Lewis 2010). In Pribilof and Zhemchug canyons from 2003-2011, 80% of the reported skate bycatch was classified simply as "skate unidentified" or "soft snout skate" (*Bathyraja*), meaning that the species composition of skate bycatch and the effects of fishing mortality on individual species in the canyons is largely unknown. Of the skate bycatch identified to the species level, Alaska skate and Aleutian skate generally predominated in terms of tonnage, followed by lesser but significant quantities of Bering skate, whiteblotched skate, and Commander skate. Trace amounts (<1 metric ton) of whitebrow skate, roughtail skate, mud skate, big skate and longnose skate were reported in most years from 2003-2011 (Fig. 27).

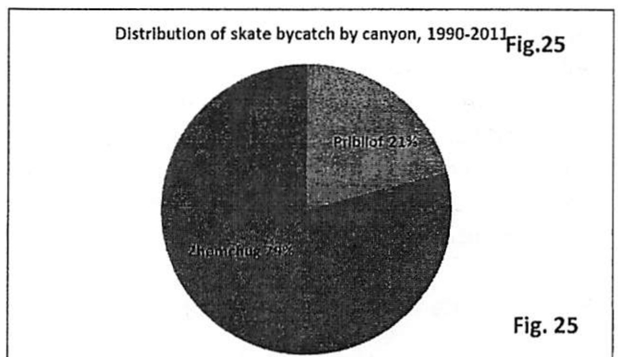


Fig. 25

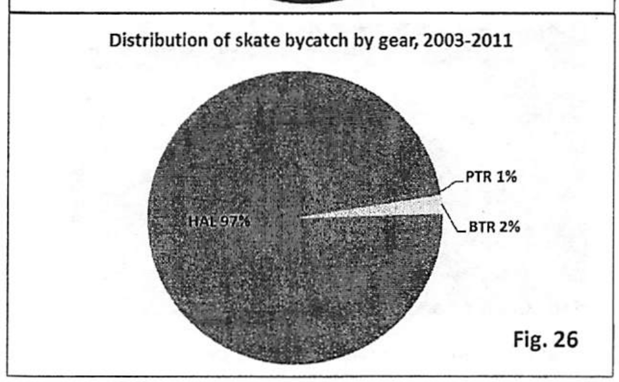


Fig. 26

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[13]NMFS (2005), Final Environmental Impact Statement (EIS) for Essential Fish Habitat (EFH) Identification and Conservation in Alaska, Appendix B, Table B.2-4.

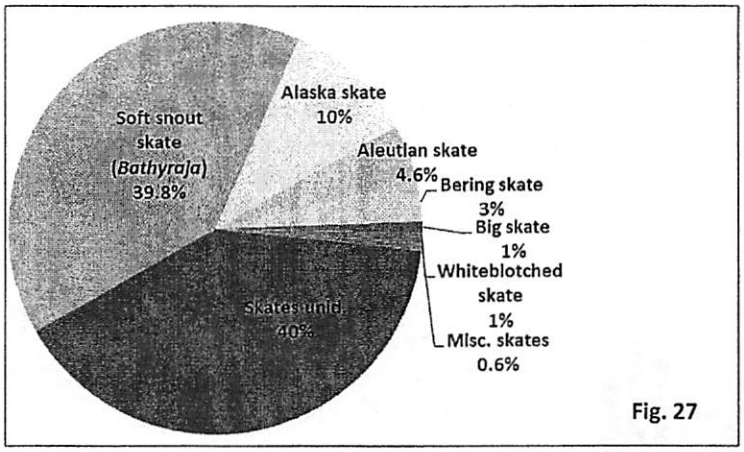


Fig. 27

Table 7. EBS-wide skate bycatch (mt) compared to observer-reported skate bycatch in Pribilof and Zhemchug canyons during 2003-2011.

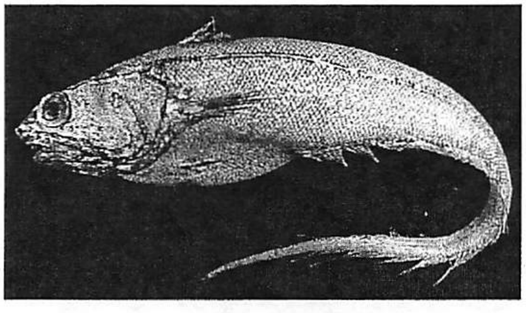
Year	EBS-wide skate bycatch/a	Prib-Zhem combined bycatch/b	Prib-Zhem % of EBS
2003	18,501	1,027	5.5%
2004	21,415	548	2.6%
2005	22,388	831	3.7%
2006	19,283	439	2.3%
2007	17,608	382	2.2%
2008	20,251	262	1.3%
2009	19,376	631	3.2%
2010	16,376	578	3.5%
2011	19,476	450	2.3%

a/ Ormseth and Matta (2011), Bering Sea and Aleutian Islands Skates, pp. 1157-1242, Table 5b, In: NPFMC BS/AI SAFE, Dec. 2011.

b/ Source: NPGOP.

Currently the Council is considering designation of six areas of known skate egg concentration situated within a number of deepwater canyons along the Green Belt as skate HAPC because the eggs and embryos are highly susceptible to disturbance, damage, or destruction from fishing gear that contacts the seafloor during their lengthy development.[14] The localized nature of these skate egg concentrations within the canyons and their vulnerability to fishing disturbance makes them logical choices for HAPC designation and protection, but the limited, site-specific approach to HAPC is not designed to address the wider impacts of fishing on the diverse and poorly understood assemblage of skate species and other vulnerable deepwater fauna that inhabit the outer continental shelf and slope of the eastern Bering Sea. Closure to all bottom-tending gear in Pribilof and Zhemchug canyons would provide this diverse assemblage of deepwater skates refuges from bycatch mortality and provide comprehensive protection to known and as-yet unidentified egg-nesting sites within the canyons.

5.3 Grenadiers (Macrouridae)



Giant grenadier (*Albatrossia pectoralis*)

[14]NPFMC Agenda C4(a), HAPC Initial Review, February 2012: 20.

Grenadiers (Family Macrouridae) are deepwater fishes related to hakes and cods that occur world-wide in all oceans. Also known as "rattails," they are especially abundant in waters of the continental slope, but some species are found at even greater depths. Like other deepwater fish species, they have life history traits such as slow growth, late maturity and long lifespan that make them particularly vulnerable to overfishing. At least seven species of grenadiers are known to occur in Alaskan waters, and three are commonly encountered in commercial fishing operations or in fishery surveys: giant grenadier (*Albatrossia pectoralis*), Pacific grenadier (*Coryphaenoides acrolepis*), and popeye grenadier (*Coryphaenoides cinereus*). Of these, giant grenadier is commonly encountered in the fisheries and groundfish surveys at depths of 200-1000 m, where it is the dominant species in terms of biomass and therefore of great ecological importance (Tribuzio *et al.* 2008). In the 2010 Eastern Bering Sea Slope survey (continental slope and canyons from 200-1200 m), the giant grenadier represented the largest biomass whereas the most abundant fish species was the popeye grenadier (Hoff and Britt 2011).

Table 8. EBS-wide grenadier bycatch (mt) compared to observer-reported grenadier bycatch in Pribilof and Zhemchug canyons.

YEAR	EBS grenadier bycatch/a	Prib-Zhem combined catch/b	Prib-Zhem % EBS bycatch
1997	2,964	481	16.2%
1998	5,011	808	16.1%
1999	4,505	459	10.2%
2000	4,067	648	15.5%
2001	2,294	136	5.9%
2002	1,891	113	6.0%
2003	2,869	185	6.4%
2004	2,223	308	13.8%
2005	2,633	449	17.0%
2006	2,070	413	19.9%
2007	1,628	363	22.3%
2008	2,670	191	7.1%
2009	2,902	695	23.9%
2010	2,052	422	20.5%
2011	na	205	

a/ David M. Clausen and Cara J. Rodgveller (2010). Alaska Grenadier Assessment, pp. 1571-1620, In: NPFMC BS/AI/GOA SAFE, Appendix 1. Includes retained and discarded catch.
b/ Source: NPGOP.

Giant grenadier is the most frequently caught member of this group as bycatch, particularly in the deepwater sablefish and Greenland turbot fisheries (Clausen 2008, Clausen and Rodgveller 2010). In the past, grenadiers were classified as "non-specified" species (requiring no management) and therefore formal stock assessments were not conducted and baseline stock status was not considered (NMFS 2004). However, observer reporting of grenadier bycatch and groundfish surveys do provide some basic information on distribution, abundance and fishing mortality that was used to develop a preliminary stock assessment for grenadiers beginning in 2006 (Clausen and Rodgveller 2010). But a Council initiative to include grenadiers in the FMP either as target species or Ecosystem Component (EC) species in plan amendment 96 (implemented in November 2010) ultimately failed, and it is uncertain if efforts to monitor fishery bycatch mortality and assess the status of these important deepwater species will continue. Early life history information is virtually non-existent, but sexual maturity is reached late in life and natural mortality is low (Rodgveller *et al.* 2010). Because the fisheries operate at depths where female giant grenadiers greatly outnumber males, the majority of the bycatch is composed of females. Although giant grenadiers are not considered to be overfished at present, the disproportionate removal of females puts them at increased risk of overfishing (Clausen 2008, Clausen and Rodgveller 2010).

Observer-reported data from Pribilof and Zhemchug canyons indicates that the grenadier bycatch in these two canyons represents a significantly large percentage of the EBS-wide grenadier bycatch in many years – as much as 20-24% in recent years (Table 8). More than 90% of this bycatch came from Zhemchug Canyon during 1990-2011 (Fig. 28 below) and demersal longline gear accounted for 94% of the total (Fig. 29 below). Although the grenadier stock complex was not considered overfished based on the preliminary assessments conducted in 2006-2010, the absence of explicit management recognition in the FMP and the continuing bycatch of these species raises serious concerns about the impacts of groundfish fisheries on a group of species of such great ecological importance in the deepwater slope ecosystem off Alaska.

Distribution of grenadier bycatch by canyon, 2004-2011

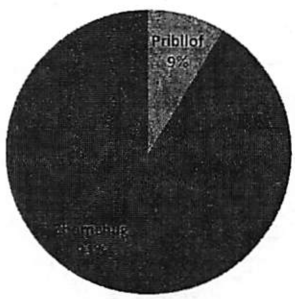


Figure 28

Distribution of combined grenadier bycatch by gear type, 2004-2011

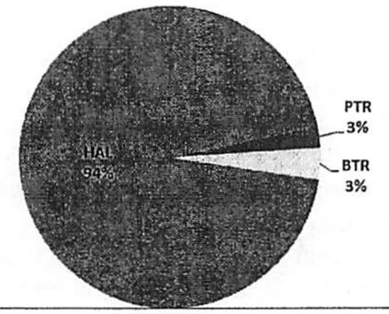


Figure 29

One way to help address these concerns would be to include grenadiers in the FMPs as Ecosystem Component (EC) species in order to monitor the impacts of the fishery and ensure that bycatch levels do not present a risk of overfishing. The basis for classifying Ecosystem Component (EC) species in an FMP under the revised National Standard 1 regulatory guidelines (74 FR 3178) is that they should be non-target species, not subject to overfishing or overfished, and not generally retained for sale or personal use.[15] EC species do not require specification of biological reference points or ACLs, but they should be monitored to the extent that any new information on catch trends, vulnerability, etc., indicate that they should be reclassified as "in the fishery." If the Council elects to classify giant grenadiers as an EC stock in the groundfish FMPs, the NS1 Guidelines require the Council to consider measures to minimize bycatch of EC species consistent with National Standard 9, and to protect their role in the ecosystem.[16]

Closure to all bottom-tending gear in Pribilof and Zhemchug canyons would provide grenadiers refuges from bycatch mortality in areas which have been shown to account for a significant percentage of the EBS-wide bycatch of grenadiers in most years, thereby providing some significant measure of insurance against the risk of overfishing. These measures would simultaneously protect representative portions of the deepwater slope habitat that they occupy.

5.4 Sculpins (Cottidae)

Bigmouth sculpin (*Hemitripterus bolini*)
NOAA/AFSC

[15] 50 CFR § 600.310 (d)(5)(A-D).
[16] 50 CFR § 600.310(d)(5)(iii).

The highest diversity of sculpins (Family Cottidae) is found in the North Pacific. In the eastern Bering Sea, 41 species have been identified, occupying all benthic habitats and depths. Abundance estimates from the EBS shelf and slope surveys indicates that most of the sculpin biomass is found on the EBS shelf (~95%). The six most common include great sculpins (*Myoxocephalus polyacanthocephalus*), threaded sculpins (*Gymnocanthus pistillger*), plain sculpins (*M. jaok*), warty sculpins (*M. verrucosus*), bigmouth sculpins (*Hemitripterus bolini*), and yellow Irish lord (*H. jordani*). Life history information is limited but studies of reproductive biology indicate that most, if not all, sculpins lay adhesive eggs in nests and many exhibit parental care for eggs (Ormseth and TenBrink 2010). This type of reproductive strategy means that sculpins are vulnerable to the disturbance and damage to benthic habitats than other groundfish that broadcast their eggs into the water column (Ormseth and TenBrink 2010). Underwater video surveys have shown sculpins in close association with corals. Studies from elsewhere indicate that sculpins are not extremely long-lived but they mature at late ages and fecundity is rather low (Ormseth and TenBrink 2010b). Food habits data indicate that sculpins are prey for Pacific cod, halibut, walleye pollock, skates, and eelpouts, as well as pinnipeds.

Observer-reported data from Pribilof and Zhemchug canyons from 1990-2011 indicates that sculpin bycatch was much higher in the canyons at the beginning of the period and rapidly declined to a lower level (Fig. 30).Over this period, 78% of the reported sculpin bycatch came from Zhemchug Canyon, nearly equally distributed in bottom trawl and longline gear with lesser amounts in pelagic trawls (Figs. 31, 32). From 1998-2011, the combined bycatch of canyon sculpins was <1% of the EBS-wide sculpin bycatch, which is consistent with the survey data showing that sculpin abundance is much higher on the EBS shelf (Table 9).

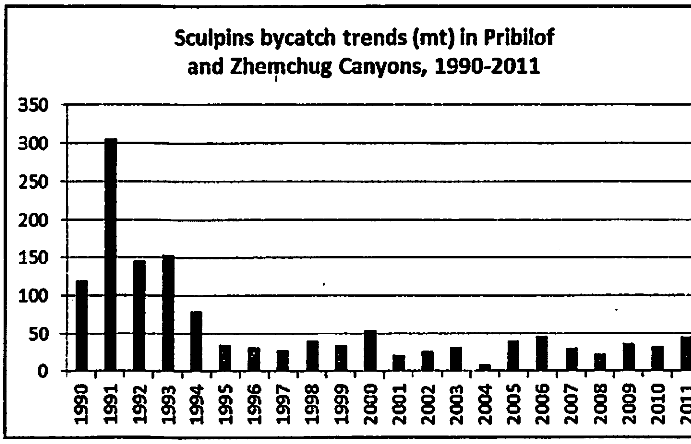


Fig. 30. Sculpin bycatch trends (mt) in Pribilof and Zhemchug canyons, 1990-2011.

Table 9. EBS-wide sculpin bycatch (mt) compared to sculpin bycatch in Pribilof and Zhemchug canyons, 1998-2011.

YEAR	EBS sculpin bycatch/a	Prib-Zhem combined bycatch/b	Prib-Zhem % of EBS bycatch
1997			
1998	5,204	40	0.7%
1999	4,503	34	0.7%
2000	5,673	54	0.9%
2001	6,067	21	0.3%
2002	6,043	26	0.4%
2003	5,184	32	0.6%
2004	5,242	9	0.1%
2005	5,114	40	0.7%
2006	4,907	47	0.9%
2007	6,505	30	0.4%
2008	6,682	23	0.3%
2009	5,915	37	0.6%
2010	5,631	33	0.6%
2011	4,592	45	1.0%

a/ Ormseth and TenBrink (2010), Bering Sea and Aleutian Islands sculpins, pp. 1537-1570, In: NPFMC BSAI SAFE, December 2010.

b/ Source: NPGOP.

Until very recently, observer reporting of sculpin bycatch has provided little species-specific information. In 2002-2003, the North Pacific Groundfish Observer Program began a project aimed at providing more detailed species information for the Other Species stock complex. Beginning in 2004, sculpin bycatch was identified to genus for the larger sculpin species, including *Hemilepidotus* spp. (Irish lords), *Myoxocephalus* spp. (great sculpins) and *Hemitripterus* spp. (bigmouth sculpins), and in 2008 observers were required to identify to species all sculpins in these three genera (Ormseth and TenBrink 2010). Observer data from Pribilof and Zhemchug canyons indicates that bigmouth sculpin (*Hemitripterus bolini*), yellow Irish lord (*Hemilepidotus jordani*), and great sculpin (*Myoxocephalus polyacanthocephalus*) were the dominant bycatch species in the canyon fisheries in all years, but small quantities of many other species were also reported, including spinyhead sculpin (*Dasycottus setiger*), crested sculpin (*Blepsias bilobus*), darkfin sculpin (*Malacoccottus zonurus*), blob sculpin (*Psychrolutes phrictus*), roughspine sculpin (*Triglops macellus*), spectacled sculpin, (*Triglops septicus*) plain sculpin (*Myoxocephalus jaok*) and warty sculpin (*Myoxocephalus verrucocus*).

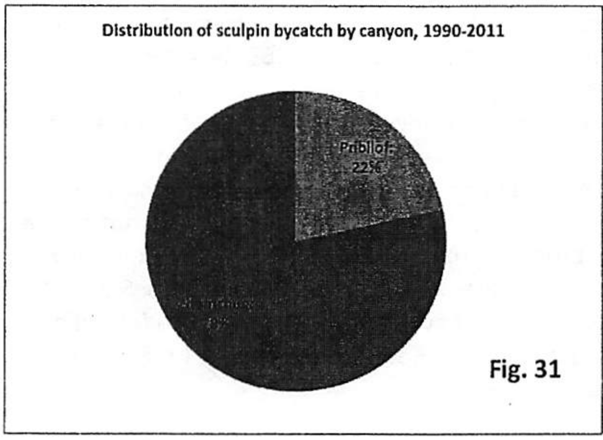


Fig. 31

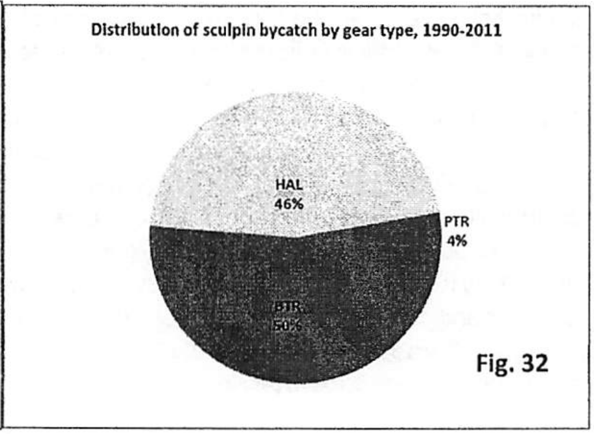
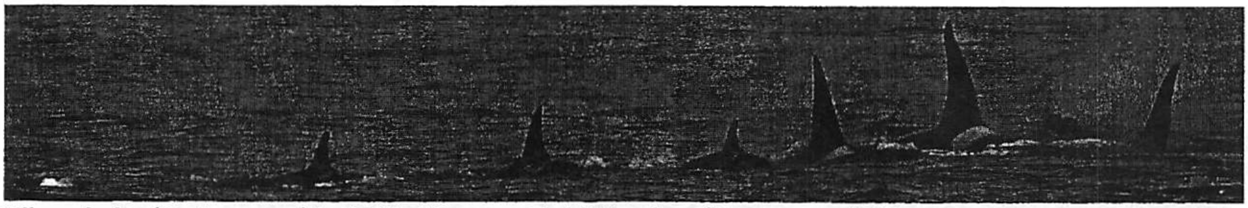


Fig. 32

Sculpin life history, species diversity and localized population structure all underscore the limitations and risks of managing this complex of species with a global aggregate catch limit (Ormseth and TenBrink 2010). As with rockfish, these life history characteristics make sculpins highly vulnerable to localized depletion and overfishing. Canyon HCAs that prohibit the use of bottom-tending gears could be an integral part of an explicitly spatial management strategy that provides refuges from directed fishing and bycatch, protection for vulnerable habitats associated with sculpins, as well as buffers against the considerable uncertainties associated with localized population structure and stock status of these species.



Killer whales (*Orcinus orca*) in Pribilof Canyon, Todd Warshaw/Greenpeace USA

6. Pelagic Habitat: Fish, Mammals and Birds of the Green Belt

Pribilof and Zhemchug canyons intersect the Bering Sea shelf break along the south-central and northern-central sections of the Green Belt. The pelagic habitat associated with them is characterized by persistent and predictable hydrographic structures such as upwelling, eddies and frontal zones that are generated by interaction with the submarine topography of the canyons. These hydrographic features concentrate plankton, zooplankton and prey fish such as squids and juvenile walleye pollock which, in turn, attract a diverse assemblage of higher trophic level predators (Springer et al. 1996, Brodeur *et al.* 1997, Stabeno *et al.* 1999, Moore *et al.* 2002, Macklin and Hunt 2004, Okkonen *et al.* 2004, Hunt *et al.* 2008, Call *et al.* 2008). The fluid, ever-changing and yet predictable features of the pelagic environment in the vicinity of the shelf break make this the most productive zone in the Bering Sea, which is why the nearby Pribilof Island Archipelago has supported some of the largest breeding colonies of marine birds and mammals in North America historically and earned a reputation as the "Galapagos of the North" (Macklin *et al.* 2008).

The largest colonies of fish-eating kittiwakes (*Rissa* spp.), murres (*Uria* spp.) and puffins (*Fratercula* spp.) in Alaska are found on the Pribilof Islands every summer, drawn to the productive shelf-edge pelagic habitat where squids, juvenile pollock and other forage fish are most often found in high concentrations. More than half of the northern fur seal population converges on the Pribilof Islands breeding and pupping grounds during the summer half of the year, feeding over a wide area of the shelf break, canyons and slope on pollock, squids, and deep-sea smelts (Lowry *et al.* 1982; Kajimura *et al.* 1984; Sinclair *et al.* 1994; Springer *et al.* 1996, NRC 1996, Robson *et al.* 2004, Call *et al.* 2008, Call and Ream 2012). Prior to whaling, much of whale biomass in the Bering Sea is thought to have been associated with the Green Belt (Springer *et al.* 1996) and many of the same species are sighted there today (Moore 2000, Moore *et al.* 2002), though not in the tens of thousands that were found before commercial whaling. The pelagic habitat of the canyons is also spawning and nursery habitat for pollock (Brodeur *et al.* 1997, Macklin and Hunt 2004, Bacheler *et al.* 2010, Quinn *et al.* 2011) as well as foraging habitat for western Alaska chinook and chum salmon.

Despite the enormous ecological importance of this ecoregion and its importance as a major fishing ground and source of the Bering Sea's fisheries bounty, the shelf break/slope habitat along the Green Belt remains unprotected – no year-round or seasonal habitat protection has been provided to date. Hyrenbach *et al.* (2000) proposed the creation of pelagic marine protected areas for these areas as a tool to ensure conservation of pelagic species and fishery resources, and specifically highlighted the persistent and predictable features of upwelling over shelf breaks, submarine canyons, seamounts, gullies, and boundaries of water masses as ideal locations for such protected areas. The distinctive features of Pribilof Canyon and Zhemchug Canyon make them ideal candidates for pelagic protected areas, encompassing areas utilized by many endangered, threatened and protected (ETP) species in addition to some of the Alaska Region's most important commercial fish species. Fully protected habitat conservation areas (HCAs) for Pribilof and Zhemchug would provide significant refuges from fishing in this pelagic convergence zone and address multiple objectives of the FMPs for conservation and management of fisheries resources.

6.1 Pelagic HCAs as Tools for Pollock Habitat Conservation

Walleye pollock (*Theragra chalcogramma*), a member of the family Gadidae (hakes and cods), is the most abundant groundfish biomass in the eastern Bering Sea and the target of one of the largest fisheries in the world. Pollock is also a major prey resource for many other fish, marine mammals, and seabirds. The scientific genus *Theragra* translates as "animal fodder" in recognition of pollock's importance to marine predators such as the northern fur seal as far back as the 19^{th} century (Jordan *et al.* 1898). Overall, 19 of 27 marine mammal species that occur in the Bering Sea are reported to prey on pollock and other gadids (Lowry *et al.* 1982, Perez and Loughlin 1986). Large nesting colonies of fish-eating black-legged kittiwakes, common murres, thick-billed murres, tufted puffins, horned puffins, red-legged kittiwakes, pigeon guillemots and cormorants rely on the availability of dense schools of pelagic juvenile pollock (age 0-1) in the critical chick-rearing season in the eastern Bering Sea, and reproductive success has been tied to the availability of age-0 pollock to nesting birds (Springer and Byrd 1989, Springer 1993, Hunt *et al.* 1996, Byrd *et al.* 1997, Brodeur *et al.* 1997, Macklin and Hunt 2004, NPFMC 2011). Many commercially important groundfish also prey heavily on juvenile pollock (Livingston et al. 1986, Livingston *et al.* 1993). In 2003, a technical review of the Bering Sea pollock fishery for the Marine Stewardship Council concluded that pollock's importance in the Bering Sea food web is akin to the keystone role played by forage species such as krill, sand eel and capelin in other marine ecosystems around the world, and that its management requires an ecosystem approach (SCS 2003).

Since 1964, when Japanese factory trawlers first started fishing in earnest for pollock, more than 54 million metric tons (nearly 120 billion lb.) of fish biomass have been mined from the eastern Bering Sea, accounting for up to 70-80% of the Alaska groundfish catch annually – a scale of fishing that has no historical precedent in the North Pacific. Although catches in the eastern Bering Sea have remained near or above the 30-year average of 1.1 million metric tons (more than 2.4 billion pounds) under U.S. management since 1990, large spawning aggregations of pollock have plummeted in the wake of heavy fishing in the international waters of the central Bering Sea and U.S. waters of the Aleutian Basin and Aleutian Islands. Directed fishing for Central Bering Sea/Aleutian Basin pollock was halted in the early 1990s due to overfishing and plummeting stock biomass, and the prohibition remains in place today under the terms of the 1994 Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (*aka* the "Donut Hole Treaty"). A moratorium on directed pollock fishing in the Aleutian Islands has been in place since 1999 due to low stock biomass, concerns about serial depletion, and Steller sea lion prey considerations. In both cases much of the fishing occurred on pollock spawning grounds when pollock are aggregated and most vulnerable to trawl nets.

The one remaining viable pollock population in the eastern Bering Sea continues to support the fishery but no protection has been afforded to spawning grounds. The annual allowable catch limit is subdivided into an A-season fishery and B-season fishery to prevent all of the catch from being taken during the late-winter and spring when pollock converge on spawning grounds along the continental shelf break and slope of the Bering Sea, but no spatial management measures are employed to prevent the fishery from concentrating effort in a given location. The only spatial management of any kind has resulted from Steller sea lion mitigation measures that limit the amount of the catch that may be taken in sea lion critical habitat in the eastern Aleutian Islands. These measures were adopted in the early 2000s to reduce the fishery's impact on designated sea lion foraging areas after NMFS concluded that the fishery was likely to jeopardize the survival and recovery of sea lions under the terms of the Endangered Species Act (NMFS 2000). Despite these measures, the fishery continues to be concentrated on spawning grounds off the eastern Aleutian Islands and northwestward along the outer shelf and slope to the Pribilof Islands, including Pribilof Canyon. In some years the fishery catches significant amounts of pollock in Zhemchug canyon (Fig. 33), which is also a known pollock spawning location. However, most of the pollock taken from the canyons since 2000 has come from Pribilof Canyon (Fig. 34).

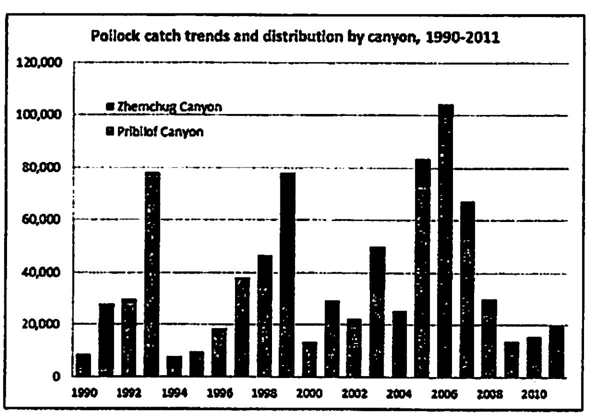


Fig. 33. Pollock catch trends and distribution by canyon, 1990-2011.

Distribution of the pollock catch by canyon, 2000-2011

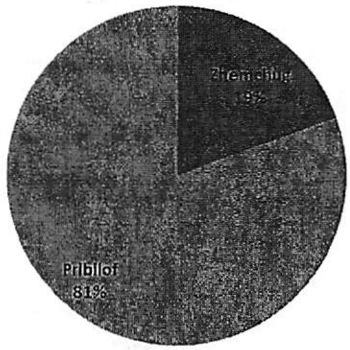


Fig. 34

Table 10. EBS-wide pollock catch (mt) and observer-reported pollock catch in Pribilof and Zhemchug canyons, 1990-2011.

Year	EBS-wide pollock catch/a	Combined Canyon Catch/b	Prib-Zhem % of EBS catch
1990	1,353,000	8,624	0.6%
1991	1,268,360	27,781	2.3%
1992	1,384,376	29,815	2.1%
1993	1,301,574	77,995	6.0%
1994	1,362,694	7,857	0.6%
1995	1,264,578	9,627	0.8%
1996	1,189,296	18,469	1.5%
1997	1,115,268	37,987	3.4%
1998	1,101,428	46,506	4.2%
1999	889,589	77,963	8.7%
2000	1,132,736	13,343	1.2%
2001	1,387,452	29,379	2.1%
2002	1,481,815	22,177	1.5%
2003	1,489,997	50,160	3.7%
2004	1,480,398	25,481	1.7%
2005	1,483,271	83,494	5.6%
2006	1,486,284	104,447	7.0%
2007	1,354,097	67,617	5.0%
2008	990,566	30,092	3.0%
2009	815,522	13,738	1.7%
2010	811,680	15,511	1.9%
2011	1,198,880	20,285	1.7%

a/ EBS pollock fishery data are from Ianelli et al. (2011), pp. 51-168, Table 1.37, In: NPFMC Bering Sea/Aleutian Islands SAFE, December 2011.
b/ Canyons catch data from NPGOP.

Overall, the amount of pollock coming from Pribilof and Zhemchug canyons is a small percentage of the EBS-wide pollock catch, averaging about 3% over the entire time period from 1990 through 2011 (Table 10). But this level of fishing is still a large amount by ordinary fishery standards and it may represent a large portion of the pollock biomass in a local area, such as Pribilof Canyon. In the absence of effective spatial management of the pollock allowable catch, there is a real risk that uniquely adapted local spawning subpopulations will be depleted or eliminated in a serial fashion over time, as may have occurred in the Aleutian Islands and Aleutian Basin. Given the enormous ecological and economic importance of pollock and the uncertainties associated with pollock stock structure (see 6.1.1 below), the Council should strive to conserve population substructure and diversity by protecting reproductive habitat and providing refuges during the period when pollock are most vulnerable to fishing.

6.1.1 Pelagic spawning HCAs as buffers against uncertainties in pollock stock structure

Although pollock in the eastern Bering Sea do not form one homogeneous population, the actual stock structure is not well known. Three stocks are recognized for management purposes in the Bering Sea and Aleutian Islands (eastern Bering Sea, Aleutian Basin and Aleutian Islands) but the relationship and interchange between these stocks is uncertain and the degree of fine-scale population structure within the eastern Bering Sea itself is largely unknown. Pollock are known to spawn at predictable times and locations and there are several well-known spawning areas that may be discrete stocks, including areas in and around Pribilof Canyon and Zhemchug canyon (Hinckley 1987, Bailey 1998, Napp *et al.* 1998, Bailey *et al.* 2000, Quinn *et al.* 2011). The uncertainty associated with stock structure has large implications for the sustainability of the fishery.

Pollock are known to spawn in predictable locations such as sea valleys and canyons along the outer margin of the continental shelf (Bailey 1998, Bailey *et al.* 2000), including areas in Pribilof Canyon and Zhemchug Canyon as shown in Fig. 35 (Bacheler *et al.* 2010, Quinn *et al.* 2011). There is also evidence to suggest that the large eastern Bering Sea "stock" may be comprised of multiple, discrete breeding subpopulations. Hinckley (1987) postulated the existence of separate pollock stocks in three major spawning areas: the Aleutian Basin near Bogoslof Island, north of Unimak Island along southeast slope and shelf (Bering Canyon/Horseshoe + Pribilofs), and the shelf/slope region northwest of the Pribilof Islands (encompassing Zhemchug Canyon). Differences in population characteristics (e.g., length at age, fecundity), timing of spawning and geographic separation supported the hypothesis of multiple stocks. More recent studies confirm that there are consistent seasonal patterns of pollock spawning locations in the eastern Bering Sea that may be a manifestation of spawning activities from multiple subpopulations, consistent with the hypothesis of previous research (Bailey et al. 2000, Bacheler *et al.* 2010).

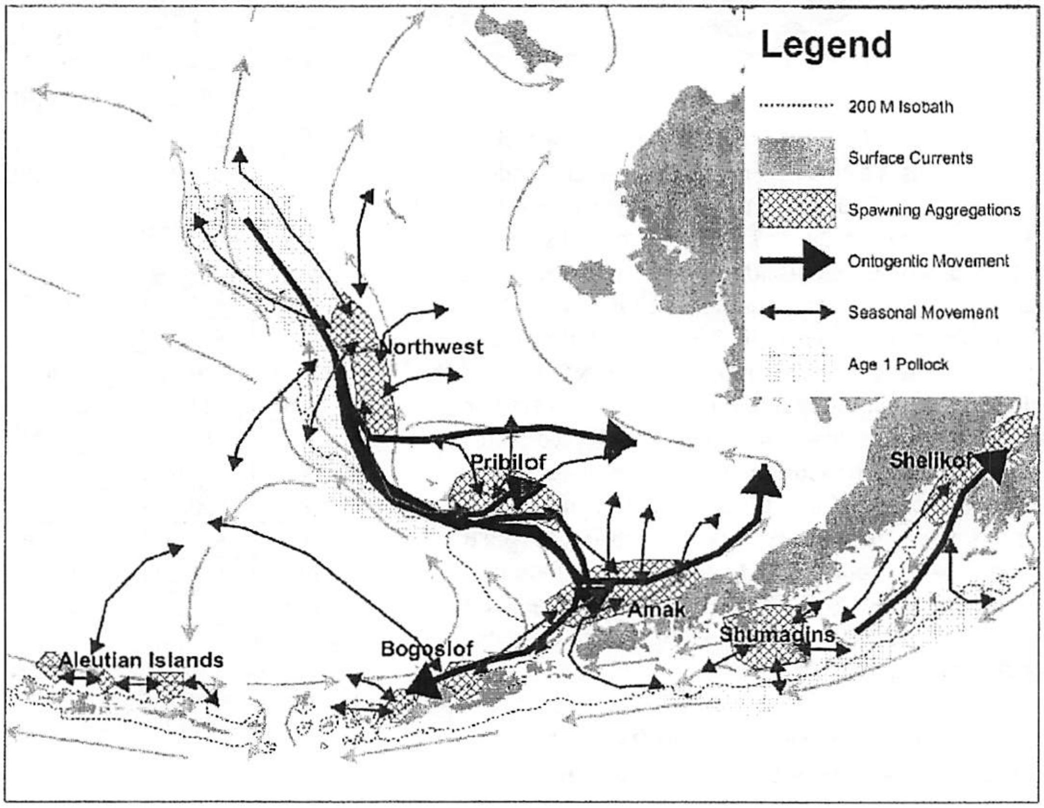


Fig. 35. Conceptual model of walleye pollock seasonal and ontogenetic movements with shaded areas representing recent spawning locations. Source: Quinn *et al.* (2011).

Thus it appears likely that there may be considerable stock separation among pollock in the eastern Bering Sea and that these stocks return to the same spawning grounds each year along the Green Belt, including areas in and around Pribilof Canyon and Zhemchug Canyon (Bacheler *et al.* 2010, Quinn *et al.* 2011). A prohibition on pelagic trawling in Pribilof and Zhemchug canyons would afford significant protection to known spawning grounds along the Green Belt and provide a buffer against the uncertainties associated with pollock stock structure and population dynamics within separate stocks in order to reduce the risk of depleting unidentified local subpopulations, losing genetic diversity and undermining population resilience (Bailey 1998, Bailey *et al.* 2000).

6.2 Pelagic HCAs as Tools for Reducing Pelagic Trawl Bycatch: Salmon, Squids and Juvenile Pollock

Chinook salmon (*Oncorhynchus tshawytscha*) and chum salmon (*O. keta*) are the primary salmon species reported as incidental bycatch in Pribilof and Zhemchug canyons groundfish fisheries. Pelagic pollock trawls accounted for most of salmon taken in the canyon fisheries, although bottom trawls accounted for a significant portion of the salmon bycatch in some years. Although the salmon bycatch coming from Pribilof and Zhemchug canyons represents a small percentage of the total catch of all species in the canyons during 1990-2011, quantities can be quite high when salmon are encountered and could pose a significant threat to vulnerable stocks (NMFS 2004). Observer-reported numbers of chinook bycatch in the canyons accounted for as much as 20-34% of the EBS-wide bycatch of chinook in the pollock fishery in some years (Table 11).

Declining returns of Western Alaska stocks of chinook salmon have been a major source of concern for many Native communities in Western Alaska who rely on the return of salmon to their natal rivers for subsistence, and a large percentage of the chinook bycatch in the Bering Sea pollock fishery comes from Western Alaska watersheds. Based on genetic analysis of chinook bycatch in the 2010 Bering Sea trawl fishery, Coastal Western Alaska Stocks accounted for nearly half of the salmon sampled with smaller contributions from Upper Yukon River, North Alaska Peninsula and Middle Yukon River (Fig 36).

Table 11. EBS-wide bycatch of chinook and chum salmon (numbers of fish) in the Bering Sea pollock fishery and chum bycatch (numbers of fish) from Pribilof and Zhemchug Canyons/a

YEAR	EBS Chinook (n)	Canyons Chinook (n)	EBS Chum (n)	Canyons Chum (n)
1997	43,336	789	61,504	296
1998	49,373	663	62,276	26
1999	10,187	1,912	44,585	568
2000	3,966	1,357	56,707	124
2001	30,107	669	52,835	223
2002	32,222	527	76,998	728
2003	43,021	4,994	180,872	4,698
2004	51,700	2,643	440,477	9,021
2005	67,364	5,732	704,586	5,101
2006	84,436	6,314	310,858	7,075
2007	127,409	7,610	100,261	1,384
2008	22,123	2,146	15,845	131
2009	13,010	668	47,602	148
2010	10,129	677	14,194	8,852
2011	25,451	286	191,441	6,807

a/ Ianelli et al. (2011), pp. 51-168, Table 1.37, In: NPFMC Bering Sea/Aleutian Islands SAFE, December 2011. Canyons data from North Pacific Groundfish Observer Program.

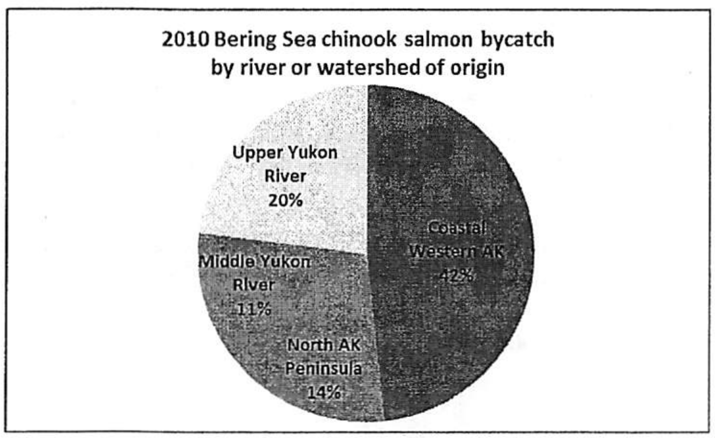


Fig. 36. Genetic stock composition analysis of chinook salmon bycatch samples from the 2010 Bering Sea trawl fisheries. Source: Guthrie *et al.* (2012).

Historically, one of the largest sources of unwanted bycatch in the pollock fishery was undersized juvenile pollock. Prior to the adoption of the Improved Retention/Improved Utilization program (IR/IU, FMP Amendment 49) in 1998, requiring groundfish fisheries to retain all pollock and cod, the magnitude of pollock bycatch and discards in the groundfish fishery was considered significant enough to be taken into account when estimating population size and forecasts of future pollock yield. Fritz (1996) estimated that discards of juvenile pollock (20-29 cm, ages 2-3 years) in the Bering Sea fishery reached levels as high as 114,975 mt in 1990, 160,260 mt in 1991, and136,702 mt in 1992 – larger than most directed fisheries in the United States. The directed fisheries for pollock and cod have accounted for the lion's share of these pollock discards. During 1991-2004, nearly 1 million tons of pollock were reported as unwanted bycatch and/or discards in the Bering Sea and Aleutian Islands pollock fishery (Table 12).

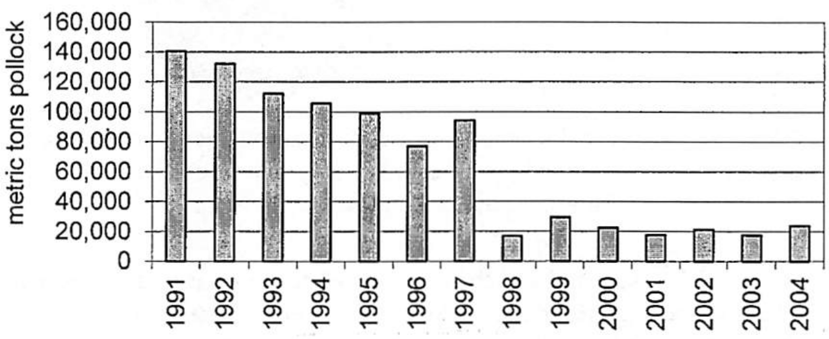
Table 12. Estimates of discarded pollock (metric tons) by area and as a percent of total BS/AI pollock catch, 1991-2004./a

	Aleutian Islands	Bogoslof region	Northwest Bering Sea	Southeast Bering Sea	Total pollock discards	% Total Catch
1991	5,231	20,327	48,205	66,789	140,552	9%
1992	2,982	240	57,609	71,195	132,026	9%
1993	1,733	308	26,100	83,989	112,130	8%
1994	1,373	11	16,083	88,098	105,565	8%
1995	1,380	267	9,715	87,491	98,853	7%
1996	994	7	4,838	71,367	77,206	6%
1997	617	13	22,557	71,031	94,218	8%
1998	164	3	1,581	15,135	16,883	2%
1999	480	11	1,912	27,089	29,492	3%
2000	790	20	1,941	19,678	22,429	2%
2001	380	28	2,450	14,873	17,731	1%
2002	758	12	1,439	19,226	21,435	1%
2003	468	n/a	2,980	14,063	17,512	1%
2004	758	0	2,723	20,302	23,783	2%

a/ Ianelli et al. (2005), pp. 31-124, Table 1.3, In: NPFMC BS/AI SAFE, Dec. 2005.

The adoption of IR/IU regulations in 1998was a means of reducing *economic discards* of pollock dramatically. After IR/IU went into effect, reported discards of pollock dropped from >94,000 t of pollock (8 percent of the pollock catch) in 1997 to only ~16,900 t of pollock in 1998 (2 percent of the catch) (Fig. 37).

Fig. 37. Trends in BS/AI pollock bycatch/discards in the EBS pollock fishery, 1991-2004. Source: Ianelli *et al.* 2005.



Although IR/IU reduces economic discards and waste, there is no evidence that the program reduces unwanted juvenile pollock bycatch, except to the extent that the provision requiring retention of all pollock and cod causes fishing vessels to modify fishing practices to avoid bycatch of pollock and other non-target species. There is no information indicating that such modifications of fishing practices have occurred. Major sources of the pollock bycatch in the surimi factory trawl fleet, for instance, have on-board fishmeal plants and may simply grind the bycatch of unwanted fish juvenile pollock into meal or minced product forms.

In addition, the pelagic trawl gear employed in the pollock fishery catches a variety of other important forage fish, including squids (Gonatidae), smelts (Osmeridae), and herring (Clupeidae).Observer data indicates all these species were caught in pelagic trawl gear in Pribilof and Zhemchug canyons during 1990-2011, although bycatch of squids in bottom trawl gear was sometimes significant. Squids were the dominant biomass of forage fish other than pollock reported in pelagic trawls and bycatch of squids was highest in years when pollock catches in the canyons were highest (Fig. 38). Most squid bycatch came from Pribilof Canyon, which is to be expected since most pollock were caught in Pribilof Canyon. Eulachon was the most commonly reported smelt species in most years but was reported in far lower quantities than squids, while herring rarely occurred at more than trace levels.

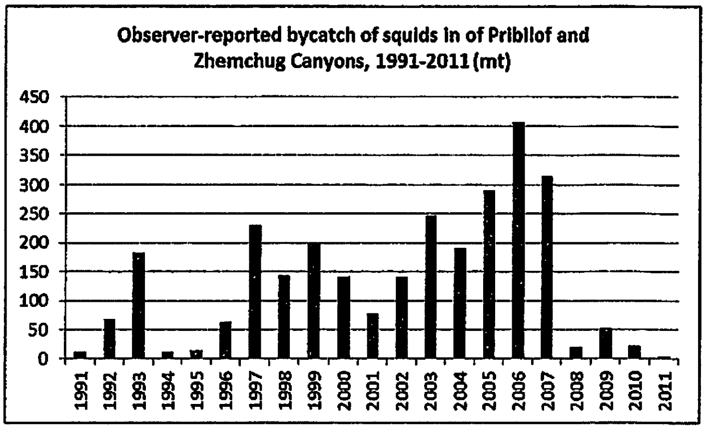


Fig. 38. Trends in squid bycatch from Pribilof and Zhemchug canyons, 1991-2011. Source: NPGOP.

All of these species are important prey for millions of sea birds and tens of thousands of northern fur seals on the Pribilof Islands during the summer half of the year. While a prohibition on pelagic trawling in Pribilof and Zhemchug canyons will not encompass all the important foraging areas of seabirds and marine mammals in the region, it would provide significant protection to prey availability in areas of the shelf break that are utilized by all these species.

6.3 Pelagic HCAs as Tools to Protect Marine Mammal Foraging Habitat and Prey Availability

Prior to whaling, much of whale biomass in the Bering Sea is thought to have been associated with the Green Belt (Springer *et al.* 1996). Sperm whales (*Physeter macrocephalus*), which were prime targets of whalers, are squid specialists and they reportedly concentrated on the shelf edge of the Bering Sea and Aleutian Islands during the whaling period (Omura 1955, Okutani and Nemoto 1964). The abundance of fin whales (*Balaenoptera physalus*) on the whaling grounds was reportedly highest at upwelling and frontal zones along the shelf edge from the southeastern Bering Sea to Cape Navarin, and more recent sightings confirm that they commonly feed in these areas today (Nasu 1966, Springer *et al.* 1996, Moore 2000, Moore *et al.* 2002). Historically, right whales (*Eubalaena japonica*) also had an extensive offshore distribution and were commonly seen in deep waters of the outer continental slope and basin in areas where few or no whales are sighted today (Clapham *et al.* 2004, Shelden *et al.* 2005). Minke whales (*Balaenoptera acutorostrata*), which were never hunted commercially in the eastern Bering Sea (Mizroch and Rice 2006), have been sighted throughout the southeastern and central-eastern Bering Sea along the upper slope in waters 100-200 m deep and along the 100 m contour near the Pribilof Islands (Moore 2000, Moore *et al.* 2002). Blue whale (*Balaenoptera musculus*), Stejneger's beaked whale (*Mesoplodon stejnegeri*) and Dall's porpoise (*Phocoenoides dalli*) are also associated with the shelf edge (Lowry *et al.* 1982; Springer *et al.* 1996; NRC 1996, Allen and Angliss 2011). Most of the northern fur seal population gathers on the Pribilof Islands breeding and pupping grounds during the summer half of the year, foraging extensively along the shelf break and around the submarine canyons on the pollock and squid (Lowry *et al.*

1982; Kajimura *et al.* 1984, Sinclair *et al.* 1994, Springer *et al.* 1996, Robson *et al.* 2004, Call *et al.* 2008). Steller sea lions and ribbon seals also utilize these foraging grounds during parts of the year. Platforms of Opportunity (POP) sightings from 1958-2000 show that Steller sea lion encounter rates were high along the continental shelf break throughout the Bering Sea and Gulf of Alaska (NMFS 2000, 2010).

The availability of abundant fish, squid and zooplankton resources in these offshore foraging areas is critical to all these species, and the lack of adequate prey resources is an especially acute concern for two of the region's most iconic pollock predators, the Steller sea lion (*Eumetopias jubatus*) and northern fur seal (*Callorhinus ursinus*).The protracted, decades-long decline of sea lion and fur seals in western Alaska (Fig. 39) stands in stark contrast to increasing trends for seals and sea lions from Southeast Alaska to California since the end of bounty programs and is not expected in species that have evolved life history strategies which should be expected to buffer them from drastic population responses to normal and recurrent environmental fluctuations (Merrick 1997).

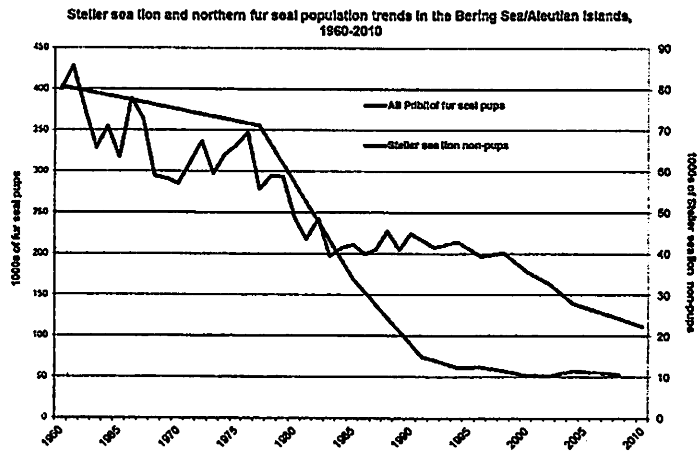


Fig. 39.Steller sea lion and northern fur seal population trends in the Bering Sea and Aleutian Islands, 1960-2010.

These trends and the accompanying declines of some of the largest nesting colonies of fish-eating seabirds in the world on the Pribilof Islands appear to indicate that a major change in the structure of the ecosystem has occurred in recent decades such that food supplies are limited or reduced and the ecosystem is no longer capable of supporting as many top predators as in the past (Merrick 1997). However, at the time of the northern fur seal listing as depleted under the Marine Mammal Protection Act in 1998, NMFS noted that there is no compelling evidence that environmental carrying capacity has declined substantially since the late 1950s to some new equilibrium level and that remains true today (NMFS 2007). Indeed, some of the largest fisheries in the world were pioneered and rapidly expanded to unprecedented levels during this same period, targeting many of the key prey species of the declining top predators. If the declining populations of top predators such as the Steller sea lion and northern fur seal are food-limited, something other than a severe decline in the environmental carrying capacity of the eastern Bering Sea is responsible, and the large-scale groundfish fisheries for pollock and important prey have long been suspected as a major factor.

The potential for conflict between large-scale commercial fisheries for pollock and large populations of pollock predators in the North Pacific was recognized thirty years ago in the final Environmental Impact Statement for the Bering Sea/Aleutian Islands Fishery Management Plan (1981), which considered the threat especially high for competing pollock predators with the greatest potential for direct competition such as the Steller sea lion and the northern fur seal (Table 13). In a 1982 report to the North Pacific Fisheries Management Council, Lowry *et al.* (1982) noted the phenomenal expansion of fishing for pollock and other groundfish from the 1950s to the early 1970s and cautioned that large-scale groundfish fishery removals may reduce the carrying capacity for competing predators. In a 2002 report to the North Pacific Council reviewing the fishery harvest policy currently employed in groundfish management, scientists concluded that a fishing strategy designed to reduce the biomass of the target stock by a large fraction could be expected to reduce the total consumption by competing predator populations by a similar large fraction, resulting in a decline in their populations over time (Goodman *et al.* 2002). More recently, in an ESA Section 7 consultation biological opinion on the fisheries and Steller sea lions, NMFS reached a similar conclusion that the fisheries are likely to lower sea lion carrying capacity (NMFS 2010).

Table 13. Relative importance of walleye pollock in the diet of pinnipeds and cetaceans in the eastern Bering Sea./a

Predators	Walleye Pollock	Fish and/or Squid	Sizes Consumed
Steller sea lion	major	major	Capable of consuming all sizes
Northern fur seal	major	major	Capable of consuming all sizes
Largha seal	minor	major	Principally <20 cm length
Harbor seal	major	major	Capable of consuming all sizes
Ribbon seal	major	major	Principally <20 cm length
Ringed seal	minor	major	Principally <20 cm length
Bearded seal	minor	major	Principally <20 cm length
Minke whale	minor	major	probably <30 cm length
Sei whale	minor	major	Probably <30 cm length
Fin whale	major	major	<30 cm length
Humpback whale	minor	major	30-40 cm length
Dall's porpoise	minor	major	Probably <40 cm length

a/ Kajimura and Fowler (1984), Apex predators in the walleye pollock ecosystem in the eastern Bering Sea and the Aleutian Islands regions, In: D.H. Ito (ed.), Proceedings of the Workshop on Walleye Pollock on its Ecosystem in the EBS. NOAA Tech. Memo. NMFS F/NWC-62.

The northern fur seal population on the Pribilof Islands rookeries, which numbered more than 2 million in the 1950s, has now declined by ~70% since 1960. The early phase of the decline can be attributed to a female culling program from 1956-1968, when approximately 300,000 females were removed from the population following complaints by Japan that fur seals were too numerous and interfering with its developing factory fisheries (York and Hartley 1981). After stabilizing for a short period from the mid-1970s to early 1980s, fur seal numbers declined to less than half of the 1950s, resulting in the eventual designation of the population as depleted under the Marine Mammal Protection Act in 1988. These trends, which have continued into the present, stand in sharp contrast to the fortunes of the pollock fishery, which has removed a cumulative total of over 54 million metric tons (nearly 120 billion lb.) from the eastern Bering Sea since 1964 (Fig. 40).

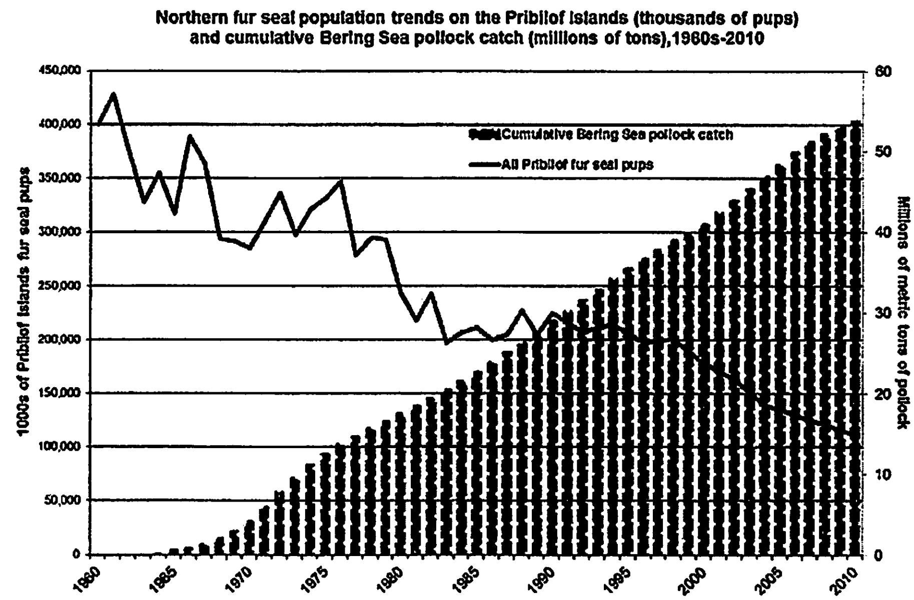


Fig. 40. Northern fur pup trend counts and cumulative Bering Sea pollock catch (millions of tons), 1960s-2010.

All past studies dating back to the 19th century and numerous recent studies have consistently found that juvenile walleye pollock and gonatid squid are the dominant prey of adult females while at the Pribilofs (Jordan et al. 1898, Fiscus *et al.* 1962, Kajimura 1984, Sinclair *et al.* 1994, Robson *et al.* 2004, Call and Ream 2012).With fur seal pup production continuing to plunge, protecting the availability of pollock, squids and other prey on fur seal foraging grounds should be a top priority. As with the Steller sea lion, fur seal reproduction is energetically expensive for the mother. Perez and Mooney (1986) calculated that the average daily feeding rate for lactating northern fur seals was 60% greater than for non-lactating females. Studies of northern and southern hemisphere fur seal species show strong links between food availability and reproductive success, and food shortages in one season may affect the pregnancy status of females in subsequent seasons, blocking estrus, terminating pregnancy, and preventing lactation (Costa *et al.* 1989, Costa 1993, Lunn and Boyd 1993).

Foraging fur seals on the Pribilofs range over large areas of the eastern Bering Sea continental shelf, shelf edge, slope and basin waters, but areas within 200-300 km from the Pribilofs are considered especially important to foraging females with pups (Robson *et al.* 2004, NMFS 2007, Call *et al.* 2008). Past analyses of pollock fishing effort in important fur seal foraging habitat indicated that the proportion of the total June-October pollock catch in fur seal foraging habitat increased sharply from an average of 40 percent in 1995-1998 to 69 percent in 1999-2000, and NMFS has acknowledged the concern that this increased fishing pressure could negatively impact lactating females from St. George Island where catch rates were consistently higher than in areas used by females from St. Paul (NMFS 2004). This area encompasses Pribilof Canyon, situated directly south of St. George.

The fishery observer data indicate that pollock catches accounted for 80% of all observed groundfish catch in Pribilof Canyon during 2000-2011. In some years pollock catches from the canyon ranged as high as 70,000-100,000 mt, although canyon catches have been variable and much lower in some years (Fig. 33, Table, Section 6.1 above). The pelagic trawl gear used in the pollock fishery is also responsible for the vast majority of squid bycatch from the canyons, which has been highest in years when pollock catches in the canyons were highest (Fig. 38, Section 6.2 above). While a prohibition on pelagic trawling in Pribilof and Zhemchug canyons will not encompass all the important fur seal foraging areas within 200-300 km of the Pribilof rookeries, it would provide substantial protection to foraging areas of the shelf break and slope utilized by fur seals and reduce the impact of the fishery on two of the top-ranked fur seal prey.

6.3 Pelagic HCAs as Tools to Reduce Seabird Incidental Takes: Short-Tailed Albatross

All three species of North Pacific albatross are closely associated with shelf-edge and canyon habitats throughout the Gulf of Alaska and Bering Sea, including the highly endangered short-tailed albatross (*Phoebastria albatrus*). Long-term sightings data indicate that the largest concentrations of short-tailed albatross are regularly found along the Bering Sea shelf edge and canyons, particularly near the heads of canyons (Piatt et al. 2006, USFWS 2008). Incidental takes of short-tailed albatross that pursue baited hooks deployed by longline fisheries pose the biggest fishing threat to recovery of the species. In 2010, two juvenile short-tailed albatross were reported as incidental takes by observers in the factory longline fishery for cod along the margins of the eastern Bering Sea shelf break northwest of the Pribilof Islands. Based on the observed takes, the total number of birds killed that year is estimated to be 15. In October 2011, another incidental take was reported in the longline fishery in reporting area 523 along the shelf break northwest of the Pribilof Islands. Prior to 2010, a total of five short-tailed albatross takes had been recorded in the Alaska longline fisheries since 1993, including at least one observed take in Zhemchug Canyon (in 1998). Telemetry tracking locations of short-tailed albatross in the Bering Sea during 2001-2011 are depicted below (Fig. 41) in brown dots, and the locations of incidental takes from 1983-2010 are shown by stars with the green star representing the most recent take. Two observed incidental takes have been reported in Zhemchug Canyon since 1983, including one in 1998.

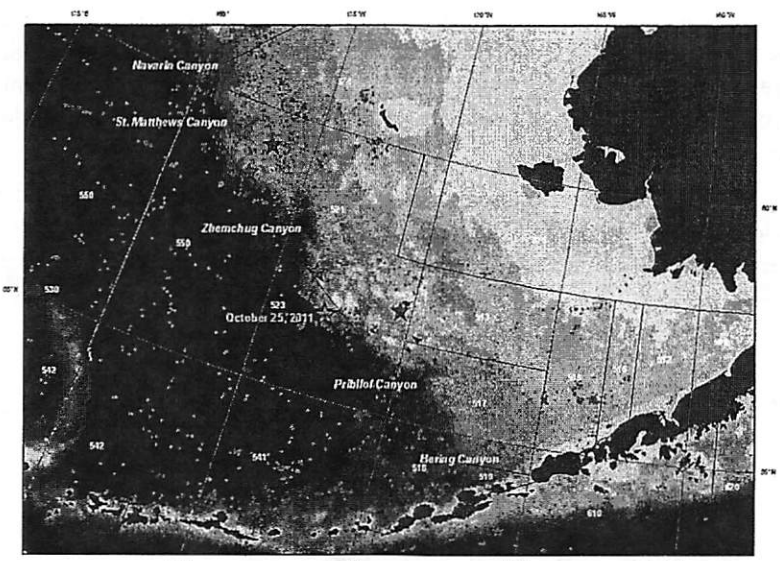


Fig. 41. Locations of short-tailed albatross in the Bering Sea during 2001-2011. Brown dots depict telemetry locations. Observed incidental takes from 1983-2010 are indicated by stars, with the green star representing the most recent take (in 2011). Sources of data: Suryan *et al.* 2006, Suryan *et al.* 2007, Suryan and Fischer 2010, http://www.fakr.noaa.gov/index/infobulletins/bulletin.asp?BulletinID=7771

The USFWS (2003) allows for an *observed* incidental take of 4 birds over any given two-year period of time in the demersal groundfish longline fishery as well as two in the halibut fishery and two in the groundfish trawl fishery. The short-tailed albatross killed in October 2011 is the first observed take in the two-year period that began on September 16, 2011. Laudable efforts by the Council and industry to adopt seabird deterrent devices have significantly reduced the takes of seabirds in longline gear from the peak mortalities of the late-1990s, but the longline groundfish fleet in Alaska continues to pose a threat to short-tailed albatross recovery. Trawl fisheries also pose a significant potential hazard and source of mortalities resulting from collisions with net wings, trawl warps and third wires, and mortalities from these sources would not be accounted for in the catch on observed vessels. Short-tailed albatross mortalities have been reported in net fisheries elsewhere, but no takes have been observed in the Alaskan trawl fisheries to date (Zador 2008). Groundfish trawl and pot fisheries are responsible for a portion of the incidental takes of other seabird species, but longline gear accounts for the great majority of all *observed* seabird takes in the Alaska groundfish fishery. During 2007-2011, Alaskan longliners accounted for about 85% of all reported seabird takes in all groundfish fishing gears over all areas, including 100% of all albatross takes (Fitzgerald 2011). Bering Sea longliners are the single biggest source of seabird mortalities in the Alaska groundfish fishery overall, accounting for 66% of seabird takes by all gears in all areas during the same period (Table 14).

Observer-reported seabird takes in longline gear in Pribilof and Zhemchug canyons averaged 3% of the total EBS-wide longline seabird take over the same period (2007-2010), but in 2009 observer-reported canyon takes of Laysan albatross (n = 6) accounted for 46% of all Laysan taken in longline gear in the EBS longline fishery that year and reported takes of black-footed albatross (n = 3) accounted for 60% of all black-footed albatross in the EBS longline fishery that year (Table 15). All three species of albatross (Laysan, black-footed and short-tailed) were identified as incidental takes in Zhemchug Canyon over the entire period from 1990-2011, including at least one observed short-tailed albatross take (3 birds total) in Zhemchug in 1998, whereas Laysan was the only albatross species identified in Pribilof Canyon. All positively identified albatross incidental takes occurred in longline gear, but trawl gear was responsible for some of the mortalities of northern fulmar, sooty and short-tailed shearwaters, black-legged kittiwakes, glaucus gulls, guillemots, auklets and murrelets that were reported in canyon fisheries.

Table 14. EBS-wide estimated seabird takes in bottom longline groundfish fisheries, 2007-2010./a

Species/Species Group	2007	2008	2009	2010
Unidentified albatross	16	0	0	0
Short-tailed albatross	0	0	0	15
Laysan albatross	4	130	13	40
Black-footed albatross	18	7	5	9
Northern fulmar	2,526	1,791	6,582	1,647
Shearwater	2,795	1,162	566	480
Storm petrel	0	0	0	0
Gull	421	1,279	808	640
Kittiwake	10	0	10	0
Murre	5	5	13	0
Puffin	0	0	0	5
Auklet	0	0	0	0
Other alcid	0	0	0	0
Other bird	0	0	0	0
Unidentified bird	445	31	122	15
Total	6,224	4,405	8,119	2,851
Percent of all seabird	60.8%	63.7%	77.8%	62.0%

a/ Shannon Fitzgerald (2011), Preliminary Seabird Bycatch Estimates for Alaskan Groundfish Fisheries, 2007-2010.

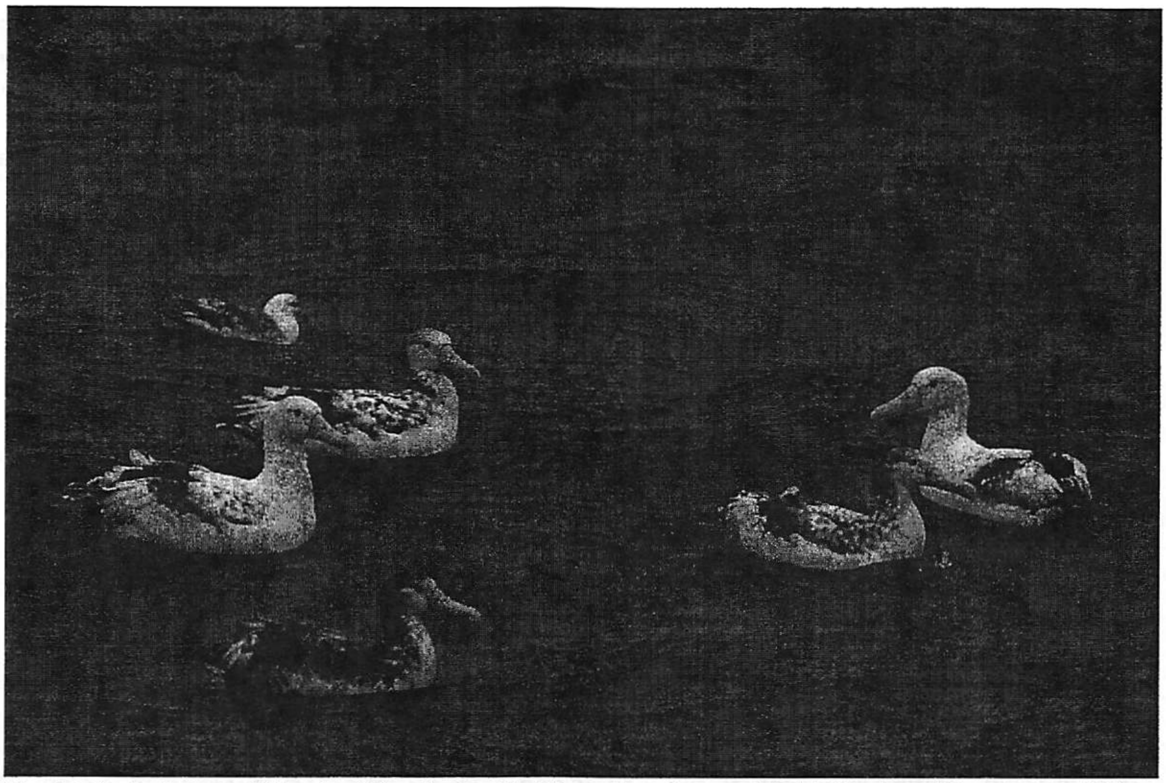
Table 15. Observer-reported seabird takes (n) in bottom longline fisheries of Pribilof and Zhemchug canyons, 2007-2010./a

Species/Species Group	2007	2008	2009	2010
Unidentified albatross				
Short-tailed albatross				
Laysan albatross			6	
Black-footed albatross			3	
Northern fulmar	122	44	187	39
Shearwater	116	40	31	49
Storm petrel				
Gull	15	12	28	3
Kittiwake				
Murre				
Puffin				
Auklet				
Other alcid				
Other bird				
Unidentified bird	3		10	
Total	256	96	255	91
Percent of EBS-wide longline seabird takes	4.1%	2.2%	3.1%	3.2%

a/ Data from NPGOP.

Highly endangered species such as the short-tailed albatross are few in number and encounter rates are low, but birds are known to concentrate in hot spots along the margins of Zhemchug, St. Matthews and Pervenets canyons, as well as Navarin Canyon on the Russian side of the Bering Sea, thus the potential for fatal encounters can be very high in localized areas (Piatt *et al.* 2006, Hunt *et al.* 2010).In one instance an estimated 200 short-tailed albatross (~10% of the total adult population) were observed near one fishing vessel in the Bering Sea (Piatt *et al.* 2006).

The true number of short-tailed albatross incidental takes in the groundfish fishery may be significantly higher than the reported numbers suggest, either because there is no observer on board a vessel to report them or because birds may drop off the hook underwater before it is hauled into view of the observer, and this unknown mortality is not factored into estimates of seabird takes in the fishery. Prohibiting the use of longline gear in addition to trawl gears in Pribilof and Zhemchug canyons would provide significant pelagic habitat protection to important seabird foraging areas where albatross and other seabirds often congregate in large numbers and where they are regularly taken in fishing gear, reducing the potential for fatal encounters on the Bering Sea shelf break and slope significantly.



Short-tailed albatross (*Phoebastria albatrus*) in Zhemchug Canyon, Todd Warshaw/Greenpeace USA

7. Summary Conclusion

Technological changes have allowed fishermen to locate fish and exploit areas which, in the past, would have been de facto refugia (Wilson *et al.* 1996, Watling and Norse 1998). The groundfish fisheries operating on the outer shelf and slope of the Bering Sea Green Belt today offer a case in point of how fishing in the past half century has expanded offshore and into depths that were out of reach to past generations of fishermen. Much of this area has been intensively fished since the arrival of the foreign factory ships in the late 1950s and early 1960s, when many whale species and many fish species such as slope rockfish, sablefish, and Greenland turbot were serially depleted in a short period of time. Benthic habitats and deep-sea corals were undoubtedly severely affected as well, although no one was monitoring those impacts. From a cumulative impacts perspective, the baseline condition of the Bering Sea Green Belt has already been adversely impacted in a variety of ways due to historical and continuing fishing impacts in these areas (NMFS 2004).

The establishment of Bering Sea Canyon HCAs would provide comprehensive protection for rare, unique and representative habitat types on the outer shelf and slope of the Bering Sea Green Belt, an area of great ecological importance that has received no protection up to now. The establishment of fully protected HCAs for Pribilof and Zhemchug canyons would address multiple FMP objectives for conservation and management of fish, mammal and bird fauna that utilize these offshore waters extensively. With respect to poorly documented deep-sea corals and other epibenthic invertebrate fauna in the region, new evidence from *in situ* observations documents the presence of previously unknown deep-sea coral and sponge species in the Bering Sea Canyons. Prohibiting the use of all bottom-tending gears in the proposed Bering Sea Canyon HCAs would provide significant protections to those living habitats while research continues to discover the full extent of those little-studied habitats.

Given how little is known about the true extent of the biodiversity in the Bering Sea Canyons or the cumulative, long-terms impacts of fishing on their representative benthic and pelagic fauna, the Council's policy should be to manage explicitly for habitat diversity and complexity *now*, while research on "essential" habitats continues (Auster *et al.* 1997). Although our scientific understanding of these unprotected marine habitats is still rudimentary in many respects, the available research clearly demonstrates the importance of the canyons as major features of the Green Belt affecting ocean circulation and nutrient transport to the shelf and harboring rare, unique and endangered fauna. A system of fully protected Canyon HCAs that *build in* refuges from fishing would provide buffers against the considerable scientific and management uncertainties associated with managing these resources sustainably for present and future generations.

For all these reasons, the Council should initiate a staff review of new and existing information in preparation for the development of a plan amendment that would include the option of establishing Habitat Conservation Areas (HCAs) encompassing the entirety of Pribilof and Zhemchug canyons, as described in this paper, with the aim of conserving the EFH of managed species, minimizing the bycatch of vulnerable non-target species, providing refuges from bottom fishing in sensitive deepwater coral and sponge habitats, and protecting the associated pelagic habitat utilized by mobile fish, seabird and marine mammal predators. The staff's analysis of HCAs should also consider the cultural importance and traditional Alaska Native subsistence uses of fish and other marine wildlife within these protected areas, as well as the benefits of establishing control areas where scientists can evaluate the responses of a fished and unfished environment over time.

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PUBLIC TESTIMONY SIGN-UP SHEET

Agenda Item: D-2 Staff Tasking

	NAME (PLEASE PRINT)	TESTIFYING ON BEHALF OF:
1	Melvin B Grove	PWS Charter ASSN
2	Kenny Down	Freezer Longline Coalition
3	Heather McCarty	CBSFA
4	MARK GLEASON	ABSC
5	Rhonda Hubbard	
6	~~Mike Szymanski~~	~~[illegible]~~
7	Ray Welsh	myself hired skipper
8	Pat Welsh	myself hired skipper
9	JACKIE DRAGON AND GEORGE PLETNIKOFF	Greenpeace
10	~~Larry Merculief~~	Seven Generations Corp
11	~~Sky Starkey~~	
12	PAT PLETNIKOFF	St. George Isld.
13	NIKOS PASTOS	ALASKA'S BIG VILLAGE NETWORK
14	~~[illegible]~~	~~[illegible]~~
15	~~[illegible]~~ Kirsten Lippmann	Center for Biological Diversity
16	DELICE CALCOTE *	ALASKA INTER-TRIBAL COUNCIL
17	JULIE BONNEY / BOB KRUEGER / GLENN REED	
18	Merrick Burden	Marine Conservation Alliance
19	Julianne Curry	Petersburg Vessel Owners
20	~~ART IVANOFF / KRIS MASHINA~~	SNSAC
21	Paul MacGregor	At-Sea Processors Assn.
22	LORI SWANSON	Groundfish Forum
23	Verner Wilson	WWF
24	Michelle Ridgway	Oceanus Alaska
25		

NOTE to persons providing oral or written testimony to the Council: Section 307(1)(I) of the Magnuson-Stevens Fishery Conservation and Management Act prohibits any person " to knowingly and willfully submit to a Council, the Secretary, or the Governor of a State false information (including, but not limited to, false information regarding the capacity and extent to which a United State fish processor, on an annual basis, will process a portion of the optimum yield of a fishery that will be harvested by fishing vessels of the United States) regarding any matter that the Council, Secretary, or Governor is considering in the course of carrying out this Act.

February 2, 2011

Art C. Ivanoff, Chairman
Southern Norton Sound Fish and Game Advisory Committee
Box 49
Unalakleet, Alaska 99684
artcivanoff@hotmail.com

U.S. Department of Commerce
Honorable Gary Locke, Secretary of Commerce
1401 Constitution Avenue, N.W.
Washington D.C. 20230

RE: PERMANENT BAN OF TRAWLING IN NORTHERN BERING SEA RESEARCH AREA.

Dear Honorable Gary Locke:

Mark Twain wrote; "*Man is the only religious animal, in the holy task of smoothing his brothers path to the happiness of heaven, he has turned the globe into a graveyard*".

My name is Art C. Ivanoff, Chairman of Southern Norton Sound Fish and Game Advisory Committee (SNSAC). I am from a commercial fishing village of Unalakleet, some 360 air miles from Anchorage. Our small scale commercial fishing operation helps off set the cost of other activities relating to a hunting, fishing and gathering. For the last several years, SNSAC has been engaged with the National Marine Fisheries Service and the North Pacific Fisheries Management Council (Council) advocating for conservative measures to address bycatch, lack of tribal representation on the Council and tribal consultation. We are keenly aware of the significant danger trawling poses to the marine resources, marine resources we depend upon.

SNSAC consist of the villages of Shaktoolik, Koyuk, Stebbins, Saint Michael, and Unalakleet. SNSAC petitions to establish a **permanent ban** on trawling in the Northern Bering Sea Research Area (NBSRA). We believe this effort is in accord to the Executive Order; <u>STEWARDSHIP OF THE OCEAN, OUR COASTS, AND THE GREAT LAKES</u> and true to the purpose and policy established by the White House which states;

Under Section 1. Purpose: This order establishes a national policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources.

Section 2. Policy states; (i) protect, maintain, and restore the health and biological diversity of ocean, coastal, and Great Lakes ecosystems and resources; the policy continues to state; (ii) improve the resiliency of ocean, coastal, and Great Lakes ecosystems, communities, and economies; and finally; (iii) bolster the conservation and sustainable uses of land in ways that will improve the health of ocean, coastal, and Great Lake ecosystems;

The Northern Bering Sea Research Area is home to Alaska's abundant marine wildlife. It is central to the health and diversity of the Alaska Native diet which consists of the five species of salmon, marine mammals, migratory birds and other resources. NBSRA is also the habitat of several species that are listed under the Endangered Species Act or being considered listing under the ESA that include; Northern Fur Seals, Northern Right Whale, Short-Tailed Albatross, and the Kittlitz's Murrelet.

By definition, the NBSRA stretches north of Saint Matthew Island into the waters of Wales and into Norton Sound. It stretches 81,693 square miles according to Bob R. Lauth of the National Marine Fisheries Service (See attached map). NBSRA was established by the North Pacific Fisheries Management Council motion as part of the Bering Sea Habitat Conservation Measures action, BSAI Amendment 89-June 2007. St. Lawrence Island has limited exclusion of NBSRA.

Josh Eagle's report Taking Stock of Regional Fishery Management Council revealed the "North Pacific fisheries discard more than 300 million pound of bycatch annually". How can we prevent trawlers or supertrawlers from further wanton waste in the Bering Sea? With these large vessels and today's technology very little prevents a collapse of stocks of Pollock and marine life dependent on the abundance. Simply put, smaller vessels and less fishing will greatly improve the conservation needed for future generations; however, industry and government tend to have a short attention span that is measured by monetary value only.

Another quote that speaks volumes regarding the fact our oceans are endangered states; "Overfishing is a growing problem. About 60 percent of the fish types tracked by the Food and Agriculture Organization of the United Nations (FAO) are categorically as full exploited, overexploited, or depleted" (Kurlansky 1997). Furthermore, a report by CNN found; "More than 70% of the world is covered by oceans. There are currently more than 4,000 marine protected areas covering just over 1 percent of the oceans, but the vast majority of reserves have only limited protection". The article went on to say; "The Global Ocean Legacy, a project of the Pew Environment Group, issued a statement to mark World Oceans Day in June signed by 257 marine scientists in 37 countries calling for a large network of highly protected no-take reserves" (Davies 2010).

Daniel Pauly, a fisheries biologist from the University of British Columba coined the term "shifting baseline syndrome". The shifting baseline syndrome suggests that with each new generation we can expect less and less fish. Pauly went on to assert: "The result is that, overtime, the expectation of the natural number of fish in the sea gets smaller and smaller-until the population is so small that even a modest environmental perturbation, or a tad more fishing, causes it to unexpectedly collapse, as the cod population collapsed off Newfoundland and Labrador in the early 1990's" (Pala 2008)

The call to establish the Northern Bering Sea no trawl zone is an effort to avert a debacle that is occurring across the world with the overharvest of fish and other marine life. We believe there is need to ensure future generations are permitted to experience, witness and indulge in the biodiversity of our oceans. This effort will also allow the hunting and fishing society found in Alaska to flourish enabling knowledge gained over generations to be passed to the next generation. Alan Friedlander, a fisheries ecologist with a biogeography branch of the National Oceanic and Atmospheric Administration in Honolulu states: "It's much better to conserve than to rehabilitate." The debacle on the east coast with the cod stock is a clear indicator that overfishing will occur despite good intentions. Alaska's marine resources in the Bering Sea Aleutian Islands show signs of exhaustion and reduction. Overfishing maybe the culprit, however, there are many variables that need to be analyzed

The nature of man kind portrayed by Mark Twain suggests man will not stop until the earthly resources are exhausted. Paul Goldberg pointed out in Four Fish: "Because seafood is such a global, boundary-free business, whenever a restaurant, a city, or a country takes to the moral high ground and tries to reduce or improve the footprint of its seafood consumption, another, less scrupulous restaurant, city, or nation is ready to step in and continue the bad practices". In reality, the problems are exacerbated because of the shear nature of corporations and access corporations have to the federal government and agencies that have been given oversight in the management of marine resources. Kurlansky's book Cod uses a quote from Will and Ariel Durant that exemplify the biological competition that sums up our concern; "So the first biological lesson of history is that life competition. Competition is not only the life of trade, it is the trade of life-peaceful when food abounds, violent when the mouths outrun the food. Animals eat one another without qualm; Civilized men consume one another by due process of the law". The founding father's of this great country understood the problem faction's posed to stable governments suggesting laws are written not for the many, but the sagacious and moneyed few. The evolution of the pivotal role faction's play in the federal government's process of making laws and policies today would bewilder and stagger those that chartered the course for this country nearly two centuries ago. Conceivably, the best case in point relating to factions, the federal government and fisheries, is the Magnuson-Stevens Fishery Conservation Management Act (MSA). The National Standard's For Fishery Conservation and Management explicitly lean heavily toward industrial commercial fishing.

While the National Standard's cites the importance of conservation, the language pertaining to conservation is inadequate and weak at best. Of the ten National Standard's found in Section 301, the phrase; "Where practicable" is referred to half a dozen times that relate to conservation. It provides for loose interpretation and was used frequently by industrial commercial fishing representatives at the North Pacific Fisheries Management during the discussion of bycatch of Chinook salmon over the last two years.

In closing, SNSAC hope is to ban permanently trawling based on an old adage; *History repeats itself.* The George Banks and Grand Banks on the east coast experienced their cod stocks spiral down; in Alaska, we have an opportunity to evade a debacle. Sam Lee argued best in Kurlansky's book Cod when the question posed was; When will the cod would return? "They're coming back because they have to". We can avoid the desperation that Sam Lee and others experienced on the east coast. The federally recognized tribes and rural residents depend on the five salmon species, marine migratory birds and marine mammals to carry on their cultural practices, not to mention to meet their source of nutrition. We need healthy and robust ecosystems. We need to prevent overfishing. If anything, research has revealed that man's impact on the oceans has been nothing more then disgraceful, however, as a beacon of the world, the United States can and must do more to prevent further degradation of our oceans. Robert F. Kennedy, Jr. book; Crimes Against Nature quotes Teddy Roosevelt's precept; "The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, not impaired, in value". We have an opportunity to do what is right, moral and just.

Sincerely,

Art C. Ivanoff
Chair

Cc: Lisa L. Praskovich, Executive Office of the President
Jose Aguto, National Congress of American Indians
Monica P. Medina, Principal Deputy Under Secretary, Dept of Commerce
Donald Chapman, Senior Advisor on Native American Affairs, Dept of Commerce
Eric Olson, North Pacific Fisheries Management Council
Karen Gillis, Bering Sea Fishermen's Association
Dorothy Childers, Alaska Marine Conservation
Loretta Bullard, Kawerak, Inc
Gary Harrison, Alaska Intertribal Council
Myron Naneng, Association of Village Council of Presidents
Ian Erlich, Maniilaq Association
Edward Itta, North Slope Borough
Julie Kitka, Alaska Federation of Natives
Native Village of Saint Michael
Native Village of Shaktoolik
Native Village of Stebbins
Native Village of Koyuk

March 20, 2012

Southern Norton Sound Fish & Game Advisory Committee
Box 49
Unalakleet, Alaska 99684

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

RE: PRIBILOF AND ZHEMCHUG CANYONS

Dear Chairman Olson and Council,

On behalf of the Southern Norton Sound Fish and Game Advisory Committee, we strongly urge you to develop conservation measures to protect the Pribilof and Zhemchug Canyons on the Bering Sea.

Alaska native communities and rural residents have relied and continue to rely on the Bering Sea to sustain their communities, but today they are seeing their native foods disappear, threatening their culture and way of life. National Standards direct fishery managers to use the best available science, to minimize bycatch, to determine the value of fishing communities, and to reduce adverse impacts on such communities.

The Magnuson Stevens Act encourages the conservation and enhancement of essential fish habitat and ecosystem-based management, and requires policy makers to identify coral habitats under their jurisdiction and report to Congress regarding efforts made to protect them.

We commend the Council for previous actions taken to protect important habitats, such as coral gardens in the Aleutian Islands. Similar measures are needed to protect the vulnerable seafloor habitat in the canyons and the pelagic habitat of the Pribilof and Zhemchug Canyons. We must take proactive measures to protect the Bering Sea marine system and take steps that give our oceans the best chance to adapt to changing conditions like climate change and ocean acidification. The Pribilof and Zhemchug Canyons are too important, both ecologically and economically, for us not to set aside a portion of this vital ecoregion as a buffer against uncertainty.

SNSAC is committed to supporting the protection of the natural environment including safeguarding and restoring the health of our oceans. Protecting Pribilof and Zhemchug Canyons will help ensure the sustainability of the Bering Sea fisheries, and the health of the ecosystem which sustains them. We urge you to act, without delay, to begin developing new conservation measures for these unique and productive areas.

Sincerely,

Kris Mashiana

Sincerely,

Art Ivanoff

NPFMC
February 1-7, 2012 - Agenda D-2
Eric Olson, chairman

2012/ January 24th

I own IFQ, (halibut), have a certificate of eligibility, my husband is an initial recipient and commercial halibut fisherman. We were a family operation with two sons holding certificates of eligibility which we earned putting our time in those 24 & 48 hour openers with our own vessel.

Our Halibut and Blackcod fishing grounds were caught in the Exxon Oil Spill and financially affected us to the extent of loosing our fishing vessel. We agreed to fish our IFQ with another skipper on his boat at a percentage. With the sale price of fish going up we decided to purchase another vessel, a fixer upper. We invested a great deal of money, which all fishermen know it can be a bottomless hole. During this rebuilding my husband had a stroke.

We now have a whole new ballgame. Our retirement is gone so hiring a Skipper is our way of financially surviving and thank the Lord for that. The sell price keeps going up but the poundage of 3A 3B Halibut keeps going down.

We contacted a broker in Seattle and calculated the value of our halibut with Blackcod and found there was another fishermen interested in our 3A&3B. We researched the cycle of blackcod and started the negations at which point we were informed that 'trade,swap,exchange' are not terms that IPHC are accepting. In other words, we buy and sell so that is what we did in July 2010

I need to make something very clear here that by buying and selling we have created a tax burden of around $23,000 dollars, but through legal channels we have deferred the tax burden until the fish our sold and here is part of the issue and burden of the Welsh family. If we have to sell our IFQ because Hired Skipper is no longer available with this motion passed with the date Feb12,2010 it will put us in such a financial bind we may loose our home.

My **OBJECTION** is with the date of Feb 12,2010. A quote from the initial review draft says *"NMFS staff has identified a high administrative burden for revising regulations (and administration of transfer) for a date, such as Feb 12,2010 The Council may wish to Revise the control date to one coincident with effective date of the final rule"* end of quote. This can be an additional financial burden as well. Is this date legal? Probably! I am asking that you refer back to the council for **testimony only to change control date** since this could have a disastrous financial effect on the original initial especially the Welsh Family

I mentioned earlier that my husband had a stroke which affects his ability to act as a skipper or crew member due to his physical limitations. I myself have had to do a medical emergency transfers. Lets face it we are old but were not dead and we still have to have an income to live, and the passage of this date of Feb 12, 2010 is not acceptable. This is 50 percent of our income. Remember we are not the only ones affected; there are the approx. 150 initial recipients who acquired QS after Feb12, 2010.

Again, I am requesting that the council receive new testimony ONLY (if necessary) to change this proposed date of Feb12, 2010 before final implementation of this rule, at least to the end a year 2011 or the date the lawyers make a decision this year 2012.

As you can tell I am not a professional writer, just communicating my distress.

Respectfully,

Patricia Welsh

DRAFT NPFMC THREE-MEETING OUTLOOK - updated 4/2/12

June 4 - 12, 2012 Kodiak, AK	October 1-9, 2012 Anchorage, AK	December 3-11, 2012 Anchorage, AK
SSL EIS scoping (T)	SSL EIS scoping (T)	
Limit Other Gear on Jig Vessels: ***Expanded Discussion Paper (T)***	Observer Deployment Plan: ***OAC report; action as necessary***	
Halibut workshop report: ***Review***	Halibut CSP: ***Action***	Charter Halibut Recommendations for 2013
GOA Halibut PSC: ***Final Action*** GOA comprehensive halibut bycatch amendments: ***Disc paper*** BSAI halibut PSC limit: ***Discussion paper (T)***	BSAI Chum Salmon Bycatch: **Initial Review**	GOA Chinook Bycatch All Trawl Fisheries: ***Initial Review***
	Halibut/Sablefish IFQ Leasing prohibition: ***NMFS Discussion paper*** Halibut/sablefish IFQ changes: ***Discussion paper (T)*** VMS Use and Requirements: ***Expanded Discussion Paper***	
BSAI Greenland turbot allocation: ***Discussion paper***		
BSAI Crab Binding Arbitration - GKC: ***Workgroup report*** BSAI Crab ROFR: ***Initial Review (T)*** Binding Arbitration Issues (lengthy season, publishing decisions, IPQ Initiation): ***Discussion Paper***	BSAI Crab active participation requirements: ***Initial Review*** BSAI Crab Cooperative Provisions for Crew : ***Discussion paper*** BSAI Crab ROFR: ***Final Action (T)*** BS Habitat Conservation Area Boundary: ***Review*** Northern Bering Sea Research: ***Discussion paper***	BSAI Crab active participation requirements: ***Final Action*** BBRKC spawning area/fishery effects: Updated Discussion paper
Revise BS FLL GOA cod sideboards: ***Discussion paper*** FLL Vessel Replacement: ***Initial Review***	AFA Vessel Replacement GOA Sideboards: ***Initial Review*** FLL Vessel Replacement: ***Final Action***	AFA Vessel Replacement GOA Sideboards: ***Final Action***
BSAI Flatfish specification flexibility: ***Discussion Paper*** HAPC - Skate sites: ***Initial Review (T)*** Crab Plan Team Report: ***Set Catch Specifications for 4 stocks*** Pribilof BKC Rebuilding Plan: ***Final Action*** BSAI Tanner Crab rebuilding plan: ***Revise Alternatives***	Groundfish Catch Specifications: ***Adopt proposed specficiations*** HAPC - Skate sites: ***Final Action (T)*** BSAI Crab SAFE: ***Final OFL/ABC specifications for 6 stocks*** BSAI Tanner Crab rebuilding plan: ***Initial Review (T)***	Groundfish Catch Specifications: ***Adopt Final specficiations*** BSAI Tanner Crab rebuilding plan: ***Final Action (T)***
5-Year Research Priorities: ***Review and Approve*** PSEIS: ***Review comments & reports; action as necessary*** Total catch and ACLs: ***Discussion paper (T)*** Grenadiers: ***Discussion paper (T)*** GOA pollock EFP: ***Review (T)***		ITEMS BELOW FOR FUTURE MEETINGS Crab PSC numbers to weight: Discussion paper Crab bycatch limits in BSAI groundfish fisheries: Disc paper MPA Nominations: Discuss and consider nominations

AI - Aleutian Islands
AFA - American Fisheries Act
BiOp - Biological Opinion
BSAI - Bering Sea and Aleutian Islands
BKC - Blue King Crab
BOF - Board of Fisheries
CQE - Community Quota Entity
CDQ - Community Development Quota
EDR - Economic Data Reporting
EFP - Exempted Fishing Permit
EIS - Environmental Impact Statement
EFH - Essential Fish Habitat
FLL - Freezer longliners
GOA - Gulf of Alaska
GKC - Golden King Crab
GHL - Guideline Harvest Level
HAPC - Habitat Areas of Particular Concern
IFQ - Individual Fishing Quota
IBQ - Individual Bycatch Quota
MPA - Marine Protected Area
PSEIS - Programmatic Suplimental Impact Statement
PSC - Prohibited Species Catch
RKC - Red King Crab
ROFR - Right of First Refusal
SSC - Scientific and Statistical Committee
SAFE - Stock Assessment and Fishery Evaluation
SSL - Steller Sea Lion
TAC - Total Allowable Catch

Future Meeting Dates and Locations

June 4-12, 2012 - Best Western, Kodiak
October 1-9, 2012 - Hilton Hotel, Anchorage
December 3-11, 2012 - Anchorage
February 4-12, 2013, Portland
April 1-9, 2013, Anchorage
June 3-11, 2013, Juneau
September 30-Oct 8, 2013 Anchorage
December 9-17, 2013, Anchorage

(T) Tentatively scheduled

April 2nd, 2012
Mr. Eric Olson
Council Members
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501-2252
RE: D2-Staff Tasking

Dear Chairman Olson and Council Members,

On behalf of our several million members and supporters, we collectively urge you to review the available science and develop conservation measures to protect Pribilof and Zhemchug canyons, on the Bering Sea shelf break.

Submarine canyons are unique marine areas from a global perspective, occurring in only 4% of the world's oceans and containing unique species assemblages[1]. Zhemchug and Pribilof Canyons have the added distinction of being two of the largest canyons in the world, both larger that Arizona's Grand Canyon. In the Bering Sea the canyons provide essential benefits, fueling the highly productive Greenbelt[2,3] ecoregion by aiding the transport of nutrients up from the deep to the continental shelf[4,5].

Alaska Native communities have relied on this vital Greenbelt zone to sustain their coastal communities for millennia, but today they are seeing their native foods disappear, threatening their culture and way of life. National Standards direct fishery managers to use the best available science, to minimize bycatch, to determine the value of fishing communities, and to reduce adverse impacts on such communities.

Deep-sea corals and sponges are essential to ocean health and provide valuable habitat for fishes including shelter and resting places, protection from predators and strong currents, nurseries for young fish, feeding and spawning areas, and also provide breeding areas for a host of other marine life. Trawling reduces the structural complexity and diversity of habitat in the Bering Sea. The Magnusen Stevens Fishery Management Act (MSA) encourages the conservation and enhancement of essential fish habitat and ecosystem-based management, and the reauthorized MSA additionally acknowledges the important habitat that corals and sponges provide for marine life, and thus requires policy makers to identify coral habitats under their jurisdiction and report to Congress regarding efforts made to protect them.

To date the Council has cited a lack of information to compel conservation of canyon or Greenbelt habitat, and has resolved that the canyons should be a priority for research. New research findings make it clear that the canyons contain high densities of corals and sponges, which provide important habitat for commercially important fish species and other marine life[6]. The canyons are also important foraging habitat for a number of protected species, including northern fur seals, Steller sea lions, and endangered short-tailed albatross.

We commend the Council for previous actions taken to protect important habitat, such as the coral gardens in the Aleutian Islands. Similar measures are needed to protect the vulnerable seafloor habitat in the canyons and the pelagic habitat of the Greenbelt zone. We must insure the resilience of the dynamic Bering Sea marine system and take steps that give our oceans the best chance of adapting to rapidly changing conditions like climate change and ocean acidification. The Greenbelt is too important, both ecologically and economically, for us not to set aside a portion of this vital ecoregion as a buffer against uncertainty.

We are committed to protecting the environment including safeguarding and restoring the health of our oceans and the invaluable services they provide – from the seafood we eat to the oxygen we breath. Protecting America's Grand Canyons of the Sea will help insure the sustainability of the Bering Sea fisheries, and the health of the ecosystem which sustains them. We urge you to act now and begin developing new conservation measures for these unique and productive areas.

Sincerely,

Alfredo Quarto,
Executive Director,
Mangrove Action Project

David Helvarg,
President,
Blue Frontier Campaign

John Hocevar,
Oceans Campaign Director,
Greenpeace

John Kaltenstein,
Marine Program Manager,
Friends of the Earth

Lance Morgan, PhD,
Vice President for Science,
Marine Conservation Institute

Leda Huta,
Executive Director,
Endangered Species Coalition

Michael F. Hirshfield, PhD,
Senior Vice President, North America, and Chief Scientist
Oceana

Dave Raney,
Chair, Marine Action Team,
Sierra Club

Rebecca Noblin,
Alaska Director,
Center for Biological Diversity

Dr Sylvia Earle,
Founder, Sylvia Earle Alliance,
Mission Blue

Shawna Larson,
Alaska Program Director,
Pacific Environment

Teri Shore,
Program Director,
Turtle Island Restoration Network

Tobias Aguirre,
Executive Director,
Fishwise

Vicki Nichols Goldstein,
Founder, Colorado Ocean Coalition

Karla Dutton,
Director, Alaska Program
Defenders of Wildlife

Betsy Beardsley,
Environmental Justice Program Director,
Alaska Wilderness League

Patti Goldman,
Vice President for Litigation,
Earthjustice

Bradford H. Sewell
Senior Attorney
Natural Resources Defense Council

[1]Bob McConnaughey and Meghan McGovern (2009), AFSC Quarterly Report, April-June 2009: 8-9.
[2]Alan M. Springer et al. (1996), The Bering Sea Green Belt: shelf-edge processes and ecosystem production, Fisheries Oceanography 5: 205-223.
[3]National Research Council (1996).
[4]J.M. Napp et al. (1998), Biophysical processes relevant to recruitment dynamics of walleye pollock in the eastern Bering Sea, In: S. Allen Macklin (editor), Bering Sea FOCI Final Report, NOAA/Pacific Marine Environmental Laboratory, December 1998, pp. 71-102.
[5]J. Clement Kinney et al. (2009), On the processes controlling shelf-basin exchange and outer shelf dynamics in the Bering Sea, Deep-Sea Research II 56: 1351-1362.
[6]Robert J. Miller et al. (2012), Structure-forming corals and sponges and their use as fish habitat in Bering Sea submarine canyons, PLoS ONE in press.

BERING SEA ELDERS GROUP

beringsea.elders@gmail.com * www.beringseaelders.org

March 2012

Mr. Eric Olson
North Pacific Fishery Management Council
605 W. 4th Ave.
Anchorage, AK 99501

Dear Mr. Olson and Members of the NPFMC,

It has come to our attention that the Council has been presented with new information on the Bering Sea canyons and you may consider initiating a review of this information and its pertinence to management of fisheries operating there. The Elders Group would appreciate the Council taking this step.

The Bering Sea Elders Group is made up of elders from 39 participating tribes from Kuskokwim Bay to the Bering Strait. Our mission is to protect our traditional ways of life and the ocean web of life that supports the resources we rely on, and our children's future. The Bering Sea is one ecosystem and the indigenous peoples throughout the region have the same needs.

Thank you for considering our support for reviewing important information about the Bering Sea canyons.

Sincerely,

David Bill Sr.

David Bill, Sr.
Chair

Alaska's Big Village Network

April 02, 2012

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

RE: D2-Staff Tasking

Dear Chairman Olson and Council Members,

On behalf of Alaska's Big Village Network and along with several million Greenpeace members and supporters, we urge you to review the available science and develop conservation measures protect Pribilof and Zhemchug Canyons on the Bering Sea shelf break.

Submarine canyons are unique marine areas from a global perspective, occurring in only 4% of the world's oceans and containing unique species assemblages. Zhemchug and Pribilof Canyons have the added distinction of being two of the largest canyons in the world, both larger than Arizona's Grand Canyon. In the Bering Sea the canyons provide essential benefits, fueling the highly productive Greenbelt ecoregion by aiding the transport of nutrients up to the continental shelf.

Alaska native communities have relied on this vital Greenbelt zone to sustain their coastal communities for millennia, but today they are seeing their native foods disappear, threatening their culture and way of life. National Standards direct fishery managers to use the best available science, to minimize bycatch, to determine the value of fishing communities, and to reduce adverse impacts on such communities.

Deep sea corals and sponges provide valuable habitat for fishes including shelter and resting places, protection from predators and strong currents, nurseries for young fish, feeding and spawning areas, and also provide breeding areas for a host of other marine life. Trawling reduces the structural complexity and diversity of habitat in the Bering Sea. The Magnuson Stevens Act encourages the conservation and enhancement of essential fish habitat and ecosystem-based management, and requires policy makers to identify coral habitats under their jurisdiction and report to Congress regarding efforts made to protect them.

To date the Council has cited a lack of information to compel conservation of canyon or Greenbelt habitat, and has resolved that the canyons should be a priority for research. New research findings make it clear that the canyons contain high densities of corals and sponges, which provide important habitat for commercially important fish species and other marine life.

We commend the Council for previous actions taken to protect important habitat, such as coral gardens in the Aleutian Islands. Similar measures are needed to protect the vulnerable seafloor habitat in the canyons and the pelagic habitat of the Greenbelt zone. We must ensure the resilience of the dynamic Bering Sea marine system and take steps that give our oceans the best chance of adapting to rapidly changing conditions like climate change and ocean acidification. The Greenbelt is too important, both ecologically and economically, for us not to set aside a portion of this vital ecoregion as a buffer against uncertainty.

We are committed to protecting the environment including safeguarding and restoring the health of our oceans and the invaluable services they provide – from the seafood we eat to the oxygen we breathe. Protecting America's Grand Canyons of the sea will help ensure the sustainability of the Bering Sea fisheries, and the health of the ecosystem which sustains them. We urge you to act now and begin developing new conservation measures for these unique and productive areas.

Sincerely,

Alaska's Big Village Network

My name is Kiersten Lippmann, and I am a biologist with the Center for Biological Diversity here in Anchorage.

This is a critical time for fisheries management in Alaska. The marine environment worldwide is facing serious threats from anthropogenic greenhouse gas emissions and faces 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 (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.

While the Council has little control of global greenhouse gas emissions, it can and should manage fishing activities in order to avoid adverse impacts on Alaska's marine ecosystem. Coral and sponge communities provide crucial habitat for many species. Coral habitats are especially important for juvenile fish, and provide an area for fish and invertebrates to spawn and lay their eggs. The current established protections for coral gardens and seamounts in the Aleutians and Gulf of Alaska are a good first step in recognizing the importance of cold water coral to the marine ecosystem, but there is more work to be done to ensure adequate protections for the majority of cold water coral areas in Alaska. Deep-sea organisms are often long-lived and extremely slow to recover. For the benthic organisms disturbed by fishing activities, recovery times of 50 to 100 years would be at the short end of the time scale (Roberts 2002). As fisheries technology improves, fishers are moving into previously un-trawled areas. I urge the Council to make protection of deep sea coral and sponge communities a priority due to their linkages with and importance to the marine ecosystem.

The loss of deep sea coral and sponge habitat can have devastating impacts on Alaska's fisheries. Alaskan fisheries are still relatively vibrant, but the Council should consider the fate of other fisheries worldwide when making management decisions in order to avoid making the same costly mistakes. Evidence from other formerly productive fisheries shows a strong correlation between loss of coral 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 this cod fishery has 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 & de Groot 1998, Hiddink et al. 2006). Seamounts in the Pacific, where corals have been stripped bare by trawling gear, have turned from rich fishing grounds to deserts, with unfished seamounts having double the benthic biomass and 46 percent 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 stocks, it is critical to prevent initial destruction from fishing activities, rather than attempting to protect coral areas after they have already been devastated by trawling.

The Council's current policy tends highly toward 'freezing' the current trawling footprint in place. This means that over 82,000 kilograms or 181 thousand pounds of coral bycatch continues to be hauled to the surface each year. This number is unsustainable and irreplaceable (Watling and Norse 1999). Many additional corals that are not carried to the surface as bycatch are uprooted, crushed or damaged by fishing gear. Pelagic fishing gear has been found to contact the sea bottom up to 44 percent of the time, with other reports much higher, at over 80 percent. Damaged corals are essentially removed from the ecosystem. Re-colonization of coral communities where corals have been killed and uprooted is on the order of multiple decades to centuries at best, and often will not occur at all due to each coral species' unique habitat requirements, reproductive limitations, and extended life histories. Corals may live hundreds to thousands of years. They are not adapted to disturbance, and have little genetic variation on which to fall back on in the face of disturbance.

Most cold water corals in Alaska are thought to reproduce at a specific time of year, requiring an exchange of genetic material between male and female colonies, with larvae having little ability to self-travel to new habitat, depending instead primarily on favorable currents. These coral areas are expected to suffer great losses due to ocean warming and ocean acidification, further decreasing the number of corals in the gene pool.

The time for protecting corals in the Bering Sea canyons, and throughout Alaska waters is now. I urge the council to make protections of cold water corals in Alaska a priority and initiate a review of existing and new information and begin a process to develop measures to preserve vulnerable coral habitat in the Bering Sea Canyon area.

Thank you.

Citations:

Guinotte, J.M. and V.J. Fabry. 2008. Ocean acidification and its potential effects on marine ecosystems. Ann. N.Y. Acad. Sci 1134:320-342.

Hiddink, J.G. et al. 2006. Cumulative impacts of seabed trawl disturbance on benthic biomass, production, and species richness in different habitats. Can.J. Fish. Aquat. Sci. 63: 721-736.

Mathis, J.T., J.N. Cross, N.R. Bates. 2011. The role of ocean acidification in systemic carbon mineral suppression in the Bering Sea. Geophysical Research Letters DOI: 0.1029/2011GL048884 6pp.

Roberts, C.M. 2002. Deep impact: the rising toll of fishing in the deep sea. TRENDS in Ecology and Evolution 17: 242-245.

Watling, L. and E. A. Norse. 1999. Disturbance of the seabed by mobile fishing gear: A comparison with forest clear-cutting.

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ALASKA INTER-TRIBAL COUNCIL

445 East Fifth Avenue - Anchorage, Alaska 99501

Phone: 907-563-9334 ~ Fax: 907-563-9337

March 20, 2012

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

RE: Protection and Promotion of Zhemchug and Pribilof Submarine Canyons

Dear Chairman Olson and Council Members,

On behalf of our Tribal Communities of Alaska and along with several million Greenpeace members and supporters, we collectively urge you to review the available science and develop conservation measures that protect Pribilof and Zhemchug Canyons on the Bering Sea shelf break.

These Submarine Canyons are unique marine areas from a global perspective, occurring in only 4% of the world's oceans and containing unique species assemblages. Zhemchug and Pribilof Submarine Canyons have the added distinction of being two of the largest Submarine Canyons in the world, both larger than Arizona's Grand Canyon. In the Bering Sea the Zemchug and Pribilof Submarine Canyons provide essential benefits, fueling the highly productive Greenbelt ecoregion by aiding the transport of nutrients up to the continental shelf.

The tribal communities of Alaska have relied on this vital Greenbelt zone to sustain their coastal communities for millennia, but today they are seeing their traditional and cultural foods disappear, threatening our traditions, our cultures and ways of life. At the Annual Convention of Alaska's Tribal Governments in 2006 AI-TC Resolution 2005-05 was adopted to Support an Ecosystem Base Management of the Gulf of Alaska and the Bering Sea, see attached.

National Standards direct fishery managers to use the best available science, to minimize bycatch, to determine the value of fishing communities, and to reduce adverse impacts on such communities.

Deep sea corals and sponges provide valuable habitat for fishes including shelter and resting places, protection from predators and strong currents, nurseries for young fish, feeding and spawning areas, and also provide breeding areas for a host of other marine life.

Trawling reduces the structural complexity and diversity of habitat in the Bering Sea. The Magnuson Stevens Act encourages the conservation and enhancement of essential fish habitat and ecosystem-based management, and requires policy makers to identify coral habitats under their jurisdiction and report to Congress regarding efforts made to protect them.

To date, the Council has cited a lack of information to compel conservation of Submarine Canyons or Greenbelt habitats, and has resolved that the Submarine Canyons should be a priority for research. New research findings make it clear that the Submarine Canyons contain high densities of corals and sponges, which provide important habitat for commercially important fish species and other marine life.

We commend the Council for previous actions taken to protect important habitat, such as Coral Gardens in the Aleutian Islands. Similar measures are needed to protect the vulnerable seafloor habitat in the Submarine Canyons and the pelagic habitat of the Greenbelt zone. We must ensure the resilience of the dynamic Bering Sea marine system and take steps that give our oceans the best chance of adapting to rapidly changing conditions like climate change and ocean acidification. The Greenbelt is too important, both ecologically and economically, for us not to set aside a portion of this vital ecoregion as a buffer against uncertainty.

We are committed to protecting the environment including safeguarding and restoring the health of our oceans and the invaluable services they provide - from the seafood we eat to the oxygen we breathe. Protecting these Grand Submarine Canyons of the Sea will help ensure the sustainability of the Bering Sea fisheries, and the health of the ecosystem which sustains them. We urge you to act now and begin developing new conservation measures for these unique and critically productive Submarine Canyons that have been used and relied on for millenia.

Sincerely,

Alaska Inter-Tribal Council

Delice Calcote

Delice Calcote
Interim Executive Director

Attachment: AI-TC Resolution 2006-05

ALASKA INTER-TRIBAL COUNCIL

Resolution #2006-05

ENTITLED: Ecosystem Base Management of the Gulf of Alaska and Bering Sea.

WHEREAS, The Gulf of Alaska (GOA) and the Bering Sea are currently being exploited by commercial bottom trawl and pelagic trawl fishers at a rate that is degrading the overall health of these waters; and

WHEREAS, Localized depletion in the vicinity of Bering Sea and Gulf of Alaska islands is contributing to the decline of fur seals, sea lions, and sea birds and forcing fishing dependent communities to travel far offshore in search of fish that were once readily available on our coasts; and

WHEREAS, The Pew Oceans Commission in a report to the President of the United States and to Congress (2003) stated: *"Our activities...are altering and threatening the structure and functioning of marine ecosystems from which all marine life springs and upon which all living things, including humans, depend"*; and

WHEREAS, The Pew Oceans Commission further states: "*We have reached a crossroads where the cumulative effect of what we take from, and put into, the ocean substantially reduces the ability of marine ecosystems to produce the economic and ecological goods and services that we desire and need. What we once considered inexhaustible and resilient is, in fact, finite and fragile*"; and

WHEREAS, The U.S. Commission on Ocean Policy, in its Final Report to the President and Congress (2004) stated: *"U.S. ocean and coastal resources should be managed to reflect the relationships among all ecosystem components, including humans and nonhuman species and the environments in which they live"*; and

WHEREAS, The industrialization of fishing has been responsible for sweeping changes in ocean ecosystems, causing the collapse of many fish populations and the fishing communities that depend on them; and

WHEREAS, The impacts of overfishing are compounded by many other serious threats to our oceans, including climate change, toxic pollution and the destruction of coastal habitats; and

WHEREAS, The Joint Ocean Commission Initiative, in its U.S. Ocean Policy Report Card of February 2006, issued our nation's administration, governors and legislature a 'D+' for ocean policy; and

WHEREAS, The Joint Ocean Commission Initiative highlighted the urgent need for a shift to ecosystem-based management (EBM) and the establishment of a network of fully protected marine reserves; and

WHEREAS, Congress, in 1996, adopted amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) which, among other things, tasked National Marine Fisheries Services (NMFS) with convening a panel to develop recommendations "to expand the application of ecosystem principles in fishery conservation and management activities"; and

WHEREAS, The report to Congress of the Ecosystem Principals Advisory Panel recommended an ecosystem-based management approach for fisheries and identified a broad fishery conservation and management goal of maintaining the health and sustainability of exploited ecosystems; and

WHEREAS, The North Pacific Fishery Management Council has yet to fully implement these measures; and

WHEREAS, The United States Congress is preparing, for the first time in 10 years, to reauthorize the Magnuson-Stevens Fisheries and Conservation Act (MSA), the law that governs federal fisheries, and consider what changes in the national law are needed for the future; and

WHEREAS, This reauthorization follows many clarion calls for major reforms of fisheries management, national ocean policy, and governance in recent national panel reports, all of which have called a more holistic, ecosystem-based approach to fisheries management; and

WHEREAS, The U.S. territorial seas and exclusive economic zone (EEZ) off Alaska's 33,000-mile coastline encompasses an area twice the size of the combined East and West Coast EEZs and include some of the most productive marine ecosystems in the world; and

WHEREAS, These ecosystems have historically supported some of the largest assemblages of marine mammals and sea birds on Earth, and – since the 1960's – an enormous fishery for bottom-tending "groundfish," dominated by Alaska Pollock; and

WHEREAS, The biggest source of this bounty is the extensive continental shelf in the eastern Bering Sea, accounting for roughly half the marine fish and shell fish caught in the entire United States annually; and

WHEREAS, There are over 64 villages on the Bering Sea Coast alone, and many more on the coast of the Gulf of Alaska, that are totally dependent on the health of these waters for subsistence and commercial small boat fisheries, marine birds and mammals for foods, and local economic, spiritual and cultural needs; and

WHEREAS, Many of our coastal villages are suffering great hardships due to over-fishing in near shore waters near our homes, further compounding the devastating effects of global climate change.

NOW, THEREFORE BE IT RESOLVED: that AI-TC does hereby...by the delegates to the December, 2006 meeting of the Alaska Inter-Tribal Council that we call upon the North Pacific Fishery Management Council to take the following actions:

1. Protect the rights and livelihoods of fishing-dependent communities and fish-eating predators by prioritizing efforts to reverse localized depletion; and
2. Utilize time and area closures and more precautionary catch limits to ensure that fishery removals do not jeopardize fishing-dependent communities or recovery of marine populations; and
3. Immediately adopt NMFS recommendations to establish experimental closures to improve our understanding of the changes taking place in the Bering Sea and Gulf of Alaska; and
4. Expand protections to sensitive habitats and communities by establishing Alaska Native Marine Cultural Heritage Zones, which would prevent trawling within twenty miles of Alaskan islands and coasts; and
5. Commit to implementing the draft fishery ecosystem plan for the Aleutian Islands and being development of a similar plan to be implemented for the Bering Sea ecosystem.

NOW, THEREFORE BE IT FURTHER RESOLVED: that this resolution shall be the policy of AI-TC until it is withdrawn or modified by subsequent resolution.

CERTIFICATION

The foregoing resolution was adopted at the 2006 Annual Convention of the Alaska Inter-Tribal Council, held at the Millennium Alaskan Hotel, in Anchorage, Alaska on December 19, 2006 with a quorum present.

ATTEST:

Olga M. Malutin

Sponsored by: Curyung Tribe

Ian Erlich, Chair

Testimony of Mark H. Gleason
Executive Director, Alaska Bering Sea Crabbers
North Pacific Fishery Management Council
March/April 2012 Meeting
Agenda Item D-2, Staff Tasking
April 3, 2012

Good morning Chairman Olsen and members of the Council. My name is Mark Gleason. I'm here testifying today on behalf of the Alaska Bering Sea Crabbers. We appreciate the opportunity to testify on agenda item D-2, Staff Tasking.

As you all know, during the December 2011 meeting the Council took action on agenda item C-4(a), "Active participation, entry opportunities, crew compensation, and lease rates. " As part of its action, the Council adopted the following problem statement:

"The Bering Sea/Aleutian Islands (BSAI) Crab Rationalization Program is a comprehensive approach to rationalize an overcapitalized fishery. Conservation, safety, and efficiency goals have largely been met under the program. Provisions that allow for absentee ownership of crab harvest shares support long-term investment by persons or corporations with little or no involvement in the prosecution of the fisheries and limit the amount of quota available for active participants. This action is intended to ensure that ownership of quota transitions to persons who are actively involved in the prosecution of the fisheries."

In addition, the Council requested staff to analyze an alternative that would describe active participation eligibility criteria for the purposes of purchasing and/or retaining Catcher Vessel Owner (CVO) shares or Catcher/Processor Owner (CPO) shares. To be considered active, this alternative would require an individual to hold a 5, 10, or 20% ownership stake in a vessel that has participated in a rationalized BSAI crab fishery in any of the previous 2 to 4 seasons, OR that individual would have to provide documentation of participation as a captain or crew in a rationalized crab fishery for at least 1, 2, or 4 fishing trips in a rationalized BSAI crab fishery in any of the 3 or 4 previous seasons. These eligibility criteria would also apply to an individual that is at least a 10, 20, or 33% share holder when the QS is held by a partnership or corporation.

If you will recall, the Alaska Bering Sea Crabbers also made a lengthy proposal to the Council at the December 2011 meeting. In our proposal, we include a Right of First Offer (RoFO) provision that we feel would help to facilitate the transfer of CVO and CPO shares to active captains and crew. Within that proposal, we also had a set of eligibility criteria that would define active participants as well as crew. To briefly recap, our definition would define an "active fisherman" as a person that either holds a direct or indirect ownership interest in a Commercial Fishing Vessel as of a specified date and is able to provide documentation backing such a claim, OR the individual must be a crewmember. A "crewmember" would be defined according to the C share participation requirements as of the Record Date and who did not receive either CVO or CPO at initial allocation. We define a "Commercial Fishing Vessel" as a vessel (not less than twenty nine (29) feet in length) that has been employed in commercial fishing in Alaska State waters or in Federal waters off Alaska during the twelve (12) month period prior to the Annual Record date. This definition would also include vessels that have been employed in support of commercial fishing as a tender or as a research vessel.

In order to implement the RoFO provision, we would have to make changes to the ICE membership agreement. The change would require that if any member of ICE wished to sell a portion of his/her quota, they must announce the terms up front. They must then make the first 10% available to crew, under those terms. Crew would then have fifteen (15) days to exercise this Right, under the original terms of offer. At the expiration of this initial period, the remaining 90% of the quota (plus whatever was left over from the original 10% offered to crew) would be offered to active participants, including crew. These active participants and crew would then have an additional five (5) days to exercise this Right. If no sale occurs during the initial offering period, the quota could then be offered more broadly under the original terms of sale. If for any reason the terms of sale were to change, this would trigger re-initiation of the RoFO process. ICE would ensure compliance with this RoFO provision through internal mechanisms such as liquidated damages and possible expulsion from ICE.

Informal discussions with a number of Council members seem to indicate this RoFO proposal has significant potential in terms of meeting the Councils intent to facilitate the transfer of quota to crew and active participants. We are concerned that the Council's motion has a number of loopholes and potential unintended consequences, not to mention significant costs in terms of enforcement. As such, we would thereby request the Council include a discussion of the RoFO provision in the analytical package that will come before the Council during the December 2012 meeting. I have attached the RoFO provision to the testimony that Maria is passing out. We appreciate your willingness to listen to our request and we stand willing to assist Council staff as they develop the analysis over the next 7 months. Thank you.

BERING SEA CRAB QUOTA SHARE

RIGHT OF FIRST OFFER AGREEMENT

This BERING SEA CRAB QUOTA SHARE RIGHT OF FIRST OFFER AGREEMENT is entered into by and among INTER-COOPERATIVE EXCHANGE, a Washington Fish Marketing Act corporation ("ICE"), and its members (each, a "Member" and collectively the "Members") as of ________________, 2011 with respect to the following facts.

A. The Members hold certain Bering Sea crab quota shares ("QS") issued under the Bering Sea Crab Rationalization program implemented by National Marine Fisheries Service regulations at 50 C.F.R. 680 et seq. (the "Crab Rationalization Program").

B. The Members wish to promote QS ownership among Bering Sea crab vessel crew members and persons who are actively engaged in commercial fishing in Alaska.

Now, therefore, the parties agree as follows:

1. Definitions. For purposes of this Agreement, the following terms shall have the following meanings.

1.1 "Active Fisherman" means a person that either: (i) holds a direct or indirect ownership interest in a Commercial Fishing Vessel as of the Annual Record Date, provides ICE or its agent with the information and documents that ICE requests as evidence of such ownership interest, and is named on the "Active Fisherman" list that ICE maintains; or (ii) is a Crab Crewmember.

1.2 "Annual Record Date" means the annual date selected and announced as such by the ICE Board of Directors from time to time.

1.3 "Commercial Fishing Vessel" means a vessel [option - not less than twenty-nine feet in length overall] that has been employed in commercial fishing in Alaska state waters or in the Federal Fishery Conservation Zone off Alaska during the twelve (12) month period prior to the Annual Record Date. For purposes of this definition, a vessel that is employed in support of commercial fishing as a tender or research vessel shall be considered a Commercial Fishing Vessel.

1.4 "Crab Crewmember" means an individual whom (i) meets the Crab Rationalization Program "C" share recent participation requirements as of the Record Date, as the same may be amended from time to time; (ii) did not receive catcher vessel owner ("CVO") or catcher processor owner ("CPO") QS at initial allocation; and (iii) is named on the Crab Crewmember list that ICE maintains.

1.5 "Person" means an individual, corporation, partnership, limited liability company or other form of business entity

2. Restrictions on Transfer. No Member shall sell any portion of his, her or its QS other than in strict compliance with the terms of this Agreement. Any sale of QS by a Member that is not made in strict compliance with the provisions of this Agreement shall be a material breach of this Agreement. For purposes of this Agreement, selling an ownership interest in an entity that holds QS and does not hold an interest in a Commercial Fishing Vessel shall be considered a QS sale, and an amount of the QS held by the entity proportionate to the ownership interest being transferred shall be subject to the rights of first offer set forth herein.

3. Sales to Crab Crewmembers. A Member may sell some or all of such Member's QS directly to one or more Crab Crewmembers on such terms as the Member and the purchasing Crab Crewmember(s) may agree. Such sales shall not be subject to the rights of first offer granted under this Agreement.

4. Rights of First Offer. A Member who wishes to sell some or all of his, her or its QS to a person who is not a Crab Crewmember (a "Selling Member") may only do so in strict compliance with the procedure set forth in this Section 4, unless the transaction is exempt from the Crab Crewmember and Active Fisherman right of first offer pursuant to Section 5, below.

4.1 Before offering QS for sale to a person who is not a Crab Crewmember, the Selling Member shall notify ICE of the amount of QS offered for sale (the "Offered QS"), and the associated sale terms (the "Offer Terms").

4.2 Upon receiving notice from a Selling Member, ICE shall notify the Crab Crewmembers that ten percent (10%) of the Offered QS is available for purchase on the Offer Terms (such 10% being the "Crew Offer QS"). Each Crab Crewmember shall have fifteen (15) days from receiving such notice during which he or she may irrevocably agree to purchase some or all of the Crew Offer QS on the Offer Terms. If the Crab Crewmember(s) agreeing to purchase Crew Offer QS (the "Purchasing Crewmembers") collectively agree to purchase an amount of QS in excess of the Crew Offer QS, ICE shall allocate the right to purchase Crew Offer QS among the Purchasing Crewmembers pro rata, according to the amount of the Crew Offer QS each of them has agreed to purchase.

4.3 Upon expiration of the 15 day Crab Crewmember offer period, ICE shall determine the amount of the Offered QS available for purchase, net of the amount that Crab Crewmembers have agreed to purchase (such remaining amount being the "Fisherman Offer QS"). The Selling Member may sell the Fisherman Offer QS to one or more Active Fishermen on such terms as the Selling Member and the Active Fishermen may agree. If the Selling Member wishes to sell some or all of the Fisherman Offer QS to one or more persons who are not Active Fishermen, the Selling Member shall first notify ICE, and ICE shall notify the Active Fishermen of the amount of Fisherman Offer QS that the Selling Member proposes to sell to persons other than Active Fishermen (the "Third Party QS") and the Offer Terms on which the Third Party QS can be purchased. The Active Fishermen shall have five (5) days during which one or more of them may agree to purchase some or all of the Third Party QS on the Offer Terms. If the

Active Fishermen agreeing to purchase Third Party QS (the "Purchasing Fishermen") collectively agree to purchase an amount of QS in excess of the Third Party QS, ICE shall allocate the right to purchase the Third Party QS among the Purchasing Fishermen pro rata, according to the amount each of them has agreed to receive. [Deposit required?]

4.4 Upon expiration of the 5 day Active Fisherman offer period, ICE shall determine the amount of the Offered QS that the Crab Crewmembers and the Active Fishermen have agreed to purchase on the Offer Terms, and shall notify the Selling Member. The Selling Member shall then have the right to offer the balance of the Offered QS in excess of the amount that the Crab Crewmembers and Active Fishermen have agreed to purchase (the "Marketable QS") for sale to persons other than the Crab Crewmembers and Active Fishermen (the "Third Parties") on terms no more favorable to the Third Parties than the Offer Terms for a period of one hundred eighty (180) days (the "Market Period").

4.5 If a Selling Member accepts an offer during the Market Period from one or more Third Parties to purchase some or all of the Marketable QS on terms no more favorable to the Third Parties than the Offer Terms (an "Accepted Offer"), the Selling Member shall notify ICE of the Accepted Offer and the proposed closing date for the related transaction, which shall not be earlier than twelve (12) business days from the date of such notice. Within two (2) business days of receiving such notice, ICE shall notify the Purchasing Crewmembers and the Purchasing Fishermen of the Accepted Offer and proposed closing date. Within ten (10) days of receiving such notice from ICE, each Purchasing Crewmember and Purchasing Fisherman shall deposit their share of any cash to be paid to the Selling Member at closing into escrow as directed by ICE, and shall execute and deliver into escrow as ICE directs any financial instruments and other documents consistent with the Offer Terms.

4.6 If the Selling Member transfers QS to one or more Third Parties in accordance with the Accepted Offer, the Selling Member shall notify ICE, and ICE shall notify the Purchasing Crewmembers, Purchasing Fishermen and direct the escrow agent with whom their funds and documents have been deposited to proceed with closing of the QS transfers from the Selling Member to the Purchasing Crewmembers and Purchasing Fishermen.

4.7 If the Selling Member does not transfer any of the Offered QS to a Third Party within the Market Period, the Transferring Member shall not offer any QS for sale unless and until the Selling Member has repeated the first offer procedure set forth in Sections 4.1 through 4.3, above.

5. Transactions Exempted from Right of First Offer. Notwithstanding the foregoing, the following QS sales shall not be subject to the rights of first offer in favor of Crab Crewmembers or Active Fishermen described above.

5.1 QS sales made in connection with a foreclosure of a security interest or pursuant to a court order.

5.2 QS sales made in connection with the sale of a Bering Sea or Aleutian Islands crab fishing vessel, or as part of the sale of an entire commercial fishing business.

5.3 QS transfers or sales between affiliated business entities. For purposes of this provision business entities in which the same person holds a ten percent (10%) or greater voting interest or ownership interest are affiliated.

5.4 Notwithstanding the provisions of Section 2 to the contrary, transfers of a direct or indirect ownership interest in a business entity between or among existing owners.

6. <u>Termination of Crab Crewmember and Active Fisherman Rights for Failure to Perform</u>. In consideration for the benefits extended to Crab Crewmembers and Active Fishermen under this Agreement, each of them shall have an obligation of strict performance in connection with the closing and purchase of any QS they agree to take under the right of first offer that is extended to them under this Agreement. ICE reserves the right in its sole discretion to permanently remove a person from the Crab Crewmember and/or Active Fisherman list maintained by ICE in response to any single breach by such person of their obligations under this Agreement.

7. <u>Breach by a Member</u>. A Member's breach of this Agreement shall constitute a material breach of the ICE Membership Agreement. Because the damages associated with a breach of this Agreement are not possible to quantify, a Member in breach shall be liable for such liquidated damages as the ICE Board of Directors adopts and announces to the Members from time to time, provided no such liquidated damages shall take effect until the next ICE membership period following their adoption and announcement. In addition to imposing liquidated damages in connection with a breach of this Agreement, the ICE Board of Directors may in its sole discretion revoke the ICE membership of a Member who breaches this Agreement.

8. <u>Assignment</u>. The rights granted to Crab Crewmembers and Active Fishermen under this Agreement are personal, and may not be assigned. Any purported assignment of such rights shall be void. ICE may assign any or all of its rights and obligations under this Agreement to such persons as ICE selects in its sole discretion.