

September 5, 2017

Mr. Phil Anderson, Chair  
Pacific Fishery Management Council  
7700 NE Ambassador Place, Suite 101  
Portland, OR 97220

Mr. Barry Thom, Regional Administrator  
National Marine Fisheries Service  
1201 Northeast Lloyd Boulevard, Suite 1100  
Portland, OR 97232

**RE: Agenda Item J.2. Swordfish Management Project Planning**

Dear Chair Anderson, Regional Administrator Thom and Council members:

We request that the Pacific Fishery Management Council (Council) and National Marine Fisheries Service (NMFS) develop and implement a revised plan for the future of the swordfish fishery off the West Coast. A revised plan is warranted in light of both the June 2017 NMFS decision to withdraw the drift gillnet (DGN) hard caps rule and the agency's decision to reject the Council recommendation to issue a rule requiring 100% monitoring of the fishery by 2018. Now, more than ever, we believe the time is right for a transition from DGN gear to cleaner gear types, which can be done through a combination of management tools available to the Council. We request that the Council take the opportunity to establish a comprehensive strategy to minimize and avoid bycatch in the fishery. That strategy should include limits on fishing effort, conservation actions and accountability measures rooted in the Council's previous work, and authorization of deep-set buoy gear, including a permitting regime with incentives and options for a transition from DGN to deep-set buoy gear. Given that the comprehensive plan envisioned by the Council in its September 2015 final recommendation to NMFS is no longer moving forward, we request that the Council and NMFS suspend efforts to federalize the California DGN swordfish fishery permits until a new comprehensive plan is established.

In withdrawing the hard caps rule, the agency contravened the will of the Council and its swordfish management and monitoring plan, as well as the State of California, lawmakers, businesses, recreational fishermen, conservation NGOs, and the tens of thousands of members of the public who supported the rule. What is more, NMFS indicated it would not implement 100 percent monitoring of the DGN swordfish fleet by the start of the 2018 fishing season, which was also recommended by the Council in 2015. The agency stated it would not hold DGN fishermen responsible for the cost of observers and, instead,

would hold a workshop to begin to consider electronic monitoring. In addition, since voting for the recommendation in 2015, the agency has been silent on the Council action to recommend NMFS remove the unobservable fishing vessel exemption for the 18 to 27 percent of the DGN fleet that never carries a fishery observer.

In light of these recent developments, we make several recommendations, set out below. We also highlight a new study finding a lack of evidence for the market transfer effect hypothesis during the 2001-2004 closure of the Hawaii pelagic longline swordfish fishery, and suggest this debate not further distract from the need to develop a revised plan to reduce bycatch while promoting domestic swordfish production with clean gear types.

**1. Develop a comprehensive plan to minimize bycatch, including time and area closures and total fishing effort caps for the California DGN swordfish fishery.**

In September 2015, the Council recommended adopting rolling two-year hard caps on the number of certain whale, dolphin and sea turtle species incidentally killed or injured by the California DGN swordfish fishery. In its letter to the Council, NMFS stated that the Magnuson Stevens Fishery Conservation and Management Act (MSA):

*requires that, if NMFS makes a negative determination on a Fishery Management Council's proposed regulations that the Council be advised of revisions that would make the proposed regulations consistent with the fishery management plan, plan amendment, the MSA, and other applicable law.*<sup>1</sup>

The agency stated that the Council could revise its proposed regulations to further reduce the probability of protected species interactions in the DGN fishery, including "specifying reduced time/area closures, which could be expected to meet the purpose of the proposed regulations."<sup>2</sup>

Thus, Oceana requests the Council initiate a process to consider both revised hard caps, including changing the duration for which the fishery would be closed should a cap be reached, and caps that trigger time and area closures. Such a process could consider hard caps and time/area closures like the emergency measures implemented in 2013 to protect endangered sperm whales,<sup>3</sup> or other variations to meet the objective of minimizing and

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<sup>1</sup> Mr. Barry Thom (National Marine Fisheries Service) (June 9, 2017). Letter to Mr. Herb Pollard (Pacific Fishery Management Council) regarding NMFS determination on the proposed hard cap rule. Pacific Fishery Management Council. Agenda Item H.1.a Supplemental NMFS Report 2. June 2017. Available: [http://www.pcouncil.org/wp-content/uploads/2017/06/H1a\\_Sup\\_NMFS\\_Rpt2\\_DGN\\_Jun2017BB.pdf](http://www.pcouncil.org/wp-content/uploads/2017/06/H1a_Sup_NMFS_Rpt2_DGN_Jun2017BB.pdf)

<sup>2</sup> *Id.*

<sup>3</sup> 78 Fed. Reg. 54,548 (September 4, 2013). NMFS issued temporary regulations under the authority of the MSA to implement an immediate closure of the California swordfish DGN fishery for the remainder of the season if one sperm whale was observed killed or seriously injured in DGN gear off California, and required all DGN fishing vessels to carry an observer when fishing in areas deeper than the 1,100 fathoms.

controlling bycatch in this fishery, establishing accountability measures for the DGN fishery, and incentives to switch to clean gear types.

In considering hard caps, the Council should consider the full suite of performance objectives related to finfish of concern, overall retention rate, marine mammals, and other species of concern. Some of these may be applied on a vessel-specific basis, while others may be more appropriate to apply fleetwide. We encourage the Council to broadly consider potential uses and application of bycatch hard caps.

We also request that as part of this process the Council consider a total effort cap on the number of DGN sets. Total bycatch in the DGN fishery (# of animals discarded) has declined over time, alongside a commensurate decline in the number of active vessels and number of sets. Therefore, capping DGN fishing at current levels provides a way to prevent an increase in total bycatch.

**2. Require 100 percent monitoring of the DGN feet and remove the unobservable fishing vessel exemption by the start of the 2018 fishing season.**

The surest way to understand the full impacts of the DGN fishery and resolve uncertainty surrounding bycatch estimates is to require 100 percent observer coverage or monitoring. As such, in 2015 the Council recommended NMFS maintain a minimum 30 percent observer coverage level until 2018, at which point the Council requested NMFS remove the unobservable vessel exemption and establish 100 percent observer coverage and/or monitoring.

We remain concerned that the existing monitoring program does not provide statistically reliable estimates of numerous species caught in the DGN fishery. Observer coverage levels have fluctuated widely in recent years, and despite the 30 percent observer coverage target,<sup>4</sup> only 10.8 percent of DGN sets were observed in the 2015-16 fishing season (the lowest level in over a decade) and only 22.4 percent of sets were observed last season. Current coverage remains inadequate to accurately and precisely document many marine mammal and sea turtle takes.

On average, more than 80 percent of sets are unobserved and four to six vessels never take aboard any observers (18 to 27 percent of the fleet in recent years). As recognized by the Council in its September 2015 final preferred alternative, one hundred percent observer coverage is needed for accurate and precise estimates of rare event bycatch (e.g.

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<sup>4</sup> In 2011 NMFS recommended 30 percent observer coverage for this fishery “to better document bycatch of rare and sensitive species.” National Marine Fisheries Service. 2011. U.S. National Bycatch Report [W. A. Karp, L. L. Desfosse, S. G. Brooke, Editors ]. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/SPO-117E, 508 p. at 359 and in 2015 the Council recommended NMFS maintain at least 30 percent observer coverage until 2018, when the Council requested 100 percent monitoring be implemented.

rare and protected species).<sup>5</sup> Increased coverage will provide greater certainty to the fleet, the concerned public and fishery managers regarding bycatch in this fishery.

**3. Create a permitting regime to transition the DGN fishery to Deep-Set Buoy Gear, providing incentives and options for fishermen.**

As detailed further in our comments under Agenda Item J.6, authorization of deep-set buoy gear provides a unique opportunity to expand swordfish landings while creating incentives to transition away from DGN. Deep-set buoy gear and harpoon gear are the only gear types used to catch swordfish that minimize and avoid bycatch.<sup>6</sup> Moreover, authorization of deep-set buoy gear provides a clean and profitable alternative to DGN. Data from the California Department of Fish and Wildlife<sup>7</sup> indicates that in 2015-16, four deep-set buoy gear exempted fishing permit vessels achieved ex-vessel revenues from landing swordfish similar to DGN vessels because of improved catch rates and a higher price per pound (\$7/lb. on average for deep-set buoy gear caught swordfish versus \$4/lb. for swordfish caught with DGN gear).

In the event NMFS continues its efforts to federalize DGN permits, we request that the Council and NMFS:

- a. Make federal DGN permits non-transferable and disallow the issuance of any new DGN permits;
- b. Retire latent DGN permits; and
- c. Provide options that would allow DGN fishermen to voluntarily retire their DGN permit now in exchange for deep-set buoy gear permits.

**4. The market transfer effect hypothesis should not distract from efforts to reduce bycatch in the West Coast swordfish fishery.**

We wish to highlight and submit to you a new study published in the Journal of Ocean and Coastal Economics, *The Market Transfer Effect in the Hawaiian Longline Fishery: Why Correlation Does Not Imply Causation*. The authors find the original studies that were the starting point for academic work on the transfer effect are seriously flawed. The study demonstrates there are many plausible reasons for increased foreign swordfish catch and

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<sup>5</sup> Babcock, E. A., and E. K. Pikitch. 2003. How much observer coverage is enough to adequately estimate bycatch? Pew Institute for Ocean Science and Oceana, 36 p. Available at:

<http://oceana.org/sites/default/files/reports/BabcockPikitchGray2003FinalReport1.pdf>

<sup>6</sup> See comparative analysis: Turner, C., Shester, G., and Enticknap, B. Providing Domestically Caught U.S. West Coast Swordfish: How to Achieve Environmental Sustainability and Economic Profitability. November 4, 2015. Available: [http://www.pcouncil.org/wp-content/uploads/2015/11/G2b\\_Sup\\_Public\\_Comment3\\_ELECTRONIC\\_ONLY\\_Nov2015BB.pdf](http://www.pcouncil.org/wp-content/uploads/2015/11/G2b_Sup_Public_Comment3_ELECTRONIC_ONLY_Nov2015BB.pdf)

<sup>7</sup> CDFW 2016. Agenda Item I.2.a, Supplemental CDFW Report: CDFW Update on Landings of Tuna, Swordfish, and Other Pelagics (Table 3). Available: [http://www.pcouncil.org/wp-content/uploads/2016/11/I2a\\_Sup\\_CDFW\\_Rpt\\_NOV2016BB.pdf](http://www.pcouncil.org/wp-content/uploads/2016/11/I2a_Sup_CDFW_Rpt_NOV2016BB.pdf)

that there is insufficient evidence to claim the closure of the Hawaii pelagic longline swordfish fishery in 2001-2004 was the underlying driver. Regardless of economic theory, however, managers ought to agree that U.S. fisheries should minimize bycatch and protect and recover threatened and endangered species, apart from whether foreign fisheries are striving for or meeting those objectives. Moreover, regardless of the methodological concerns with the transfer effect, scaling up domestic swordfish production with clean gears like deep set buoy gear can achieve a win-win of reducing our reliance on swordfish imports while reducing bycatch locally and globally. Lastly, we continue to support efforts by NMFS and the Council to restrict imports of foreign caught swordfish not meeting U.S. bycatch standards.<sup>8</sup>

In conclusion, the Council has many options available for moving forward and ultimately finding solutions to the bycatch concerns in the swordfish fishery. As the Council is now reconsidering a path forward, in light of NMFS's withdrawal of hard caps, we ask that you suspend federalization of permits, and develop a comprehensive plan for the swordfish fishery. Thank you for your time and consideration.

Sincerely,



Ben Enticknap  
Pacific Campaign Mgr. and Sr. Scientist



Geoffrey Shester, Ph.D.  
California Campaign Director & Sr. Scientist

Attached: Scorse, JD, Richards S, King P (2017) The Market Transfer Effect in the Hawaiian Longline Fishery: Why Correlation Does Not Imply Causation, *Journal of Ocean and Coastal Economics*: Vol. 4: Iss. 1, Article 2. DOI: <https://doi.org/10.15351/2373-8456.1060>

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<sup>8</sup> See Marine Mammal Protection Act, 16 U.S.C. § 1371(a)(2); Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1826k.

June 2017

## The Market Transfer Effect in the Hawaiian Longline Fishery: Why Correlation Does Not Imply Causation

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# The Market Transfer Effect in the Hawaiian Longline Fishery: Why Correlation Does Not Imply Causation

## **Acknowledgments**

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## 1. INTRODUCTION

A significant amount of discussion has surrounded the question as to whether the *market transfer effect* in the Hawaii longline swordfish fishery occurred during the US swordfish closure of 2001-2004, primarily due to the potential impact on sea turtle mortality. The market transfer hypothesis posits that any reduction in the US swordfish catch due to increased US regulation will result in increased catch by foreign fleets (Squires, 2013 and Pacific Fishery Management Council, 2013). If the market transfer hypothesis is correct—and if the foreign catch would *not* have otherwise increased—then the total number of sea turtle interactions by fishing fleets during this period may have increased, since foreign swordfish fleets typically have higher turtle bycatch rates than the Hawaii fleet (Bartram, Kaneko, and Kucey-Nakamura, 2010).

The starting point for the academic work in support of the market transfer effect during the Hawaii longline closure of 2001-2004 is a paper by Rausser et al. (2009): “Unintended Consequences: The Spillover Effects of Common Property Regulations.” In this paper, the authors claim to uncover evidence in support of the market transfer effect. They base their case on two main points: 1) while US fresh swordfish catch decreased due to the 2001-2004 closure, there was also an increase in fresh US swordfish imports (caught by foreign fleets) during this same period, and 2) the overall swordfish catch within the Eastern Pacific Ocean (EPO), where they believe the market transfer effect occurred, increased after the closure. The authors conclude that 2,882 additional turtles were killed worldwide because of the Hawaii longline swordfish fishery closure. More recent work by Chan and Pan (2016) reaches similar conclusions.

To our knowledge, no one has assessed the underlying assumptions that Rausser et al. and Chan and Pan rely on to reach their conclusions. Other studies have examined the market transfer effect in the Hawaii swordfish fishery (see Sarmiento, 2006, Bartram et al., 2010, Mukherjee, 2015, Squires et al., 2016), but all of them essentially accept the results from Rausser et al. and Chan and Pan.

Our analysis indicates that Rausser et al.’s and Chan and Pan’s conclusions about increased global turtle mortality are not robust, because while they provide evidence that demonstrates a correlation between the US closure and a market transfer effect, this correlation can be explained by other factors. They do not provide sufficient evidence to demonstrate that the Hawaii closure is the primary



factor that led foreign fleets to increase their swordfish catch. For the market transfer hypothesis to be robust one must demonstrate that foreign fleets in the EPO increased their catch in response to the closure. This paper shows that there are other explanations for the increased swordfish catch not accounted for in these previous papers, in particular:

1. Spain significantly increased its catch during the 2001-2004 closure period and this increase likely accounted for the subsequently higher US swordfish imports.<sup>1</sup> However, as our paper indicates, the Spanish fleet expanded significantly during this period due to increased subsidies from the Spanish government and the European Union. This increased Spanish fishing capacity was completely independent of US regulations (and began before 2001), but its effects coincidentally overlap with the 2001-2004 closure.
2. While Spain's catch dipped after the closure ended, it quickly increased again, far surpassing the average during the 2001-2004 closure, indicating sufficient demand for Spanish catch independent of the US market. Furthermore, as discussed below, the demand for swordfish from countries besides the US is more than adequate to sustain the Spanish fleet. Put another way, because of the closure, the US happened to provide a convenient and temporary market opportunity for the Spanish fleet, but they subsequently found many more willing buyers.
3. In the case of swordfish, most proponents of the market transfer effect assume (explicitly or implicitly) that swordfish not caught by the US fleet in Hawaii will migrate to other fishing grounds, where

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<sup>1</sup> As Rausser et al. (2009) correctly point out, because fishing fleets often sell fish through foreign ports, it is very hard to determine exactly which swordfish from which fleets ended up as new US imports. Consequently, they only analyze changes at the regional level. The only country that fishes swordfish in the EPO region which significantly increased fresh swordfish exports to the US during 2001-2004 was Panama; however, Panamanian swordfish catch in the EPO from 2001-2004 averaged only 225 tons, while in 2003 and 2004 they exported over 1000 tons to the US (FAO Fisheries and Aquaculture Information and Statistics, 1998-2016 and NOAA, 2000-2004), indicating that much of this fish had to have come from another fleet. The most likely fleet that accounted for these increased swordfish exports to the US was Spain, which sold them through Panama

they will then be caught by foreign fleets. A growing body of evidence suggests, however, that swordfish tend to remain within the sub-regions of the EPO, and are not as migratory as once thought. Therefore, the additional swordfish caught by the Spanish fleet are not the same swordfish that compete with the US fleets.

4. The likelihood that the market transfer effect occurred in the Western and Central Pacific Ocean (WCPO), as suggested by Chan and Pan (2016), is low. Countries that fish in this region include Australia, China, Chinese Taipei, Indonesia, Japan, Mexico, the Philippines, Republic of Korea, and the US. Chinese Taipei and the Philippines are the only countries that increased their swordfish landings during the 2001-2004 closure period. Chinese Taipei did not directly increase swordfish effort; they continued a seasonal coastal harpoon fishery between 2001 and 2004, and the bulk of their increase in swordfish landings can be attributed to the development of their tuna fisheries, and a subsequent increase in swordfish bycatch. The Philippines only fish for swordfish using municipal vessels and primarily use single hook hand lines, which would not overlap with the part of the WCPO used by the Hawaii longline fishery, nor very likely result in a large increase in turtle mortality.

Based on these findings, we conclude that there is insufficient evidence to suggest that the market transfer effect occurred in the Hawaii swordfish fishery during the closure of 2001-2004, and therefore insufficient evidence to suggest more turtles were killed. Furthermore, given that pelagic fish are a high value global commodity sought by many nations, the incentive to increase production by any one country or fleet is likely largely independent of the regulations of any other single country. There are many factors that influence catch which need to be examined, which is especially true for swordfish.

## **2. WHY THE SPANISH CATCH DRAMATICALLY INCREASED POST-2001**

EU domestic consumption of swordfish increased significantly post-2001 largely due to an outbreak of mad cow disease, as well as a large increase in subsidies to Spanish fishing fleets. Franz Fischler, the agricultural minister of the European Union, stated at a news conference in 2000, “Mad cow disease knows no borders but is moving from one member state to another (Daley, 2000).” In Spain, “the meat industry was severely affected, with slaughterhouses and meatpackers reporting a fall of 70 percent in animals produced for consumption (Daley, 2000).” The large drop in demand for beef after the outbreak created a search for alternative animal-based proteins to replace bovine sources. Following the announcements linking mad cow disease to degenerative brain disease, European consumers significantly reduced their consumption of beef. Consequently, beef producers reduced their herds, thereby removing cattle from the food chain (Perloff, 2014). Furthermore, in 2003 Jackie Hruby, US Meat Export Federation director for Europe, Russia, and the Middle East said: “The EU has a large and growing beef deficit expected to reach 450,000 metric tons in the next two years. This deficit comes from a decline in beef production and a recovery from beef consumption following the [mad cow disease] crisis in Europe a few years ago,” (Kamenski, 2005).

This reduction in beef consumption throughout Europe produced a corresponding increase in demand for fish protein within the EU. During this same time, the European Union significantly increased subsidies to Spanish fishing fleets. All of this was completely independent of US policy in the Hawaii longline swordfish fishery.

The EU’s head of fisheries Valérie Lainé stated, “politically [the fishing industry] is more important than any other industry,” (Wilson, Cabra, and García, 2014). Starting in 2000 (the year preceding the Hawaii longline closure) and continuing through 2006, the EU gave Spain nearly half (46%) of its entire fishery subsidies (approximately \$1.7 billion) to maintain and increase their fleets. The Spanish government increased this subsidy by an additional \$675 million, bringing the total subsidies between 2000 and 2006 to \$2.39 billion (Greenpeace España, 2010). These subsidies were used for a large construction and modernization effort within the Spanish fleet. During this time, 50 new Spanish vessels were constructed,

all of them larger than 30 meters, whereas most vessels prior to this were less than 25 meters in length. These new, large-scale vessels were thus able to hold more fish and stay out at sea longer.

Spanish culture is rooted in fishing, and Spain continues to be the primary source for swordfish within the EU (Spanish Ministry for Agriculture, Food, and the Environment, 2013). Spain is the EU's largest fishing nation in terms of catch, tonnage, and global coverage, and contributed an average of 67% of total EU swordfish catch from 2000-2013 (FAO Fisheries and Aquaculture Information and Statistics, 1998-2016) Throughout the mad cow scare (and beyond), Spain played a key role in providing swordfish and other fish protein to the EU. The situation is summed up by University of Miami marine science adjunct professor and record-setting fisherman, Stephen Sloan, who in his book *Ocean Bankruptcy: World Fisheries on the Brink of Disaster* stated:

In the year 2001, with its mad-cow disease, foot-and-mouth disease, and anthrax scare in Europe, there was a greater demand for protein to replace all the cattle that were destroyed. The one great source left was the oceans, already under severe pressure in so-called normal times.

Sloan describes how under a 1999 agreement, the European Commission (EC) was set to deduct approximately 4,000 metric tons from the 1999 swordfish quota, reducing it from 14,000 to approximately 10,000 metric tons. Since swordfish bring about \$3.00 - \$4.00 per pound at the dock this equated to an approximately \$30 million reduction in revenue. However, the EC ultimately ignored this recommendation and allowed swordfish to be exploited at the higher rates.

To summarize, two factors contributed to the increase in demand for swordfish in the EU after 2000: the shift to fish instead of livestock protein due to an outbreak of mad cow disease, and the corresponding increase in the fishing capacity of the Spanish fleet, driven by a large increase in subsidies. Neither of these factors had anything to do with the closure of the Hawaii longline swordfish fishery.

### **3. EPO CATCH BY COUNTRY FROM 2000-2013**

Of the 14 countries that fish for swordfish in the EPO, only four increased their catch by a significant amount (i.e., more than 500 tons) from 2001-2004 (compared to their 2000 levels): Chinese Taipei, Spain, Chile, and China. Figure 1 below shows the annual swordfish catch for these 4 countries from 2000-2013. The first thing to notice is the incredible volatility in swordfish catch from year to year, with individual fleet catches often changing by thousands of tons in either direction from any given year to the next. More importantly, if the market transfer effect hypothesis is valid, after 2004 the countries that had dramatically increased their catch during the closure would have experienced significant long-term reductions, given the increased US catch and the loss of US export markets. This is not what occurred.

While Spanish catch declined in 2005, it quickly rebounded during 2006-2008, before increasing significantly in 2009, falling in 2010, and once again skyrocketing in 2011 and 2013. The average Spanish swordfish catch from 2005-2013 was almost double the catch during 2001-2004 (8204 tons compared to 4802). In fact, none of the countries that experienced significant swordfish catch increases during the 2001-2004 closure period saw reduced average catch once the Hawaii fishery reopened in 2005; Chinese Taipei, China, and Chile all experienced significant average increases in swordfish catch in the EPO post-2004.

What the data clearly show is that the trend for swordfish catch in the EPO increased steadily from 2000-2013. Consequently, attributing any increased catch by non-Hawaii fleets during 2001-2004 to the Hawaii closure is inconsistent with the totality of the available data. Total swordfish catch from all 14 EPO countries, despite the yearly volatility, has steadily increased from 27,252 tons in 2000 to 44,977 in 2013, indicating that there is more than enough global demand and more than enough markets in which to sell swordfish, regardless of the regulations of any single country (FAO Fisheries and Aquaculture Information and Statistics, 1998-2016).

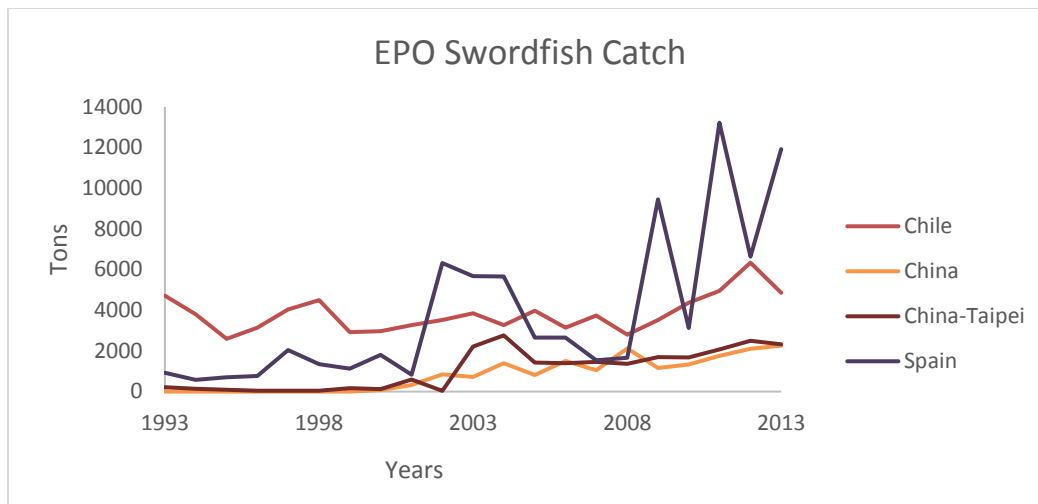


Figure 1. Swordfish catch in the EPO 1993-2013 (FAO Fisheries and Aquaculture Information and Statistics, 1998-2016)

#### 4. ADDITIONAL EVIDENCE: PACIFIC SWORDFISH STOCK DIFFERENTIATION

On page 27, Rausser et al. (2009) state:

Swordfish is a highly migratory species, and there are a small number of stocks in the Pacific. This would mean that the reduction of catch by Hawaiian fisheries would cause an increase in fish available to other fisheries, which would increase their catch per unit effort, and attract more fishers to the market. Third, the fishing grounds frequented by Hawaiian longliners are largely international waters, and longliners often travel thousands of miles in fishing expeditions. Therefore, any decrease in effort by Hawaiian fishers might be compensated by foreign fishers working the same fishing grounds.

As it turns out, however, swordfish in the Pacific Ocean very likely *do not* migrate (or migrate infrequently) across different fishery sub-regions. The Hawaii fleet operates solely in the Northern Pacific Ocean and Spanish fleets operate solely in the Southern EPO, so any fish that were not caught by Hawaii-based longline fishermen due to the closure would have to migrate into the waters frequented by

the Spanish fleets for the market transfer effect to have taken place (55428-00 STATE (INR/GGI); García-Cortés and Mejuto, 2005; Hinton and Maunder, 2011). Although the southeastern and central north Pacific (Hawaii region) are very similar, they are not the same fishing grounds and do not hold the same stock populations. Alvarado Bremer et al. (2006) have studied swordfish migratory patterns extensively and conclude that there are four distinct swordfish stocks: The Northwest, Northeast, Southwest, and Southeast. Figure 2 below shows several swordfish migration patterns tracked using telemetry tagging techniques in the Southeast region, none of which migrated out of the region over the course of the study (Abascal et al., 2010). This suggests that swordfish not caught by Hawaii longline fishermen do not migrate to other regional fisheries, such as those frequented by Spanish fleets.

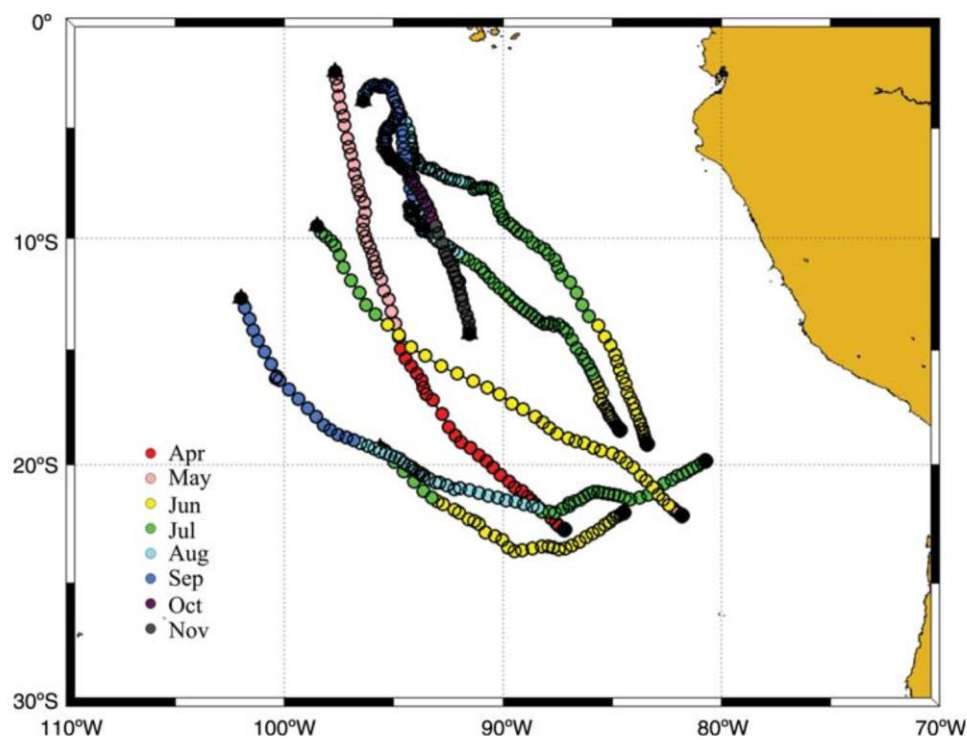


Figure 2. Map of Southeast Pacific swordfish (off the coast of Chile) migrations, by month, showing the swordfish moving northwest for autumn and then returning south for early spring, but remaining within the Southeast Pacific region (F.J. Abascal et al., 2009)

## 5. THE CHAN AND PAN STUDY

In 2012, NOAA issued Technical Memorandum NMFS-PIFSC-30 entitled, “Spillover Effects of Environmental Regulation for Sea Turtle Protection: The Case of the Hawaii Shallow-set Longline Fishery.” In this memorandum, Chan and Pan build upon the work of Rausser et al. to arrive at similar conclusions: that the 2001-2004 closure led to increased global turtle mortality. However, they arrive at this conclusion by contradicting one of Rausser et al.’s (2009) key claims: that the market transfer effect was likely isolated to the EPO. Instead, Chan and Pan claim that the market transfer effect also likely occurred in the WCPO, the predominant fishing grounds of the Hawaii longline fleet.

But just as Rausser et al. do not examine the many factors that contribute to swordfish effort by non-US fleets, and simply assume that any increase in swordfish catch is attributable to the closure alone, Chan and Pan also claim correlation is causation.

Their 2012 work was published in 2016 in *Marine Resource Economics* under a slightly different title, “Spillover Effects of Environmental Regulation for Sea Turtle Protection in the Hawaii Longline Swordfish Fishery.” The authors claim to find evidence of “production displacement”—lower US Pacific swordfish catch leading to higher non-US Pacific swordfish catch—because they find an inverse correlation between US Pacific swordfish catch and non-US Pacific swordfish catch after 2001. They then follow similar logic as Rausser et al. to conclude that this market transfer effect led to increased turtle mortality.

In essence, Chan and Pan simply show that US and non-US swordfish catch was uncorrelated between 1991-2000 (largely due to the high volatility of both US and non-US catch during this period—see Figure 3 below) and then correlated from 2001-2012, when US catch steadily declined and non-US catch continued its increase (which began in 1991). They attribute the post-2000 correlation to the change in US policy (the Hawaii closure), without a rigorous attempt to analyze the many other factors that could have also led to this change, most of which are completely independent of US regulation.

There are only two fisheries that increased their swordfish catch in the WCPO during the closure: Chinese Taipei and the Philippines. Neither is likely to have been impacted by the Hawaii closure. In the WCPO, Chinese Taipei primarily caught swordfish as bycatch from their tuna fisheries, which experienced a



significant increase in vessels after 1996, apart from a small-scale seasonal coastal harpoon fishery (Fisheries Agency Council of Agriculture, 2007). In the case of the Philippines, swordfish landings occurred in the municipal rather than commercial fishery, primarily using hand lines; these small fishing vessels operated entirely in the inshore area and did not overlap with the commercial region of the WCPO frequented by the Hawaii longline swordfish fishery (Lewis, 2005). In addition, the single hook hand lines are considered ecosystem-friendly and have very low incidence of turtle mortality, unlike the non-discriminatory longlines used by Hawaiian vessels (Cochrane and García, 2009). If there was an incidental increase in swordfish landings in this fishery due to the 2001-2004 closure, it would not have resulted in increased turtle mortality.

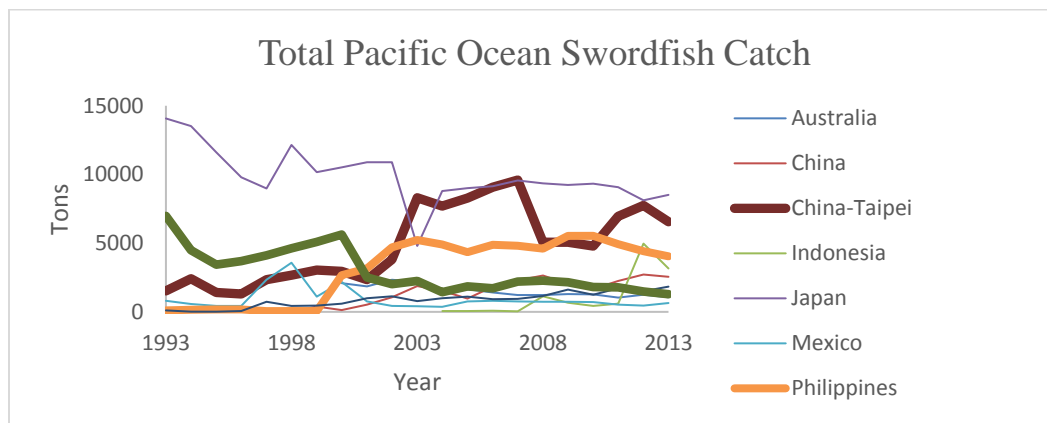


Figure 3. Total Pacific Ocean swordfish catch by country (FAO Fisheries and Aquaculture Information and Statistics, 2017)

To summarize, Chan and Pan expand Rausser et al.'s analysis to include the WCPO, and they find a correlation between US and non-US swordfish catch in the WCPO in the post-2000 time period (see Figure 4 below), but this does not signify a causal link. Just as in the case of the Spanish fleets, many other factors could have contributed to increases in non-US catch in the WCPO besides the closure, including increased subsidies in the fisheries or the construction of a larger fleet that was built in the lead up to 2001. In addition, if foreign fleets increased their catch in response to the closure from 2001-2004, we would expect to witness a decrease in catch after 2004 when the Hawaii fishery reopened, but the opposite occurred; non-US catch continued to increase in the WCPO through 2007.

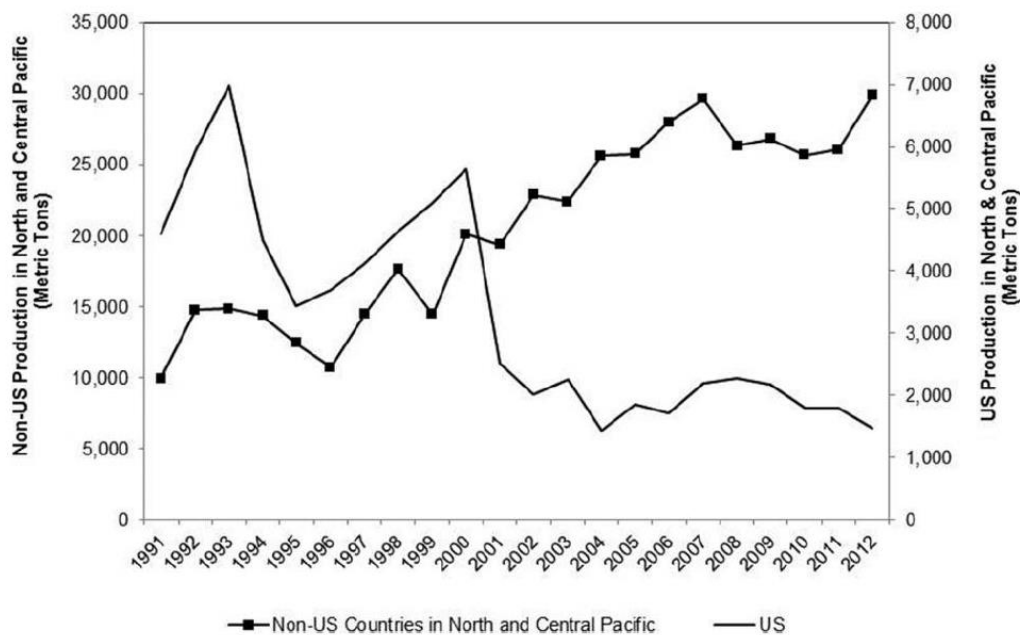


Figure 4. US and non-US Swordfish Production in the North and Central Pacific Ocean, 1991–2012 (FAO, 1998-2016)

## 6. SUMMARY AND CONCLUSION

For the market transfer hypothesis to be robust in the case of the Hawaii longline swordfish closure of 2001–2004, one must demonstrate that foreign fleets in the EPO and WCPO increased their catch in response to the closure. This paper demonstrates that there is insufficient evidence to support such a claim. While there is a negative correlation between non-US swordfish catch and US catch after 2000, there are several other reasonable explanations for this correlation. In particular, the significant increase in the Spanish fleet's swordfish catch was directly related to increases in EU and Spanish fleet subsidies independent of the Hawaii closure. In addition, the increase in EU demand for swordfish occurred at a time when European consumers significantly decreased their beef demand due to concerns about mad cow disease.

Even if Spain temporarily increased its swordfish exports to the US from 2001–2004, these fish would most likely have been sold elsewhere had the Hawaii swordfish fishery not been closed. Since the Hawaii swordfish fishery reopened in

2005, Spain's swordfish catch has continued to increase, far surpassing its 2001-2004 average. Other countries that have increased their catch significantly during the closure include Chinese Taipei, China, and Chile, which all fish in either the EPO, WCPO, or both. Similar to Spain, none of these countries decreased their catch after the reopening of Hawaii's fishery in 2004, as predicted by the market transfer effect. Additionally, in the WCPO, the only two countries to increase their swordfish catch in the region between 2001-2004—Chinese Taipei and the Philippines—either did not specifically increase swordfish effort (Chinese Taipei), or only continued to fish for swordfish using municipal vessels and hand lines within their own Exclusive Economic Zone (Philippines).

Finally, recent scientific studies of swordfish migration patterns suggest that these fish do not migrate freely within the EPO region, as previously thought, but instead tend to stay within the sub-regions that are frequented by different fleets that do not necessarily compete for the same fish.

In conclusion, a more thorough evaluation of the available data indicates that there are many plausible explanations for the increase in non-US swordfish catch during the 2001-2004 Hawaiian closure, and therefore, there is insufficient evidence to claim that the closure is the underlying driver. Consequently, there is insufficient evidence to conclude that the market transfer effect occurred. We find no robust evidence to suggest that future restrictions or expansions of the Hawaii fishery will cause a corresponding net change in turtle bycatch by foreign vessels.

In our judgment, US policymakers should base domestic fisheries regulations on the impacts to US fisheries and the resources contained within them, not on hypothesized impacts on foreign fishing fleets. Furthermore, long-term efforts to reduce sea turtle bycatch must involve strengthening regulations in countries that have much weaker standards than the US. The potential for strong global turtle bycatch standards is bolstered by the results of NOAA Fisheries' Northeast Distant Fishery Experiment's efforts to reduce turtle bycatch rates in the Hawaii swordfish fishery, which ultimately led to its reopening in 2005 (Watson, Foster, Epperly, and Shah, 2004) NOAA tested various hooks and bait types, and demonstrated that reducing turtle bycatch in the swordfish fishery is both technically and economically feasible. With assistance from the US, these practices could be adopted by foreign fleets, leading to truly sustainable global bycatch standards.

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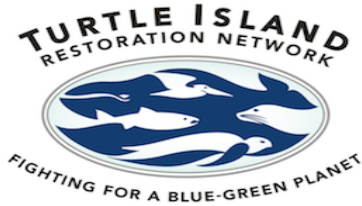
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September 5, 2017

Pacific Fisheries Management Council  
770 NE Ambassador Place, Suite 101  
Portland, OR 97220

RE: Agenda Item J.2 Swordfish Management Project Planning

Dear Councilmembers,

This letter is written on behalf of the over 80,000 members of Turtle Island Restoration Network. As the Pacific Fishery Management Council continues its work to manage fishing for swordfish, we encourage the Council to support efforts to address bycatch from the drift gillnet fishery and transition away from drift gillnet fishing to more sustainable deep-set buoy gear. We remain greatly concerned that bycatch in the drift gillnet industry continues to kill endangered and protected species that are of great ecological significance.

We were disappointed with the National Oceanic and Atmospheric Administration's withdrawal of the proposed hard cap rule, and we appreciated the efforts from the Council in support of the hard caps. The situation summary for Swordfish Management Project Planning indicates that, in response to withdrawal of the hard caps, the Council may be reconsidering its rationale for the increased monitoring in the DGN fishery.

We continue to support the increase to 100% monitoring for the drift gillnet fishery. Although the rationale previously put forth by the Council may need to be updated to reflect the withdrawal of the proposed hard cap rule, it is our hope that the Council will not move backwards and remove support for increased monitoring, including requiring 100% monitoring.

After the withdrawal of the proposed hard cap rule, which has been described as a 'bait and switch' done by NOAA, it appears clear that action by NOAA to address bycatch in the drift gillnet fishery is not forthcoming. Instead, fishery managers at the Council and with the state of California have the opportunity to lead this effort. The Director of the California Department of Fish and Wildlife and the President of the California Fish and Game Commission recently announced that they are working together with stakeholders to find and consider actions to address the drift gillnet fishery.

As California takes the initiative to address bycatch from the drift gillnet fishery, we request the Council to reconsider its support for DSBG only as a complementary gear for

drift gillnets. While we are very supportive of DSBG and its low bycatch rates, supporting the continuation of drift gillnet use is counterproductive for the protection of ocean wildlife and the responsible management of the fishery for swordfish. We request the Council to take action to create a more sustainable swordfish fishery by ending the use of drift gillnets and transitioning to deep-set buoy gear.

Because our oceans are critically important, with ocean health and diversity connected to other aspects of life on the planet, we urge you to take action to end the use of drift gillnets.

Sincerely,

Cassie Burdyshaw, Advocacy & Policy Director  
Turtle Island Restoration Network





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September 5, 2017

Phil Anderson, Chair  
Pacific Fishery Management Council  
1100 NE Ambassador Place, #101  
Portland, Oregon 97220

**Re: Agenda Item J.2 – Swordfish Management Project Planning**

Dear Chair Anderson and members of the Council:

We write to ask that you add discussion of future management actions for the drift gillnet (DGN) fishery and a discussion of Highly Migratory Species (HMS) priorities to the agenda item titled “Swordfish Management Project Planning.” In light of NOAA Fisheries’ withdrawal of the hard cap rule, we suggest the Council schedule time for an agenda item to further discuss the following topics at the November meeting in Costa Mesa:

1. reaffirmation of the Council’s support and rationale for 100 percent monitoring in the DGN fishery;
2. the value of federalizing DGN permits without additional management measures;
3. the efficacy of DGN performance metrics without a prescribed management response; and
4. HMS workload planning that prioritizes the authorization of deep-set buoy gear (DSBG) and additional management measures in the DGN fishery over the authorization of longlines.

Council meetings over the last several years included significant deliberation over the continued management of the DGN fishery. Discussions acknowledge the need to address bycatch in the DGN fishery. Pew agrees with the overarching comments in the California Department of Fish and Wildlife (CDFW) March 2015 report to Council, particularly that:

*The future success of [the DGN] fishery depends on the recognition that this fishery needs to change. Fishermen need to change how they fish or the gears they use and measures need to be implemented to allow for timely monitoring and management.<sup>1</sup>*

Criticism of the environmental damage caused by DGN gear is not new or unique to this region. Around the world, management bodies have taken action to curb or ban DGN gear

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<sup>1</sup> [Supp. CDFW Report](#), March 2015, p. 1.

due to concerns over high levels of bycatch and interactions with rare and vulnerable species. Restrictions placed on the DGN fishery since its introduction on the West Coast, including time and area closures, gear modifications, and the recently withdrawn hard cap regime, demonstrate the difficulty this gear has in meeting acceptable bycatch standards. We therefore provide the following comments and recommendations for the Council's consideration.

### **1. Reaffirm the Council's support and rationale for 100 percent monitoring in the DGN fishery**

We request that the Council send a letter to NOAA Fisheries that reaffirms support for 100 percent monitoring in the DGN fishery in order to help build the record for rulemaking. Although the hard cap rule was withdrawn, NOAA Fisheries plans to issue a separate rule addressing monitoring in the DGN fishery. According to the 2016-2017 observer data, 7 vessels in the DGN fishery were unobservable resulting in 33 percent of the effort in the DGN fishery being unobservable.<sup>2</sup> One of these unobservable vessels conducts a majority of the effort.<sup>3</sup> Only 22.4 percent of total effort was observed.<sup>4</sup> This level of observer coverage is not adequate in a fishery with known bycatch issues.

With fishing effort at the current level in the DGN fishery, 100 percent monitoring is required to collect a statistically valid sample of the fishery's bycatch. Monitoring every set made takes away the need for extrapolation of observed takes and the possibility that the fishery is shut down prematurely due to excessive takes of protected species. We are sympathetic to the cost of observer coverage and understand that NOAA Fisheries will not be able to fund 100 percent observer coverage in the DGN fishery. For this reason, the Council should consider the benefits of requiring industry funding to meet the requisite level of observer coverage as is done in other fisheries.

### **2. The value of federalizing DGN permits without additional management measures**

The Council voted to federalize DGN permits under the assumption that hard caps and 100 percent monitoring would be implemented. Without these or other management measures in place to address bycatch in the DGN fishery, the only reason for federalizing DGN permits is administrative.

At the August meeting of the California Fish and Game Commission, CDFW Director Chuck Bonham and Commission President Eric Sklar committed to working with the DGN fleet and other stakeholders toward a solution that could satisfy all parties. In light of this and

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<sup>2</sup> [2016/2017 Observer Data](#), Monitoring\*/Enforcement Update to the Take Reduction Team, slide 19.

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

the recent withdrawal of the hard cap rule, the Council may wish to reconsider their decision to take over permitting of the DGN fishery in order to allow the state of California to use its authority to the maximum extent in working with stakeholders. Therefore, we recommend the Council revisit their decision to federalize DGN permits and request NOAA Fisheries delay rulemaking on this issue until the state of California has time to convene all stakeholders and bring forward solutions under state authority.

### **3. The efficacy of DGN performance metrics without a prescribed management response**

The Council is scheduled to receive an annual report on how the DGN fishery is doing relative to the Council's adopted performance metrics each June. We support CDFW's recommendation to include hard cap species in this annual report in order for the Council to track the fishery's performance in regards to these high priority protected species. Last year, the DGN fishery exceeded the performance metric for short-finned pilot whales by 15 individuals catching an estimated 26 animals. There was little Council discussion on this item and no response to the exceedance of a performance metric. We request the Council identify a meaningful management response for when the fishery exceeds a marine mammal, sea turtle or finfish performance objective. This should include a structure and process for systematic review of bycatch data and define levels or trigger points at which particular management responses would be warranted, including time/area closures, gear modifications or complete closure of the fishery.

### **4. Prioritization of HMS workload**

We recommend the Council have a discussion about their priorities relative to the HMS workload. In determining next steps for the swordfish fishery, we request the Council prioritize the authorization of DSBG along with the implementation of additional management measures in the DGN fishery and forgo any further consideration of a West Coast-based longline fishery.

The introduction of a West Coast-based longline fishery is likely to be highly controversial. It makes little sense for the Council to prioritize the authorization of a longline fishery over other HMS workload and we request that this item be removed from the March 2018 agenda. Longlines are known to have high bycatch of protected and recreationally important species that should not be included in the suite of gears allowed under the HMS Fishery Management Plan (FMP). As the Council looks toward alternative gears, it is important to take into account their overall ecosystem impact and evaluate which gears are likely to meet the Council's twin goals of reducing bycatch and promoting a West Coast swordfish fishery.

It is difficult to see a way in which increased longline effort would not increase take of protected species and bycatch of finfish. In 2014, the Hawaii shallow-set longline fishery caught 16 leatherback and 15 loggerhead sea turtles.<sup>5</sup> This is far above the number of turtle takes currently authorized in the West Coast swordfish fishery. Since 2004, the Hawaii shallow-set fleet has also caught over 8,000 billfish,<sup>6</sup> which are not permitted to be landed on the West Coast under the Billfish Conservation Act<sup>7</sup> and would be required to be discarded as bycatch.

Further, with the designation of overfishing on the Eastern Pacific Ocean (EPO) stock of swordfish,<sup>8</sup> the Council should consider how increasing longline effort could exacerbate fishing pressure on this stock. The Hawaii fishery is known to catch fish from the EPO stock and many assume that a West Coast fleet would fish primarily in the eastern portion of the Hawaii fishery's range, closer to the EPO stock boundary.<sup>9</sup> Climate change and stronger El Niño events may also effect the distribution of the EPO swordfish stock.<sup>10</sup> It is important that managers assess what, if any, changes are occurring and how this could increase the amount of EPO fish caught in any potential longline fisheries particularly when the stock boundary line is admittedly arbitrary.<sup>11</sup>

The most recent stock assessment of the Western Central and North Pacific Ocean (WCNPO) stock of swordfish is also telling.<sup>12</sup> Projections for the WCNPO stock were conducted using eight harvest scenarios through 2016. For the high harvest rate scenarios, exploitable biomass was projected to decline below  $B_{MSY}$ . In comparison, the stock would not be expected to experience any overfishing under the status quo catch and status quo harvest rate scenarios. Essentially, the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean found that any significant increase in the

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<sup>5</sup> [Scoping Information Document for Council Action to Authorize the Use of Shallow-Set Longline Gear outside the West Coast Exclusive Economic Zone under the Fishery Management Plan for West Coast Fisheries for Highly Migratory Species](#), p. 4.

<sup>6</sup> *Id.*

<sup>7</sup> [Billfish Conservation Act of 2012](#), H.R. 2706.

<sup>8</sup> [Determination of Overfishing or an Overfished Condition](#), Fed. Reg. Volume 80, Number 170, p.53115, Wednesday, September 2, 2015.

<sup>9</sup> [Scoping Information Document for Council Action to Authorize the Use of Shallow-Set Longline Gear outside the West Coast Exclusive Economic Zone under the Fishery Management Plan for West Coast Fisheries for Highly Migratory Species](#), Figure 6, p. 9.

<sup>10</sup> Cheung et al., *Projecting future changes in distributions of pelagic fish species of Northeast Pacific shelf seas*, Progress in Oceanography, Vol. 130, January 2015, pp. 19-31 (predicting eastern Pacific species shifting poleward by 30 km per decade).

<sup>11</sup> [Scoping Information Document for Council Action to Authorize the Use of Shallow-Set Longline Gear outside the West Coast Exclusive Economic Zone under the Fishery Management Plan for West Coast Fisheries for Highly Migratory Species](#), p. 17 ("This boundary is quasi-arbitrary so the actual catch of EPO swordfish by the Hawaii SSL fishery could be more or less than the amount stated in the notification.").

<sup>12</sup> [Report of the Seventeenth Meeting of the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean](#), p. 44.

harvest level on this stock would likely result in the stock experiencing overfishing. The Council should consider what impact the effort level of a West Coast-based longline fishery could have on the WCNPO swordfish stock status.

Given the ability of new gears to target swordfish with significantly lower bycatch and ecological impact, we ask the Council reaffirm its 2009 decision not to move forward with a longline fishery outside or inside the exclusive economic zone. Longlines have been prohibited off our coast for over a decade<sup>13</sup> and in California waters for over 25 years.<sup>14</sup> The reasons given for not authorizing this fishery in 2009 are still relevant and some even more significant than they were at that time. Time and energy should be invested in new gears such as deep-set buoy gear that have the ability to reduce bycatch in the swordfish fishery.

## Conclusion

At the September meeting, the Council has the opportunity to change management of the West Coast swordfish fishery and move toward more selective and actively tended gear types. The public's support for such a transition is abundantly clear. Thousands of people and dozens of organizations and businesses have contacted the Council urging a shift away from DGN gear. By discussing the above issues, the Council can take a broader view of the management of the swordfish fishery and can set its priorities to reflect the Council's bycatch reduction goals.

Sincerely,



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<sup>13</sup> [Final rule to prohibit shallow longline sets east of 150° W](#), 50 CFR Part 223, Fed. Reg. Vol. 69, No. 48, Thursday, March 11, 2004.

<sup>14</sup> In 1989 with the enactment of Section 9028 of the Fish and Game Code, the California Legislature prohibited pelagic longline fishing off the California coast by banning the use of hook and line fishing gear longer than 900 feet.