

Initial Feedback on the Preliminary Preferred Alternative in the Steller Sea Lion Protection Measures EIS for the Groundfish Fisheries of the Bering Sea and Aleutian Islands

**By
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Background

At its April, 2013 meeting, the North Pacific Fishery Management Council (Council) selected a preliminary preferred alternative (PPA, Alternative 5) composed of elements from the alternatives in the preliminary draft Environmental Impact Statement (EIS) for the Steller Sea Lion Protection Measures for Groundfish Fisheries in the Bering Sea and Aleutian Islands (BSAI) Management Area. The NMFS Alaska Region Sustainable Fisheries Division (SFD) analyzed the effects of the Council's PPA and included the alternative in the draft EIS as Alternative 5. In May 2013, the NMFS Alaska Region Protected Resources Division (PRD) reviewed the draft EIS' analysis of the effects of Alternative 5 on prey availability for Steller sea lions as a preliminary step for the required consultation under Section 7 of the Endangered Species Act (ESA). PRD reviewed the effects analysis in the draft EIS to provide early input to SFD and the Council to assist them with insuring that the proposed action is not likely to jeopardize the continued existence of Steller sea lions or adversely modify critical habitat as required under section 7(a) of the ESA.

In a formal ESA section 7 consultation on the Fisheries Management Plan (FMP) for the BSAI groundfish fisheries in 2010, NMFS concluded that it could not insure that the action, as proposed, was not likely to jeopardize the continued existence of the western distinct population segment of Steller sea lions (WDPS) or adversely modify critical habitat. In that FMP-level consultation NMFS highlighted concerns about the continued strong decline of the WDPS in the western Aleutian Islands (AI) and the lack of recovery in the adjacent central AI. The population trends in these two sub-regions signaled that the WDPS was not recovering in a manner consistent with the abatement of threats to the continued existence of the WDPS per the demographic recovery criteria in the 2008 Steller Sea Lion Recovery Plan. NMFS determined that additional protection from potential competition with the fisheries for prey was necessary given the continued decline of sea lions and the concentrated fishing activity in the sea lion's critical habitat in these sub-regions. NMFS implemented the Reasonable and Prudent Alternative (RPA) from the 2010 FMP Biological Opinion (FMP BiOp) via an interim final rule in January 2011.

The FMP BiOp and interim final rule were subjected to external peer review and legal scrutiny. The U.S. District Court for the District of Alaska (Court) upheld the FMP BiOp and interim final rule but required NMFS to prepare an EIS on the effects of the sea lion protection measures on the human environment. While its legal sufficiency was upheld, external reviews of the FMP BiOp by the states of Alaska and Washington and by the Center for Independent Experts (CIE) highlighted concerns with the underlying science and assumptions relied on by NMFS in reaching the conclusions. NMFS, working in conjunction with the Council, prepared a draft EIS on alternative fishery protection measures in the AI and released this draft on May 14, 2013 for public comment. NMFS is also reviewing the science in the FMP BiOp and conducting new analyses in response to the external critiques of the FMP BiOp. NMFS is reinitiating formal ESA section 7 consultation on the effects of the proposed action. PRD is evaluating the PPA and will formally consult on the preferred alternative. The Council is scheduled to recommend a preferred alternative in October 2013. NMFS intends to complete a project-level BiOp on the revised Steller sea lion protection measures (the proposed action) concurrent with the completion of the EIS on the timeline approved by the Court.

PRD anticipates several new analyses will be useful for evaluating whether the proposed action complies with section 7 of the ESA. Most of these analyses resulted from feedback received on the FMP BiOp including the feedback from the CIE review. The details of these new analyses are described in the attached analytical approach for the project-level BiOp. PRD presented the analytical approach to the Council's Scientific and Statistical Committee at its April 2013 meeting. As described in the analytical approach, PRD will undertake a step-wise approach to evaluating the efficacy of the proposed action and insure that the action is not likely to jeopardize the continued existence of the WDPS or adversely modify critical habitat.

Due to the schedule required by the Court for the EIS, the outcome of the formal consultation will not be known when the Council recommends a preferred alternative in October 2013. Therefore, PRD performed an initial, simplified analysis of the PPA to provide early input to the Council at its June 2013 meeting. PRD understands the need for transparency and timely communication to help SFD and the Council comply with the ESA. PRD is striving to identify as early as possible any issues associated with the PPA that may be of concern when we develop the new BiOp. PRD identified elements of the PPA where the Council and SFD may wish to consider additional or alternate protections for the WDPS and critical habitat to front-load protection into the proposed action.

Sea lion and fishery areas in the Central and Western Aleutian Islands

The western and central AI are divided into various areas for sea lion and fishery management purposes. Fishery management area 543 corresponds with the Steller sea lion western AI sub-region. Fishery management areas 542 and 541 comprise the Steller sea lion central AI sub-region (see draft EIS Figure 5-1). Table 1 shows which major sea lion rookery and haulout sites occur in each fishery management area. This information is important when considering fishery management measures, including seasonal provisions.

Table 1. Sea lion Sites in the Aleutian Islands Fishery Management Areas 543, 542, 541 (modified from FMP Biop Table 3.31). This table shows sites designated as critical habitat in 50 CFR 226.202 and sites that have been used since the designation of critical habitat. Critical habitat includes an aquatic zone that extends 20 nm seaward from the baseline or basepoint of each major rookery and major haulout in Alaska that is west of 144 deg. W. longitude. The site type and season fields indicate the usage of the site as analyzed by the National Marine Mammal Lab (NMML) in 2006. In this table summer reflects usage meeting the thresholds (>200 non-pups in summer and >100 non-pups in winter from 1990 -2005) in May through October and winter reflects usage in November through April.

	543			542			541		
	Site Type ¹	Season ²		Site Type ¹	Season ²		Site Type ¹	Season ²	
Rookeries	Attu Island/ Cape Wrangell	R	All	Ulak Island/ Hasgox Pt.	R	All	Adak Island	R	All
	Attu Island/ Cape Sabak	R	All	Amchitka Island/ East Cape	H/R	All	Seguam Island/Saddleridge Pt.	R	All
	Agattu Island/ Gillion Pt.	R	All	Kiska Island/ Cape St. Stephen	R	All	Kasatochi Island	R	All
	Buldir	R	All	Kiska Island/ Lief Cove	R	All	Agligadak Island	H/R	S
				Semisopochnoi/ Petrel Pt.	H/R	All	Yunaska Island	R	All
				Ayugadak Point	R	S			
				Amchitka Island/ Column Rocks	R	S			
				Semisopochnoi Island/ Pochnoi	H/R	All			
				Tag Island	R	All			
				Gramp Rock	R	All			
Haulouts	Attu Island/ Chirikof Pt.	H	S	Kavalga Island	H	W*	Amlia Island/ East	H	All
	Alaid Island	H	All	Unalga & Dinkum Rocks	H	W	Great Sitkin Island	H	N
	Shemya Island	H	S	Kiska Island/ Sobaka & Vega	H	N	Seguam Island/ Turf Point	H	All
				Tanaga Island/ Bumpy Point	H	N	Seguam Island/ Finch Point	H	W*
				Segula Island	H	W	Little Tanaga Strait	H	All
				Kiska Island/ Sirius Point	H	N	Anagaksik Island	H	N
				Tanadak Island (Kiska)	H	N	Atka Island/ N. Cape	H	All
				Little Sitkin Island	H	W	Amlia Island/ Sviech. Harbor	H	All
				Ugidak Island	H	N	Sagigik Island	H	N
				Bobrof Island	H	W	Tanadak Island (Amlia)	H	N
				Kanaga Island/ Ship Rock	R/H	All	Amukta Island & Rocks	H	N
				Kanaga Island/ North Cape	H	W	Chagulak Island	H	W
				Rat Island/ Krysi Point	RPA	All			
				Amchitka Island/ Cape Ivakin	RPA	N			

*The seasonal site use has been revised relative to the information in the FMP BiOp Table 3.31 due to updated count information. In March, 2012 NMML sighted 632 animals at Seguam Island/Finch Point and 103 animals at Kavalga Island.

¹ RPA = haulout not designated as critical habitat, but listed as an important site for management purposes in 1999; R/H = functional rookery that is a listed critical habitat haulout; H/R = functional haulout that is listed as a critical habitat rookery; R = rookery critical habitat; H = haulout critical habitat

² S = summer; W = winter, N = neither

Approach

The draft EIS evaluates the anticipated effects of the fisheries on Steller sea lions in three main categories—incidental take, prey availability, and disturbance. The only category identified as a potentially high threat to the WDPS in the 2008 Steller Sea Lion Recovery Plan was competition with fisheries for prey. Given the protections in place for Steller sea lions, incidental take in fisheries and disturbance from vessel traffic were rated as low threats to the recovery of the WDPS. Thus, PRD focused on the effects of the PPA on prey availability. Although some stakeholders and external reviewers have questioned whether sufficient information exists to conclude that fisheries have the potential to cause or contribute to nutritional stress in WDPS sea lions, based on the best available information PRD continues to regard prey removal as the principal potential stressor that fisheries may exert on the WDPS.

PRD compared the elements of the status quo fishery management regime (Alternative 1 - the RPA from the FMP BiOp and current pollock fisheries management) for Pacific cod, Atka mackerel, and pollock in the BSAI with elements of Alternative 4 (essentially the regime that NMFS determined did not insure adequate protection to the WPDS and critical habitat in 2010) and Alternative 5 (the PPA). PRD identified elements that were similar among the three alternatives, elements of Alternative 1 that were more protective than Alternative 4, and elements of Alternative 5 that were assumed to be more or less protective than Alternative 4. This step revealed the relative protection to sea lion prey availability under the various alternatives and working assumptions in the draft EIS.

PRD reviewed the PPA for consistency with the performance standards for Steller sea lion protection measures in Chapter 1 of the draft EIS (see appendix), which were adopted from the 2010 FMP BiOp. PRD also considered the importance of prey species in the WDPS diet by season as described in Chapter 5 of the draft EIS. PRD was also mindful of the key data gaps highlighted in the attached analytical approach. Steller sea lion prey species are an essential feature of Steller sea lion marine critical habitat. In assessing the effects of the fisheries on critical habitat in a BiOp we consider the base status of critical habitat and then the status of critical habitat given exposure to the effects of the proposed action. Our best understanding of the base status of marine critical habitat, including the abundance and distribution of prey, derives from summer trawl survey data. NMFS' scientists continue to caution that these data do not inform us as to the distribution of fish biomass in the winter when the fisheries for two sea lion prey species (Pacific cod and pollock) are most active. PRD will apply the best available data on fish biomass, including information that can be gleaned from fishery-dependent data in the winter; however, we anticipate that we will remain confronted with a lack of data to quantify the effects of expected fishery removals from critical habitat. With this in mind, as a general matter, PRD recommends a cautious approach to fishing for Steller sea lion prey species in critical habitat.

Given the limited amount of time available between the release of the draft EIS and the June Council meeting and the presentation of the data in the draft EIS, PRD evaluated the elements for the individual fisheries (Atka mackerel, Pacific cod non-trawl, Pacific cod trawl, and pollock) for this initial analysis. A more comprehensive analysis with the elements and their anticipated effects aggregated across fisheries will be done for the new BiOp.

Results

The following pages provide PRD's initial analysis for each fishery.

Table 2. Atka mackerel (modified from draft EIS Table 2-19).

Alternative	Seasons	Area 543		Area 542		Area 541/Bering Sea	
		closures	Catch and participation limits	closures	Catch and participation limits	closures	Catch and participation limits
1 (status quo)	Trawl: A season: 1/20-6/10 B season: 6/10-11/1.	No retention.	Not applicable.	Critical habitat closed except between 178°W and 179° W long., critical habitat closed 0-10 nm	Must be in a cooperative or CDQ fishing to fish inside critical habitat.	Critical habitat closed to directed fishing.	TAC for combined Area 541/BS subarea
	No more than 10% of the group's allocation harvested from critical habitat, distribute evenly between seasons.						
	TAC ≤ 47% of ABC.				BS subarea closed to directed fishing.		
4 (pre-2011)	Trawl: A season: 1/20-6/10 B season: 6/10-12/31.	Critical habitat closed 0-3 nm from haulouts and 0-10 nm from rookeries. Close Buldir Island 0-15 nm.	Critical habitat harvest limit 60% of TAC, distribute evenly between seasons.	West of 178°W, critical habitat closed 0-3 nm from haulouts and 0-10 nm from rookeries. Critical habitat closed east of 178°W. long.	Critical habitat harvest limit 60% of TAC west of 178° W long, distribute evenly between seasons.	Critical habitat closed to directed fishing.	Same as Alternative 1
	50:50 seasonal apportionment including CDQ.						
	Rollover from A to B season.						
5 (PPA)	Trawl: A season: 1/20-6/10 B season: 6/10-12/31.	Critical habitat closed 0-3 from haulouts and 0-10 from rookeries.	Critical habitat harvest limit 60% of TAC, distribute evenly between seasons.	Critical habitat closed 0-3 nm from haulouts and 0-10 nm from rookeries except close critical habitat between 178°E long. to 180° E and east of 178°W long.	Same as Alternative 4	Critical habitat closed except 12-20 nm portion southeast of Seguam Island. Bering Sea subarea closed	TAC for combined Area 541/BS subarea Amend. 80 coop and CDQ in BS: Revise MRA calculation for Atka mackerel as an incidental species.
	50:50 seasonal apportionment including CDQ.		TAC ≤ 65% ABC.				
	Rollover from A to B season fished outside of critical habitat.						

Green colored cells are elements of the status quo measures that are assumed to be more protective than the other two alternatives. White cells are essentially assumed equivalent among alternatives. Red cells are assumed to be less protective than pre-2011 elements, and yellow cells are assumed to be more protective than pre-2011 elements.

Atka mackerel

The elements of the alternatives for Atka mackerel are shown in Table 2. The draft EIS notes that Alternative 5 would open more area to Atka mackerel fishing in Steller sea lion critical habitat in area 543 than in 542 or 541 (draft EIS page 174). Draft EIS Table 5-156 shows that under the PPA 76% of the critical habitat would be closed to fishing in area 543, and 92% and 97% of the critical habitat would be closed in areas 542 and 541 respectively. However, under the PPA, 60% of the TAC could be caught in the small open areas of critical habitat in area 542 and there would be no limit on the amount of the area 541 TAC that could be harvested from the Seguam foraging area in area 541. Thus, the amount of catch that could be harvested from critical habitat would be an equal percentage of the respective area TACs in areas 543 and 542.

Seasons: The PPA extends the status quo B season from November 1st through December 31st. This may result in the temporal dispersion of catch, though there is no assurance that this would be the effect since nothing would preclude harvesting the TAC in a shorter period of time, and as noted in Chapter 5 of the draft EIS, this provision may increase the potential for fisheries competition in the winter when adult female sea lions that are pregnant and nursing a pup have the highest bioenergetic requirements.

Seasonal apportionment of TAC: identical among all three alternatives.

Rollover: identical among the three alternatives except that any A season rollover would be taken outside of critical habitat in the B season under the PPA. The requirement to catch any amount of rolled over A season TAC outside of critical habitat is assumed to be more protective than the rollover provisions prior to 2011 and the rollover provision in area 542 under the status quo.

Area 543:

Closures: The PPA would open all of area 543 to fishing for Atka mackerel except from 0-3 nm around haulouts and 0-10 nm from rookeries. This is a big change relative to the status quo, which prohibits retention of Atka mackerel in area 543, and a minor change relative to the pre-2011 measures. The sole difference in area closures relative to the pre-2011 measures is the reduced area closure around Buldir Island under the PPA. Two facts may mitigate opening this additional area, however—the lack of historic fishing in this area (draft EIS page 5-156) and the low usage of this site by Steller sea lions in recent years. Thus, opening this additional area around Buldir Island does not appear to be a significant lessening of protection relative to the pre-2011 measures.

Catch limit: Limiting TAC to 65% of ABC could result in a slight reduction of harvest in area 543 relative to the baseline TACs which averaged 69% of ABC from 2004 to 2010 under the pre-2011 measures as shown in the draft EIS table 5-114.

Assuming 60% of the TAC could be taken in critical habitat, the PPA is estimated to increase catch in critical habitat in area 543 by an average of 6,130 mt relative to pre-2011 measures (See draft EIS Table 5-114). Table 5-86 in the draft EIS shows the amount of the area 543 catch that was caught in critical habitat historically and the amount expected to be caught in critical habitat under each of the alternatives. It shows that the PPA would allow as much catch to be taken from critical habitat as Alternative 4, the pre-2011 fishery management measures.

Area 542:

Closures: The PPA would close critical habitat in area 542 that was open under the pre-2011 measures and would increase 0-10 nm closures to 0-20 nm closures year-round at five rookeries (Ayugadak Point, Aчитka/Column Rocks, Amчитka Island/East Cape, Semisopchnoi/Petrel and

Semisopochnoi/Pochnoi) and four haulouts (Amchitka Island/Cape Ivakin, Rat Island, Little Sitkin Island, and Segula Island) from 178° E to 180°. According to the draft EIS table 5-115, an average of 39% (11,773 mt) and a maximum of 54% (14,350 mt) of the area 542 Atka mackerel catch from 2004 through 2010 was estimated to have been caught in the area from 178° E to 180° that would be closed under the PPA. This area that would be closed to Atka mackerel fishing relative to the pre-2011 measures, includes sites around Amchitka Island where NMFS' Fisheries Interaction Team (FIT) studies show a high rate of Atka mackerel movement from inside the trawl exclusion areas to outside the exclusion areas and low Atka mackerel biomass relative to other sites (e.g. Seguam Island)¹. These closures are consistent with the performance standards to conserve prey where tagging studies indicate high movement of fish from inside to outside trawl exclusion zones.

All other critical habitat closures under the PPA are the same as the pre-2011 measures. Thus, the PPA would close all critical habitat around four haulouts (Tanaga Island/Bumpy Point, Bobrof Island, Kanaga Island/North Cape, and Kanaga Island/Ship Rock) east of 178° W to the boarder of area 541. This closure would protect critical habitat around Kanaga Island/Ship Rock, which is now functioning as a rookery and is used by sea lions year-round. These protections are consistent with the performance standards to maintain groundfish fishing closures around currently designated rookeries and establish new groundfish fishing closures around emerging rookeries.

As with the pre-2011 measures, critical habitat would be closed to Atka mackerel fishing out to 3 nm from the following haulouts in area 542 under the PPA: Kavalga Island, Unalga & Dinkum Rocks, Kiska Island/Sobaka & Vega, Kiska Island/Sirius Point, Tanadak Island, and Ugidak Island. As shown in Table 1, only Kavalga Island and Unalga & Dinkum Rocks have been used by a large number of sea lions in winter in recent years. The remaining five rookeries in area 542 would be closed to fishing for Atka mackerel out to 10 nm (Ulak Island, Kiska Island/Cape St. Stephen, Kiska Island/Lief Cove, Tag Island, and Gramp Rock).

Catch and participation: The harvest limit in the open area of critical habitat in area 542 would be increased from 10% under the status quo to 60% of TAC under the PPA. The TAC in area 542 reverts back to the pre-2011 measures under the PPA. Under the status quo, the area 542 TAC is constrained to a maximum of 47% of ABC. There would be no TAC constraint in area 542 under the PPA.

Area 541:

Closures: The PPA would open critical habitat area in area 541 that was closed under the pre-2011 measures and status quo (all of critical habitat has been closed in area 541 since 1992). The PPA would open a portion of critical habitat from 12 to 20 nm to the southeast of Seguam Island. Seguam Island is a designated rookery that is also used as a haulout year-round. Research on Atka mackerel abundance and movement indicates a small amount of movement of Atka mackerel from inside the trawl exclusion zones to outside the exclusion areas, which suggests the trawl exclusion zones may be effective at conserving prey for Steller sea lions around the Seguam Island rookery. The FIT research also indicates a large biomass of Atka mackerel inside the trawl exclusion zone around Seguam Island, which may help mitigate the potential for local depletion of Atka mackerel. However the PPA would not limit the amount of the area 541 TAC that could

¹ Ortiz, I. and E. Logerwell. Draft. Evaluating the efficacy of trawl exclusion zones for Steller sea lion foraging on Atka mackerel. II. Site-specific estimates to evaluate availability of Atka mackerel production for sea lion consumption. Available from: www.alaskafisheries.noaa.gov/protectedresources/stellers/esa/biop/draft/trawlexclusionzones.pdf

be harvested from this critical habitat open area, which is a big change relative to the pre-2011 fishery management regime which did not allow fishing inside critical habitat in area 541.

Conclusions

Based on the above analysis of information provided in the draft EIS, it is apparent that the PPA for Atka mackerel is very similar to the pre-2011 fishery management regime in area 543, more protective than the pre-2011 measures in area 542, and less protective than the pre-2011 measures in area 541. NMFS determined that it could not insure that the pre-2011 management regime was not likely to jeopardize the continued existence of the WDPS or adversely modify critical habitat.

Area 543 is the geographic extent of the Steller sea lion's western AI sub-region. Of the six sub-regions in the range of the WDPS in Alaska, NMFS is most concerned about the continued strong declines of sea lion pups and non-pups in the western AI sub-region. Table 5-86 in the draft EIS shows that the amount of catch that may be taken in critical habitat in area 543 is equivalent to the pre-2011 management regime. Additionally, draft EIS Table 5-114 shows that the PPA is estimated to increase catch in critical habitat relative to the pre-2011 management regime. In area 543, the PPA would limit TAC to a maximum of 65% of the ABC. PRD used the values in draft EIS Table 5-100 to calculate the TAC as a percentage of the ABC. The average TAC percentage of ABC was 69% from 2004 through 2010, thus the 65% TAC limit under the PPA would result in a slight overall reduction in total Atka mackerel catch in area 543 relative to the pre-2011 fishery. The Council could set TAC at an amount much smaller than 65% of ABC under the PPA which would decrease the potential effects on prey availability for sea lions, however the PPA provides no assurance that the TAC would be set lower than 65% of ABC, or how frequently TAC would be less than 65% under the PPA, and thus for the new BiOp PRD will have to assume that TAC would be set at 65%.

Of the three prey species taken by the groundfish fisheries, Atka mackerel occurs in the highest proportion of sea lion scats and is the only species taken by the groundfish fisheries that occurs in more than 10% of sea lion scats in both summer and winter in the western and central AI. Thus, at this early consultation phase, the amount of Atka mackerel that could be removed from Steller sea lion critical habitat in Area 543 is PRD's biggest concern with the PPA. PRD recommends that the Council consider the elements in Alternatives 1 or 2 for Atka mackerel in area 543.

Table 3. Pacific Cod Non Trawl (modified from draft EIS Table 2-20).

Alternative	Seasons	Area 543		Area 542		Area 541	
		closures	Catch and participation limits	closures	Catch and participation limits	closures	Catch and participation limits
1 (status quo)	Hook-and-Line: A season: 1/1-6/10 B season: 6/10-12/31	No retention	Not applicable	Critical habitat closed 0-6 nm year round.	ESA reinitiation trigger with harvest more than 1.5% of BSAI Pacific cod ABC.	Critical habitat closed 0-10 nm year round and 0-20 nm Jan 1-March 1.	ESA reinitiation trigger with harvest more than 1.5% of BSAI Pacific cod ABC.
	Pot: A season: 1/1-6/10 B season: 9/1-12/31			For vessels ≥60 ft, close critical habitat 0-20 nm Jan 1-March 1		Seguam Foraging Area closed.	
	Jig: A season: 1/1-4/30 B season: 4/30-8/31 C season: 8/31-12/31			Prohibit directed fishing after Nov. 1.		Prohibit directed fishing after Nov. 1.	
	Seasonal apportionments based on BSAI-wide TACs under Amend 85.						
4 (pre-2011)	Same as Alternative 1	Hook-and-line and pot: Critical habitat closed 0-3 nm from rookeries and 0-10 from Buldir Island.	None	Hook-and-line and pot: Critical habitat closed 0-3 nm from rookeries.	None	Hook-and-line and pot: Critical habitat closed 0-3 nm from rookeries W of 172.59° W long.	None
						Hook-and-line and pot: Critical habitat closed east of 172.59° W long.	
						Hook-and-line, pot and jig: Seguam Foraging Area closed.	
5 (PPA)	Same as Alternatives 1 and 4	Same as Alternative 4	Catch limit in proportion to Area 543 abundance based on annual stock assessment.	Same as Alternative 4	Same as Alternative 4*	Same as Alternative 4	Same as Alternative 4

* The only difference for Pacific cod non-trawl under the PPA relative to the pre-2011 measures is that the Pacific cod TAC would be specified separately for the AI and EBS and the amount of the AI Pacific cod TAC that could be harvested in area 543 will be limited based on the annual stock assessment. Note the distinction in this analysis relative to the draft EIS. In this analysis, PRD compared the PPA relative to measures in place prior to 2011, whereas Alternative 4 in the draft EIS would also assumes a split in the BS and AI Pacific cod TAC. However, that split was not in place prior to 2011 so we have assumed that split to be more protective for sea lions relative to fishery management prior to 2011.

Table 4. Pacific cod trawl (modified from draft EIS Table 2-21).

Alternative	Seasons	Area 543		Area 542		Area 541	
		closures	Catch and participation limits	closures	Catch and participation limits	Closures	Catch and participation limits
1	A season: 1/20-4/1 B season: 4/1-6/10 C season: 6/10-11/1	No retention	Not applicable	Critical habitat closed except between 178°W and 177° W long.	ESA reinitiation trigger with harvest more than 2% of BSAI Pacific cod ABC.	Critical habitat closed 0-10 nm year round and 0-20 nm June 10-Nov. 1.	ESA reinitiation trigger with harvest more than 11.5% of BSAI Pacific cod ABC.
	Seasonal apportionment based on BSAI wide TAC level under Amend 85.			Critical habitat closed 0-10 nm year round and 0-20 nm June 10-Nov. 1.		Seguam Foraging Area closed.	
4	A season: 1/20-4/1 B season: 4/1-6/10 CVs and AFA CPs: C season: 6/10-11/1. Amend. 80 and CDQ: C season: 6/10-12/31	Critical habitat closed 0-3 nm from haulouts and 0-10 nm from rookeries	None	Critical habitat closed 0-3 nm from haulouts and 0-10 nm from rookeries.	None	Critical habitat closed 0-3 nm from haulouts and 0-10 nm from rookeries, except a 20 nm closure from Agligadak.	None
	Seasonal apportionment based on BSAI wide TAC level under Amend 85.					Seguam Foraging Area closed.	
5 (PPA)	Same as Alternative 4	Same as Alternative 4	Catch limit in proportion to Area 543 abundance based on annual stock assessment.	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4

* The only difference for Pacific cod trawl under the PPA relative to the pre-2011 measures is that the Pacific cod TAC would be specified separately for the AI and EBS and the amount of the AI Pacific cod TAC that can be harvested in area 543 will be limited based on the annual stock assessment. Note the distinction in this analysis relative to the draft EIS. In this analysis, PRD compared the PPA relative to measures in place prior to 2011, whereas Alternative 4 in the draft EIS would also assumes a split in the BS and AI Pacific cod TAC. However, that split was not in place prior to 2011 so we have assumed that split to be more protective for sea lions relative to fishery management prior to 2011.

Pacific Cod Non-trawl

The elements of the alternatives for Pacific cod non-trawl gear are shown in Table 3. The Pacific cod non-trawl sectors are allocated 60.8% of the BSAI Pacific cod TAC (draft EIS Table 2-1). The hook-and-line catcher/processor sector receives the largest TAC allocation of all Pacific cod sectors; they are allocated 48.7% of the BSAI Pacific cod TAC. The draft EIS concluded that the rate of removal of Pacific cod with hook-and-line and pot gear is not as likely to cause localized depletions of Pacific cod due to the slower rate of removal relative to removals with pot and trawl gear (page 5-99). The draft EIS page 5-157 notes that Alternatives 4 and 5 are the least restrictive on the harvest of Pacific cod in the AI and present the greatest potential for impacts on Pacific cod prey resources for Steller sea lions. Pacific cod are a primary prey species for Steller sea lions in winter (November through April) in the western and central AI.

Seasons: same among all three alternatives.

Area 543: The PPA would revert from no retention of Pacific cod inside or outside critical habitat under the status quo to allowing the full AI TAC (as adjusted for proportion of biomass estimated to be in area 543 in the annual stock assessment) to be taken inside critical habitat. The PPA would allow fishing for Pacific cod in the parallel fisheries to occur up to the beach at haulouts (Attu Island/Chirikof Point, Alaid Island and Shemya Island) to within 3 nm from 3 rookeries (Attu/Cape Wrangell, Agattu Island/Gillon Point, and Agattu Island/Cape Sabak) and 10 nm from Buldir Island. The only difference in the PPA relative to the pre-2011 measures is the intention to split the EBS and AI TAC, which is more protective than pre-2011 measures. Managing Pacific cod as a single BSAI stock may have allowed a disproportionate amount of the Pacific cod harvest to be taken from the AI relative to the estimated available biomass. Global harvest control rules in the BSAI FMP would remain in effect under the PPA, and fishing would be prohibited if the AI Pacific cod stock is estimated to be below $B_{20\%}$.

Given the bathymetry in the AI, most of the accessible habitat to non-trawl gear occurs within critical habitat. The draft EIS Table 5-64 shows that almost all (96% in 2010) Pacific cod non-trawl harvest in area 543 was harvested from critical habitat and the PPA would return Pacific cod to this management structure.

Area 542: Nearly 100% of Pacific cod would be harvested from critical habitat in area 542 under the PPA according to Draft EIS Table 5-42; the greatest percentage of this would be taken from 3-10 nm.

Area 541: The majority of Pacific cod non-trawl catch would be taken from critical habitat in area 541 (76% in 2010 according to draft EIS Table 5-75), though not as high a percentage as occurs in critical habitat in area 543 and 542.

Conclusions

The intention to split the EBS and AI Pacific cod TAC is assumed to be more protective than the pre-2011 fishery management measures, which did not limit the amount of the BSAI Pacific cod TAC that could be harvested in the AI. Moreover, PRD recognizes that non-trawl gear sectors are allocated a greater percentage of the overall Pacific cod TAC. Since non-trawl gear removes Pacific cod at a slower rate than trawl gear, PRD recognizes the potential for localized depletion to be mitigated somewhat due to the non trawl sector allocations.

To protect the conservation value of critical habitat in the western AI where sea lions are in decline, PRD recommends modifying the proposed action to increase protection of critical habitat from potential effects of Pacific cod fishing with non-trawl gear, especially in winter (November

through April) when the available data suggest Pacific cod is an important component of the sea lion diet. PRD also recommends maintaining a minimum critical habitat closure of 3 nm around all identified rookeries and haulouts in the western and central AI. The maintenance of closures around designated and emerging rookeries is one of the performance standards provided in Chapter 1 of the draft EIS. If the Council deems this nearshore area critical to the execution of the AI Pacific cod fishery, PRD recommends that the Council consider offsetting potential impacts from increased encroachment into critical habitat relative to the status quo regime with more protective measures in other fisheries in area 543.

Pacific cod Trawl

The elements of the alternatives for Pacific cod trawl gear are shown in Table 4. Pacific cod trawl sectors are allocated a total of 37.8% of the BSAI Pacific cod TAC. The draft EIS mentions the Council's intentions to split the BS and AI P cod TACs for the 2014 fishing year. The sector-specific TAC allocations are set at the BSAI level and therefore a sector's entire BSAI allocation could be harvested within the AI as long as the AI TAC is not exceeded.

Seasons: The A and B seasons are identical among the three alternatives in Table 4. The PPA would extend the C season by two months (from November 1 through December 31) for Amendment 80 vessels and CDQ. This may result in the temporal dispersion of catch, though there is no assurance that this would be the effect since nothing would preclude harvesting the TAC in a shorter period of time, and as noted in Chapter 5 of the draft EIS, this provision may increase the potential for fisheries competition in the winter when adult female sea lions that are pregnant and nursing a pup have the highest bioenergetic requirements.

Seasonal apportionments: Same among all three alternatives.

Area 543: The PPA would revert from no-retention inside or outside critical habitat under the status quo to allowing the full TAC (as adjusted for the proportion of biomass estimated to be in area 543 in annual stock assessment) to be taken inside of critical habitat. The only difference in the PPA relative to the pre-2011 measures is the intention to split the EBS and AI TAC, which is more protective than pre-2011 measures. Managing Pacific cod as single BSAI stock may have allowed for a disproportionate amount of harvest to be taken from the AI relative to the Pacific cod biomass in the AI. The BSAI FMP global harvest control rules would remain in effect under the PPA, and fishing would be prohibited if spawning female biomass is estimated to be below $B_{20\%}$.

Table 5-117 in the draft EIS shows the area 543 Pacific cod catch limits had the PPA been in effect during the baseline period, the catch that historically occurred in critical habitat area that would be open under the PPA, and catch that historically occurred in critical habitat area that would be closed under the PPA. Table 5-117 shows that the Pacific cod trawl sector would have been constrained by the 543 area limit in 2008 through 2010; it would not have been constrained by this limit in area 543 from 2004 through 2007. Table 5-117 in the draft EIS also shows that almost none of the Pacific cod trawl catch was from areas of critical habitat that would be closed under the PPA in area 543. The PPA would have been more effective at reducing Pacific cod trawl harvest in critical habitat in areas 542 and 541 from 2004 through 2008 when a greater proportion of the BSAI Pacific cod TAC was harvested in areas 542 and 541 compared to 543.

Area 542: The area closures for Pacific cod trawl in area 542 under the PPA are the same as the pre-2011 measures with the additional protection on Pacific cod harvest in the AI through an AI-specific TAC.

Area 541: The area closures for Pacific cod trawl in area 541 under the PPA are the same as the pre-2011 measures with the additional protection on Pacific cod harvest in the AI through an AI-specific TAC.

Conclusions

The intention to split the EBS and AI Pacific cod TAC is assumed to be more protective than the pre-2011 fishery management measures, which did not limit the amount of the BSAI Pacific cod TAC that could be harvested in the AI. Moreover, there have not been limits on the amount of the Pacific cod TAC that can be taken from inside critical habitat. NMFS recognizes that removal rates of Pacific cod with trawl gear are much higher than removal rates with non-trawl gear, and thus the potential for localized depletion of Pacific cod is assumed to be higher with trawl gear than for non-trawl gear. PRD recommends that the Council consider offsetting effects of trawling for Pacific cod in Steller sea lion critical habitat, especially in winter (November through April) by precluding other fisheries for Steller sea lion prey species in the same times and areas.

Table 5. Pollock (modified from draft EIS Table 2-22).

Alternative	Seasons	Area-wide Catch and Participation limits	Area 543	Area 542	Additional participation limits	Area 541
			Closures and catch limit	Closures and catch limit		Closures and catch limit
1 (status quo)	A season: 1/20-6/10.	Only CDQ and vessels registered with the Aleut Corporation in directed fishery. 50% of Aleut Corp. directed fishery allocation to vessels < 60 ft.	Critical habitat closed to directed fishing.	Critical habitat closed to directed fishing.	None	Critical habitat closed to directed fishing.
	B season: 6/10-11/1.	When AI ABC ≥ 19,000 mt, AI TAC = 19,000 mt. When AI ABC < 19,000 mt, AI TAC ≤ ABC. Total A season apportionment no more than 40% of ABC.				
5 (PPA)	Same as Alternative 1	Same as Alternative 1	Critical habitat closed except an area outside of 0-3 nm from Shemya, Alaid, and Chirikof haulouts and outside 20 nm of rookeries.	Critical habitat closed 0-20 nm from at rookeries and haulouts west of 178°W long. except open a portion of critical habitat at Rat Islands Area outside 3 nm from Tanadak, Segula, and Krysi Point, and 10 nm from Little Sitkin and Ayugudak	Same as Alternative 1	Critical habitat closed to directed fishing 0-3 nm from haulouts and 0-10 nm from rookeries
				Critical habitat closed 0-3 nm from haulouts and 0-10 nm from rookeries east of 178° W long., except open portions of critical habitat outside 3 nm from Kanaga and Bobrof Island.		Seguam Foraging Area closed to directed fishing.
			A season catch limit 5% of ABC.	A season catch limit 15% of ABC.	A season catch limit 30% of ABC.	

* For pollock, Alternative 1 is the same as the pre-2011 fishery management regime. Green colored cells are elements of the status quo measures that are assumed to be more protective than the PPA. White cells are essentially assumed equivalent between alternatives. Red cells are assumed to be less protective than pre-2011 elements, and yellow cells are assumed to be more protective than pre-2011 elements.

Pollock

The elements of the alternatives for pollock are shown in Table 5. The seasons and area-wide catch and participation limits would be the same as under the status-quo. The PPA would maintain the closure for pollock fishing from November 1 through noon, Alaska local time January 20. The A season pollock apportionment would be limited to 40% of the AI pollock ABC.

Area 543: The PPA would open a portion of the area outside of 3 nm from all three sites designated as haulouts in area 543 to pollock with pelagic trawl gear. While this is less protective than the status quo, the maximum catch amount in the A season would be limited to 5% of ABC. Overall the A season apportionment would be limited to a maximum of 40% of the AI pollock ABC, so it would not be permissible to reach the maximum area apportionments in all three areas (area 543 limit = 5%, area 542 limit = 15%, area 541 limit = 30%). Of the three haulouts, PRD's best available information (Table 1) indicates that only Alaid is used year-round; the other two haulouts are used only in the summer months. The four sites designated as rookeries in area 543 would continue to be closed to pollock fishing from 0-20 nm year-round. For comparison, PRD notes that several sites designated as haulouts in the GOA and EBS are open from 3-10 nm to pollock trawling.

Area 542: The PPA would open a portion of critical habitat to trawling for pollock in area 542. The A season catch limit would be 15 percent of the AI pollock ABC. West of 178° W: The PPA would open a portion of critical habitat outside of 3nm from Tanadak Island, Segula Island, and Krysi Point. Of these haulouts, Krysi Point and Segula are used in the winter (November through April) when pollock are an important part of the sea lion diet in the central AI. Both of these sites would be closed to Atka mackerel fishing under the PPA. Tanadak Island is the only site that would be open to pollock trawling in a portion of critical habitat outside of 3 nm that is also proposed to be open to Atka mackerel trawling. The best available data indicate that sea lions do not use Tanadak Island to a great extent (Table 1).

The PPA would also open a portion of critical habitat outside of 10 nm from one rookery (Ayugadak Point) and one haulout (Little Sitkin Island) to pollock trawling in the western portion of area 542. The rookery is used by sea lions in the summer and pollock are an important component of the sea lion diet in winter in the central AI. The Little Sitkin Island haulout is used by sea lions in the winter. Ayugadak Point and Little Sitkin Island would be closed to trawling for Atka mackerel under the PPA.

East of 178° W in area 542: The PPA would open critical habitat to pollock trawling 3 – 20 nm from three haulouts (Tanaga Island/Bumpy Point, Bobrof Island, and Kanaga Island/North Cape). There are three haulouts (see previous sentence) and one rookery (Kanaga Island/Ship Rock) east of 178° W in area 542. Thus, under the PPA all of these sites would be open outside of 3 nm to pollock trawling. This includes Kanaga Island/Ship Rock rookery which was open to the Atka mackerel fishery under the pre-2011 fishery management measures, but which would be closed to Atka mackerel under the PPA. An important difference, however, is that Atka mackerel are important in the sea lion diet in summer and winter in the central AI and pollock is important in the sea lion diet in winter. However, the PPA would allow pollock fishing outside of 3 nm from all sea lion winter sites in this one-degree of latitude in the eastern portion of area 542.

Area 541: The PPA would open critical habitat to trawling for pollock from 10 to 20 nm from rookeries and from 3 to 20 nm from haulouts. As with the status-quo, fishing would be prohibited in the Seguam Foraging area. The A season catch limit would be 30% of the AI pollock ABC.

Conclusions

The PPA would open area of critical habitat to pollock fishing that was closed under status quo. Alternative 5 for pollock is more protective than Alternatives 2 through 4, but less protective than status quo (draft EIS page 158). The A season catch limits are more restrictive from east to west, consistent with the performance standards to provide more protection to Steller sea lions where more decline is evident.

PRD needs to examine the effects of the PPA in aggregate to understand where impacts may be cumulative across fisheries. The extent to which the PPA for pollock would be assumed to affect critical habitat may depend on the extent to which the other fisheries affect prey availability in critical habitat in various areas.

Summary

PRD's initial evaluation of the PPA reveals some areas where the Council may wish to consider modifications to the proposed action to protect the conservation value of critical habitat. PRD will analyze the proposed modifications to the Steller sea lion protection measures for the Atka mackerel, pollock, and Pacific cod fisheries under section 7 of the ESA. Because the results of the full analysis for the new BiOp will not be known when the Council is scheduled to take final action in October 2013, PRD undertook this initial analysis to provide input to the Council on areas of the PPA that may be problematic in a section 7 consultation given the information available to date.

From the initial review of the PPA, PRD has identified the following concerns with the PPA (in order with one being the highest concern):

1. Provisions for Atka mackerel fishing in area 543 including potential for critical habitat catch amounts as occurred under the pre-2011 fishery management regime.
2. Provisions for Pacific cod non-trawl fishing in area 543 including potential critical habitat catch amounts, proximity to haulouts, and extended season dates.
3. Provisions for Pacific cod trawl fishing in area 543 including potential critical habitat catch amounts, critical habitat catch rates, and extended season dates.
4. Provisions for Pacific cod non-trawl and trawl fishing in area 542 including proximity of non-trawl fisheries to haulouts, potential critical habitat catch amounts, trawl critical habitat catch rates, and extended season dates.
5. Cumulative effects of opening area 543 critical habitat to Atka mackerel, Pacific cod, and pollock fishing.
6. Additional fishing inside critical habitat in Area 541 relative to pre-2011 fishing measures.

Through this initial analysis, PRD has focused on some measures of the effects of prey availability for sea lions in the draft EIS more than others. For example, PRD relied more on the amount of catch estimated to be displaced under the PPA relative to the baseline to understand the net effect off the proposed measures than on the amount of critical habitat area closed under the PPA. This is especially true for Atka mackerel fisheries since Atka mackerel habitat and aggregations are patchily distributed in the AI. The spatial patterns of the Atka mackerel fishery reflect the distribution and behavior of the species. The fishery is highly localized and focuses on

the same locations each year.² Thus, PRD does not rely much on the percent of critical habitat closed to fishing for Atka mackerel under each of the alternatives to inform prey availability and potential competition between sea lions and Atka mackerel fisheries. Because Pacific cod are more widely distributed and believed to make seasonal migrations, the percent area closed may be a more informative metric for Pacific cod conservation measures.

Ideally, we would evaluate the amount of biomass available in an area by month against sea lion foraging requirements. We would then estimate how much catch was likely to be removed and determine whether sufficient forage was available on a spatial and temporal scale relevant to foraging sea lions. Because biomass data are not available at this fine scale, PRD relies on the data from the available FIT studies and the estimated amount of catch from within 3, 10, and 20 nm of important sea lion sites to estimate the conservation value of various protection measures. Also, in the absence of other direct indicators or data, PRD tends to focus on sea lion abundance and trends at various sites as signals for the presence of potential ecological limitations to population maintenance and growth.

Depending on the signals in the fishery and sea lion data, in previous section 7 consultations NMFS has used amount of harvest displaced from an area of critical habitat, the percent of critical habitat closed from 0-3, 3-10 and 10-20 nm of important sea lion sites, the projected change in the WDPS population growth rate given various measures, and the projected change in the amount of fish spawning stock biomass given various levels of fishing mortality for Steller sea lion prey species as metrics for the adequacy of the protection measures. These metrics have typically flowed from the preceding analyses in the section 7 consultations.

Thus, while there is not a formula for the Council or its Steller sea lion mitigation committee to use at this stage to develop conservation measures certain to avoid JAM, there are metrics that NMFS has consistently used to infer the conservation value of proposed fishery mitigation measures. At a minimum, PRD suggests that the protection measures proposed for the central and western AI through this EIS process be consistent with the qualitative performance standards described in Chapter 1 of the draft EIS.

² McDermott, S.F. 2010. Introduction to a Special Section: Atka Mackerel Distribution, Life History, Ecology, and Management. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* 2:304–305.

Appendix
Draft EIS Section 1.10.3: Steller Sea Lion Protection Measures Objective and Performance Standards

In this EIS, we evaluate the alternatives considering the following objective and performance standards. NMFS developed the objective and performance standards to insure the Alaska groundfish fisheries are not likely to result in jeopardy. NMFS based these metrics on traditional methods used to mitigate potential effects of fishery removals of important Steller sea lion prey species. NMFS has consistently implemented fishery mitigation measures with the goal of conserving the overall and local availability of prey for Steller sea lions.

The objective of the Steller sea lion protection measures is to:

conserve the overall forage availability for Steller sea lions and the value of critical habitat by limiting harvest of important prey species at times and in the areas where Steller sea lions forage; focused on sub-regions where the combined sea lion and fishery signals indicate the likelihood of a compromised prey field.

Performance standards outline the important considerations for developing management strategies to mitigate potential adverse impacts of the fisheries on Steller sea lions. The following performance standards reflect concepts that NMFS has traditionally applied to mitigate potential impacts of the groundfish fisheries on Steller sea lions and their critical habitat and have been upheld in court. These performance standards guided the development and analysis of the alternatives in this EIS. To protect Steller sea lions and their critical habitat, fishery management measures should:

- Be commensurate with rate of population declines with more stringent measures in sub-regions, as described in the Steller sea lion Revised Recovery Plan (NMFS 2008), with greater population declines.
- Conserve the conservation value of designated critical habitat around rookeries and haulouts and in foraging areas.
- Disperse fishery removals at times and in areas to prevent local depletion of the prey field.
- Consider distributional effects of time and area closures that are not combined with reductions in total allowable catch such that fishery removals are not concentrated at another time or in another area that may be deleterious to foraging Steller sea lions.
- Conserve prey availability inside areas closed to directed fishing for Atka mackerel where Atka mackerel tagging studies indicate high movement of fish from inside to outside closure areas (e.g., Amchitka North in Area 542).
- Consider fishery removals in State of Alaska waters.
- Maintain or establish 3 nm groundfish fishing closures around rookeries in the AI subarea.

This list of performance standards is similar to those listed in the FMP biop, but not all the performance standards that were listed in the FMP biop (NMFS 2010a) are considered for this proposed action based on concerns raised by the independent reviews of the FMP biop (Stokes 2012), (Bowen 2012), (Stewart 2012), and (Bernard et al. 2011). No additional new information was identified during scoping on this EIS that would lead to different performance standards. The performance standard related to the conservation of offshore foraging resources outside of critical habitat will be further examined in any subsequent ESA consultation on this proposed action. The FMP biop included a performance standard related to estimating foraging biomass ratios, which is

not included in this EIS. Foraging biomass ratios and fisheries effects on Steller sea lions are controversial issues that are further discussed in section 1.9.

NMFS has determined that considering these performance standards is necessary to modify the groundfish fisheries in a manner that would insure the groundfish fisheries' impacts are not likely to jeopardize Steller sea lions and adversely modify their designated critical habitat. These performance measures allow for the focused application of revised Steller sea lion protection measures, particular to area, fishery, and Steller sea lion behavior. The proposed action is focused in the location where Steller sea lions are experiencing the greatest rate of population decline and where the groundfish fisheries may adversely affect Steller sea lions or adversely modify their designated critical habitat.