AGENDA D-1(a)
OCTOBER 2000

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
Acting Executive Director

DATE: September 27, 2000

SUBJECT: Groundfish Management

ESTIMATED TIME
5 HOURS
(for all D-1 items)

ACTION REQUIRED

Recommend interim and preliminary specifications for 2001 for the Bering Sea/Aleutian Islands and the Gulf of Alaska.

BACKGROUND

The preliminary BSAI and GOA groundfish ABCs and TACs, bycatch apportionments, and halibut discard mortality rates need to be approved and made available for public review and comment. The attached Tables 1 through 6 from the December 1999 newsletter list the 2000 final specifications (ABCs, TACs, PSC limits, and halibut discard mortality rates) that the Council is considering for approval as preliminary specifications for 2001.

Item D-1(a) is a letter from the IPHC regarding a new cycle for establishing halibut discard mortality rates.

Gulf of Alaska 2000 Specifications

TABLE 1

	1999				2000		
Species	Area	ABC	TAC	Catch[1]	Area	ABC	TAC
Pollock	W (61)	23,120	23,120	23,387	W (61)	38,350	38,350
	C (62)	38,840	38,840	38,135	C (62)	22,820	22,820
	C (63)	30,520	30,520	30,095	C (63)	30,030	30,030
	WYAK	8,440	2,110	1,759	WYAK	2,340	2,340
	EYAK/SEO	0	6,330	4	EYAK/SEO	6,460	6,460
	Total	100,920	100,920	93,380	Total[2]	100,000	100,000
Pacific Cod	W	29,540	23,630	23,154	W	27,500	20,625
	C	53,170	42,935	44,559	C	43,550	35,165
	E	1,690	1,270	857	E	5,350	4,010
	Total	84,400	67,835	68,570	Total	76,400	59,800
Flatfish, Deep Water	W	240	240	22	W	280	280
	C	2,740	2,740	1,865	C	2,710	2,710
	WYAK	1,720	1,720	389	WYAK	1,240	1,240
	EYAK/SEO	1,350	1,350	9	EYAK/SEO	1,070	1,070
	Total	6,050	6,050	2,285	Total	5,300	5,300
Rex Sole	W	1,190	1,190	603	W	1,230	1,230
	C	5,490	5,490	2,391	C	5,660	5,660
	WYAK	850	850	41	WYAK	1,540	1,540
	EYAK/SEO	1,620	1,620	22	EYAK/SEO	1,010	1,010
	Total	9,150	9,150	3,057	Total	9,440	9,440
Shallow water flatfish	W	22,570	4,500	252	W	19,510	4,500
	C	19,260	12,950	2,282	C	16,400	12,950
	WYAK	250	250	6	WYAK	790	790
	EYAK/SEO	1,070	1,070	5	EYAK/SEO	1,160	1,160
	Total	43,150	18,770	2,545	Total	37,860	19,400
Flathead Sole	W	8,440	2,000	184	W	8,490	2,000
	C	15,630	5,000	680	C	15,720	5,000
	WYAK	1,270	1,270	16	WYAK	1,440	1,440
	EYAK/SEO	770	770	11	EYAK/SEO	620	620
	Total	26,110	9,040	891	Total	26,270	9,060
Arrowtooth	W	34,400	5,000	3,656	W	16,160	5,000
	C	155,930	25,000	11,787	C	97,710	25,000
	WAYK	13,260	2,500	383	WAYK	23,770	2,500
	EYAK/SEO	13,520	2,500	236	EYAK/SEO	7,720	2,500
	Total	217,110	35,000	16,062	Total	145,360	35,000
Sablefish[3]	W	1,820	1,820	1,487	W	1,840	1,840
	C	5,590	5,590	5,828	C	5,730	5,730
	WYAK	5,290	2,090	1,704	WYAK	5,760	2,207
	EYAK/SEO		3,200	3,080	EYAK/SEO		3,553
	Total	12,700	12,700	12,099	Total	13,330	13,330
Other slope rockfish	W	20	20	40	W	20	20
	C	650	650	615	C	740	740
	WYAK	470	470	122	WYAK	250	250
	EYAK/SEO	4,130	4,130	12	EYAK/SEO	3,890	3,890
	Total	5,270	5,270	789	Total	4,900	4,900
Northern rockfish	W	840	840	573	W	630	630
	C	4,150	4,150	4,825	C	4,490	4,490
	E	0	0	0	E	0	0
	Total	4,990	4,990	5,398	Total	5,120	5,120
Pacific Ocean Perch	W	1,850	1,850	1,935	W	1,240	1,240
	C	6,760	6,760	7,914	C	9,240	9,240
	WYAK	1,350	820	627	WYAK	840	840
	EYAK/SEO	3,160	3,160	0	EYAK/SEO	1,700	1,700
	Total	13,120	12,590	10,476	Total	13,020	13,020

Table 1 cont.	1999				2000		
Species	Area	ABC	TAC	Catch	Area	ABC	ABC
Shortraker/Rougheye	W	160	160	194	W	210	210
	C	970	970	577	C	930	930
	E	460	460	531	E	590	590
	Total	1,590	1,590	1,302	Total	1,730	1,730
Pelagic shelf rockfish	W	530	530	130	W	550	550
	C	3,370	3,370	3,835	C	4,080	4,080
	WYAK	740	740	672	WYAK	580	580
	EYAK/SEO	240	240	20	EYAK/SEO	770	770
	Total	4,880	4,880	4,657	Total	5,980	5,980
Demersal shelf rockfish		560	560	262		340	340
Atka Mackerel	Gulfwide	600	600	262	Gulfwide	600	600
Thornyhead	W	260	260	282	W	430	430
	C	700	700	582	C	990	990
	E	1,030	1,030	410	E	940	940
	Total	1,990	1,990	1,274	Total	2,360	2,360
Other Species	Gulfwide		14,600	3,735	Gulfwide		14,270
GULF OF ALASKA	TOTAL	532,590	306,535	227,044	TOTAL	431,410	299,650

1/ Catch through November 6, 1999

2/ pollock W/C/WY ABCs &TACs adjusted downwards by 1,420 mt for Prince William Sound State fishery GHL

3/ includes 5% transfer from EY/SEO TAC to WY TAC

OFL = Overfish level, ABC = Acceptable biological catch, TAC = Total allowable catch, WYAK = Western Yakutat, EYAK = Eastern Yakutat Southeast outside.

PSC Limits for Halibut

	Trawl			Hook and Line	
1st quarter	600 mt	30%	1st trimester	250 mt	86%
2nd quarter	400 mt	20%	2nd trimester	15 mt	5%
3rd quarter	600 mt	30%	3rd trimester	25 mt	9%
4th quarter	400 mt	20%	DSR	10 mt	
	2,000 mt			300	

Trawl apportionments

Quarter	Shallow water Complex	Deep water Complex	Total
1	500 mt	100 mt	600 mt
2	100 mt	300 mt	400 mt
3	200 mt	400 mt	600 mt
4	No apportionment		400 mt

Table 2. **Summary of halibut discard mortality rates (DMRs) in the Bering Sea/Aleutian Islands (BSAI) groundfish fisheries during 1990-1998 and recommendations for Preseason Assumed DMRs in monitoring halibut bycatch mortality in 2000.**

Gear and Target	1990	1991	1992	1993	1994	1995	1996	1997	1998	Trend?	2-Year Mean	Used in 1999	Recommendations for 2000
Trawl													
Atka mackerel	66	77	71	69	73	73	83	85	77	No	81	85	81
Bottom pollock	68	74	78	78	80	73	79	72	80	No	76	76	76
Pacific cod	68	64	69	67	64	71	70	67	66	Yes/dn	67	69	66
Other Flatfish	80	75	76	69	61	68	67	71	78	No	75	69	75
Rockfish	65	67	69	69	75	68	72	71	56	No	64	72	64
Flathead sole	-	-	-	-	67	62	66	57	70	No	64	62	64
Other species	-	-	-	-	-	-	-	-	-	-	-	69	66
Pelagic pollock	85	82	85	85	80	79	83	87	86	No	87	85	87
Rock sole	64	79	78	76	76	73	74	77	79	Yes/up	78	76	79
Sablefish	46	66	-	26	20	-	-	-	-	No	23	23	23
Turbot	69	55	-	-	58	75	70	75	86	No	81	73	81
Yellowfin sole	83	88	83	80	81	77	76	80	82	No	81	78	81
Pot													
Pacific cod	12	4	12	4	10	10	7	4	13	No	9	4	9
Other species	-	-	-	-	-	-	-	-	-	-	-	4	9
Longline													
Pacific cod	19	23	21	17	15	14	12	11	11	No	11	11	11
Rockfish	17	55	-	6	23	-	20	4	52	No	28	12	28
Other species	-	-	-	-	-	-	-	-	-	-	-	11	11
Sablefish	14	32	14	13	38	-	-	-	-	-	-	-	-
Turbot	15	30	11	10	14	9	15	22	18	No	20	19	20
CDQ Trawl													
Bottom pollock	-	-	-	-	-	-	-	-	90	-	-	76	90
Pelagic pollock	-	-	-	-	-	-	-	-	90	-	-	81	90
CDQ Longline													
Pacific cod	-	-	-	-	-	-	-	-	10	-	-	11	10

Table 3. Summary of halibut discard mortality rates (DMRs) in the Gulf of Alaska (GOA) groundfish fisheries during 1990-1998 and recommendations for Preseason Assumed DMRs in monitoring halibut bycatch mortality in 2000.

Gear and Target	1990	1991	1992	1993	1994	1995	1996	1997	1998	Trend?	2-Year Mean	Used in 1999	2000 Recommendation
Trawl													
Atka mackerel	67	89	81	67	53	-	60	-	-	No	57	57	57
Bottom pollock	51	62	66	57	48	66	79	66	55	No	61	73	61
Pacific cod	60	62	66	59	53	64	70	62	64	No	63	66	63
Deep wtr flats	61	58	70	59	60	56	71	61	51	No	56	66	56
Shallow wtr flats	66	71	69	65	62	70	71	71	67	No	69	71	69
Rockfish	65	75	79	75	58	71	65	63	68	No	66	64	66
Flathead sole	-	-	-	-	54	64	67	74	39	No	57	**	57
Other species	-	-	-	-	-	-	-	-	-	-	-	66	66
Pelagic pollock	71	82	72	63	61	51	81	70	80	No	75	76	75
Sablefish	70	60	68	59	67	58	80	61	-	No	71	71	71
Arrowtooth fldr	-	-	-	-	-	-	66	48	62	No	55	57	55
Rex sole	-	-	-	-	56	76	63	47	58	No	53	55	53
Pot													
Pacific cod	12	7	16	24	17	21	7	11	16	No	14	6	14
Other species	-	-	-	-	-	-	-	-	-	-	-	6	14
Longline													
Pacific cod	15	18	13	7	11	13	11	22	11	No	17	16	17
Rockfish	6	-	-	7	-	4	13	-	9	No	11	9	11
Other species	-	-	-	-	-	-	-	-	-	-	-	16	17
Sablefish	17	27	28	30	22	-	-	-	-	-	-	-	-

**Catcher vessel fleet = 58%; Catcher/Processor fleet = 74%.

Table 4. Bering Sea and Aleutian Islands
Council Recommended 2000 Catch Specifications (mt)

Species	Area	2000 Biomass	2000 OFL	2000 ABC	2000 TAC	1999 ABC	1999 TAC	1999 Catch
Pollock	EBS	7,700,000	1,680,000	1,139,000	1,139,000	992,000	992,000	884,133
	AI	106,000	31,700	23,800	2,000	23,800	2,000	1,003
	Bogoslof	475,000	30,400	22,300	1,000	15,300	1,000	21
Pacific cod	BS/AI	1,300,000	240,000	193,000	193,000	177,000	177,000	160,084
Yellowfin sole	BS/AI	2,820,000	226,000	191,000	123,262	212,000	207,980	67,392
Greenland turbot	BS/AI	233,000	42,000	9,300	9,300	14,200	9,000	
	BS			67%	67%	67%	67%	5,315
	AI			33%	33%	33%	33%	461
Arrowtooth	BS/AI	785,000	160,000	131,000	131,000	140,000	134,354	10,679
Rock sole	BS/AI	2,070,000	273,000	230,000	134,760	309,000	120,000	40,362
Flathead sole	BS/AI	611,000	90,000	73,500	52,652	77,300	77,300	17,777
Other flatfish	BS/AI	829,000	141,000	117,000	83,813	154,000	154,000	15,184
Sablefish	EBS	18,000	1,750	1,470	1,470	1,340	1,340	628
	AI	33,000	3,090	2,430	2,430	1,860	1,380	529
POP complex								
True POP	EBS	47,700	3,100	2,600	2,600	1,900	1,400	376
Other POP	EBS	8,200	259	194	194	267	267	217
True POP	AI	192,000	14,400	12,300	12,300	13,500	13,500	
	Eastern			3,120	3,120	3,430	3,430	2,416
	Central			3,510	3,510	3,850	3,850	2,815
	Western			5,670	5,670	6,220	6,220	6,545
Sharp/Northern	AI	115,000	6,870	5,150	5,150	4,230	4,230	5,181
Short/Rougheye	AI	41,500	1,180	885	885	965	965	474
Other rockfish	EBS	7,030	492	369	369	369	369	137
	AI	13,000	913	685	685	685	685	632
Atka mackerel	AI	565,000	119,000	70,800	70,800	73,300	66,400	
	Eastern			16,400	16,400	17,000	17,000	15,893
	Central			24,700	24,700	25,600	22,400	21,443
	Western			29,700	29,700	30,700	27,000	15,626
Squid	BS/AI	n/a	2,620	1,970	1,970	1,970	1,970	413
Other species	BS/AI	611,000	71,500	31,360	31,360	32,860	32,860	18,396
BS/AI TOTAL		18,580,430	3,139,274	2,260,113	2,000,000	2,247,846	2,000,000	1,223,618

EBS = eastern Bering Sea
BS/AI = Bering Sea & Aleutians
BS = Bering Sea
AI = Aleutian Islands

OFL = overfishing level
ABC = acceptable biological catch
TAC = total allowable catch

1999 catch as of 10/30/99
(CDQ catch not included)

Footnote: The pollock assessment model used post-1978 recruitment data.

TABLE 5. 2000 BSAI Trawl Fisheries PSC Council Recommended Apportionments and Seasonal Allowances

Fishery Group	Halibut Mortality Cap (mt)	Herring (mt)	Red King Crab (animals) Zone1	C. bairdi Zone1	C. bairdi Zone2	C. opilio COBLZ
Yellowfin sole	26.06%	9.14%	12.99%	37.61%	64.98%	71.49%
	958	**169**	**12,600**	**312,163**	**1,637,448**	**3,109,815**
January 20 - March 31	*29.63%*					
April 1 - May 20*	*22.00%*					
May 21 - July 3	*5.45%*					
July 4 - Dec 31	*42.82%*					
Rocksole/other flatfish	22.91%	1.31%	72.17%	40.29%	21.66%	21.62%
	842	**24**	**70,005**	**334,407**	**545,832**	**940,470**
January 20 - March 31	*57.62%*					
April 1 - July 3	*20.95%*					
July 4 - December 31	*21.31%*					
Turbot/sablefish/		0.59%				1.02%
Arrowtooth		**11**				**44,370**
Rockfish	2.03%	0.47%			0.42%	1.02%
July 4 - Dec 31	**75**	**9**			**10,884**	**44,370**
Pacific cod	42.18%	1.31%	12.99%	20.17%	11.83%	3.07%
	1,550	**24**	**12,600**	**167,411**	**298,116**	**133,545**
Pollock/mackerel/o.species	6.82%	87.18%	1.85%	1.93%	1.10%	1.78%
	250	**1,616**	**1,795**	**16,019**	**27,720**	**77,430**
TOTAL	**3,675**	**1,853**	**97,000**	**830,000**	**2,520,000**	**4,350,000**

1) Includes 7.5% CDQ allocation.
2) Unused PSC allowances may be rolled into the following seasonal apportionment.
3) 35% of the red king crab PSC for the rock sole fishery is apportioned to the 56 - 56o10' RKCSA strip.
4) Accounts for the reductions in halibut and crab PSCs due to ban on pollock bottom trawling (halibut: -100 mt; RKC: -3,000; Z1 bairdi: -20,000; Z2 bairdi: -30,000; opilio: -150,000 crab)
5) Accounts for adjustments due to changes in biomass for herring, red king crab, Z2 bairdi, and opilio.
6) For herring PSC in pollock/makerel/o.species category, 1,558 mt for midwater pollock fishery.

Table 6. 2000 BSAI Non-Trawl Fisheries PSC Bycatch Allowances and fixed gear Pacific cod seasonal apportionments

Fishery Group	Halibut Mortality (mt)		Seasonal Apportion of cod TAC (mt)	
Pacific Cod	810			
Jan 1 - April 30		495	65,000	first tr.
May 1 - August 31		0	0	second tr.
Sept. 1 - Dec. 31		315	26,048	third tr.
Other Non-Trawl*	90			
May 1 - December 31		90		
Groundfish Pot	Exempt			
TOTAL	900 mt		91,048	

Note: unused halibut PSC or P. cod TAC from first trimester will be rolled into the third trimester.
Any halibut PSC removed from the CDQ fisheries will be replaced from PSC apportioned from the third trimester.

* Includes hook & line fisheries for rockfish and Greenland turbot.
Sablefish hook & line fisheries will be exempted from the halibut mortality cap.
Jig gear will also be exempted from the halibut mortality cap.

AGENDA D-1(a)
OCTOBER 2000
Supplemental

INTERNATIONAL PACIFIC HALIBUT COMMISSION

P.O. BOX 95009
SEATTLE, WA 98145-200

TELEPHONE
(206) 634-1838

FAX:
(206) 632-2983

ESTABLISHED BY A CONVENTION BETWEEN CANADA

AND THE UNITED STATES OF AMERICA

September 26, 2000

Mr. Chris Oliver, Acting Director
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Dear Chris:

Since 1990 the IPHC staff has been analyzing observer data on halibut bycatch release condition to determine discard mortality rates (DMRs) and making annual recommendations for preseason assumed DMRs to the Council during the fall specification process. The preseason assumed DMRs are used by NMFS for inseason tracking of halibut bycatch mortality. While some fishery sectors have enacted programs to reduce DMRs in their fisheries, the most obvious being the BSAI hook-&-line fishery for cod and the Careful Release Program, we have noticed that DMRs in most fisheries have demonstrated little change over the past few years.

At this time we do not see any proposals for programs that might affect halibut DMRs and overall mortality. For this reason the IPHC staff is proposing to discontinue the process of annual recommendations for preseason assumed DMRs. Instead, we propose that NMFS use an average of the annual DMRs demonstrated during 1990-1999, which in most cases encompass 10 years of information. We will propose revisions to the average DMRs on a periodic basis, perhaps every 3 years, or following the implementation of management programs which would affect the DMRs, such as HMAP.

We believe that this proposal will help to focus attention on reducing bycatch rather than mortality. The general stability noted in DMRs in recent years suggests that the industry may have achieved most of the mortality reductions possible. Shifting the emphasis to bycatch reduction while holding the DMRs fixed may be advisable as the Council looks at new ways of structuring the groundfish fishery.

An analysis supporting our proposal will be distributed to the SSC prior to the meeting for their review. Additional copies will be available to the public at the meeting. Gregg Williams from our staff will be attending the October meeting and will present our proposal to the AP, SSC, and Council, and will address any questions that may arise about our proposal.

Sincerely yours,

Bruce M. Leaman
Director

cc: Commissioners

D1(a)
Supplement

Table 1. Groundfish harvest specifications for the Bering Sea and Aleutian Islands management area. For the year 2000 these data include: OFLs, ABC, TAC specifications; Proposed 2001 TAC specifications are identical to final 2000 TACs. 2001 Interim specifications are derived from the proposed specifications using the regulatory formula (proposed TAC x .85 x .25) with exceptions for pollock, sablefish, and Atka mackerel. All values are in metric tons.

	2000 Specifications and Proposed and Interim 2001 Specifications				
Species	Area	OFL	ABC	2000 TAC and proposed 2001 TAC	2001 Interim Specifications
Pollock (1)	Bering Sea (BS)	1,680,000	1,139,000	1,139,000	389,538
	Aleutian Is. (AI)	31,700	23,800	2,000	800
	Bogoslof	30,400	22,300	1,000	400
Pacific cod (2)	BSAI	240,000	193,000	193,000	41,013
Sablefish (3)	BS	1,750	1,470	1,470	156
	AI	3,090	2,430	2,430	129
Atka mackerel (4)	Total	119,000	70,800	70,800	30,019
	Western AI		29,700	29,700	12,622
	Central AI		24,700	24,700	10,497
	Eastern AI/BS		16,400	16,400	6,900
Yellowfin sole	BSAI	226,000	191,000	123,262	26,193
Rock sole	BSAI	273,000	230,000	134,760	28,637
Greenland turbot	Total	42,000	9,300	9,300	1,976
	BS			6,231	1,324
	AI			3,069	652
Arrowtooth flounder	BSAI	160,000	131,000	131,000	27,838
Flathead sole	BSAI	90,000	73,500	52,652	11,189
Other flatfish	BSAI	141,600	117,000	83,813	17,811
Pacific ocean perch	BS	3,100	2,600	2,600	553
	AI Total	14,400	12,300	12,300	2,614
	Western AI		5,670	5,670	1,205
	Central AI		3,510	3,510	746
	Eastern AI		3,120	3,120	663
Other red rockfish	BS	259	194	194	41
Sharpchin/Northern	AI	6,870	5,150	5,150	1,094
Shortraker/Rougheye	AI Total	1,180	885	885	188
Other rockfish	BS	492	369	369	79
	AI	913	685	685	146
Squid	BSAI	2,620	1,970	1,970	419
Other species	BSAI	71,500	31,360	31,360	6,664
	Total	3,139,274	2,260,113	2,000,000	587,497

Excessive harvesting share limit 170,442 mt pollock.

(1) interim pollock see subtable 1a. for apportionments

(2) Pacific cod see subtable 1b. for apportionments

(3) Sablefish see subtable 1c. for apportionments

(4) Atka mackerel see subtable 1d. for apportionments

Table 1a. Apportionments of pollock interim TACs

Pollock	2001 Proposed TAC	2001 Interim TAC	2001 Interim CDQ
BS Total	1,139,000	389,538	45,560
Inshore BS (50%)		194,769	
Offshore C/P BS (40%)		155,815	
Mothership BS (10%)		38,954	
CDQ	113,900		45,560
Incidental Catch BS	51,255	51,255	
AI Incidental Catch	2,000	800	
Bogoslof Incidental	1,000	400	
Interim TAC algorithm is CDQ allocated 40% of 10%; then incidental catch allocated 5%. Remainder is initial TAC. Processing sectors 40% of initial, then divided 50%, 40%, 10%, respectively for interim.			

Table 1b. Apportionments of Pacific cod interim TACs

Pacific cod	2001 Proposed TAC	2001 Interim TAC	2001 Interim CDQ
BSAI Total	193,000	41,013	3,619
BSAI non-CDQ			
Fixed gear (51%)		20,917	
Trawl(47%)		19,276	
Jig(2%)		820	
CDQ			3,619
Interim TAC algorithm is 15% to reserves and remainder is initial TAC. CDQ is 50% of reserve and 25% for interim. Gear sectors 25% of Initial, then 51%, 47%, 2% respectively for interim.			

Table 1c. Apportionments of sablefish interim TACs

Sablefish	2001 Proposed TAC	2001 Interim TAC	2001 Interim CDQ
BS total	1,470	156	14
Trawl (25%)	735	156	14
Fixed (75%)	N/A	N/A	N/A
AI total	2,430	129	11
Trawl (25%)	607	129	11
Fixed (75%)	N/A	N/A	N/A
Interim TAC algorithm is 15% to reserves and remainder is initial TAC. Gear sectors 50% of Initial, then 25%, 75% respectively. Fixed gear closed during interim. 50% of reserve is CDQ with same gear sector split percentages and 50% for interim.			

Table 1d. Apportionments of Atka mackerel interim TACs

Atka mackerel	2001 Proposed TAC	2001 Interim TAC	2001 Interim CDQ
Total AI	70,800	30,019	1,327
Western AI	29,700	12,622	557
Central	24,700	10,497	463
Eastern AI & BS subarea	16,400	6,900	307
Jig		35	
Other gear		6,865	
Interim TAC algorithm is 15% to reserves and remainder is initial TAC. Area allocations then 50% of Initial. In Eastern AI, jig gear allocated 1% of initial and 25% for interim. 50% of reserve is CDQ with 25% for interim.			

Table 2. Groundfish harvest specifications for the Gulf of Alaska management area. For the year 2000 these data include: OFLs, ABCs, TAC specifications; Proposed 2001 TACs are identical to final 2000 specifications. 2001 Interim specifications are derived from the proposed specifications using the regulatory formula (proposed TAC x .85 x .25). All values are in metric tons.

Species	2000 Specifications and Proposed and Interim 2001 Specifications				
	Area	OFL	ABC	2000 TAC and proposed 2001 TAC	2001 Interim Specifications
	W (610)			32,340	7,498
	C (620)			13,372	546
	C (630)			24,501	5,325
Pollock	Shelikof (1)			20,987	13,992
	WYK (640)		2,340	2,340	585
	subtotal	130,760	93,540	93,540	27,946
	SEO(650)	8,610	6,460	6,460	1,615
	Total	139,370	100,000	100,000	29,561
Pacific Cod	W		27,500	20,625	4,125
	C		43,550	34,080	6,816
	E		5,350	4,010	802
	Total	102,000	76,400	58,715	11,743
Flatfish, Deep Wat	W		280	280	70
	C		2,710	2,710	678
	WYK		1,240	1,240	310
	SEO		1,070	1,070	268
	Total	6,980	5,300	5,300	1,326
Rex Sole	W		1,230	1,230	308
	C		5,660	5,660	1,415
	WYK		1,540	1,540	385
	SEO		1,010	1,010	252
	Total	12,300	9,440	9,440	2,360
Flatfish, Shal water	W		19,510	4,500	1,125
	C		16,400	12,950	3,237
	WYK		790	790	198
	SEO		1,160	1,160	290
	Total	45,330	37,860	19,400	4,850
Flathead Sole	W		8,490	2,000	500
	C		15,720	5,000	1,250
	WYK		1,440	1,440	360
	SEO		620	620	155
	Total	34,210	26,270	9,060	2,265
Arrowtooth	W		16,160	5,000	1,250
	C		97,710	25,000	6,250
	WYK		23,770	2,500	625
	SEO		7,720	2,500	625
	Total	173,910	145,360	35,000	8,750
Sablefish	W Total		1,840	1,840	92
(Trawl only)	C Total		5,730	5,730	286
	WYK Total		2,207	2,207	72

Species	2000 Specifications and Proposed and Interim 2001 Specifications				
	Area	OFL	ABC	2000 TAC and proposed 2001 TAC	2001 Interim Specifications
Sablefish	Total	16,660	13,330	13,330	450
Rockfish, Other	W		20	20	5
Slope	C		740	740	185
	WYK		250	250	62
	SEO		3,890	3,890	972
	Total	6,390	4,900	4,900	1,224
Rockfish, Northern	W		630	630	158
	C		4,490	4,490	1,122
	E		na	na	na
	Total	7,510	5,120	5,120	1,280
POP	W	1,460	1,240	1,240	310
	C	10,930	9,240	9,240	2,310
	WYK		840	840	210
	SEO		1,700	1,700	425
	E subtotal	3,000			
	Total	15,390	13,020	13,020	3,255
Shortraker/Rough	W		210	210	52
	C		930	930	232
	E		590	590	148
	Total	2,510	1,730	1,730	432
Rockfish, Pel Shelf	W		550	550	138
	C		4,080	4,080	1,020
	WYK		580	580	145
	SEO		770	770	192
	Total	9,040	5,980	5,980	1,495
Rockfish, DemShlf	SEO	420	340	340	85
Atka Mackerel	Gulfwide	6,200	600	600	150
Thornyhead	W		430	430	108
	C		990	990	248
	E		940	940	235
	Total	2,820	2,360	2,360	591
Other Species	Gulfwide		NA	14,215	3,554
GULF OF ALASKA	TOTAL	581,040	448,010	298,510	73,371

(1) Shelikof pollock fishery exists only during A and B seaons; interim Shelikof TAC is first seasonal allowance. The pollock catch limit for the Shelikof Strait conservation zone is determined by calculating the ratio of the most recent estimate of pollock biomass in Shelikof Strait (489,900mt) divided by the most recent estimate of total pollock biomass in the GOA (958,000 mt). This ratio is then multiplied by the pollock TAC in the A season for the combined Western and Central areas of the GOA (27,360 mt). The remainder of the combined W/C TAC in the A season is apportioned among Regulatory Areas 610, 620, and 630 outside the Shelikof Strait based on the distribution of pollock outside the Shelikof Strait; 56.09%, 4.08%, and 39.83% respectively.

Table xx. Prohibited species bycatch allowances for the BSAI trawl and non-trawl fisheries. 2001 Interim allowances are 25% of these amounts.

	Prohibited Species and Zone					
	Halibut mortality (mt) BSAI	Herring (mt) BSAI	Red King Crab (animals) Zone 1	*C. opilio* (animals) COBLZ	*C. bairdi* (animals)	
					Zone 1	Zone 2
Trawl Fisheries						
Yellowfin sole	886	169	11,655	2,876,579	288,750	1,514,683
Rocksole/oth.flat/fla	779	24	42,090	869,934	309,326	504,894
Turbot/sablefi/arrow		11		41,043		
Rockfish	69	9		41,043		10,024
Pacific cod	1,434	24	11,656	123,529	154,856	275,758
Pollock/Atka/other	232	1,616	1,660	71,622	14,818	25,641
RKC savings subar			22,665			
Total Trawl PSC	3,400	1,853	89,725	4,023,750	767,750	2,331,000
Non-Trawl Fisherie						
Pacific cod	748					
Other non-trawl	84					
Groundfish pot&jig	exempt					
Sablefish hook-and-l	exempt					
Total Non-Trawl	833					
PSQ Reserve	343		7,275	326,250	62,250	189,000
Grand Total	4,675	1,853	97,000	4,350,000	830,000	2,520,000

DRAFT ENVIRONMENTAL ASSESSMENT AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

For The Proposed and Interim Total Allowable Catch Specifications for the Year 2001
Alaska Groundfish Fisheries

Implemented Under The Authority Of The
Fishery Management Plans
For The
Groundfish Fishery Of The Bering Sea And Aleutian Islands Area
And
Groundfish Of The Gulf Of Alaska

October 2, 2000

Lead Agency: National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Alaska Regional Office
Juneau, Alaska

Responsible Official James W. Balsiger
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Abstract: This draft Environmental Assessment documents the analysis of the groundfish target species stock status, higher and lower trophic level species, and the physical and socioeconomic environment. The federal action consists of specifying groundfish total allowable catch limits for fishing year 2001 in the exclusive economic zones of the Bering Sea and Aleutian Islands management area and the Gulf of Alaska management area. Interim total allowable catch specifications are established to allow timely opening of fisheries while public review of the proposed new total allowable catch levels occurs. The total allowable catch, when approved, becomes the upper limit of groundfish harvested in the fisheries during calendar year 2001.

Comment due date: October 16, 2000

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EXECUTIVE SUMMARY

The proposed federal action is the establishment of harvest quotas for fishing that will take place during calendar year 2001. Proposed and interim total allowable catch (TAC) specifications are being proposed and implemented. The purpose of this Environmental Assessment (EA) is to assess the potential impacts of groundfish harvest on the human environment at alternative TAC levels. This EA tiers off the broader action of groundfish fishing under various levels of TAC which were analyzed in a supplemental environmental impact statement (SEIS, NMFS 1998a) prepared to supplement the original Environmental Impact Statements (EISs) for the Fishery Management Plans for the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI).

This EA updates the information available and pertinent to changing the TAC amounts from those set for previous fishing years to these proposed for fishing year 2001. Potential impacts of groundfish harvest at alternative proposed and interim TAC levels specified for 2001on target groundfish species, higher trophic level species, Endangered Species Act (ESA) listed species, marine habitat, other predators and prey which together constitute the ecosystem, and socioeconomic impacts are addressed in this EA.

Species listed under the ESA are present in the action area and some could be negatively affected by the proposed action. NMFS is the expert agency for ESA listed marine mammals and anadromous fish. The US Fish and Wildlife Service is the expert agency for ESA listed seabirds. The action, establishment of harvest quotas in the exclusive economic zone (EEZ) off Alaska, must be in compliance with the ESA. An Fishery Management Plan (FMP) level Biological Opinion is being prepared pursuant to Section 7 of the ESA on all listed species present in the fishery management areas for the entire groundfish fisheries program. The opinion is expected to be completed in the fall 2000. Consultations under Section 7 of the ESA were also initiated for ESA listed marine mammals and for the endangered short-tailed albatross using the TAC specifications to be established for calendar year 2001 to 2004.

NMFS is pursuing rulemaking to permanently implement mitigation measures for Steller sea lion determined necessary in Section 7 consultations prepared in 1998 (NMFS 1998b) and the revised final reasonable and prudent alternatives for that Biological Opinion. NMFS acknowledges that mitigation measures must be in place before the start of the year 2001 BSAI and GOA groundfish fisheries in order to reach a finding of no significant impact on the action, specifying 2001 TACs, considered in this EA. In 2000, the mitigation measures were implemented by an emergency interim rule that changed the pollock fishery in the BSAI and GOA to avoid jeopardizing the continued existence of the western population of endangered Steller sea lions or adversely modifying its critical habitat. If these mitigation measures are not implemented permanently through proposed and final rulemaking by 2001, NMFS, by emergency rule under the authority of the Magnuson-Stevens Act, will prohibit fishing as necessary to avoid jeopardy and adverse modification of Steller sea lion critical habitat until such time that mitigation measures can be fully implemented.

Information on the status of groundfish stocks, economic status of groundfish fisheries off Alaska, ecosystem consideration and essential fish habitat is located in the Appendices to the Environmental Assessment for the Interim and Final Total Allowable Catch Specifications for the Year 2000 Alaska Groundfish Fisheries (2000 Groundfish EA, NMFS 1999d). The status of groundfish stocks was reviewed by the Plan Teams for the groundfish fisheries of the BSAI and GOA at their September and November 1999 meetings, and is presented in the Stock Assessment and Fishery Evaluation (SAFE) Reports for the Groundfish Resources of the BSAI and GOA as Projected for 2000 (Appendices A and B of the 2000 Groundfish EA, NMFS 1999d). The economic status of the groundfish fisheries off Alaska

are updated in Appendix C of the 2000 Groundfish EA. Ecosystem considerations are presented in Appendix D of the 2000 Groundfish EA. An assessment of impacts to essential fish habitat is contained in Appendix E of the 2000 Groundfish EA. All of this information is available to members of the North Pacific Fishery Management Council (Council), its Scientific and Statistical Committee, and Advisory Panel, and the general public during deliberations on the setting of proposed and interim TAC specifications for the year 2001. No new information on the status of stocks will be available until early December 2000 when the SAFE report for 2001 will be presented to the Council.

The following are the sums of the Council-recommended acceptable biological catch (ABC), proposed TAC, and overfishing limit (OFL) specifications for the year 2000. The OY levels were established in the Fishery Management Plans for the Groundfish Fishery of the BSAI (NPFMC 1995) and the GOA (NPFMC 1994).

Specifications	Year 2000 BSAI	Year 2001 BSAI	Year 2000 GOA	Year 2001 GOA
OY (upper limit)	2,000,000	2,000,000	800,000	800,000
ABC	2,260,113		448,010	
TAC	2,000,000		298,510	
OFL	3,139,274		581,040	

1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

Under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the United States has exclusive fishery management authority over all marine fishery resources found within the exclusive economic zone which extends to between 3 and 200 nautical miles from the baseline used to measure the territorial sea The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in Regional Fishery Management Councils. In the Alaska region, the North Pacific Fishery Management Council (Council) has the responsibility to prepare fishery management plans (FMPs) for the marine fisheries it finds require conservation and management. The National Marine Fisheries Service (NMFS) is charged with carrying out the federal mandates of the Department of Commerce with regard to marine fish. NMFS Alaska Regional Office and Alaska Fisheries Science Center provides research, analysis and technical support for management actions recommended by the Council.

The Magnuson-Stevens Act requires FMPs to specify the optimum yield from each fishery, that is the yield which would provide the greatest benefit to the Nation. The FMPs also must specify the level of fishing that would constitute overfishing. Using the framework of the FMPs and current information about the marine ecosystem (stock status, natural mortality rates, and oceanographic conditions), the Council recommends total allowable catch limits (TAC) for each species and prohibited species catch (PSC) limits based on biological determinations of ABC and OFL amounts, as modified by socioeconomic and ecological considerations.

Using stock assessments prepared annually by NMFS and the Alaska Department of Fish and Game (ADF&G), the Council's Groundfish FMP Teams (Plan Teams) calculate biomass, ABC, and OFL for each species or species group, as appropriate, for each of the various geographic areas of the Alaska EEZ that are open to harvest. The Plan Teams' rationale, models, and resulting ABC and OFL calculations are documented in the Stock Assessment and Fishery Evaluation (SAFE) reports. The 2000 SAFE reports incorporate biological survey work completed during the summer of 1999, any new methodologies applied to obtaining these data, and ABC and OFL determinations that are based on the most recent stock assessments. At its December 1999 meeting, the Council, its Advisory Panel (AP), Scientific and Statistical Committee (SSC), and the public reviewed the SAFE reports and made recommendations based on that information about the condition of groundfish stocks in the respective fishing areas. The 2001 SAFE will not be available until after November 2000 and will be used for establishing final 2001 TACs. The proposed and interim TAC specifications recommended by the Council for the year 2001 harvest quotas are based on data from the 2000 SAFE report, which is the most recent scientific information available at this time. This information includes projected biomass trends, information on assumed distribution of stock biomass, and revised technical methods used to calculate stock biomass. SAFE reports are part of the permanent record on the fisheries.

Total allowable catch specifications and prohibited species catch limits are determined by the Council and recommended to the Secretary annually. NMFS and ADF&G collect data for stock assessments annually. Generally, the Plan Teams meet in September and November each year. Preliminary SAFE reports are produced by the end of September and final SAFE reports by the end of November. In 2000, a preliminary SAFE report was not produced because the Plan Teams has no new information relative to

the 2000 SAFE reports with which to produce preliminary 2001 SAFE reports. Interim TAC specifications have been made since 1990. Interim specifications are, with a few exceptions, one-fourth of the proposed TAC specifications and one-fourth of each proposed PSC allowance and apportionments thereof. Interim TAC specifications are effective upon filing with the Office of the Federal Register and are used to manage the fisheries occurring in the first quarter of the calendar year. Final TAC specification recommendations are made by the Council at its December meeting following completion of final analyses of any new stock status information. Interim TAC specifications and PSC limits are being recommend to the Secretary for implementation in the first quarter of fishing year 2001. The final specifications when approved and implemented (usually in February) replace the interim specifications as soon as they are effective.

Actions taken to amend FMPs or implement other regulations governing the groundfish fisheries must meet the requirements of Federal laws and regulations. In addition to the Magnuson-Stevens Act, these include the National Environmental Policy Act (NEPA), the Administrative Procedures Act, the Endangered Species Act (ESA) and the Regulatory Flexibility Act (RFA). Annual specification of the groundfish TACs is required by regulations at 50 CFR 679.20(c). This EA and IRFA must meet requirements of RFA, in addition to NEPA.

The RFA, first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a federal regulation. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action.

The RFA requires the preparation of initial and final regulatory flexibility analyses (IRFA and FRFA) for each proposed and final regulatory action that can not be certified to "not have a significant economic impact on a substantial number of small entities." To ensure a broad consideration of impacts and alternatives, NMFS has prepared an IRFA pursuant to 5 USC 603, without first making the threshold determination of whether or not this proposed action would have a significant economic impact on small entities. The IRFA is included as chapter 4 of this document.

1.2 Regulatory Changes

Regulatory changes and proposed changes in the Alaska Groundfish Fisheries during 2000 that may have an effect on the TAC-setting process for the year 2001 fisheries are listed below. For details of inseason actions affecting the groundfish fisheries in the GOA and BSAI see the NMFS Alaska Regional Web page at www.fakr.noaa.gov/infobulletins.

Other Species:
Allocations of squid were removed from the CDQ program in 1999 by emergency rule (64 FR 3877, January 26, 1999 and 64 FR 34743, June 29, 1999). BSAI groundfish FMP Amendment 66 permanently

removes squid from the CDQ program. The proposed rule for this action was published July 17, 2000 (65 FR 44018) and Amendment 66 was approved August 30, 2000. A final rule is scheduled to be published soon.

Pollock Allocation:
The Council adopted Amendments 61/61/13/8 to the BSAI FMP which would implement major provisions of the American Fisheries Act (AFA). On January 28, 2000 an emergency interim rule included some of these changes (65 FR 4520, January 28, 2000). This rule includes a new formula to allocate the BSAI pollock TAC between the Community Development Quota (CDQ) program and inshore, catcher/processor, and mothership industry sectors. The AFA requires pollock TAC in the BSAI, after subtraction of the 10 percent CDQ reserve and establishing an incidental catch allowance to account for pollock taken in other directed groundfish fisheries, to be allocated 50 percent to vessels harvesting pollock for processing by AFA inshore processors, 40 percent to vessels harvesting pollock for processing by AFA catcher processors, and 10 percent to vessels harvesting pollock for processing by AFA motherships. Restrictions also are placed on AFA catcher vessels and AFA catcher/processors to limit effort of such vessels in other groundfish and crab fisheries. AFA mothership processors and AFA inshore processors are restricted in processing crab received from pollock harvest by BSAI cooperatives in the direct pollock fishery. Interim harvest specifications for BSAI and GOA groundfish harvest were revised and interim pollock TAC were allocated to inshore pollock cooperatives. The AFA provisions were implemented by emergency interim rules in 2000. Proposed and final rulemaking are being pursued by NMFS to permanently implement these provisions in 2001 and beyond.

Pollock and Steller Sea Lions:
In 1999, the pollock fisheries in the GOA and BSAI were subject to additional management under emergency rules (64 FR 3437, January 22, 1999 and 64 FR 39087, July 21, 1999) implemented to avoid jeopardizing the continued existence of the western population of endangered Steller sea lions and avoid adverse modification of its critical habitat. Effective through Dec. 31, 2000, NMFS issued an emergency interim rule of revised final reasonable and prudent actions necessary to prevent the pollock fishery from jeopardizing the Steller sea lion and adversely modifying its critical habitat (65 FR 3892 January 25, 2000 and 65 FR 36795 June 12, 2000). This rule implemented management measures to disperse fishing effort over time and space and to limit competition between the pollock fisheries and Steller sea lion for prey near rookeries and haul outs.

On July 19, 2000 the U. S. District Court for the Western District of Washington issued an order that granted a motion for partial injunction of the North Pacific groundfish fisheries. The motion requested injunctive relief until NMFS issues a legally adequate biological opinion addressing the combined, overall effects of the North Pacific groundfish fisheries on Steller sea lions and their critical habitat pursuant to the ESA. NMFS issued an interim rule to close the groundfish commercial trawl fisheries in the exclusive economic zone within the Steller sea lion critical habitat of Alaska west of 144 °W long (65 FR 49766 August 15, 2000).

Atka Mackerel TAC:
The Atka mackerel fishery was closed to all gear except jig in the eastern Aleutian district and Bering Sea subareas of BSAI in 2000 (65 FR 4893 February 2, 2000). This action was needed to prevent exceeding the TAC of Atka mackerel in these areas.

Bycatch:
On May 18, 2000, the hook-and-line fishery for all but sablefish and demersal shelf rockfish in the GOA was closed because the second seasonal halibut bycatch mortality allowances apportioned for this fishery was caught (65 FR 31105 May 16, 2000).

In July 2000 the NMFS reallocated halibut bycatch mortality allowance for the Pacific cod hook-and-line fishery to other nontrawl fisheries in the BSAI (65 FR 44011 July 17, 2000). This allowed the harvest of species constrained by the other nontrawl halibut bycatch mortality allowance without further restricting the hook-and-line Pacific cod fishery.

Bycatch and ESA:
On February 2, 2000 the Secretary of Commerce approved Amendment 58 to the BSAI FMP which is designed to reduce chinook salmon bycatch. When implemented this action will adjust the prohibited species catch limits of chinook salmon in Chinook Salmon Savings Area (CHSSA) of the BSAI. This action will modify slightly the boundaries of the CHSSA, set new CHSSA closure dates, and reduce the annual trawl chinook salmon bycatch limit in the CHSSA to 37,000 fish for 2001. The proposed rule was published in the *Federal Register* in December 1999 (64 FR 71390, December 21, 1999). The final rule should be effective by the 2001 fishing season.

The short-tailed albatross was originally designated as endangered under the Endangered Species Conservation Act of 1969 on the list of foreign-listed species. When the ESA replaced the 1969 Act in 1973, it was included as a foreign species but not as a native species, thus the current listing notes the short-tailed albatross as endangered except in the United States. The USFWS proposed to correct this administrative error by extending the endangered status for the short-tailed albatross to include the species' range within the United States (63 FR 58692, November 2, 1998). This proposal was finalized and the endangered status of the short-tailed albatross extended in a final rule published by the USFWS on July 31, 2000 (65 FR 46643). Despite the listing oversight, the short-tailed albatross has always been considered a protected species in the EEZ since its 1970 listing. The EEZ is beyond the 3-mile territorial limit of the United States and is an economic zone rather than an area where the United States has territorial jurisdiction. Therefore, section 7 consultations between NMFS and USFWS are appropriate and required and have occurred since 1989. Although USFWS has determined that this species is adversely affected by hook-and-line Pacific halibut and groundfish fisheries off Alaska, the determinations to date are the fisheries do not jeopardize the continued existence of the short-tailed albatross.

Pacific Cod:
Amendment 64 approved by NMFS on July 12, 2000 and published as a final rule (65 FR 51553, August 24, 2000) allocated Bering Sea Pacific cod among different sectors of the BSAI fixed gear fleet. This action closed the Pacific cod fishery for hook-and-line catcher vessels over 60 feet length overall and pot gear vessel over 60 feet length overall September 1, 2000 through December 31, 2000. The Pacific cod TAC allocations to these vessels were exceeded, prompting the closure by the RA.

A Draft Environmental Assessment for interactions between the Pacific cod fisheries in the Bering Sea, Aleutian Islands, and the Gulf of Alaska and Steller sea lions was released for public comment August 23, 2000. The purpose is to assess development and implementation of management measures to reduce the competition between Steller sea lions and Pacific cod fisheries through temporal and/or spatial

dispersion of the fisheries and precluding fisheries around rookeries and haulouts. Final Council action is scheduled for November 2000. Any necessary protection measures to address concerns about the impact of the Pacific cod fisheries on the Steller sea lions would be implemented by emergency rule for 2001.

State and Federal Interaction:
The groundfish harvest quotas are also affected by the annual guideline harvest levels (GHL) of groundfish fisheries managed by the Alaska Department of Fish and Game that occur in State of Alaska waters. In the past, the GHL for pollock in Prince William Sound has been deducted from the federal GOA ABC and the GHLs for Pacific cod in the GOA have been deducted from the federal harvest quota in the GOA.

1.3 Purpose and Need

The proposed federal action is establishment of harvest quotas for fishing that will take place during calendar year 2001. Federal action is necessary to allow groundfish fisheries to proceed in 2001. This action prescribed in 50 CFR 679.20(c) specifies TAC amounts of groundfish and PSC limits.

Interim TAC specifications are amounts of groundfish catch and bycatch that can be taken for each category of groundfish and prohibited species taken in groundfish fisheries in federal waters in the BSAI and GOA fishery management areas. Proposed and interim specifications for 2001 are based on the final harvest specifications for groundfish and associated management measures for the 2000 fishing year (BSAI at 65 FR 8282 and GOA at 65 FR 8298 and 65 FR 11909). Regulations require one-fourth of each proposed TAC and apportionment thereof (not including the reserves and the first seasonal allowance of pollock), one-fourth of the proposed halibut PSC amounts, and the proposed first seasonal allowance of pollock and Atka mackerel become available for harvest at 0001 hours, Alaska local time, January 1, on an interim basis and remain in effect until superseded by the final harvest specifications. See Tables 1 and 2 for year 2001 interim specifications.

Final TAC specifications are upper limits on the amounts of harvest and bycatch that can be taken for each category of groundfish and prohibited species taken in groundfish fisheries in federal waters in the BSAI and GOA fishery management areas during the calendar year. Final specifications are based on current information about the population status of both target and prohibited species and scientific interpretation of appropriate harvest quotas using that information. Current information is contained in the year 2000 SAFE reports (Appendices A and B of the 2000 Groundfish EA, NMFS 1999d) explained above. The TAC specifications (Council recommended TAC specifications, Tables 1 and 2 and Alternative 9 in Tables 18 and 19), if approved, define upper harvest limits, or fishery removals, on harvests occurring during the year 2001. Absent approval within the first quarter of calendar year 2001, directed fishing in excess of the interim TAC specifications is unauthorized.

The purpose of this Environmental Assessment (EA) is to assess the impacts of groundfish harvest accruing from harvest at these proposed and interim TAC specifications. This EA tiers off the broader analysis of groundfish fishing under various levels of TAC specifications which was documented in a supplemental environmental impact statement (SEIS, NMFS 1998a) prepared to supplement the original Environmental Impact Statements (EISs) for the Fishery Management Plans for the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI). NMFS notes that in a July 8, 1999, order, amended

on July 13, 1999, the Court in Greenpeace, et al., v. NMFS. et al., Civ No. 98-0492 (W.D. Wash.) held that the SEIS did not adequately address aspects of the GOA and BSAI groundfish fishery management plans other than TAC setting, and therefore was insufficient in scope under National Environmental Policy Act (NEPA.) In response to the Court's order, NMFS is currently preparing a programmatic SEIS for the GOA and BSAI groundfish fishery management plans. Notwithstanding the less expansive scope of the 1998 SEIS, NMFS believes that the discussion of impacts and alternatives in the SEIS is directly applicable to the proposed action to be analyzed in this EA. Therefore, this EA adopts the discussion and analysis in the SEIS (NMFS 1998a).

2.0 PROPOSED ACTION and ALTERNATIVES TO THE PROPOSED ACTION

Alternatives 1 through 5 were designed to provide a range of harvest alternatives that were likely to bracket the final TAC specifications for the year 2001. Using the same alternative descriptions, the stock assessment authors prepared analyses accordingly with their respective species' data and presented the results in the 1999 SAFE chapters and at the1999 November Plan Team meetings. For purpose of the analysis in Alternatives 1 through 4, the proposed fishing mortality rate (*F*) is extrapolated into future years so that a theoretical biomass can be calculated. This has the effect of making the result of each *F* level more tangible in the long term scenario. This process involves the inclusion of a variety of assumptions, however, it does offer information about how each alternative could affect the trends in biomass, either decreasing, increasing, or stable.

The Plan Teams considered the findings of Alternatives 1 through 5, and made a finding of their own which is captured as Alternative 6. The results of those six alternatives were presented to the Council, its SSC, and AP and the general public during the Council's 1999 December meeting. For presentation purposes, the ABC recommendations from the Council's SSC are captured as Alternative 7, the TAC recommendations from the Council's AP are captured as Alternative 8, and the Council's ABC and TAC recommendations are Alternative 9.

Alternative 1: Set *F* equal to $maxF_{ABC}$, "$maxF_{ABC}$" refers to the maximum permissible value of F_{ABC} under Amendment 56. Historically, TAC has been constrained by ABC, so this alternative provides a likely upper limit on future TACs.

Alternative 2: Set *F* equal to the stock assessment author's recommended ABC. *F* is set equal to a constant fraction of $maxF_{ABC}$, where this fraction is equal to the ratio of the F_{ABC} value recommended in the assessment to the $maxF_{ABC}$. The stock assessment author's recommended fractions of $maxF_{ABC}$ may vary between stocks, based on other considerations unique to individual stocks.

Alternative 3: Set *F* equal to 50% of $maxF_{ABC}$. This alternative provides a likely lower bound on F_{ABC} that still allows future harvest rates to be adjusted downward should stocks fall below reference levels.

Alternative 4: Set *F* equal to the 1994-1998 average *F*. This alternative recognizes that for some stocks, TAC may be set well below ABC, and recent average *F* may provide a better indicator of F_{TAC} than F_{ABC}.

Alternative 5: Set *F* equal to zero. This alternative recognizes that, in extreme cases, TAC may be set at a level close to zero. This is the **no action alternative.**

Alternative 6: Set *F* equal to the North Pacific Fishery Management Council's Plan Teams' recommended ABCs. This alternative results from the Plan Teams' review of the stock assessment authors' recommendations.

Alternative 7: Set *F* equal to the North Pacific Fishery Management Council's Science and Statistical Committee's (SSC) recommended ABC. This alternative is the result of the SSC's review of the stock assessment authors and Plan Team recommendations. The SSC reviewed the selection of the assessment model alternative, tier determination, other ABC considerations, and considered public testimony.

Alternative 8: Set *F* equal to the North Pacific Fishery Management Council's Advisory Panel (AP) TAC recommendations. This alternative represents the best way to achieve optimum yield from the groundfish fisheries. Socioeconomic concerns are addressed in the TAC recommendations. The AP also recommended annual and seasonal apportionments of prohibited species catch (PSC)amounts to optimize opportunities to harvest groundfish. Public testimony received on TAC and PSC apportionments was considered by the AP to be of critical importance.

Alternative 9: Set *F* equal to the North Pacific Fishery Management Council TAC recommendations. This alternative focuses on the biological condition of the groundfish stocks, effects of the groundfish fisheries on endangered, prohibited, and other species dependant upon the marine environment and their habitat. ABC, TAC and PSC recommendations are based on these considerations as well as socioeconomic concerns to achieve optimum yield in the groundfish fisheries. Consideration of public testimony was also of critical importance in arriving at this recommendation. This alternative incorporates the most recent and best scientific information available, therefore, is the **preferred alternative.**

3.0 ENVIRONMENTAL AND ECONOMIC CONSEQUENCES

The groundfish fisheries occur in the North Pacific Ocean and Bering Sea in the U.S. EEZ from 50° N to 65°N. These TAC specifications affect groundfish fishing throughout the BSAI and GOA management area.. Descriptions of the affected environment are given in the SEIS (NMFS 1998a). Substrate is described at section 3.1.1, water column at 3.1.3, temperature and nutrient regimes at 3.1.4, currents at 3.1.5, groundfish and their management at 3.3, marine mammals at 3.4, seabirds at 3.5, benthic infauna and epifauna at 3.6, prohibited species at 3.7, and the socioeconomic environment at 3.10. Additionally, the status of each target species category, biomass estimates, and acceptable biological catch specifications are presented both in summary and in detail in the annual GOA and BSAI stock assessment and fishery evaluation (SAFE) reports (Appendices A and B of the 2000 Groundfish EA, NMFS 1999a).

An EA is prepared pursuant to NEPA to determine whether a proposed action will result in significant effects on the human environment. If the environmental effects of the action are determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact are the final environmental documents required by NEPA. If this analysis concludes that the proposal is a major Federal action significantly affecting the human environment, an environmental impact statement must be prepared.

An EA must include a discussion of the need for the proposal, the environmental impacts of the proposed action, and a list of agencies and persons consulted. The purpose and need are discussed in Section 1. The proposed action is presented in Section 2 and Tables 1 and 2. Section 6 contains the list of preparers and agencies consulted. This section contains the discussion of the environmental impacts including impacts on threatened and endangered species and marine mammals.

The environmental impacts generally associated with fishery management actions are effects resulting from: 1) harvest of fish stocks that may result in changes in food availability to predators, changes in population structure of target fish stocks, and changes in community structure; 2) changes in the physical and biological structure of the benthic environment as a result of fishing practices (e.g., gear effects and fish processing discards); 3) entanglement/entrapment of non-target organisms in active or inactive fishing gear; and 4) major shifts in the abundance and composition of the marine community as a result of disproportionate fishing pressure on a small set of species (also known as "cascading effects," National Research Council, 1996). The SEIS (NMFS 1998a) comprehensively analyzes these effects at a variety of TAC levels. Only information that is new since preparation of the SEIS is presented in this EA.

3.1 Overview of Status

The status of each target species or species group category, biomass estimates, and ABC specification are presented both in summary and in detail in the GOA and BSAI 2000 SAFE reports (Appendices A and B of the 2000 Groundfish EA, NMFS 1999d). This EA addresses the information about target species stock status as it is known in 1999 and recommends appropriate harvest levels in the year 2001 based on that current biological information. This EA tiers off scientific information and analytical methods for setting harvest levels presented in the SEIS (NMFS 1998a); therefore, only new information regarding the status of stocks, evaluation methods, impacts on ESA listed species are provided.

Four categories of species are likely to be taken in the GOA and BSAI groundfish fisheries:
1) Prohibited species--those species and species groups the catch of which must be returned to the sea with a minimum of injury except when their retention is authorized by other applicable law; 2) target species--those commercially important species for which sufficient data exists to allow each to be managed on its own biological merits; 3) other species--those species and species groups currently of slight economic value and not generally targeted for harvest; and 4) non-specified species--those species and species groups that currently have little economic value but are taken by the groundfish fishery in Federal waters as incidental catch.

Amendments 56/56 to the BSAI and GOA Groundfish FMPs, approved by the Secretary in January 1999, define ABC and OFL for the BSAI and GOA fisheries. These Amendments define overfishing as any amount of fishing in excess of a prescribed maximum allowable rate. This maximum allowable rate is prescribed through a set of six tiers which are defined in sections 4.3 and 2.2 of the BSAI and GOA FMPs respectively. Each target species assessment is analyzed under one of the six tiers. The Council's SSC has final authority for determining whether a given item of information is "reliable" for the purpose of this definition, and may use either objective or subjective criteria in making such determinations. A stock is determined to be "overfished" whenever it has fallen below its minimum stock size threshold (MSST), defined as whichever of the following is greater: one-half the MSY stock size, or the minimum

stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock were exploited at the maximum allowable harvest rate.

3.1.1 Status of Groundfish Target Species in the BSAI

Designated target species and species groups in the BSAI are walleye pollock, Pacific cod, yellowfin sole, Greenland turbot, arrowtooth flounder, rock sole, other flatfish, flathead sole, sablefish, Pacific ocean perch, other rockfish, Atka mackerel, squid and other species. The most current information on ABCs is found in the 2000 SAFE reports (Appendices A and B of the 2000 Groundfish EA, NMFS 1999d). Year 2000 OFLs, ABC, TAC, and catch through September 2, 2000, along with 2001 proposed and interim specifications for the BSAI area are presented in Table 1 and discussed below. Harvest alternatives considered are presented in Table 18. For detailed life history, ecology, and fishery management information regarding groundfish stocks in the BSAI see Section 3.3.3 of the SEIS. The Plan Teams did not meet in September 2000 so all following discussion is based upon 2000 specification information. The specification information will be updated following the November Plan Team meetings.

Walleye pollock in the Eastern Bering Sea (EBS) is currently managed under Tier 1a. Year 2000 pollock assessment features data from the 1999 fishery and bottom trawl and echo-integration trawl surveys. The 1999 bottom trawl survey estimated a biomass of 3,570,000 mt, an increase of 61% relative to the 1998 estimate. The 1999 echo-integration trawl survey estimated a biomass of 3,290,000 mt, an increase of 27% from the 1997 estimate, the last year an echo-integration trawl survey was conducted in this region. Exploitable biomass of the EBS pollock stock is estimated to be 7.7 million mt. Of the eight models presented, the Plan Team based its recommendations for 2000 on Model 2, which assumes a Ricker stock-recruitment relationship and uses the average commercial fishery selectivity pattern from the most recent three years to make projections of future catch and stock size. This is the same model used by the Plan Team to recommend the 1999 ABC, except that the recruitment distribution used for harvest projections was estimated from year classes spawned after 1976 only. Projections of age 3+ biomass beyond 2000 are not available, but spawning biomass is projected to remain constant from 2000 to 2001, then decrease in 2002. The OFL fishing mortality rate under Tier 1a is 0.80, the arithmetic mean value of F_{MSY}. A fishing mortality rate of 0.80 translates into a 2000 OFL of 1,680,000 mt. Model projections indicate that the EBS walleye pollock stock is not overfished.

The updated estimates of B_{MSY} and the harmonic and arithmetic means for F_{MSY} from the present assessment are 1,790,000 t, 0.50, and 0.80, respectively. Projected spawning biomass for 2000 is 2,160,000 mt, placing EBS walleye pollock in sub-tier "a" of Tier 1. The maximum permissible value of F_{MSY} under Tier 1a is 0.50, the harmonic mean of the probability density function for F_{MSY}. A fishing mortality rate of 0.50 translates into a 2000 catch of 1,200,000 mt, which would be the maximum permissible ABC under Tier 1a. However, the senior assessment author recommends setting ABC at a lower value, specifically, the maximum permissible level that would be allowed under Tier 3. The Tier 3 reference points $B_{40\%}$ and $F_{40\%}$ are estimated at values of 2,340,000 mt and 0.48, respectively. Because projected spawning biomass for 2000 is below $B_{40\%}$, the maximum permissible value of F_{ABC} that would be allowed under Tier 3 is the adjusted $F_{40\%}$ rate of 0.46. The 2000 catch associated with a fishing mortality rate of 0.46 is 1,100,000 mt, an 8% reduction from the maximum permissible level under Tier 1. The Plan Team concurred with the senior assessment author that a 2000 ABC of 1,100,000 mt is

appropriate. The SSC and Council recommended an ABC of 1,139,000 mt. The AP and Council recommended a TAC of 1,139,000 mt.

The 1997 bottom trawl survey of the Aleutian Islands region resulted in an exploitable biomass estimate of 106,000 t, an increase of 23% relative to the 1994 estimate. The 1997 stock assessment concluded that the model which had been used to recommend ABC for 1997 was no longer reliable due to the confounding effect of immigration from other areas, and the SSC determined that Aleutian pollock qualified for management under Tier 5. The recommended 1998 and 1999 ABC was 23,800 mt, computed as the product of the 1997 survey biomass estimate and 75% of the natural mortality rate (0.3). The recommended 1998 and 1999 OFL was 31,700 mt, computed as the product of the 1997 survey biomass estimate and the natural mortality rate. Anticipating that the SSC will continue to find that Aleutian pollock qualify for management under Tier 5, the Plan Team recommends retaining the 1997 survey biomass estimate as the best available estimate of biomass in 1999 (by assuming that growth and recruitment balance mortality), and keeping 2000 ABC and OFL at their respective 1999 levels. As a Tier 5 stock, it is not possible to determine whether Aleutian pollock is overfished or whether it is approaching an overfished condition. However, because of endangered Steller sea lion concerns, pollock is available for bycatch only in the Aleutian Islands to prohibit any directed fishing for pollock during the 1999 fishery. Therefore, only incidental catch amounts of pollock in the Aleutian Islands area can be harvested in 2000. The SSC and Council concurred with the Plan Team's ABC recommendation of 23,800 mt. The AP and Council recommended a TAC of 2,000 mt to allow for the retention of incidental catch only.

The 1999 hydroacoustic survey of the Bogoslof region resulted in an exploitable biomass estimate of 475,000 mt. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, with values of 2,000,000 mt, 0.27, and 0.37 respectively, and that Bogoslof pollock therefore qualified for management under Tier 3 (the $B_{40\%}$ estimate of 2,000,000 mt presumably includes both males and females). The 1999 assessment includes an age-structured model for Bogoslof pollock that calls the $B_{40\%}$ estimate of 2,000,000 mt into question. The new age-structured model gives a females-only $B_{40\%}$ estimate of 96,800 mt, which is a full order of magnitude lower than the previous estimate, even after correcting for the combined-sexes nature of the old estimate. The senior assessment author has not been able to reproduce the calculations that led to the original acceptance of the old estimate several years ago. The Plan Team thus recommends that Bogoslof pollock be moved from Tier 3 down to Tier 5, based on the following rationale: 1) Until questions surrounding computation of $B_{40\%}$ for this stock are resolved, it is not clear that a reliable estimate of this quantity exists, which implies that Bogoslof pollock should move down to at least Tier 4. 2) Given that there has been no fishery on this stock for so long and that selectivity patterns estimated for the shelf stock are probably not applicable to the deep-water Bogoslof stock, it is not clear that a reliable estimate of fishery selectivity--and thus $F_{40\%}$--exists, which implies that Bogoslof pollock should move down to at least Tier 5. 3) It appears that a reliable estimate of natural mortality (0.20) does exist, which places Bogoslof pollock in Tier 5. The Plan Team also noted that placement of Bogoslof pollock in Tier 5 would classify it similarly with Aleutian pollock, a stock which generally has about the same quality of assessment information. The SSC and Council recommended an OFL of 30,400 mt and an ABC of 22,300 mt. The AP and Council recommended a TAC of 1,000 mt to allow for retention of incidental catch only.

Atka mackerel are found from the Kamchatka Peninsula through the Bering Sea and GOA to southeast Alaska. Atka mackerel is a schooling, semi-demersal species most abundant in the Aleutian Islands, and

is harvested primarily with trawl gear. In 1994, the Atka mackerel ABC in the Aleutian Islands subarea was divided between the Western, Central, and Eastern Aleutian districts. The present assessment is a straightforward update of 1998's assessment, incorporating new catch data only. In 1999, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. Exploitable biomass of the Atka mackerel stock for 2000 is estimated to be 536,000 mt. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 154,000 mt, 0.35, and 0.42, respectively. Projected spawning biomass for 2000 is 163,000 t, placing Atka mackerel in sub-tier "a" of Tier 3. The maximum F_{ABC} value allowable under Tier 3a is $F_{40\%}$ (0.35). Projected harvesting at a fishing mortality rate of 0.35 gives a 2000 catch of 103,000 mt, which is the maximum permissible value of ABC under Tier 3a. The current F_{ABC} rate of 0.23 would give a 2000 catch of 70,800 mt, about 31% below the maximum permissible value. The Plan Team recommended setting F_{ABC} at a value of 0.26, slightly higher than the current F_{ABC} rate but still substantially below the maximum permissible rate. They derive their F_{ABC} value as follows: First, compute the lower limit of the 50% confidence interval for each survey biomass estimate since 1986. Second, compute the ratio of this lower limit to the survey biomass point estimate for each survey since 1986. Third, compute the average value of this ratio (0.74). Finally, multiply this average by $F_{40\%}$ ($0.74 \times 0.35 = 0.26$). A fishing mortality rate of 0.26 would give a 2000 catch of 78,500 mt. The SSC and Council concurred with the Plan Team's ABC recommendations of 16,400, 24,700, and 29,700 mt for the Eastern, Central, and Western Aleutian Island areas respectively. The AP and Council recommended that TAC be set equal to ABC amounts.

Pacific cod is managed as a single BSAI stock and is the second largest Alaskan groundfish fishery. A length-based synthesis model is used to assess Pacific cod biomass estimates. Annual trawl surveys in the eastern Bering Sea and triennial trawl surveys in the Aleutian Islands are the primary fishery independent sources of data. The present assessment incorporates new catch and survey information. This year's EBS bottom trawl survey resulted in a biomass estimate of 583,000 mt, a 9% increase relative to the 1998 estimate. Exploitable biomass is estimated to be 1.3 million mt. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 379,000 mt, 0.30, and 0.35, respectively. Fishing at a rate of 0.28 is projected to result in a 2000 spawning biomass of 357,000 mt, and solves the equation for the maximum permissible value of F_{ABC} under tier 3. Because projected biomass for 2000 is less than $B_{40\%}$, Pacific cod qualify for management under sub-tier "b" of tier 3. Fishing at an instantaneous rate of 0.28 is projected to result in a 2000 catch of 206,000 mt, which is the maximum permissible ABC under Amendment 56. The Plan Team concurred with the chapter authors' recommendation to set 2000 ABC at 193,000 mt, about 6% below the maximum permissible level. This recommendation is based on a risk-averse optimization procedure which considers uncertainty in the estimates of the survey catchability coefficient and the natural mortality rate in the computation of an $F_{40\%}$ harvest level. The Plan Team felt that a 6% reduction from the maximum permissible ABC is justified not only on the basis of these decision-theoretic concerns, but also because estimated spawning biomass from the model has declined continuously since 1985 and because three of the last four year classes (assessed at age 3) appear to have been well below average. In year 2000, a catch of 193,000 mt would represent an increase of 9% over the 1999 ABC of 177,000 mt, matching the 9% increase in the trawl survey biomass estimate. However, the Plan Team noted that the assessment model projects a 2001 ABC (using the same relative harvest rate) of 171,000 mt with a continuing decline through 2003 (expected ABC = 138,000 mt), meaning that the increase for 2000 is

expected to be short-lived. A 2000 catch of 193,000 mt corresponds to a fishing mortality rate of 0.26, below the value of 0.28 which constitutes the upper limit on F_{ABC} under tier 3b. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at the ABC level.

The Plan Team's recommended OFL was determined from the tier 3b formula, where fishing at a rate of 0.33 gives a 2000 catch of 240,000 mt. Model projections indicate that this stock is neither overfished nor approaching an overfished condition.

Sablefish

The BSAI sablefish biomass can be described as below target stock size but stable. Relative to the 1999 SAFE report, new sources of information include: 1) relative abundance and length data from the 1999 longline survey; 2) historical catch data from 1960-1978; 3) catch rate and length data from the Japanese longline fishery from 1964-1981; 4) length data from the Japanese trawl fishery from 1964-1971; 5) catch rate date from the U.S. longline fishery from 1990 through 1999; 6) length data from the U.S. trawl fishery from 1990-1996; 7) age composition data from the 1998 sablefish longline survey; and 8) length data from the 1999 longline fishery.

Revisions to the sablefish assessment from 1998 primarily include: the addition of about 20 years of historical data, adding recent fishery catch rate data, the use of ageing imprecision, and a Bayesian decision analyzes. Recruitment variability was significantly different compared to the 1998 assessment. This was due to the addition of true ageing error estimates. Exploitable biomass for 2000 is estimated to be 18,000 mt in the Eastern Bering Sea and 33,000 mt in the Aleutian Islands areas.

The Team selected the *F40% adjusted rate* that used the split gears for setting the maximum permissible ABC level (Tier 3b). This gave the adjusted EBS value for the year 2000 ABC of 1,410 mt as the maximum permissible ABC (F_{ABC}=0.11) and in the AI, and ABC of 2,490 mt (F_{ABC}=0.11) . The Plan Teams also discussed the three different methods for computing area apportionments for sablefish. There are significant differences in the area apportionments depending on the method. The questions are what biological effects area apportionments may have on the sablefish stock. Based on the earlier work of Heifetz *et al.* (1997), area-specific harvest rates begin to have significant impacts at levels (e.g., >30%) significantly higher than what is currently estimated. The Teams suggested that Council should continue to apportion based on the 5-year weighted average as in the past. There are concerns that biases may be introduced by adding the fishery data. While the Team did not have any compelling evidence that suggested biological issues are of concern, they felt that a good strategy continues to be one of area apportionment based on the best estimate of the biomass distribution. The SSC concurred with the Plan Team's ABC recommendation and the AP recommended that TAC be set at ABC levels. The Council recommended that the BSAI ABC recommendation of 3,900 mt be apportioned to the Eastern Bering Sea based on an alternative that includes consideration of commercial fisheries information. This resulted in an apportionment of 1,470 mt to the Eastern Bering Sea and 2,430 mt to the Aleutian Islands areas. The Council recommended that TAC be set at ABC levels.

Yellowfin sole is the most abundant flatfish species in the eastern Bering Sea and is the target of the largest flatfish fishery in the United States. They inhabit the Bering Sea shelf and are considered to be one stock. The present assessment includes significant changes from the 1999 assessment, including use of a new modeling platform and incorporation of new catch and survey information. The 1999 EBS

bottom trawl survey resulted in a biomass estimate of 1,310,000 mt, a 44% decrease relative to the 1998 estimate. The sharp decrease appears due to an effect of cold water to decrease availability; water temperatures were the coldest on record in 1999 and previous trawl survey results appear affected by shelf bottom temperatures. Exploitable biomass is estimated to be 2,820,000 mt in 2000. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 577,000 t, 0.11, and 0.13, respectively. Given that the projected 2000 spawning biomass of 789,000 mt exceeds $B_{40\%}$, the Plan Team's ABC and OFL recommendations for 2000 were calculated under sub-tier "a" of Tier 3. The Plan Team recommended setting F_{ABC} at the $F_{40\%}$ (=0.11) level, which is the maximum permissible level under Tier 3a. Projected harvesting at the $F_{40\%}$ level gives a 2000 ABC of 191,000 mt. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at 123,262 mt.

The Plan Team's OFL was determined from the Tier 3a formula, where an $F_{35\%}$ value of 0.13 gives a 2000 OFL of 226,000 mt. Model projections indicate that this stock is neither overfished nor approaching an overfished condition.

Rock sole is abundant on the eastern Bering Sea shelf and to a lesser extent in the Aleutian Islands. The present assessment includes significant changes from the 1999 assessment, including use of a new modeling platform, incorporation of new catch and survey information, and use of year-specific weight-at-age schedules. The 1999 EBS bottom trawl survey resulted in a biomass estimate of 1,690,000 mt, a 22% decrease relative to the 1998 estimate. The biomass estimate from the 1998 survey constituted a 20% decrease relative to 1997. Exploitable biomass is estimated to be 2,070,000 mt in 2000. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 285,000 t, 0.15, and 0.19, respectively. Given that the projected 2000 spawning biomass of 676,000 mt exceeds $B_{40\%}$, the Plan Team's ABC and OFL recommendations for 2000 were calculated under sub-tier "a" of Tier 3. The Plan Team recommended setting F_{ABC} at the $F_{40\%}$ (=0.15) level, which is the maximum permissible level under Tier 3a. Projected harvesting at the $F_{40\%}$ level gives a 2000 ABC of 230,000 mt. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended a TAC of 134,760 mt.

The Plan Team's OFL was determined from the Tier 3a formula, where an $F_{35\%}$ value of 0.19 gives a 2000 OFL of 273,000 mt. Model projections indicate that this stock is neither overfished nor approaching an overfished condition.

Greenland turbot is distributed from Baja California northward throughout Alaska, primarily found in the BSAI region. The 1999 EBS bottom trawl survey resulted in a biomass estimate of 19,797 t, a 30% decrease relative to the 1998 estimate. Exploitable biomass is estimated to be 233,000 mt in 2000. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 81,300 t, 0.26, and 0.32, respectively. Projected spawning biomass for 2000 is 165,000 mt, placing Greenland turbot in sub-tier "a" of Tier 3. The Plan Team noted that the ratio of 1999

spawning biomass to $B_{40\%}$ has changed dramatically since the 1998 assessment: In that assessment, the ratio was 79%, whereas in the present assessment, the ratio is 203%. The main reason for this change is that the recruitments used to estimate $B_{40\%}$ in the 1998 assessment included year classes spawned prior to the regime shift of 1977, whereas the recruitments used to estimate $B_{40\%}$ in the present assessment include only year classes spawned during the current environmental regime. The maximum permissible value of F_{ABC} under Tier 3a is 0.26. A fishing mortality rate of 0.26 translates into a 2000 catch of 34,700 mt, which would be the maximum permissible ABC under Amendment 56. The Plan Team recommended a 2000 ABC value substantially less than the maximum permissible, using $F_{ABC} = 0.25 \times max\ F_{ABC}$, which results in a 2000 ABC of 9,300 mt. The Plan Team believed that a 2000 ABC well below the maximum permissible value is warranted for the following reasons: 1) estimated age 1+ biomass has trended downward continually since 1972; 2) the 7 most recent age 1 recruitments constitute 7 of the lowest 8 values in the entire time series; and 3) if the maximum permissible ABC of 34,700 mt were actually caught, this would constitute the highest catch since 1983, even though spawning biomass in 2000 is projected to be less than half of what it was in 1983. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at ABC levels and apportioned 6,231 mt to the Bering Sea and 3,069 mt to the Aleutian Islands areas.

The OFL fishing mortality rate is computed under Tier 3a, $F_{OFL} = F_{35\%} = 0.32$, and translates into a 2000 OFL of 42,000 mt. Model projections indicate that this stock is neither overfished nor approaching an overfished condition.

Arrowtooth flounder (*Atheresthes stomias*) is common from Oregon through the eastern Bering Sea. The very similar Kamchatka flounder (*Atheresthes evermanni*) also occurs in the Bering Sea. Because it is not usually distinguished from arrowtooth flounder in commercial catches, both species are managed as a group. The stock assessment uses a method of weighting sex-specific size composition data that had been used prior to 1998 assessment and incorporates new catch and survey information. The 1998 EBS bottom trawl survey resulted in a biomass estimate of 244,000 mt, a 29% decrease relative to1998 estimate. Exploitable biomass is estimated to be 785,000 mt in 2000. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 195,000 mt, 0.22 and 0.27, respectively. Given that the projected 2000 spawning biomass of 496,000 mt exceeds $B_{40\%}$, the Plan Team's ABC and OFL recommendations for 2000 were calculated under sub-tier "a" of Tier 3. The Plan Team recommended setting F_{ABC} at the $F_{40\%}$ (=0.22) level, which is the maximum permissible level under Tier 3a. Projected harvesting at the $F_{40\%}$ level gives a 2000 ABC of 131,000 mt. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at the ABC level.

The OFL fishing mortality rate is computed under Tier 3a, $F_{OFL} = F_{35\%} = 0.27$, and translates into a 2000 OFL of 160,000 mt. Model projections indicate that this stock is neither overfished nor approaching an overfished condition.

Flathead sole (*Hippoglossoides elassodon*) is distributed from northern California northward throughout Alaska (Wolotira et al. 1993). In the northern part of its range, it overlaps with the related and very similar Bering flounder (*Hippoglossoides robustus*) (Hart 1973). Because it is difficult to separate these two species at sea, they are currently managed as a single stock (Walters and Wilderbuer 1997). The

1999 EBS bottom trawl survey resulted in a biomass estimate of 395,000 mt, a 43% decrease relative to 1998 estimate. It should be noted that 1998 estimate was a 14% decrease relative to that of 1997, which in turn was a 31% increase relative to the 1996 estimate. Exploitable biomass is estimated to be 611,000 mt in 2000. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 134,000 t, 0.28, and 0.35, respectively. Given that the projected 2000 spawning biomass of 261,000 mt exceeds $B_{40\%}$, the Plan Team's ABC and OFL recommendations for 2000 were calculated under sub-tier "a" of Tier 3. The Plan Team recommended setting F_{ABC} at the $F_{40\%}$ (=0.28) level, which is the maximum permissible level under Tier 3a. Projected harvesting at the $F_{40\%}$ level gives a 2000 ABC of 73,500 mt. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended a TAC of 52,652 mt.

The Plan Team's OFL was determined from the Tier 3a formula, where an $F_{35\%}$ value of 0.35 gives a 2000 OFL of 90,000 mt. Model projections indicate that this stock is neither overfished nor approaching an overfished condition.

Other flatfish compose eight species in the Bering Sea (Alaska plaice, rex sole, Dover sole, starry flounder, English sole, butter sole, sand sole, and deep sea sole). In the Bering Sea, Alaska plaice is the most abundant (comprising 92 percent of the group biomass) and more commercially important of the other flatfish species. In general, other flatfish are taken as incidental catch in other directed groundfish fisheries. The present assessment includes significant changes from 1998 assessment, including use of AD Model Builder as a modeling platform for the first time (Alaska plaice only) and incorporation of new catch and survey information. The 1999 EBS bottom trawl survey resulted in biomass estimates of 547,000 mt for Alaska plaice and 69,700 mt for the remaining species in the "other flatfish" complex, representing an increase of 21% and a decrease of 6% relative to the 1998 estimates, respectively. The Plan Team noted that Alaska plaice was the only major flatfish species that showed increased abundance in the 1999 bottom trawl survey. Exploitable biomass is estimated to be 829,000 mt in 2000. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock complex, and that this stock complex therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 100,000 mt (Alaska plaice only), 0.28, and 0.35, respectively. Given that the projected 2000 spawning biomass (Alaska plaice only) of 187,000 mt exceeds $B_{40\%}$, the Plan Team's ABC and OFL recommendations for 2000 were calculated under sub-tier "a" of Tier 3. The Plan Team recommended setting F_{ABC} at the $F_{40\%}$ level (=0.28 for all species), which is the maximum allowable under Tier 3a. Projected harvesting at the $F_{40\%}$ level gives a 2000 ABC of 117,000 mt for the complex. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at 83,813 mt.

The Plan Team's OFL was determined from the Tier 3a formula, where an $F_{35\%}$ value (=0.35 for all species) gives a 2000 OFL of 141,000 mt for the complex. Model projections indicate that this stock complex is neither overfished nor approaching an overfished condition.

Pacific ocean perch (POP) is primarily a demersal species which inhabits the North Pacific and Bering Sea. Pacific ocean perch is the most commercially important rockfish in Alaska's fisheries and is taken almost exclusively with bottom trawls.

EBS Pacific Ocean Perch: The present assessment is a straightforward update of the 1998 assessment, incorporating new catch information. Exploitable biomass is estimated to be 47,700 mt in 2000. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 26,200 mt, 0.057, and 0.069, respectively. Projected spawning biomass for 2000 is 24,900 mt, placing true POP in the EBS in sub-tier "b" of Tier 3. The maximum F_{ABC} value allowed under Tier 3b is 0.054. Projected harvesting at a fishing mortality rate of 0.054 gives a 2000 catch of 2,600 mt, which is the Plan Team's recommended ABC (the 1998 ABC was set using a lower fishing mortality rate, 0.040, in part because the 1998 $B_{40\%}$ estimate of 34,400 mt was higher than the 1999 estimate of 26,200 t). The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at the ABC level.

The OFL fishing mortality rate under Tier 3b is 0.065. Projected harvesting at a fishing mortality rate of 0.065 gives a 2000 catch of 3,100 mt, which is the Plan Team's recommended OFL. Model projections indicate that this stock is neither overfished nor approaching an overfished condition.

AI Pacific Ocean Perch: The present assessment is a straightforward update of the 1998 assessment, incorporating new catch information and age composition data. Exploitable biomass is estimated to be 192,000 mt. In 1998, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed for this stock, and that this stock therefore qualified for management under Tier 3 of the BSAI Groundfish FMP. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ (which replaces $F_{30\%}$ under Amendment 56) from the present assessment are 100,000 mt, 0.072, and 0.085, respectively. Projected spawning biomass for 2000 is 97,800 mt, placing true POP in the Aleutians in sub-tier "b" of Tier 3. The maximum F_{ABC} value allowed under Tier 3b is 0.070. Projected harvesting at a fishing mortality rate of 0.070 gives a 2000 catch of 12,300 mt, which is the Plan Team's recommended ABC (the 1998 ABC was set based on Tier 3a, so no adjustment of the $F_{40\%}$ rate was required). The ABC is apportioned among AI subareas based on survey distribution as follows: Western AI = 46.1%, Central AI = 28.5% , and Eastern = 25.4%. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at the ABC levels of 3,120, 3,510, and 5,670 mt in the Eastern, Central and Western Aleutian Islands areas respectively.

The OFL fishing mortality rate under Tier 3b is 0.083. Projected harvesting at a fishing mortality rate of 0.083 gives a 2000 catch of 14,400 mt, which is the Plan Team's recommended OFL. Model projections indicate that this stock is neither overfished nor approaching an overfished condition.

Other red rockfish complex is composed of sharpchin, northern, shortraker, and rougheye rockfish in the EBS. In the current assessment, biomass was estimated from domestic trawl surveys only (1988-1997). This modification addresses concerns about biomass estimates for northern rockfish that included results from two exceptionally large tows of northern rockfish from the 1986 Aleutian trawl survey (in the small part of the EBS covered by that survey). These tows were responsible for approximately 94% of the northern rockfish biomass estimate in that year. Exploitable biomass is estimated to be 8,200 mt in 2000. In 1998, the Plan Team and the SSC concluded that biomass estimates produced by eliminating the 1986 survey estimate represented the best estimate of northern rockfish biomass in the EBS. The change provided in this assessment addresses these concerns, and the Plan Team agreed that the 1988-1997 surveys provide better estimates of current biomass.

In 1998, the SSC determined that reliable estimates of the natural mortality rate (*M*) existed for the species in this complex, and that non-*alutus* members of the POP complex in the EBS therefore qualified for management under Tier 5 of the BSAI Groundfish FMP. The accepted estimates of *M* for these species in the EBS are as follows: rougheye rockfish–0.025, shortraker rockfish–0.030, and northern rockfish–0.060. The Plan Team recommended setting F_{ABC} at the maximum value allowable under Tier 5, which is 75% of *M*. On a species-specific basis, this translates into the following F_{ABC} values: rougheye rockfish–0.019, shortraker rockfish–0.023, and northern rockfish–0.045. Multiplying these rates by the best estimates of species-specific biomass and summing across species gives a 2000 ABC of 194 mt. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at the ABC level.

Sharpchin and northern rockfish are broken out of the other red rockfish complex for management purposes in the Aleutian Islands area. Because sharpchin rockfish are found only rarely in the Aleutians, northern rockfish are for all practical purposes the only species in this complex. Traditionally, the biomass estimates from all Aleutian bottom trawl surveys have been averaged over all years to obtain the best estimate of northern rockfish biomass. In the current assessment, however, biomass was estimated from the domestic trawl surveys only (1988-1997). Exploitable biomass is estimated to be 115,000 mt in 2000. In 1998, the SSC determined that a reliable estimate of the natural mortality rate (*M*) existed for this stock, and that northern rockfish in the Aleutians therefore qualified for management under Tier 5 of the BSAI Groundfish FMP. The accepted estimate of *M* for northern rockfish in the Aleutians is 0.06. The Plan Team recommended setting F_{ABC} at the maximum value allowable under Tier 5, which is 75% of *M*, or 0.045. Multiplying this rate by the best estimate of biomass gives a 2000 ABC of 5,150 mt. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at the ABC level.

The Plan Team's OFL was determined from the Tier 5 formula, where setting $F_{OFL}=M$ gives a 2000 OFL of 6,870 t. As a Tier 5 stock complex, it is not possible to determine whether the AI sharpchin/northern complex is overfished or whether it is approaching an overfished condition.

Shortraker and rougheye rockfish are broken out of the other red rockfish complex for management purposes in the Aleutian Islands area. Traditionally, the biomass estimates from all Aleutian bottom trawl surveys have been averaged over all years to obtain the best estimate of shortraker and rougheye rockfish biomass. In the current assessment, however, biomass was estimated from the domestic trawl surveys only (1988-1997). Exploitable biomass is estimated to be 41,500 mt in 2000. In 1998, the SSC determined that reliable estimates of the natural mortality rate (*M*) existed for the species in this complex, and that shortraker and rougheye rockfish in the Aleutians therefore qualified for management under Tier 5 of the BSAI Groundfish FMP. The accepted estimates of *M* for these species in the Aleutians are as follows: rougheye rockfish–0.025 and shortraker rockfish–0.030. The Plan Team recommended setting F_{ABC} at the maximum value allowable under Tier 5, which is 75% of *M*. On a species-specific basis, this translates into the following F_{ABC} values: rougheye rockfish–0.019 and shortraker rockfish–0.023. Multiplying these rates by the best estimates of species-specific biomass and summing across species gives a 2000 ABC of 885 mt. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at the ABC level.

The Plan Team's OFL was determined from the Tier 5 formula, where setting $F_{OFL}=M$ for each species gives a combined 2000 OFL of 1,180 mt. As a Tier 5 stock complex, it is not possible to determine

whether the AI shortraker/rougheye complex is overfished or whether it is approaching an overfished condition.

Other rockfish. Most of the species in the other rockfish complex have been reported to be demersal or semi-demersal, with different species occupying different depth strata. Most other rockfish are long lived with low natural mortality rates.

Traditionally, the biomass estimates (split according to management area) from all bottom trawl surveys (EBS shelf/slope and Aleutians) are averaged over all years to obtain the best estimates of biomass for the species in this complex. Summed over the species in the complex, this procedure produces a biomass estimate of 7,030 mt in the EBS and a biomass estimate of 13,000 mt in the Aleutians. The great majority of this biomass is comprised of thornyhead rockfish. Exploitable biomass is estimated to be 7,030 mt in the Eastern Bering Sea and 13,000 mt in the Aleutian Islands areas in 2000. In 1998, the SSC determined that a reliable estimate of the natural mortality rate (M) existed for the species in this subcomplex, and that "other rockfish" in the EBS and Aleutians therefore qualified for management under Tier 5 of the BSAI Groundfish FMP. The accepted estimate of M for these species in both areas is 0.07. The Plan Team recommended setting F_{ABC} at the maximum value allowable under Tier 5, which is 75% of M, or 0.053. Multiplying this rate by the best estimate of complex-wide biomass gives a 2000 ABC of 369 mt in the EBS and 685 mt in the Aleutians. The SSC and Council concurred with the Plan Team's ABC recommendations. The AP and Council recommended that TAC be set at ABC levels.

The Plan Team's OFLs were determined from the Tier 5 formula, where setting $F_{OFL}=M$ gives a 2000 OFL of 492 mt in the EBS and 913 mt in the Aleutians. As a Tier 5 stock complex, it is not possible to determine whether the "other rockfish" complex is overfished or whether it is approaching an overfished condition.

Squid are found throughout the Pacific Ocean and are not currently the target of groundfish fisheries in the BSAI region. They are primarily caught as incidental catch in trawl fisheries for pollock and rockfish. The present squid assessment incorporates new catch information. Estimates of exploitable biomass are not available. In 1998, the SSC determined that a reliable catch history existed for this stock complex, and that squid therefore qualified for management under Tier 6 of the BSAI Groundfish FMP. Under Tier 6, OFL is set equal to the average catch from 1978 through 1995 (unless an alternative value is established by the SSC on the basis of the best available scientific information), and ABC is constrained to be no greater than 75% of OFL. The average catch from 1978 through 1995 was 2,620 mt. Given a 2000 OFL of 2,620 mt, the maximum permissible value of ABC for 2000 would be 1,970 mt, which is the Plan Team's recommended value. As a Tier 6 stock complex, it is not possible to determine whether the squid complex is overfished or whether it is approaching an overfished condition. The SSC and Council concurred with the Plan Team's ABC recommendation. The AP and Council recommended that TAC be set at the ABC level

Other species The "other species" assessment is a straightforward update of the 1998 assessment, incorporating new catch and survey biomass information. It should be noted that assessments prior to 1999 included smelts in the "other species" category, but that smelts have now been moved into the "forage fish" category. The 1999 EBS bottom trawl survey resulted in a biomass estimate (exclusive of smelts) of 520,000 mt, a 7% decrease from the 1998 estimate of 556,000 mt. Exploitable biomass is estimated to be 611,000 mt in 2000. In 1998, the SSC determined that a reliable estimate of the natural

mortality rate (M) existed for the species in this complex, and that the "other species" complex therefore qualified for management under Tier 5 of the BSAI Groundfish FMP. The accepted value of M was 0.20. Under Tier 5, the maximum permissible value for F_{ABC} is $0.75 \times M$.

The Plan Team has noted that sculpins and skates, which tend to have M values substantially below 0.20, make up the majority of the survey biomass of the "other species" complex, meaning that an M of 0.20 might not be appropriate on average. As an alternative, M for the complex could be computed as the biomass-weighted estimates of the main component species. Using this method, the maximum permissible ABC for 2000 would be 53,600 mt. However, a catch of this magnitude would be twice the average catch since 1977. Given the large number of species in this complex, it would be unwise to increase harvests until more information is available regarding the status of the complex's individual components. Therefore, the Plan Team recommended a 2000 ABC equal to the average catch, which is 26,800 mt. The SSC and Council recommended that the ABC be set using the ten year stair step strategy leading to maximum permissible ABC begun in 1999 resulting in an ABC of 31,360 mt. The AP and Council recommended that TAC be set at the ABC level.

Under Tier 5, the 2000 OFL computed by the above method is 71,500 mt. As a Tier 5 stock complex, it is not possible to determine whether the "other species" complex is overfished or whether it is approaching an overfished condition.

For Table 1 the most recent information available is the 2000 SAFE. If the council chose to propose specifications for 2001 based on information used for 2000 specifications and no new information, this table list the possible resulting TACs.

Table 1. Groundfish harvest specifications for the Bering Sea and Aleutian Islands management area. For the year 2000 these data include: OFLs, ABC, TAC specifications, and actual catch (January 1, 2000 through September 2, 2000); Proposed 2001 TAC are identical to final 2000 specifications. 2001 Interim specifications are derived from the proposed specifications using the regulatory formula. All values are in metric tons.

	2000 Specifications and Proposed and Interim 2001 Specifications					
Species	Area	OFL	ABC	2000 TAC and proposed 2001 TAC	Actual Catch	2001 Interim Specifications
Pollock	Bering Sea (BS)	1,680,000	1,139,000	1,139,000	72,7940	389,538
	CDQ			11,3900		45,560
	Incidental Catch			51,250		12,814
	Inshore			486,922		194,769
	Offshore C/P			389,537		155,815
	Mothership			97,384		38,954
	Aleutian Is. (AI)	31,700	23,800	2,000	1,106,	1,800
	Bogoslof District	30,400	22,300	1,000	26	900
	Exc. Harvest			170,442		68,177
Pacific cod	BSAI	240,000	193,000	193,000	130,061	44,631
Sablefish	BS	1,750	1,470	1,470	594	156
	AI	3,090	2,430	2,430	762	129
Atka mackerel	Total	119,000	70,800	70,800	30,826	32,745
	Western AI		29,700	29,700		13,736
	Central AI		24,700	24,700		11,424
	Eastern AI/BS		16,400	16,400		7,509
Yellowfin sole	BSAI	226,000	191,000	123,262	50,292	26,193
Rock sole	BSAI	273,000	230,000	134,760	47,749	28,637
Greenland turbot	Total	42,000	9,300	9,300	6,338	2,151
	BS			6,231		1,441
	AI			3,069		710
Arrowtooth flounder	BSAI	160,000	131,000	131,000	8,929	27,838
Flathead sole	BSAI	90,000	73,500	52,652	16,907	11,189
Other flatfish	BSAI	141,000	117,000	83,813	13,648	17,811
Pacific ocean perch	BS	3,100	2,600	2,600	450	553
	AI Total	14,400	12,300	12,300	8,418	2,845
	Western AI		5,670	5,670		1,311
	Central AI		3,510	3,510		812
	Eastern AI		3,120	3,120		722
Other red rockfish	BS	259	194	194	213	41
Sharpchin/Northern	AI	6,870	5,150	5,150	3,253	1,191
Shortraker./rougheye	AI Total	1,180	885	885	335	205
Other rockfish	BS	492	369	369	237	79
	AI	913	685	685	403	146
Squid	BSAI	2,620	1,970	1,970	332	419
Other species	BSAI	71,500	31,360	31,360	14,827	6,664
	TOTAL	3,139,274	2,260,113	2,000,000	1,063,646	661,919

3.1.2 Status of Groundfish Target Species in the GOA

Designated target species and species groups in the GOA are walleye pollock, Pacific cod, deep water flatfish, rex sole, shallow water flatfish, flathead sole, arrowtooth flounder, sablefish, other slope rockfish, northern rockfish, Pacific Ocean perch, shortraker and rougheye rockfish, pelagic shelf rockfish, demersal shelf rockfish, Atka mackerel, thornyhead rockfish, and other species. Year 2000 OFLs, ABC, TAC, and catch through September 2, 2000, along with 2001 proposed and interim specifications GOA area are presented in Table 2 and discussed below. Harvest alternatives considered are presented in Table 19. For detailed life history, ecology, and fishery management information regarding groundfish stocks in the GOA see Section 3.3 of the SEIS.

Walleye pollock The GOA pollock biomass can be described as below target stock size and increasing. Relative to the 1999 SAFE report, new sources of information include: 1) 1997 and 1998 echo integration trawl (EIT) survey age composition; 2) an evaluation of 1989-98 ADF&G coastal trawl survey biomass and length composition data for inclusion in the model; 3) age composition from the 1998 fishery; 4) updated catch data from the fisheries; and 5) the 1999 ADF&G summer biomass estimate for Prince William Sound (PWS). The Shelikof EIT survey was not conducted in 1999. In addition, the stock assessment was extended eastward to 140° W to coincide with the area open for trawling in the Gulf of Alaska; this assessment previously extended only to 147° W long. Annual catches and the AFSC bottom trawl survey biomass time series were revised to correspond to the larger area. Biomass estimates in the trawl survey time series were also increased to account for biomass in PWS. Exploitable biomass for 2000 is estimated to be 588,000 mt.

Projected spawning biomass in 2000 for the Western, Central and West Yakutat (WYK) areas is 214,900 mt, which is below the $B_{40\%}$ value of 247,000 mt and places Gulf pollock in Tier 3b. Exploitable biomass is estimated to be 588,000 in the W/C/WYK combined areas. Following substantial discussion, the Plan Team recommended the 1999 ABC of 94,400 mt be applied as the 2000 ABC for the Western/Central area. This harvest rate, while less than the maximum permissible of $F_{40\%\ adjusted}$=0.34, was recommended to address some of the following concerns: 1) the stock continues to decline; 2) the stock biomass is now at an all time low; and 3) the large variability around the biomass estimate from the 1999 trawl survey. Given the low biomass and continued decline, the Team felt it inappropriate to increase the ABC relative to that from 1999. Total recommended ABC for Western, Central, and West Yakutat areas is 96,560 mt, which represents a fishing mortality rate of F = 0.29. The Plan Team recommended the 2000 ABC be apportioned according to mean distribution of the exploitable population biomass in the four most recent bottom trawl surveys. ABC apportionment by mean distribution among surveys is a departure from previous pollock assessments and was used because of the high variability observed in the 1999 trawl survey distributions. This resulted in an apportionment of 41.0% (39,590 mt) to the Shumagin area, 24.4% (23,560 mt) to the Chirikof area, 32.1% (31,000 mt) to the Kodiak area, and 2.5% (2,410 mt) to the West Yakutat area. OFL for gulf pollock in 2000 is defined as $F_{35\%adjusted}$ = 0.40.
The 1999 ADF&G survey estimated a PWS biomass of 1.05% of the AFSC survey estimate of Gulf pollock. As an interim approach, pollock biomass estimates from the triennial survey time series were increased by 1.05% prior to Gulf assessment model runs. This allows the PWS ABC to be deducted from the ABC for the combined Western, Central, and West Yakutat areas, consistent with the assessment approach. The PWS ABC is estimated to be approximately 1,420 mt.

Pollock in the Southeast Outside and East Yakutat areas fall into a Tier 5 assessment. Under this approach, 2000 ABC is 6,460 mt, based on 1999 trawl survey biomass estimate of 28,710 mt and a natural mortality estimate of 0.30. OFL is 8,610 mt. The assessment authors noted that pollock catch in the pooled Southeast Outside and East Yakutat areas never exceeded 100 mt during 1991-98.

The Plan Team's total recommended 2000 ABC for pollock in the GOA was 103,020 mt, up from 100,920 mt in 1999. The SSC and Council recommended using an adjusted F45% exploitation strategy (F_{ABC}=0.28) for the western population. The recommended ABCs of 38,352, 22,824, 30,027, and 2,339 mt in areas 610, 620, 630, and 640 also reflect proportional reductions in these areas based on the 2000 pollock guideline harvest level in Prince William Sound. The SSC and Council concurred with the Plan Team's recommended ABC for area 650 of the Eastern GOA of 6,460. The AP and Council recommended that TAC be set at ABC levels.

Two other harvest alternatives were evaluated for comparative purposes to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Spawning biomass is projected to be 212,700 mt in the year 2000 under an F_{OFL} harvest policy, less than $B_{35\%}$ (216,000 mt), but greater than ½ of $B_{35\%}$. At F_{OFL}, the projected mean spawning biomass in 2010 is 239,100 mt, 111% of $B_{35\%}$. Therefore, GOA pollock stocks are not currently overfished. The projected mean spawning biomass in 2002 is 166,600 mt, less than $B_{35\%}$, but greater than ½ of $B_{35\%}$. Projected mean spawning biomass in 2012 is 236,300 mt, 109% of $B_{35\%}$. Therefore, GOA pollock stocks are not approaching an overfished condition. The OFL determinations for pollock falls under tier 3(b) in the combined Western, Central, and West Yakutat areas and under tier 5 in the Southeast Outside (SEO) District and are 130,760 and 8,610 mt respectively.

Pacific cod The GOA Pacific cod biomass can be described as above target stock size but declining. Relative to the 1999 SAFE report, new sources of information include: 1) size composition data from the 1998 and January through August 1999 commercial fisheries; 2) size composition data from the 1999 GOA bottom trawl survey; 3) the biomass estimate from the 1999 GOA bottom trawl survey; and 4) weight-at-length data from recent GOA bottom trawl surveys have been incorporated. Exploitable biomass for 2000 is estimated to be 567,000 mt.

The 1999 bottom trawl survey biomass estimate of 305,823 mt was down about 43% from the 1996 survey estimate. Maximum permissible values of ABC and OFL under Tier 3a are the $F_{40\%}$ (=0.38) and $F_{35\%}$ (=0.46) yields 86,000 and 102,000 mt, respectively. The projected age 3+ exploitable biomass for the year 2000 is 567,000 mt. The author noted that the historic trend of catch and age 3+ biomass shows a pattern in exploitation rate over time where the rate has met or exceeded the average for every year after 1989, while the estimated values fall below average for every year prior to 1990.

The assessment author's ABC recommendation of 76,400 mt is the geometric mean of the posterior distribution of 2000 catch obtained under an $F_{40\%}$ harvest strategy and is equivalent to an F=0.33. In past years the author's similarly obtained ABC recommendation represented an increase in ABC, while the assessment indicated a decreasing stock trend. The Team chose in those years to not increase ABC, but to forward the previous year's ABC. In 1999, the assessment still estimated the stock to be decreasing, however, 76,400 mt does not represent an increase over the past year's ABC, and is accepted as the Plan Team's recommended ABC for the year 2000.

The assessment author noted in his report that if the ABC is to be distributed between regulatory areas in proportion to the biomass estimates from the most recent trawl survey, the proportions are: Western-36%, Central-57%, and Eastern-7%, which would result in 27,500 mt, 43,550 mt, and 5,350 mt, respectively, for a 76,400 mt Gulfwide ABC.

The Plan Team's total recommended 2000 ABC for Pacific cod in the GOA was 76,400 mt , down from 84,400 mt in 1999. The SSC and Council concurred with the Plan Team's recommended ABC and areas apportionments. The AP and Council recommended TACs lower than ABCs by 25% in the Western GOA, 19.25% in the Central GOA, and 25% in the Eastern GOA, based on the 2000 guideline harvest levels of Pacific cod in the state waters fishery.

Two other harvest alternatives were evaluated for comparative purposes to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Spawning biomass is projected to be 109,400 mt in 2000 under an FOFL harvest policy, greater than $B_{35\%}$ (86,400 mt). Therefore, GOA Pacific cod stocks are above MSST and are not currently overfished. The projected mean spawning biomass in 2002 is 89,800 mt, greater than $B_{35\%}$. Therefore, GOA Pacific cod stocks are not approaching an overfished condition. The OFL determination for Pacific cod falls under tier 3(a) and is 102,000 mt.

Deep water flatfish include Greenland turbot, Dover sole and deep sea sole. Deep water flatfish inhabit the continental shelf and slope across the northern Pacific Ocean from northern Baja California to Japan to depths as great as 1100 meters. These fish were separated from other flatfish in the GOA based on seasonal differences in the bycatch of Pacific halibut. The relative abundance and trend of the deep water flatfish biomass is unknown. Relative to the 1999 SAFE report, new sources of information include: 1) updated catch information; and 2) biomass and size composition from the 1999 bottom trawl survey, which included additional survey efforts in deep water habitat. Exploitable biomass for 2000 is estimated to be 74,460 mt.

The 2000 exploitable biomass for deep water flatfish is based on abundance estimated from the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey and is estimated to be 74,460 mt. The Plan Team recommended that ABCs for deep water flatfish be apportioned among the regulatory areas in proportion to the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey. The Team further recommends splitting the eastern GOA ABC of 2,310 mt between the WYK and SEO subareas. The resulting 2000 ABCs are 280, 2,710, 1,240, and 1,070 mt for the Western, Central, West Yakutat, and Southeast Outside areas respectively.

The Plan Team's total recommended 2000 ABC for deep water flatfish in the GOA was 5,300 mt , down from 6,050 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended that TAC be set at ABC levels.

Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). The overfishing level for deep water flatfish is determined by the fishing mortality rates from the tier structure to the exploitable

biomass estimates. The OFL determinations for deep water flatfish fall under tiers 5 and 6 and is 6,980 mt.

Rex sole inhabit the continental shelf and slope at depths from the surface to 800 meters but are most abundant below 200 meters. Rex sole was separated from the deep water flatfish group in 1993 due to high incidental catch rates of Pacific ocean perch while targeting rex sole. The relative abundance of the rex sole flatfish biomass is unknown but stable. Relative to the 1999 SAFE report, new sources of information include: 1) updated catch information; and 2) biomass and size composition from the 1999 bottom trawl survey, which included additional survey efforts in deep water habitat.

The 2000 exploitable biomass for rex sole is based on abundance estimated from the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey and is estimated to be 72,330 mt. The Plan Team recommended that ABCs for rex sole be apportioned among the regulatory areas in proportion to the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey. The Team further recommended splitting the eastern GOA ABC of 2,550 mt between the WYK and SEO subareas. The resulting 2000 ABCs are 1,230, 5,660, 1,540, and 1,010 mt for the Western, Central, West Yakutat, and Southeast Outside areas respectively.

The Plan Team's total recommended 2000 ABC for rex sole in the GOA was 9,440 mt , up from 9,150 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended that TAC be set at ABC levels.

Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). The overfishing level for rex sole is determined by the fishing mortality rates from the tier structure to the exploitable biomass estimate. The OFL determination for rex sole falls under tier 5 and is 12,300 mt.

Shallow water flatfish comprise all flatfish species in the GOA, except those species for which a separate ABC is calculated (deep water flatfish, rex sole, flathead sole, arrowtooth flounder, and Pacific halibut). The relative abundance of the shallow water flatfish biomass is unknown but stable. Relative to 1999 SAFE, new sources of information include: 1) updated catch information; and 2) biomass and size composition from the 1999 bottom trawl survey, which included additional survey efforts in deep water habitat.

The 2000 exploitable biomass for shallow water flatfish is based on abundance estimated from the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey. Exploitable biomass for 2000 was estimated to be 299,100 mt. The Plan Team recommended that ABCs for shallow water flatfish be apportioned among the regulatory areas in proportion to the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey. The Team further recommended splitting the eastern GOA ABC of 1,950 mt between the WYK and SEO subareas. The resulting 2000 ABCs are 19,510, 16,400, 790, and 1,160 mt for the Western, Central, West Yakutat, and Southeast Outside areas respectively.

The Plan Team's total recommended 2000 ABC for shallow water flatfish in the GOA was 37,860 mt , down from 43,150 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area

apportionments. The AP and Council recommended TACs of 4,500, 12,950, 790, and 1,160 mt for the Western, Central, West Yakutat, and Southeast Outside areas respectively.

Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). The overfishing level for shallow water flatfish is determined by the fishing mortality rates from the tier structure to the exploitable biomass estimates. The OFL determination for shallow water flatfish fall under tiers 4 and 5 and is 45,320 mt

Flathead sole occurs widely over the continental shelf and slope from northern California through the North Pacific and Bering Sea to Japan. They are widely found from near the surface to depths of 800 meters. A separate ABC was assigned for flathead sole because they overlap the depth distributions of the deep and shallow water flatfish groups. The relative abundance of the flathead sole biomass is unknown but stable. Relative to the 1999 SAFE report, new sources of information include: 1) updated catch information; and 2) biomass and size composition from the 1999 bottom trawl survey, which included additional survey efforts in deep water habitat.

The 2000 exploitable biomass for flathead sole is based on abundance estimated from the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey and is estimated to be 207,520 mt. The Plan Team recommended that ABCs for rex sole be apportioned among the regulatory areas in proportion to the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey. The Team further recommended splitting the eastern GOA ABC of 2,060 mt between the WYK and SEO subareas. The resulting 2000 ABCs are 8,490, 15,270, 1,440, and 620 mt for the Western, Central, West Yakutat, and Southeast Outside areas respectively.

The Plan Team's total recommended 2000 ABC for flathead sole in the GOA was 26,760 mt , up from 26,110 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended TACs of 4,500, 12,950, 790, and 1,160 mt for the Western, Central, West Yakutat, and Southeast Outside areas respectively.

Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). The overfishing level for flathead sole is determined by the fishing mortality rates from the tier structure to the exploitable biomass estimate. The OFL determination for rex sole falls under tier 4 and is 45,320 mt.

Arrowtooth flounder occurs over the continental shelf and slope from depths near the surface to 900 meters from California to the eastern Bering Sea. Arrowtooth flounder were separated from the other flatfish complex in 1990, due to their disproportionally high abundance. The GOA arrowtooth flounder biomass can be described as above target stock size and declining. Relative to the 1999 SAFE report, new sources of information include: 1) biomass and size composition from the 1999 bottom trawl survey; 2) a projection of biomass based on an ADModel Builder model which is now being used as the main assessment model; and 3) differential mortality values for males and females.

The 2000 exploitable biomass was based on abundance estimates derived from an ADModel Builder stock assessment model and is estimated to be 1,571,670 mt. There was a change in the way the model accounted for higher proportions of females in the larger size intervals. In the previous model, the changing sex ratio was fit by having different selectivity for males and females as size increased. In the present model, the sex ratio pattern is fit by giving males a higher mortality rate than females. The Plan Team agreed with the assessment authors that this was a more appropriate way to model the pattern in sex ratio, as this pattern (fewer males at larger sizes) is observed in both the Bering Sea and the Gulf of Alaska, and in both survey and commercial catches. This change is largely responsible for the drop in exploitable biomass estimated in 2000, although there was also a less-dramatic decrease in the trawl survey biomass in the 1999 survey.

The Plan Team recommended that ABCs for arrowtooth flounder be apportioned among the regulatory areas in proportion to the 1999 triennial trawl survey biomass distributions in the 1999 trawl survey. The Team further recommended splitting the eastern GOA ABC of 31,490 mt between the WYK and SEO Districts. The resulting 2000 ABCs are 16,160, 97,710, 23,770, and 7,720 mt for the Western, Central, West Yakutat, and Southeast Outside Districts respectively.

The Plan Team's total recommended 2000 ABC for arrowtooth flounder in the GOA was 145,360 mt, down from 217,110 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended TACs of 5,000, 25,000, 2,500, and 2,500 mt for the Western, Central, West Yakutat, and Southeast Outside areas respectively.

Two other harvest alternatives were evaluated for comparative purposes to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Spawning biomass is projected to be 1,075,900 mt in 2000 under an FOFL harvest policy, greater than $B_{35\%}$ (394,219 mt). Therefore, GOA arrowtooth flounder stocks are above MSST and are not currently overfished. The projected mean spawning biomass in 2002 is 826,786 mt, greater than $B_{35\%}$. Therefore, GOA arrowtooth flounder stocks are not approaching an overfished condition. Using Tier 3a criteria, the overfishing level based on $F_{35\%} = 0.159$ is 173,910 mt.

Sablefish The GOA sablefish biomass can be described as below target stock size but stable. Relative to the 1999 SAFE report, new sources of information include: 1) relative abundance and length data from the 1999 longline survey; 2) historical catch data from 1960-1978; 3) catch rate and length data from the Japanese longline fishery from 1964-1981; 4) length data from the Japanese trawl fishery from 1964-1971; 5) catch rate date from the U.S. longline fishery from 1990 through 1999; 6) length data from the U.S. trawl fishery from 1990-1996; 7) age composition data from the 1998 sablefish longline survey; and 8) length data from the 1999 longline fishery. Exploitable biomass for 2000 was estimated to be 169,000 mt.

Revisions to the sablefish assessment from 1998 primarily include: the addition of about 20 years of historical data, adding recent fishery catch rate data, the use of ageing imprecision, and a Bayesian decision analyses. Recruitment variability was significantly different compared to the 1998 assessment. This was due to the addition of true ageing error estimates.

The Team selected the $F_{40\%}$ *adjusted rate* that used the split gears for setting the maximum permissible ABC level (Tier 3b). This gave the adjusted GOA value for the year 2000 harvest level of 13,400 mt as the maximum permissible ABC (F_{ABC}=0.109). The Team recommended that this value should also be used for setting the ABC level. The Plan Teams also discussed the three different methods for computing area apportionments for sablefish. There are significant differences in the area apportionments depending on the method. The questions are what biological effects area apportionments may have on the sablefish stock. Based on the earlier work of Heifetz *et al.* (1997), area-specific harvest rates begin to have significant impacts at levels (e.g., >30%) significantly higher than what is currently estimated. The Teams suggested that Council should continue to apportion based on the 5-year weighted average as in the past. There are concerns that biases may be introduced by adding the fishery data. While the Team did not have any compelling evidence that suggested biological issues are of concern, they felt that a good strategy continues to be one of area apportionment based on the best estimate of the biomass distribution.

As in 1999, the Plan Team recommended that five percent of the East Yakutat/SEO area ABC be subtracted, and added to the West Yakutat area ABC. This adjustment of ABC allows five percent of the total Eastern GOA TAC to be available to trawl gear as incidental catch in other directed fisheries following the prohibition of trawl gear east of 140 degrees West Longitude. This adjustment does not change the allocation of TAC to fixed gear in any management area of the Eastern GOA. The Team further recommended splitting the eastern GOA ABC of 31,490 mt between the WYK and SEO subareas. The resulting 2000 ABCs (which do not include the recommended adjustments in the Eastern GOA described above) were 1,960, 6,030, 1,920, and 3,490 mt for the Western, Central, West Yakutat, and SEO areas respectively.

The Plan Team's total recommended 2000 ABC for sablefish in the GOA is 13,400 mt , up from 12,700 mt in 1999. The SSC concurred with the Plan Team's ABC and area apportionments and the AP recommended that TACs be set at those levels. The Council recommended an alternate ABC apportionment based on inclusion of commercial fisheries data with the survey estimates. These ABCs are 1,840, 5,730, 2,207, and 3,553 mt for the Western, Central, West Yakutat, and Southeast Outside areas respectively. These apportionments also take into account the effect of allocating 5 % of combined Eastern Gulf sablefish TACs to trawl gear in the West Yakutat area without affecting the amounts allocated to hook-and-line gear in each area. The Council recommended that TAC be set at ABC levels.

Two other harvest alternatives were evaluated for comparative purposes to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Spawning biomass is projected to be 176,000 mt in 2000 (in the combined BSAI/GOA) under an FOFL harvest policy, less than B35% (190,000 mt), but greater than ½ of B35%. At FOFL, the projected mean spawning biomass in 2010 is 218,000 mt, 115% of B35%. Therefore, BSAI/GOA sablefish stocks are not currently overfished. The projected mean spawning biomass in 2002 is 176,600 mt, less than B35%, but greater than ½ of B35%. Projected mean spawning biomass in 2012 is 221,000 mt, 116% of B35%. Therefore, BSAI/GOA sablefish stocks are not approaching an overfished condition.. Using Tier 3b criteria, the overfishing level based on $F_{35\%}$adjusted = 0.136 is 16,700 mt.

Other slope rockfish include all species in the genus *Sebastes* excluding Pacific Ocean perch, northern rockfish, shortraker rockfish, rougheye rockfish, pelagic shelf rockfish, and demersal shelf rockfish in the

Southeast Outside District. The relative abundance and trend of the other slope rockfish biomass is unknown. Relative to the 1999 SAFE report, new sources of information include: 1) updated catch information; and 2) biomass and size composition from the 1999 bottom trawl survey.

As in the past, the recommended ABC for other slope rockfish is based on F = M or F = 0.75M applied to exploitable biomass. Exploitable biomass is determined from the average of the three most recent trawl surveys and is estimated to be 102,510 mt. Applying the definitions for ABC and OFL places sharpchin rockfish in Tier 4 where $F_{ABC} \leq F_{40\%}$, and the other species of other slope rockfish in Tier 5 where $F_{ABC} \leq 0.75M$. For sharpchin rockfish, $F_{ABC} = M = 0.05$ is less than $F_{40\%} = 0.055$. This results in a recommended combined ABC for other slope of 4,900 mt (including 5 mt of northern rockfish in the West Yakutat area). Distributing this ABC based on the same method used for Pacific ocean perch results in ABCs of 20 mt in the Western area, 740 mt in the Central area, and 4,140 mt in the Eastern area.

The Team recommended that a separate ABC be set for other slope rockfish in the West Yakutat area. Using the same weighted average method as used for Pacific ocean perch results in a point estimate of 0.06 for the proportion of the exploitable biomass in the Eastern area that occurs in West Yakutat. Because a small portion of the Eastern ABC of other slope rockfish has been taken recently and some other slope rockfish are caught with longline gear, the Team recommended that this point estimate be used to apportion the ABC. This corresponds to an ABC of 250 mt (including 5 mt of northern rockfish) in WYK and 3,890 mt in the SEO areas.

The Plan Team's total recommended 2000 ABC for other slope rockfish in the GOA was 4,900 mt, down from 5,270 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended that TAC be set at ABC levels.

Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). The overfishing level for other slope rockfish is determined by the fishing mortality rates from the tier structure to the exploitable biomass estimate. Overfishing is defined as $F_{35\%} = 0.064$ for sharpchin rockfish (tier 4) and F=M (tier 5) for the other species. The OFL determination for other slope rockfish is 6,390 mt.

Northern rockfish are found from the GOA through the Bering Sea at depths generally greater than 100 meters. A separate ABC has been recommended since 1993 to prevent overfishing of the highly valued northern rockfish. The relative abundance and trend of northern rockfish biomass is unknown. Relative to the 1999 SAFE report, new sources of information include: 1) updated catch information; and 2) biomass and size composition from the 1999 bottom trawl survey.

In the past, the unweighted average of the exploitable biomass in the three most recent surveys (1993, 1996, and 1999) were used to determine current exploitable biomass. This results in exploitable biomass estimate of 125,545 mt. However, variance of the 1999 survey was exceptionally large, approximately 30 and 15 times larger than the 1996 and 1993 survey variances, respectively. This large variance is due to one very large haul in one strata. The biomass estimate for this strata makes up 78% of the 1999 survey estimate of exploitable biomass for northern rockfish. The Team concurred with the author that to account for the increased level of uncertainty in the 1999 survey estimate, exploitable biomass this

year should be estimated using a weighted average. Weights for each survey estimate are in proportion to the inverse of their respective variances. This weighted average results in an estimate of 85,360 mt of exploitable biomass for northern rockfish.

Applying the definitions for ABC and OFL places northern rockfish in Tier 4 where $F_{ABC} \leq F_{40\%}$. As in the past, an F=M harvest strategy is used to determine ABC. This results an F_{ABC}=M= 0.06 which is less than $F_{40\%}$=0.075. Applying the F=0.06 harvest rate to the estimated exploitable biomass of 85,360 mt results in an ABC of 5,120 mt for northern rockfish. Distributing this ABC based on the same method used for Pacific ocean perch results in ABCs of 630 mt in the Western area and 4,485 mt in the Central area. The small ABC of 5 mt apportioned to the Eastern is combined with the WYK ABC for other slope rockfish. The Eastern area is the edge of the geographical range of northern rockfish and such a small ABC is impracticable to manage.

The Plan Team's total recommended 2000 ABC for northern rockfish in the GOA was 5,120 mt , up from 4,990 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended that TAC be set at ABC levels.

Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). The overfishing level for other slope rockfish is determined by the fishing mortality rates from the tier structure to the exploitable biomass estimate. Overfishing is defined as $F_{35\%}$ = 0.088 for northern rockfish (tier 4). The OFL determination for northern rockfish is 7,510 mt.

Pacific ocean perch (POP) inhabit the outer continental shelf and slope regions of the North Pacific and Bering Sea at depths of 100 to 450 meters. The GOA POP biomass can be described as below target stock size but increasing. Relative to the 1999 SAFE report, new sources of information include: 1) updated catch information; 2) biomass and size composition from the 1999 bottom trawl survey; and 3) a projection of biomass based on the stock synthesis model for POP.

As in the past, the Team and the authors concurred that a model that treats survey biomass as an index of abundance rather than absolute abundance should be used as the basis for ABC and overfishing levels. Thus, survey catchability q was estimated in the current stock assessment. Survey catchability q was estimated at 2.99, compared with an estimate of q = 2.78 for the 1998 assessment. Justification for an estimate of q >1.0 is based on expansion of the trawl survey estimates to untrawlable areas and on possible herding of fish into the trawl by the bridles and trawl doors. Submersible studies indicate adult Pacific ocean perch often concentrate over trawlable substrates. The Team had a difficult time reconciling the high estimated value for q. However, other factors independent of surveys, such as parameter confounding contribute to the estimate of q. The model chosen for ABC and OFL recommendations fit the data best (q = 2.99) and is in keeping with the desire to remain conservative. Exploitable biomass for 2000 is estimated to be 200,310 mt.

The current female spawning biomass (B_{2000} = 92,920 mt) is less than $B_{40\%}$ (110,120), where $B_{40\%}$ is determined from the average recruitment of the 1977-92 year classes. Since B_{2000} is less than $B_{40\%}$, the computation in Tier 3b is used to determine the maximum value of F_{ABC}. The current estimate of $F_{40\%}$ is

0.078. Applying Tier 3b results in $F_{ABC} \leq 0.065$ and an ABC ≤ 13,020 mt. The Team recommended that the ABC for Pacific ocean perch for the 2000 fishery in the Gulf of Alaska be set at 13,020 mt.

The Team and the authors concurred with the method of apportionment used for the 1999, 1998 and 1997. The method weights prior surveys based on the relative proportion of variability attributed to survey error. Survey error is assumed to contribute 2/3 of the total variability in predicting the distribution of biomass. Thus, the weight of a prior survey should be 2/3 the weight of the preceding survey. This results in weightings of 4:6:9 for the 1993, 96, and 99 surveys, respectively and area apportionments of 9.5% for the Western area, 71.0% for the Central area, and 19.4% for the Eastern area. This results in recommended ABCs of 1,240 mt for the Western area, 9,240 mt for the Central area, and 2,540 mt for the Eastern area. For Pacific ocean perch the overfishing level is apportioned by area. Using the same apportionment as used for ABC, results in overfishing levels by area of 1,460 mt in the Western area, 10,930 mt in the Central area, and 3,000 mt in the Eastern area. The authors pointed out that an alternative apportionment scheme may be warranted because variance of the 1999 survey estimate is considerably higher than previous surveys. Thus an alternative weighting scheme that considers year specific estimates of measurement error (i.e. survey variance) may be warranted.

The Team recommended that a separate ABCs be set for Pacific ocean perch in the Eastern Gulf between the WYK and SEO Districts. Using the same weighted average method as described above results in a point estimate of 0.22 for the proportion of the exploitable biomass in the Eastern area that occurs in WYK. However, there is considerable uncertainty in this estimate. In an effort to balance this uncertainty with associated costs to the industry, the Team recommended apportionments to West Yakutat, be based on proportions from the upper 95% confidence limit of 0.33. This corresponds to an ABC of 840 mt for WYK. Under this apportionment strategy, very little of the 1,700 mt assigned to the remaining SEO District is expected to be harvested.

The Plan Team's total recommended 2000 ABC for POP in the GOA was 13,020 mt , down from 13,120 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended that TAC be set at ABC levels.

Two other harvest alternatives were evaluated for comparative purposes to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Spawning biomass is projected to be 90,116 mt in 2000 under an FOFL harvest policy, less than B35% (96,102 mt), but greater than ½ B35%. At FOFL, the projected mean spawning biomass in 2010 is 102,440 mt, 101% of B35%. Therefore, GOA POP stocks are not currently overfished. The projected mean spawning biomass in 2002 is 98,478 mt, greater than B35%.Therefore, GOA POP stocks are not approaching an overfished condition.. Using Tier 3b criteria, the overfishing level based on $F_{30\%} = 0.115$ is estimated at 17,750 mt gulfwide; 1,690, 12,620, 3,440 mt in the Western, Central, and Eastern GOA respectively.

Shortraker and rougheye rockfish are found from California to the Bering Sea, at depths from 100 to 800 meters. In 1991, shortraker and rougheye rockfish were separated from the other slope rockfish complex to prevent overfishing of shortraker and rougheye rockfish. The relative abundance and trend of shortraker and rougheye rockfish biomass is unknown. Relative to the 1999 SAFE report, new sources

of information include: 1) updated catch information; and 2) biomass and size composition from the 1999 bottom trawl survey.

As in the past, the average of the exploitable biomasses in the three most recent surveys (1993, 1996, and 1999) were used to determine current exploitable biomass. The current estimates of exploitable biomass are 22,480 mt for shortraker rockfish and 48,400 mt for rougheye rockfish. Applying the definitions for ABC and OFL places shortraker rockfish in Tier 5 where $F_{ABC} \leq 0.75M$. Thus, the recommended F_{ABC} for shortraker rockfish is 0.023 (i.e., 0.75 X 0.03). Applying Tier 4 to rougheye rockfish (i.e., $F_{ABC} \leq F_{40\%}$) allows an F_{ABC}=M= 0.025 which is less than $F_{40\%}$=.032. Applying these F_{ABC} rates to the estimates of exploitable biomass results in ABCs of 520 mt for shortraker rockfish and 1,210 mt for rougheye rockfish and a total ABC for the subgroup of 1,730 mt.

As in the 1998 assessment, to apportion ABC among areas, the Team recommended that the same methodology used for Pacific ocean perch be applied to shortraker and rougheye rockfish. This method results in apportionments of 210 mt for the Western area, 930 mt for the Central area and 590 mt for the Eastern area.

The Plan Team's total recommended 2000 ABC for other shortraker and rougheye rockfish in the GOA is 1,730 mt , up from 1,590 mt in 1999. Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Overfishing is defined as $F_{35\%}$ = 0.088 for northern rockfish (tier 4). The OFL determination for northern rockfish is calculated to be 7,510 mt. Overfishing is defined to occur at the harvest rate set equal to $F_{35\%}$ of 0.038 for rougheye rockfish and at the F=M rate of 0.03 for shortraker rockfish because data are not available to determine $F_{35\%}$ for shortraker rockfish. These harvest rates are applied to estimates of current exploitable biomass to yield an overfishing catch limit of 2,510 mt for the shortraker/rougheye assemblage.

Pelagic shelf rockfish inhabit the continental shelf of the GOA and typically exhibit mid-water schooling behavior. The pelagic shelf rockfish (PSR) assemblage is comprised of dusky, yellowtail, and widow rockfishes. The assemblage was separated from the other slope rockfish complex in 1988. Pelagic shelf rockfish are taken primarily by trawl and jig gear in the GOA. In 1998, two species, black rockfish and blue rockfish, were removed from the pelagic shelf rockfish complex so that the State of Alaska could manage these near shore species. The relative abundance and trend of pelagic shelf rockfish biomass is unknown. Relative to the 1999 SAFE report, new sources of information include: 1) biomass and size compositions from the 1999 bottom trawl survey; 2) revised von Bertalanffy growth parameters for dusky rockfish; 3) age at 50% maturity for female dusky rockfish (11.3) years); and 4) revised estimates of age at 50% recruitment for dusky rockfish (10 years).

Biomass estimates for PSR indicate that dusky rockfish comprise nearly all the biomass. Based on mean trawl survey data in 1993, 1996, and 1999, the 1999 exploitable biomass was calculated to be 66,443 mt. An F=M strategy equal to 0.09 for dusky rockfish resulted in an ABC of 5,980 mt for the assemblage. This strategy is more conservative than the Tier 4 maximum $F_{40\%}$ of 0.11 and the Team felt a reduction is justified due to concern over the reliability of biomass estimates and the estimates of $B_{40\%}$ for this assemblage. The Team concurred with the authors that sufficient data may now exist to conduct an age-structured assessment for dusky rockfish and recommends that this work proceed. Given the rational

described above for Pacific ocean perch, a respective weighting of 4:6:9 applied to PSR geographical distributions from the 1993, 1996, and 1999 surveys results in ABC apportionments of 550 mt to the Western, 4,080 mt to the Central, and 1,350 mt to the Eastern areas.

The Team recommended that the Eastern area ABC be apportioned to West Yakutat according to the upper 95% confidence limit estimate of proportion in West Yakutat from the three most recent survey years with total Eastern area ABC not to exceed 1,350 mt, resulting in 580 mt and 770 mt for the WYK and SEO Districts respectively. Point estimates for West Yakutat and SEO are 420 and 930 respectively.

The total recommended 2000 ABC for pelagic shelf rockfish in the GOA was 5,980 mt , up from 4,880 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended that TAC be set at ABC levels.

Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Overfishing is defined as $F_{35\%}$ = 0.136 for pelagic shelf rockfish (tier 4). The OFL determination for pelagic shelf rockfish is 9,036 mt.

Demersal shelf rockfish (DSR) is a subgroup of seven species from the other slope rockfish complex which is managed by the State of Alaska in the Southeast Outside area of the GOA. DSR was separated from other slope rockfish in 1987. These rockfish are bottom dwelling in shallow near shore waters, and are primarily harvested with longline gear. The relative abundance and trend of demersal shelf rockfish biomass is unknown. Relative to the 1999 SAFE report, new sources of information include: 1) updated catch information; 2) density estimates for the SSEO and EYK areas from the 1999 line transect survey; and 3) revised estimates of rocky habitat areas.

Estimates of rock habitat were revised using a combination of information available from submersible dives, side-scan data, NOS data, and commercial logbook data. Areas were digitized into a GIS. Changes from previous estimates were significant and varied by area with some areas showing an increase and some a decrease in estimated area of rock habitat. The overall change was down 34%, with 3,095 km^2 compared to 5,758 km^2 used in previous assessments. Area estimates will most likely change in the future as more information on habitat is collected.

The exploitable biomass estimate for yelloweye rockfish, based on the sum of the lower 90% confidence limit of biomass is 15,100 mt. This is a decrease of 40% over the 1999 estimate. This decrease is largely due to the change in estimate of rock habitat as well as the lower density for EYK.

Because of the continued uncertainty in estimation of yelloweye biomass due to difficulties in estimation of total area of rock habitat, and our inability to include the uncertainty of this estimate in our assessment, we continue to advocate using the lower 90% confidence limits of biomass, as the reference number for setting ABC. Consistent with past years, the exploitable biomass estimate is based on the sum of the lower 90% confidence limits for each management area. This is appropriate as there are significant differences in density between management areas and the directed fishery quota is set by management area.

The SEO exploitable biomass estimate for 1999 was 15,100 mt. Using tier 4 and adjusting for the 10% of other species landed in the assemblage, the F_{ABC} was set at F=M=0.02, more conservative than the $F_{40\%}$ rate and yields an ABC of 340.

The Plan Team's total recommended 2000 ABC for demersal shelf rockfish in the SEO District of the GOA was 340 mt, down from 560 mt in 1999. The SSC and Council concurred with the Plan Team's ABC. The AP and Council recommended that TAC be set at ABC level.

Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Overfishing is defined as $F_{35\%}$ = 0.0279 for demersal shelf rockfish (tier 4). The OFL for demersal shelf rockfish is 420 mt in the SEO District.

Atka mackerel is a schooling, semi-demersal species, most abundant in the Aleutian Islands. Atka mackerel is harvested primarily with trawl gear. In 1994, Atka mackerel was separated from the other species group in the GOA to prevent overfishing Atka mackerel. The relative abundance and trend of Atka mackerel biomass is unknown. Relative to the 1999 SAFE report, new sources of information include updated catch information.

Prior to 1997, exploitable biomass and ABC for GOA Atka mackerel were based on triennial bottom trawl survey estimates. However, schooling behavior, patchy distribution, and habitat preference makes this species difficult to sample with standard trawl survey gear. Atka mackerel are also poor targets for hydroacoustic surveys because they lack swim bladders. Re-evaluation of historical survey data indicated abundance estimates prior to 1997 were also compromised by high variability. Thus, existing GOA bottom trawl survey data has limited utility for either absolute abundance estimates or indices for Atka mackerel.

The Plan Team supported a bycatch only fishery as a conservative harvest policy for Atka mackerel because: 1) there is no reliable biomass estimate; 2) localized depletion may occur; and 3) this species has previously exhibited a particular vulnerability to fishing pressure in the GOA. The Team recommended an ABC of 600 mt in 2000 to satisfy bycatch needs in other fisheries.

The total recommended 2000 ABC for Atka mackerel in the GOA was 600 mt, unchanged from 1999. The Plan Team recommendations for Atka mackerel ABC and OFL are presented in Table 2. Harvest alternatives for GOA Atka mackerel are presented in Table 19. Additional harvest alternatives could not be evaluated to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Under Tier 6 criteria, the overfishing level is equal to 6,200 mt, the average catch for 1978-1995.

Thornyhead rockfish inhabit the outer continental shelf and slope throughout the northeastern Pacific and Bering Sea at depths of 90 to 1,460 meters. Thornyheads have been managed as a single stock in the GOA since 1980. Beginning in 1998, the gulfwide thornyhead ABC was divided between the Western, Central, and Eastern areas of the GOA. The GOA thornyhead biomass can be described as above target

stock size and stable. Relative to the 1999 SAFE report, new sources of information include: 1) updated estimated catch information and 2) biomass and size composition from the 1999 bottom trawl survey.

Shortspine thornyheads were assessed using the same model as in the preceding year. The 1999 NMFS survey extended into deeper water thereby covering more of the shortspine thornyhead habitat. Exploitable biomass for 2000 is estimated to be 53,200 mt. The authors treated the 1999 estimate the same as the earlier surveys where deeper areas had been surveyed. The Team concurred with the author's recommendation for a year 2000 ABC of 2,360 t (based on Tier 3a; $F_{ABC} = 0.077$). The area specific apportionments give 430, 990, and 940 tons to the Western, Central and Eastern areas, respectively.

The Plan Team's total recommended 2000 ABC for thornyhead rockfish in the GOA was 2,360 mt , up from 1,990 mt in 1999. The SSC and Council concurred with the Plan Team's ABC and area apportionments. The AP and Council recommended that TAC be set at ABC levels.

Two other harvest alternatives were evaluated for comparative purposes to determine if under Amendment 56 to the FMP the status of the stock is overfished (any stock below its MSST) or approaching an overfished condition (any stock that is expected to fall below its MSST in the next two years). Spawning biomass is projected to be 23,084 mt in 2000 under an OFL harvest policy, greater than B35% (15,032 mt). Therefore, GOA thornyhead stocks are not currently overfished. The projected mean spawning biomass in 2002 is 21,223 mt, greater than B35%.Therefore, GOA thornyhead stocks are not approaching an overfished condition.. Using Tier 3a criteria, the overfishing level based on $F_{35\%} = 0.093$ is 2,830 mt.

Other species in the GOA includes sharks, skates, sculpins, squid, and octopus. At present, these species are not targeted in the GOA and are taken incidentally in trawl and longline fisheries. The relative abundance and trend of these stocks are unknown. The Plan Team reviewed the stock assessment for the "other species" assemblage in the Gulf of Alaska presented in Appendices D and E to the final SAFE report. The Plan Team believed that following the removal of the forage species, eulachon and smelts, and the proposed removal of sharks and skates, several alternatives considered by Amendment 63 would result in an "other species" assemblage that could not support full harvest of the 5 % TAC without damaging the sustainability of the remaining species groups. In reviewing the status of the "other species" assemblage in the Gulf of Alaska the Plan Team agreed with the assessment authors that cephalopod biomass is substantially underestimated by the bottom trawl survey. Amendment 63 to the Gulf of Alaska FMP analyzes the separation of sharks and skates from the "other species" assemblage in the GOA. The Plan Team recommended that additional alternatives be analyzed in the proposed Amendment 63 to the Gulf of Alaska FMP. The Plan Team recommended that Amendment 63, in addition to evaluating sharks and skates, also undertake a more comprehensive reconstruction of the "other species" assemblage including the following: 1) Remove the FMP provision that establishes the "other species" TAC at 5% of the sum of all other assessed target species in the GOA and 2) Establish ABCs, OFLs, and TACs for the five major species groups in the "other species" assemblage; sharks, skates, sculpins, octopi, and squid. 3) Include the species group grenadiers, and possibly additional utilized species (prowfish for example), in the FMP and establish ABCs, OFLs, and TACs for these species groups.

In the interim, the Plan Team recommended that NMFS place the "other species" assemblage on bycatch status from January 1, 2000 to December 31, 2000. Under current regulations, this action would still allow 20% retention in other directed groundfish fisheries. The vast majority of "other species" catch in previous years has been taken incidentally in other directed groundfish fisheries. This action, if adopted, would approximate the status quo of the groundfish fisheries as they are presently conducted while precluding the development of large-scale directed fisheries on species groups within the "other species" assemblage. For example, 20% octopus could be retained in the Pacific cod pot gear fishery or 20% skates could be retained in either the hook-and-line or trawl gear fisheries. The Plan Team believed that relatively few fish that would otherwise be utilized would be required by regulation to be discarded. The Council recommended that NMFS place the "other species" assemblage on bycatch status.

Table 2. Groundfish harvest specifications for the Gulf of Alaska management area. For the year 2000 these data include: OFLs, ABCs, TAC specifications, and actual catch (January 1, 2000 through September 2, 2000); Proposed 2001 TAC are identical to final 2000 specifications. 2001 Interim specifications are derived from the proposed specifications using the regulatory formula. All values are in metric tons.

Species	2000 Specifications and Proposed and Interim 2001 Specifications					
	Area	OFL	ABC	2000 TAC and proposed 2001 TAC	Actual Catch	2001 Interim Specifications
Pollock	W (610)		32,340	32,340	14,244	9,702
	C (620)		13,372	13,372	91	4,012
	C (630)		24,501	24,501	16,947	7,350
	Shelikof*		20,987	20,987	26,384	6,296
	WYK (640)		2,340	2,340	1915	585
	subtotal	130,760	93,540	93,540	57,666	27,945
	SEO(6500	8,610	6,460	6,460	4	1,615
	Total	139,370	100,000	100,000	59,585	29,560
Pacific Cod	W		27,500	20,625	21,494	4,125
	C		43,550	34,080	31,480	6,816
	E		5,350	4,010	360	802
	Total	102,000	76,400	58,715	53,334	11,743
Flatfish, Deep Wat	W		280	280	25	70
	C		2,710	2,710	727	678
	WYK		1,240	1,240	115	310
	SEO		1,070	1,070	21	268
	Total	6,980	5,300	5,300	888	1,325
Rex Sole	W		1,230	1,230	834	308
	C		5,660	5,660	2,511	1,415
	WYK		1,540	1,540	4	385
	SEO		1,010	1,010	0	252
	Total	12,300	9,440	9,440	3,349	2,360
Flatfish, Shal Water	W		19,510	4,500	561	1,125
	C		16,400	12,950	5,323	3,237
	WYK		790	790	5	198
	SEO		1,160	1,160	2	290
	Total	45,330	37,860	19,400	5,891	4,850
Flathead Sole	W		8,490	2,000	211	500
	C		15,720	5,000	1,146	1,250
	WYK		1,440	1,440	10	360
	SEO		620	620	0	155
	Total	34,210	26,270	9,060	1,367	2,265
Arrowtooth	W		16,160	5,000	5,903	1,250
	C		97,710	25,000	16,558	6,250
	WYK		23,770	2,500	121	625
	SEO		7,720	2,500	169	625
	Total	173,910	145,360	35,000	22,751	8,750
Sablefish	W Total		1,840	1,840	1,386	92
(Trawl only)	C Total		5,730	5,730	5,568	286
	WYK Total		2,207	2,207	1,812	72

Species	2000 Specifications and Proposed and Interim 2001 Specifications					
	Area	OFL	ABC	2000 TAC and proposed 2001 TAC	Actual Catch	2001 Interim Specifications
Sablefish	Total	16,660	13,330	13,330	11,885	450
Rockfish, Oth Slope	W		20	20	50	5
	C		740	740	352	185
	WYK		250	250	116	62
	SEO		3,890	3,890	35	972
	Total	6,390	4,900	4,900	553	1,225
Rockfish, Northern	W		630	630	748	158
	C		4,490	4,490	2,549	1,122
	E		na	na	na	na
	Total	7,510	5,120	5,120	3,297	1,280
POP	W	1,460	1,240	1,240	1,151	310
	C	10,930	9,240	9,240	8,317	2,310
	WYK		840	840	61610	210
	SEO		1,700	1,700	1	425
	E subtotal	3,000			617	
	Total	15,390	13,020	13,020	10,085	3,255
Shortraker/Rough	W		210	210	133	52
	C		930	930	837	232
	E		590	590	512	148
	Total	2,510	1,730	1,730	1,482	432
Rockfish, Pel Shelf	W		550	550	188	138
	C		4,080	4,080	3,059	1,020
	WYK		580	580	445	145
	SEO		770	770	19	192
	Total	9,040	5,980	5,980	3,711	1,459
Rockfish, DemShelf	SEO	420	340	340	238	85
Atka Mackerel	Gulfwide	6,200	600	600	169	150
Thornyhead	W		430	430	316	108
	C		990	990	515	248
	E		940	940	241	235
	Total	2,820	2,360	2,360	1,072	590
Other Species	Gulfwide		NA	14,215	5,277	3,554
GULF OF ALASKA	TOTAL	581,040	448,010	298,510	184,399	73,369

*Shelikof pollock fishery exists only during A and B Seasons.

3.2 Prohibited Species Stock Status

Prohibited species taken incidentally in groundfish fisheries include: Pacific salmon (chinook, coho, sockeye, chum, and pink salmon), steelhead trout, Pacific halibut, Pacific herring, and Alaska king, Tanner and snow crab. The Council recommends prohibited species catch (PSC) limits to control its bycatch of prohibited species in the groundfish fisheries. During haul sorting, these species or species groups are to be returned to the sea with a minimum of injury except when their retention is required by other applicable law. The status of the different prohibited species are summarized as follows:

Pacific salmon are managed by the State of Alaska. A detailed description of its management, production history, and life history are contained in Section 3.7.2 of the SEIS. Salmon run sizes off Alaska have exhibited wide variations throughout its known history and have generally been strongly correlated to environmental factors.

In 1999, salmon harvests in Alaska are estimated at nearly 208 million fish, making it the second largest commercial catch in the State's history. Following two years (1997 and 1998) of low red salmon returns to Bristol Bay, preseason forecasts of the run strength were greatly exceeded. Returns of over 39 million fish met all escapement goals for Bristol Bay. Commercial harvests in Bristol Bay exceeded 26 million fish which approximates the most recent 20 year average harvest for the Bay. The statewide pink salmon harvest of 140 million fish set a new record high for that species. Southeast Alaska's harvest of nearly 75 million pinks far exceeds the region's previous record of 64 million in 1966. Prince William Sound's harvest of over 40 million pinks is close to the region's record harvest of 44 million achieved in 1990. The overall harvests of nearly 20 million chum salmon also ranks among the three historical largest, however poor returns of chum salmon to the Yukon, Kuskokwim, and Norton Sound region remain a concern. Harvests of coho salmon were down in all areas expect Southeast Alaska. Of particular concern are poor returns to the Kuskokwim area which reached only 10 percent of expectations. The statewide harvest of 350,000 king salmon is down by nearly a third from 1998.

In the Bering Sea, a PSC limit of 48,000 chinook salmon exists between January 1 and April 15, for trawl gear in the Chinook Salmon Savings Area (CHSSA) (Figure 3-9 of the NMFS 1998 SEIS (§ 679.21 (e)(1)(v)). A PSC limit of 42,000 non-chinook salmon between August 15 and October 15 in the Catcher Vessel Operational Area (CVOA) (§ 679.21 (e)(1)(vi)) was also established. Pacific salmon bycatch data are routinely tabulated by species only for chinook salmon. All other salmon species and steelhead trout are merged as "other salmon". The Council adopted and the Secretary approved Amendment 58 to the BSAI FMP which would implement reductions in chinook salmon bycatch. When implemented this action will reduce the prohibited species catch limits of chinook salmon in Chinook Salmon Savings Area (CHSSA) of the BSAI. This action will modify slightly the boundaries of the CHSSA, set new CHSSA closure dates, and reduce the Chinook Salmon bycatch limit in the CHSSA to 37,000 fish in 2001.

In the GOA, while PSC limits have not been established for salmon, in previous years the timing of seasonal openings for pollock in the Central and Western GOA have been adjusted to avoid periods of high chinook and chum salmon bycatch. In 2000, the trawl gear groundfish fisheries of the GOA had a bycatch of 25,593 chinook and 6,595 "other" salmon through September 2, 2000. As of September 2, 2000, neither the chinook or non-chinook PSC limits were exceeded to trigger closure of the CHSSA or

CVOA in the BSAI. Incidental takes of salmon by trawl fisheries through September 2, 2000, in the BSAI are reported in Table 3.

Table 3--Incidental Take of Salmon in BSAI Trawl Fisheries in 2000 (values are in numbers of fish), through September 2, 2000.

BSAI Trawl Fishery Group	Chinook	Other Salmon	Total
Midwater Pollock	4,089	43,770	47,859
Bottom Pollock	0	0	0
Pacific Cod	2,690	129	2,819
Yellowfin Sole	1	141	142
Rock Sole/Other Flatfish	289	58	347
Rockfish	8	0	8
Other	339	71	410
Total	7,415	44,170	51,585

Pacific halibut fisheries are managed by a Treaty between the United States and Canada through recommendations of the International Pacific Halibut Commission (IPHC). Pacific halibut is considered to be one large interrelated stock, but is regulated by subareas through catch quotas. The commercial and recreational fishery has a long tradition dating back to the late 1800s . Further details on the management, production history, and life history of Pacific halibut are described in section 3.7.2 of the SEIS.

The halibut resource is considered to be healthy, with total catch near record levels. The current estimate of exploitable halibut biomass for 1999 is estimated to be 227,366 mt. The exploitable biomass of the Pacific halibut stock apparently peaked at 326,520 mt in 1988 (Sullivan, 1998). The long-term average reproductive biomass for the Pacific halibut resource was estimated at 118,000 mt (Parma, 1998). Long-term average yield was estimated at 26,980 mt, round weight (Parma, 1998). The species is fully utilized. Recent average catches (1994-96) were 33,580 mt for the U.S. and 6,410 mt for Canada, for a combined total of 39,990 mt for the entire Pacific halibut resource. This catch was 48 percent higher than long-term potential yield, which reflects the good condition of the Pacific halibut resource. At its January 1999 annual meeting, the IPHC recommended commercial catch limits totaling 35,314 mt (round weight equivalents) for Alaska in 1999, up from 32,580 mt in 1998. Though September 14, 2000 commercial hook-and line harvests of halibut in Alaska total 19,008 mt (headed and gutted). For 1999 IFQ TAC was 26,486 mt (headed and gutted) and for 2000 it was 24,074 mt (headed and gutted).

Fixed PSC mortality limits have been set for the Alaska groundfish fisheries. Each year the IPHC evaluates the performance of the groundfish fisheries and recommends mortality rates for halibut bycatch in each groundfish fishery. PSC amounts for Pacific halibut mortality are actually deducted from the available fishery yields for the directed Pacific Halibut fishery by the IPHC. Therefore, the allowable commercial catch of halibut is reduced on account of halibut bycatch mortality in the groundfish fisheries. The Council uses the best estimate of halibut bycatch mortality rates each year and the groundfish TAC apportionments to project halibut bycatch mortality allowances for each gear and target fishery group. NMFS monitors halibut bycatch performance throughout the fishing season, including the

extrapolation of data to unobserved vessels, and closes fishing by gear group before bycatch mortality limits are reached.

In the GOA, the PSC mortality limit for halibut is 2,300 mt (allocated as 2,000 mt for the trawl fisheries and 290 mt to the hook & line non-Demersal shelf rockfish (DSR) fisheries and 10 mt to hook-and-line DSR fisheries). Since 1996 pot gear and jig gear targeting groundfish, and hook-and-line gear targeting sablefish have been exempted from PSC caps due to relatively low bycatch by these gear types and since the sablefish and halibut IFQ program requires quota share holders to retain halibut. The 2,000 mt of halibut mortality allocated to trawl gear is further apportioned by season throughout the fishing year and to two target fishery complexes; the shallow water complex (consisting of pollock, pacific cod, shallow-water flatfish, flathead sole, Atka mackerel, and "other species") and the deep-water complex (consisting of sablefish, rockfish, deep-water flatfish, rex sole, and arrowtooth flounder). As of September 8, 2000, neither the 2000 mt mortality limit for the trawl fisheries nor the 290 mt of halibut mortality allocated to the hook-and-line fisheries were not exceeded. The 290 mt PSC cap for other hook-and-line fisheries is further apportioned seasonally throughout the fishing year.

For 2000 the BSAI halibut PSC mortality limit is 4,575 mt (3,400 mt for trawl and 832 mt for non-trawl gear, and 343 mt for the multispecies CDQ program). The trawl mortality component (3,400mt) is sub-allocated to target groundfish fisheries (Pacific cod, yellowfin sole, rock sole, pollock/Atka mackerel/other species, rockfish, and arrowtooth/sablefish/turbot). The 2000 bycatch amounts of Pacific halibut in the BSAI through September 9, 2000, by the trawl groundfish fisheries are given in Table 4. Although the rock sole/flathead sole/other flathead fishery exceeded its bycatch allocations, the overall halibut PSC limit has not been exceeded.

Table 4—Halibut Bycatch in BSAI Trawl Fisheries in 2000 through September 9, 2000.

BSAI Trawl Fishery Group	Bycatch (mt)	Cap (mt)	Percent
Pacific cod	932	1,434	65%
Yellowfin sole	375	886	42%
Rock sole/Flathead sole/Other Flats	804	779	103%
Pollock/Atka mackerel/Other Spp.	121	232	52%
Rockfish	12	69	17%
Turbot/Arrowtooth flounder/Sablefish	80	0	0
Total	2,322	3,400	68%

The bycatch amounts of Pacific halibut through September 2, 2000 by the fixed-gear groundfish fisheries are given in Table 5. None of the target fisheries have exceeded their bycatch allocations.

Table 5—Seasonal Halibut Bycatch in BSAI Fixed Gear Fisheries in 2000 through September 2, 2000.

BSAI Fixed Gear Fishery Groups	Bycatch (mt)	Cap (mt)	Percent
Pacific cod, Hook & Line	174	673	26%
Other species, Hook & Line, Jig	122	159	77%
Total	296	832	36%

Pacific Herring fisheries are managed by the State of Alaska. A detailed description of its management, production history, and life history are contained in Section 3.7.4 of the Final Groundfish SEIS. The fisheries occur in specific areas in the Gulf of Alaska and the Bering Sea when the stocks come inshore to spawn. In the Gulf of Alaska, spawning concentrations occur mainly off southeastern Alaska, in Prince William Sound, and around the Kodiak Island-Cook Inlet area. In the Bering Sea, the centers of abundance are in northern Bristol Bay and Norton Sound. Although most herring are harvested near-shore in the sac-roe season in spring, fall seasons are also designated for food and bait fisheries. From catch records, it is evident that herring biomass fluctuates widely due to influences of strong and weak year-classes. The Bering Sea and Gulf of Alaska stocks are currently at moderate to high levels and in relatively stable condition, with the exception of Prince William Sound and Cook inlet. Stock assessments indicated that the herring biomass in Prince William Sound and Cook Inlet were below the minimum threshold needed to conduct a harvest so these fisheries were closed for 1999 and 2000. Annual statewide harvests of herring through June 21, 2000 were estimated at 29,460 mt for the Sac Roe harvest and 2980 mt for the food and bait fishery through July 31, 2000. Recent statewide harvests have averaged 52,800 mt.

Pacific herring PSC limitations in the groundfish fisheries apply to trawl gear in the Bering Sea. The PSC limit for trawl gear is determined each year during the ABC and TAC setting process, and is set at 1 percent of the estimated EBS herring biomass, which is further apportioned by target fishery (§ 679.21 (e)(1)(iv)). Should the herring PSC limit for a particular groundfish target fishery be reached during the fishing year, the trawl fishery for that species is closed in the Herring Savings Areas (Figure 3-10 of the NMFS 1998 SEIS) (§ 679.21 (e)(7)(v)). In 2000, the bycatch amounts of Pacific herring through September 2, 2000, in the trawl groundfish fisheries are given in Table 6. None of the bycatch allocations have been exceeded.

Table 6—Herring Bycatch in the BSAI Area in 2000 through September 2, 2000.

BSAI Trawl Fishery Group	Bycatch (mt)	Cap (mt)	Percent
Midwater pollock/other/atka mkrl	106	1,616	7%
Pacific cod	1	24	4%
Yellowfin sole	21	169	13%
Rockfish	0	9	0%
Rock sole/Other flatfish	2	24	8%
Turbot/A. flounder/Sablefish	0	11	0%
Total	130	1,853	7%

Alaska king, Tanner and snow crab fisheries are managed by the State of Alaska, with federal oversight established in the FMP for the BSAI crab fisheries. The commercially important crab species are: red king crab (*Paralithodes camtschaticus*), blue king crab (*Paralithodes platypus*), golden or brown king crab (*Lithodes aequispinus*), Tanner crab (*Chionoecetes bairdi*), and snow crab (*Chionoecetes opilio*). A detailed description of their management, production history, and life history are contained in Section 3.7.1 of the SEIS.

Annual trawl surveys for crab stock assessments are conducted by NMFS in the BSAI. A length-based analysis, developed by ADF&G, incorporates survey, commercial catch, and observer data to estimate stock abundance (Zheng 1995; Zheng 1998). Abundance estimates generated by this model are used to

set guideline harvest levels for the crab fisheries. Catches are restricted by guideline harvest levels, seasons, permits, pot limits, and size and sex limits that restrict landings to legal sized male crabs. Fishing seasons are set at times of the year which avoid molting, mating, and softshell periods, both to protect crab resources and to maintain product quality.

Based on analysis of the 1999 NMFS survey results, the latest status of red king crabs are as follows. In Bristol Bay the number of mature male red king crab increased in 1999. Numbers of mature female red king crabs (>90mm carapace width), however, decreased. The effective spawning biomass is estimated at 47 million pounds (21,319 mt). A 10 percent exploitation rate of mature male crabs has, therefore, been established for the 1999 fishery, down from the 15 percent exploitation rate in 1998. The guideline harvest level (GHL) for 1999 was 10.66 million pounds (4,835 mt), which included 0.533 million pounds (242 MT) for the CDQ fisheries. This is a reduction from the 16.4 million pound (7,439 mt) GHL in 1998. The Bristol Bay stock remains depressed compared to past abundance levels. In 1999, 259 vessels participated in the fishery, harvesting 11 million pounds (4,990 mt) in five days. Estimates of red king crabs in the Pribilof Islands area increased significantly from 1998. However, most red king crabs were captured in a single tow, making the reliability of that estimate extremely low. Given significant declines of blue king crab in that area, the high degree of uncertainty surrounding the estimate of red king crab abundance, and the poor fishery performance of recent years, the red and blue king crab fishery in the Pribilof District were closed in 1999. In 2000, the bycatch amounts of red king crab by the various trawl target fisheries in Zone 1 of the BSAI through September 2, 2000 are listed in Table 7. Only the PSC cap for rock sole/other flatfish has been exceeded.

Table 7—Bycatch of Red King Crab in Zone 1 BSAI Fisheries in 2000 through September 2,2000.

BSAI Trawl Fishery Group	Number of Crab	PSC Cap (number of crab)	Percent
Rock sole/Other flatfish	53,390	42,090	127%
Pacific cod	4,378	11,656	38 %
Yellowfin sole	8,240	11,655	71 %
Pollock/Atka mackerel/Other Spp.	0	1,660	0 %
RKC Saving Area	unknown	22,665	unknown
Total	66,008	67,061	74 %

The blue king crab population in the Pribilof District is low and population trends are not easily detectable (NPFMC 1998b). For reason outline above, the Pribilof district was closed in 1999. Survey results for blue king crabs in the St. Matthews Island area indicate dramatic declines of both male and female crabs in all size categories, with mature males at the lowest level since 1986. Results of the 1999 ADF&G near-shore pot survey of St. Matthew Island are also consistent with a dramatic decline in mature female abundance. The current estimate of spawning biomass , 2177 mt, is well below the minimum stock size threshold (MSST) of 4990 mt . This stock is overfished as defined in the federal BSAI King and Tanner Crab Fishery Management Plan. As a result, and coupled with the poor fishery performance in 1998, this area was closed for the 1999 and 2000 season. The Council forwarded Amendment 15, the rebuilding plan, to the Secretary in June 2000 (65 FR 52405, August 29, 2000).

ADF&G and NMFS do not make annual abundance estimates for Bering Sea golden king crabs and commercial harvest is controlled by ADF&G permit (Morrison 1998). Catches have declined from the

early years of the fishery as the virgin stock was exploited and recruitment was unable to sustain the fishery at its initial harvest levels (Morrison 1998). In 1995 the State of Alaska mandated observer coverage for all vessels targeting golden king crab in the Aleutian Islands.

The Tanner crab fishery was closed in 1997 and 1998 due to low abundance. Based on 1999 survey results, the abundance of legal sized *C. bairdi* Tanner crabs continues to be extremely low and showed little change from 1998. In contrast, the abundance of mature female and small crabs of both sexes increased by 80 percent and 64 percent respectively. However, due to the extremely low abundance of legal male crabs, the entire Bering Sea was closed to the harvest of *C. bairdi* Tanner crabs for the 1999 and 2000 fishing seasons. The stock was declared overfished on March 3, 1999, because survey data indicated that spawning biomass was below the MSST established for this stock. At its October 1999 meeting the Council adopted Amendment 11, a rebuilding plan for this stock. This Amendment was approved June 8, 2000 (65 FR 38216, June 20, 2000). The plan consists of a conservative and precautionary harvest strategy, reduced crab bycatch in crab fisheries through the Board of Fisheries, increased habitat protection through consultations, and allowances for future actions to be taken to stay within the projected rebuilding time period. The 2000 bycatch amounts of Tanner crab through September 2, 2000, by the various trawl target fisheries in Zones 1 and 2 of the BSAI are given in Table 8. The trawl target fisheries have not exceed any Tanner crab PSC allocations, except for the Greenland turbot/Arrowtooth/Sablefish target species.

Table 8—Bycatch of Tanner crab in the BSAI by Area in 2000 through September 2, 2000.

BSAI Trawl Fishery Group	Zone 1			Zone 2		
	Crabs #	Cap #	%	Crabs #	Cap #	%
Rock sole/Other Flatfish	192,168	309,326	62%	153,473	504,894	30%
Pacific cod	55,388	154,856	36%	34,559	275,758	13%
Yellowfin sole	29,744	288,750	10%	159,932	1,514,683	11%
Pollock/Atka/ Other .	19	14,818	0%	1,426	25,641	6%
Rockfish	0	0	0%	52	10,024	1%
Turbot/A.Flounder/ Sablefish	0	0	0%	4,077	0	0%
Total	277,319	767,750	36%	353,519	2,331,000	15%

From a low in 1985, snow crab rebounded sharply, producing high catches in 1991 which have since declined. The biomass of both male and female snow crab in the Bering Sea declined significantly from levels observed during the 1998 survey. The 1999 estimate of male crabs 4 inches and larger dropped 63 percent from 1998. In addition, 41 percent of legal males observed were old shell crabs. The number of small crabs observed during the 1999 survey declined 50 percent and female crabs declined 60 percent. Survey results indicate that the Bering Sea snow crab stock is below the MSST of one half the long term average mature biomass as defined in the FMP for BSAI king and Tanner crab. The Magnuson-Stevens Act directs NMFS to develop a rebuilding plan within one year to bring the stock back to the average mature biomass. A rebuilding plan was submitted September 18, 2000. The snow crab stock is expected to further decline and thus remain below the minimum stock size threshold in 2000 given the current size and age distribution even if there were no fishery in 2000. ADF&G has established a GHL of 28.5

million pounds (12,928 mt) for the 2000 fishing season, which includes 2.137 million pounds (970 mt) for the CDQ fishery. This amount is an 85 % reduction from the 1999 GHL of 196 million pounds (89,000 mt). The outlook for a fishery in 2001 appears doubtful at this time. In 1999, *C. opilio* bycatch was apportioned by fishery for the first time. No PSC allocation has been exceeded. Bycatch of snow crab in the BSAI fisheries through September 2, 2000 is reported in Table 9.

Table 9—Bycatch of *C. opilio* Crab by Trawl Fisheries in the BSAI in 2000 through September 2, 2000.

BSAI Trawl Fishery Group	Crab #s	Cap #s	Percent
Rock sole/Other flatfish	114,203	869,934	13%
Pacific cod	14,077	123,529	11%
Yellowfin sole	1,051,335	2,876,579	37%
Pollock/Atka mackerel/Other Spp.	10,966	71,622	15%
Rockfish	0	41,043	0%
Turbot/Arrowtooth flounder/Sablefish	0	41,043	0%
Total	1,190,601	4,023,750	30%

3.3 Forage Species

Forage fish species are abundant fishes that are preyed upon by marine mammals, seabirds and other commercially important groundfish species. Forage fish perform a critical role in the complex ecosystem functions of the Bering Sea and Aleutian Islands management area and the Gulf of Alaska by providing the transfer of energy from the primary or secondary producers to higher trophic levels. Because of their importance to so many ecosystem components, a management assemblage for forage fish was established in 1998 in Amendments 36 and 39 to the BSAI and GOA FMPs, respectively (63 FR 13009, March 17, 1998). Although ABC and TAC amounts are not specified for species in the forage fish category, the amendments provide protection for forage fish by preventing the development of commercial fisheries for these species. Directed fishing for forage fish species is restricted year-round with a maximum retainable bycatch of 2 percent. These Amendments also established mandatory reporting categories for forage fish species that took effect during 1998.

The following forage species are included in the forage fish category established in 1998: Osmeridae (which includes capelin and eulachon), Myctophidae, Bathylagidae, Ammodytidae, Trichodontidae, Pholidae, Stichaeidae, Gonostomatidae, and the Order Euphausiacea. For further detailed discussion of forage fish species, see section 3.3.3.13 of the SEIS.(NMFS 1998a)

3.4 Status of Marine Habitat

Inclusively all the marine waters and benthic substrates in the management areas comprise the habitat of the target species. Additionally the adjacent marine waters outside the EEZ, adjacent State waters inside the EEZ, shoreline, freshwater inflows, and atmosphere above the waters, constitutes habitat for prey species, other life stages, and species that move in and out of, or interact with, the target species in the management areas. Distinctive aspects of the habitat include water depth, substrate composition, substrate infauna, light penetration, water chemistry (salinity, temperature, nutrients, sediment load, color, etc.), currents, tidal action, plankton and zooplankton production, associated species, natural disturbance regimes, and the seasonal variability of each aspect. Substrate types include bedrock,

cobbles, sand, shale, mud, silt, and various combinations of organic material and invertebrates which may be termed biological substrate. Biological substrates present in these management areas include corals, tunicates, mussel beds, tube worms. Biological substrate has the aspect of ecological state (from pioneer to climax) in addition to the organic and inorganic components. Ecological state is heavily dependant on natural and anthropogenic disturbance regimes. The fishery management plans (NPFMC 1995, 1994) contain some descriptions of habitat preferences of the target species and projects are underway to systematically present biological requirements for each life history stage that are known (NMFS-Council in progress). Much remains to be learned about habitat requirements for most of the target species.

Appendix E of the EA for the Interim and Final Total Allowable Catch Specifications for the Year 2000 Alaska Groundfish Fisheries (2000 Groundfish EA, NMFS 1999d) contains an assessment of impacts to essential fish habitat (EFH) as required by amendments to the Magnuson-Stevens Fishery Conservation and Management Act of 1996. This assessment addresses the effects of the authorization of the proposed and final specifications on EFH pursuant to the requirements of 50 CFR 600.920(h) and in coordination with the review procedures required under the National Environmental Policy Act.

The assessment of the impacts on EFH (Appendix E of 2000 Groundfish EA) concludes that fishing actions may have substantial adverse impacts on fish habitat essential to the spawning, breeding, feeding and growth to maturity of managed and un-managed species. In formal response to the assessment dated December 17, 1999, the NMFS Habitat Conservation Division, Alaska Region (HCD) concurred with the assessment that fishing may have adverse impacts on EFH for managed species but concluded that any adverse effects have been minimized to the extent practicable (NMFS 1999a). For similar reasons, proposed 2001 actions authorized by the year 2001 harvest specifications have been mitigated, and are continually being mitigated, as a result of protective measures taken by the Council under the Magnuson-Stevens Act. The NPFMC has already set aside areas of essential habitat or have curtailed fishing in a season or location as a result of previous, and ongoing, NPFMC actions, or has taken measures to protect critical habitat for the Steller sea lion that also benefits EFH for managed species in those areas. NMFS will do EFH consultation for the 2001 specifications prior to finalization of this EA.

For further information about the habitat and ongoing habitat studies in the fisheries management area, see Section 3.1 and 3.6 of the SEIS (NMFS 1998a), and Appendix D (Ecosystems Considerations for 2000) of the 2000 Groundfish EA (NMFS 1999d).

3.5 Status of Marine Mammal Pinniped Species

The SEIS (NMFS 1998a) contains a detailed analysis on the ecology, population trends, and the impacts of an array of alternative TAC specifications on marine mammals. For further information see Section 3.4 and 4.3.2 of the SEIS (NMFS 1998a), and the section on marine mammals in Appendix D of the 2000 Groundfish EA (NMFS 1999d). New information on population status and current management concerns for selected marine mammals is summarized below.

Steller Sea Lions

Recent reviews of Steller sea lion population status in Alaska are contained in the Section 7 Biological Opinions on ESA listed species (NMFS 1998b, 1998c, and 1999b.) Recent survey data used to monitor population status are summarized below:

NMFS and ADF&G conducted surveys of Steller sea lion pups and non-pups during June and July of 1998 from southeast Alaska to the western Aleutian Islands. Numbers of sea lions counted during a "winter" or "non-breeding season" survey conducted in March 1999 are still being analyzed. In general, numbers of non-pups in the western stock (west of 144°W) continued to decline in 2000 (Table 10). In the Kenai to Kiska area, non-pup numbers at trend sites declined by 18.6 percent from 1994 to 2000 (18,713 to 15,228) and 14.9 percent (17,900 to 15,228) from 1996 to 2000. This compares to a Kenai to Kiska decline of 4.6 percent from 1994 to 1996. The Aleutian Islands as a whole declined by 16 percent from 1994 to 2000, as compared to a marginal increase (1.1 percent) from 1994 to 1996. Combined, the western and central Gulf of Alaska declined 22 percent from 1996 to 2000, and 4.0 percent from 1997 to 1998. The central Aleutian Islands (Islands of Four Mountains to Kiska) was the one area that did show a marginal increase (4.2 percent) from 1996 to 1998.

Although the numbers for southeast Alaska show a decline, only 18 sites were surveyed in 1998, and other indications, particularly pup count results (below) suggest that the population in this area is stable. Survey coverage in the eastern Gulf of Alaska was too incomplete to provide a reliable trend for non-pups.

NMFS and ADF&G conducted counts of Steller sea lion pups at all rookeries in Alaska, from the Forrester Island Complex in southeast Alaska to Attu Island in the western Aleutian Islands during 19 June to 5 July 1998. NMFS and ADF&G conducted counts of Steller Sea Lion pups and non pups in June and July 2000 from southeast Alaska to the western Aleutian Islands. From June 11-20, 2000, NMFS surveyed Cape St. Elias to Attu Island counting all adults and juvenile sea lions one or more years old (non-pups). ADF&G 2000 survey data are not available at the time of this EA. Since 1994, non-pup counts from trend sites from the central Gulf of Alaska through the central Aleutian Islands has decreased by 18.6% (from 18,713 non-pups to 15,228)(NMFS 2000c).

Table 10--Counts of Non-pup Steller Sea Lions at Trend Sites (Rookeries and Haulouts) During Aerial Surveys in Alaska, 1994 to 2000.

	Non-pup counts at Trend Sites				Percent change	
Region	1994	1996	1998	2000	1994-00	1996-00
Western Aleutian Islands	2,037	2,190	1,913	1,071	-47.4	-51.1
Central Aleutian Islands	5,790	5,528	5,761	5,427	-6.3	-1.8
Eastern Aleutian Islands	4,421	4,716	3,847	3,842	-13.1	-18.5
Western Gulf of Alaska	3,982	3,741	3,361	2,842	-28.6	-24.0
Central Gulf of Alaska	4,520	3,915	3,346	3,117	-31.0	-20.4
Kenai to Kiska subtotal (Central Gulf of Alaska through central Aleutian Islands)	18,713	17,900	16,315	15,228	-18.6	- 14.9

Since 1994, the last range-wide pup counts, pup numbers decreased by 10.8 percent (from 14,198 pups to 12,670) at all rookeries (Table 11). For the western stock (reflected by the counts from Kenai to Kiska) the decline was 19.1 percent over 4 years. In general, pup numbers were up slightly in parts of the central Aleutian Islands (8 rookeries from Seguam Island to the Delarof Islands), but down elsewhere. Rookeries in the western Aleutian Islands (particularly those in the Near Islands: 3 rookeries at Attu and Agattu Islands) were counted completely for the first time in 1997. Pup numbers at these three rookeries declined by 18.0 percent in one year (979 pups to 803 pups). The 2 rookeries in the eastern Gulf of

Alaska declined 23.7 percent from 1994 to 1998, but increased 13 percent from 1997 (610 pups to 689). Pup numbers in southeast Alaska have increased 12.3 percent from 1994, but showed little change from 1997 to 1998.

NMFS counted sea lion pups at four rookeries in the eastern Aleutian Islands and five rookeries in the Gulf of Alaska during June 20 through July 6, 2000. No appreciable change in pup counts were seen over the past two years (NMFS 2000c).

Table 11--Counts of Steller Sea Lion Pups in Alaska, 1994 to 1998.

Region	Number of rookeries	1994	1997	1998	Percent change 94-98	97-98
Western Aleutian Islands	4		979	803		-18.0
Central Aleutian Islands	16	3,162		2,862	-9.5	
Eastern Aleutian Islands	6	1,870		1,516	-18.9	
Western Gulf of Alaska	4	1,662		1,493	-10.2	
Central Gulf of Alaska	5	2,831		1,876	-33.7	
Eastern Gulf of Alaska	2	903	610	689	-23.7	13
Western Stock subtotal (Kiska to Seal Rocks)	33	10,428		8,436	-19.1	
Southeast Alaska	3	3,770	4,160	4,234	12.3	1.8

Northern fur seals

Northern fur seals were listed as depleted in 1988 under the Marine Mammal Protection Act. Much of the research effort for fur seals takes place on the Pribilof Islands (St. Paul and St. George). The National Marine Mammal Laboratory (NMML) conducts counts of adult males (bulls) annually, and counts of pups biennially. Analysis of the 1998 bull and pup counts indicate a continued slight decrease in fur seal numbers on both of the Pribilof Islands. From 1997 to 1998 the total number of adult males on the Pribilof Islands decreased by 1.6 percent. Because of the high variability in these counts, however, several more years of data are needed to determine if a trend exists. The estimate of the total number of pups born on St. Paul Island in 1998 was 179,149 (SE = 6,193); the standard error accounts for variance in the estimation of both live and dead pups. The total estimated number of pups born in 1998 was not significantly different ($P = 0.82$) from 1996, but was significantly less than the estimate in 1994 ($P < 0.01$). The total number of pups born on St. George Island and the approximate 95 percent confidence interval was 21,547 - 22,633. The 1998 estimate of pups born on St. George Island is significantly less ($P < 0.01$) than the number of pups born in 1996, but the estimate is not significantly different ($P = 0.22$) from the estimate of the number of pups born in 1994..

Harbor seals

The NMML conducted aerial assessment surveys for harbor seals in the southern portion of southeast Alaska, from Frederick Sound to the US/Canadian border in 1998. The northern portion of southeast Alaska was surveyed in 1997. Two observers worked out of Petersburg and five observers used Ketchikan as their base of operations. From 18 to 28 August, the entire coastline was surveyed from small, single-engine aircraft equipped with floats, at an altitude of 200-250 m (700-800 ft.). Observers estimated the number of seals hauled out and took photographs of all seal haulouts. Results from the two surveys will be combined to produce an overall estimate for southeast Alaska.

When seals are censussed from the air, an unknown number of seals are in the water and not present at the haulout sites. A companion project to the assessment surveys is development of a correction factor for each haulout type (rocky, sandy, and ice) to account for seals not present at the time of the census surveys. This is accomplished by capturing 20-40 seals and attaching a small VHF radio transmitter to the left rear flipper. The proportion of radio-tagged seals hauled during subsequent surveys should be representative of all seals at the haulout. The resulting correction factor is then applied to the population estimates derived in the assessment analysis. The estimates are then adjusted upwards to account for those seals not present during the aerial census surveys.

Correction factors have been developed previously for seals hauling out on rocky and sandy substrates. Little is known about the seals hauling out on glacial ice because no one has been able to successfully capture one. The NMML developed new capture techniques using a variety of net materials and types and net deployment methods. In early August, the NMML successfully captured and radio-tagged 19 seals at Aialik and Peterson Glaciers in the Kenai Fiords National Park near Seward, Alaska. Their movements were tracked from aircraft (22 August to 2 September) and remote data collection computers (19 August to about 8 October). Results from the assessment and correction factor surveys are currently being analyzed and will be used to estimate the number of harbor seals in Alaska and determine key components used in the NMFS annual stock assessment report.

Beluga whales

The NMML flew aerial surveys of the isolated stock of beluga whales in Cook Inlet, Alaska, during June and July of 1993 through 1998. This included nearly 100% of the coastal areas each year, and with the addition of offshore transects, systematic searches encompassed 13 to 29 percent of the entire inlet. Beluga whales were concentrated in a few dense groups in shallow areas near river mouths in the northern portion of upper Cook Inlet. Very few belugas occurred elsewhere. Over the past three decades, there have been decreases in sightings of beluga whales both in offshore areas and in lower Cook Inlet. Estimated abundance of beluga's has declined 50 % from 1994 to 1998 leading to the stock being designated as depleted under the Marine Mammal Protection Act. Since 1995, there have been no sightings in our surveys south of the upper inlet. Because their diet consists mainly of salmonids and small schooling fishes, there is little groundfish fisheries interaction for this species.

Harbor porpoise and Dall's porpoise

Researchers from the NMML conducted line transect aerial surveys for harbor porpoise and Dall's porpoise from 27 May to 28 July 1998 in the Gulf of Alaska (offshore waters from Cape Suckling to Unimak Pass), Prince William Sound, and Shelikof Strait. The survey aircraft was a Twin Otter flown at an altitude of 500 ft and an airspeed of 100 knots. Sawtooth lines covered the offshore waters from Cape Suckling to Unimak Pass (offshore of Kodiak Island) from about 15 nm seaward to the 1,000 fathom line. A series of zigzag lines covered Shelikof Strait, between the Alaska Peninsula and Kodiak Island. Larger inlets and bays were also included in the survey. The survey in Prince William Sound consisted of two lines: one covering the central waters and one along the coast with extensions into selected inlets. Two primary observers surveyed from bubble windows on each side of the aircraft. A third observer, viewing directly beneath the aircraft from a belly window, recorded porpoises missed on the trackline by the primary observers.

Poor weather restricted the completion of the entire planned survey. Survey lines were completed in Prince William Sound and an adequate number of survey miles were completed offshore from Cape

Suckling west along the Kenai Peninsula, offshore of Kodiak Island, west to Sutwik Island (Alaska Peninsula), and in Shelikof Strait. A total of 5,722 nm were flown, with sightings of 83 harbor porpoise, 69 Dall's porpoise, 13 killer whales, 47 humpback whales, 24 fin whales, 1 Cuvier's beaked whale, 1 northern right whale, 25 harbor seals, 20 Steller sea lions, and 1 northern fur seal. These data are used to estimate annual abundance of harbor porpoise and Dall's porpoise, one of the key pieces of information needed to manage marine mammal-fishery interactions. A report should be available in 2001.

3.6 Seabird Species Population Status

Seabirds spend the majority of their life at sea rather than on land. Alaska's extensive estuaries and offshore waters provide breeding, feeding, and migrating habitat for approximately 100 million seabirds. Thirty-four species breed in the Bering Sea/Aleutian Islands (BSAI) and Gulf of Alaska (GOA) regions and number 36 million and 12 million individuals, respectively. Another 6 species breed at other locations in Alaska. In addition, up to 50 million shearwaters and 3 albatross species feed in Alaskan waters during the summer months but breed farther south. The current world population of short-tailed albatross is approximately 1200 individuals. Detailed seabird information on species population status, life history, ecology, and bycatch is contained in section 3.5 of the SEIS (NMFS 1998a).

3.7 Impacts on Endangered or Threatened Species

The Endangered Species Act of 1973 as amended (16 U.S.C. 1531 *et seq*; ESA), provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The program is administered jointly by the NMFS for most marine mammal species, marine and anadromous fish species, and marine plants species, and by the USFWS for bird species, and terrestrial and freshwater wildlife and plant species.

The designation of an ESA listed species is based on the biological health of that species. The status determination is either threatened or endangered. Threatened species are those likely to become endangered in the foreseeable future [16 U.S.C. § 1532(20)]. Endangered species are those in danger of becoming extinct throughout all or a significant portion of their range [16 U.S.C. § 1532(20)]. Species can be listed as endangered without first being listed as threatened. The Secretary of Commerce, acting through NMFS, is authorized to list marine fish, plants, and mammals (except for walrus and sea otter) and anadromous fish species. The Secretary of the Interior, acting through the USFWS, is authorized to list walrus and sea otter, seabirds, terrestrial plants and wildlife, and freshwater fish and plant species.

In addition to listing species under the ESA, the critical habitat of a newly listed species is designated concurrent with its listing to the "maximum extent prudent and determinable" [16 U.S.C. § 1533(b)(1)(A)]. The ESA defines critical habitat as those specific areas that are essential to the conservation of a listed species and that may be in need of special consideration. Federal agencies are prohibited from undertaking actions that destroy or adversely modify designated critical habitat. Some species, primarily the cetaceans, which were listed in 1969 under the Endangered Species Conservation Act and carried forward as endangered under the ESA, have not received critical habitat designations.

Federal agencies have an affirmative mandate to conserve listed species (Rohlf 1989). One assurance of this is Federal actions, activities or authorizations (hereafter referred to as Federal action) must be in compliance with the provisions of the ESA. Section 7 of the Act provides a mechanism for consultation

by the Federal action agency with the appropriate expert agency (NMFS or USFWS). Informal consultations, resulting in letters of concurrence, are conducted for Federal actions that have no adverse affects on the listed species. Formal consultations, resulting in biological opinions, are conducted for Federal actions that may have an adverse affect on the listed species. Through the biological opinion, a determination is made as to whether the proposed action poses "jeopardy" or "no jeopardy" of extinction to the listed species. If the determination is that the action proposed (or ongoing) will cause jeopardy, reasonable and prudent alternatives may be suggested which, if implemented, would modify the action to no longer pose the jeopardy of extinction to the listed species. These reasonable and prudent alternatives must be incorporated into the Federal action if it is to proceed. A biological opinion with the conclusion of no jeopardy may contain a series of management measures intended to further reduce the negative impacts to the listed species. These management alternatives are advisory to the action agency [50 CFR. 402.24(j)]. If a likelihood exists of any taking[1] occurring during promulgation of the action, an incidental take statement may be appended to a biological opinion to provide for the amount of take that is expected to occur from normal promulgation of the action. An incidental take statement is not the equivalent of a permit to take.

Twenty-three species occurring in the GOA and/or BSAI groundfish management areas are currently listed as endangered or threatened under the ESA (Table 12). The group includes great whales, pinnipeds, Pacific salmon and steelhead, and seabirds.

[1] The term "take" under the ESA means "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct" [16 U.S.C. § 1538(a)(1)(B)].

Table 12. ESA Listed Species. The following species are currently listed as endangered or threatened under the ESA and occur in the GOA and/or BSAI groundfish management areas.

Common Name	Scientific Name	ESA Status
Northern Right Whale	*Balaena glacialis*	Endangered
Bowhead Whale [1]	*Balaena mysticetus*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Blue Whale	*Balaenoptera musculus*	Endangered
Fin Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sperm Whale	*Physeter macrocephalus*	Endangered
Snake River Sockeye Salmon	*Onchorynchus nerka*	Endangered
Short-tailed Albatross	*Phoebaotria albatrus*	Endangered
Steller Sea Lion	*Eumetopias jubatus*	Endangered and Threatened [2]
Snake River Fall Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Snake River Spring/Summer Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Puget Sound Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Lower Columbia River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Willamette River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Columbia River Spring Chinook Salmon	*Onchorynchus tshawytscha*	Endangered
Upper Columbia River Steelhead	*Onchorynchus mykiss*	Endangered
Snake River Basin Steelhead	*Onchorynchus mykiss*	Threatened
Lower Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Upper Willamette River Steelhead	*Onchorynchus mykiss*	Threatened
Middle Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Spectacled Eider	*Somateria fishcheri*	Threatened
Steller Eider	*Polysticta stelleri*	Threatened

[1] The bowhead whale is present in the Bering Sea area only.
[2] Steller sea lion are listed as endangered west of Cape Suckling and threatened east of Cape Suckling.

Of the species listed under the ESA and present in the action area (Table 12), some may be negatively affected by groundfish fishing. NMFS is the expert agency for ESA listed marine mammals and anadromous fish species. The USFWS is the expert agency for ESA listed seabirds. The fisheries as a whole, including the year 2001 proposed and interim TAC specifications, must be in compliance with the ESA.

Section 7 consultations with respect to actions of the federal groundfish fisheries have been done for all the species listed in Table 12, either individually or in groups. See section 3.8 of the SEIS (NMFS 1998a), for summaries of section 7 consultations done prior to December 1998. Consultations have been re-initiated with respect to the 2001 proposed and interim TAC specifications for marine mammal listed species, and a biological opinion is expected in December 2000. In addition, an FMP-level biological opinion is being prepared pursuant to Section 7 of the ESA on all NMFS listed species present in the fishery management areas for the entire groundfish fisheries program. The opinion is expected to be completed in the fall 2000. Consultations prepared subsequent to the SEIS (NMFS 1998a) are summarized below.

Steller sea lions and other ESA listed marine mammals.
A Biological Opinion for the action authorizing the pollock and Atka mackerel fisheries for the years

1999 through 2002 was issued December 3, 1998, by the Office of Protected Resources of NMFS (NMFS 1998b.). The scope of the consultation was the Atka mackerel fishery of the BSAI, and the pollock fisheries in the BSAI and the GOA. The conclusions were: 1) the Atka mackerel fishery was not likely to jeopardize the continued existence of the western population of Steller sea lions or adversely modify its critical habitat, and 2) the GOA and BSAI pollock fisheries, as they had been proposed in 1998, were likely to cause jeopardy to Steller sea lions and adverse modification of designated Steller sea lion critical habitat. This determination was based primarily on the premise that the two pollock fisheries would compete with Steller sea lions by removing prey items from important foraging areas at crucial times of the year.

To avoid the likelihood of causing jeopardy and adverse modification, NMFS developed a framework of reasonable and prudent alternatives (RPAs) based on three objectives: 1) temporally disperse fishing effort, 2) spatially disperse fishing effort, and 3) provide sufficient protection from fisheries competition in waters adjacent to rookeries and important haulouts. The RPAs contained guidelines for management measures which would achieve these principles. The Council initially provided recommendations for management measures at its December 1998 meeting. NMFS evaluated those recommendations and incorporated them into the RPAs on December 16, 1998. The RPAs were implemented by emergency interim rule for the first half of 1999, published on January 22, 1999 (64 FR 3437), amended on February 17, 1999 (64 FR 7814) and February 25, 1999 (64 FR 9375). The Council met again in February, April, and June 1999, to consider recommendations for extending the emergency rule for the second half of 1999, and at its June meeting, voted to extend the emergency rule (with modifications to the Bering Sea B and C seasons) until December 31, 1999 (July 21, 1999, 64 FR 39087; technical amendment August 10, 1999, 64 FR 43297).

The December 3, 1998, Biological Opinion was challenged in the United States District Court for the Western District of Washington by Greenpeace, the American Oceans Campaign, and the Sierra Club. On July 9, 1999, (amended July 13, 1999), the Court upheld the no-jeopardy conclusion for the Atka mackerel fishery and the jeopardy conclusion for the pollock fisheries. However, the Court also found that "the Reasonable and Prudent Alternatives . . . were arbitrary and capricious . . . because they were not justified under the prevailing legal standards and because the record does not support a finding that they were reasonably likely to avoid jeopardy." On August 6, 1999, the Court remanded the Biological Opinion back to NMFS for further analysis and explanation. To comply with the Court's Order, NMFS conducted additional analyses and developed Revised Final Reasonable and Prudent Alternatives (RFRPAs) (October 1999).

A second Biological Opinion on the action of authorization of the BSAI and GOA groundfish fisheries (other than pollock and Atka mackerel) year 1999 TAC specifications was issued December 24, 1998, by the Office of Protected Resources of NMFS (NMFS 1998c). That Biological Opinion examined the year 1999 proposed TAC specifications for the BSAI and GOA and the effect of that action on ESA listed marine mammal species and critical habitat. The conclusion was that mitigation measures recommended by the Council and modified by NMFS, for the BSAI and GOA pollock fisheries and the BSAI Atka mackerel fisheries, were sufficient to avoid jeopardizing the continued existence of the western population of Steller sea lions and avoid adverse modification to its critical habitat.

The December 24, 1998, biological opinion (NMFS 1998c) was also the subject of a Court challenge leading to a reinitiated consultation including preparation of a programmatic consultation to be

completed in conjunction with the programmatic SEIS, as well as consultation on the year 2000 TAC specifications. The consultation on the year 2000 TAC specifications was issued December 23, 1999, and contained a determination of no jeopardy and no adverse modification to critical habitat for Steller sea lion. The Biological Opinion examined three actions: 1) authorization of the BSAI groundfish fisheries based on the year 2000 interim and final TAC specifications recommended by the Council, 2) authorization of the GOA groundfish fisheries based on year 2000 interim and final TAC specifications recommended by the Council, and 3) authorization of BSAI and GOA groundfish fisheries based on implementation of the American Fisheries Act of 1998. The opinion considered the potential effect of these three actions on protected species that occur in the corresponding action areas. The protected species include northern right whales, blue whales, fin whales, sei whales, humpback whales, sperm whales, the eastern population of Steller sea lions, and the western population of Steller sea lions. The opinion concluded that these three actions were not likely to jeopardize the continued existence of protected species in the action areas, nor destroy or adversely modify designated critical habitat for the Steller sea lion (the only relevant protected species for which critical habitat has been designated in the action areas). The conclusions were based, in part, on implementation of conservation measures originating from the Revised Final Reasonable and Prudent Alternatives (RFRPAs) issued by NMFS on October 15, 1999, for the pollock fisheries, and conservation measures for the Atka mackerel fishery recommended by the Council in June of 1998 and being implemented over the period from 1999 to 2002. The opinion also identified important areas for further analysis of potential conflicts between the western population of Steller sea lions and the Pacific cod fisheries in the BSAI and GOA regions, and required that those areas be addressed again in the FMP-level consultation to be conducted by NMFS in the year 2000, or in a separate consultation on the cod fisheries in the year 2000. The opinion also included conservation recommendations urging more extensive survey effort to understand the distribution of fished stocks throughout the year, rather than in summer months only, and greater effort to determine the relative importance of various target species to the diet of Steller sea lions. The opinion was accompanied by an Incidental Take Statement setting limits on the number of individuals of each protected species that could be taken before consultation would be re-initiated.

Effective through December 31, 2000, NMFS issued an emergency interim rule of RFRPAs necessary to prevent the pollock fishery from jeopardizing the Steller sea lion and adversely modifying its critical habitat (65 FR 3892 January 25, 2000 and 65 FR 36795 June 12, 2000). This rule implemented management measures to disperse fishing effort over time and space and to limit competition between the fisheries and Steller sea lion for prey near rookeries and haul outs. A final rule is expected to be effective prior to the start of the 2001 pollock fishery.

On December 23, 1999, the NMFS Office of Protected Resources issued a biological opinion on the 2000 groundfish TAC specifications as authorized under the FMPs for the BSAI and GOA (NMFS 1999b). After reviewing the status of the eastern and western population of Steller sea lions, the critical habitat designated for Steller sea lions, and the environmental baseline for the action area (including the extensive changes being implemented under the RFRPAs), the NMFS determined that the action as proposed was not likely to (1) jeopardize the continued existence of the western population of Steller sea lions, or (2) destroy or adversely modify designated Steller sea lion critical habitat. However, the biological opinion did point out the potential for competition between the Pacific cod fisheries and the western population of Steller sea lions, and under the conservation recommendations section of the opinion, listed a number of studies needed to further investigate the potential for competitive interactions.

ESA Listed Pacific Salmon

When the first Section 7 consultations for ESA listed Pacific salmon taken by the groundfish fisheries were done in 1994 and 1995 only three ESUs of Pacific salmon were listed that ranged into the fishery management areas (NMFS 1994, 1995). Additional ESUs of Pacific salmon and steelhead were listed under the ESA in 1998 and 1999. Only the Snake River fall chinook salmon has designated critical habitat and none of that designated habitat is marine habitat. Under Section 7 regulations, consultation should be reinitiated in the event of additional listings. Using the year 2000 proposed TAC specifications, NMFS reinitiated consultations for ESA listed Pacific salmon for all twelve ESUs of Pacific salmon that are thought to range into Alaskan waters. The consultation for the Pacific salmon species was issued December 22, 1999, and contained a determination of not likely to jeopardize their continued existence. No critical habitat has been designated for these species within the action area, therefore, none will be affected by the proposed fisheries. The biological opinion reviewed the status of Snake river fall chinook, Snake River spring/summer chinook, Puget Sound chinook, Upper Columbia river spring chinook, Upper Willamette River chinook, Lower Columbia river chinook, Upper Columbia river steelhead, Upper Willamette River steelhead, Middle Columbia river steelhead, Lower Columbia river steelhead, and Snake river Basin steelhead, the environmental baseline for the action area, the effects of the proposed fishery and the cumulative effects. The opinion was accompanied by an Incidental Take Statement that states the catch of listed fish will be limited specifically by the measures proposed to limit the total bycatch of chinook salmon. Bycatch should be minimized to the extent possible and in any case should not exceed 55,00 chinook per year in the BSAI fisheries or 40,000 chinook salmon per year in the GOA fisheries.

Project-level consultation for ESA listed Pacific salmon is not being reinitiated for the year 2001 TAC specifications because none of the triggers for reinitiation are thought to have occurred. Those four triggers include: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion; (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, the action agency must immediately reinitiate formal consultation. As mentioned previously, the FMP-level Section 7 consultation will evaluate the ESA listed Pacific salmon.

Short-tailed Albatross

The only new information on seabirds since publication of the SEIS (NMFS 1998a) concerns the taking of short-tailed albatross and subsequent Section 7 consultations on that species. It is summarized below:

On 22 October 1998, NMFS reported the incidental take of 2 endangered short-tailed albatrosses in the hook-and-line groundfish fishery of the BSAI. The first bird was taken on 21 September 1998, at 57 30'N, 173 57'W. The bird had identifying leg bands from its natal breeding colony in Japan. It was 8 years old. In a separate incident, one short-tailed albatross was observed taken on 28 September 1998, at 58 27'N, 175 16'W, but the specimen was not retained for further analysis. Identification of the bird was confirmed by USFWS seabird experts. The confirmation was based upon the observer's description of key characteristics that matched that of a subadult short-tailed albatross to the exclusion of all other species. A second albatross was also taken on 28 September 1998, but the species could not be

confirmed (3 species of albatross occur in the North Pacific). Both vessels were using seabird avoidance measures when the birds were hooked.

The USFWS listed the short-tailed albatross as an endangered species under the ESA throughout its United States range (65 FR 46644, July 31, 2000). Under terms of the 1999 biological opinion, incidental take statement, a take of up to 4 birds is allowed during the 2-year period of 1999 and 2000 for the BSAI and GOA hook-and-line groundfish fisheries (USFWS 1999). If the anticipated level of incidental take is exceeded, NMFS must reinitiate formal consultation with the USFWS to review the need for possible modification of the reasonable and prudent measures established to minimize the impacts of the incidental take.

NMFS Regional Office, NMFS Groundfish Observer Program, and the USFWS Offices of Ecological Services and Migratory Bird Management are actively coordinating efforts and communicating with each other in response to the 1998 take incidents and are complying to the fullest extent with ESA requirements to protect this species. Regulations at 50 CFR Parts 679.24(e) and 679.42(b)(2) contain specifics regarding seabird avoidance measures. In February 1999, NMFS presented an analysis on seabird mitigation measures to the Council that investigated possible revisions to the currently required seabird avoidance methods that could be employed by the long-line fleet to further reduce the take of seabirds.

The Council took final action at its April 1999 meeting to revise the existing requirements for seabird avoidance measures. The Council's preferred alternative would: 1) Explicitly specify that weights must be added to the groundline. (Currently, the requirement is that baited hooks must sink as soon as they enter the water. It is assumed that fishermen are weighting the groundlines to achieve this performance standard.); 2) The offal discharge regulation would be amended by requiring that prior to any offal discharge, embedded hooks must be removed; 3) Streamer lines, towed buoy bags and float devices could both qualify as bird scaring lines. (Specific instructions are provided for proper placement and deployment of bird scaring lines.); 4) Towed boards and sticks would no longer qualify as seabird avoidance measures; 5) The use of bird scaring lines would be required in conjunction to using a lining tube; and 6) Night-setting would continue to be an option and would not require the concurrent use of a bird scaring line.

These revised seabird avoidance measures are expected to be effective in 2001. The avoidance measures affect the method of harvest in the hook-and-line fisheries, but are not intended to affect the amount of harvest.

A Biological Opinion on the BSAI hook-and-line groundfish fishery and the BSAI trawl groundfish fishery for the ESA listed short-tailed albatross was issued March 19, 1999, by the USFWS for the years 1999 through 2000 (USFWS 1999). The conclusion continued a no jeopardy determination and the incidental take statement expressing the requirement to immediately reinitiate consultations if incidental takes exceed four short-tailed albatross over two years' time. Consultations on short-tailed albatross was not re-initiated for the year 2000 TAC specifications because the March 19, 1999, biological opinion covered through the end of calendar year 2000. In September 2000, NMFS requested re-initiation of consultation for all listed species under the jurisdiction of the USFWS, including the short-tailed albatross, for the BSAI and GOA FMPs and 2001 TAC specifications.

3.8 Socioeconomic Summary

The most recent description of the groundfish fishery is contained in the *Economic Status of the Groundfish Fisheries Off Alaska, 1998* (Hiatt and Terry. 1999). Selections from the narrative in this report may be found in the IRFA in Chapter 4.

The report, incorporated herein by reference, presents the economic status of groundfish fisheries off Alaska in terms of economic activity and outputs using estimates of catch, by-catch, ex-vessel prices and value, the size and level of activity of the groundfish fleet, the weight and value of processed products, wholesale prices, exports, and cold storage holdings. The catch, ex-vessel, ex-processor, and fleet size and activity data are for the fishing industry activities that are reflected in Weekly Production Reports, Observer Reports, fish tickets from processors who file Weekly Production Reports, and the annual survey of groundfish processors. All catch data for 1991 through 1998 are based on the blend estimates of total catch which are used by NMFS to monitor groundfish and PSC quotas during each fishing year. External factors included, which in part, determine the economic status of the fisheries are foreign exchange rates, the prices and price indexes of products that compete with products from these fisheries, and fishery imports.

3.8.1 Summary of 1999 Ex-vessel Values

Preliminary tables from the *Economic Status of the Groundfish Fisheries Off Alaska, 1999* are available and the following narrative is based on these. These tables provide data through 1999.

The commercial groundfish catch off Alaska totaled 1.66 million mt in 1999, 11.5 percent below 1998. The decrease in catch was accompanied by a 31 percent increase in the average ex-vessel price of groundfish and the estimated ex-vessel value of the catch, excluding the value added by at-sea processing, rose from $415.9 million in 1998 to $483.4 million in 1999. (Preliminary Tables 1 and 19 for the 2001 Economic SAFE report).

During the ten years from 1990 to 1999 the total catch in the commercial groundfish fisheries off Alaska varied between 1.66 and 2.43 million mt. The peak catch occurred in 1991, in part because blend estimates of catch and bycatch were not yet used to monitor most quotas. If they had been, several fisheries would have been closed earlier in the year (Greig et al. 1999; Preliminary Table 1 for the 2001 Economic SAFE report).

The ex-vessel value of domestic landings, excluding the value added by at-sea processing, increased from $415.9 million in 1998 to $483.4 million in 1999. In 1999, catcher vessels accounted for 52.2 percent of the ex-vessel value of the groundfish landings compared to 48.3 percent of the total catch, because catcher vessels take a higher percentage of valuable species such as sablefish which was $2.786 per pound in 1999. Similarly, trawl gear accounted for only 63.8 percent of the total ex-vessel value compared to 89.5 percent of the catch because much of the trawl catch is of low priced species such as pollock which was about $0.088 per pound in 1999 (Preliminary Tables 4 and 19 for the 2001 Economic SAFE report).

Price changes for groundfish species between 1998 and 1999 are summarized below. These are ex-vessel prices and do not include the value added by at-sea processing.

- The average price of pollock increased from $0.065 per pound in 1998 to $0.088 in 1999.
- Average prices of sablefish rose from $2.359 in 1998 to $2.786 in 1996.
- Pacific cod prices went from $0.209 in 1998 to $0.287 in 1999.
- Flatfish prices rose from $0.129 in 1998 to $0.137 in 1999.
- Rockfish prices declined from $0.148 in 1999 to $0.133 in 1999.
- Atka mackerel prices rose from $0.069 in 1998 to $0.081 in 1999.

(All prices from preliminary Table 18 for the 2001 Economic SAFE report).

Walleye pollock has been the dominant species in the commercial groundfish catch off Alaska. The pollock catch in 1999 totaled 1.09 million mt and accounted for 66 percent of the total groundfish catch of 1.66 million mt. The pollock catch was down 13.1 percent from 1998. The next major species, Pacific cod, accounted for 242.5 mt or 14.6 percent of the total 1999 groundfish catch. The Pacific cod catch was down 6 percent from a year earlier. The 1999 catch of flatfish, which includes yellowfin sole, rock sole, and arrowtooth flounder was 186.4 mt in 1999, down 16.5 percent from 1998. Pollock, Pacific cod, and flatfish comprised 91.5 percent of the total 1999 catch. Other important species are sablefish, rockfish, and Atka mackerel (preliminary Table 1 from the 2001 Economic SAFE report).

3.8.2 Economic Considerations of the 2001 TACs

The actual value realized from the groundfish harvest is dependent on factors unquantifiable at present, including market demand, costs of harvesting and processing, proportion of catch processed at sea (value added), and the degree to which the harvests are constrained by PSC limits. See Tables 1 and 2, for TAC, ABC, and OFL specifications for 2001.

A component of the 1996 Sustainable Fisheries Act amendments to the Magnuson-Stevens Act is the requirement to evaluate affects of changes in TAC on economic value of the harvest. Analysis to predict the 2001 product prices by regulatory area for target species management groups, utilizing the catch specification, bycatch and discard rates is not, however, available.

4.0 Initial Regulatory Flexibility Analysis (IRFA)

4.1 The Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act (RFA) first enacted in 1980 was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a federal regulation.

Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and the consideration of alternatives that may minimize the impacts while still achieving the stated objective of

the action.

On March 29, 1996, President Clinton signed the Small Business Regulatory Enforcement Fairness Act (SBREFA). Among other things, the new law amended the RFA to allow judicial review of an agency's compliance with the RFA. The 1996 amendments also updated the requirements for a final regulatory flexibility analysis, including a description of the steps an agency must take to minimize the significant economic impact on small entities. Finally, the 1996 amendments expanded the authority of the Chief Counsel for Advocacy of the Small Business Administration (SBA) to file *amicus* briefs in court proceedings involving an agency's violation of the RFA.

4.1.1 Requirement to prepare an IRFA

If it cannot be certified that a proposed rule "*will not* have a significant adverse economic impact on a substantial number of small entities", an initial regulatory flexibility analysis (IRFA) must be prepared. To ensure a broad consideration of impacts and alternatives, NMFS has prepared an IRFA pursuant to 5 USC 603, without first making the threshold determination of whether or not this proposed action would have a significant economic impact on small entities.

The central focus of the IRFA should be on the economic impacts of a regulation on small entities and on the alternatives that might minimize adverse impacts and still accomplish the statutory objectives. The level of detail and sophistication of the analysis should reflect the significance of the impact on small entities. Under 5 U.S.C., Section 603(b) of the RFA, each IRFA is required to address:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the objectives of, and the legal basis for, the proposed rule;
- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
- A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;
- A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the Magnuson-Stevens Act and any other applicable statutes and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:

    1. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;

2. The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;

3. The use of performance rather than design standards;

4. An exemption from coverage of the rule, or any part thereof, for such small entities.

4.1.2 What is a small entity?

The RFA recognizes and defines three kinds of small entities: (1) small businesses, (2) small non-profit organizations, and (3) and small government jurisdictions.

4.1.2.1 Small businesses

Section 601(3) of the RFA defines a "small business" as having the same meaning as "small business concern" which is defined under Section 3 of the Small Business Act. "Small business" or "small business concern" includes any firm that is independently owned and operated and not dominate in its field of operation. The SBA has further defined a "small business concern" as one "organized for profit, with a place of business located in the United States, and which operates primarily within the United States or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor...A small business concern may be in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the form is a joint venture there can be no more than 49% participation by foreign business entities in the joint venture."

The SBA has established size criteria for all major industry sectors in the United States including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual receipts not in excess of $ 3 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $3 million criterion for fish harvesting operations. Finally a wholesale business servicing the fishing industry is a small businesses if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide.

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring

the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when (1) A person is an affiliate of a concern if the person owns or controls, or has the power to control 50% or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock, or (2) If two or more persons each owns, controls or has the power to control less than 50% of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors or general partners controls the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as joint venturers if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

4.1.2.2 Small organizations

The RFA defines "small organizations" as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

4.1.2.3 Small governmental jurisdictions

The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of fewer than 50,000.

4.2 2001 Specification Alternatives

The groundfish fisheries in the Exclusive Economic Zone EEZ (3 to 200 miles offshore) off Alaska are managed under the Fishery Management Plans (FMP) for the GOA and BSAI. Both FMPs were developed by the North Pacific Fishery Management Council (Council) under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The GOA FMP was approved by the Secretary of Commerce and became effective in 1978, and the BSAI FMP became effective in 1982.

Actions taken to amend FMPs or implement other regulations governing the groundfish fisheries must meet the requirements of Federal laws and regulations. In addition to the Magnuson-Stevens Act, the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act

(ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA).

4.2.1 Purpose and Need for the Action

Federal regulations at 50 CFR part 679 implement the Fishery Management Plans (FMPs) for Groundfish of the Gulf of Alaska (GOA) and in the Bering Sea and Aleutian Islands (BSAI) management areas and govern the groundfish fisheries in the GOA and BSAI. The North Pacific Fishery Management Council (NPFMC) prepared the FMPs, and NMFS approved them under the authority of the Magnuson-Stevens Fishery Conservation and Management Act. General regulations that also pertain to the U.S. fisheries appear at 50 CFR part 600.

The BSAI and GOA FMPs and their implementing regulations require NMFS, after consultation with the Council, to specify annually the total allowable catch (TAC) for each target species and for the "other species" category. In the GOA the sum of these must be within the optimum yield range of 116,000 to 800,000 metric tons (mt) (§679.20(a)(1)(ii)). In the BSAI the sum of these must be within the optimum yield range of 1.4 million to 2.0 million mt (§679.20(a)(1)(i)).

Regulations at §679.20(c)(1) further require NMFS to publish proposed specifications for the succeeding fishing year and accept public comment on the regulations. These proposed specifications specify annual TAC amounts for targeted and other species, apportionments of these set out in the FMPs, halibut and other PSCs, seasonal allowances of pollock, inshore/offshore allocations of Pacific cod, prohibited species quotas (PSQs), and CDQ reserve amounts.

Regulations at §679.20(c)(2) provide that interim specifications become effective 0001 hours, Alaska local time (A.l.t.) January 1 and remain in effect until superseded by the final harvest specifications. In the GOA the regulations provide that the interim specifications will be established as one-fourth of each proposed TAC and apportionment thereof (not including the reserves and the first seasonal allowance of pollock), one-fourth of the proposed halibut PSC amounts, and the proposed first seasonal allowance of pollock. In the BSAI the regulations provide that, aside from pollock and the hook-and-line and pot allocation of sablefish, one-fourth of each proposed initial TAC and apportionment, one quarter of each CDQ reserve, one-fourth of the proposed PSQ reserve, and one-fourth of PSCs.

Regulations at §679.20(c)(3) require NMFS to consider public comments received on the proposed specifications during the comment period and, after consultation with the Council, to publish final specifications in the *Federal Register.*

The practical implications of these procedures are summarized in the following extract from a recent discussion paper on the specifications process (Salveson. 2000):

> Proposed Specifications. Under the current system, the proposed specifications published in the Federal Register are based largely on the preliminary Stock Assessment and Fishery Evaluation (SAFE) reports prepared by the GOA and BSAI Plan Teams during their September meetings. After the Council has reviewed the preliminary SAFE reports and has solicited public comment during its fall meeting, the Council adopts proposed TAC and prohibited species catch (PSC) recommendations that are reviewed and approved by NMFS and published in the Federal

Register as soon as possible after the fall meeting.

The proposed specifications are updated after the final SAFE documents are produced by the Plan Teams in November, and after the public has had opportunity to comment before and during the December Council meeting. The final specifications are adopted by the Council at its December meeting, submitted to NMFS for review and approval, and become effective when filed with the Office of the Federal Register, usually by mid to late February of each year.....

Interim Specifications. The interim specifications are published annually approximately the same time as the proposed specifications. Current regulations at § 679.20(a) establish interim specifications equal to one-fourth of the proposed initial TAC (with the exception of the first seasonal allowance of pollock and Atka mackerel) for groundfish and one-fourth of the PSC amounts. The interim specifications are intended to allow the groundfish fisheries to begin in an orderly manner on January 1 of each year and remain in effect until superseded by the filing of the final specifications with the Office of the Federal Register. Because the interim specifications are based on the proposed specifications, they do not take into account the recommendations contained in the Plan Team's final SAFE documents or the recommendations coming from public testimony, the Scientific and Statistical Committee (SSC), Advisory Panel (AP), and Council at its December meeting.....

4.2.2 Alternatives considered

Two alternatives are considered in this IRFA:

7. No proposed or interim specifications. This is the EA Alternative 5, "Set *F* equal to zero for year 2001 harvest." "*F*" is a fishery mortality target. Under this alternative no proposed and interim specifications would be effective between January 1, 2001 and the effective date for the final specifications.. There would be no groundfish fishing in the GOA or BSAI in 2001 until the final specifications become effective.

8. Establish proposed and interim specifications. Under this alternative the proposed and interim specifications would be effective on January 1, 2001. Groundfish fishing would begin on January 1, 2001 under these specifications and continue until TACs or PSCs authorized under these specifications had been utilized, or until final specifications became effective. EA alternative's 1 to 4 and 6 to 9 provide for a range of positive *F* values.

4.2.3 Description of the alternatives

4.2.3.1 No proposed or interim specifications

As noted above (section 4.2.2), this is the "no action" alternative. Under this alternative no proposed and interim specifications would be effective. NMFS would be in violation of regulations at §679.20(c)(1) which require that proposed specifications be published and of regulations at §679.20(c)(2) which require that interim harvest specifications be in effect on January 1. In the absence of proposed specifications it is assumed that there would be no basis for interim or final specifications and no groundfish fishing in the GOA or BSAI in 2001.

If proposed specifications were adopted but interim specifications did not become effective NMFS would be in violation of regulations at §679.20(c)(2). In the absence of interim specifications it is assumed that there would be no fishing until final specifications become effective.

Both variants: (1) no proposed and no interim specifications, and (2) proposed but no interim specifications, have been analyzed in this IRFA. While this can be thought of as a "no action" alternative, it would actually involve a change from fisheries management procedures in earlier years.

4.2.3.2 Adopt proposed and interim specifications

In the second alternative the proposed and interim specifications are those found in Tables 1 and 2 of the EA. These correspond to Alternative 9, identified as the preferred alternative. The proposed specifications are identical to the 2000 final specifications. The interim specifications would be effective until superceded by final 2001 specifications later in the year. The EA lists seven alternatives (other than Alternative 9) that would allow for some harvest in 2001.

Alternatives 1 to 4 mechanically set F equal to different levels, including (1) the maximum permissible value of F_{ABC}, (2) the stock assessment author's ABC, (3) half of the maximum permissible value of F_{ABC}, and (4) the 1994-1998 average F. Alternatives 6 to 9 set F equal to the recommendations of different Council organizations. The four options considered include (1) the Plan Team's recommendations, (2) the Statistical and Science Committee's (SSC's) recommendations, (3) the Advisory Panel's (AP's) recommendations, and (4) the recommendations of the NPFMC itself. The NPFMC recommendations are Alternative 9.

Alternative 9 was chosen as the preferred alternative for 2001 because it was the alternative chosen by the NPFMC for 2000. As the description of the alternative in section 2.0 of the EA notes, "This alternative focuses on the biological condition of the groundfish stocks, effects of the groundfish fisheries on endangered, prohibited, and other species dependent upon the marine environment and their habitat. ABC, TAC and PSC recommendations are based on these considerations as well as socioeconomic concerns to achieve optimum yield in the groundfish fisheries. Consideration of public testimony was also of critical importance in arriving at this recommendation. This alternative incorporates the most recent and best scientific information available, therefore, is the preferred alternative." Since the updating of the information available when this alternative was chosen hasn't been completed, this remains the choice made on the basis of the best scientific information available.

4.3 Number and description of affected small entities

4.3.1 Description of the 1998 BSAI and GOA Groundfish Fisheries

An IRFA should be based on the best available scientific information. The most recent complete socio-economic description of the Gulf of Alaska and Bering Sea and Aleutians groundfish fisheries is contained in the "Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and the Bering Sea/Aleutian Islands Area: Economic Status of the Groundfish Fisheries Off Alaska, 1998" (hereinafter 2000 Economic SAFE). The following selections from that document provide an overview of the fishery in 1998:

The domestic groundfish fishery off Alaska has become an important segment of the U.S. fishing industry. With a total catch of 1.9 million metric tons (t), a retained catch of 1.7 million t, and an ex-vessel value of $385 million in 1998, it accounted for 41% of the weight and 12% of the ex-vessel value of total U.S. domestic landings as reported in Fisheries of the United States, 1998. The value of the 1998 catch after primary processing was approximately $1 billion.

All but a small part of the commercial groundfish catch off Alaska occurs in the groundfish fisheries managed under the FMP for the GOA and the BSAI. In 1998, other fisheries accounted for only 5,200 t of the catch reported above. The catch, ex-vessel value, and vessel data presented in this report are for those two FMP fisheries.

The fishery management and development policies for the BSAI and GOA groundfish fisheries have resulted in high levels of catch, ex-vessel value, processed product value, exports, employment, and other measures of economic activity. The cost data required to estimate the success of these policies with respect to net benefits to either the participants in these fisheries or the Nation are not available. However, the use of the race for fish as a principal mechanism for allocating the groundfish quotas and prohibited species catch limits among competing fishing operations probably has decreased the overall benefit to the Nation of these fisheries.....

The commercial groundfish catch off Alaska totaled 1.9 million t in 1998, compared to 2.1 million t in 1997. Based on a preliminary estimate for 1998 that may not be consistent with the estimates for previous years, the ex-vessel value of the catch, excluding the value added by at-sea processing, decreased from $583 million in 1997 to $385 million in 1998. The value of the 1998 catch after primary processing was approximately $1 billion. The final estimates of ex-vessel value and product value will be made after summaries of the groundfish fish ticket and Commercial Operators Annual Report data are provided to the Pacific Fisheries Information Network (PacFIN) and NMFS, respectively. The groundfish fisheries accounted for the largest share of the ex-vessel value of all commercial fisheries off Alaska in 1998 (40%), while the Pacific salmon (*Oncorhynchus* spp.) fishery was second with $243 million or 26% of the total Alaska ex-vessel value. The value of the shellfish catch amounted to $219 million or 23% of the total for Alaska.

During the last 15 years, estimated total catch in the commercial groundfish fisheries off Alaska (including foreign and joint venture fisheries as well as the domestic fishery) varied between 1.9 and 2.4 million tons. The rapid displacement of the foreign fishery by the joint venture fishery and then of the joint venture fishery by the domestic fishery between 1981 and 1991 is documented by the data in the 1999 Economic SAFE.

The peak catch occurred in 1991, in part, because blend estimates of catch and bycatch were not yet used to monitor most quotas. If they had been, several fisheries would have been closed earlier in the year. There are three reasons why the catch estimates for 1988 through 1990 have a significant downward bias compared to the estimates for the other years. First, the domestic fishery accounted for a large part of total catch in 1988 through 1990. Second, discards were not included in the reported estimates of domestic catch prior to 1991. Based on estimates of the discard rates for 1992 through 1995, discards would have been about 16% of total catch. Finally, the blend estimates of catch, excluding at-sea discards, tend to exceed the estimates based solely

on industry reports and prior to 1991 only industry reports were used to estimate retained catch in the domestic fishery. Variations in the catch estimates also reflect changes in the TAC, area closures, and bycatch restrictions.

Walleye (Alaska) pollock (*Theragra chalcogramma*) has been the dominant species in the commercial groundfish catch off Alaska. The 1998 pollock catch of 1.25 million t accounted for 67% of the total groundfish catch of 1.87 million t. The pollock catch was up less than 1% from 1997. The next major species, Pacific cod (*Gadus macrocephalus*), accounted for 257,900 t or almost 14% of the total 1998 groundfish catch. The Pacific cod catch was down about 21% from a year earlier. The 1998 catch of flatfish, which includes yellowfin sole (*Pleuronectes asper*), rock sole (*Pleuronectes bilineatus*), and arrowtooth flounder (*Atheresthes stomias*) was 223,100 t in 1998, down almost 35% from 1997. Pollock, Pacific cod, and flatfish comprised almost 93% of the total 1998 catch. Other important species are sablefish (*Anoplopoma fimbria*), rockfish (*Sebastes and Sebastolobus* spp.), and Atka mackerel (*Pleurogrammus monopterygius*). The contributions of the major groundfish species or species groups to the total catch in the domestic groundfish fisheries off Alaska are depicted in the 1999 Economic SAFE.

Trawl, hook-and-line (including longline and jigs), and pot gear account for virtually all the catch in the BSAI and GOA groundfish fisheries. There are catcher vessels and catcher processor vessels for each of these three gear groups. The 1999 Economic SAFE presents catch data by area, gear, vessel type, and species. The catch data, catch, ex-vessel value, and vessel information in the report are for the BSAI and GOA FMP fisheries.

In the last 5 years, the trawl catch averaged about 91% of the total catch, while the catch with hook-and-line gear accounted for 7.5%. Most species are harvested predominately by one type of gear, which typically accounts for 90% or more of the catch. The one exception is Pacific cod, where in 1998, 48% (123,000 t) was taken by trawls, 43% (110,000 t) by hook-and-line gear, and 9% (24,000 t) by pots. In the last five years for the BSAI and GOA as a whole, catcher vessels took 41% of the catch and catcher processor vessels took the other 59%. In 1998, catcher vessels took almost 43% of the total. The distribution of catch between catcher vessels and catcher processor vessels differed substantial by species and area.

The discards of groundfish in the groundfish fishery have received increased attention in recent years by NMFS, the Council, Congress, and the public at large. The discard rate is the percent of total catch that is discarded. For the BSAI and GOA fisheries as a whole, the annual discard rate for groundfish decreased from 15.1% in 1994 to 8.2% in 1998 with the vast majority of the reduction occurring in 1998. The 43% reduction in the overall discard rate in 1998 is the result of prohibiting pollock and Pacific cod discards in all BSAI and GOA groundfish fisheries beginning in 1998. Total discards decreased by almost 49% in 1998 with the aid of a 9.5% reduction in total catch. The prohibition was so effective in decreasing the overall discard rate because the discards of these two species had accounted for 43% of the overall discards in 1997. The benefits and costs of the reduction in discards in 1998 have not been determined. In 1998, the overall discard rates were, 9.1% and 8.1%, respectively, for the GOA and the BSAI compared to 16.2% and 14.3% in 1997.

Although the fixed gear fisheries accounted for a small part of either total catch or total discards,

the 1998 overall discard rate was substantially higher for fixed gear (13.9%) than for trawl gear (7.6%). Previously, the overall discard rates had been similar for these two gear groups. This change occurred because the prohibition on pollock and Pacific cod discards had a much larger effect on trawl discards than on fixed gear discards. In the BSAI, the 1998 discard rates were 15% and 7.4% for fixed and trawl gear, respectively. However, in the GOA, the corresponding discard rates were 9.5% and 9%. One explanation for the relatively low discard rates for the BSAI trawl fishery is the dominance of the pollock fishery with very low discard rates. The mortality rates of groundfish that are discarded are thought to differ by gear or species; however, estimates of groundfish discard mortality are not available.

The 1999 Economic SAFE provides estimates of total catch, discarded catch, and discard rates by species, area, gear, and target fishery. Within each area or gear type, there are substantial differences in discard rates among target fisheries. Similarly, within a target fishery, there are often substantial differences in discard rates by species. Typically, in each target fishery the discard rates are very high except for the target species. The regulatory exceptions to the prohibition on pollock and Pacific cod discards explain, in part, why there are still high discard rates for these two species in some fisheries.

The bycatch of Pacific halibut, crab, Pacific salmon, and Pacific herring (*Clupea pallasi*) has been an important management issues for more than twenty years. The retention of these species was prohibited first in the foreign groundfish fisheries. This was done to ensure that groundfish fishermen had no incentive to target these species. Estimates of the bycatch of these prohibited species for 1995-98 are summarized by area and gear in the 1999 Economic SAFE. The estimates for halibut are in terms of bycatch mortality because the bycatch limits for halibut are set and monitored using estimated discard mortality rates. The estimates for the other prohibited species are of total bycatch, this is in part due to the lack of well established discard mortality rates for these species. The discard mortality rates probably approach 100% for salmon and herring in the groundfish fishery as a whole; however, the discard mortality rates for crab may be substantially lower.

Residents of Alaska and of other states, particularly Washington and Oregon, are active participants in the BSAI and GOA groundfish fisheries. Catch data by residency of vessel owners are presented in the 1999 Economic SAFE. For the domestic groundfish fishery as a whole, 92% of the 1998 catch was made by vessels with owners who indicated that they were not residents of Alaska. The catches of the two vessel residence groups were much closer to being

equal in the Gulf where Alaskan vessels accounted for the majority of the Pacific cod and sablefish catch.

The 2000 Economic SAFE contains the estimated ex-vessel prices that were used with estimates of retained catch to calculate ex-vessel values. The estimates of ex-vessel value by area, gear, type of vessel, and species are included in the report. PacFIN has not received the data required to estimate ex-vessel prices and values for 1998; therefore, price and value tables have not been updated. The ex-vessel value of the domestic landings in the FMP fisheries, excluding the value added by at-sea processing, increased from $425 million in 1993 to $585 million in 1995, decreased in 1996 to $531 million, and increased to $570 in 1997. The distribution of ex-vessel

value by type of vessel differed by area, gear and species. In 1997, catcher vessels accounted for 44% of the ex-vessel value of the groundfish landings compared to 42% of the total catch because catcher vessels take larger percentages of higher priced species such as sablefish which was $2.25 per pound in 1997. Similarly, trawl gear accounted for only 67% of the total ex-vessel value compared to 90% of the catch because much of the trawl catch is of low priced species such as pollock which was about $0.10 per pound in 1997.

The 2000 Economic SAFE provides estimates of ex-vessel value by residency of vessel owners, area, and species. For the BSAI and GOA combined, 82.5% of the 1997 ex-vessel value was accounted for by vessels with owners who indicated that they were not residents of Alaska. Vessels with owners who indicated that they were residents of Alaska accounted for 15.5% of the total and the remaining 2.0% was taken by vessels for which the residence of the owner was not known. The vessels owned by residents of Alaska accounted for a much larger share of the ex-vessel value than of catch (15.5% compared to 8.5%) because these vessels accounted for relatively large shares of the higher priced species such as sablefish.....

The Weekly Production Reports include employment data for at-sea processors but not inshore processors. The data indicate that in 1998, the crew weeks totaled 106,365 with the majority of them (101,064) occurring in the BSAI groundfish fishery. In 1998, the maximum monthly employment (18,864) occurred in October. Much of this was accounted for by the BSAI pollock fishery.

There are a variety of at least partially external factors that affect the economic performance of the BSAI and GOA groundfish fisheries. They include landing market prices in Japan, wholesale prices in Japan, U.S. imports of groundfish products, U.S. per capita consumption of seafood, U.S. consumer and producer price indexes, foreign exchange rates, and U.S. cold storage holdings of groundfish.

Exchange rates and world supplies of fishery products play a major role in international trade. Exchange rates change rapidly and can significantly affect the economic status of the groundfish fisheries. There is also considerable uncertainty concerning the future conditions of stocks, the resulting quotas, and future changes to the fishery management regimes for the BSAI and GOA groundfish fisheries. The management actions taken to allocate the catch between various user groups can significantly affect the economic health of either the domestic fishery as a whole or segments of the fishery. Changes in fishery management measures are expected as the result of continued concerns with: 1) the bycatch of prohibited species; 2) the discard and utilization of groundfish catch; 3) the effects of the groundfish fisheries on marine mammals and sea birds; 4)

other effects of the groundfish fisheries on the ecosystem and habitat; 5) excess harvesting and processing capacity; and 6) the allocations of groundfish quotas among user groups.

The implementation of the American Fisheries Act, related regulatory changes, and the full implementation of the Multi-species CDQ Program have the potential to address a number of these concerns and to improve substantially the economic performance of the BSAI and GOA groundfish fisheries. They can do this by eliminating the race for fish which has given fishermen incentives to take actions that have deceased the overall benefits to the Nation from the BSAI

and GOA groundfish fisheries.

4.3.2 Numbers of Small Entities in 1999

As noted in Section 4.2.3.1, this IRFA evaluates a no action alternative with two variants: (1) no publication of proposed specifications, and (2) proposed but no interim specifications.

Since 1999 is the most recent year for which systematic information on numbers of vessels is available from preliminary tables for the 2001 Economic SAFE report, 1999 estimates are used here as the best available information for estimating likely 2001 vessel numbers. The estimated numbers of small entities in 1999 are shown below in Tables 13 and 14.

Table 13, shows estimates of the number of small entities that would be affected by the decision on whether or not to publish the proposed specifications. Since a decision not to publish proposed specifications implies that there would be no interim or final specifications and no fishery, this table shows estimates of the number of entities during all of 1999.

Table 14, shows estimates of the numbers of operations that would be affected by the decision on whether or not to adopt the interim specifications, given that proposed specifications were published. Since it is assumed that final specifications would become effective in mid to late February, this table provides estimates of the numbers of operations in January and February 1999.

Numbers are shown for different sectors of the fishery fleet. Fleet sectors are defined by GOA and BSAI management area, gear type (hook-and-line, pot and trawl), and by whether or not the vessel processed its own catch (catcher vessels do not, while catcher processors do). These distinctions are common and important in the fishery. They reflect important behavioral differences. Moreover, many regulations, including some that allocate fish among different groups, take account of these distinctions. In addition, small entity estimates are provided for two classes of processors, one class of non-for-profit organizations, and two classes of government jurisdictions.

Estimates of the numbers of vessels in the fleet sectors are based on preliminary tables for the 2001 Economic SAFE document. The sources for all of the estimates are discussed in more detail below in section 4.3.3, "Small businesses," section 4.3.4, "Small organizations," and section 4.3.5, "Small governmental jurisdictions."

Table 13. Estimated numbers and types of entities participating in the BSAI and GOA Groundfish fisheries in 1999.

Industry component or type of entity	Small	Large	Total
GOA Hook-and-line catcher vessel	909	0	909
GOA Hook-and-line catcher processor	17	12	29
BSAI Hook-and-line catcher vessel	78	0	78
BSAI Hook-and-line catcher processor	21	20	41
GOA Pot catcher vessel	198	0	198
GOA Pot catcher processor	0	11	11
BSAI Pot catcher vessel	90	0	90
BSAI Pot catcher processor	12	2	14
GOA Trawl catcher vessel	152	2	154
GOA Trawl catcher processor	8	10	18
BSAI Trawl catcher vessel	124	2	126
BSAI Trawl catcher processor	16	24	40
Motherships	0	3	3
Inshore processors	32	26	58
CDQ groups (not-for-profit)	6	0	6
Gov't jurisdictions: CDQ communities	65	0	65
Gov't jurisdictions: Alaskan ports	23	1	24

Notes: "Hook-and-line" gear includes longline and jig operations. Data are not additive within a column due to some overlaps between cells.
Source: Total vessel counts from Preliminary 2001 SAFE Tables 26, 27, and 28. Small and large estimates and estimates of other types of entities as described in text.

If the proposed specifications are not published, fishing would not take place under either the interim specifications or the final specifications. Summing down the small entity column across the different categories of entities generates an estimate of the total number of small entities impacted if the proposed specifications are not adopted. This is 1,751. This estimate is biased upwards. First, for reasons stated below, the estimates of small business entities for the entity categories may be high. Second, there is some duplication with some entities occurring in more than one category.

Table 14. Estimated numbers and types of entities participating in the BSAI and GOA Groundfish fisheries during January and February, 1999.

Industry component or type of entity	Small	Large	Total
GOA Hook-and-line catcher vessel	82	0	82
GOA Hook-and-line catcher processor	7	5	12
BSAI Hook-and-line catcher vessel	1	0	1
BSAI Hook-and-line catcher processor	15	13	28
GOA Pot catcher vessel	73	0	73
GOA Pot catcher processor	0	0	0
BSAI Pot catcher vessel	2	0	2
BSAI Pot catcher processor	0	0	0
GOA Trawl catcher vessel	98	1	99
GOA Trawl catcher processor	1	2	3
BSAI Trawl catcher vessel	84	2	86
BSAI Trawl catcher processor	14	22	36
Motherships	0	3	3
Inshore processors	32	26	58
CDQ groups (not-for-profit)	6	0	6
Gov't jurisdictions: CDQ communities	65	0	65
Gov't jurisdictions: Alaskan ports	23	1	24

Notes: "Hook-and-line" gear includes longline and jig operations. Data are not additive within a column due to some overlaps between cells.
Source: Total vessel counts from Preliminary 2001 SAFE Tables 26, 27, and 28. Small and large estimates and estimates of other types of entities as described in text.

If the proposed specifications are published but the interim specifications are not adopted there would be no fishing until final specifications were adopted. Summing down the small entity column across the different categories of entities generates an estimate of the total number of small entities impacted. This is 503. As noted with respect to a similar calculation based on Table 13, this estimate is biased upwards for two reasons: (1) for reasons stated below, the estimates of small business entities for the entity categories may be high, (2) there is some duplication with some entities occurring in more than one category.

4.3.3 Small businesses

There are many ways to characterize the fishing fleet. In this IRFA the fleet has been broken out by management area, the gear used to fish for groundfish and by whether or not the catch receives some

processing on the vessel itself. The main gear types used for harvesting groundfish are longlines, pots, trawls and jigs. Vessels that do not process their own catch are referred to as catcher vessels, while vessels that do process their own catch are referred to as catcher-processors. These are common distinctions and are used in the preliminary tables for the 2001 Economic SAFE document from which the vessel numbers have been obtained.

If no proposed specifications were published, no interim or final specifications would become effective. In this case no fishery would take place in 2001. All entities that would have been active in the fishery would be adversely affected. The numbers of these entities have been estimated from the number of operations active in 1999. As noted earlier, 1999 was chosen since it is the last year for which complete activity data is available from the preliminary tables for the 2001 Economic SAFE document. The numbers of these entities have been summarized in Table 13 above.

To identify the number and type of business concerns participating in the GOA and BSAI groundfish fisheries that meet the definition of "small entities," each must be measured against the size and affiliation standards outlined in Section 4.1.2. The standard for "unaffiliated" fishing vessels is $3,000,000 in gross revenues from all sources in a year. Summary data on gross revenues from all sources for groundfish vessels is not currently available.

The estimates of the number of small and large entities among the catcher vessels and the catcher processors is based on a comparison of Table 26.1 from the 2000 Economic SAFE with preliminary versions of Tables 27-29 for the 2001 Economic SAFE. Table 26.1 provides the most recent systematic data on the numbers of groundfish catcher vessels and catcher processors with over $3,000,000 in gross revenues from their Alaska groundfish fisheries. The most recent data are available for 1997. These 1997 figures were compared with total numbers of vessels fishing in 1997 to determine the percentages of small vessels. These percentages were then used with estimates of the numbers of vessels fishing in 1999 to produce estimates of small entities in 1999.

These estimates overestimate the number of fishing vessels that are small entities for the following reasons: 1) a vessels's earnings from other fisheries and activities were not included; 2) a vessel owner's earnings from other sources (i.e., another vessel) were not included; 3) the ex-vessel value of a delivery by a catcher vessel to an at-sea processor was included only when a fish ticket with value data was submitted for the delivery; and 4) vessel-specific fish ticket landings weight and value data are used to estimate ex-vessel value for catcher vessels but such data are not available for all deliveries to inshore processors. Although this procedure overestimates the number of small entities, it avoids the risk of *understating* the potential impact on "small entities." If more precise data become available, prior to the completion of the Final Regulatory Flexibility Analysis (FRFA), the totals will be corrected.

Three mother ships were in operation in 1999 (Northern Economics, 2000). All three have ownership or business affiliations with large Japanese-owned processing companies, and are further affiliated with some of their delivering catcher vessels. Taken together with their affiliated entities, none of these motherships meet the criteria for small entities (NMFS. 2000.).

There were 58 onshore processors operating in 1999. Large entities in the processing sector are those employing more than 500 persons (including employment in affiliated operations). In 1999 onshore processors fell into five groups. Six plants were Bering Sea Pollock Inshore Plants. These are assumed

to be large processors. Similarly, there were 10 Alaska Peninsula and Aleutian Island Inshore Plants in 1999 and 10 Kodiak Island Inshore Plants in 1999. These have also all been assumed to be large entities. Eighteen plants were Southcentral Alaska Inshore Plants and 14 were Southeast Alaska Inshore Plants. These last two classes of plants have been assumed to be small entities. This gives a total of 32 small entities and 26 large entities among the onshore processing plants. This is a rough estimate of the numbers of large and small onshore processing entities. (The classification of onshore processors into different regional categories has been based on Northern Economics, 2000.) Small and large entity determinations have been based on anecdotal information. If better information becomes available it will be used to update the FRFA.

Although 1,274 catcher vessels and 91 catcher processors caught groundfish off Alaska in 1999, smaller numbers operated in January and February, the months most likely to be affected by an absence of interim specifications. In January there were 289 catcher vessels and 68 catcher processors and in February there were 302 catcher vessels and 74 catcher processors. In the GOA there were 222 catcher vessels in January and 8 catcher processors; in the BSAI there were 67 catcher vessels in January and 63 catcher processors. (Preliminary 2001 Economic SAFE Table 32).

In the absence of interim specifications, the number of affected operations, is the number operating in January and February, not the number for the whole year. Monthly participation data is provided in the Preliminary Economic SAFE Table 32. Many of the operations operating in each month are the same; however, there are undoubtedly operations active in January that are not active in February and some that start in February that did not operate in January. For the purposes of this IRFA, the number of operations active during the January-February period is estimated to be the number active in the month with the larger level of activity. Levels of activity by month are summarized in Table 15 below.

Table 15 Counts of Vessels Operating in the Alaskan Groundfish Fisheries in January and February 1999.

Fleet segment	Gulf of Alaska		Bering Sea and Aleutian Islands		All Alaska	
	January	February	January	February	January	February
Catcher vessels						
Longline	82	55	1	1	83	56
Pot	66	73	2	2	68	74
Trawl	77	99	64	86	141	175
All gear	222	225	67	89	289	302
Catcher processors						
Longline	5	12	27	28	31	36
Pot	0	0	0	0	0	0
Trawl	3	3	36	36	37	39
All gear	8	15	63	63	68	74

Notes: Data from preliminary 2001 Economic SAFE Table 32.

The numbers of small business entities active in January and February 1999 were estimated using data on vessels grossing under $3,000,000 from groundfish fisheries in 1997. This technique was described above in the discussion of the numbers of small vessels fishing in all of 1999. The same technique was used to make the estimates in Table 14. In the absence of better information, the numbers of small processing businesses are the same in Tables 13 and 14..

4.3.4 Small organizations

Since 1992 parts of the pollock TAC have been set aside for Community Development Quotas in the BSAI. Since 1998 parts of the TACs for several other groundfish species have also been set aside for CDQ operations.

The groundfish TACs set aside for CDQs are distributed among six CDQ groups operating in the BSAI. The CDQ groups may either fish themselves, or lease their allocations to others. The net revenues from CDQ harvests (or leases) are divided among 65 member villages represented by the CDQ groups. These funds support community development, infrastructure investment, and economic diversification in villages with virtually no other means of economic sustenance. The CDQ groups with their associated CDQ communities are listed in Table 16. The number of CDQ groups has been assumed to be the same for Tables 13 and 14.

Table 16 Eligible Western Alaska Communities and the CDQ Groups

Aleutian Pribilof Island Community Development Association (APICDA)

Akutan
Atka
False Pass
Nelson Lagoon
Nikolski
Saint George

Bristol Bay Economic Development Corporation (BBEDC)

Aleknagik
Clark's Point
Dillingham
Egegik
Ekuk
Ekwok
Levelock
Manokotak
Naknek
Pilot Point
Port Heiden
Portage Creek
South Naknek
Sovonoski/King Salmon
Togiak
Twin Hills
Ugashik

Central Bering Sea Fishermen's Association (CBSFA)

Saint Paul

Coastal Villages Region Fund (CVRF)

Chefornak
Chevak
Eek
Goodnews Bay
Hooper Bay
Kipnuk
Kongiganak
Kwigillingok

CVRF (cont.)

Mekoryuk
Napakiak
Napaskiak
Newtok
Nightmute
Oscarville
Platinum
Quinhagak
Scammon Bay
Toksook Bay
Tuntutuliak
Tununak

Norton Sound Economic Development Corporation (NSEDC)

Brevig Mission
Diomede
Elim
Gambell
Golovin
Koyuk
Nome
Saint Michael
Savoonga
Shaktoolik
Stebbins
Teller
Unalakleet
Wales
White Mountain

Yukon Delta Fisheries Development Association (YDFDA)

Alakanuk
Emmonak
Grayling
Kotlik
Mountain Village
Sheldon Point

4.3.5 Small governmental jurisdictions

Groundfish from the Gulf of Alaska and the Bering Sea and Aleutian Islands management areas were landed in 24 Alaskan ports. Only one of these, Anchorage, had a population greater than 50,000 persons and qualified as a large governmental jurisdiction. (2000 SAFE, Table 22).

Sixty-five communities in Western Alaska participate in one of the six CDQ groups. All of these communities are small entities for the purposes of the RFA. These communities are listed in Table 16.

The numbers of small governmental jurisdictions has been assumed to be the same for Tables 13 and 14.

4.4 Effects of the proposed specifications on small entities

4.4.1 Impact on the length of the fishing season and on catches

If the proposed specifications are not published, interim and final specifications could not become effective and there would be no fisheries during 2001. A review of Tables 1 and 2 in the EA will show the potential losses in groundfish catches. The analysis assumes that fishing would resume in 2002.

The actual length of time the groundfish fisheries will be closed may be affected by two factors. First, if NMFS fails to publish proposed specifications, it will be in violation of regulations at §679.20(c)(1) which require that the proposed specifications be published before the succeeding fishing year. Lawsuits may compel the agency to publish proposed specifications. Second, the State of Alaska has pot and jig fisheries for Pacific cod that it can open by emergency order in its own waters when the Federal fisheries are closed. Alaska's management plans for these fisheries could allow fishing in state waters if the federal fishery was not open.

The economic values involved in a closure of the groundfish fisheries for 2001 are large. In 1999, the total ex-vessel value (that is, the value before value-added in processing) for the groundfish harvest was $483.4 million. Pollock was the most important species by value, generating $204 million in gross revenues. Pacific cod was the next most important species, generating $150 million in gross revenues. Total processed value of output is also large. Total processed value in 1999 was $994.6 million; total processed value of pollock products was $588.7 million and total processed value of Pacific cod products was $230.6 million. Note that the ex-vessel and total processed product values are not additive. (Preliminary tables 19, 21, and 36 for the 2001 Economic SAFE document). Gross revenue information can be very misleading in the absence of operating cost data. These estimates do provide some indication of the importance of these fisheries, however.

If the proposed specifications are published and the interim specifications become effective, the groundfish fisheries in the Gulf of Alaska and the Bering Sea open on January 1. Fixed gear fishermen, including operators using longlines, pots, and jigs, will be able to begin operations on January 1, while trawl fishermen will be able to begin operations on January 20. Later in the year the final specifications will be substituted for the interim specifications. Table 17 shows the dates on which the final specifications became effective in each of the last five calendar years.

Table 17 Dates final specifications became effective, 1996-2000	
Year	Date final specifications became effective
1996	GOA: January 30 BSAI: January 30
1997	GOA: February 19 BSAI: February 12
1998	GOA: March 9 BSAI: March 11
1999	GOA: March 8 BSAI:March 8
2000	GOA: February 15 BSAI: February 15

Over the period examined final specifications were imposed between January 30 (in 1996) and March 11 (for the BSAI in 1998). The median dates are February 19 in the GOA and February 15 in the BSAI. If proposed specifications are published, but the interim specifications are not put into effect, the groundfish fisheries in the Gulf of Alaska will not open until the final specifications become effective. It is assumed that there would be no groundfish fishing operations during this period.

The actual length of time the groundfish fisheries will be closed may be affected by three separate factors. First, if NMFS fails to put the interim specifications into effect, it will be in violation of regulations at §679.20(c)(2) which require that the interim specifications be effective on January 1. Lawsuits may compel the agency to implement interim specifications. Second, the dates that final specifications were effective, in Table 17 above, occurred in years when interim specifications were effective and managers were not under unusual pressure to prepare and publish the final specifications. This would not be the case if interim specifications were not effective. Managers would then be under pressure to publish the final specifications as quickly as possible. This may lead to publication of final specifications earlier in the year. Third, the State of Alaska has pot and jig fisheries for Pacific cod that it can open by emergency order in its own waters when the Federal fisheries are closed. It is possible that Alaska's management plans for these fisheries could allow fishing in state waters in January and February if the federal fishery was not open in those months.

The most valuable fisheries during this period are those for pollock, Pacific cod, rock sole and Atka mackerel. The pollock and Pacific cod fisheries are the first and second most important groundfish fisheries that take place off of Alaska.

The pollock fishery, the most valuable, starts when trawl gear is allowed to fish on January 20. It would thus be impacted for a shorter period of time than the fisheries for some other species. The pollock fishery catches the pollock while they are in spawning aggregations and while they have a high roe content. This is an extremely valuable fishery, made more so by effort limits associated with the AFA and fishery management cooperatives. The next most valuable fishery is the Pacific cod fishery. Pacific

cod are harvested with longlines, pots, jig gear and trawls. These are also in spawning concentrations during this period and roe provides a value added product. The rock sole fishery targets BSAI spawning concentrations of fish for their roe from late January to mid-March. Atka mackerel are targeted by catcher processors in the Aleutian Islands; primary products are headed and gutted and whole fish.

The first month and a half of the year are important for all of these fisheries. Significant volumes of fish are taken during this period. In 1999, by February 20, the fishery had taken 279,258 mt of an eventual 1999 catch of 1,086,354 mt of pollock. That is, about 26% of the pollock harvest was taken during this period. Operating cost information for the pollock fishermen is not available and in its absence reports of total revenue data can be very misleading. However, it may show the importance of pollock fishing in this period, to note that 279,258 mt of pollock, at $0.088 per pound, is worth about $54 million (the price information is from section 3.8 of this EA/IRFA).

In addition to these pollock catches, by February 20 the fishery had taken 63,063 mt, or about 26%, of an eventual catch of 242,608 mt of Pacific cod, about 14,214 mt, or about 25.2% of an eventual catch of 56,498 mt of Atka mackerel and, about 15,080 mt, or about 37% of an eventual catch of 41,088 mt of rock sole.[2] The Pacific cod, valued at $0.287 per pound, had a total gross value of about $40 million (the price information is also from section 3.8 of this EA/IRFA)

The fisheries for these four species involve large proportions of the year's catch. Even if all the fish would eventually be caught, a delay in the fishery until mid-February would require a considerable rearrangement of fishing patterns.

4.4.2 Impacts on Small Businesses

A closure of the fishery for the whole year would be extremely serious for small businesses. Fishermen and processors would lose the net revenues from operations for the whole year. This would cause very severe cash flow problems for almost all business entities. Many may be forced out of fishing. Operations that remain would have no profits from fishing.

A closure of the fishery between January 1 and mid-February would eliminate income flows from this source during this period for the participants. This could create cash-flow problems for some operations at this time.

A closure of the fishery between January 1 and mid-February would also reduce the year's net profit for fishermen participating during this period, almost by definition. Fishermen who choose to fish in January when they could have fished later, perhaps in March, must do so because it is more profitable for them. Either the costs of fishing earlier are lower or the revenues are higher, or both.

On the cost side, fishermen may be able to target spawning aggregations of Pacific cod or pollock during this period with a relatively high catch per unit of effort (CPUE) and relatively low cost. It is possible that they prefer to fish in January because of higher by-catch rates and associated higher costs later in the season. It may also be that the opportunity costs in terms of foregone catches in other fisheries (perhaps

[2]Estimates based on the blend.

herring sac roe in Alaska waters) are lower in January than at other fishing times. On the revenue side market prices may be better or product quality may be unusually high. Roe by-products may be available in January but not later.

There are good theoretical reasons to believe that net revenues for many participants in the groundfish fisheries may be relatively small. If this is the case, a reduction in net revenue associated with a closure may have a particularly serious negative impact. This concern results from the "common property" nature of many fisheries.

Segments of the groundfish fisheries retain many common property aspects, and there is a tendency for effort in common property fisheries to increase until costs are approximately equal to revenues.[3] There are several reasons to be concerned that effort in some of these fisheries brings costs close to revenues. Although these fisheries have been under a moratorium on new entry, and more recently under a license limitation program (LLP) these programs have not restricted entry very severely. In addition, while license limitation programs restrict the number of separate operations that can participate in a fishery, they don't, by themselves, limit the additional effort that licensed operators can supply. Finally, the number of operators in the fisheries during January and February is only a small proportion of the numbers who participate in the fisheries during the year. It is possible that if profits in the fisheries, or if profits in only the January-February fisheries, were higher, some of these other fishermen could easily enter and increase costs.

The concern for the common property nature of the fishery is likely to be less important in fishery segments which are protected against new entry by provisions of the American Fisheries Act (AFA) and in which operators can use coops to organize fishing effort and keep costs down. To the extent that the provisions of the AFA and coops benefit larger scale operations, a 2001 January-February closure may hurt small entities relatively more than large entities.

4.4.3 Impacts on small organizations

The CDQ groups obtain their revenues from their position as coordinators of the fishing activities for the TAC held by the CDQ communities. A reduction in fishing for first part of 2001 would reduce their revenues during this period. A closure of the fishery for the whole year would eliminate their net revenues for the year entirely.

4.4.4 Impacts on small governmental jurisdictions

If CDQ groups would have preferred to fish at the start of the season, but were prevented from doing so because interim specifications were not adopted, they would be forced to fish for their share of the TAC at other times. The harvest of the TAC would produce lower net revenues, either because they would have to harvest at times when markets were not as good or when costs were higher. In some cases, for example if they were prevented by by-catch restrictions, they may not be able to harvest catch not taken

[3] Taxable profits may remain positive since some costs of importance to fishermen and economic analysis (for instance the opportunity costs of the fishermen's time) are not considered for tax purposes.

at the start of the year. Revenue reductions would mean less revenue passed through from the CDQ groups to the 65 Western Alaska CDQ communities and less revenue used for community economic development projects in the region.

Governmental jurisdictions in which fish are landed may experience reduced revenues from fish landings taxes. If economic activity in the community is reduced for a period, the community may also receive lower revenues from sales or other taxes or fees. If fishermen living in the community experience hardship, the community may have higher service costs. These adverse impacts would be worse if the fishery were closed for the whole year.

4.4.5 Steps to Minimize the Impacts of this Action on Small Entities

Alternative 2 would allow the BSAI and GOA groundfish fisheries to start on January 1 and continue until superceded by the final specifications. This would take place in February. Alternative 1, the "No action" alternative could result in effective closure of the groundfish fisheries in the BSAI and GOA management for a period of time at the start of 2001 or could result in the closure of the groundfish fisheries for the whole year. Closure at the start of the year could create severe economic impacts for 502 small entities; closure for the whole year would create severe economic impacts for 1,751 small entities. This would have adverse effects on small entities in all three SBA categories (i.e., small businesses, small non-profits, and small jurisdictions).

Eight alternatives specify a positive level of fishing. While a full analysis of which of these alternatives would minimize the effect on small entities is not possible with the available information the EA does provide some information which makes it possible to indicate some of the issues.

EA Table 20 compares the TACs implied by alternatives 1 to 5 and alternative 9. In addition, Table 20 contains information on the resulting future biomass levels implied if these TACs were maintained in future years. The table provides information on two issues that may be important to the impacts on small entities. These are (1) the differences in 2001 TACs by species that are associated with the different alternatives, and (2) the implications for future biomass levels (and future possible TACs) associated with different current TACs.

Each of the alternatives summarized in Table 20 has different implications for 2001 TACs. These implications vary by species. Alternatives may have relatively high TACs for some species and at the same time have relatively low TACs for other species. In general, Alternatives 3 and 4 (50% of the maximum F_{ABC}, and 1994 to 1998 average F) tend to have lower TACs, and Alternatives 1 and 2 (maximum F_{ABC}, and assessment author's ABCs) tend to have higher TACs. Alternative 9, the preferred alternative, tends to be in the middle or the upper end of the range of TAC alternatives depending on species. The impacts on gross revenues are harder to determine. To estimate the impact on gross revenues it would be necessary to have information on the responsiveness of price that buyers are willing to pay to differences in quantities harvested or processed. Economists call this the elasticity of demand. This information is not available. In addition, gross revenue can be misleading in the absence of cost information and cost information is not available.

Each of the alternatives summarized in Table 20 has different implications for biomass in future years. The table shows the estimated biomass by species in 2006 and 2012 if the 2000 TACs were continued in

each year. This suggests a tradeoff between 2001 TACs and TACs in future years: lower TACs in 2001 may mean higher biomass in future years, and higher biomass in future years may mean that higher TACs might be possible in future years. In general, Alternatives 1 and 2 are associated with higher current TACs and lower future biomass. Alternatives 3 and 4 are associated with lower current TACs and higher future biomass. Alternative 9, the preferred alternative, tends to be in the middle or upper range of 2001 TAC alternatives and, where the information is available in Table 20, in the lower range of future biomass. It is not possible to perform a technical economic evaluation on the impact of these alternatives on small entities without information on the optimal rate of trade off between current and future net benefits, information on elasticities of demand, and information on operating costs.

4.4.6 Other Requirements of an IRFA

There are no record keeping and reporting requirements with the action. Current record keeping and reporting requirements are contained in regulations at 50 CFR 679.5 and are not altered by the interim specifications.

NMFS is not aware of any other Federal rules which duplicate, overlap or conflict with the proposed specifications.

4.5 Conclusions

The alternatives are (1) publication of proposed specifications and effective interim specifications that will permit groundfish fishing on January 1, 2001, or (2) non-publication of proposed specifications, or publication of proposed specifications but no effective interim specifications between January 1 and the effective date for final specifications. Based on past experience final specifications are likely in February.

If proposed specifications are not published, as many as 1,751 small entities of all types may be affected. These estimates are made by summing across different categories of small entities and are biased upward to some extent due to the methods used to estimate the individual category numbers and to overlap between some of the categories and consequent double-counting. These operations would not fish for a year. In 1999 total ex-vessel groundfish revenues were $483.4 million and total processed product revenues for groundfish products were $994.6 million. While gross revenues are not net revenues or profits, they do suggest that large sums of money are at stake.

If proposed regulations were published, but interim regulations were not adopted, groundfish fishing would not take place between January 1 and mid to late February. Important groundfish fisheries would normally take place during this period. These include fisheries for pollock, Pacific cod, rock sole and Atka mackerel. The closure of these fisheries would have negative impacts on small businesses, small non-profits, and small government jurisdictions. As many as 503 small entities of all types may be affected if proposed specifications are published but interim specifications do not become effective. These estimates are also made by summing across different categories of small entities and are biased upward to some extent due to the methods used to estimate the individual category numbers and to overlap between some of the categories and consequent double-counting. These operations harvest and process significant parts of the pollock, Pacific cod, Atka mackerel and rock sole annual catches during this period.

5.0 CONCLUSIONS

Section 4.0 of the NMFS 1998 SEIS analyzes the possible impacts of different TAC specification levels on future catches, marine mammals, seabirds, forage species, and prohibited species, as well as other components of the physical and chemical environment. New information that has arisen since that analysis is summarized in this EA. This EA tiers off the analysis presented in the SEIS. The proposed and interim 2001 TAC specifications are also within the range of alternatives analyzed for TAC amounts in the GOA and BSAI.

5.1 Impacts on Groundfish Species

The proposed TAC specifications for each target groundfish category are equal to or less than respective ABC and OFL specifications. The sum of the BSAI and GOA TAC specifications would be 2,000,000 mt and 298,510 mt, respectively. The BSAI would operate at the maximum OY level, while the GOA would operate at a level between the maximum and minimum OY level. Updated information on the status of groundfish stocks was reviewed by the Plan Teams for the groundfish fisheries of the BSAI and GOA at their November 1999 meeting, and is presented in the SAFE Reports for the Groundfish Resources of the BSAI and GOA as Projected for 2000 (Appendices A and B of the 2000 Groundfish EA). A summary of the Year 2000 harvest alternatives for the BSAI is presented in Table 18 and the GOA in Table 19. These alternatives are used to propose the year 2001 harvest specifications. New alternatives for the 2001 harvest specifications will be presented after the 2000 SAFE is available and the Council acts on the recommendations in November. Harvest specifications for the year 2001 will be presented in the EA for the final 2001 specifications for the BSAI and the GOA.

Table 18. Bering Sea Aleutian Islands Area Year 2000 Harvest Alternatives (values are in mt)

Species/Area	Alternative 1 *F*=max*F*abc	Alternative 2 Assessment Author's ABC	Alternative 3 *F*=50%max*F*abc	Alternative 4 *F*='94-'98ave*F*	Alternative 5 *F*=0
Pollock EBS	1,200,000	1,100,000	604,000	843,000	0
AI	23,800	23,800	11,900	37,356	0
Bogslof	71,300	71,300	35,650	276	0
Pacific cod	206,000	193,000	108,000	152,000	0
Yellowfin sole	191,000	191,000	97,000	135,000	0
Greenland turbot	34,700	9,300	18,185	7,891	0
Arrowtooth	131,000	131,000	66,314	10,927	0
Rock sole	230,000	230,000	116,933	32,530	0
Flathead sole	73,500	73,500	38,647	15,262	0
Other flatfish	117,000	117,000	62,231	15,847	0
Sablefish					
EBS	1,410	1,384	725	1,360	0
AI	2,490	2,446	1,280	2,403	0
POP					
EBS	2,600	2,600	1,316	1,665	0
AI	12,300	12,300	6,240	10,099	0
Other red rockfish	194	194	97	204	0
Sharpchin/North	5,150	5,150	2,575	4,173	0
Shortraker/Rough	885	885	442	779	0
Other rockfish					
EBS	369	369	184	191	0
AI	685	685	342	296	0
Atka mackerel	103,000	70,800	54,754	47,007	0
Squid	1,970	1,970	985	925	0
Other species	91,600	26,800	45,800	23,780	0
Total	2,500,953	2,265,483	1,273,600	1,342,971	0

Table 18.continued. Bering Sea Aleutian Islands Area Year 2000 Harvest Alternatives (values are in mt)

Species/Area	Alternative 6 Plan Team ABC	Alternative 7 SSC ABC	Alternative 8 AP TAC	Alternative 9 Council TAC	Tier
Pollock EBS	1,100,000	1,139,000	1,139,000	1,139,000	1a
AI	23,800	23,800	2,000	2,000	5
Bogoslof	71,300	22,300	1,000	1,000	5
Pacific cod	193,000	193,000	193,000	193,000	3b
Yellowfin sole	191,000	191,000	123,262	123,262	3a
Greenland turbot	9,300	9,300	9,300	9,300	3a
Arrowtooth	131,000	131,000	131,000	131,000	3a
Rock sole	230,000	230,000	134,760	134,760	3a
Flathead sole	73,500	73,500	52,652	52,652	3a
Other flatfish	117,000	117,000	83,813	83,813	3a
Sablefish					
EBS	1,410	1,410	1,410	1,470	3b
AI	2,490	2,490	2,490	2,430	3b
POP					
EBS	2,600	2,600	2,600	2,600	3b
AI	12,300	12,300	12,300	12,300	3b
Other red rockfish	194	194	194	194	5
Sharpchin/North	5,150	5,150	5,150	5,150	5
Shortraker/Roug	885	885	885	885	5
Other rockfish					
EBS	369	369	369	369	5
AI	685	685	685	685	5
Atka mackerel	70,800	70,800	70,800	70,800	3a
Squid	1,970	1,970	1,970	1,970	6
Other species	26,800	31,360	31,360	31,360	5
Total	2,265,553	2,260,113	2,000,000	2,000,000	

Table 19. Gulf of Alaska Year 2000 Harvest Alternatives (values are in mt)

Species/Area	Alternative 1 *F*=max*F*abc	Alternative 2 Assessment Author's ABC	Alternative 3 *F*=50%max*F*abc	Alternative 4 *F*='94-'98 ave *F*	Alternative 5 *F*=0
Pollock					
W/C/WYK	111,310	96,560	58,980	60,150	0
EYK/SE0	6,460	6,460	3,230	30	0
Pacific cod	86,600	76,400	45,500	41,300	0
Flatfish(deep)	5,300	5,300	2,650	2,700	0
Rex sole	9,440	9,440	4,720	6,020	0
Flathead sole	26,270	26,270	13,140	2,400	0
Flatfish(shal)	37,860	37,860	18,930	3,920	0
Arrowtooth	145,360	145,360	76,400	11,640	0
Sablefish	13,400	13,170	6,900	12,940	0
POP	13,020	13,020	6,600	11,280	0
SR/RE	2,070	1,730	1,850	1,030	0
Other rockfish	5,010	4,900	1,070	2,500	0
Northern rockfish	6,400	5,120	4,010	3,240	0
Pelagic rockfish	7,310	5,980	3,650	3,090	0
Thornyhead	2,360	2,360	1,190	1,370	0
Demer rockfish	380	340	290	300	0
Atka mackerel	4,700	600	2,350	1,300	0
Total	483,250	450,870	251,460	165,210	0

Note: Does not include "other species" assemblage.

Table 19. continued. Gulf of Alaska Year 2000 Harvest Alternatives (values are in mt)

Species/Area	Alternative 6 Plan Team ABC	Alternative 7 SSC ABC	Alternative 8 AP TAC	Alternative 9 Council TAC	Tier
Pollock					
W/C/WYK	96,560	93,540	93,540	93,540	3b
EYK/SEO	6,460	6,460	6,460	6,460	5
Pacific cod	76,400	76,400	59,800	58,715*	3a
Flatfish (deep)	5,300	5,300	5,300	5,300	5,6
Rex sole	9,440	9,440	9,440	9,440	5
Flathead sole	26,270	26,270	9,060	9,060	5
Flatfish (shallow)	37,860	37,860	19,400	19,400	4,5
Arrowtooth	145,360	145,360	35,000	35,000	3a
Sablefish	13,400	13,170	13,400	13,330	3b
POP	13,020	13,020	13,020	13,020	3b
SR/RE	1,730	1,730	1,730	1,730	4.5
Other rockfish	4,900	4,900	4,900	4,900	4.5
Northern rockfish	5,120	5,120	5,120	5,120	4
Pelagic rockfish	5,980	5,980	5,980	5,980	4
Thornyhead	2,360	2,360	2,360	2,360	3a
Demersal rockfish	340	340	340	340	4
Atka mackerel	600	600	600	600	6
Total	451,100	447,850	285,450	298,510*	

Note: Does not include "other species" assemblage.
* Includes March 7, 2000 adjustments to TAC for Pacific cod and other species.

The Plan Teams determined that the OFLs and ABCs implemented for the year 2000 fisheries are based on the most current information available.

Table 20 shows the relationship between harvesting under Alternatives 1through 5 and 9 and the effects on the biomass projected over time for several fisheries in the GOA and BSAI. Biomass projections were not estimated for Alternative 9 yellowfin sole or rock sole fisheries. Due to lack of information, biomass projections to the year 2012 were not available for a number of the fisheries in the BSAI and GOA. Except for pollock and sablefish, all Alternative 9 TACs were set at or below the SAFE authors' ABC listed in Alternative 2. Additional biomass information for the BSAI and GOA fisheries is in the 1999 SAFE.

Table 20. Spawning biomass remaining over an eleven years period for alternatives 1 through 5 and 9 in selected BSAI and GOA fisheries. Information for this table was taken from the 1999 SAFE.

Species/Area	Alternative 1 *F*=max*F*abc		Alternative 2 Assessment Author's ABC		Alternative 3 *F*=50%max*F*abc		Alternative 4 *F*='94-'98ave*F*		Alternative 5 *F*=0		Alternative 9 Council TAC	
	2000 TAC mt*	biomass	2000 TAC mt*	biomass	2000 TAC mt*	biomass	2000 TAC mt*	biomass	2000 TAC mt*	biomass	2000 TAC mt	Biomass
Pollock EBS	1,200,000	2,225tt	1,100,000	2,225tt	604,000	2,495tt	843,000	2,365tt	0	2,855t	1,139,000	2,225tt
Year 2001		2,381tt		2,381tt		2,946tt		2,592tt		4,668t		2,381tt
Year 2006												
Year 2012		2,427tt		2,427tt		3,103tt		2,705tt		5,161t		2,427tt
Bogslof Year 2001	71,300	204,455	71,300	204,455	35,650	233,366	276	260,646	0	266,716	1,000	
Year 2006		109,313		109,313		159,294		229,835		249,457		
Year 2012		99,670		99,670		143,312		220,029		244,438		
Pacific cod (BSAI) Year 2001	206,000	331tt	193,000	336tt	108,000	372tt	152,000	353tt	0	419t	193,000	336tt
Year 2006		356tt		366tt		454tt		396tt		656t		366tt
Year 2012		393tt		409tt		559tt		482tt		901t		409tt
Yellowfin sole (female spawning biomass) (EBS) Year 2001	191,000	711,432	191,000	711,432	97,000	760,476	135,000	740,145	0	813,086	123,262	
Year 2006		641,020		641,020		834,295		748,784		1,096560		
Year 2012		589,587		589,587		812,478		697,448		1,222,870		
Greenland turbot (BSAI) Year 2001	34,700	117,174	9,300	135,910	18,185	129,333	7,891	136,965	0	142,844	9,300	135
Year 2006		56,853		93,702		75,826		97,031		118,094		93,
Year 2012		79,683		120,544		100,371		124,680		153,015		120,544
Arrowtooth (BSAI) female spawning biomass Year 2001	131,000	375,488	131,000	375,488	66,314	419,924	10,927	461,771	0	470,127	131,000	375,488
Year 2006		178,885		178,885		256,400		370,923		399,636		178,885
Year 2012		196,043		196,043		264,019		392,836		429,656		196,043
Rock sole (BSAI) female spawning biomass Year 2001	230,000	562,489	230,000	562,489	116,933	610,766	32,530	646,620	0	663,330	134,760	
Year 2006		278,508		278,508		394,427		515,711		571,440		
Year 2012		262,297		262,297		366,101		505,737		577,790		
Sablefish (BSAI and GOA) Year 2001	17,300	180tt	17,000	180tt	8,905	187tt	16,703	180tt	0	196t	17,230	180tt
Year 2006		201tt		202tt		235tt		206tt		288t		202tt
Year 2012		221tt		223tt		280tt		235tt		389t		221tt
Atka mackerel BSAI (female spawning biomass) Year 2001	103,000	146,521	70,800	158,278	54,754	170,736	47,007	174,926	0	202,249	70,800	158,278
Year 2006		162,515		188,338		221,219		233,085		333,462		188,338
Year 2012		161,799		190,385		229,274		244,319		378,901		190,385

* The 2000 TAC under Alternatives 1 through 5 are the harvest values that would have been used in 2000 if adopted by the council. Alternative 9 2000 TACs are the adopted harvest levels for 2000.
tt = thousand metric tons

5.2 Effects on Species Prohibited in Groundfish Fisheries Harvest

Fishing at the Council proposed TAC levels in fishing year 2001 (Alternative 9) is not expected to adversely affect stocks of fish or invertebrates prohibited in groundfish fisheries harvest. Catches of Pacific halibut, crabs, salmon, and herring are controlled by PSC limits that are established based in proportion to the biomass estimates of those species. Section 4.3.5 of the NMFS 1998 SEIS describes the possible impacts of a range of total harvest alternatives on prohibited species. New information presented in section 3.2 does not demonstrate any impacts that NMFS considers to be significant or that were not already analyzed in the SEIS.

5.3 Effects on Essential Fish Habitat

The management areas where the fisheries take place are identified as essential fish habitat (EFH) for all the managed species listed in the fishery management plans. NMFS prepared an assessment of impacts to essential fish habitat (Appendix E of the 2000 Groundfish EA) and received a letter of consultation in reply (NMFS 1999a). In that letter NMFS stated it concurs with the assessment that fishing may have adverse impacts on EFH for managed species but concluded that any adverse effects have been minimized to the extent practical. No EFH recommendations were offered. See Section 3.4 for a summary of the consultation.

5.4 Effects on Marine Mammals and Species Listed as Threatened or Endangered Under the ESA

The effects of groundfish harvest at various TAC levels on marine mammals is discussed in section 4.3.2 of the SEIS (NMFS 1998a). Assessment of potential impacts is somewhat simpler for direct interactions than for indirect considerations. Estimates of marine mammal incidental takes in the federally managed groundfish fisheries are based on observer data whereby mortalities are tallied and observed takes are extrapolated to fishery-wide totals. In all cases in the groundfish fisheries, levels of direct incidental take are low relative to each marine mammal stock's Potential Biological Removal. As noted previously, two short-tailed albatross were taken in 1998 in the long-line fishery, however, this was within incidental take guidelines and did not prompt the USFWS to re-initiate consultation. The Council adopted additional seabird avoidance measures for implementation in the year 2001. NMFS is reviewing proposed rulemaking to implement the Council's recommendations.

Indirect interactions between marine mammals and commercial fisheries are much more difficult to detect and document. They include, competition for similar prey resources which may result in local scarcity of prey, and disturbance by fishing activities. Additional impacts have been suggested, including alteration of the age structure of fish stocks targeted by a fishery, resulting in a shift in biomass from older to younger age groups, and alteration of the actual and relative abundance of fish stocks in the ecosystem and increase in the dominance of less desirable forage species. Whereas the first two indirect effects are based on observed overlaps in marine mammal diets and harvested species and on spatial and temporal overlaps in fisheries and marine mammal distributions, the latter two suggest specific outcomes of ecosystem processes even though the processes themselves are poorly understood. As such, these concerns are speculative and can not be objectively evaluated with regard to their impacts on marine mammals.

Causal relationships between commercial harvesting of groundfish in the EEZ off Alaska and the population status and trends of marine mammal have not been established. The complexity of potential interactions at multiple temporal and spatial scales that might affect foraging behavior, coupled with the paucity of data available to characterize those relationships, inherently limit detection of fisheries effects. Thus, the mechanisms by which fish biomass removals might translate to marine mammal fitness or mortality are largely unknown at this time.

Interactions, either direct or indirect, between commercial fisheries and the 26 species of marine mammals inhabiting federal waters off Alaska vary widely, given those mammals diverse life histories and spatial distribution patterns. In general, the impacts resulting from the fisheries are likely to be constrained to those marine mammal species with the greatest potential dependence on prey species that are harvested commercially. Likewise, those marine mammals which feed more extensively in the commercial fishing grounds may be proportionally more affected. Of the 26 marine mammal species described in section 3.4 of the NMFS 1998 SEIS, only a subset have been shown to consume groundfish species as a large part of their diet, and to potentially do so in areas coincident with groundfish harvest operations. Thus, the greatest emphasis is placed on those species: Steller sea lion, northern fur seal and harbor seal. Among the cetacean species, a few include groundfish in their diets, but most exploit a larger prey base, with extensive consumption of invertebrates and small schooling fishes.

The new information on marine mammals presented in section 3.5 does not contain any impacts that would be considered significant or that were not already analyzed in the SEIS.

The section 7 consultations on Steller sea lion (NMFS 1998b, c) considered the impacts of the BSAI and GOA pollock and Atka mackerel fisheries and the TAC amounts being recommended for 1999 through 2001, and concluded that certain mitigation measures must be implemented for the BSAI and GOA. Fishery removals equal to or less than the ABC amounts were considered satisfactory (as under status quo TAC setting), but that these removals should be redistributed spatially and temporally according to the pollock stock biomass. Emergency rulemaking by NMFS redistributed the 1999 pollock fisheries both temporally and spatially, thereby reducing competition for prey between the fishery and Steller sea lions. In January 2000 NMFS promulgated emergency rulemaking to implement the revised final reasonable and prudent alternatives for the pollock fishery in fishing year 2000. Section 7 consultations on impacts of the year 2000 TAC specifications to marine mammals, particularly Steller sea lion, were concluded December 22, 1999, with a no jeopardy and no adverse modification to critical habitat determination (NMFS 1999b). See section 3.7 for a summary of the considerations.

Using the year 2000 proposed TAC specifications, NMFS reinitiated consultations for ESA listed Pacific salmon for all twelve ESUs of Pacific salmon that are thought to range into Alaskan waters. The consultation for the Pacific salmon species was issued December 20, 1999, and contained a determination of no jeopardy and no adverse modification of critical habitat (NMFS 1999c). See section 3.7 for a summary of the considerations.

Consultations have been re-initiated with respect to the 2001 proposed and interim TAC specifications for marine mammal listed species, and a biological opinion is expected in December 2000. In addition, an FMP-level biological opinion is being prepared pursuant to Section 7 of the ESA on all listed species present in the fishery management areas for the entire groundfish fisheries program. The opinion is expected to be completed in the fall 2000.

5.5 Socioeconomic Impacts

Socioeconomic impacts from a range of TAC levels are discussed in section 4.4 of the NMFS 1998 SEIS. All harvest levels are anticipated to have different net economic benefits. The actual value realized is dependent on factors unquantifiable at present, including market demand, costs of harvesting and processing, proportion of catch processed at sea, and the degree to which the TAC specifications are constrained by PSC limits.

A variety of at least partially external factors affect the economic performance of the BSAI and GOA groundfish fisheries. They include landing market prices in Japan, wholesale prices in Japan, U.S. imports of groundfish products, U.S. per capita consumption of seafood, Foreign exchange rates, and U.S. cold storage holdings of groundfish. More information on these factors are included in the 1999 Economic SAFE (Appendix C of the 2000 Groundfish EA).

Management actions that will decrease groundfish catches or increase operating costs may result from continued concerns with: 1) the bycatch of prohibited species, 2) the discard and utilization of groundfish catch, and 3) the effects of the groundfish fisheries on marine mammals and sea birds. The implementation of the American Fisheries Act and Steller sea lion conservation measures are expected to result in changes in the economic performance of the BSAI and GOA groundfish fisheries.

If proposed specifications are not published, as many as 1,751 small entities of all types may be affected. These operations would not fish for a year. In 1999 total ex-vessel groundfish revenues were $483.4 million and total processed product revenues for groundfish products were $994.6 million. While gross revenues are not net revenues or profits, they do suggest that large sums of money are at stake.

If proposed regulations were published, but interim regulations were not adopted, groundfish fishing would not take place between January 1 and mid to late February. Important groundfish fisheries would normally take place during this period. These include fisheries for pollock, Pacific cod, rock sole and Atka mackerel. The closure of these fisheries would have negative impacts on small businesses, small non-profits, and small government jurisdictions. As many as 503 small entities of all types may be affected if proposed specifications are published but interim specifications do not become effective.

The alternatives considered for the IRFA are (1) effective proposed and interim specifications that will permit groundfish fishing on January 1, 2001, or (2) no effective proposed and interim specifications and a closure of the groundfish fisheries between January 1 and the effective date for proposed and final specifications. Based on past experience, final specifications are likely in February. Important groundfish fisheries would normally take place during the period from January 1 to mid-February. These include fisheries for pollock, Pacific cod, rock sole and Atka mackerel. The closure of these fisheries would have negative impacts on small businesses, small non-profits, and small government jurisdictions. As many as 503 small entities of all types may be affected. This estimate is made by summing across different categories of small entities and is biased upward to some extent due to overlap between some of the categories and consequent double-counting.

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