

HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM REPORT ON WEST COAST SWORDFISH MANAGEMENT

The Highly Migratory Species Management Team (HMSMT) wrote a supplemental report (Agenda Item B.3.b.) to address the November 2011 Council request for new information on bycatch and bycatch mitigation in swordfish fisheries as background for a decision on whether to consider options for revitalizing the West Coast swordfish fishery. This report summarizes key points in the HMSMT supplemental report, provides additional information and offers HMSMT recommendations based on discussions held with the HMS Advisory Subpanel (HMSAS).

Executive Summary of Supplemental Report 1 and New Information:

The genesis for Council discussion on potential revitalization of the West Coast swordfish fishery was partially in response to a September 2011 National Marine Fisheries Service (NMFS) report to the Council on the May 2011 swordfish workshop sponsored by the NMFS Southwest Region. Background provided in the report summarizes recent trends in landings and effort in the U.S. West Coast-based drift gillnet (DGN) fishery. The fishery has experienced a marked decline in effort since the early 1990s (Figure 1) that is projected to decrease further if the current management regime continues (Figure 2), despite a healthy population of swordfish in the North Pacific (Appendix B). The U.S. fisheries account for roughly 20 percent of all swordfish landed in the North Pacific with Japan accounting for the largest share. Currently over half of U.S. swordfish consumption is met by imports from foreign fisheries.

The California Department of Fish and Game recently conducted a survey of swordfish fishermen in order to gather opinions on the current state of the swordfish fisheries in California (Appendix A). Of 130 surveys sent out, 48 were returned¹. The DGN respondents overwhelmingly indicated that changes are needed in the fishery in order to make it more viable, specifically addressing time-area modifications to the Pacific Leatherback Conservation Area (PLCA). Survey results suggest that the majority of DGN respondents lack interest in transitioning to a longline fishery, unless it would be possible to fish within the U.S. Exclusive Economic Zone (EEZ). Since the survey only includes a subset of current fishery participants, and the West Coast swordfish fishery has dwindled in recent years, a question remains about the interests of other potential participants.

Past Council action regarding West Coast swordfish fisheries included consideration of EFPs for the DGN fishery (2006) and for authorizing a single vessel to target swordfish inside the West Coast EEZ with shallow-set longline (SSLL) gear and stringent bycatch mitigation measures (2007). In addition, the Council developed an amendment to the HMS Fishery Management Plan (2009) that would have authorized a limited entry SSLL fishery for swordfish outside the EEZ which was not adopted due in part to concerns raised about latent DGN permits and potential bycatch. Information on recent trends in active vs. latent permit holders is shown in Figure 10. Since the Hawaii SSLL reopened in 2004, vessels fishing under a Hawaii Pelagics

¹ Note that in Agenda Item B.3.b. Supplemental HMSMT Report 1, Appendix A indicates 48 respondents including 15 harpoon and “27” DGN fishers responded, but the correct number of DGN respondents should read “33”.

Plan permit have supplied an increasing proportion of swordfish delivered to California ports (Figure 5). Recent evidence suggests that spillover effects of U.S. fishery regulations increased dependence on foreign fleets not subject to comparable bycatch mitigation measures to meet U.S. and global swordfish demand at a higher cost in terms of turtle bycatch (e.g. Rausser et al. 2008).

Significant reductions in sea turtle bycatch resulted when the Hawaii SSSL fishery reopened (Figure 7). The bycatch mitigation measures now required in the Hawaii SSSL fishery originated with gear experiments on the U.S. East Coast that showed large reductions in leatherback and loggerhead sea turtle bycatch with the use of circle hooks and mackerel-type bait (Figure 6). The success in meeting sustainability standards and reducing bycatch likely contributed to an MSC Certification of the U.S. North Atlantic swordfish pelagic longline and buoy gear fishery in 2011.

The observed catch and bycatch for the West Coast DGN fishery are provided in Appendix C comparing before and after implementation of the PLCA. The data demonstrate declines in the total catch of many species including swordfish, sea turtles, and mammals, while nominal swordfish catch per set has remained unchanged. Comparable data from the Hawaii SSSL observer program for vessels landing into or originating from California ports are shown below. While comparing these data with the DGN catch and bycatch data is somewhat problematic due to the different times and areas fished, the data suggest lower rates of non-marketable bycatch with SSSL than with DGN gear.

Table 1: Hawaii shallow-set longline fishery observed catch of finfish from trips landing in or originating from California ports, 2008-2011.²

Species	2008-2011			
	Number Caught	Percent Retained	Percent Returned Alive	Number Caught per 100 Swordfish
Marketable Catch (Percent Retained greater than 50)				
Swordfish	12663	88.9	3.8	
Tuna, Albacore	2801	79.3	10.6	22.1
Dolphinfish	2449	81.9	15.4	19.3
Escolar	1176	59.2	24.7	9.3
Tuna, Bigeye	431	87.2	9.5	3.4
Opah	389	50.4	37.5	3.1
Pomfret, Brama spp.	101	70.3	12.9	0.8
Marlin, Striped	86	65.1	24.4	0.7
Spearfish, Shortbill	49	57.1	26.5	0.4
Tuna, Yellowfin	43	93.0	7.0	0.3
Pomfret, Sickle	20	95.0	0.0	0.2
Tuna, Skipjack	20	80.0	10.0	0.2
Marlin, Blue	12	66.7	16.7	0.1
Wahoo	4	100.0	0.0	0.0
Non-marketable Catch				
Shark, Blue	6810	0.0	87.7	53.8
Lancetfish, Longnose	2420	0.0	10.6	19.1
Shark, Shortfin Mako	1414	5.3	67.1	11.2
Stingray, Pelagic	403	17.9	72.2	3.2
Oilfish	320	6.3	72.2	2.5
Snake Mackerel	119	20.2	37.8	0.9
Mola, Common	75	0.0	98.7	0.6
Shark, Unidentified	48	0.0	91.7	0.4
Ribbonfish, Tapertail	20	20.0	15.0	0.2
Shark, Bigeye Thresher	19	15.8	47.4	0.2
Boney Fish, Unidentified	19	0.0	89.5	0.2
Shark, Oceanic Whitetip	11	0.0	81.8	0.1
Shark, Unid. Mako	8	0.0	87.5	0.1
Puffer, Pelagic	7	0.0	100.0	0.1
Shark, Longfin Mako	7	0.0	100.0	0.1
Boney Fish, Other Identified	6	50.0	16.7	0.0
Pomfret, Dagger	5	0.0	60.0	0.0
Tuna, Unidentified	5	0.0	0.0	0.0
Dolphinfish, Pompano	4	50.0	50.0	0.0
Other Non-marketable Fish	16			

² Total number of hooks fished was 1,092,507 (1090 sets during 58 trips). Observer coverage was 100%. Species listed by common name include finfish that were caught four or more times. Other non-marketable fish include species for which three or fewer individuals were caught.

Table 2. Observed turtle, mammal and seabird catch in the Hawaii shallow-set longline fishery from trips landing in or originating from California ports, 2008-2011.³

Species	2008-2011	
	Number of Interactions	Number Released Alive
Seaturtles		
Turtle, Leatherback	12	12
Turtle, Loggerhead	6	6
Turtle, Green/Black	1	1
Cetaceans		
Dolphin, Risso's	9	8
Dolphin, Striped	2	1
Whale, Humpback	1	1
Beaked Whale, Mesoplodont	1	1
Seabirds		
Albatross, Black-footed	13	9
Albatross, Laysan	12	9

There does not appear to be much potential for the harpoon fishery to substitute for other swordfish gears. West Coast longline and DGN landings declined substantially over 2000-2010; however, the open access harpoon fishery showed little increase in landings, suggesting it did not serve to replace DGN and longline landings (Figure 8)⁴.

New information has become available since the implementation of the PLCA, including designation of critical habitat for leatherback turtles which warrants examination of the spatial and temporal extent of the existing closure. In addition, recent research includes experiments testing buoy gear and deep-set longlines for targeting swordfish deep during the day below the epipelagic zone where turtles forage. Swordfish were caught during both experiments. A key objective of both experiments is to determine where the swordfish are located relative to bycatch species (both vertical and horizontal separation) as measured by depth at capture and electronic tagging.

The HMSMT calls the Council’s attention to Informational Report 1, a paper by Carretta and Barlow (2011), on the “Dinner Bell” properties of acoustic pingers in the DGN fishery. The key findings are that pingers have helped reduce cetacean bycatch, and there is little statistical evidence to link pinger use to increased marine mammal depredation in the DGN fishery.

Recent market-related initiatives for better meeting U.S. conservation standards in swordfish fisheries include proposed import prohibitions on nations that do not meet U.S. standards for bycatch reduction, and the aforementioned MSC certification of the U.S. Atlantic longline and buoy fishery.

³ Total number of hooks fished was 1,092,507 over 58 trips (1090 sets). Observer coverage was 100%. Number released alive includes those released alive and alive with injury.

⁴ Due to confidentiality requirements, no West Coast-based longline fishery landings are shown after 2004 when the HMS FMP went into effect without authorizing shallow-set longline as a legal gear.

The NOAA Southwest Fisheries Science Center has additional ongoing research into swordfish and leatherback habitat use and overlap including spatial modeling of marketable catch and bycatch with respect to environmental features. Predictive models similar to the Hawaii Turtle Watch product could help fishermen increase efficiency and avoid fishing times and locations where bycatch species of concern are likely to be present.

HMSMT Recommendations:

The HMSMT discussed the approach of pursuing near-term, mid-term and long-term strategies should the Council choose to revitalize the West Coast swordfish fishery. Near-term and mid-term steps could involve adopting precautionary adaptive management measures to enable fishing when conditions indicate low bycatch risk and to gain fisheries-dependent data needed to support long-term decisions. Measures would need to ensure compliance with applicable conservation laws.

Possible near-term actions could be to (a) modify the existing DGN PLCA boundary or open season, to reflect research about leatherback turtle habitat and distribution, as well as research on the effects of mandatory conservation gear such as pingers and net extenders; and (b) support ongoing research to inform decision-making.

Possible mid-term measures include (a) exploring development of a SSSL fishery inside the EEZ, subject to precautionary bycatch mitigation measures; (b) testing alternative gears and fishing strategies which reduce protected species interactions for a given level of swordfish and other desirable catch; and (c) revisiting alternatives for a west coast SSSL fishery outside the EEZ.

Data obtained from the near-term and mid-term phases of development would be used to support a long-term decision toward revitalizing a West Coast swordfish fishery.

In conclusion, the HMSMT recommends that the Council continue to support research that further informs decision-making. If the Council decides that current West Coast swordfish fishery management does not meet the Council's objectives, then the Council should proceed with developing precautionary adaptive management measures that:

1. Enable near-term and mid-term collection of fishery-dependent data needed to inform decision-making and long-term actions while ensuring compliance with applicable conservation law.
2. Modify the current PLCA boundary or open season as supported by research regarding leatherback turtle habitat and distribution, current effort levels, existing conservation measures, and current bycatch rates.
3. Use data collected over the near- and mid-term as the basis for a decision on long-term development of a sustainable, economically-viable West Coast swordfish fishery while promoting protected species and finfish conservation.