

## 16. Gulf of Alaska Skates (Executive Summary)

by

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### 16.1 Introduction

Gulf of Alaska (GOA) skates has been moved to a biennial stock assessment schedule to coincide with new survey data. A full assessment was presented in 2005 which included data from the 2005 GOA bottom trawl survey and updated life history information from recent research results. On alternate (even) years we will present an executive summary with updated catch, last year's key assessment parameters, any significant new information available in the interim, and projections for this year.

Skate management units have continued to evolve in 2004-2006 based on stock assessment and Plan Team input. Until 2003, skates were primarily caught as bycatch in both longline and trawl fisheries directed at Pacific halibut and other groundfish. In 2004, the skate species which were the targets of the 2003 fishery, big and longnose skates, were managed together under a single TAC in the Central GOA where the fishery had been concentrated in 2003. The remaining skates were managed as an "Other skates" species complex in the Central GOA, and all skates including big and longnose skates were managed as an "Other skates" species complex in the Western and Eastern GOA in 2004. As identification of species in the fisheries improved, skate management became more specific. In 2005 and 2006 big and longnose skates have been managed as single species groups throughout the GOA. Furthermore, to address concerns about disproportionate harvest of skates, big skate and longnose skate TACs were managed separately for the Western, Central, and Eastern GOA. The remaining skates (in the genus *Bathyraja*) were managed as a gulfwide species complex on "Other skates" in 2005 and 2006 because they were not the targets of the fishery and they are more difficult to identify.

Since 2004, GOA skates have been assessed using Tier 5 criteria given the lack of age data and other important life history information available to support age structured modeling. The average of the three most recent GOA trawl survey biomass estimates (2001, 2003 and 2005) was used to estimate exploitable biomass for big, longnose and Other skates of 47,260 mt, 38,601 mt, and 21,564 mt, respectively. Under Tier 5,  $F_{OFL} = M = 0.10$  (applied to all skates), and maximum permissible  $F_{ABC} = 0.75 \times M = 0.075$ . The 2006 (and 2007) ABCs were determined by multiplying the exploitable biomass by  $\max F_{ABC} = 0.075$  giving 3,544 mt, 2,895 mt, and 1,617 mt for big, longnose and Other skates, respectively. The corresponding OFLs were 4,726 mt, 3,860 mt, and 2,156 mt for big, longnose and Other skates, respectively. No directed fishing for skates in the GOA was recommended, due to high incidental catch in groundfish and halibut fisheries. In addition, the authors recommended area-specific ABCs *and* OFLs for both big and longnose skates. The Council set 2006 gulfwide OFLs at 4,726 mt, 3,860 mt, and 2,156 mt for

big, longnose, and Other skates, respectively. The Council set 2006 area-specific, total Gulf ABCs equal to TAC for big, longnose, and other skates at 3,544 mt, 2,895 mt, and 1,617 mt, respectively. Last year's full assessment is available on the web (Gaichas et al. 2005, <http://www.afsc.noaa.gov/refm/docs/2005/GOAskates.pdf> ).

## 16.2 New information and projection

New catch information includes updated 2005 catches and 2006 catch as of November 4, 2006 ([http://www.fakr.noaa.gov/2006/car110\\_goa.pdf](http://www.fakr.noaa.gov/2006/car110_goa.pdf)).

Gulfwide (mt)	2005	2006
Big skate	694	1463
Longnose skate	897	846
Other skates	418	930

However, for projection purposes, catch equal to TAC is assumed. There is no new information incorporated into the projection. For the 2007 fishery, we continue to recommend no directed fishing, area-specific ABCs *and* OFLs for big and longnose skates, and gulfwide ABCs and OFLs for Other skates. These total Gulf ABCs and OFLs (below) are equivalent to last year's ABCs and OFLs for 2006 (and 2007). The corresponding reference values for skates are summarized below. Because skates are managed in Tier 5, several of the values are not applicable (NA).

Tier 5	Last year's projection		This year's projection	
	<u>2006</u>	<u>2007</u>	<u>2007</u>	<u>2008</u>
M = 0.10				
$B_{40\%}$ (mt)	NA	NA	NA	NA
Female Spawning Biomass (mt)	NA	NA	NA	NA
Maximum permissible $F_{ABC}$	0.075	0.075	<b>0.075</b>	0.075
$F_{ABC}$	0.075	0.075	<b>0.075</b>	0.075
$F_{OFL}$	0.10	0.10	<b>0.10</b>	0.10
ABC (mt yield at $F_{ABC} = 0.75M$ )				
Big skate	3,544	3,544	<b>3,544</b>	3,544
Longnose skate	2,895	2,895	<b>2,895</b>	2,895
Other skates	1,617	1,617	<b>1,617</b>	1,617
OFL (mt, yield at $F_{ABC} = M$ )				
Big skate	4,726	4,726	<b>4,726</b>	4,726
Longnose skate	3,860	3,860	<b>3,860</b>	3,860
Other skates	2,156	2,156	<b>2,156</b>	2,156

## 16.3 Area apportionment

The apportionment percentages are identical to last year, because there is no new survey information. The following table shows the recommended apportionment for 2007.

	Western	Central	Eastern	Total
Area Apportionment	20%	63%	17%	100%
Area ABC (mt)				
Big skate	695	2,250	599	3,544
Longnose skate	65	1,969	861	2,895
Other skates	--	--	--	1,617
Area OFL (mt)				
Big skate	927	3,001	798	4,726
Longnose skate	87	2,625	1,148	3,860
Other skates	--	--	--	2,156

#### 16.4 Research priorities

Research has been conducted since the 2005 SAFE with new information on the life history of big and longnose skates (*Raja* spp.). The table below provides a comparative list of studies conducted in the Northeast Pacific, including the Gulf of Alaska. In 2007, observers will be collecting vertebrae for age structures for big, longnose, and Aleutian (*Bathyraja aleutica*) skates during fishery operations in the Gulf of Alaska. This work will also involve collecting baseline data to define maturity stages in these species. In addition, there is on-going work on *Bathyraja* skates (Bering skate *Bathyraja interrupta*, and Aleutian skate) conducted by researchers at Moss Landing Marine Laboratory to develop maturity schedules in the Bering Sea and Gulf of Alaska.

Common Name	Area	Max. Age	Length (Age) at 50% Maturity	Source
Big skate	Gulf of Alaska	15		1
Big skate	British Columbia	26	M: 72cm (6); F: 90cm (8)	2
Longnose skate	Gulf of Alaska	24		1
Longnose skate	British Columbia	26	M: 65cm (7); F: 83cm (10)	2
Longnose skate	West coast	22	M: 108cm (14); F: 120cm (16)*	3

1: Gburski et al.; 2: McFarlane and King 2006; 3: Thompson 2006; \*North of Cape Mendocino, CA

#### 16.5 Summaries for the Plan Team

Species	Year	Biomass	OFL	ABC	TAC	Catch <sup>1</sup>
Big skates (Gulfwide)	2005	53,324	5,332	3,999	3,999	694
	2006	47,260	4,726	3,544	3,544	1463
	2007	47,260	4,726	3,544		
	2008	47,260	4,726	3,544		

Species	Year	Biomass	OFL	ABC	TAC	Catch <sup>1</sup>
Longnose skates (Gulfwide)	2005	37,575	3,757	2,818	2,818	897
	2006	38,601	3,860	2,895	2,895	846
	2007	38,601	3,860	2,895		
	2008	38,601	3,860	2,895		

Species	Year	Biomass	OFL	ABC	TAC	Catch <sup>1</sup>
Other skates (Gulfwide)	2005	17,689	1,769	1,327	1,327	418
	2006	21,564	2,156	1,617	1,617	930
	2007	21,564	2,156	1,617		
	2008	21,564	2,156	1,617		

Stock/ Assemblage	Area	2006 <sup>2</sup>				2007 <sup>3</sup>		2008 <sup>3</sup>	
		OFL	ABC	TAC	Catch <sup>1</sup>	OFL	ABC	OFL	ABC
Big skates	W	--	695	695	66	927	695	927	695
	C	--	2,250	2,250	1146	3001	2,250	3001	2,250
	E	--	599	599	251	798	599	798	599
	Total		4,726	3,544	3,544	1463	4,726	3,544	4,726

Stock/ Assemblage	Area	2006 <sup>2</sup>				2007 <sup>3</sup>		2008 <sup>3</sup>	
		OFL	ABC	TAC	Catch <sup>1</sup>	OFL	ABC	OFL	ABC
Longnose skates	W	--	65	65	34	87	65	87	65
	C	--	1,969	1,969	673	2,625	1,969	2,625	1,969
	E	--	861	861	139	1,148	861	1,148	861
	Total		3,860	2,895	2,895	846	3,860	2,895	3,860

Stock/ Assemblage	Area	2006 <sup>2</sup>				2007 <sup>3</sup>		2008 <sup>3</sup>	
		OFL	ABC	TAC	Catch <sup>1</sup>	OFL	ABC	OFL	ABC
Other skates	W	--	--	--	--	--	--	--	--
	C	--	--	--	--	--	--	--	--
	E	--	--	--	--	--	--	--	--
	Total		2,156	1,617	1,617	930	2,156	1,617	2,156

1. Source: ([http://www.fakr.noaa.gov/2006/car110\\_goa.pdf](http://www.fakr.noaa.gov/2006/car110_goa.pdf)).
2. [http://www.fakr.noaa.gov/sustainablefisheries/specs06\\_07/goatable1.pdf](http://www.fakr.noaa.gov/sustainablefisheries/specs06_07/goatable1.pdf)
3. Stock assessment recommendations.

## 16.6 References (New)

- Gburski, C.M., S.K. Gaichas, and D.K. Kimura. *Submitted*. The age and growth of big skate (*Raja binoculata*) and longnose skate (*R. rhina*) and implications to the skate fisheries in the Gulf of Alaska. *Environmental Biology of Fishes*.
- McFarlane, G.A., and J.R. King. 2006. Age and growth of big skate (*Raja binoculata*) and longnose skate (*Raja rhina*) in British Columbia waters. *Fisheries Research* 78: 169-178.
- Thompson, J. 2006. Age, growth and maturity of the longnose skate (*Raja rhina*) on the U.S. West coast and sensitivity to fisheries impacts. M.S. Thesis, Oregon State University, Corvallis, Oregon.