1d. Gulf of Alaska Sharks

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Executive Summary

Through 2007, sharks have been managed as part of the "other species" complex in the Gulf of Alaska (GOA), with catch reported only in the aggregate with octopus, squids, and sculpins. For the 2007 SAFE report, it was decided that for many of the "other species" reports a full assessment was not necessary, and that an Executive Summary would suffice. The shark species complex in Alaska may consist of up to 10 species, however, spiny dogfish (*Squalus acanthias)*, Pacific sleeper shark (*Somniosus pacificus*) and salmon sharks (*Lamna ditropis*) are by far the three most common species in the GOA. There is no directed fishery for sharks in the GOA at this time. However, spiny dogfish and Pacific sleeper sharks are taken incidentally in bottom trawl and longline fisheries, but most sharks are not retained. Courtney et al. (2006) used two of the three available time series for estimating catches of sharks. The 2006 assessment authors' recommended method (option 1, "Modified Tier 6 Approach", Courtney et al. 2006), which was endorsed by the Plan Team, uses the data from 1997-2005 only to calculate shark catches. Up-to-date catches are reported in Table 1. The current assessed status suggests that overfishing for sharks in the GOA is not occurring. In 2006, the authors presented three alternative methods for calculating ABC and OFL: Tier 5, Tier 6 using the average catch (1977-1995) calculation, and a modified Tier 6 approach. There have always been problems with applying Tier 5 and Tier 6 options to sharks in the GOA. Tier 5 criteria for establishing ABC and OFL require reliable point estimates for biomass, which currently do not exist for sharks in the GOA, as the efficiency of bottom trawl gear is questionable for assessing these species. Tier 5 also requires reliable estimates of natural mortality (*M*). The two most abundant species in the GOA, spiny dogfish and Pacific sleeper shark, currently lack reliable estimates of *M*. As part of an ongoing PhD project at the University of Alaska Fairbanks, a preliminary estimate of *M* for spiny dogfish is reported in the 2006 GOA shark assessment (Courtney at al. 2006) and a final estimate is being calculated and should be available next year. However, an estimate for Pacific sleeper sharks does not exist. Tier 6 criteria requires a reliable catch history from 1978-1995, which does not exist for sharks in the GOA. The modified Tier 6 approach presented is based on the premise that estimated incidental catch can be considered a known safe level of fishing. Based on this premise, the maximum incidental catch can be used to set OFL for the shark complex, and the ABC would be estimated as 75% of the OFL. The Plan Team concurred with the authors' general recommendation in 2006, that using the modified Tier 6 approach (option 1, using the maximum incidental catch for the OFL, Courtney et al. 2006) may be the most appropriate way to proceed at this point. Under the modified Tier 6 approach, the ABC for GOA sharks is 1,792 mt, and the

OFL is 2,390 mt (Tables 2 and 3). The ABC and OFL under the Tier 6 approach are also presented in Table 4 for comparison.

Updated Catches

Table 1. Estimated catch (mt) of sharks in the Gulf of Alaska (GOA) by species. Catches for years 1997–2002 from the NMFS REFM pseudo-blend catch estimation procedure. Catches for years 2003-2007 from NMFS AKRO.

Year	Spiny dogfish	Pacific sleeper shark	Salmon shark	Other/Unidentified shark	Total sharks	Total other species	% of Total
1997	657	136	124	123	1,041	5,409	19%
1998	865	74	71	1,380	2,390	3,781	63%
1999	314	558	132	33	1,036	3,859	27%
2000	398	608	38	74	1,117	5,649	20%
2001	494	249	33	77	853	4,801	18%
2002	117	226	58	26	427	4,040	11%
2003	369	292	36	62	759	6,339	12%
2004	175	232	22	39	468	1,559	30%
2005	408	440	52	58	959	2,294	42%
2006	1,324	209	29	53	1,615	3,467	47%
2007	344	217	13	63	637	2,151	30%
Average 1997-2005*	421.8	312.8	62.7	208.0	1,005.4	4,192.3	
Maximum 1997-2005*	1,324	608	132	1,380	2,390	6,339	
Total All years	5,464	3,242	593	1,988	11,300	43,349	
% of Total All years	48%	29%	5%	18%	100%	26%	

* Average and maximum catch for 1997-2005 used for modified Tier 6 calculations.

Alternative Tier 6 ABC and OFL Options

Table 2. Estimates of shark catch limits under the modified Tier 6 method

	Alternative Tier 6 Criteria GOA – Shark Complex	Alternative Tier 6 Options GOA – Sharks (mt)
ABC	0.75*Maximum incidental catch (1997-2005)	1,792
OFL	Maximum incidental catch (1997-2005)	2,390

Table 3. Gulf of Alaska (GOA) modified Tier 6 calculations by species and total of all species (mt).

Alternative GOA Tier 6 Calculations (mt)					
Species	Spiny dogfish	Pacific sleeper shark	Salmon shark	Unidentified shark	**Total sharks**
Maximum incidental catch (1997-2005)	1,324	608	132	1,380	2,390
ABC	993	456	99	1035	**1,792**
OFL	1324	608	132	1380	**2,390**

Table 4. Estimates of shark catch limits under the Tier 6 method.

	Tier 6 Criteria GOA – Shark Complex	Tier 6 Options GOA – Sharks (mt)
ABC	0.75*Average incidental catch (1997-2005)	754
OFL	Average incidental catch (1997-2005)	1,005

New Information in 2007

New information in 2007 for sharks includes updated commercial catch estimates for 2007 and a biomass estimate from the 2007 trawl survey. Biomass estimates for sharks were: 0 for unidentified sharks, 12,340 mt for salmon sharks, 161,965 mt for spiny dogfish, and 39,635 mt

for sleeper sharks. The biomass estimates of spiny dogfish have increased greatly since the first survey in 1984, and the 2007 biomass estimate is substantially larger than the estimates in any of the previous surveys. However, estimates of biomass are highly variable because the efficacy of bottom trawl gear is questionable for assessing these species.

Reference

Courtney, D., C. Tribuzio, K. J. Goldman, and J. Rice. 2006. GOA Sharks. *In* Stock assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska, Appendix E, p. 481-561. North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage AK 99501.