18. Assessment of the skate stock complex

in the Gulf of Alaska

Olav A. Ormseth
NMFS Alaska Fisheries Science Center, Seattle WA

Executive Summary

The Gulf of Alaska (GOA) skate complex is managed as three units. Big skates (*Raja binoculata*) and longnose skates (*Raja rhina*) each have separate harvest specifications, with acceptable biological catches (ABCs) specified for each GOA regulatory area (western, central, and eastern). A single gulfwide overfishing level (OFL) is specified for each stock. All remaining skate species are managed as an "Other Skates" group with gulfwide harvest specifications. All GOA skates are managed under Tier 5, where OFL and ABC are based on survey biomass estimates and natural mortality rate.

Gulf of Alaska skates are on a biennial stock assessment schedule to coincide with the availability of new survey data from the biennial trawl survey. A full assessment was presented in 2011, which included data from the 2011 GOA bottom trawl survey. On alternate (even) years an executive summary is presented with updated catch, last year's key assessment parameters, any significant new information available in the interim, and projections for this year. Last year's full assessment is available on the web (Ormseth 2011, http://www.afsc.noaa.gov/REFM/docs/2011/GOAskate.pdf).

Summary of Changes in Assessment Inputs

1) Catch data are updated through September 28, 2012.

Summary of Results

1) The total 2011 skate catch was down slightly relative to 2010, and the 2012 catch as of September 28 is down substantially from previous years.
2) Retention rates in 2012 have increased for big skates (92% vs. 81% in 2011) and longnose skates (77% vs. 65%).

The harvest recommendation summary tables are on the following pages. W, C, and E indicate the western, central, and eastern GOA regulatory areas, respectively. Big and longnose skates have area-specific ABCs and gulfwide OFLs; other skates have a gulfwide ABC and OFL.

big skate (*Raja binoculata*)

Quantity		As estimated or *specified last* year for		As estimated or *recommended this* year for:	
		2012	*2013*	**2013**	*2014*
M (natural mortality)		*0.1*	*0.1*	**0.1**	0.1
Specified/recommended Tier		*5*	*5*	**5**	5
Biomass (t; 3-survey average)	W	*6,258*	*6,258*	**6,258**	6,258
	C	*23,900*	*23,900*	**23,900**	23,900
	E	*20,071*	*20,071*	**20,071**	20,071
	GOA-wide	*50,229*	*50,229*	**50,229**	50,229
F_{OFL} ($F=M$)		*0.1*	*0.1*	**0.1**	0.1
$maxF_{ABC}$		*0.075*	*0.075*	**0.075**	0.075
F_{ABC}		*0.075*	*0.075*	**0.075**	0.075
OFL (t)	GOA-wide	*5,023*	*5,023*	**5,023**	5,023
ABC (t; equal to maximum ABC)	W	*469*	*469*	**469**	469
	C	*1,793*	*1,793*	**1,793**	1,793
	E	*1,505*	*1,505*	**1,505**	1,505
	GOA-wide	*3,767*	*3,767*	**3,767**	3,767
Status		As determined *last* year for:		As determined *this* year for:	
		2010	2011	**2011**	2012
Overfishing?		*no*	*na*	**no**	na
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)					

longnose skate (*Raja rhina*)

Quantity		As estimated or *specified last* year for		As estimated or *recommended this* year for:	
		2012	*2013*	**2013**	*2014*
M (natural mortality)		*0.1*	*0.1*	**0.1**	0.1
Specified/recommended Tier		*5*	*5*	**5**	5
Biomass (t; 3-survey average)	W	*928*	*928*	**928**	928
	C	*25,059*	*25,059*	**25,059**	25,059
	E	*9,008*	*9,008*	**9,008**	9,008
	GOA-wide	*34,995*	*34,995*	**34,995**	34,995
F_{OFL} ($F=M$)		*0.1*	*0.1*	**0.1**	0.1
$maxF_{ABC}$		*0.075*	*0.075*	**0.075**	0.075
F_{ABC}		*0.075*	*0.075*	**0.075**	0.075
OFL (t)	GOA-wide	*3,500*	*3,500*	**3,500**	3,500
ABC (t; equal to maximum ABC)	W	*70*	*70*	**70**	70
	C	*1,879*	*1,879*	**1,879**	1,879
	E	*676*	*676*	**676**	676
	GOA-wide	*2,625*	*2,625*	**2,625**	2,625
Status		As determined *last* year for:		As determined *this* year for:	
		2010	2011	**2011**	2012
Overfishing?		*no*	*n/a*	**no**	n/a
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)					

Other skates (*Bathyraja* sp.)					
		As estimated or *specified last* year for		As estimated or *recommended this* year for:	
Quantity		*2012*	*2013*	**2013**	2014
M (natural mortality)		*0.1*	*0.1*	**0.1**	0.1
Specified/recommended Tier		*5*	*5*	**5**	5
Biomass (t)	GOA-wide	*27,061*	*27,061*	**27,061**	27,061
F_{OFL} (*F=M*)		*0.1*	*0.1*	**0.1**	0.1
$maxF_{ABC}$		*0.075*	*0.075*	**0.075**	0.075
F_{ABC}		*0.075*	*0.075*	**0.075**	0.075
OFL (t)	GOA-wide	*2,706*	*2,706*	**2,706**	2,706
ABC (t; equal to maximum ABC)	GOA-wide	*2,030*	*2,030*	**2,030**	2,030
Status		As determined *last* year for:		As determined *this* year for:	
		2010	2011	**2011**	2012
Overfishing?		*no*	*na*	**no**	na
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)					

Tables

Table 1. Time series of ABC, OFL and catch for skates, beginning in 2004 when skates were first managed separately from the Other Species complex.

	ABC			OFL	estimated skate catch			management method
	W	**C**	**E**		**W**	**C**	**E**	
2004		4,435		10,859		1,569		big/longnose CGOA
		3,709				1,451		other skates gulfwide + big/longnose W/E
2005	727	2,463	809	5,332	26	811	67	big
	66	1,972	780	3,757	37	993	173	longnose
		1,327		1,769		719		other skates gulfwide
2006	695	2,250	599	4,726	72	1,268	359	big
	65	1,969	861	3,860	57	679	240	longnose
		1,617		2,156		1,402		other skates gulfwide
2007	695	2,250	599	4,726	69	1,517	9	big
	65	1,969	861	3,860	76	966	335	longnose
		1,617		2,156		1,241		other skates gulfwide
2008	632	2,065	633	4,439	132	1,241	48	big
	78	2,041	768	3,849	34	965	115	longnose
		2,104		2,806		1,402		other skates gulfwide
2009	632	2,065	633	4,439	73	1,803	122	big
	78	2,041	768	3,849	78	1,018	271	longnose
		2,104		2,806		1,340		other skates gulfwide
2010	598	2,049	681	4,438	146	2,219	171	big
	81	2,009	762	3,803	104	839	180	longnose
		2,093		2,791		1,489		other skates gulfwide
2011	598	2,049	681	4,438	91	2,074	126	big
	81	2,009	762	3,803	61	855	103	longnose
		2,093		2,791		1,206		other skates gulfwide
*2012**	*469*	*1,793*	*1,505*	5,023	*59*	*1,302*	*57*	big
	70	*1,879*	*676*	3,500	*19*	*541*	*97*	longnose
		2,030		2,706		*1,052*		other skates gulfwide

* 2012 catch is incomplete; retrieved September 28, 2012.

Sources: Harvest specifications from AKRO catch statistics website. Estimated skate catch 2003-2012 from AKRO Catch Accounting System (CAS).

Table 2. Catch of big, longnose, and other skates by regulatory area. Data are from the Alaska Regional Office Catch Accounting System. * 2012 data are incomplete; retrieved September 28,2012.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*
					WGOA					
big	0	63	26	72	69	132	73	146	91	59
longnose	1	28	37	57	76	34	78	104	61	19
other	571	358	163	354	479	253	335	413	284	238
					CGOA					
big	0	1,125	811	1,268	1,517	1,241	1,803	2,219	2,074	1,302
longnose	40	444	993	679	966	965	1,018	839	855	541
other	3,802	794	506	988	672	1,058	881	984	853	713
					EGOA					
big	0	16	67	359	9	48	122	171	126	57
longnose	11	67	173	240	335	115	271	180	103	97
other	154	125	50	61	90	91	123	92	68	101
					TOTAL GOA					
big	0	1,204	904	1,699	1,595	1,421	1,998	2,536	2,291	1,419
longnose	53	539	1,202	976	1,377	1,114	1,367	1,124	1,020	657
other	4,527	1,277	719	1,402	1,241	1,402	1,340	1,489	1,206	1,052

Table 3. Catches of skates in the GOA by target fishery, 2003-2012. Data in Tables 3a-c are from the Alaska Regional Office Catch Accounting System. * 2012 are incomplete; retrieved September 28, 2012.

Table 3a. Big skate catch, GOA, 2003-2012.

| | | | | | big skate | | | | | |
target fishery	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*
Pacific cod		331	222	417	537	586	550	940	916	564
arrowtooth flounder		140	225	163	299	219	433	478	812	549
shallow flatfish		237	251	350	608	413	535	707	190	115
IFQ halibut		24	37	577	11	36	90	43	132	28
rex sole		31	49	99	74	70	264	172	106	108
walleye pollock		1	2	23	38	22	34	47	93	15
flathead sole		38	21	30	23	66	53	112	31	30
rockfish		16	19	4	0	4	4	13	8	7
sablefish		6	24	9	6	3	5	11	2	1
deepwater flatfish		4	0	0	0	0	0	1	1	0
GOA total		1,204	904	1,699	1,595	1,421	1,998	2,536	2,291	1,419

Table 3b. Longnose skate catch, GOA, 2003-2012.

| | | | | | longnose skate | | | | | |
target fishery	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*
Pacific cod	10	83	139	165	306	361	325	425	345	258
arrowtooth flounder	14	63	373	135	165	212	152	166	238	104
IFQ halibut	1	35	106	197	394	109	380	115	171	70
shallow flatfish	3	26	278	97	168	227	239	173	78	38
sablefish	16	121	113	306	264	123	79	98	67	89
rex sole	0	13	19	29	24	36	82	52	44	26
walleye pollock	0	0	5	13	27	24	35	10	35	2
rockfish	1	32	20	21	17	12	17	12	25	24
flathead sole	9	7	11	11	13	11	24	30	17	47
deepwater flatfish	0	3	1	0	0	0	0	1	0	0
GOA total	53	539	1,202	976	1,377	1,114	1,367	1,124	1,020	657

Table 3c. Other skates catch, GOA, 2003-2012.

target fishery	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*
				other skates						
Pacific cod	806	490	175	981	529	958	689	1,059	665	693
arrowtooth flounder	195	173	194	64	122	88	99	133	243	120
IFQ halibut	191	73	47	78	108	58	253	46	122	40
sablefish	153	113	129	128	260	134	82	121	111	128
rex sole	346	46	36	56	103	22	60	41	21	13
rockfish	105	19	59	49	20	10	13	28	14	16
flathead sole	191	44	38	12	20	5	13	19	13	11
shallow flatfish	559	65	36	27	70	107	98	36	12	27
Atka mackerel	0	0	0	0	0	0	0	0	2	0
walleye pollock	11	2	1	5	9	6	3	7	2	2
deepwater flatfish	0	1	0	0	0	0	0	0	0	0
GOA total	**4,527**	**1,277**	**719**	**1,402**	**1,241**	**1,402**	**1,340**	**1,489**	**1,206**	*1,052*

Table 4. Retention rates of skates in GOA fisheries, 2007-2012. Data are from tables published by the Alaska Regional Office. * 2012 data are incomplete.

	other skates	big skate	longnose skate
2007	27%	46%	28%
2008	17%	70%	64%
2009	18%	76%	51%
2010	15%	72%	64%
2011	19%	81%	65%
2012*	14%	92%	77%

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