



Alaska Responsible Fishery Management Certification

3rd Surveillance Report

For The

**U.S. Alaska Bering Sea and Aleutian Islands King, Tanner and Snow Crab
Commercial Fisheries**

Facilitated by

Alaska Seafood Marketing Institute (ASMI)

And

Bering Sea Crab Client Group LLC

Assessors: Dr. Ivan Mateo, Lead Assessor
Dr. Wesley Toller, Assessor

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SAI Global
3rd Floor, Block 3,
Quayside Business Park,
Mill Street, Dundalk,
Co. Louth, Ireland.
T: + 353 42 932 0912
www.saiglobal.com



Foreword

The Alaska Responsible Fisheries Management (RFM) Standard Version 1.3 is composed of Conformance Criteria and is based on the 1995 FAO Code of Conduct for Responsible Fisheries and the FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries adopted in 2005 and amended/extended in 2009. The Standard also includes full reference to the 2011 FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Inland Fisheries which in turn are now supported by a suite of guidelines and support documents published by the UN FAO.

Further information on the Alaska RFM program may be found here:

<https://www.alaskaseafood.org/rfm-certification/certified-fisheries/>

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Glossary

AAC	Alaska Administrative Code
ABC	Allowable Biological Catch
ADFG	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
ASMI	Alaska Seafood Marketing Institute
BOF	Board of Fisheries
BSAI	Bering Sea and Aleutian Islands
BSFRF	Bering Sea Fisheries Research Foundation
CCRF	Code of Conduct for Responsible Fisheries
CDQ	Community Development Quota
CFEC	Commercial Fisheries Entry Commission
CFR	Code of Federal Regulations
CPT	Crab Plan Team
CPUE	Catch per Unit Effort
EIS	Environmental Impact Statement
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESP	Ecosystem and Socioeconomic Profile
FAO	Food and Agriculture Organization of the United Nations
FEP	Fishery Ecosystem Plan
FMP	Fishery Management Plan
GOA	Gulf of Alaska
GHL	Guideline Harvest Level
IFQ	Individual Fishing Quota
IPHC	International Pacific Halibut Commission
IRFA	Initial Regulatory Flexibility Analysis
IRIU	Improved Retention/Improved Utilization
LLP	License Limitation Program
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fisheries Management and Conservation Act
MSE	Management Strategy Evaluation
mt	Metric tons
MSY	Maximum Sustainable Yield
NC	Non-conformity
NEPA	National Environmental Policy Act
nm	Nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOV	Notice of Violation
NPFMC	North Pacific Fishery Management Council
OFL	Overfishing Level
OLE	Office for Law Enforcement
OY	Optimum Yield

PSC	Prohibited Species Catch
RACE	Resource Assessment and Conservation Engineering
REFM	Resource Ecology and Fisheries Management
RFM	Responsible Fisheries Management
SAFE	Stock Assessment and Fishery Evaluation (Report)
SSC	Scientific and Statistical Committee
SSL	Steller Sea Lion
TAC	Total Allowable Catch
USCG	U.S. Coast Guard

Summary and Recommendations

This is the 3rd Surveillance Report (ref AK/CRA/003.2/2019) for the U.S. Alaska Bering Sea and Aleutian Islands King, Snow crab and Tanner commercial fisheries produced on behalf of the Bering Sea Crab Client Group according to the Alaska Based Responsible Fisheries Management (RFM) Certification Program. The Bristol Bay Red King crab (*Paralithodes camtschaticus*), St. Matthew Island Blue King crab (*Paralithodes platypus*) and Eastern Bering Sea Snow crab (*Chionoecetes opilio*) commercial fisheries were originally certified on 16th of April 2012. More recently on December 7th 2017, the Eastern Bering Sea Tanner Crab (*Chionoecetes bairdi*) and Aleutian Islands Golden King Crab (*Lithodes aequispinus*) fisheries were certified.

The objective of this Surveillance Report is to monitor for, and evaluate the impacts of, any changes to the management regime, regulations and their implementation since the previous assessment. Having assessed these changes to the fishery (if any) the Assessment Team determines if these changes materially affect the fisheries' conformance to the AKRFM Standard and whether current practices remain consistent with the overall confidence ratings assigned during either initial certification or subsequent surveillance audits where the original confidence rating(s) have been changed.

In addition to this, any areas reported as "items for surveillance" or corrective action plans in the previous assessment are reassessed and a new conclusion on consistency of these items with the Conformance Criteria is given accordingly. No non-conformances were identified since certification was granted.

The certification covers the U.S. Alaska Bering Sea and Aleutian Islands King, Tanner, and Snow crab commercial fisheries [Bristol Bay Red King crab (*Paralithodes camtschaticus*), St. Matthew Island Blue King crab (*Paralithodes platypus*), Eastern Bering Sea Tanner Crab (*Chionoecetes bairdi*), Aleutian Islands Golden King Crab (*Lithodes aequispinus*), and Eastern Bering Sea Snow crab (*Chionoecetes opilio*)] legally employing pot gear within Alaska jurisdiction (200 nautical miles EEZ) and subject to a federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] joint management regime.

The surveillance assessment was conducted according to the Global Trust Certification procedures for Alaska Responsible Fisheries Management Certification using the FAO – Based RFM Conformance Criteria (v1.3) fundamental clauses as the assessment framework.

The assessment was conducted by an Assessment Team comprised of two externally contracted fishery experts and SAI Global internal staff; details of the assessment team are provided in Appendix 1.

The main Key outcomes have been summarized in Section 5 "[Assessment Outcome Summary](#)".

Assessment Team Details

Dr. Ivan Mateo, Lead Assessor

SAI Global/Global Trust Certification Ltd.
Quayside Business Centre,
Dundalk, Co. Louth, Ireland.
Email: ivan.mateo@saiglobal.com

Dr. Wes Toller, Assessor

Independent fishery expert
Seattle, U.S.A.
Email: wesleytoller@gmail.com

Elaine O'Donoughe, Program Administrator

SAI Global
Quayside Business Centre,
Dundalk, Co. Louth, Ireland.
Email: Elaine.O'Donoghue@saiglobal.com

1. Introduction

This Surveillance Report documents the 3rd Surveillance Assessment of the U.S. Alaska Bering Sea and Aleutian Islands King and Snow crab commercial fisheries originally certified on 16th of April 2012, and the Eastern Bering Sea Tanner Crab and Aleutian Islands Golden King Crab fisheries that were recently certified on December 7th 2017, and presents the recommendation of the Assessment Team for continued FAO-Based RFM Certification.

Unit of Certification

The U.S. Alaska Bering Sea and Aleutian Islands King, Tanner, and Snow crab commercial fisheries [Bristol Bay Red King crab (*Paralithodes camtschaticus*), St. Matthew Island Blue King crab (*Paralithodes platypus*), Eastern Bering Sea Tanner Crab (*Chionoecetes bairdi*), Aleutian Islands Golden King Crab (*Lithodes aequispinus*), and Eastern Bering Sea Snow crab (*Chionoecetes opilio*)] legally employing pot gear within Alaska jurisdiction (200 nautical miles EEZ) and subject to a federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] joint management regime. The UoCs are as described in Table 2.

This Surveillance Report documents the assessment results for the continued certification of the above fisheries to the Alaska RFM Certification Program. This is a voluntary program that has been supported by ASMI who wish to provide an independent, third-party certification that can be used to verify that these fisheries are responsibly managed.

The assessment was conducted according to the Global Trust procedures for Alaska RFM Certification using the fundamental clauses of the Alaska RFM Conformance Criteria Version 1.3 (November 2015) in accordance with ISO 17065 accredited certification procedures.

The assessment is based on 6 major components of responsible management derived from the FAO Code of Conduct for Responsible Fisheries (1995) and Guidelines for the Eco-labelling of products from marine capture fisheries (2009); including:

- A. [The Fisheries Management System](#)
- B. [Science and Stock Assessment Activities](#)
- C. [The Precautionary Approach](#)
- D. [Management Measures](#)
- E. [Implementation, Monitoring and Control](#)
- F. [Serious Impacts of the Fishery on the Ecosystem](#)

These six major components are supported by 12 fundamental clauses (+ 1 in case of enhanced fisheries) that guide the AK RFM Certification Program surveillance assessment.

A summary of the site meetings is presented in Section 5. Assessors included both externally contracted fishery experts and SAI Global internal staff (Appendix 1).

1.1. Recommendation of the Assessment Team

Following this 3rd Surveillance Assessment, the assessment team recommends that continued Certification under the Alaska Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fisheries, the U.S. Alaska Bering Sea and Aleutian Islands King, Tanner, and Snow crab commercial fisheries [Bristol Bay Red King crab (*Paralithodes camtschaticus*), St. Matthew Island Blue King crab (*Paralithodes platypus*), Eastern Bering Sea Tanner Crab (*Chionoecetes bairdi*), Aleutian Islands Golden King Crab (*Lithodes aequispinus*), and Eastern Bering Sea Snow crab (*Chionoecetes opilio*)] legally employing pot gear within Alaska jurisdiction (200 nautical miles EEZ) and subject to a federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] joint management regime.

2. Fishery Applicant Details

Table 1. Fishery applicant details.

Organisation/Company Name:	Bering Sea Crab Client Group LLC
Date:	2/1/2020
Correspondence Address:	
Street:	23929 22ND Drive, SE, Bothell
City:	Seattle
Country:	United States of America
Postal Code:	98199
Phone:	(425) 486 8173
Web:	
E-mail Address	sgoodman@nrccorp.com

3. Unit(s) of Assessment and Certification

The applicant Units of Assessment (UoA) (i.e., what is to be assessed) are described by the following:

Table 2. Units of Assessment (UoAs).

Unit of Assessment (UoA)/Unit of Certification (UoC)					
Species:	Common name:	1	Red King crab	Stock:	Bristol Bay
	Latin name:		Paralithodes camtschaticus		
	Common name:	2	Blue King crab		St. Matthew Island
	Latin name:		Paralithodes platypus		
	Common name:	3	Golden King Crab		Aleutian Islands
	Latin name:		Lithodes aequispinus		
	Common name:	4	Snow crab		Eastern Bering Sea
	Latin name:		Chionoecetes opilio		
Common name:	5	Tanner Crab	Eastern Bering Sea		
Latin name:		Chionoecetes bairdi			
Geographical Area(s)		1	U.S. Federal and State fisheries within the Bering Sea & Aleutian Islands.		
Management System		3	U.S. Federal and State fisheries within the Bering Sea & Aleutian Islands managed by: - NOAA Alaska Regional Office or National Marine Fisheries Service (NMFS) - North Pacific Fishery Management Council (NPFMC) - Alaska Department of Fish and Game (ADFG) and Board of Fisheries (BOF)		
Fishing gear(s)		4	Trap Gear (Baited pots)		

The applicant Unit of Certification (UoC) (i.e., what is to following be covered by the certificate if all Units of Assessment listed above meet the required standard) is described by the:

Table 3. Unit of Certification.

Unit of Assessment (UoA)/Unit of Certification (UoC)					
Species:	Common name:	1	Red King crab	Stock:	Bristol Bay
	Latin name:		Paralithodes camtschaticus		
	Common name:	2	Blue King crab		St. Matthew Island
	Latin name:		Paralithodes platypus		
	Common name:	3	Golden King Crab		Aleutian Islands
	Latin name:		Lithodes aequispinus		
	Common name:	4	Snow crab		Eastern Bering Sea
	Latin name:		Chionoecetes opilio		
	Common name:	5	Tanner Crab		Eastern Bering Sea
	Latin name:		Chionoecetes bairdi		
Geographical Area(s)		1	U.S. Federal and State fisheries within the Bering Sea & Aleutian Islands.		
Management System		3	U.S. Federal and State fisheries within the Bering Sea & Aleutian Islands managed by: - NOAA Alaska Regional Office or National Marine Fisheries Service (NMFS) - North Pacific Fishery Management Council (NPFMC) - Alaska Department of Fish and Game (ADFG) and Board of Fisheries (BOF)		
Fishing gear(s)		4	Trap Gear (Baited pots)		

4. Fishery Observations

4.1. Stock status, landings and TAC update

4.1.1. Eastern Bering Sea Snow Crab

Stock Status

Fishery information relative to OFL setting¹

Total catch mortality in 2018/19 was 15,400 t (with discard mortality rates applied), while the retained catch in the directed fishery was 12,510 t (Table 4). Because the total catch mortality for this stock was below the 2018/19 OFL of 29,700 t, **overfishing did not occur**. Snow crab bycatch occurs in the directed fishery in the groundfish trawl fisheries. Estimates of trawl bycatch in recent years are less than 1% of the total snow crab catch.

Tier determination/Plan Team discussion and resulting OFL and ABC determination

EBS snow crab is a Tier 3 stock. OFL was determined by the F_{OFL} control rule using $F_{35\%}$ as the proxy for F_{MSY} . The proxy for B_{MSY} ($B_{35\%}$) is the mature male biomass at mating (126.1 kt) based on average recruitment over 1982 to 2018. Consequently, the minimum stock size threshold (MSST) is 63.0 kt. Projected MMB for 2019/20 (167.3) is above the MSST, so **the stock is not overfished**. The CPT recommended that the ABC should be less than maximum permissible ABC. The CPT recommended continuing the buffer of 20% used for the 2017 and 2018 assessments for setting the 2019/20 ABC. This level of buffer is justified given the continuing concerns about model misspecification (growth) and parameter confounding, the ongoing evidence for retrospective patterns, and the uncertainty surrounding rates of natural mortality

Table 4. Historical status and catch specifications for Snow Crab (thousand t). Shaded values are new estimates or projections based on the current assessment. Other table entries are based on historical assessments and are not updated except for total and retained catch.

Year	MSST	Biomass (MMB)	TAC	Retained Catch	Total Catch	OFL	ABC
2015/16	75.8	91.6	18.4	18.4	21.4	83.1	62.3
2016/17	75.8	96.1	9.7	9.7	11.0	23.7	21.3
2017/18	71.4	99.6	8.6	8.6	10.5	28.4	22.7
2018/19	63.0	123.1	12.5	12.5	15.4	29.7	23.8
2019/20		167.3				54.9	43.9

4.1.2. Bristol Bay Red King Crab

Stock Status

Fishery information relative to OFL setting²

The commercial harvest of Bristol Bay red king crab (BBRKC) dates to the 1930s. The fishery was initially prosecuted mostly by foreign fleets but shifted to a largely domestic fishery in the early 1970s. Retained catch peaked in 1980 at 58.9 kt but harvests dropped sharply in the early 1980s, and population abundance has remained at relatively low levels over the last two decades compared to those seen in the 1970s. The fishery is managed for a total allowable catch (TAC) coupled with restrictions for sex (males only), a minimum size for legal retention (6.5-in carapace width; 135-mm carapace length is used a proxy for 6.5-in carapace width in the assessment), and season (no fishing during mating/molting periods). In addition to the retained catch that occurs during the commercial fishery, which is limited by the TAC, there is also retained catch that occurs in the ADF&G cost-recovery fishery.

¹ <https://www.npfmc.org/fishery-management-plan-team/bsai-crab-plan-team/#currentcrab>

² <https://www.npfmc.org/fishery-management-plan-team/bsai-crab-plan-team/#currentcrab>

The current SOA harvest strategy allows a maximum harvest rate of 15% of mature-sized (≥ 120 mm CL) males, but also incorporates a maximum harvest rate of 50% of legal males and a threshold of 8.4 million mature-sized (≥ 90 mm CL) females and 6.6 kt of effective spawning biomass (ESB), to prosecute a fishery. Annual non-retained catch of female and sublegal male RKC during the fishery averaged less than 8.6 kt since data collection began in 1990. Total catch (retained and bycatch mortality) increased from 7.6 kt in 2004/05 to 10.6 kt in 2007/08 but has decreased since then; retained catch in 2018/19 was 2.03 kt and total catch mortality was 2.65 kt (Table 5). Because the total catch mortality for this stock was below the 2018/19 OFL of 5.34 kt, **overfishing did not** occur.

Tier determination/Plan Team discussion and resulting OFL and ABC determination

Bristol Bay red king crab is in Tier 3. Based on the author's discussion regarding an apparent reduction in stock productivity associated with the 1976/77 climate regime shift in the EBS, the CPT recommends computing average recruitment as has been done in recent assessments (i.e., based on model recruitment using the time period 1984 and corresponding to fertilization in 1977) to the penultimate year of the assessment. Following discussions at the January and May 2018 CPT meetings, the CPT concurred with the author's recommendation to drop the terminal year recruitment from the time period for average recruitment because it is highly uncertain. The estimated $B_{35\%}$ is 21.2 kt. MMB projected for 2019/20 is 15.96 kt, 75% of $B_{35\%}$. Consequently, the BBRKC stock is in Tier 3b in 2019/20.

The CPT recommended that the OFL for 2019/20 be set according to model scenario 19.0, for which the calculated OFL is 3.40 kt. Given the inability of the model to adequately fit the last two years (2018 and 2019) survey biomasses, the team recommended that the ABC for 2019/20 be set below the maximum permissible ABC. The team recommended that a 20% buffer from the OFL be used to set the ABC at 2.72 kt. This buffer is consistent with 2018 CPT recommendations, which were based on the rather unusual environmental conditions in the EBS the last two years (e.g., elevated bottom temperatures, lack of a cold pool) and the model's poor fit to the 2018 and 2019 survey data increase the uncertainty associated with this stock and warrant additional precaution.

MMB for 2018/19 was estimated to be 16.92 kt and above MSST (10.62 kt); hence **the stock was not overfished** in 2018/19. The stock at 2019/20 time of mating is projected to be above the MSST and 75% of $B_{35\%}$ hence the stock is not **approaching an overfished condition** in 2019/20.

Table 5. Historical status and catch specifications for Bristol Bay Red King Crab (thousand t). Shaded values are new estimates or projections based on the current assessment. Other table entries are based on historical assessments and are not updated except for total and retained catch.

Year	MSST	Biomass (MMB)	TAC	Retained Catch	Total Catch	OFL	ABC
2015/16	12.89	27.68	4.52	4.61	5.34	6.73	6.06
2016/17	12.53	25.81	3.84	3.92	4.28	6.64	5.97
2017/18	12.74	24.86	2.99	3.09	3.48	5.60	5.04
2018/19	10.62	16.92				5.34	4.27
2019/20		15.96				3.40	2.72

4.1.3. Eastern Bering Sea Tanner Crab

Stock Status

Fishery information relative to OFL setting

Eastern Bering Sea (EBS) Tanner crab are caught in directed Tanner crab fisheries, as bycatch in the groundfish and scallop fisheries, as bycatch in the directed Tanner crab fishery (mainly as non-retained females and sublegal males), and other crab fisheries (notably, eastern Bering Sea snow crab and, to a lesser extent, Bristol Bay red king crab). A single OFL is set for Tanner crab in the EBS. Under the Crab Rationalization Program, ADF&G sets separate TACs for directed fisheries east and west of 166° W longitude. The mature male biomass was estimated to be below the Minimum Stock Size Threshold (0.5BMSY) in February 2010 (the assumed time of mating) based on trends in mature male biomass from the survey, and NMFS declared the stock overfished in September 2010. The directed fishery was closed from 2010/11 through 2012/13 crab fishery years.

NMFS determined the stock was rebuilt in 2012 based on a new assessment model with a revised estimate of BMSY. The directed fishery was open for the 2013/14 to 2015/16 seasons with a total allowable catch (TAC) of 1,410 t in 2013/14, 6,850 t in 2014/15, and 8,920 t in 2015/16. The total retained catch in 2015/16 (8,910 t) was the largest taken in the fishery since 1992/93. In 2016/17, ADF&G determined that mature female biomass did not meet the criteria for opening a fishery according to the regulatory harvest strategy, and the TAC was set at zero. Consequently, there was no directed harvest in 2016/17. In 2017/18, ADF&G determined that a directed fishery could occur in the area west of 166°W longitude. The TAC was set at 1,110 t for 2018/19, of which 100% was taken (Table 6).

OFL and ABC determination

The CPT recommended the OFL for this stock be based on the Tier 3 control rule. Application of the Tier 3 control rule requires a set of years for defining average recruitment corresponding to BMSY under prevailing environmental conditions. This recommended time period is 1982 – 2019; the 1982-and- onwards time period has been used in previous OFL determination and follows the most recent recommendation of the SSC.

Based on the estimated biomass at 15 February 2019, the stock is at Tier 3b. The FMSY proxy ($F_{35\%}$) is 1.18 yr⁻¹, and the 2019/20 FOFL is 1.08 yr⁻¹ under the Tier 3b OFL Control Rule, which results in a total male and female OFL of 28.86 kt. The CPT recommends a 20% buffer to account for model uncertainty and applied to the OFL to set ABC = 23.09 kt. The 20% buffer is the same that the SSC recommended for determination of the 2018/19 ABC.

MMB for 2018/19 was estimated to be 82.61 kt and above MSST (20.54 kt); hence **the stock was not overfished** in 2018/19. The total catch in 2018/19 (1.90 kt) was less than the 2018/19 OFL (20.87 kt); hence **overfishing did not occur in 2018/19**. The stock at 2019/20 time of mating is projected to be above the MSST and 75% of B35% hence the stock is not **approaching an overfished condition** in 2019/

Table 6. Historical status and catch specifications for Eastern Bering Sea Tanner Crab (thousand t). Shaded values are new estimates or projections based on the current assessment. Other table entries are based on historical assessments and are not updated except for total and retained catch.

Year	MSST	Biomass (MMB)	TAC	Retained Catch	Total Catch	OFL	ABC
2015/16	12.82	73.93	8.92	8.91	11.38	27.19	21.75
2016/17	14.58	77.96	0.00	0.00	1.14	25.61	20.49
2017/18	15.15	64.09	1.13	1.13	2.37	25.42	20.33
2018/19	20.54	82.61	1.11	1.11	1.90	20.87	16.70
2019/20		39.55				28.86	23.09

4.1.4. St. Matthew Island Blue King Crab

Stock Status

Fishery information relative to OFL setting

The fishery was prosecuted as a directed fishery from 1977 to 1998. Harvests peaked in 1983/84 when 4,288 t (9.453 million lb) were landed by 164 vessels. Harvest was fairly stable from 1986/87 to 1990/91, averaging 568 t (1.252 million lb) annually. Harvest increased to a mean catch of 1,496 t (3.298 million lb) during the 1991/92 to 1998/99 seasons until the fishery was declared overfished and closed in 1999 when the stock size estimate was below the MSST. In November 2000, Amendment 15 to the FMP was approved to implement a rebuilding plan for the St. Matthew Island blue king crab stock. The rebuilding plan included a harvest strategy identified in regulation by the Alaska Board of Fisheries, an area closure to control bycatch, and gear modifications. In 2008/09 and 2009/10, the MMB was estimated to be above *BMSY* for two years and the stock declared rebuilt in 2009.

The fishery re-opened in 2009/10, closed in 2013/14, opened from 2014/15 – 2015/16, and has been closed since 2016/17. Bycatch of non-retained blue king crab has occurred in the St. Matthew blue king crab fishery, the eastern Bering Sea snow crab fishery, and trawl and fixed-gear groundfish fisheries. The stock declined below the minimum stock size threshold in **2018 and was declared overfished**. A rebuilding plan is under development

Tier determination/Plan Team discussion and resulting OFL and ABC determination

This stock is in Tier 4. The CPT recommends that the full assessment period (1978/79–2018/19) be used to define the proxy for *BMSY* in terms of average estimated *MMB* mating. The projected MMB estimated for 2019/20 under the recommended model is 1,151 t and the F_{MSY} proxy is the natural mortality rate (0.18^{-1} year) and F_{OFL} is 0.042, resulting in a mature male biomass OFL of 0.04 kt (Table 7). The MMB/ B_{MSY} ratio is 0.310. The author recommended and the CPT concurred with a 20% buffer on the OFL for the ABC which was consistent with the approach used last year. The ABC based on this buffer is 0.03 kt.

Table 7. Historical status and catch specifications for St. Mathew Blue King Crab (thousand t). Shaded values are new estimates or projections based on the current assessment. Other table entries are based on historical assessments and are not updated except for total and retained catch.

Year	MSST	Biomass (MMB)	TAC	Retained Catch	Total Catch	OFL	ABC
2015/16	1.84	2.11	0.19	0.05	0.05	0.28	0.22
2016/17	1.97	2.23	0.00	0.00	0.001	0.14	0.11
2017/18	1.85	1.29	0.00	0.00	0.003	0.12	0.10
2018/19	1.74	1.15	0.00	0.00	0.001	0.04	0.03
2019/20		1.08				0.04	0.03

4.1.5. Aleutian Islands Golden King Crab

Stock Status

Fishery information relative to OFL setting³

The directed fishery has been prosecuted annually since the 1981/82 season. Retained catch peaked in 1986/87 at 14.7 million lb and averaged 11.9 million lb over the 1985/86–1989/90 seasons. Average harvests dropped sharply from 1989/90 to 1990/91 to a level of 6.9 million lb for the period 1990/91–1995/96. Management based on a formally established GHF began with the 1996/97 season. The 5.9 million lb GHF established for the 1996/97 season, which was based on the previous five-year average catch, was subsequently reduced to 5.7 million lb beginning in 1998/99. The GHF (or TAC, since 2005/06) remained at 5.700 million lb for 2007/08, but was increased to 5.985 million lb for the 2008/09–2011/12 seasons, and to 6.290 million lb starting with the 2012/13 season.

³ <https://www.npfmc.org/fishery-management-plan-team/bsai-crab-plan-team/#currentcrab>

The TAC was reduced to 5.545 million lb for the 2016/17 season and increased to 6.356 million lb for the 2018/19 season. This fishery is rationalized under the Crab Rationalization Program.

Total mortality of AI golden king crab includes retained catch in the directed fishery, mortality of discarded catch, and bycatch in fixed-gear and trawl groundfish fisheries, though bycatch in other fisheries is low compared to mortality in the directed fishery. Retained catch in the post-rationalized fishery (2005/06-2018/19) has ranged from 5.245 million lb in 2006/07 to 6.536 million lb in 2018/19 (Table 8). Total mortality ranged from 5.427 to 7.396 million lb for the same period.

Tier determination/Plan Team discussion and resulting OFL and ABC determination

The CPT recommended the AIGKC to be managed as a Tier 3 stock in 2019/20. A single OFL and ABC is defined for AIGKC; however, separate models are available by area. The CPT recommended that stock status be determined by adding the estimates of current MMB and *BMSY* by area. This stock status is then used to determine the ratio of F_{OFL} to $F_{35\%}$ by area, which is then used to calculate the OFLs by area which are then added together to calculate an OFL for the entire stock. The SSC has concurred with this approach. The stock is currently estimated to be above *BMSY* in both areas therefore no adjustment is needed to the F_{OFL} to determine the combined OFL for both areas.

The total catch in 2018/19 (3.35 kt) was less than the 2018/19 OFL (5.51 kt); hence overfishing did not occur in 2018/19. MMB for 2018/19 was estimated to be 17.88 kt and above MSST (5.88); hence the stock was not overfished in 2018/19. The stock at 2019/20 time of mating is projected to be above the MSST and 75% of *BMSY* (see above); hence the stock is not approaching an overfished condition in 2019/20

Table 8. Historical status and catch specifications for Aleutian Islands Golden King Crab (thousand t). Shaded values are new estimates or projections based on the current assessment. Other table entries are based on historical assessments and are not updated except for total and retained catch.

Year	MSST	Biomass (MMB)	TAC	Retained Catch ^a	Total Catch ^a	OFL	ABC
2015/16	NA	NA	2.853	2.729	2.964	5.69	4.26
2016/17	NA	NA	2.515	2.593	2.829	5.69	4.26
2017/18	6.044	14.205	2.515	2.585	2.942	6.048	4.536
2018/19	5.880	17.848	2.883	2.965	3.355	5.514	4.136
2019/20		15.944				5.249	3.937

4.2. Enforcement update

There were no significant changes to enforcement impacts of the Alaska BSAI king and Tanner Crab fisheries in the last year. In 2019, there were a total of 989 federal fisheries & safety boardings documented by the US Coast Guard: 5 boardings for vessels fishing BBRKC, and 2 boardings for vessels fishing AIGKC. No notices of violation (NOVs) were issued⁴.

4.3. Ecosystem Update

In the past year there were no significant changes in the actual or potential impacts of the BSAI crab fisheries on the EBS ecosystem. There were, however, a number of noteworthy environmental trends detected in the Eastern Bering Sea ecosystem⁵, some of which may impact upon BSAI crab stocks. For example, the cold pool extent for summer 2019 was reduced and retracted over the northwest portion of the EBS survey area, reflecting low sea ice extent over the shelf during the winter 2018/2019. Such conditions could negatively impact upon rebuilding of St. Matthew Blue King Crab stocks⁶. As reported in the ESP (Fedewa *et al.* 2019⁷), trend modeling for ecosystem indicators revealed poor conditions for SMBKC in recent years, attributed to above average bottom temperatures, a reduction in the cold pool extent, and an increase in mean benthic predator biomass in the St. Matthew Island management boundary.

4.4. Relevant changes to Legislation and Regulations

There were no significant changes to federal legislation and/or regulations that govern the Alaska BSAI king and Tanner crab fisheries in the last year. However, a substantial change occurred at state level - the BOF approved a state harvest strategy for Aleutian Islands Golden King Crab in March of 2019.⁸

4.5. Relevant changes to the Management Regime

There were no significant changes to the management regime that governs the U.S. Alaska Bering Sea and Aleutian Islands King, Tanner, and Snow crab commercial fisheries in the last year.

⁴ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=41ec7c2b-41cb-42bc-99a8-ab7bac263fe9.pdf&fileName=B6%20USCG%202019%20Year%20in%20Review.pdf>

⁵ <https://access.afsc.noaa.gov/REFM/REEM/ecoweb/pdf/2019EBSecosys.pdf>

⁶ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=c45c58ad-ec18-44f2-abc5-95ed49be1fd1.pdf&fileName=C6%20SMBKC%20Rebuilding%20Initial%20Review%20Analysis.pdf>

⁷ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=6ffde3ce-67be-4139-b165-cbff9062da06.pdf&fileName=C4%206%20SMBKC%20SAFE%202019.pdf>

⁸ <https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=03-09-2019&meeting=anchorage>

5. Surveillance Meetings

No surveillance meetings were conducted for the 3rd surveillance audit.

The assessment team conducted a desktop review of the fishery for the purpose of identifying if there has been any significant updates since the date of recertification

6. Assessment Outcome Summary

6.1. Fundamental Clauses Summaries

Fundamental Clause 1: Structured and legally mandated management system

Evidence adequacy rating: High

There is a structured and legally mandated management system in place for the BSAI king and Tanner crab fisheries. Alaska's BSAI crab stocks are managed under the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (FMP). The crab FMP was developed under a negotiated agreement between the State of Alaska and the federal government. The result was a state/federal fishery management plan (FMP) which incorporated concerns of the NPFMC, NMFS and MSA requirements on the federal side and ADFG, the BOF and Alaska statutes on the state side. This balance resulted in true joint management where the needs of both Alaska residents and those from other states were met. The crab FMP has three categories of regulations which reflect the state and federal emphasis. Once the state and federal agencies and the BOF and NPFMC arrived at consensus and put the joint management document to public review, it was submitted to the Secretary of Commerce who accepted joint management for the BSAI crab fisheries.

Fundamental Clause 2: Coastal area management frameworks

Evidence adequacy rating: High

The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. This occurs whenever resources under their management may be affected by other developments and each time they create, renew or amend regulations. The fishery management agencies have processes, committees and groups that allow potential coastal zone developments and issues to be brought to formal review and engagement such as the NPFMC meetings or the BOF meetings. From witnessing the processes, interviews with representatives of these organizations, The Council and the BOF actively encourage stakeholder participation, and all their deliberations are conducted in open, public sessions. Decisions are transparently documented on the various websites of these organizations in a timely manner.

Fundamental Clause 3: Management objectives and plan

Evidence adequacy rating: High

Long-term objectives for the fishery are outlined in the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (NPFMC 2011). FMP objectives are dictated by, and consistent with, the Magnuson-Stevens Act (MSA). The decision-making processes of responsible agencies are extremely transparent and inclusive of all stakeholders, thereby ensuring that the plan is subscribed to by all interested parties. Conservation and management measures ensure that excess fishing capacity is avoided and exploitation of the stocks remains economically viable.

Fundamental Clause 4: Fishery data

Evidence adequacy rating: High

The collection, aggregation and use of data in stock assessments for the BSAI crab fisheries are undertaken through collaboration between the NPFMC, the NMFS and ADFG. Data collection, analysis and stock assessment of the BSAI crab fisheries respect the NPFMC's BSAI crab FMP requirements. NMFS and ADFG collect fishery dependent data and undertake fishery-independent surveys for all BSAI crab fisheries providing the basis for the assessment of the crab stocks and their impact on the ecosystem. The NMFS annual trawl surveys of the eastern Bering Sea provide indices of relative abundance and biomass for four of the five fisheries under consideration. Full details of the datasets for the five fisheries and their time series can be found in the annual Stock Assessment and Fishery Evaluation (SAFE) reports.

Fundamental Clause 5: Stock assessment**Evidence adequacy rating: High**

The NMFS undertakes shellfish stock assessments through the annual Eastern Bering Sea trawl survey which provides the primary input to the shellfish assessments. Information derived from both regular surveys and associated research are analyzed by AFSC stock assessment scientists and supplied to fishery management agencies and to the commercial fishing industry. In addition, economic and ecosystem assessments are provided to the Council on an annual basis.

For the BBRKC fishery, a length-based analysis (LBA) model combines multiple sources of survey, catch and bycatch data using a maximum likelihood approach to estimate abundance, recruitment and catchabilities, catches and bycatch of the commercial pot fisheries and groundfish trawl fisheries. For the SMBKC fishery a three-stage catch- survey analysis (CSA) assesses the male component of the stock incorporating data from commercial catches from the directed fishery and its observer program, the annual EBS trawl survey, triennial pot surveys and bycatch data from the groundfish trawl fishery. For the EBSSC fishery the stock assessment uses a size and sex-structured model which is fitted to time series of total catch data from the directed fishery and bycatch data from the trawl fishery, size frequency data from the catch in the pot fishery and the bycatch in both the pot and trawl fisheries, and abundance data from the NMFS trawl survey and two recent BSFRF surveys. For the AIGKC fishery, the stock assessment uses a length-based model that combines a variety of catch, catch composition and catch discard data from commercial crab and groundfish (trawl and pot) fisheries and standardized observer legal size catch-per- unit-effort (CPUE) as indices of abundance. For the EBSTC fishery, the stock assessment model is a stage/size- based population dynamics model that incorporates sex (male, female), shell condition (new shell, old shell), and maturity (immature, mature) as different categories into which the overall stock is divided on a size-specific basis.

An ongoing goal is to produce an ecosystem assessment utilizing a blend of data analysis and modelling to clearly communicate the current status and possible future directions of ecosystems.

Fundamental Clause 6: Biological reference points and harvest control rule**Evidence adequacy rating: Medium**

The status determination criteria for crab stocks are calculated on an annual basis using a five-tier system that accommodates varying levels of uncertainty of information, and incorporates new scientific information providing a mechanism for continually improving the status determination criteria as more information becomes available. For example, for tier 3 stocks, the target reference point is B35% (when spawning biomass is reduced to 35% of the unfished condition), a proxy for BMSY, or biomass at Maximum Sustainable Yield (MSY). Stock status of BSAI crabs are determined by two metrics. Firstly, the stock is considered to be overfished if the stock size is estimated to be below the minimum stock size threshold (MSST) or limit reference point ($1/2$ MSY). Secondly, overfishing is considered to have occurred if the exploitation level, or fishing mortality, exceeds the fishing mortality at the overfishing level (FOFL), or more intuitively if the total catch exceeds the OFL level (equivalent to MSY).

As reported in the 2nd surveillance assessment of certified BSAI crab fisheries⁹, a medium confidence rating was assigned to RFM Supporting Clause 6.3 for the St. Matthew Island Blue King Crab unit or certification because the SMBKC stock was determined to be in an “overfished” condition (Zheng and Ianelli 2018). An overfished determination has again been reached in 2019 (Palof et al. 2019) despite fishery closures in the last three years (and hence overfishing has not occurred). Thus a medium confidence rating must be sustained. Progress against the agreed action plan is reviewed in Section 9 of this report.

⁹ <https://uploads.alaskaseafood.org/2019/04/Form-9g-BSAI-CRAB-AKRFM-2nd-Surveillance-Audit-Report-April-2019.pdf>

Fundamental Clause 7: Precautionary approach**Evidence adequacy rating: High**

The overall management for the BBRKC, EBSSC, SMBKC, AIGKC and EBSTC comprises all the elements as specified in the FAO guidelines for the precautionary approach. FAO Guidelines for the Precautionary Approach (PA) (FAO 1995) advocate a comprehensive management process that includes data collection, monitoring, research, enforcement, and review. Absence of adequate scientific information is not used as a reason for postponing or failing to take conservation and management measures. The five crab stocks under consideration are managed under a tier system rule based on stock knowledge.

Status determination criteria for crab stocks are annually calculated using a five-tier system that accommodates varying levels of uncertainty of information. The five-tier system incorporates new scientific information and provides a mechanism to continually improve the status determination criteria as new information becomes available. The lower the tier, the less conservative the determination of OFL/ABC and ACL are, due to a greater level of information being known about the stock. Higher tier stocks are managed more conservatively due to gaps in the information about the stock. This system is intrinsically precautionary in nature and the results involve catches always lower than the overfishing level. The annual assessments and subsequent SAFE reports for the BSAI crab fisheries allow for the identification of areas where there are gaps in the knowledge of the stock which require further research and/or improvements.

Fundamental Clause 8: Management measures**Evidence adequacy rating: High**

Conservation and management measures are in place to ensure the long-term sustainability of BSAI crab resources at levels which promote optimum utilization that are based on verifiable and objective scientific and traditional, fisher and community information sources. Long-term fisheries management objectives are outlined in the BSAI Crab FMP. State regulations for the king crab fisheries and Tanner crab fisheries (inclusive of snow crab) are listed under the Alaska Administrative Code, Title 5, Chapters 34 and 35, respectively. The MSA, as amended, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851) to which all fishery management plans must be consistent. Conservation of aquatic habitats and biodiversity are integral parts of the NPFMC's management process. These concerns and decisions are summarized annually in the AFSC Alaska Marine Ecosystem Status Reports and the ecosystem sections of each annual Stock Assessment and Fishery Evaluation (SAFE) report. Furthermore, Essential Fish Habitat (EFH) identification and protection constitute a key objective for the management system as outlined in the BSAI crab FMP.

Fundamental Clause 9: Appropriate standards of fisher's competence**Evidence adequacy rating: High**

Advanced education and training programs are readily available and required by fishers to enhance their skills and professional qualifications. All those engaged in BSAI crab fishing operations are provided information on the most important provisions of the FAO CCRF (1995), as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations, as part of required education and training. Records of all BSAI crab fishers are maintained as part of license and permit programs which contain information on their service and qualifications, including certificates of competency.

Fundamental Clause 10: Effective legal and administrative framework**Evidence adequacy rating: High**

There is a division of effort and emphasis in the at-sea enforcement between the USCG and the AWT. Under joint management there are both state and federal laws to enforce, and both state and federal agents actively conduct at-sea enforcement. The USCG is responsible for enforcing the main federal vessel regulations: this includes safety

at sea, drug enforcement, vessel compliance with ESA and EFH requirements and assuring compliance of federal permits, observer coverage, licenses and VMS in the crab fisheries. AWT have vessels that conduct at-sea compliance with gear regulations, capable of hauling and confiscating crab pots, sample crab harvests at sea, assure sex and size requirements are met and assure that the vessels have all required state and federal licenses. Additionally AWT, along with ADFG area biologists and technicians, conduct vessel inspections dockside, conducting hold inspections and observing offloads of harvested crab for compliance. The entire crab harvests are conducted in Alaskan waters by American vessels. No foreign fleet is allowed to fish in the Alaska's EEZ. Because the fishery was rationalized in 2005, most enforcement of IFQ/IPQ violations, as well as size, sex and season violations occur at offloading. In 2019, there were a total of 989 federal fisheries & safety boardings documented by the US Coast Guard: 5 boardings for vessels fishing BBRKC, and 2 boardings for vessels fishing AIGKC. No notices of violation (NOVs) were issued .

Fundamental Clause 11: Framework for sanctions

Evidence adequacy rating: High

In Alaska waters, enforcement policy section 50CFR600.740 states: (a) The MSA provides four basic enforcement remedies for violations, in ascending order of severity, as follows: (1) Issuance of a citation (a type of warning), usually at the scene of the offense (see 15 CFR part 904, subpart E). (2) Assessment by the Administrator of a civil money penalty. (3) For certain violations, judicial forfeiture action against the vessel and its catch. (4) Criminal prosecution of the owner or operator for some offenses. The MSA treats sanctions against the fishing vessel permit to be the carried out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator. The 2011 Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions issued by NOAA Office of the General Counsel – Enforcement and Litigation, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. This policy was recently reviewed in 2019. The revisions to the policy reflect new legislation enacted and regulations promulgated, the most recent adjustments to the maximum civil monetary penalties authorized under statutes administered and enforced by NOAA, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990, and clarifications to improve enforcement consistency nationally, increase predictability in enforcement, improve transparency in enforcement, and more effectively protect natural resources.

The Marine Division of AWT and the State of Alaska Department of Law pursue a very aggressive enforcement policy. They attend the BOF and are integral into the process for regulation formulation and legislation, analogous to the USCG attendance and input in the Council process. AWT has Statutory / Regulatory legislation pertaining to their Authority.

Fundamental Clause 12: Impacts of the fishery on the ecosystem

Evidence adequacy rating: Medium

There is in place a robust fisheries management system that appropriately and adequately considers fishery interactions and effects on the ecosystem. The BSAI crab fishery management system is based on the best available science while allowing for inputs from fishery participants and other stakeholders. The management system also incorporates risk-based approaches for determining most probable adverse impacts of the fishery so that potentially adverse impacts of the fishery on the ecosystem are appropriately assessed and effectively addressed. Habitat protection areas, prohibited species catch (PSC) limits and crab bycatch limits are in place to protect important benthic habitat for crab and other resources and to reduce crab bycatch in the trawl and fixed gear groundfish fisheries. If PSC limits are reached in bottom trawl fisheries executed in specific areas, those fisheries are closed. The crab fisheries catch a small amount of other species as bycatch. A limited number of groundfish, such as Pacific cod, Pacific halibut, yellowfin sole, and sculpin are caught in the directed pot fishery.

The invertebrate component of bycatch includes echinoderms, snails, non-FMP crab, and other invertebrates. As noted in the Endangered Species Act EIS report, crab fisheries do not adversely affect ESA listed species, destroy or modify their habitat, or comprise a measurable portion of their diet. Based on food habits data collected in the summer months during the annual EBS bottom trawl survey¹⁰, Pacific cod, Pacific halibut and skates are the primary predators of large or legal size crab although legal-sized crab are a minimal component of these predators diets. The short and long term effects of removing large male crab from a population are not well understood and may vary by species and population as outlined in various scientific studies.

The Aleutian Islands golden king crab fishery takes place in deep water areas where coral and sponge habitats may be adversely impacted by bottom contact gear such as pots. For the AI GKC unit of certification, it was not shown that outcome indicators are in place that are consistent with avoiding, minimizing, or mitigating the impact on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification (i.e. pots). For example, there are no spatial analyses available which would allow an estimation of current and historic overlap of AIGKC pot fishing effort with the distribution of vulnerable coral and sponge habitats in the Aleutian Islands. The AIGKC unit of certification was therefore assigned a medium confidence rating for clause 12.13 and, consequently, a minor non-conformity was raised at re-assessment (SAI Global 2017). The minor non-conformance is now being addressed through a Corrective Action Plan that was developed by the Bering Sea Crab Client Group and which was accepted by the assessment team and incorporated into the re-assessment report. Progress against the agreed action plan is reviewed in Section 9 of this report.

Fundamental Clause 13: Fisheries enhancement activities (where applicable)

Evidence adequacy rating: NA

NA

¹⁰ <https://www.fisheries.noaa.gov/resource/document/draft-technical-memorandum-2019-eastern-bering-sea-continental-shelf-trawl-survey>

7. Conformity Statement

The assessment team recommends that continued Certification under the Alaska Responsible Fisheries Management Certification Program is granted to U.S. Alaska Bering Sea and Aleutian Islands King, Tanner, and Snow crab commercial fisheries [Bristol Bay Red King crab (*Paralithodes camtschaticus*), St. Matthew Island Blue King crab (*Paralithodes platypus*), Eastern Bering Sea Tanner Crab (*Chionoecetes bairdi*), Aleutian Islands Golden King Crab (*Lithodes aequispinus*), and Eastern Bering Sea Snow crab (*Chionoecetes opilio*)] legally employing pot gear within Alaska jurisdiction (200 nautical miles EEZ) and subject to a federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] joint management regime.

8. Evaluation of Fundamental Clauses

8.1. Section A. The Fisheries Management System

8.1.1. Fundamental Clause 1

There shall be a structured and legally mandated management system based upon and respecting International, National and local fishery laws, for the responsible utilization of the stock under consideration and conservation of the marine environment.

Number of Supporting clauses	13
Supporting clauses applicable	6
Supporting clauses not applicable	7
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized evidence:

1.1. There shall be an effective legal and administrative framework established at local and national level appropriate for the fishery resource and conservation and management.

There is a structured and legally mandated management system in place for the BSAI king and Tanner crab fisheries. Alaska's BSAI crab stocks are managed under the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (FMP). The crab FMP was developed under a negotiated agreement between the State of Alaska and the federal government. The result was a state/federal fishery management plan (FMP) which incorporated concerns of the NPFMC, NMFS and MSA requirements on the federal side and ADFG, the BOF and Alaska statutes on the state side. This balance resulted in true joint management where the needs of both Alaska residents and those from other states were met. The crab FMP has three categories of regulations which reflect the state and federal emphasis. Once the state and federal agencies and the BOF and NPFMC arrived at consensus and put the joint management document to public review, it was submitted to the Secretary of Commerce who accepted joint management for the BSAI crab fisheries. The management system and the fishery continue to operate in compliance with applicable law including the MSA.

1.2. Management measures shall take into account the whole stock unit over its entire area of stock distribution.

As detailed previously in the BSAI Crab RFM Re-assessment Report¹¹, management measures consider the whole stock biological unit over its entire area of distribution, the area through which the species migrates during its life cycle, and other biological characteristics of the stock. The Council and NMFS produce annually a Stock Assessment & Fishery Evaluation (SAFE) report¹² covering all crab stocks within the BSAI King and Tanner Crab Fishery Management Plan (FMP), including each of the five stocks under consideration here. Both state and federal assessment biologists meet at the NPFMC Plan Team meetings and share assessment information and harvest strategies to assure conservation management over the entire stock distribution. Investigation of crab stock structure is ongoing. Work includes studies of distribution and movement (Zacher et al. 2018; Murphy et al. 2018, 2020)^{13,14,15} as well as population genetic research (e.g. Johnson 2019)¹⁶. However, no compelling information has come to light since re-assessment that indicates a need to revise the current understanding of crab stock unit structure.

¹¹ <https://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-crab/>

¹² <https://www.npfmc.org/safe-stock-assessment-and-fishery-evaluation-reports/>

¹³ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0201190>

¹⁴ <https://www.sciencedirect.com/science/article/abs/pii/S0165783618301000>

¹⁵ <https://www.sciencedirect.com/science/article/abs/pii/S0165783619302723>

¹⁶ https://scholarworks.alaska.edu/bitstream/handle/11122/10506/Johnson_G_2019.pdf?sequence=1

1.3./1.4/1.5./1.6. Transboundary stocks

The five stocks under assessment are not considered shared, straddling, high seas or highly migratory stocks, nor are they considered common shared resources exploited by two or more States. As such, the following six supporting clauses are not applicable: 1.3, 1.3.1, 1.4, 1.4.1, 1.5 and 1.6.1. With respect to supporting clause 1.6, an updated rationale is provided below.

With respect to continuing conformity with supporting clause 1.6, there is evidence for well-established means by which fisheries management activities, organizations and arrangements are financed, including arrangements aiming to recover the costs of fisheries conservation, management and research. Specific costs incurred during management, research and enforcement of BSAI crab fisheries are largely funded through the Crab Rationalization cost recovery program implemented by NMFS in 2005 (70 FR 10174, March 2, 2005). The CR cost recovery program authorizes the collection of actual management and enforcement costs up to 3% of ex-vessel gross revenues. Up to 25% of collections are deposited into the U.S. Treasury and made available to Congress for annual appropriations to support the BSAI Crab Quota Share Loan Program. The other remaining funds are placed in a limited access account available only to the Secretary and which must be spent on CR Program management and enforcement¹⁷.

The State of Alaska also receives some funding from NMFS, in addition to funding from the Alaska Legislature. The Crab Observer Program is funded through industry funds as well as Test Fish funding sources. The Crab Observer Oversight Task Force (COOTF) is an advisory body comprised of crab industry members, including representative stakeholders. Its purpose is to review and recommend specific actions to Board of Fisheries on all aspects of the BSAI crab observer program including funding mechanisms for observers as well as budget and reserve priorities (RC 020¹⁸, March 2014). In 2017 the Board of Fisheries determined that the COOTF was useful and should continue (RC 033¹⁹, March 2017).

Research and management efforts are also supported by industry. For example, the Bering Sea Fisheries Research Foundation (BSFRF²⁰) is a non-profit research foundation whose funding comes primarily from private industry. BSFRF has engaged in cooperative research with industry, ADFG, and NMFS since 2005 with the aim of improving the science used to manage Bering Sea crab fisheries. Recent BSFRF research projects include collection of *Chionoecetes* for growth studies, side-by-side trawl survey work, and tagging studies of red king crab movement using saildrones. BSFRF presented an update on these activities at a recent meeting of the Crab Plan Team (CPT Report, October 2019²¹).

1.7. Review and Revision of conservation and management measures

The NPFMC has procedures in place to ensure continuous review of the efficacy of conservation and management measures. Mechanisms exist to revise or abolish current management measures in light of new information. For example, the Magnuson-Stevens Act (MSA) requires Regional Fishery Management Councils 1852(f)(5) to “review on a continuing basis, and revise as appropriate, the assessments and specifications made pursuant to section 1853(a)(3) and (4) of this title with respect to the optimum yield...”

¹⁷ <https://www.fisheries.noaa.gov/resource/document/crab-rationalization-program-cost-recovery-reports>

¹⁸ https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2013-2014/statewide/rcs/rc020_Bering_Sea_Aleutian_Is_Crab_Observer_Oversight.pdf

¹⁹ http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2016-2017/statewide/rcs/rc033_BOF_Crab_Observer_Task_Force.pdf

²⁰ <http://www.bsfrf.org/>

²¹ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=735d3abb-51ad-4601-9ca2-3c9251264648.pdf&fileName=C4%20CPT%20Report%20Sept%202019.pdf>

Similar to NPFMC, the Alaska BOF also has procedures in place to ensure continuous review of the efficacy of state conservation and management measures, including measures for BSAI crab stocks. ADFG publishes the BOF's meeting schedule to allow for stakeholder to propose revisions to existing regulations or to input on current proposals. Notably, this includes compilation and publication of a Book of Proposals²² which details all regulatory proposals that will be heard by the BOF during upcoming meetings. Proposals may concern changes to the state's fishing regulations from members of the public, organizations, advisory committees, and ADFG staff. Proposals concerning BSAI crab regulations are often consolidated and considered at a single BOF meeting (e.g. 33 statewide king and Tanner crab proposals were scheduled for review at the March 2020 BOF meeting)²³.

1.8. Transparent management arrangements and decision making

The NPFMC and Alaska BOF processes are organized in a highly transparent manner in terms of both management arrangements and decision-making processes. The Council provides a great deal of information on their website²⁴, including meeting agendas, discussion papers, and records of decisions. The Council actively encourages stakeholder participation, and all Council deliberations are conducted in open, public session. The Council's Three Meeting Outlook outlines issues likely to be of concern and therefore likely to be discussed at the following three NPFMC meetings, affording stakeholders the opportunity to prepare and submit comments for discussion in advance of meetings.

Similar to NPFMC, Alaska's Board of Fisheries (BOF) management arrangements and decision-making processes for the fishery are organized in a highly transparent manner. The Board and ADFG provide a great deal of information on their websites²⁵, including agenda of meetings, discussion papers, news items, and records of decisions. The BOF actively encourages stakeholder participation, and BOF deliberations are conducted in open, public session. Anyone may submit regulatory proposals, and all such proposals are given due consideration by the BOF.

1.9. Compliance with international conservation and management measures

The crab fisheries under consideration are prosecuted exclusively within waters of the U.S. EEZ and State of Alaska. These fisheries do not occur on the high seas. As such, supporting clause 1.9 is not applicable.

²² http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2019-2020/proposals/2019-2020_proposal_book_digital.pdf

²³ <http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2019-2020/proposals/crab.pdf>

²⁴ <https://www.npfmc.org/>

²⁵ <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main>

8.1.2. Fundamental Clause 2

Management organizations shall participate in coastal area management institutional frameworks, decision-making processes and activities related to the fishery and its users, in support of sustainable and integrated resource use, and conflict avoidance.

Number of Supporting clauses	10
Supporting clauses applicable	10
Supporting clauses not applicable	0
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized evidence:

2.1./2.2./2.3./2.4. Policy, legal and institutional frameworks adopted to achieve sustainable and integrated use of marine resources along with mechanisms to avoid conflict shall be in place. Representatives of the fisheries sector and fishing communities shall be consulted in decision making processes and information related to management measures shall be disseminated.

A framework comprised of policy, legal and institutional capacities is in place to achieve sustainable and integrated use of marine resources and this framework provides for mechanisms to avoid conflict among users. The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. This occurs whenever resources under their management may be affected by other developments and each time they create, renew or amend regulations. The fishery management agencies have processes, committees and groups that allow potential coastal zone developments and issues to be brought to formal review and engagement such as the NPFMC meetings or the BOF meetings.

Representatives of the fisheries sector and fishing communities are consulted in decision making processes and information related to management measures is disseminated. The Council and the BOF actively encourage stakeholder participation, and all their deliberations are conducted in open, public sessions. Decisions are transparently documented on the respective websites of these organizations^{26,27} in a timely manner.

Information related to management measures is disseminated in a timely manner. For example, ADFG regularly publishes and distributes booklets summarizing current regulations (e.g. the 2017-2019 King and Tanner Crab Commercial Fishing Regulations; ADFG 2017) which are also made available online²⁸. The NPFMC publicly disseminates information related to management measures on its website by providing up-to-date content about current and future meetings, current issues, and Council publications. ADFG publishes on its website in a timely manner notifications relevant to implementation of management measures for commercial fisheries including fishery advisories, summaries, press releases and forecasts.²⁹ Similarly, NMFS makes available on its websites³⁰ information about regulatory and management actions and other resources relevant to commercial fisheries.

²⁶ <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main>

²⁷ <https://www.npfmc.org/>

²⁸ http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2017-2020_cf_king_tanner_crab.pdf

²⁹ <https://www.adfg.alaska.gov/index.cfm?adfg=fishingCommercial.main>

³⁰ <https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/sustainable-fisheries-alaska>

2.5. The economic, social and cultural value of coastal resources shall be assessed in order to assist decision-making on their allocation and use.

Assessment of the economic, social and cultural value of Alaskan fisheries is an integral part of the decision-making process for management of coastal resources. The primary job of the NPFMC and the BOF is to manage fisheries resources sustainably and to determine the allocation of resources to different users in accordance with provisions of the Magnuson-Stevens Act (MSA).

Alaska Fisheries Science Center (AFSC) runs the Economic and Social Sciences Research (ESSR) Program in Alaska³¹. The aim of the ESSR Program is to provide economic and sociocultural information to assist NMFS in meeting its stewardship responsibilities with activities being conducted in support of this mission. AFSC maintains online access to community profiles of baseline socioeconomic information for 136 Alaska communities most involved in commercial fisheries. Comprehensive community profiles, concise snapshots and searchable maps of communities involved in commercial, recreational and subsistence fishing may be found on the AFSC website³². AFSC has also recently published a wholesale market profile for Alaska groundfish and crab (AFSC 2016).

Many of the activities of the AFSC Program are conducted in collaboration with other Federal and State agencies and universities. Current research topics being addressed include regional economic impact models, behavioral models of fishing operations, indicators of economic performance, and the non-market valuation of living marine resources.

Additional information about the value of coastal resources comes from the Alaska Fisheries Information Network (AKFIN). AKFIN was established in 1997 in response to an increased need for detailed, organized fishery information to aid decision-making by managers with the aims of consolidating, managing and dispensing information related to commercial fishing in Alaska³³. The AKFIN maintains an analytic database of both State and Federal historic, commercial Alaska fisheries data relevant to the needs of fisheries analysts and economists and provides that data in a usable format. These data are essential for, among other things, assessing the economic value of the Alaska seafood industry (McDowell Group 2017³⁴).

Results from economic assessments are presented annually in Economic Stock Assessment and Fishery Evaluation Reports or “Economic SAFE reports” (Garber-Yonts and Lee 2018³⁵), together with comprehensive information on stock assessments and updates on ecosystem status and trend (“Ecosystem SAFE” reports).

2.6./2.7/2.8. Research and monitoring of the coastal environment, mechanisms for cooperation and coordination, appropriate technical capacities and financial resources, conflict avoidance amongst user groups

State and Federal agencies coordinate ongoing research and monitoring programs for the coastal environment. There are well-established multidisciplinary research programs to assess physical, chemical, biological, economic and social aspects of the coastal area which contribute to improved management. As detailed in the BSAI Crab Re-assessment Report³⁶, the NPFMC, NMFS and ADFG are engaged in monitoring of coastal resources either during the NEPA review of plan amendments or during their on-going studies and evaluations. Other State and federal entities also cooperate at the sub-regional level via NEPA processes in order to improve coastal area management. These entities include: Alaska Department of Environmental Conservation (ADEC); Alaska

³¹ <https://www.afsc.noaa.gov/REFM/Socioeconomics/Default.php>

³² <https://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/communities/>

³³ <https://akfin.psmfc.org/>

³⁴ https://www.npfmc.org/wp-content/PDFdocuments/resources/SAFE/CrabSAFE/Econ/Crab_Economic_SAFE_2018.pdf

³⁵ https://www.afsc.noaa.gov/REFM/Socioeconomics/SAFE/crab_safe/Crab_Economic_SAFE_2017.pdf

³⁶ <https://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-crab/>

Department of Natural Resources (ADNR); DNR Office of Project Management and Permitting (OPMP); U.S. Fish and Wildlife Service (USFWS); and Bureau of Ocean Energy Management (BOEM), as well as the North Pacific Research Board (NPRB) and Institute of Marine Science (IMS) of the UAF's School of Fisheries and Ocean Science.

There are well-established mechanisms for domestic cooperation and coordination that are secured by appropriate technical capacities and financial resources. For example, state and federal management authorities have established a framework for management of artificial reefs and fish aggregation devices in the coastal waters of Alaska. These management systems require approval for the construction and deployment of such reefs and devices, and management takes into account the interests of fishers, including artisanal and subsistence fishers.

Mechanisms for international cooperation and coordination are in place as well. If an incident were to occur with potential for adverse environmental effects (e.g. oil spill, escape of an invasive species), there are management systems and action plans in place for response and containment. Additionally, there are systems to ensure the early sharing of information with the relevant Canadian authorities should such events have the potential for spill-over impacts on Canadian waters.

8.1.3. Fundamental Clause 3

Management objectives shall be implemented through management rules and actions formulated in a plan or other framework.

Number of Supporting clauses	7
Supporting clauses applicable	7
Supporting clauses not applicable	0
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized evidence:

3.1. Long-term management objectives shall be translated into a plan or other management document and be subscribed to by all interested parties.

Long-term objectives for the fishery are outlined in the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (NPFMC 2011)³⁷. FMP objectives are dictated by, and consistent with, the Magnuson-Stevens Act (MSA)³⁸. Management decisions are made by the Council and BOF, and implemented and enforced by AWT, NMFS-OLE and USCG (see discussion of enforcement under clause 10). Both NPFMC and ADFG make Council and Board deliberations and associated records publicly available on their websites. The decision-making processes of both agencies are extremely transparent and inclusive of all stakeholders, thereby ensuring that the plan is subscribed to by all interested parties

3.2. Management measures should limit excess fishing capacity, promote responsible fisheries, take into account artisanal fisheries, protect biodiversity and allow depleted stocks to recover.

Conservation and management measures ensure that excess fishing capacity is avoided and exploitation of the stocks remains economically viable. With a Congressionally approved approach creating Processor Quota Shares and Individual Fishing Quotas for rationalized crab fisheries in the BSAI in 2005, the numbers of buyers and sellers were capped, seasons were protracted and vessels were able to join cooperatives that resulted in fewer vessels deploying less gear on the grounds. The economic conditions under which the crab fishing industries now operate promote responsible fisheries, and these circumstances are actively reviewed and demonstrated in various analysis by NMFS³⁹. NPFMC recently contracted a ten-year review of the effectiveness of crab rationalization⁴⁰ which was approved by the Council in 2016 (D. Stram, pers. comm.). Authors of the CR review concluded that the extent to which crab harvesting and processing capacity was reduced [since CR Program implementation] is measurable, and fairly objective when considered in terms of the number of vessels and processing facilities that have participated in CR program fisheries over time.

ADFG also tracks the ex-vessel value of the fisheries they manage, and produce Annual Management Reports⁴¹ that support the analysis. Decisions are based on both biological and socio-economic information collected and analyzed by NPFMC, NMFS and ADFG staff economists that participate in the economic, social and cultural evaluation and review process of fishery management proposals. Allocation also considers subsistence and community development initiatives.

³⁷ <https://www.npfmc.org/wp-content/PDFdocuments/fmp/CrabFMPOct11.pdf>

³⁸ <https://www.law.cornell.edu/uscode/text/16/chapter-38/subchapter-IV>

³⁹ <https://www.afsc.noaa.gov/refm/Socioeconomics/SAFE/crab.php>

⁴⁰ https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/Crab/Crab10yrReview_Final2017.pdf

⁴¹ http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2016-2017/statewide/WR3_FMR17-10.pdf

Where stocks are determined to be depleted, there are formal processes in place to ensure their recovery. The Magnuson-Stevens Act section 304(e)(4)(A) and the National Standard Guidelines require development of a rebuilding plan to prevent overfishing and to rebuild depleted stocks. Rebuilding should take place in as short a time as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem.

8.2. Section B. Science and Stock Assessment Activities

8.2.1. Fundamental Clause 4

There shall be effective fishery data (dependent and independent) collection and analysis systems for stock management purposes.

Number of Supporting clauses	13
Supporting clauses applicable	7
Supporting clauses not applicable	6
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized evidence:

4.1. All fishery removals and mortality of the target stock(s) shall be considered by management.

All fishery removals and mortality of the target stocks is considered by management. ADFG undertakes a comprehensive, annual monitoring program to collect data on retained catch, bycatch/discards in all BSAI directed crab fisheries as well as crab bycatch/discards in all groundfish fisheries. Collectively, these monitoring and observer programs provide the basis for reliable estimation of total removals from all crab stocks annually for assessment and management purposes. Complete and reliable statistics are compiled on catch and fishing effort and subjected to rigorous statistical analysis in each annual stock assessment. Research results have been used as a basis for the setting of management objectives, reference points and performance criteria, as well as for annual adjustment of allowable catch levels. Historical and most recent data are available in the 2019 crab stock assessments⁴²⁴³.

4.2. An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.

A scheme of at-sea and dock-side observers is established to collect accurate data for research and support compliance with applicable fishery management measures⁴⁴. Historical and most recent data are available in the 2019 crab stock assessments.

4.3. Management entities shall make data available in a timely manner and in an agreed format in accordance with agreed procedures.

Data collected as part of 4.1 and 4.2 above are made available as required to conduct annual assessments of all BSAI crab stocks. Policies and procedures are prescribed at the federal and state levels to protect the confidentiality of data submitted to and collected by employees and contractors. Only authorized users have access to confidential data to perform an official⁴⁵⁴⁶.

4.4/4.5. States shall stimulate the research required to support national policies related to fish as food and collect sufficient knowledge of social, economic and institutional factors relevant to the fishery in question to support policy formulation.

There is strong promotion of research into all aspects of seafood use by federal and state agencies and industry organizations that support national policies related to fish as food. Extensive knowledge of the economic, social,

⁴² <http://www.sf.adfg.state.ak.us/FedAidPDFs/FDS14-49.pdf>

⁴³ <https://www.npfmc.org/fishery-management-plan-team/bsai-crab-plan-team/#currentcrab>

⁴⁴ <https://www.fisheries.noaa.gov/webdam/download/100373573>

⁴⁵ https://www.st.nmfs.noaa.gov/st1/recreational/documents/Intercept_Appendices/Appendix%20M%20031408%20NOAA%20administrative%20order%20216-100.pdf

⁴⁶ <http://www.adfg.alaska.gov/FedAidPDFs/SP12-14.pdf>

marketing and institutional aspects of the BSAI crab fisheries has been acquired through dedicated research. Annual collection and analysis of relevant data provide the basis for ongoing monitoring, analysis and policy formulation related to these aspects of the fisheries. The most recent information is available in the 2019 socioeconomic evaluation of these fisheries⁴⁷.

4.6. States shall investigate and document traditional fisheries knowledge and technologies, in particular those applied to small scale fisheries, in order to assess their application to sustainable fisheries conservation, management and development.

Traditional fisheries knowledge is obtained through ongoing opportunity for public/community input to the fisheries management process to ensure its application to sustainable fisheries conservation, management and development.

4.7. States conducting scientific research activities in waters under the jurisdiction of another State shall ensure that their vessels comply with the laws and regulations of that State and international law.

NA

4.8. States shall promote the adoption of uniform guidelines governing fisheries research conducted on the high seas.

NA

4.9/4.10/4.11. States shall promote and enhance the research capacities of developing countries, support (upon request) States engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished.

NA

⁴⁷ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=56dfdaec-02d5-4b22-a24f-e9d0d2af0c4f.pdf&fileName=D7%20Crab%20Economic%20SAFE%202019.pdf>

8.2.2. Fundamental Clause 5

There shall be regular stock assessment activities appropriate for the fishery, its range, the species biology and the ecosystem, undertaken in accordance with acknowledged scientific standards to support its optimum utilization.

Number of Supporting clauses	7
Supporting clauses applicable	7
Supporting clauses not applicable	0
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized Evidence:

5.1 States shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. The research shall be disseminated accordingly. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.

A well-organized institutional framework is in place that conducts the research required for fishery management purposes. The BSAI crab fisheries are jointly managed by the NPFMC and the BOF under the Fishery Management Plan (FMP).⁴⁸ A requirement of the FMP is the production of an annual stock assessment and fishery evaluation (SAFE) report. For each stock/fishery, the SAFE report provides a detailed description of the data and methodology used in the stock assessment, any changes in approaches, the estimated status of the stocks in relation to pre-determined fisheries management reference points, advice on appropriate harvest levels, and an assessment of the relative success of existing state and federal fishery management programs.

Stock status criteria used in the assessment of BSAI crab stocks ensure more precautionary approaches to managing fisheries when uncertainty is high. None of the BSAI crab fisheries can be considered small scale or low value. Nevertheless, the assessment methodology and degree of reliability varies between stocks. Status determination criteria for these stocks are calculated using a five-tier system that accommodates varying levels of uncertainty of information. The five-tier system incorporates new scientific information and provides a mechanism to continually improve the status determination criteria as new information becomes available.

Well established institutions with qualified staff are in place that conduct research into all aspects of fisheries. Results are made available as needed to ensure that the best scientific evidence is used for fisheries conservation, management and development. The research branch of the NMFS Alaska Region is the Alaska Fisheries Science Center (ASFC).⁴⁹ Its mission is to plan, develop, and manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence. The Resource Assessment and Conservation Engineering (RACE) Division⁵⁰ comprises scientists from a wide range of disciplines whose function is to conduct quantitative fishery surveys and related ecological and oceanographic research to describe the distribution and abundance of commercially important fish and shellfish stocks in the region, and to investigate ways to reduce bycatch, bycatch mortality and the effects of fishing on habitat.

⁴⁸ <http://www.fakr.noaa.gov/npfmc/fishery-management-plans/crab.html>

⁴⁹ <http://www.afsc.noaa.gov/>

⁵⁰ <http://www.afsc.noaa.gov/race/default.php>

Resource Ecology and Fisheries Management (REFM) Division conducts research and data collection to support an ecosystem approach to management of fish and crab resources⁵¹. Division scientists evaluate how fish stocks, ecosystem relationships and user groups might be affected by fishery management actions and climate. The Habitat and Ecological Processes Research (HEPR) Program⁵² develops scientific research that supports implementation of an ecosystem approach to fishery management.

5.2. The state of the stocks under management jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration shall be monitored.

There is well established research capacity to assess and monitor the effects of climate or environment change on BSAI crab stocks and their ecosystem, the state of these stocks and the impacts of ecosystem changes resulting from human activity. See 5.1 evidence summary. Annual Ecosystem SAFE documents provide a concise summary of the status of marine ecosystems in Alaska for stock assessment scientists, fishery managers, and the public. It provides detailed information and updates on the status and trends of ecosystem components as well as early signals of direct human effects that might warrant management intervention or to provide evidence of the efficacy of previous management actions.⁵³ The annual crab SAFE report includes a section on ecosystem considerations which provides information on ecosystem indicators which may have an impact on crab stocks. Also, monitoring of and research related to effects of pollution of the marine environment throughout Alaska is an ongoing priority for AFSC and various State agencies.⁵⁴

5.3. Management organizations shall cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.

There is extensive international collaboration/cooperation that encourages research to ensure optimum utilization of BSAI crab resources. Research output on BSAI crab stocks is regularly published in the scientific literature and presented/discussed at relevant international conferences and symposia⁵⁵. Scientists participate in meetings of different organizations involving attendees from various countries, including, for example, the North Pacific Marine Science Organization (PICES)⁵⁶, which has members from the US, Russia, Japan and Canada, to exchange and discuss the latest results and advances stock assessment science and management of fishery resources.

5.4. The fishery management organizations shall directly, or in conjunction with other States, develop collaborative technical and research programs to improve understanding of the biology, environment and status of trans-boundary aquatic stocks.

Although the BSAI crab are not trans-boundary stocks, the United States and Russia share many important stocks of living marine resources in the North Pacific Ocean and Bering Sea, lending importance to coordination of efforts of the two countries to conserve and manage those resources. On May 31, 1988 the United States and Russia signed the “Agreement Between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics on Mutual Fisheries Relations”, establishing the U.S.-Russia Intergovernmental Consultative Committee.⁵⁷ The main objective of the Agreement is to maintain a fisheries relationship that benefits both countries. The United States and Russia cooperate on scientific research, consult on fisheries matters beyond their EEZs and beyond the EEZ of any third party to ensure proper conservation and management, and cooperate to address Illegal, Unreported, and Unregulated (IUU) fishing activities. On April 29, 2013, the United States and

⁵¹ <http://www.afsc.noaa.gov/refm/default.php>

⁵² <http://www.afsc.noaa.gov/HEPR/default.php>

⁵³ <https://access.afsc.noaa.gov/reem/ecoweb>

⁵⁴ http://www.afsc.noaa.gov/ABL/Habitat/ablhab_contaminants.htm

⁵⁵ <http://www.pmel.noaa.gov/foci/publications>

⁵⁶ <http://www.pices.int/>

⁵⁷ http://www.nmfs.noaa.gov/ia/agreements/bilateral_arrangements/russia/us-russia.html

Russia signed a Joint Statement on Enhanced Fisheries Cooperation, which reaffirms the 1988 Agreement while focusing future cooperation on combating IUU fishing, collaborating on science and management of Arctic fisheries, and advancing conservation efforts in the Ross Sea region of Antarctica.

5.5. Data generated by research shall be analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.

Results of analysis of data from the BSAI crab fisheries that are generated both through the data collection programs for commercial fisheries and through research surveys and other research programs are published in reports of specific programs and the annual SAFE report describes how the various datasets have contributed to the assessment of the status of stocks. NOAA administrative order 216-100 prescribes policies and procedures for protecting the confidentiality of data submitted to and collected by NOAA/National Marine Fisheries Service⁵⁸. Only authorized users have access to confidential data, they must have a need to collect or use these data in the performance of an official duty, and they must sign a statement of nondisclosure affirming their understanding of NMFS obligations with respect to confidential data and the penalties for unauthorized use and disclosure. All procedures applicable to Federal employees must be followed by contractors collecting data with Federal authority. Under agreements with the State, each State data collector collecting confidential data will sign a statement at least as protective as the one signed by Federal employees

⁵⁸http://www.st.nmfs.noaa.gov/st1/recreational/documents/Intercept_Appendices/Appendix%20M%20031408%20NOAA%20administrative%20order%20216-100.pdf

8.3. Section C. The Precautionary Approach

8.3.1. Fundamental Clause 6

The current state of the stock shall be defined in relation to reference points or relevant proxies or verifiable substitutes allowing for effective management objectives and targets. Remedial actions shall be available and taken where reference point or other suitable proxies are approached or exceeded.

Number of Supporting clauses	4
Supporting clauses applicable	4
Supporting clauses not applicable	0
Overall level of conformity	Medium Conformity
Non Conformances	1 open NC (no new NCs)

Summarized Evidence:

6.1/6.2/**6.3**/6.4 States shall determine for the stock both safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), shall measure the status of the stock against these reference points and agree to actions to be undertaken if reference points are exceeded.

Safe target reference points have been established for management of BSAI crab fisheries. The Crab FMP⁵⁹ contains the following stock status definitions: Acceptable biological catch (ABC) is a level of annual catch of a stock that accounts for the scientific uncertainty in the estimate of OFL and any other specified scientific uncertainty and is set to prevent, with a greater than 50 percent probability, the OFL from being exceeded. The ABC is set below the OFL. ABC Control Rule is the specified approach in the five-tier system for setting the maximum permissible ABC for each stock as a function of the scientific uncertainty in the estimate of OFL and any other specified scientific uncertainty. Annual catch limit (ACL) is the level of annual catch of a stock that serves as the basis for invoking accountability measures. For EBS crab stocks, the ACL will be set at the ABC. Total allowable catch (TAC) is the annual catch target for the directed fishery for a stock, set to prevent exceeding the ACL for that stock and in accordance with section 8.2.2 of the FMP. Guideline harvest level (GHL) means the preseason estimated level of allowable fish harvest which will not jeopardize the sustained yield of the fish stocks. A GHL may be expressed as a range of allowable harvests for a species or species group of crab for each registration area, district, sub district, or section (examples of setting crab TAC and GHL are found in ADFG 2019⁶⁰). Maximum sustainable yield (MSY) is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions. MSY is estimated from the best information available. For crab stocks, the OFL equals the maximum sustainable yield (MSY). FMSY control rule means a harvest strategy which, if implemented, would be expected to result in a long term average catch approximating MSY. BMSY stock size is the biomass that results from fishing at constant FMSY and is the minimum standard for a rebuilding target when a rebuilding plan is required. Maximum fishing mortality threshold (MFMT) is defined by the FOFL control rule, and is expressed as the fishing mortality rate. Minimum stock size threshold (MSST) is one half the BMSY stock size.

Overfished is determined by comparing annual biomass estimates to the established MSST. For stocks where MSST (or proxies) are defined, if the biomass drops below the MSST (or proxy thereof) then the stock is considered to be overfished. Overfishing is defined as any amount of catch in excess of the overfishing level (OFL). The OFL is calculated by applying abundance estimates to the FOFL control rule. Status determination criteria for crab stocks are annually calculated using a five-tier system that accommodates varying levels of uncertainty of information.

⁵⁹ <http://www.fakr.noaa.gov/npfmc/fishery-management-plans/crab.html>

⁶⁰ <http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareaaleutianislands.shellfish#management>

If overfishing occurred or the stock is overfished, section 304(e)(3)(A) of the Magnuson-Stevens Act, as amended, requires the NPFMC to immediately end overfishing and rebuild affected stocks.

The MSA also requires that Fishery Management Plans (FMPs) incorporate accountability measures to prevent the ACL from being exceeded and to correct any excesses in ACLs if they do occur. Accountability measures could include seasonal, area and gear allocations, closed areas, bycatch limits, in-season fishery closures, gear restrictions, limited entry, catch shares and observer and vessel monitoring requirements. All such measures are designed to allow close monitoring of catch levels from all sources, to react to specific bycatch problems and to provide a database for evaluating potential consequences of future management actions.

Under the BSAI crab FMP, specific accountability measures that have been used to prevent the ACL being exceeded include individual fishing quotas (IFQs) and measures to ensure IFQs are not exceeded, measures to minimize bycatch in the directed crab fisheries and monitoring and catch accounting measures. In addition, the ACL and TAC have been reduced if the ACL was exceeded in the previous fishing year.

Supporting Clause 6.3

Note as this Clause has scored less than Full Conformance it has been scored in full.

Data and assessment procedures shall be installed measuring the position of the fishery in relation to the reference points. Accordingly, the stock under consideration shall not be overfished (i.e. above limit reference point or proxy) and the level of fishing permitted shall be commensurate with the current state of the fishery resources, maintaining its future availability, taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing.

FAO CCRF (1995) 7.5.3, 7.6.1

FAO Eco (2009) 29.2-29.2bis, 29.6, 30-30.2

FAO Eco (2011) 36.2, 36.3, 37, 37.1, 37.2

Evidence Rating:	Low ☐	Medium ☒	High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☒

Summary Evidence:

Procedures are in place to measure the position of BSAI crab fisheries in relation to their reference points and measures are in place to ensure they are not overfished or being overfished and take into account long term changes in productivity or impacts other than fishing.

Evidence:

The SSC reviewed the SAFE chapters and information provided by the CPT with respect to the stock status information from 2018/2019 and relative to total catch during the 2018-2019 season (**Error! Reference source not found.**). In addition, Table **Error! Reference source not found.** contains the SSC recommendations for 2019/2020 catch specifications, with maximum permissible ABCs for 2019/2020 shown in **Error! Reference source not found.**. The SSC endorsed all OFL and ABC recommendations of the CPT. St. Matthew Island blue king crab and Pribilof Islands blue king crab are overfished; none of the other crab stocks were overfished or approaching overfished status (**Error! Reference source not found.**). None of the crab stocks were subject to overfishing.

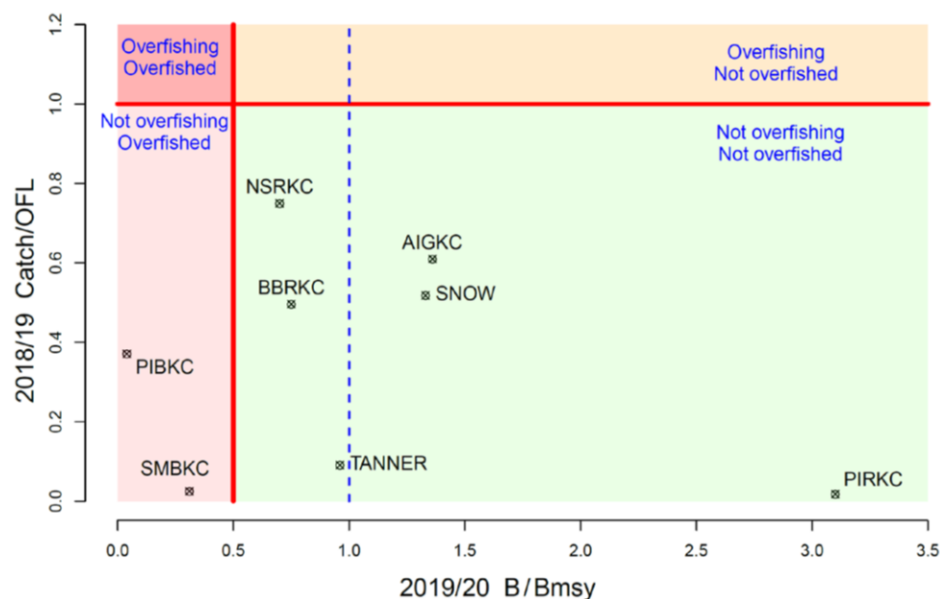


Figure 1 . Status of Bering Sea crab stocks in2019 in relation to status determination criteria(BMSY, ½ BMSY, OFL)

Table 9. Stock status of BSAI crab stocks in relation to status determination criteria for 2018/19. Values are in thousand metric tons (kt).

Chapter	Stock	Tier	MSST ^[1]	B _{MSY} or B _{MSYproxy}	2018/19 ^[2] MMB	2018/19 MMB / MMB _{MSY}	2018/19 OFL	2018/19 Total catch	Rebuilding Status
1	EBS snow crab	3	63.00	142.80	123.10	0.86	29.70	15.40	
2	BB red king crab	3	10.62	25.50	16.92	0.66	5.34	2.65	
3	EBS Tanner crab	3	20.54	21.87	23.53	1.08	20.87	1.9	
4	Pribilof Islands red king crab	4	0.87	1.73	4.192	2.42	0.404	0.00722	
5	Pribilof Islands blue king crab	4	2.05	4.11	0.23	0.06	0.00116	0.00043	overfished
6	St. Matthew Island blue king crab	4	1.74	3.48	1.15	0.33	0.04	0.001	overfished
7	Norton Sound red king crab	4	1.09	2.18	1.85	0.85	0.20	0.16	
8	AI golden king crab	3	5.88	11.76	17.848	1.52	5.514	3.36	
9	Pribilof Islands golden king crab	5					0.09	Conf.	
10	Western AI red king crab	5					0.06	< 0.001	

Table 10. TAC Recommendations approved by the SSC in October 2019.

Chapter	Stock	Tier	Status (a,b,c)	F _{OFL}	B _{MSY} or B _{MSYproxy}	Years ^[1] (biomass or catch)	2019/20 ^[2] MMB	2019/20 MMB / MMB _{MSY}	γ	Mortality (M)	2019/20 ^[3] OFL	2019/20 ABC	ABC Buffer
1	EBS snow crab	3	a	1.93	126.10	1982-2018 [recruitment]	167.3	1.33		0.41 (females) 0.31 (imm) 0.30 (mat males)	54.90	43.90	20%
2	BB red king crab	3	b	0.22	21.35	1984-2018 [recruitment]	15.96	0.75		0.18	3.40	2.72	20%
3	EBS Tanner crab	3	b	1.08	41.07	1982-current [recruitment]	39.55	0.96		0.30 (females) 0.23 (imm) 0.30 (mat males)	28.86	23.09	20%
4	Pribilof Islands red king crab	4	a	0.21	1.73	2001-present [MMB]	5.37	3.10	1	0.21	0.86	0.65	25%
5	Pribilof Islands blue king crab	4	c		4.11	1980/81-1984/85 & 1990/91-1997/98	0.175	0.04	1	0.18	0.00116	0.00087	25%
6	St. Matthew Island blue king crab	4	c	0.04	3.48	1978-2018 [MMB]	1.08	0.31	1	0.18	0.44	0.35	20%
7	Norton Sound red king crab	4	b	0.12	2.06	1980-2018 [MMB]	1.41	0.68	1	0.18	0.11	0.09	20%
8	AI golden king crab	3	a	EAG (0.66) WAG (0.60)	11.76	1987/88-2012/13	15.94	1.36		0.21	5.25	3.94	25%
9	Pribilof Islands golden king crab	5				See intro chapter					0.09	0.07	25%
10	Western AI red king crab	5				1995/96-2007/08					0.06	0.01	75%

Table 11. Maximum permissible ABCs for 2019/20 and SSC recommended ABCs for stocks where the SSC recommendation is below the maximum permissible ABC

Stock	Tier	2019/20	2019/20
		<i>Max ABC</i> ^[2]	ABC
EBS Snow Crab	3	54.777	43.90
Bristol Bay RKC	3	3.37	2.72
Tanner Crab	3	28.79	23.09
Pribilof Islands RKC	4	0.853	0.65
Pribilof Islands BKC	4	0.00104	0.00087
Saint Matthew BKC	4	0.0438	0.035
Norton Sound RKC	4	0.11	0.09
Aleutian Islands GKC	3	5.224	3.94
Pribilof Islands GKC ^[1]	5	0.081	0.07
Western Aleutian Islands RKC	5	0.054	0.01

Updates on SMBKC

The Council reviewed an initial draft environmental assessment of a rebuilding plan for St Matthew Island blue king crab⁶¹. The Council chose a preliminary preferred alternative that would allow directed harvest during rebuilding if estimates of stock biomass are sufficient to open the fishery under the State of Alaska's crab harvest strategy. Official notice that the stock was overfished was communicated to the Council in October 2018, which started a two-year process at the end of which the rebuilding plan must be implemented. The draft EA will be revised based on Council and SSC input, and the Council is scheduled to make a final recommendation in April in order for implementation to occur before the October 2020 deadline.

Under the alternative rebuilding approaches considered by the Council, the St Matthew blue king crab stock could take between 14 to 25 years to recover. The directed fishery has been closed since 2016 under the State of Alaska harvest strategy, and has only been open 6 out of the past 20 years. Multiple measures for habitat protection and bycatch reduction are in place for the stock, and fishing mortality is not considered to be the primary constraining factor. The groundfish fisheries incur low levels of bycatch of St Matthew blue king crab, but in analytical projections, average bycatch rates had no constraining effect on rebuilding. Instead, rebuilding will depend on successful recruitment of crab under ecosystem conditions that have recently been very unfavorable. Warm bottom temperatures, low pre-recruit biomass, and northward movement of predator species, primarily Pacific cod, have constrained stock growth.

⁶¹ <https://www.npfmc.org/blue-king-crab-rebuilding/>

Given the intermittent openings of the targeted St Matthew blue king crab fishery over the last 20 years, vessel and community reliance on harvest of blue king crab is relatively low. Under the draft rebuilding plan, ecosystem indicators developed for the stock will be monitored in the coming years

In the last surveillance assessment of the certified BSAI crab fisheries (the 2nd surveillance conducted in 2018), the assessment team found that the St. Matthew Island Blue King Crab unit of certification was not in conformity with RFM Supporting Clause 6.3 because NMFS had determined that the SMBKC stock was “overfished”. A minor non-conformity was raised and the fishery client prepared a corrective action plan that was accepted by the assessment team, as documented in the 2nd surveillance report⁶².

During the present surveillance assessment (the 3rd surveillance audit), the stock status of SMBKC was found to be unchanged from 2018. That is, the 2019 SAFE report indicates that SMBKC continues to be designated as overfished (Palof et al. 2019)⁶³. For this reason, the assessment team has again assigned a confidence level of “medium” to RFM Supporting Clause 6.3 and the minor non-conformity remains open. Progress by the client in implementing the agreed upon corrective action plan to resolve the NC is described further in Section 9 of this report.

Preliminary Corrective Action Plan – for minor non-conformances in the St. Matthew Blue King Crab Unit of Assessment. Ref: AK/CRA/002.2/2018:

Date: April 6, 2020

From: Bering Sea Crab Client Group (BSCCG) [*BSCCG is wholly owned subsidiary of BSFRF*]
Mr. Scott Goodman (Executive Director)
Bering Sea Fisheries Research Foundation (BSFRF)
4039 21st Avenue W, Suite 404
Seattle, WA 98199

To: Dr. Ivan Mateo, Ph.D
Fisheries Assessment Officer
3rd Floor, Block 3
Quayside Business Park
Mill Street, Dundalk
Co. Louth, Ireland

RE: Preliminary **Corrective Action Plan** – for minor non-conformances in the St. Matthew Blue King Crab Unit of Assessment. Ref: AK/CRA/002.2/2018
(Conducted as part of U.S. Alaska Bering Sea and Aleutian Islands King, Tanner, and Snow Crab Commercial Fisheries – Re and Full Assessments, 2019/20)

Dear Dr. Mateo,

Please find this summary below to be our response to the approved corrective action plan which we submitted as part of ongoing surveillance and certification work last year, 04/05/19. The St. Matthew Blue King Crab (SMTBKC) continues in its official “overfished” status, and our updates for the three action items are below for your review. Importantly and as a reminder, our action plan steps take a top-down approach in participating, reviewing and reporting back to the assessment team as further information is shared in three areas; rebuilding plan progress, stock assessment refinement, and

⁶² <https://uploads.alaskaseafood.org/2019/04/Form-9g-BSAI-CRAB-AKRFM-2nd-Surveillance-Audit-Report-April-2019.pdf>

⁶³ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=6ffde3ce-67be-4139-b165-cbff9062da06.pdf&fileName=C4%206%20SMBKC%20SAFE%202019.pdf>

incidental bycatch monitoring and reporting. While this important update is brief, it includes correspondence from the lead assessment author (K. Palof, ADFG) for information she provided in a more recent update, which speaks to each of our steps in part (attached).

Action Plan Item 1: Support of and Attention to St. Matthew Blue King Crab Rebuilding Plan

Our most recent information on [STMTBKC status](#) comes from the January 2020 Crab Plan Team (Kodiak, AK) which we attended to be updated on the latest steps within the stock assessment integration of rebuilding plan terms. Generally, the terms of a potential [rebuilding plan](#) are still in development but are nearing official approval from the Council (NPFMC). This action has been delayed due to the [pandemic crisis](#), but is rescheduled to occur in June 2020. A set of alternatives for the rebuilding plan have been reviewed and a potential [recommended option](#) has been identified. As noted by presentations at the meeting and by Ms. Palof, there was some apparent positive signal from NMFS survey results which reflected the stock (mature male biomass) to be over an identified threshold for setting a directed harvest amount based on the current State of Alaska harvest Strategy (SHS).

However, terms of the recommended rebuilding option which provide some flexibility to managers, also note that further conservation considerations be taken into account before determining that a seasonal harvest amount be allocated as a total allowable catch (TAC). It is likely that the June NPFMC meeting will see the approval of the recommended option, and also likely that managers will take a cautious approach to managing the stock toward its rebuilding goals, regardless of some variability up or down

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from the NMFS summer survey results. We will report at the next update on the Council's official actions and subsequent steps.

Action Plan Item 2: Support of and Participation in SMBKC Stock Assessment – GMACs Support

As a reminder on brief history, the Generic Models for Alaskan Crab (GMACs) program was originally initiated by a collaboration of the stakeholder group BSFRF which has client ownership of BSCCG. The generic project has since broadened and been renamed Generic Models for Assessment of Crustaceans (GMACs). The GMACs progress has been slow over the last several years, but BSFRF/BSCCG support with NOAA/ADF&G and others has persisted. Importantly, the SMBKC stock has been the first of the Alaskan stocks to utilize and rely on GMACs for approved management action. While most of the SMBKC GMAC technical modeling work has been completed over the last two years by UW and NOAA researchers (Dr. A. Punt and Dr. J. Ianelli), the [current stock assessment](#) has been passed to State (ADF&G) managers (K. Palof). We have been attentive to the utility provided by GMACs to SMBKC stock status evaluation and concur with the stock assessment scientists and current high level of concern.

Moreover, we would note that our support and funding of portions of the GMAC project have led to the current level of review and precaution in managing this stock.

Our second action plan step was to report on GMACs support and the increasing utility of this tool in STMTBKC management. We paraphrase from Ms. Palof (referenced in attached) that SMBKC stock is assessed, as it has been since 2016, using the GMACS model, which is now a standardized modeling framework that has been reviewed extensively by crustacean stock assessment authors in Alaska. As of 2019 the NPFMC crab plan team and SSC has approved this model for use with two other stocks, and is encouraging stock assessment authors for the additional stocks to migrate to this modeling framework in the near future. We will continue to report as part of action plan updates on the continued status of GMACs for STMTBKC management.

Action Plan Item 3: Record Keeping & Reporting for SMBKC Stock – Bycatch Monitoring

As a final action step, in the context of STMTBKC bycatch management, we would note again that no SMBKC directed fishery has occurred over the last several seasons. As we noted in our prior updates, management summaries indicate that the only SMBKC bycatch from directed crab pot fishing comes

during snow crab fishing and has generally been negligible for the last several years. We also report again, the CPT and SSC note that bycatch overall does not appear to be a significant driver in stock status review, but is importantly considered for its influence in rebuilding plan options. For this action step we proposed to report any new bycatch activity that had occurred in crab or non-crab fisheries in the SMBKC management area. As noted also by Ms. Palof in the attached, during the rebuilding analysis projections for rebuilding showed that a close review of bycatch in other fisheries, at its current levels, is insignificant and does not influence the rebuilding time for this stock.

Please let me know if there are further questions you may have at this time.

Sincerely,

BERING SEA CRAB CLIENT GROUP LLC



Scott Goodman (BSFRF, Executive Director)

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ATTACHED EMAIL FROM STMTBKC LEAD ASSESSMENT AUTHOR:

SMBKC update
Palof, Katie J (DFG) <katie.palof@alaska.gov>
4/7/2020 11:23 AM
To: Scott Goodman sgoodman@nrccorp.com

Scott,

Per our conversation early today I'm writing about the status of the St. Matthew blue king crab assessment and rebuilding plan. Please reach out if there is any additional information that you need.

Thanks,
Katie Palof

Currently, the St. Matthew blue king crab (SMBKC) stock is assessed, as it has been since 2016, using the GMACS model, which is a standardized modeling framework that has been reviewed extensively by crustacean stock assessment authors. As of 2019 the NPFMC crab plan team and SSC has approved this model for use with two other stocks, and is encouraging stock assessment authors for the additional stocks to migrate to this modeling framework in the near future.

The SMBKC rebuilding plan is set to go before the NPFMC for final action this spring/summer. The current preferred alternative in this rebuilding plan allows for harvest under the current State of Alaska harvest strategy (SHS) if and when the stock makes substantial progress towards rebuilding. The current State of Alaska harvest strategy has a threshold for harvest that is defined as 50% of the average mature male biomass from 1978 to 2012, which for 2019 is approximately 57% of the Bmsy proxy. At this point the harvest rate would be 5% of the mature males biomass, increasing gradually to a maximum of 10% when the current year's biomass is larger than the Bmsy proxy (or at 100% of the average mature male biomass from 1978 to 2012). For harvest to occur on this stock the biomass would have to make progress towards rebuilding, showing growth in consecutive years to reach the SHS threshold. In addition to the SHS being a conservative plan, the State of Alaska reserves the right to keep the fishery closed if there are conservation concerns for the stock that are not encompassed in the model, which may include but are not limited to things such as: reproductive failures, health of females (currently not modeled), or concerns over recruitment due to our changing climate.

Rebuilding progress for this stock will be monitored annual with NPFMC annual stock assessment, which includes estimating the current population abundance, monitoring bycatch estimates, and addressing ecosystem and socioeconomic concerns for this stock. During the rebuilding analysis projections for rebuilding showed that bycatch in other fisheries, at its current levels, is insignificant and does not influence the rebuilding time for this stock.

Katie Palof
katie.palof@alaska.gov
Biometrician
Alaska Department of Fish and Game
Division of Commercial Fisheries

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References:

NOAA BSAI CRAB SAFE 2019

Non-Conformance Number (if relevant)

#3 (new)

8.3.2. Fundamental Clause 7

Management actions and measures for the conservation of stock and the aquatic environment shall be based on the precautionary approach. Where information is deficient a suitable method using risk assessment shall be adopted to take into account uncertainty.

Number of Supporting clauses	5
Supporting clauses applicable	4
Supporting clauses not applicable	1
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized Evidence:

7.1. The precautionary approach shall be applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment.

The precautionary approach is applied to conservation, management and exploitation of the BSAI crab resources in order to protect them and preserve their environment. The MSA dictates the development of FMPs for all the federally managed/overseen fisheries. The NPFMC treats OFL (MSY) as an upper limit rather than a target. Catches are in line with the TAC and well below the OFL to take into account the risks involved when calculating MSY. As implemented in management of BSAI crab fisheries, the precautionary approach takes into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities on non-target and associated or dependent species as well as environmental and socio-economic conditions.

Of note, in March of 2019 the BOF approved a state harvest strategy for Aleutian Islands Golden King Crab (Daly et al., 2019a,b).

7.2. For new and exploratory fisheries, procedures shall be in place for promptly applying precautionary management measures, including catch or effort limits.

NA: there are no new and exploratory species.

8.4. Section D. Management Measures

8.4.1. Fundamental Clause 8

Management shall adopt and implement effective management measures designed to maintain stocks at levels capable of producing maximum sustainable yields, including harvest control rules and technical measures applicable to sustainable utilization of the fishery and be based upon verifiable evidence and advice from available scientific and objective, traditional sources.

Number of Supporting clauses	17
Supporting clauses applicable	16
Supporting clauses not applicable	1
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized evidence:

8.1. Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional sources. In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact shall be considered.

Conservation and management measures are in place to ensure the long-term sustainability of BSAI crab resources at levels which promote optimum utilization that are based on verifiable and objective scientific, traditional, fisher and community sources. The NPFMC's fishery management plan (FMP) for BSAI crab stocks outlines the stock status definitions, the criteria used to determine stock status using a five-tier system and the step-by-step framework under which the Council sets final overfishing levels (OFLs) and acceptable biological catches (ABCs). The MSA requires that the Science and Statistical Committee (SSC) of the NPFMC determines the scientific benchmarks while the Council itself recommends quotas based on these benchmarks. This separation of responsibilities is a key step forward in eliminating overfishing and enhancing recovery of overfished stocks.

In the evaluation of alternative conservation and management measures for BSAI crab fisheries, their cost-effectiveness and social impact are considered. Resource Ecology and Fisheries Management (REFM) Division at the NMFS AFSC conducts a program of research to support an ecosystem approach to management of BSAI crab stocks, examining climate and environmental changes as well as a socio-economic program whose work includes evaluating economic impacts of fisheries rationalization programs, and compiling and evaluating socio-cultural information on Alaskan communities and traditional ecological knowledge. Economic and ecosystem assessments provide a basis for scientific evaluation of how fish stocks, ecosystem relationships and user groups might be affected by fishery management actions and climate.

8.2. States shall prohibit dynamiting, poisoning and other comparable destructive fishing practices.

Dynamiting, poisoning and other comparable destructive fishing practices are prohibited in Alaska. The BSAI crab FMP authorizes the use of pot gear to harvest crab resources.

8.3. States shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery.

All domestic parties with a legitimate interest in the use and management of BSAI crab fisheries were identified as part of Crab Rationalization and the impact of the CR Program on these parties has been tracked over time (see Weidlich and Downs 2016)⁶⁴. Recognition is given to the traditional practices, needs and interests of indigenous

⁶⁴ https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/Crab/AppendixA-SocialImpactAssessment.pdf

people and local fishing communities. Arrangements are in place to consult all interested parties to gain their collaboration in achieving responsible fisheries.

Recent Council activities affirm that the process for identifying domestic parties with a legitimate interest in a fishery is an ongoing priority. For example, during drafting of the Rebuilding Plan for Saint Matthew Island Blue King Crab (NPFMC 2019)⁶⁵, those domestic parties with a legitimate interest in the SMBKC fishery were identified as part of the Council's socio-economic analysis to determine impacts of proposed alternative actions.

8.4. Mechanisms shall be established where excess capacity exists, to reduce capacity. Fleet capacity operating in the fishery shall be measured. States shall maintain, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations and a record of all authorizations to fish allowed by them.

Mechanisms are in place to reduce capacity to levels commensurate with sustainable use of the BSAI crab resources. Fleet capacity has been measured and is monitored. Statistics are updated regularly on all fishing operations and a record is maintained of all authorizations to fish these resources. BSAI crab fisheries are limited entry, rationalized fisheries. Fishing capacity has been reduced since 2002. Fleet consolidation accompanying rationalization was substantial and remaining vessel ownership has tended to aggregate in fewer and larger communities (see NPFMC 2017: Ten-Year Program Review for the Crab Rationalization Management Program in the Bering Sea/ Aleutian Islands⁶⁶). The capacity of the crab fleet has been fixed since 2006 and participation has been continuously monitored by NMFS's Restricted Access Management Program (RAM)⁶⁷ and the Alaska Commercial Fisheries Entry Commission (CFEC).⁶⁸

8.5. Technical measures shall be taken into account, where appropriate, in relation to: fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, protection of juveniles or spawners.

Measures are in place in BSAI crab fisheries that restrict sizes that can be retained, require escape mechanisms to protect undersize and female crabs, establish closed seasons and closed areas and reserve areas for local, aboriginal fisheries.⁶⁹ The BSAI crab FMP authorizes the State to adjust size limits under State regulations. Typically, biological considerations are used to establish minimum legal size limits to ensure that conservation needs are served. Unless a surplus is determined to be available, female crabs cannot be taken. Fishing seasons are used to protect crabs during the molting and mating portions of their life cycle. Closed seasons have been set to maximize the reproductive potential of crab populations. The FMP specifically prohibits the use of trawls and tanglenet gear for catching crab because of the high mortality rates that could be inflicted on nonlegal crab. Pots and ring nets are the specified legal commercial gear in the BSAI crab fisheries. FMPs are required to describe and identify Essential Fish Habitat (EFH), minimize to the extent practicable adverse effects of fishing on EFH, and identify other actions to conserve and enhance EFH. The BSAI crab FMP⁷⁰ describes crab EFH and includes information on habitat and biological requirements for each life history stage of these species.

⁶⁵ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=c45c58ad-ec18-44f2-abc5-95ed49be1fd1.pdf&fileName=C6%20SMBKC%20Rebuilding%20Initial%20Review%20Analysis.pdf>

⁶⁶ https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/Crab/Crab10yrReview_Final2017.pdf

⁶⁷ <http://www.fakr.noaa.gov/ram>

⁶⁸ <http://www.cfec.state.ak.us>

⁶⁹ http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2017-2020_cf_king_tanner_crab.pdf

⁷⁰ <https://www.npfmc.org/wp-content/PDFdocuments/fmp/CrabFMPOct11.pdf>

8.6. Fishing gear shall be marked.

Gear used in BSAI crab fisheries must be marked so the owner can be identified (5 AAC 34.051.King crab gear marking requirements; 5 AAC 35.051 Tanner crab gear marking requirements)⁷¹.

8.7. Measures shall be introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery/restoration of such stocks. Also, efforts shall be made to ensure that resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities are restored.

Measures are in place to identify and protect depleted resources and those resources threatened with depletion, and to facilitate their sustained recovery/restoration. Also, measures are in place to ensure that resources and habitats critical to the well-being of BSAI crab resources which have been adversely affected by fishing or other human activities are restored. The MSA also requires that the FMP include accountability measures to prevent ACLs from being exceeded and to correct overages if they do occur. Clearly defined management measures, including harvest strategies and control rules, designed to maintain crab stocks at levels capable of producing maximum sustainable levels are included in the FMP. Measures require reducing fishing mortality if a stock is declining and closure of the directed fishery if depleted.

The National Environmental Policy Act (NEPA)⁷² requires preparation of an Environmental Impact Statement (EIS) for any federal action that may significantly affect the quality of the human environment. NEPA is a comprehensive process to provide checks and balances against changes to the environment that may impact ecosystems and the natural processes, as well as the socio-economic sphere of fisheries. The EIS Database⁷³ provides detailed information about EISs concerning potential impacts of federal action on the resources and habitats of Alaska.

Where stocks are determined to be depleted, there are formal processes in place to ensure their recovery. The Magnuson-Stevens Act section 304(e)(4)(A) and the National Standard Guidelines require development of a rebuilding plan to prevent overfishing and to rebuild depleted stocks. Rebuilding should take place in as short a time as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem.

There is evidence that the aforementioned MSA-mandated processes for responding to depleted stocks are being implemented in BSAI crab fisheries as required. The Council has developed a draft rebuilding plan for SMBKC⁷⁴ in response to notification from NMFS in October 2018 that the stock is overfished. The commercial fishery on the SMBKC stock has been closed for the last three years and in recent years the main source of SMBKC fishery mortality derives from bycatch in fixed gear fisheries (bycatch for 2018/19 was 2,553 kg⁷⁵). SMBKC is now considered a BSAI prohibited species and, as such, prohibited species catch (PSC) data for SMBKC are reported weekly on the NMFS website⁷⁶ to safeguard against overfishing.

⁷¹ http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2017-2020_cf_king_tanner_crab.pdf

⁷² <https://www.epa.gov/nepa/national-environmental-policy-act-review-process>

⁷³ <https://cdxnodenengn.epa.gov/cdx-enepa-ll/public/action/eis/search;jsessionid=0875ED9C2F29B516C92603E60A7D62EF?search=&fsk=-1062329806#results>

⁷⁴ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=c45c58ad-ec18-44f2-abc5-95ed49be1fd1.pdf&fileName=C6%20SMBKC%20Rebuilding%20Initial%20Review%20Analysis.pdf>

⁷⁵ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=735d3abb-51ad-4601-9ca2-3c9251264648.pdf&fileName=C4%20CPT%20Report%20Sept%202019.pdf>

⁷⁶ <https://www.fisheries.noaa.gov/alaska/commercial-fishing/fisheries-catch-and-landings-reports#bsai-prohibited-species>

8.8/8.9/8.10/8.11/8.12/8.13. States shall encourage the development and implementation of technologies and operational methods that reduce waste and discards and reduce the loss of fishing gear. The implications of the introduction of new fishing gears, methods and operations shall be assessed and the effects of such introductions monitored. New developments shall be made available to all fishers and shall be disseminated and applied appropriately.

BSAI crab fisheries are required to use gear and technologies that research has demonstrated are environmentally safe, cost effective and sufficiently selective to minimize catch, waste and discards of non-target species as well as the use of gear and practices that increase survival rates of escaping fish and crab. Use of highly selective pots to minimize unwanted catch of target species as well as the bycatch of non-target species, along with development of handling practice to minimize mortality of discarded catch, have been key aspects of the management of BSAI crab fisheries for a long time. All aspects of gear performance and discard mortality have been extensively researched. On-board observers in all fisheries record discards and estimates of total discard mortality are included in total fishery removals. This has provided considerable incentive to minimize unwanted catch to the fullest extent possible. Their reports demonstrate catches are dominated by legal crab of the target species, with much smaller amounts of other species.⁷⁷

Selective, environmentally safe and cost-effective fishing gear and techniques have been developed and applied in BSAI crab fisheries to minimize the loss of gear and the ghost fishing effects of lost or abandoned gear, pollution and waste. After rationalization of the BSAI crab fisheries, the number of participating vessels decreased which resulted in a slower paced fishery with decreased rates of lost fishing gear and longer soak times providing more time for the escapement of undersized and female crab. Crabbers are constructing pots with larger web on the panels to allow for female and juvenile crab to exit the pot before the gear is hauled back. State regulations⁷⁸ require crab pots have escape rings and other mechanisms to minimize the potential for ghost fishing.

ADFG perform pot and vessel holding tank inspections prior to each fishing season. At-sea enforcement of all regulations is conducted by Alaska Wildlife Troopers (AWT), and the ADFG on-board observer program collects information that can be used for enforcement. There is no evidence to indicate any use of devices to circumvent the intent of gear regulations. Information on new gear developments and any related regulatory requirements are readily available to harvesters through professional associations and the licensing system.

New fishing technologies (i.e. new fishing gear, methods and operations) are fully assessed prior to introduction in order to understand their potential for disturbance of BSAI crab habitats and ecosystems. Any commercial-scale introduction of a new fishing method would necessarily undergo extensive evaluation prior to implementation as well as needing to demonstrate compliance with regulatory requirements and being subject to ongoing monitoring. No new fishing technologies of relevance to BSAI crab fisheries have been reported since re-assessment.

8.14. Policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures.

NA

⁷⁷ <http://www.adfg.alaska.gov/FedAidPDFs/FDS14-49.pdf>

⁷⁸ https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2017-2020_cf_king_tanner_crab.pdf

8.4.2. Fundamental Clause 9

Fishing operations shall be carried out by fishers with appropriate standards of competence in accordance with international standards and guidelines and regulations.

Number of Supporting clauses	3
Supporting clauses applicable	3
Supporting clauses not applicable	0
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized evidence:

9.1./9.2./9.3. Education and training programs.

Advanced education and training programs are readily available and required by fishers to enhance their skills and professional qualifications.^{79,80,81} At the Federal level, NOAA has formulated a plan to implement the FAO CCRF across all US fisheries (NMFS 1997)⁸². The plan, recently updated (NMFS 2012)⁸³, includes objectives for education, safety and training of fishers. All those engaged in BSAI crab fishing operations are provided information on the most important provisions of the FAO CCRF (1995), as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations, as part of required education and training. A 2019 report by United Fishermen of Alaska (UFA) and Alaska Fisheries Development Foundation (AFDF) summarizes required documentation and permits for commercial fishing in Alaska.⁸⁴ Records of all BSAI crab fishers are maintained as part of licence and permit programs which contain information on their service and qualifications, including certificates of competency.^{85,86}

⁷⁹ <http://www.avtec.edu>

⁸⁰ <http://seagrant.uaf.edu/map/fishbiz/index.php>

⁸¹ <http://amsea.org>

⁸² <https://repository.library.noaa.gov/view/noaa/3063>

⁸³ https://repository.library.noaa.gov/view/noaa/4057/noaa_4057_DS1.pdf?

⁸⁴ <https://www.afdf.org/wp-content/uploads/Social-Responsibility-on-Vessels-in-Alaska-Med-Res-FINAL-2019-03-08.pdf>

⁸⁵ <http://www.fakr.noaa.gov/ram>

⁸⁶ <http://www.cfec.state.ak.us>

8.5. Section E. Implementation, Monitoring and Control

8.5.1. Fundamental Clause 10

An effective legal and administrative framework shall be established and compliance ensured through effective mechanisms for monitoring, surveillance, control and enforcement for all fishing activities within the jurisdiction.

Number of Supporting clauses	6
Supporting clauses applicable	2
Supporting clauses not applicable	4
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized evidence:

10.1. Enforcement agencies and framework:

There is a collaborative effort emphasizing the at-sea enforcement between the USCG and the AWT. Under joint management there are both state and federal laws to enforce, and both state and federal agents actively conduct at-sea enforcement. The USCG is responsible for enforcing the main federal vessel regulations: this includes safety at sea, drug enforcement, vessel compliance with ESA and EFH requirements and assuring compliance of federal permits, observer coverage, licenses and VMS in the crab fisheries. AWT have vessels that conduct at-sea compliance with gear regulations, capable of hauling and confiscating crab pots, sample crab harvests at sea, assure sex and size requirements are met and assure that the vessels have all required state and federal licenses. Additionally AWT, along with ADFG area biologists and technicians, conduct vessel inspections dockside, conducting hold inspections and observing offloads of harvested crab for compliance. The entire crab harvests are conducted in Alaskan waters by American vessels. No foreign fleet is allowed to fish in the Alaska's EEZ. Because the fishery was rationalized in 2005, most enforcement of IFQ/IPQ violations, as well as size, sex and season violations occur at offloading.

The NMFS Office of Law Enforcement with use of the United States Coast Guard's at-sea platforms is primarily responsible for enforcing crab regulations at sea, while the NMFS Office of Law Enforcement and the State of Alaska's Division of Wildlife Troopers (AWT) have that responsibility ashore. AWT spends about 90% of their effort doing dockside enforcement of offloaded crab (although The AWT vessel E/V Stinson also does at-sea enforcement, checking gear and catch for legal specification). The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50 CFR 679. . In 2019, there were a total of 989 federal fisheries & safety boardings documented by the US Coast Guard: 5 boardings for vessels fishing BBRKC, and 2 boardings for vessels fishing AIGKC. No notices of violation (NOVs) were issued⁸⁷ .

10.2./10.3/10.4. Fishing permit requirements:

All vessels harvesting BSAI crab must be authorized and permitted to fish, in accordance with federal regulations. Fishing vessels are not allowed to operate on the resource in question without specific authorization. All crab vessels participating in the BSAI rationalized crab fishery must obtain a Federal Crab Vessel Permit (FCVP).

An annual FCVP is required for owners of any vessel used in the rationalized crab fisheries (CR crab, includes IFQ/IPQ fisheries; CDQ fisheries except Norton Sound king crab; and the Golden King Crab allocation to Adak). Operation Type endorsements are: SFP (Stationary Floating Processor); CPR (catcher-processor); and CAT (catcher

⁸⁷ <https://meetings.npfmc.org/CommentReview/DownloadFile?p=41ec7c2b-41cb-42bc-99a8-ab7bac263fe9.pdf&fileName=B6%20USCG%202019%20Year%20in%20Review.pdf>

vessel). This permit has requirements for VMS and logbook reporting. A copy of the permit must be on board any vessel of the fishery and must be available for inspection at any time by an authorized officer.

As of January 1, 2000, a Federal LLP license is required for vessels participating in directed fishing for LLP groundfish species in the GOA or BSAI, or fishing in any BSAI LLP crab fisheries. A vessel must be named on an original LLP license that is onboard the vessel.

The crab fisheries under assessment here are harvested exclusively within the Alaska EEZ only.

Those fisheries are not part of any international agreement or part of a framework of sub-regional or regional fisheries management organizations or arrangements. No foreign fleet is allowed to fish in the Alaska's EEZ. All fishing vessels must be at least 75% U.S. ownership.

8.5.2. Fundamental Clause 11

There shall be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations.

Number of Supporting clauses	3
Supporting clauses applicable	2
Supporting clauses not applicable	1
Overall level of conformity	Full Conformity
Non Conformances	0

Summarized evidence:

11.1/11.2/11.3. Enforcement policies and regulations, state and federal:

11.1 National laws of adequate severity shall be in place that provide for effective sanctions.

The Magnuson-Stevens Act (MSA) provides four basic enforcement remedies for violations (50 CFR 600.740 Enforcement policy)⁸⁸:

1. Issuance of a citation (a type of warning), usually at the scene of the offense (see 15 CFR part 904, subpart E).
2. Assessment by the Administrator of a civil money penalty.
3. For certain violations, judicial forfeiture action against the vessel and its catch.
4. Criminal prosecution of the owner or operator for some offenses.

In some cases, the MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the MSA treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator.

On March 16, 2011, NOAA issued a new Penalty Policy that provided guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. In that Policy, the NOAA General Counsel's Office committed to periodic review of the Penalty Policy to consider revisions or modifications as appropriate. The July 2014 revised version of the Penalty Policy⁸⁹ is a result of that review. The purpose of the 2014 Policy is to ensure that;

1. Civil administrative penalties and permit sanctions are assessed in accordance with the laws that NOAA enforces in a fair and consistent manner;
2. Penalties and permit sanctions are appropriate for the gravity of the violation;
3. Penalties and permit sanctions are sufficient to deter both individual violators and the regulated community as a whole from committing violations;
4. Economic incentives for noncompliance are eliminated; and
5. Compliance is expeditiously achieved and maintained to protect natural resources.

⁹⁰In 2019, the NOAA policy was revised again. This revised Policy included legislation passed and regulations promulgated since issuance of the 2014 Policy, in particular:

- The Illegal, Unreported, and Unregulated Fishing Enforcement Act of 2015, Pub. L. 114-81, which implemented the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing and amended the enforcement provisions of a number of statutes administered by NOAA; and
- The most recent adjustments to the maximum civil monetary penalties authorized under statutes administered

⁸⁸ <https://www.law.cornell.edu/cfr/text/50/600.740>

⁸⁹ <https://www.gc.noaa.gov/enforce-office3.html>

⁹⁰ <https://www.gc.noaa.gov/documents/Penalty-Policy-CLEAN-June242019.pdf>

and enforced by NOAA, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990 (see 83 Fed. Reg. 706 (January 8, 2018)).

The effective date of this Policy is June 24, 2019. This Policy supersedes all previous guidance regarding the assessment of penalties or permit sanctions, and all previous penalty and permit sanction schedules issued by the NOAA Office of General Counsel.

For significant violations, the NOAA attorney may recommend charges under NOAA's civil administrative process (see 15 CFR Part 904), through issuance of a Notice of Violation and Assessment of a penalty (NOVA), Notice of Permit Sanction (NOPS), Notice of Intent to Deny Permit (NIDP), or some combination thereof. Alternatively, the NOAA attorney may recommend that there is a violation of a criminal provision that is sufficiently significant to warrant referral to a U.S. Attorney's office for criminal prosecution.

11.2 Sanctions applicable in respect of violations and illegal activities shall be adequate in severity to be effective in securing compliance and discouraging violations wherever they occur. Sanctions shall also be in force that affects authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures.

The MSA provides four basic enforcement remedies for violations (50 CFR 600.740 Enforcement policy):

1. Issuance of a citation, usually at the scene of the offense (see 15 CFR part 904, subpart E).
2. Assessment by the Administrator of a civil money penalty.
3. For certain violations, judicial forfeiture action against the vessel and its catch.
4. Criminal prosecution of the owner or operator for some offenses.

In some cases, the MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In summary, the MSA treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner/operator.

NOAA's OLE Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). GCEL can then assess a civil penalty in the form of a Notice of Permit Sanctions (NOPS) or Notice of Violation and Assessment (NOVAs), or they can refer the case to the U.S. Attorney's Office for criminal proceedings. For perpetual violators or those whose actions have severe impacts upon the resource criminal charges may range from severe monetary fines, boat seizures and/or imprisonment may be levied by the US Attorney's Office.

There are very few repeat offenders. Sanctions include the possibility of temporary or permanent revocation of fishing privileges. Withdrawal or suspensions of authorizations to serve as masters or officers of a fishing vessel are also among the enforcement options. Within the USA EEZ, penalties can range up through forfeiture of the catch to forfeiture of the vessel, including financial penalties and prison sentences.

Finally, the cooperation of citizens and industry is cultivated through programs such as AWT's Fish & Wildlife Safeguard program, which encourages the reporting of violations, and "leverages" the range of enforcers.

11.3 Flag States shall take enforcement measures in respect of fishing vessels entitled to fly their flag which have been found by them to have contravened applicable conservation and management measures, including, where appropriate, making the contravention of such measures an offence under national legislation.

Not applicable. The entire crab harvests are conducted in Alaskan waters by American vessels. No foreign fleet is allowed to fish in the Alaska's EEZ. All fishing vessels must be at least 75% U.S. ownership.

8.6. Section F. Serious Impacts of the Fishery on the Ecosystem

8.6.1. Fundamental Clause 12

Considerations of fishery interactions and effects on the ecosystem shall be based on best available science, local knowledge where it can be objectively verified and using a risk based management approach for determining most probable adverse impacts. Adverse impacts on the fishery on the ecosystem shall be appropriately assessed and effectively addressed.

Number of Supporting clauses	16
Supporting clauses applicable	16
Supporting clauses not applicable	0
Overall level of conformity	Medium Conformity
Non Conformances	1 open NC (no new NCs)

Summarized evidence:

12.1. Assessment of environmental effects on target stocks and ecosystem

There is an assessment of the impacts of environmental factors on target stocks and species belonging to the same ecosystem. NPFMC and NMFS regularly assess the impacts of environmental factors on BSAI crab stocks (e.g. Crab SAFE; NPFMC 2019)⁹¹ and other species belonging to the same ecosystem (e.g. Groundfish SAFE).⁹² Ecosystem assessments for BSAI crab fisheries are updated annually in the BSAI Crab SAFE. In 2019, an Ecosystem and Socioeconomic Profile (ESP) was introduced for St. Matthew Blue King Crab stock (Fedawa et al. 2019). The SMBKC ESP followed a new standardized framework for evaluating ecosystem and socioeconomic considerations, and may be considered a proving ground for potential operational use in main stock assessments. Additionally, the status of habitats and ecosystems are monitored within the broader framework of Alaska's large marine ecosystems and results are updated and published annually.⁹³ Collectively, these ecosystem assessments consider target stocks, associated or dependent species, and the relationship among populations in the ecosystem.

In 2018, the Council approved the Bering Sea Fisheries Ecosystem Plan (NPFMC 2019)⁹⁴, thereby formalizing its commitment to ecosystem-based fisheries management (EBFM) of the Bering Sea. The Council has acknowledged that moving toward EBFM is an ongoing process and as new information or tools become available the Council will respond by improving the fishery management program. The BS FEP will serve as a framework for continued incorporation of ecosystem goals and actions in regional management. The BS FEP sits alongside the Fishery Ecosystem Plan already developed for the Aleutian Islands (NPFMC 2007)⁹⁵ and it augments ongoing efforts for monitoring ecosystems in the Alaska Region.⁹⁶ Additional ongoing and related ecosystem research and monitoring initiatives are described in greater detail in the BSAI Crab Re-assessment Report⁹⁷.

In 2019, the Council initiated two Action Modules under the framework of the Bering Sea FEP. Taskforces have been created to accomplish their tasks over the course of 2-3 years.

The first taskforce will address a Climate Action Module whose goal is to evaluate the vulnerability of key species and fisheries to climate change, and to strengthen resilience in regional fisheries management.

⁹¹ <https://www.npfmc.org/safe-stock-assessment-and-fishery-evaluation-reports/>

⁹² <https://www.afsc.noaa.gov/REFM/stocks/assessments.htm>

⁹³ https://www.afsc.noaa.gov/refm/stocks/plan_team/2018/NovDraftDocs_2018.htm

⁹⁴ <http://meetings.npfmc.org/CommentReview/DownloadFile?p=9fd5d027-86a8-4983-a7e7-f456acc478bf.pdf&fileName=C4%20BS%20FEP.pdf>

⁹⁵ <https://www.npfmc.org/aleutian-islands-fishery-ecosystem-plan/>

⁹⁶ https://www.afsc.noaa.gov/refm/stocks/plan_team/2018/NovDraftDocs_2018.htm

⁹⁷ <https://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-crab/>

The second taskforce will address an Action Module on Local Knowledge (LK), Traditional Knowledge (TK) and Subsistence. Its goal is to develop protocols for using LK and TK in management, and to understand the impacts of Council decisions on subsistence resources, users, and practices.

12.2 Research and Institutional capacity for environmental impact assessment

Adverse environmental impacts on BSAI crab resources from human activities are assessed. NPFMC and NMFS conduct regular assessments of crab ecosystems and habitats and investigate how environmental factors affect crab resources (e.g. Chilton et al. 2011). Findings and conclusions are published in the Ecosystem section of the annual SAFE document (e.g. NPFMC 2019)⁹⁸, annual marine Ecosystem Status Reports⁹⁹, and scientific journals.^{100,101,102,103}

Currently, the best available science indicates that the largest impact resulting from human activities on BSAI crab resources, and more specifically, on the five stocks under consideration here, is fishing. Directed crab fishing as well as crab bycatch in other fisheries such as the groundfish fisheries is assessed yearly and accounted for appropriately through yearly stock assessment activities, and through the formulation of overfishing levels (OFLs), acceptable biological catches (ABCs), annual catch limits (ACLs), and total allowable catches (TACs). These determinations and actions are all documented in the yearly crab SAFE report compiled by ADFG, NMFS and NPFMC scientists.

NMFS examines the effects of non-fishing activities on EFH (Limpinsel et al. 2017)¹⁰⁴ and makes conservation recommendations designed to mitigate a range of activities that may have adverse impacts on EFH including: oil and gas exploration and development; vessel casualties that result in physical damage to living habitats or spill of toxic substances (i.e., oil spill); introduction of exotic species; depositional fill; marine dredging; mineral extraction; and waste water discharges. These conservation recommendations are included in the FMPs, and they have been reviewed by the staff of NMFS Alaska Region HCD. These recommendations are used by NMFS staff when consulting on effects to EFH by other agencies, and updating the FMPs to reflect the most recent recommendations may be a higher priority amendment for the Council to consider (Simpson et al. 2017).¹⁰⁵

Where the potential for adverse environmental impacts on crab resources does arise, there is evidence that the Council considers and undertakes appropriate corrective measures. For example, effects on crab EFH caused by fishing activities such as trawling are routinely assessed (see NOAA's recent EFH 5-year review summary report; Simpson et al. 2017). In addition, there is strong evidence that the Council and NMFS take measures to protect and conserve EFH and HAPCs through establishment of habitat protection areas and habitat conservation areas.

More broadly, NEPA processes ensure that human activities with potential to impact BSAI crab resources are assessed and, where appropriate, corrected. The Council's analytical review documents that evaluate proposed changes to the conservation and management of groundfish and shellfish stocks for which they are responsible, are NEPA compliant documents. These documents are widely distributed and made available so that the public at large and other natural resource, management or development agencies will have an opportunity to testify or comment on possible impacts to their sphere of influence. In like manner, when other resource, development or

⁹⁸ <https://www.npfmc.org/safe-stock-assessment-and-fishery-evaluation-reports/>

⁹⁹ <https://access.afsc.noaa.gov/REFM/REEM/ecoweb/index.php>

¹⁰⁰ <https://academic.oup.com/icesims/article/73/3/849/2458912>

¹⁰¹ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0060959>

¹⁰² <https://doi.org/10.1371/journal.pone.0178955>

¹⁰³ <https://www.sciencedirect.com/science/article/abs/pii/S0165783619302723>

¹⁰⁴ ftp://ftp.library.noaa.gov/noaa_documents.lib/NMFS/TM_NMFS_AFKR/TM_NMFS_FAKR_14.pdf

¹⁰⁵ <https://alaskafisheries.noaa.gov/habitat/efh>

management agencies that receive federal funds wish to implement new activities or develop new regulations that may impact fisheries under the auspices of the Council, they must also develop NEPA documents which show their project's plan conform to existing Council FMPs and seek comments from the Council on ways that their proposed activities may impact the resources under Council jurisdiction.

As discussed under Supporting Clause 2.1, NEPA requires federal agencies to prepare Environmental Assessments or Environmental Impact Statements prior to making decisions. The President's Council on Environmental Quality, referred to as CEQ, which was established along with NEPA, has adopted regulations and other guidance that provide general procedures for federal agencies to follow when preparing these documents. Moreover, each federal agency has adopted its own detailed NEPA procedures, and the federal courts, after more than 30 years of litigation, have played a major role in shaping NEPA's interpretation and implementation. Further details of the process can be found in The NEPA Book¹⁰⁶ and A Citizen's Guide to NEPA.¹⁰⁷

12.3./12.4/12.5/12.6. Fishery Interaction with the ecosystem, non-target catches, discards associated, dependent or endangered species

The management system considers the most probable adverse impacts of BSAI crab fisheries on the ecosystem/environment, taking into account available scientific information and local knowledge. Where the risk of adverse impact of crab fisheries on the ecosystem or environment is greater, the Council seeks more specific evidence to support management action by, for example, identifying research priorities and coordinating research plans. Chilton *et al.* (2011)¹⁰⁸ provide a good summary of available scientific information on the most probable adverse impacts of BSAI crab fisheries on the ecosystem/environment.

The fishery management system addresses impacts that are likely to have serious consequences. NPFMC and NMFS conduct regular assessments of crab ecosystems and habitats and investigate how environmental factors affect crab resources. Findings and conclusions are published in the Ecosystem section of the annual SAFE document, annual Ecosystem Status Reports, and scientific journals (see above rationale for RFM Supporting Clause 12.2).

Decisions regarding management responses always proceed from the best available scientific information. Management responses may be immediate (e.g. a Category 2 response taken by the State such as in-season adjustments) or they may be more protracted, following on further analysis of the identified risk (e.g. a Category 1 response such as a decision taken by the Council and NMFS to amend the Crab FMP). The BSAI Crab FMP was recently amended^{109,110} to update the description and identification of essential fish habitat (EFH), and to update information on adverse impacts to EFH based on the best scientific information available.

Appropriate measures are applied to minimize the catch, waste and discards of non-target species (of both fish and non-fish species), and to minimize impacts on associated, dependent or endangered species. The BSAI crab fisheries under consideration here have relatively low levels of catch of non-target species and are therefore often described as "clean" fisheries (C. Siddon, ADFG; pers. comm.). The majority of non-target species taken in each of the five fisheries are mostly crab. A limited number of groundfish, such as Pacific cod, Pacific halibut, yellowfin sole, and sculpin (*Myoxocephalus* spp.), are caught in the directed pot fishery (Barnard and Burt 2008; Gaeuman

¹⁰⁶ http://www.solano.com/old_site_02/oldsite/bookinfo_nepa.htm

¹⁰⁷ https://ceq.doe.gov/get-involved/citizens_guide_to_nepa.html

¹⁰⁸ http://www.npfmc.org/wp-content/PDFdocuments/resources/SAFE/CrabSAFE/511Chapters/Ecosystem_CrabSAFE.pdf

¹⁰⁹ <https://www.fisheries.noaa.gov/action/amendment-49-fmp-bering-sea-aleutian-islands-king-and-tanner-crabs>

¹¹⁰ <https://www.federalregister.gov/documents/2018/07/05/2018-14347/fisheries-of-the-exclusive-economic-zone-off-alaska-essential-fish-habitat-amendments>

2014).^{111,112} The invertebrate component of bycatch includes echinoderms (sea stars and sea urchins), snails, non-FMP crab (hermit crabs and lyre crabs), and other invertebrates (sponges, octopus, anemone, and jellyfish). Typically, low levels of bycatch of these species do not impact their abundance (Final EIS, NMFS 2004).¹¹³ Appropriate conservation and management measures are applied to BSAI crab fisheries to minimize levels of catch, waste and discards of non-target species (crab, fish and non-fish species). Gear modifications are described in the Crab FMP (NPFMC 2011).

ADFG has in place a mandatory observer program for BSAI crab fisheries (see Gaeuman 2014). Non-target catches, including discards, of stocks other than the “stock under consideration” are monitored. ADFG maintains an observer database and provides relevant information to stock assessment authors (M. Stichert, pers. comm.) Representative bycatch data from the ADFG summary reports were presented in the BSAI Crab Re-assessment Report.¹¹⁴

Management objectives exist which seek to ensure that endangered species are protected from adverse impacts resulting from interactions with BSAI crab fisheries. All U.S. fisheries management, including that of BSAI crab fisheries, must be consistent with the Magnuson-Stevens Act (MSA), the Marine Mammal Protection Act (MMPA)¹¹⁵, and the U.S. Endangered Species Act (ESA).¹¹⁶ Each of these acts establishes management guidelines, objectives and legal protections for threatened and endangered species.

12.7. Role of the “stock under consideration” in the ecosystem

The role of BSAI crab stocks in the food web is adequately considered. King and Tanner crab stocks under assessment are not considered key prey species in BSAI ecosystems.

12.8. Pollution – MARPOL

Laws and regulations based on the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) are in place and enforced.^{117, 118}

12.9. Knowledge of the essential habitats for the “stock under consideration” and potential fishery impacts on them.

In accordance with requirements of the MSA, management agencies have knowledge of essential fish habitat (EFH) for the BSAI crab stocks under consideration. The potential for fishery impacts on EFH is assessed. Management systems ensure that fishery impacts on EFH and on habitats that are highly vulnerable to damage by the fishing gear are avoided, minimized or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat is considered.

Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of essential fish habitat: “waters” includes aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom structures underlying the waters, and associated

¹¹¹ <http://www.adfg.alaska.gov/FedAidPDFs/fds08-17.pdf>

¹¹² <http://www.adfg.alaska.gov/FedAidPDFs/FDS14-49.pdf>

¹¹³ <https://alaskafisheries.noaa.gov/sites/default/files/analyses/crabeis0804-chapters.pdf>

¹¹⁴ <https://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-crab/>

¹¹⁵ <http://www.nmfs.noaa.gov/pr/laws/mmpa/>

¹¹⁶ <https://www.fws.gov/endangered/laws-policies/>

¹¹⁷ <https://www.blankrome.com/publications/marpol-enforcement-united-states>

¹¹⁸ <https://www.epa.gov/enforcement/act-prevent-pollution-ships-apps-enforcement-case-resolutions>

biological communities; “necessary” means the habitat required to support a sustainable fishery and a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle (see Crab FMP; NPFMC 2011). The MSA requires fishery management plans to describe and identify EFH, minimize to the extent practicable adverse effects of fishing on EFH, and identify other actions to conserve and enhance EFH (16 U.S.C. 1853(a)(7)). The NPFMC and NMFS identify and describe crab EFH in section Appendix D.3 of the Fishery Management Plan for BSAI king and Tanner crab (NPFMC 2011).

NPFMC initiated a review of EFH in 2015 and found there had been large advances in EFH information, and in particular there had been a substantial refinement of EFH maps for fish and crab species (Simpson et al. 2017). Refinements were obtained through an analysis to determine the environmental influences on species distributions and this information was used to improve EFH maps. These maps provide EFH Level 2 information (habitat-related densities) for the adult life stage for many FMP species and EFH Level 1 information (habitat distribution) for the juvenile life stages of some FMP species. These maps also provide a solid foundation for the next 5 years of EFH research. According to the most recent NPFMC review of EFH, during 2006-2016 NMFS had spent about \$5 M in total on 91 EFH projects in Alaska resulting in 74 scientific publications (NPFMC 2016).

In 2018, NMFS published the Final Environmental Assessment for Essential Fish Habit Omnibus Amendments¹¹⁹ which included Amendment 49 to the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs. FMP amendment 49, which was approved on May 31, 2018 (Final Rule: 83 FR 31340), updates the description and identification of essential fish habitat (EFH), and updates information on adverse impacts to EFH based on the best scientific information available.

NMFS has also released a five-year plan for EFH research (Sigler et al. 2017).¹²⁰ The new EFH research plan retains the original long-term goals that have guided EFH research in Alaska since 2005, namely: 1) characterize habitat utilization and productivity; 2) assess habitat sensitivity and recovery; 3) validate and improve fishing impacts model; 4) map the seafloor; and 5) assess coastal habitats facing development. However, the 2017 EFH plan recognizes two specific objectives that are to be achieved over the next five years: 1) Develop EFH Level 1 information (distribution) for life stages and areas where missing; and 2) Raise EFH level from Level 1 or 2 (habitat-related densities) to Level 3 (habitat-related growth, reproduction, or survival rates). In addition, a recent report by the Alaska Regional Habitat Assessment Prioritization Team (McConnaughey et al. 2017)¹²¹ assigned prioritization scores to the five crab stocks under consideration here that were either ‘high’ (AI Golden King Crab, BB Red King Crab, SM Blue King Crab and EBS snow crab) or ‘medium’ (EBS Tanner crab).

12.10. Research shall be promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities.

Management agencies actively promote research on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities. The Council, AFSC and the NPRB all annually produce a list of research priorities^{122,123, 124} that focus on timely and important management concerns. This list helps NMFS, NPRB and other research funding agencies focus their tight research funds to resolve topical fishery management issues. For BSAI crab fisheries, the Council has established an explicit “Research and Management Objective” in the crab FMP (NPFMC 2011) to provide fisheries research, data

¹¹⁹ <https://alaskafisheries.noaa.gov/sites/default/files/analyses/efh-omnibus-amendments-ea0618.pdf>

¹²⁰ <http://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-05.pdf>

¹²¹ <https://repository.library.noaa.gov/view/noaa/15500>

¹²² <https://www.npfmc.org/research-priorities/>

¹²³ https://www.afsc.noaa.gov/program_reviews/2017/2017_Core_Documents/FY18%20AFSC%20AGM.pdf

¹²⁴ <https://www.nprb.org/nprb>

collection, and analysis to ensure a sound information base for management decisions. The Crab Plan Team regularly updates research priorities which are made available online via the NPFMC Research Priority Database.¹²⁵ Other organizations are also actively involved in relevant research on the environmental impacts of fishing gear on biodiversity, habitats, socioeconomics and ecosystems as previously described for RFM Fundamental Clause 2.

12.11. Outcome indicator(s) and management objectives for non-target stocks.

There are outcome indicators for non-target stocks taken in the BSAI crab fisheries. These outcome indicators are consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible). Evidence is presented below in relation to four categories of non-target stock: 1. Crab (FMP species); 2. Finfish; 3. Invertebrates; and 4. Seabirds.

Crab Bycatch (crab FMP species)

The largest component of bycatch in BSAI crab fisheries is crab (undersized, female, and non-target species). For those crab species falling within the scope of certification¹²⁶ and within the scope of the BSAI king and Tanner crab FMP (Bristol Bay red king crab, *Paralithodes camtschaticus*, St. Matthew blue king crab, *P. platypus*, Aleutian Islands golden (or brown) king crab, *Lithodes aequispinus*, Eastern Bering Sea Tanner crab, *Chionoecetes bairdi*, and Eastern Bering Sea snow crab, *C. opilio*), outcome indicators are explicitly incorporated into the Council's five-tiered system for stock assessment. Non-target crab bycatch of FMP species in directed crab fisheries, as well as FMP crab bycatch in other fisheries (such as the groundfish fisheries) is assessed yearly and corrected appropriately through yearly stock assessment activities, and through the formulation of overfishing levels (OFLs), acceptable biological catches (ABCs), annual catch limits (ACLs), and total allowable catches (TACs). These determinations and actions are all documented in the yearly crab SAFE report compiled by ADFG, NMFS and NPFMC scientists (e.g. Crab SAFE, NPFMC 2019)¹²⁷. Annual NMFS bottom trawl surveys (Zacher et al. 2019)¹²⁸ collect fishery-independent data on the distribution and abundance of crab, groundfish, and other benthic resources in the eastern Bering Sea. These data are used to estimate population abundances for the management of commercially important species in the region.

Finfish Bycatch

The ADFG observer program collects data to monitor bycatch in BSAI crab fisheries. Finfish - including a number of crab predators, especially Pacific cod, halibut, yellowfin sole and sculpin - account for the greatest proportion of estimated crab pot bycatch (Final EIS, NMFS 2004)¹²⁹. These species are widely distributed and highly abundant representatives of the greater groundfish community. Pacific cod is managed by NPFMC as a tier 3 stock in the Eastern Bering Sea (Thompson 2017)¹³⁰, yellowfin sole is managed as a tier 1 stock in BSAI (Wilderbuer et al. 2017)¹³¹, and BSAI sculpin are managed by NPFMC as a species complex within tier 5 (Spies et al. 2017)¹³². As such, there are outcome indicators whose explicit aim is to avoid overfishing. Similarly, outcome indicators (reference points) exist for Pacific halibut, a species managed by the International Pacific Halibut Commission (IPHC). Halibut fisheries are closely monitored, heavily regulated, and the resource is currently healthy (not subject to overfishing

¹²⁵ <https://www.npfmc.org/research-priorities/>

¹²⁶ Excludes crab stocks managed exclusively by the State of Alaska (Aleutian Islands Tanner crab, Dutch Harbor red king crab, St. Matthew golden king crab, and St. Lawrence blue king crab; NPFMC 2018) as well as FMP crab stocks which are subject to stock assessment and fishery evaluation (SAFE) but which not included in the unit of certification (Pribilof Islands red king crab, Pribilof Islands blue king crab, Norton Sound red king crab, Adak red king crab and Pribilof Islands golden king crab).

¹²⁷ <https://www.npfmc.org/safe-stock-assessment-and-fishery-evaluation-reports/>

¹²⁸ <https://www.fisheries.noaa.gov/resource/document/draft-technical-memorandum-2019-eastern-bering-sea-continental-shelf-trawl-survey>

¹²⁹ <https://alaskafisheries.noaa.gov/sites/default/files/analyses/crabeis0804-chapters.pdf>

¹³⁰ <https://www.afsc.noaa.gov/REFM/Docs/2017/EBSpcod.pdf>

¹³¹ <https://www.afsc.noaa.gov/REFM/Docs/2017/BSAlyfin.pdf>

¹³² <https://www.afsc.noaa.gov/REFM/Docs/2017/BSAIsculpin.pdf>

and not overfished; IPHC 2019)¹³³. In the Final Environmental Impact Statement for BSAI crab fisheries, it was concluded that the effects on species caught as bycatch in the BSAI crab fisheries are insignificant (NMFS 2004).

Invertebrate Bycatch (excluding crab FMP species)

Data on invertebrate bycatch are also collected in the ADFG observer program. These data were reviewed by NMFS during preparation of the Final Environmental impact Statement for BSAI crab fisheries (NMFS 2004). The following excerpt from the Final EIS discusses invertebrate bycatch: Crab pot bycatch is deemed insignificant for any population of other benthic species routinely caught in the major eastern Bering Sea crab fisheries. Fishes including Pacific cod, yellowfin sole, Pacific halibut, sculpin, walleye pollock, other flatfish, and skates all have very high abundance relative to the level of estimated pot bycatch. Gastropods and echinoderms comprise a major portion of the total biomass of the eastern Bering Sea and small losses due to pot bycatch would have little significance. In some cases crab pot bycatch have become part of small dedicated fisheries as for snails, octopus, and Korean hair crab. Minor losses of other invertebrates are not estimable but assumed to be relatively insignificant. In addition, the minor amount of these species caught as bycatch does not result in declines in species diversity because it does not cause a decline in any species abundance. From this information, NOAA Fisheries concludes that status quo has an insignificant effect on the population levels of benthic species caught as bycatch.

Seabirds

NOAA's National Marine Fisheries Service annually updates their estimates of seabirds caught as bycatch in commercial groundfish fisheries operating in Federal waters off Alaska (Eich et al. 2016, 2017, 2018; Kriefer et al. 2019). The most recent catch accounting data from 2007 through 2015 attribute 88% of seabird bycatch in the groundfish and halibut fisheries (hook-and-line, trawl, and pot gear, combined) to hook-and-line fisheries, 10% to trawl fisheries, and < 2.5% to pot fisheries. NMFS (2004) indicated that the bycatch of non-ESA listed seabirds in groundfish and crab pot fisheries is approximately 100 birds per year consisting of primarily northern fulmars. NMFS (2004) concluded that fisheries on crab FMP species have very limited interactions with seabirds and that the interactions that do occur do not impact any species of seabird on a population level (see RFM Supporting Clause 12.12 for further discussion about the potential for crab fisheries to interact with ESA-listed seabird species).

12.12. Outcome indicator(s) and management objectives for endangered species.

There are outcome indicators consistent with ensuring that endangered species are protected from adverse impacts resulting from interactions with BSAI crab fisheries (including recruitment overfishing or other impacts) that are likely to be irreversible or very slowly reversible. Ongoing programs that monitor outcome indicators help to ensure that adverse impacts to endangered species do not arise.

The Marine Mammal Protection Act (MMPA) requires stock assessment reports to be reviewed annually for stocks designated as strategic, annually for stocks where there is significant new information available, and at least once every three years for all other stocks. Each stock assessment includes, when available, a description of the stock's geographic range, a minimum population estimate, current population trends, current and maximum net productivity rates, optimum sustainable population levels and allowable removal levels, and estimates of annual human-caused mortality and serious injury through interactions with commercial fisheries and subsistence hunters (see Muto et al. 2019 for the most recent Marine Mammal stock assessment for the Alaska region).¹³⁴

¹³³ <https://iphc.int/uploads/pdf/am/2019am/iphc-2019-am095-r.pdf>

¹³⁴ <https://repository.library.noaa.gov/view/noaa/18114>

The annual Ecosystems Status Reports¹³⁵ for the Aleutian Islands (Zador and Ortiz 2018) and Eastern Bering Sea (Siddon and Zador 2018, 2019) elaborate on additional outcome indicators which are consistent with monitoring for adverse impacts on endangered species. For marine mammals, ecosystem indicators include estimations of stock abundance and/or related parameters for Stellar sea lions, northern fur seals, harbor seals, arctic ice seals (bearded seal, ribbon seal, ringed seal, spotted seal) and bowhead whales. For seabirds, the EBS Ecosystem Status Report includes an Integrated Seabird Information section which synthesizes seabird information to provide an overview of environmental impacts to seabirds and what that may indicate for ecosystem productivity as it pertains to fisheries management. Seabird information comes a wide variety of sources including long-term monitoring programs such as the Alaska Maritime National Wildlife Refuge (e.g. 2019 Seabird Report Card) as well as agency/university researchers, citizen science organizations, and coastal community members.

As noted in the Crab Ecosystem Considerations Report (Chilton et al. 2011)¹³⁶, there is very limited potential for BSAI crab fisheries to have adverse impacts on endangered species or marine mammals. The USFWS website¹³⁷ identifies three seabird species that are listed as endangered or threatened in Alaska: Steller's eider, *Polysticta stelleri* (threatened); Spectacled eider, *Somateria fischeri* (threatened); and Short-tailed albatross, *Phoebastria albatrus* (endangered). In the Final EIS for BSAI crab (NMFS 2004), NOAA Fisheries concluded that the actions considered in the Biological Assessment are not likely to (1) adversely affect the listed seabirds, or (2) destroy or adversely modify designated critical habitat. Results from ongoing monitoring of seabirds (Eich 2016) continue to support the conclusion that there is little if any bycatch of these species in BSAI crab fisheries.

12.13. Outcome indicator(s) and management objectives for avoiding, minimizing or mitigating the impacts of the unit of certification on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.

The management system has well-established outcome indicators for avoiding, minimizing or mitigating impacts to essential fish habitat (EFH) for four of the assessed stocks. BB red king crab, SM blue king crab, EBS snow crab, and EBS Tanner crab fisheries are not typically prosecuted in areas with habitats that are highly vulnerable to damage by pots. Outcome indicators for these units of assessment are consistent with achieving management objectives. A more detailed description of the evidence which supports this conclusion can be found in the BSAI Crab Re-Assessment Report¹³⁸.

As described in the BSAI Crab Re-assessment Report, the Aleutian Islands golden king crab fishery takes place in deep water areas where coral and sponge habitats may be adversely impacted by bottom contact gear such as pots. For the AI GKC unit of certification, it was not shown that outcome indicators are in place that are consistent with avoiding, minimizing, or mitigating the impact on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification (i.e. pots). For example, there are no spatial analyses available which would allow an estimation of current and historic overlap of AIGKC pot fishing effort with the distribution of vulnerable coral and sponge habitats in the Aleutian Islands. The AIGKC unit of certification was therefore assigned a medium confidence rating for clause 12.13 and, consequently, a minor non-conformity was raised at re-assessment (SAI Global 2017).

The Bering Sea Crab Client Group (BSCCG) prepared a corrective action plan to address the minor non-conformance. The plan was accepted by the assessment team and was incorporated into the re-assessment report. According to the action plan, BSCCG will perform...

¹³⁵ <https://www.fisheries.noaa.gov/resource/document/alaska-marine-mammal-stock-assessments-2018>

¹³⁶ http://www.npfmc.org/wp-content/PDFdocuments/resources/SAFE/CrabSAFE/511Chapters/Ecosystem_CrabSAFE.pdf

¹³⁷ <https://www.fws.gov/alaska/fisheries/endangered/listing.htm>

¹³⁸ <https://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-crab/>

1. a complete historical spatial review of fishing effort as depicted in Figures 1 and 2 of this document which will include analysis of fishing effort in relation to the distribution of sensitive coral and sponge habitat using the best available information.
2. an update of the recent season's fishing effort in proximity to the coral closure areas.
3. a review of AIGKC observer pot bycatch data for coral species to evaluate trends in bycatch CPUE.

During the second surveillance assessment, the team evaluated client progress against the plan. The assessment team concluded that the client had satisfactorily completed item #2 of the action plan and was "on target" to complete items #1 and #3. These determinations were documented in the 2nd surveillance report¹³⁹.

On April 7, 2020, the assessment team received an update to the corrective action plan to address Minor Non-Conformance #2 (Clause 12.13) with respect to indicators for monitoring the potential impact of the AI Golden King Crab unit of certification on sensitive or vulnerable habitats.

The client's corrective action plan (CAP) has three parts:

- 1) Mapping of AIGKC fishing effort onto known/modeled distribution of sensitive habitats.
- 2) Review of spatial distribution of AIGKC pot fishing effort in relation to spatial closures.
- 3) Quantifying coral bycatch rates and trends using observer data from the AIGKC fishery.

With respect to part #1 of the CAP, the update from BSCCG indicates that this action is ongoing. It describes progress made to resolve concerns about the confidentiality of data. No new quantitative information is given but the described action is essential for completing part #1 of the CAP. BSCCG intends to provide an update on part #1 as soon as possible. The assessment team should request to see quantitative data in advance of the next surveillance audit. **Conclusion:** on target.

With respect to CAP part #3, the update provides the team with a first multi-year (2007-2017) summary of the ADFG observer data for coral bycatch in the AIGKC fishery. The bycatch summary is necessarily preliminary and brief. It does not elaborate on species compositions, quantity of bycatch (no. or pieces or wt. per pot), or other qualitative factors and there are concerns about the consistency of data collection/handling over time. This may prevent BSCCG from doing a "before and after comparison" of bycatch rates relative to area closures as originally envisioned. It is the team view, that it may be more desirable to relate observations on coral bycatch incidence rates to results of CAP part#1. Regardless, the update demonstrates progress towards completing the agreed action. **Conclusion:** on target

In summary, it is the team view that the update describes satisfactory progress made by the client to address NC#2 according to the agreed time frame.

¹³⁹ <https://uploads.alaskaseafood.org/2019/04/Form-9g-BSAI-CRAB-AKRFM-2nd-Surveillance-Audit-Report-April-2019.pdf>

Update on Corrective Action Plan – for minor non-conformances in the Aleutian Islands Golden King Crab Unit of Assessment. Ref: fm13/AK/CRA/2017

Date: April 6, 2020

From: Bering Sea Crab Client Group (BSCCG)
Mr. Scott Goodman (Executive Director)
Bering Sea Fisheries Research Foundation (BSFRF)
4039 21st Avenue W, Suite 404
Seattle, WA 98199
(BSCCG is wholly owned subsidiary of BSFRF)

To: Dr. Ivan Mateo, Ph.D
Fisheries Assessment Officer
3rd Floor, Block 3
Quayside Business Park
Mill Street, Dundalk
Co. Louth, Ireland

RE: Update on **Corrective Action Plan** – for minor non-conformances in the Aleutian Islands Golden King Crab Unit of Assessment. Ref: fm13/AK/CRA/2017
(Conducted as part of U.S. Alaska Bering Sea and Aleutian Islands King, Tanner and Snow Crab Commercial Fisheries – Re and Full Assessments, 2019/2020)

Dear Dr. Mateo,

Please find this summary below to be an update of our January 2019 report on our collaborative work to address the three Action Plan items originally referenced in August 2017. The items covered in this update address summary information from spatial review of bycatch in the AIGKC fishery, specifically with reference to documented bycatch of sensitive species (coral, etc.) and compliance with area closures. These primary focus items in this update are #s 2 and 3 in the Action Plan, but I have provided a status update for #1, also.

Action Plan Item 1: Historical spatial review of AIGKC pot fishing effort

We have worked with Dr. Chris Siddon and staff (ADFG, Juneau) toward more progress of mapping and reviewing spatial effort. As we noted in our prior updates the detailed work steps involved in spatially reviewing the fishing activity require closely reconciling the positional information of fishing data which is confidential based on State of Alaska policies for data from 3 or fewer entities. The fishermen have agreed to sign waivers of confidentiality for other related spatial research in the area, which has allowed us to review and provide the updated mapping results. Generally, the current spatial review of annual effort conducted by ADFG is completed as part of AIGKC pot survey research planning. The survey planning involves mapping of gridded spatial areas of historical fishing activity in both eastern and western AIGKC districts and selecting focused seasonal survey areas for continued surveying. This review is represented in Figure 1 below by the three most recent mapping reviews. The AIGKC eastern and western pot survey effort is currently in its sixth season, and survey data is incorporated into the AIGKC stock assessment model along with the standard pot fishery CPUE data. If further information is required regarding how annual spatial reviews are completed, or how the resulting data is used in the assessment, Dr. Siddon and Dr. Shareef Sideek (ADFG, Juneau).

Action Plan Item 2: Update of recent fishing season effort in proximity to closure areas

We have completed a review of the updated charting through the most recent season available (2017/18) of AIGKC pot fishing effort overlain with the closure areas (6 polygonal no-fishing areas). Figure 2 from ADFG staff continues to reflect a high degree of compliance of no fishing activity within the closed areas. There are approximately 18,300 GKC pots observed over the period after the closures went into effect through the most recently available data (2007-2018). For this update there are no new instances of pot effort reported inside the closure areas. As noted in our last update, there were two (2) observed pots reported inside the southern-most closure area that reflected 99.88% of pots were observed and reported outside the closures in 2013. We reviewed the information with Dr. Siddon and ADFG staff and have concluded that observations for the 2 pots of interest may contain positional errors. Further, part of required compliance during AIGKC fishing operations is an active vessel monitoring system (VMS) which documents each boat's activity with a high degree of positional precision, especially adjacent to closed or sensitive areas. We consulted with all fishermen in the stakeholder group and further with ADFG Westward Region staff (Kodiak and Dutch Harbor) and NMFS (Dutch Harbor) and have found no evidence of a VMS report of activity inside the closed area of interest.

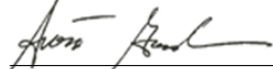
Action Plan Item 3: A review of AIGKC observer pot bycatch data for coral species to evaluate trends in bycatch CPUE

In collaboration with ADFG staff in Juneau, we have completed another update of the bycatch database from the AIGKC observer data over the period of interest (2007-2018). As in the prior update, there has been some aggregation to present information that may be confidential and these are unofficial summary runs from the observer database. Figure 3 below shows the email and table from Mr. L. Hulbert (ADFG, Juneau) in response to our update. As we reported in our preparations of the Action Plan, the coral bycatch rates are variable, but are consistently declining over the last 5 reported years (2014-2018). On average, the summary suggests that about 28% of observed pots have coral bycatch. Coral bycatch, as defined in the observer records, has not been further reviewed at this time to ascertain relative differences between pots with single or many pieces of coral, or any other qualitative factors that may help with further understanding of documented bycatch. We have not conducted a review of these incidence rates further back in time to compare periods before and after the spatial closures. ADFG staff have reported that both database methods and staff tasking have influenced the consistency of the records available to complete a consistent review of "before and after" coral bycatch rates. Given that trends in compliance to avoid identified areas are high, trends of incidence with coral as observed are declining, and that annual spatial reviews are now a normal part of survey planning, a further spatial review before and after coral closures is unnecessary.

We look forward to providing you with further Action Plan updates and continuing toward full compliance for the AIGKC pot fishery. We hope this information will assist with your surveillance and review. Please let me know if there are further questions you may have at this time.

Sincerely,

BERING SEA CRAB CLIENT GROUP LLC



Scott Goodman (BSFRF, Executive Director)

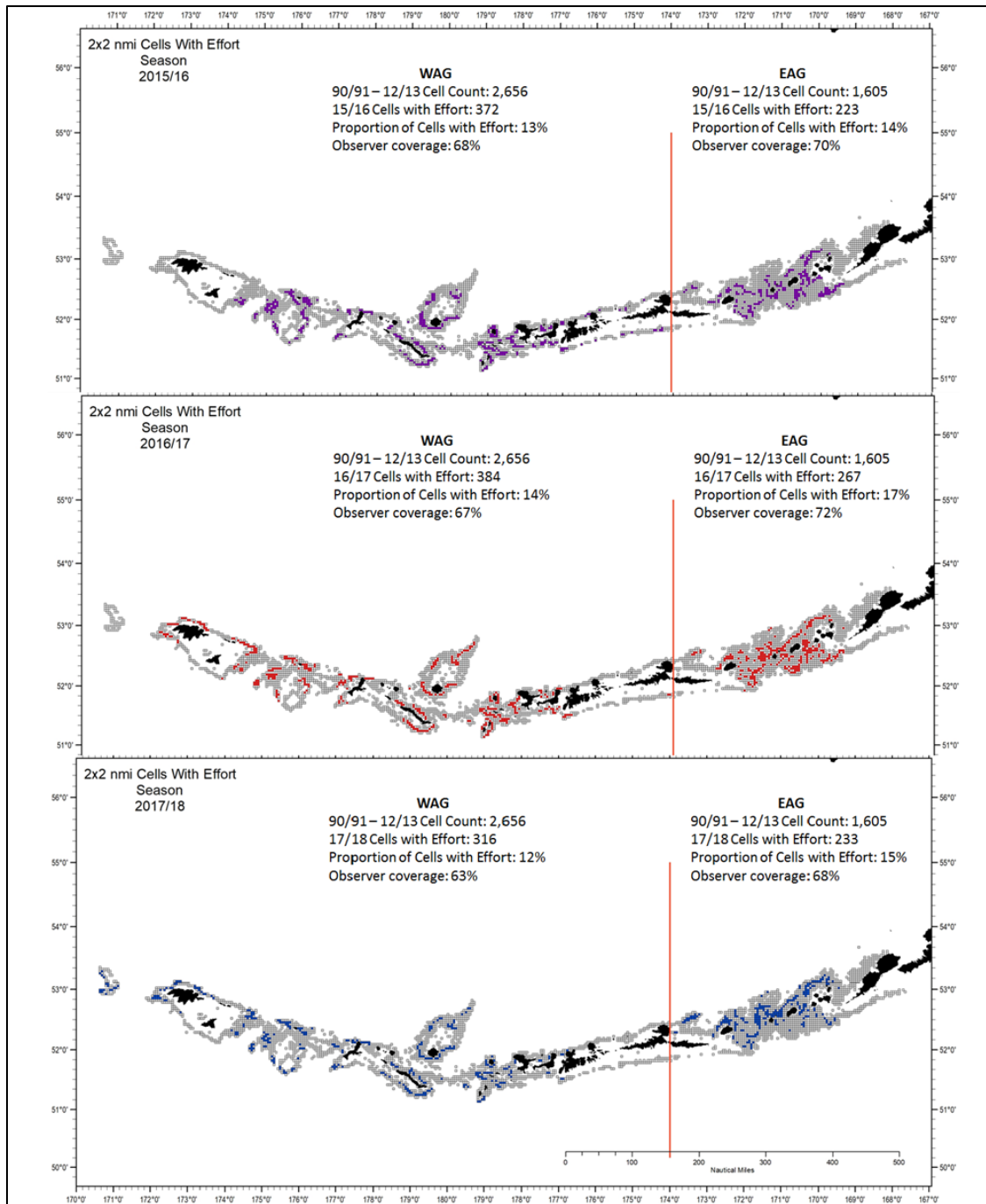


Figure 1. Updated spatial review and mapping of AIGKC pot effort in three most recently completed and reviewed seasons for western (WAG) and eastern (EAG) AIGKC survey planning. Source: ADF&G, C. Siddon, L. Hulbert (Spatial data may be confidential).

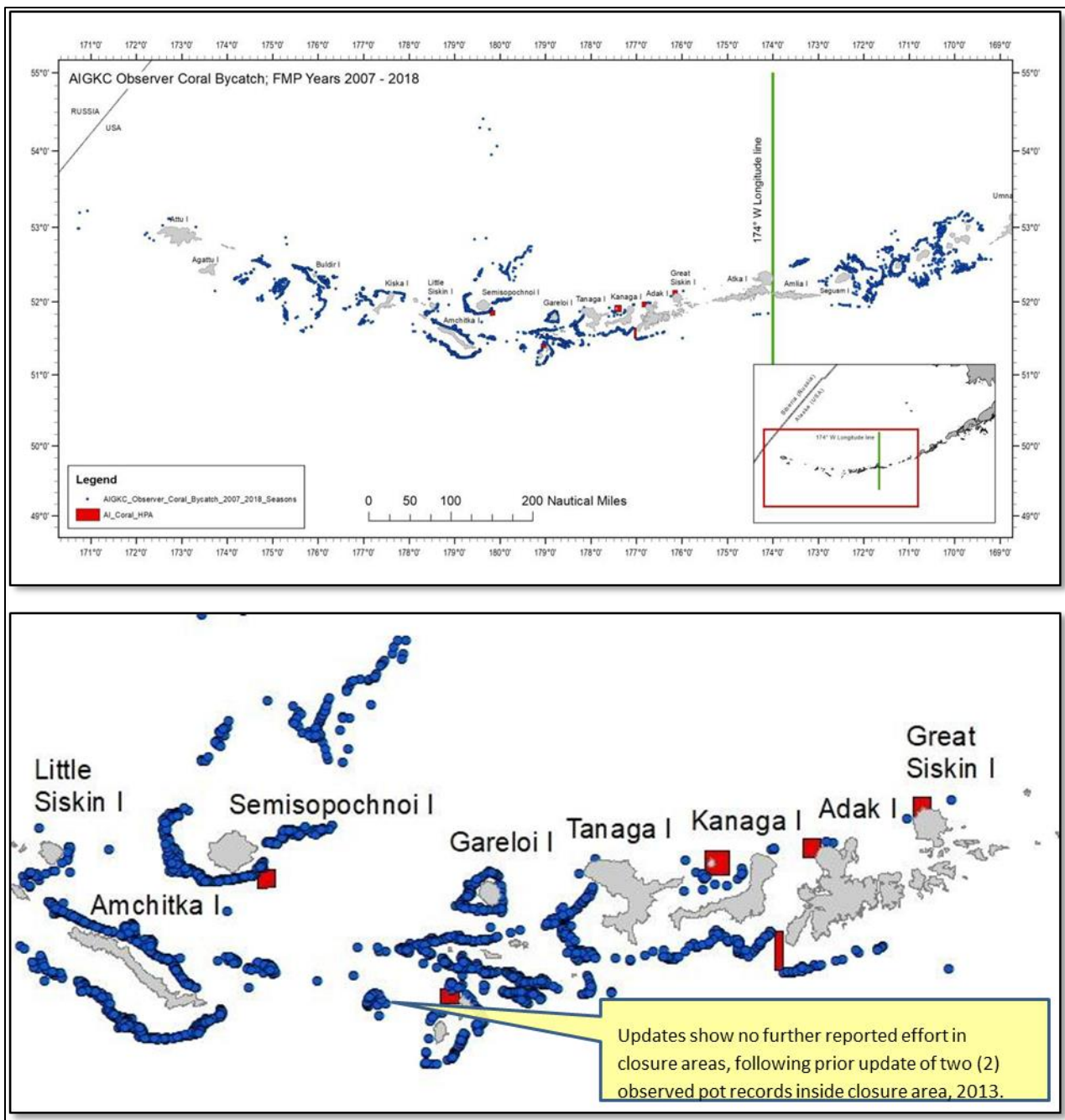


Figure 2. Updated spatial plot of AIGKC pot effort in proximity to AI Coral Closure Areas, 2007-2018 (top panel total area, bottom panel zoomed into red closure areas reflecting no further reported effort inside closure areas). Source: ADF&G, C. Siddon, L. Hulbert (Spatial data may be confidential).

It is important to acknowledge that in the time since re-assessment of the BSAI crab fisheries, there have been a number of advances made with respect to the knowledge base for habitat outcome indicators. Amendment 49 to the BSAI Crab FMP, which was approved on May 31, 2018 (Final Rule: 83 FR 31340), updates the description and

identification of essential fish habitat (EFH), and updates information on adverse impacts to EFH based on the best scientific information available. New or updated information sources include scientific publications by Goddard et al. (2017)¹⁴⁰, MacLean et al. (2017)¹⁴¹, Rooper et al. (2017, 2018)^{142,143}, Stone and Cairns (2017), and Wilborn et al. (2018), as well as a discussion paper on the effects of EFH in Alaska (NPFMC 2017)¹⁴⁴ and a Technical Memorandum summarizing the research completed under the Alaska Deep-Sea Coral and Sponge Initiative (Rooper et al. 2017)¹⁴⁵.

12.14. Outcome indicator(s) and management objectives for dependent predators.

There are outcome indicators consistent with achieving avoidance of severe adverse impacts on dependent predators resulting from fishing on BSAI crab stocks (e.g. as described in supporting clause 12.12 with regard to indicators for marine mammals). Available evidence (Chilton et al. 2011) indicates that the BSAI crab stocks under consideration here are not key prey species whose removal adversely impacts on dependent predators. Nonetheless, ongoing programs for monitoring of outcome indicators ensures that adverse impacts to dependent predators do not arise from fishing BSAI crab stocks.

12.15. Outcome indicator(s) and management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.

There are outcome indicators specific to the BSAI king and Tanner crab fisheries. A set of 'Crab Ecosystem Considerations Indicators' or CECIs (Chilton et al. 2011¹⁴⁶) are used to assess impacts of crab fisheries on aquatic ecosystems. These CECIs are consistent with achieving management objectives of identifying and minimizing adverse impacts of BSAI crab fisheries on aquatic ecosystems. In addition to crab-specific indicators, managers utilize outcome indicators which are more broadly applicable to the monitoring of the Alaska's fisheries and marine ecosystems, as described in Alaska Marine Ecosystem Status Reports.¹⁴⁷ The goals of the Ecosystem Status Reports are to (1) provide stronger links between ecosystem research and fishery management and (2) spur new understanding of the connections between ecosystem components by bringing together the results of diverse research reports into one document. A wide array of indicators is utilized to assess physical and environmental trends, ecosystem trends, and fishing and fisheries trends. Ecosystem Status Reports are updated regularly and are accessible online¹⁴⁸: see Siddon and Zador (2019) and Zador and Ortiz (2018) for the most recent reports for Eastern Bering Sea and Aleutian Islands, respectively. Taken together, there is strong evidence that management utilizes outcome indicators consistent with achieving management objectives that seek to minimize adverse impacts of BSAI crab fisheries on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.

¹⁴⁰ <https://deepseacoraldata.noaa.gov/library/results-of-the-2012-and-2014-underwater-camera-surveys-of-the-aleutian-islands>

¹⁴¹ <https://www.frontiersin.org/articles/10.3389/fmars.2017.00142/full>

¹⁴² https://deepseacoraldata.noaa.gov/library/2015-state-of-dsc-report-folder/NOAA_State-of-DSC-Ecosystems_2017_OHC-TM04.pdf

¹⁴³ <https://doi.org/10.1093/icesjms/fsx087>

¹⁴⁴ <https://alaskafisheries.noaa.gov/habitat/efh>

¹⁴⁵ <https://www.fisheries.noaa.gov/alaska/habitat-conservation/deep-sea-corals-and-sponge-research-alaska>

¹⁴⁶ http://www.npfmc.org/wp-content/PDFdocuments/resources/SAFE/CrabSAFE/511Chapters/Ecosystem_CrabSAFE.pdf

¹⁴⁷ <https://access.afsc.noaa.gov/reem/ecoweb/Index.php>

¹⁴⁸ <https://access.afsc.noaa.gov/reem/ecoweb/Index.php>

8.6.2. Fundamental Clause 13

Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.

Number of Supporting clauses	19
Supporting clauses applicable	0
Supporting clauses not applicable	19
Overall level of conformity	NA
Non Conformances	NA

Summarized evidence:

13.1. States shall promote responsible development and management of aquaculture, including an advanced evaluation of the effects of aquaculture development on genetic diversity and ecosystem integrity, based on the best available scientific information.

As detailed more fully in the BSAI Crab RFM Re-assessment Report¹⁴⁹, BSAI King and Tanner Crab Fisheries are not enhanced fisheries and there are no associated aquaculture developments. The Alaska King Crab Research, Rehabilitation and Biology (AKCRRAB) Program continues to research the feasibility of red and blue king crab restoration work as outlined in the AKCRRAB Strategic Plan¹⁵⁰. However, no facilities are currently permitted by ADFG for the release of cultivated crab (exclusive of scientific investigations). Interviews during the second surveillance audit reconfirmed the determination that BSAI crab fisheries are not enhanced (pers. comm. R. Foy and F. Bowers). Therefore, Fundamental Clause 13 is not applicable.

13.2. State shall produce and regularly update aquaculture development strategies and plans, as required, to ensure that aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities.

NA

13.3. Effective procedures specific to aquaculture of fisheries enhancement shall be established to undertake appropriate environmental assessment and monitoring, with the aim of minimizing adverse ecological changes (such as those caused by inputs from enhancement activities and related economic and social consequences.

NA

13.4. Stock assessment of enhanced fisheries consideration of separate contributions from aquaculture and natural production.

NA

13.5. Habitat modifications for the purposes of enhancement do not cause serious or irreversible harm to the natural ecosystem's structure and function.

NA

13.6/13.7/13.8. Aquaculture practices and transboundary ecosystems including introduction of non-indigenous species.

NA

¹⁴⁹ <https://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-crab/>

¹⁵⁰ <https://seagrant.uaf.edu/research/projects/kingcrab/general/>

13.9. State shall establish appropriate mechanisms, such as databases and information networks to collect, share and disseminate data related to their aquaculture activities to facilitate cooperation on planning for aquaculture development at the national, sub-regional, regional and global level.

NA

13.10. State shall cooperate in the elaboration, adoption and implementation of international codes of practice and procedures for introductions and transfers of aquatic organisms.

NA

13.11. Practices/procedures/national codes of practice and procedures in the selection and genetic improvement of broodstocks, introduction of non-native species, and production, sale and transport of eggs, larvae, fry, broodstock or other live materials.

NA

13.12. Management of aquaculture production for stocking purposes.

NA

13.13. Where applicable, enhanced fisheries shall meet the following criteria:

- the species shall be native to the fishery's geographic area or introduced historically and have subsequently become established as part of the "natural" ecosystem;
- there shall be natural reproductive components of the "stock under consideration";
- the growth during the post-release phase shall be based upon food supply from the natural environment and the production system shall operate without supplemental feeding.

NA

13.14. In the context of avoiding significant negative impacts of enhancement activities on the natural reproductive components of "stock under consideration":

- naturally reproductive components of enhanced stocks shall not be overfished;
- naturally reproductive components of enhanced stocks shall not be substantially displaced by stocked components. In particular, displacement shall not result in a reduction of the natural reproductive stock component below abundance-based target reference points (or their proxies) defined for the regulation of harvest.

NA

9. Performance specific to agreed corrective action plans

One new minor non-conformance has been raised for the St Matthew Island Blue King Crab unit of certification. A medium confidence rating and consequent minor non-conformance is issued under:

Fundamental Clause 6:

The current state of the stock shall be defined in relation to reference points or relevant proxies or verifiable substitutes allowing for effective management objectives and targets. Remedial actions shall be available and taken where reference point or other suitable proxies are approached or exceeded

Supporting Clause 6.3:

Data and assessment procedures shall be installed measuring the position of the fishery in relation to the reference points. Accordingly, the stock under consideration shall not be overfished (i.e. above limit reference point or proxy) and the level of fishing permitted shall be commensurate with the current state of the fishery resources, maintaining its future availability, taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing.

Details of Non-conformance:

Non-Conformance #3 (MINOR non-conformance: Clause 6.3)

The RFM Program provides assessment teams with guidance for scoring clause 6.3 which consists of three evaluation parameters: process; current status/appropriateness/effectiveness; and evidence basis. With respect to the first evaluation parameter, we find strong evidence of conformity because the Council process has been followed and the stock assessment was conducted according to procedure using the appropriate datasets to measure the position of the fishery in relation to its limit reference point (MSST). With respect to the third evaluation parameter, we find strong evidence of conformity because the stock assessment of SMBKC, as documented in the SAFE report, was based on high-quality information. With respect to the second evaluation parameter, however, we find that the stock under consideration (SMBKC) does not meet the RFM criterion for current status/appropriateness/effectiveness because the stock is below its limit reference point and therefore designated as 'overfished' (NMFS Letter to NPFMC, Oct 2018). Consequently, clause 6.3 is lacking in one evaluation parameter and must therefore be assigned a medium confidence rating. A minor non-conformity is raised.

A corrective action plan from the client shall detail;

1. How Bering Sea Crab Client group intends to address these non-conformances, and
2. a set of specific timelines to allow for assessment during the next surveillance activities in 2019, 2020 and the second full assessment audit in 2021, as relevant and if needed.

This NC will remain open throughout the period of certificate validity (5 years) until the confidence level can be re-assigned to a 'high' level based on evidence of effective implementation of corrective actions.

Surveillance Update:

This is the third surveillance assessment following re-assessment of the BSAI crab fisheries which was completed on December 7, 2017. Some progress has been made according to the Client Action Plan. However, the actions taken are not yet sufficient to be considered fulfillment of the minor non-conformance.

One minor non-conformance is open for the Aleutian Islands Golden King Crab unit of certification. A medium confidence rating and consequent minor non-conformance was issued under:

Fundamental Clause 12:

Considerations of fishery interactions and effects on the ecosystem shall be based on best available science, local knowledge where it can be objectively verified and using a risk based management approach for determining most probable adverse impacts. Adverse impacts of the fishery on the ecosystem shall be appropriately assessed and effectively addressed.

Supporting Clause 12.13:

There shall be outcome indicator(s) consistent with achieving management objectives for avoiding, minimizing or mitigating the impacts of the unit of certification on essential habitats for the “stock under consideration” and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.

Details of Non-conformance:

Non-Conformance #2 (MINOR non-conformance: Clause 12.13)

With respect to the AI Golden King Crab unit of certification, the spatial distribution of pot fishing effort in relation to vulnerable habitats is unclear but may be extensive in some areas. Predictive models of coral and sponge distribution have been developed for the Aleutian Islands. However no spatial analysis is yet available which would allow an estimation of current and historic overlap of AIGKC pot fishing effort with the distribution of vulnerable coral and sponge habitats in the Aleutian Islands.

A corrective action plan from the client shall detail,

3. How Bering Sea Crab Client group intends to address these non-conformances.
4. A set of specific timelines to allow for assessment during the next surveillance activities in 2018, 2019 and 2020 and the second full assessment audit in 2021, as relevant and if needed.

This NC will remain open throughout the period of certificate validity (5 years) until the confidence level can be re-assigned to a ‘high’ level based on evidence of effective implementation of corrective actions

Surveillance Update:

This is the third surveillance assessment following re-assessment of the BSAI crab fisheries which was completed on December 7, 2017. Some progress has been made according to the Client Action Plan. However, the actions taken are not yet sufficient to be considered fulfillment of the minor non-conformance.

10. Unclosed, new non-conformances and new corrective action plans

Not applicable. No new non-conformities have been raised.

11. Future Surveillance Actions

The next assessment will be the 4th surveillance assessment which will commence for the anniversary of the re-certification in December 2020. This 4th surveillance will examine progress made in fulfilling the milestones of the corrective action plan.

12. Client signed acceptance of the action plan

Not applicable. No new non-conformances were issued during the 3rd Surveillance audit.

There are two action plans for outstanding minor non-conformities that were previously accepted by the assessment team. The first action plan, in response to non-conformity of the AIGKC unit of certification with RFM Supporting Clause 12.3, is fully detailed in the BSAI Crab RFM Re-assessment Report¹⁵¹. The second action plan, in response to non-conformity of the SMBKC unit of certification with RFM Supporting Clause 6.3, is detailed in the 2nd Surveillance Report¹⁵². Client progress against these two plans is detailed in Section 9 above.

13. Recommendation and Determination

Following this 3rd Surveillance Assessment, the assessment team recommends that continued Certification under the Alaska Responsible Fisheries Management Certification Program is maintained for the management system of the U.S. Alaska Bering Sea and Aleutian Islands King, Tanner, and Snow crab commercial fisheries [Bristol Bay Red King crab (*Paralithodes camtschaticus*), St. Matthew Island Blue King crab (*Paralithodes platypus*), Eastern Bering Sea Tanner Crab (*Chionoecetes bairdi*), Aleutian Islands Golden King Crab (*Lithodes aequispinus*), and Eastern Bering Sea Snow crab (*Chionoecetes opilio*)] legally employing pot gear within the U.S. EEZ off Alaska and subject to a federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] joint management regime.

¹⁵¹ <https://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-crab/>

¹⁵² <https://uploads.alaskaseafood.org/2019/04/Form-9g-BSAI-CRAB-AKRFM-2nd-Surveillance-Audit-Report-April-2019.pdf>

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15. Appendices

15.1. Appendix 1 – Assessment Team Details

Dr. Ivan Mateo (Lead Assessor)

Dr. Ivan Mateo has over 20 years' experience working with natural resources population dynamic modeling. His specialization is in fish and crustacean population dynamics, stock assessment, evaluation of management strategies for exploited populations, bioenergetics, ecosystem-based assessment, and ecological statistical analysis. Dr. Mateo received a Ph.D. in Environmental Sciences with Fisheries specialization from the University of Rhode Island. He has studied population dynamics of economically important species as well as candidate species for endangered species listing from many different regions of the world such as the Caribbean, the Northeast US Coast, Gulf of California and Alaska. He has done research with NMFS Northeast Fisheries Science Center Ecosystem Based Fishery Management on bioenergetic modeling for Atlantic cod. He also has been working as environmental consultant in the Caribbean doing field work and looking at the effects of industrialization on essential fish habitats and for the Environmental Defense Fund developing population dynamics models for data poor stocks in the Gulf of California. Recently Dr. Mateo worked as National Research Council postdoc research associate at the NOAA National Marine Fisheries Services Ted Stevens Marine Research Institute on population dynamic modeling of Alaska sablefish.

Dr. Wes Toller

Wes has an extensive background in fisheries management and habitat conservation. As owner and operator of his own consulting business since 2010, Wes has worked closely with a number of leading certification schemes including the Marine Stewardship Council (MSC) and Aquaculture Stewardship Council (ASC) to develop and improve processes for auditing and accreditation of sustainability standards. He previously worked as a program manager with Accreditation Services International (ASI) where he helped establish the company's MSC Program. Wes has an in-depth knowledge of ISO requirements and international best practices that pertain to eco-labelling. He has a detail-oriented work style and wide ranging interests. Wes has experience in many subject areas within the field of sustainability, and a specialist in sustainable use of fishery resources in the field of fisheries management and marine science. Wes received his doctorate in biological sciences from the University of Southern California. He currently resides in Seattle.