17 Gulf of Alaska skates (Executive summary)

by
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Introduction

Assessment of skates (Rajidae) in the Gulf of Alaska (GOA) occurs on a biennial schedule, with full assessments occurring in years (currently odd-numbered years) where new biomass data are available from surveys. In "off" years, an executive summary is presented that updates catch data and other relevant information. Harvest recommendations are identical to those presented in the 2007 stock assessment and fishery evaluation (SAFE) report. That report, which also includes extensive information on skate biology and fisheries, can be found at: http://www.afsc.noaa.gov/refm/docs/2007/GOAskate.pdf

At least eleven skate species are known to occur in the GOA. Of these, big skates (*Raja binoculata*) and longnose skates (*Raja rhina*) are the most abundant (Fig. 1). These are also the species that are of greatest interest to commercial fisheries. The remaining nine species are considered in aggregate as "other skates". Skates occur throughout the GOA, but there are some differences in distribution. The majority of the total gulfwide skate biomass occurs in the Central Regulatory Area (Table 1). According to survey data, big skates are most common in depths shallower than 100m and longnose skates are more common in depths ranging from 100 to 200 m. The other skates are most abundant below 200m.

The survey estimates of skate biomass in the GOA have increased from the early 1990s until 2003 (Table 1 & Fig. 1). Since 2003, the biomass of big and longnose skates has decreased while the biomass of other skates has continue to grow (Table 1 & Fig. 1). However, surveys have varied in the depth ranges they have covered and some of the observed changes in skate biomass may be due to greater sampling effort. .

Management of skates in the GOA has changed considerably over the last few years. Until 2004, skates were managed as part of the "Other Species" complex with an aggregate total allowable catch (TAC) for all species groups. In 2004 skates were moved to a separate target species category. Since 2005, big and longnose skates have received separate harvest specifications, including separate acceptable biological catches (ABCs) and TACs for the three GOA regulatory areas. Other skates remain aggregated with a gulfwide ABC and TAC. Overfishing limits (OFLs) for big, longnose, and other skates are specified on a gulfwide basis. However, we continue to recommend separate big and longnose skate OFLs for each regulatory area.

The main impetus for these management changes was the onset of directed fishing for skates in 2003. Due to the high levels of incidental catch and uncertainty regarding commercial catches, directed fishing has been prohibited in the GOA since 2005. There are three main sources of uncertainty in the catch data for GOA skates: 1) many fishing vessels in the GOA, and particularly those potentially targeting skates, are sufficiently small (less than 125 ft.) to require only limited or no observer coverage; 2) fish tickets, another potential source of catch data, rarely include detailed information on skate species composition; and 3) there are no data regarding incidental skate catches in the IFQ halibut fishery, which may be a significant source of skate mortality. The catch data reported in this summary include only groundfish fisheries catches.

Harvest specifications for 2009 and 2010

There was no survey information for 2008, so biomass data (Table 1) and harvest specifications remain the same as last year. Catch data were updated to include the total 2007 catch and 2008 catch through October 3, 2008 (Table 2). Harvest specifications for skates are set according to Tier 5 using a natural mortality rate of 0.1 for all skates. Under Tier 5, $F_{OFL} = M = 0.1$, OFL = F_{OFL} * average biomass, maximum $F_{ABC} = 0.75$ X $M = 0.075$, and ABC = F_{ABC} * average biomass. Average biomass from biennial surveys during 2001-2007 is used. Harvest specifications for 2009 and 2010 are:

	Area	Big Skate	Longnose Skate	Other skates
M		0.1	0.1	0.1
F_{ABC}		0.075	0.075	0.075
F_{OFL}		0.1	0.1	0.1
avg. biomass 2001-2007	Western	8,422	1,043	
	Central	27,536	27,209	
	Eastern	8,434	10,239	
	Gulfwide	44,392	38,491	28,057
ABC	Western	632	78	
	Central	2,065	2,041	
	Eastern	633	768	
	Gulfwide	3,329	2,887	2,104
OFL	Western	842	104	
	Central	2,754	2,721	
	Eastern	843	1,024	
	Gulfwide	4,439	3,849	2,806

New developments

Skate reproductive biology

Research published in fall 2008 explored the reproductive biology of big and longnose skates in the GOA (Ebert et al. 2008, Fisheries Research 94(1): 48-57). For big skates, length at 50% maturity was estimated at 148.6 cm for females and 119.2 cm for males. For longnose skates, length at 50% maturity was estimate at 113.2 cm for females and 102.9 cm for males. These values suggest that big and longnose skates mature at larger sizes than do individuals of the same species in British Columbia and California. No evidence of seasonality in reproductive output was observed for either species.

Development of a state-waters skate fishery in Prince William Sound

The Alaska Department of Fish & Game (ADF&G) is preparing to open a limited fishery for skates in the state waters of Prince William Sound. This action was precipitated by the Alaska Legislature, which has approved $50,000 for the data collection efforts required to provide sufficient information to permit a fishery. Scientists at ADF&G are currently preparing harvest guidelines for this fishery.

Table 1. Biomass estimates (t) from the GOA bottom trawl surveys conducted by the Alaska Fisheries Science Center. No survey was conducted in 2001 in the Eastern Regulatory Area. Depth ranges surveyed differ among some years, and species identification is considered unreliable prior to 1999.

(all data in t)	1984	1987	1990	1993	1996	1999	2001	2003	2005	2007
Big skate										
Western	3,339	4,313	1,745	2,287	13,130	11,038	8,425	9,602	9,792	5,872
Central	17,635	20,855	9,071	21,586	26,544	34,007	30,658	33,814	25,544	23,249
Eastern	6,566	2,925	11,501	15,836	3,391	9,606		11,981	3,984	9,337
Gulfwide	27,540	28,093	22,316	39,708	43,064	54,650	39,082	55,397	39,320	38,458
Longnose skate										
Western	0	41	1,045	105	278	1,747	104	782	1,719	628
Central	2,280	2,667	8,708	14,158	20,328	29,872	23,171	25,741	29,853	26,034
Eastern	6,722	3,923	2,242	3,539	5,620	7,714		13,081	9,876	7,759
Gulfwide	9,002	6,631	11,995	17,803	26,226	39,333	23,275	39,603	41,449	34,421
Other skates										
Western	728	483	167	956	761	2,956	3,245	4,880	2,288	3,844
Central	3,632	2,590	13,146	3,769	9,675	14,269	9,612	15,910	26,992	27,630
Eastern	287	266	624	1,467	1,476	1,721		985	784	859
Gulfwide	4,647	3,339	13,936	6,191	11,912	18,946	12,857	21,775	30,063	32,333

Table 2. Catch and harvest specifications for GOA skates. Data are from the Catch Accounting System maintained by the Alaska Regional Office. * In 2003 skates were managed as part of the Other Species complex with a single TAC for the complex and no ABC or OFL. ** For 2004 skates were separated from Other Species and split into two specification groups: 1) ABC and TAC for big and longnose skates in the central area, and 2) ABC and TAC for big and longnose skates in the western and eastern areas and other skates gulfwide. A single OFL was specified for all skates gulfwide. ***2008 data are as of October 3, 2008.

(all data in t)		2003*	2004**	2005	2006	2007	2008***
Big skate (*Raja binoculata*)							
Catch	Western	0	59	21	25	61	39
	Central	0	846	619	975	895	709
	Eastern	0	7	55	2	4	45
	Gulfwide	0	912	694	1,001	961	792
ABC	Western	N/A	N/A	727	695	695	632
	Central	N/A	4,435**	2,463	2,250	2,250	2,065
	Eastern	N/A	N/A	809	599	599	633
	Gulfwide	N/A	N/A				
TAC	Western	N/A	N/A	727	695	695	632
	Central	N/A	4,435**	2,463	2,250	2,250	2,065
	Eastern	N/A	N/A	809	599	599	633
	Gulfwide	N/A	N/A				
OFL	Gulfwide	N/A	N/A	5,332	4,726	4,726	4,439
Longnose skate (*Raja rhina*)							
Catch	Western	2	16	7	24	23	9
	Central	40	277	791	393	526	434
	Eastern	10	8	98	9	12	39
	Gulfwide	52	301	897	426	561	482
ABC	Western	N/A	N/A	66	65	65	78
	Central	N/A	4,435**	1,972	1,969	1,969	2,041
	Eastern	N/A	N/A	780	861	861	768
	Gulfwide	N/A	N/A				
TAC	Western	N/A	N/A	66	65	65	78
	Central	N/A	4,435**	1,972	1,969	1,969	2,041
	Eastern	N/A	N/A	780	861	861	768
	Gulfwide	N/A	N/A				
OFL	Gulfwide	N/A	N/A	3,757	3,860	3,860	3,849
Other skates							
Catch	Western	586	347	146	335	318	185
	Central	3,840	636	264	311	309	295
	Eastern	150	87	9	6	17	33
	Gulfwide	4,576	1,069	419	653	644	513
ABC	Gulfwide	N/A	3,709**	1,327	1,617	1,617	2,104
TAC	Gulfwide	N/A	3,709**	1,327	1,617	1,617	2,104
OFL	Gulfwide	N/A	N/A	1,769	2,156	2,156	2,806

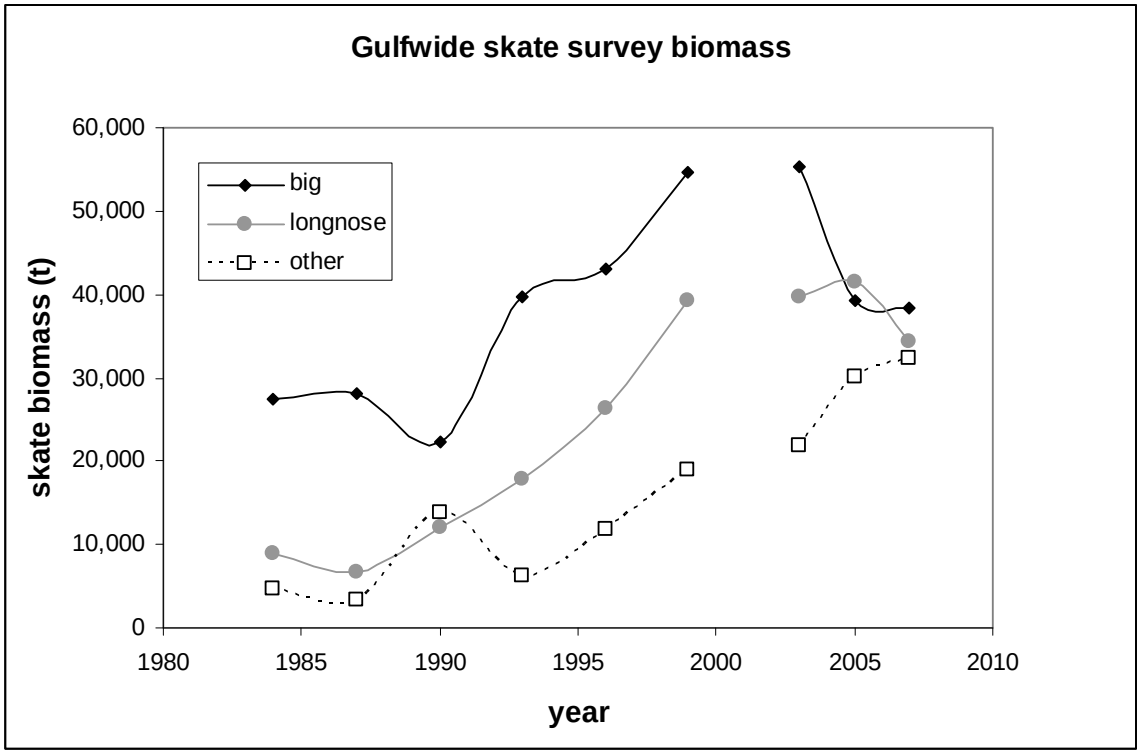

Figure 1. Biomass estimates (t) from the GOA bottom trawl surveys conducted by the Alaska Fisheries Science Center. No survey was conducted in 2001 in the Eastern Regulatory Area and that year's survey data are not presented. It should be noted that depth ranges surveyed differ among some years, and species identification is considered unreliable prior to 1999.

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