

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE UPDATE ON  
LANDINGS OF TUNA, SWORDFISH AND OTHER PELAGICS

**Update on Pacific Bluefin Tuna**

Commercial Landings

As of 11/18/16, 338 metric tons (mt) of Pacific bluefin tuna (PBF) have been landed into California ports. To date, more than 95 percent of this catch has been taken by the purse seine fleet in southern California, similar to recent years. A concentrated effort by four to five vessels targeting large schools off southern California produced most of this catch during a 16-day period at the end of July and beginning of August. Initially the loads consisted largely of PBF, but by the first week of August the proportion of yellowfin tuna (YFT) increased and the most recent landings were almost entirely YFT.

In 2015 and 2016, a PBF vessel trip limit of 25mt was established to keep catches within the biennial quota of 600mt, with not more than 425mt to be taken in any one of those years. Once catches reach a prescribed number above the annual limit, the trip limit is reduced to two tons. This trip limit management scheme, combined with collective efforts by agencies and industry to keep within the limits, was effective in keeping catches within the limits in both years.

California Department of Fish and Wildlife (CDFW) recognizes industry's efforts to adhere to the catch limit, and to proactively coordinate and communicate with fishery managers and each other to maintain landings below the limit. Voluntary notification of incoming landings by industry allowed for near real-time catch monitoring by CDFW. Additionally, CDFW also monitored commercial landings of PBF statewide through landing receipts, and catch information collected daily by samplers visiting select ports. Landing updates were sent weekly to both NMFS and industry representatives, then daily as landings approached the catch limit.

CDFW recommends NMFS implement a similar management approach for the commercial PBF fishery in 2017 and 2018, including vessel-based trip limits and a trigger point at which only small-volume landings are allowed thereafter.

Commercial Biological Sampling

Throughout 2016, CDFW visited major southern California ports to collect samples from PBF landings. During the peak of the 2016 PBF season, CDFW intercepted seven of 17 total commercial purse seine landings (roughly 40 percent of trips) and subsampled the catch to collect representative biological data on 168 individual PBF (e.g., fork length, weight and fin clips for close-kin genetic testing). Fork lengths of sampled fish ranged

from 635mm to 989mm (average 773mm) and individual weights ranged from 5kg to 19kg (average 9.90kg).

### Recreational Monitoring

#### *CPFV Catch*

The vast majority of recreationally-caught PBF are taken in the CPFV fishery. CDFW monitored catch of recreationally caught PBF taken by the commercial passenger fishing vessel (CPFV) fleet inseason, by examining CPFV logbook data as well as tracking anecdotal fish reports on Sportfishingreport.com. CPFV logbook records indicate the sport fishery began encountering PBF in significant numbers in April of this year and catch appears to have peaked in August (Table 1). This was also reflected in online anecdotal fish reports. Preliminary CPFV logbook data is available through September 2016, but there is still some lag in reporting, despite improvements in submission and processing times with electronic logbooks. To date, the 2016 recreational fishery has taken substantially fewer fish than prior recent years - the 7,646 fish reported kept thus far is a significant decrease from the 21,345 reported kept in 2015.

**Table 1. Number of Pacific bluefin tuna reported caught by California CPFVs each month in 2016 based on CDFW logbook data.**

Log Month	Total Kept	Total PBF Kept		
		US	US/Mexico	Mexico
Jan				
Feb				
Mar				
Apr	617	382	76	159
May	286	23		263
Jun	428	73	21	334
Jul	467	300	53	114
Aug	2,842	2,591	126	125
Sept	2,633	2,445	96	92
Oct	364	339		25
Nov	9	9		
Dec				
<b>Total</b>	<b>7,646</b>	<b>6,162</b>	<b>372</b>	<b>1,112</b>

*Data source: CDFW Marine Logs System (MLS), extracted 10/07/16. Area of fishing is determined by CDFW fishing block; US/Mex includes those blocks straddling the border of the U.S. and Mexico EEZ.*

#### *Private Boat Catch*

The California Recreational Fishery Survey (CRFS) monitors shore based, private boat and CPFV fishing catch and effort by species. Estimates of catch and effort for PBF were generated for private boats fishing in California and Mexican waters and landing in California at public launch ramps and private access sites such as marinas (Table 2). As of the end of September of this year, CRFS estimated 1,144 fish were caught and kept in U.S. waters by private recreational boats, with an additional 563 caught and kept

from Mexican waters, for a total estimate of 1,707 PBF kept by private boaters in California (August and September estimates are preliminary) compared to 4,400 PBF in 2015.

**Table 2. Pacific bluefin tuna CRFS estimates of number of fish taken by private and rental boats(PR) by month, in 2016.**

Month	Total Estimated PBF Kept		
	Total Kept	US	Mexico
Jan			
Feb			
Mar			
Apr	155	57	98
May	161	65	96
Jun	532	178	354
Jul	610	610	0
Aug	206	190	16
Sept	44	44	0
Oct			
Nov			
Dec			
<b>Total</b>	<b>1,707</b>	<b>1,144</b>	<b>563</b>

*Data source: CRFS Data Portal, extracted 10/12/16. Area of fishing is determined by CDFW fishing block; where majority of fishing trip occurred.*

CRFS samplers encountered 96 fish landed by private/rental boats to date in 2016 (272 in 2015) and collected biological data (lengths and weights) from 69 individuals (232 in 2015).

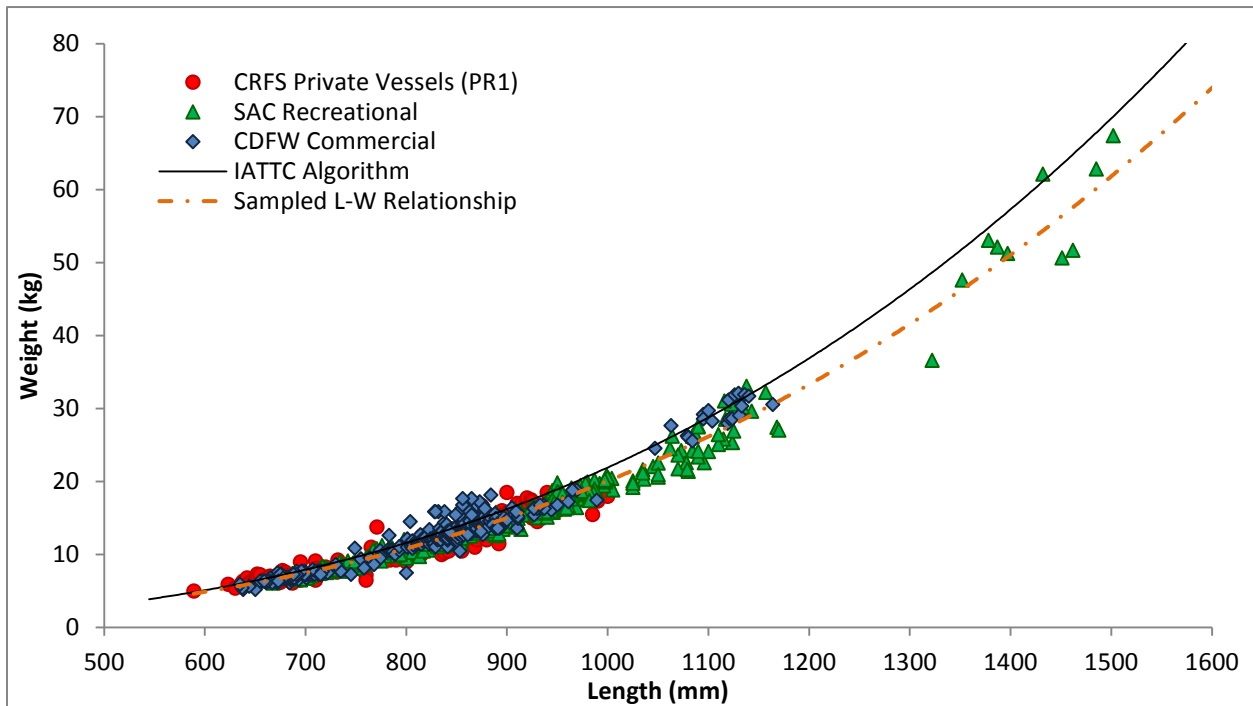
In 2016 from April through June, 65 percent of the PBF observed were reportedly taken from waters off Mexico (43 fish observed U.S. & MX; 32 fish measured U.S. & MX); from July through September, all observed fish were reportedly taken in U.S. waters (53 fish observed; 37 fish measured).

Update on Available Length-Weight Data

For the November 2015 Council meeting, CDFW provided a summary report ([Agenda Item G.1.a Supplemental CDFW Report](#)) which included a figure showing recent length-weight data collected from all available sampling sources compared to the length-weight regression generated from Inter-American Tropical Tuna Commission (IATTC) CPFV dockside sampling conducted in past years. CDFW and SAC continued priority emphasis on collecting PBF length and weight data in 2016 fisheries off California and northern Mexico. All the new data sources have been combined and updated in Figure 1, which also depicts the new length-weight relationship from these sources compared to the regression produced from earlier years.

The Sportfishing Association of California’s (SAC) data collection efforts (Figure 1) represent PBF measurements from CPFV tuna trips operating from San Pedro to San

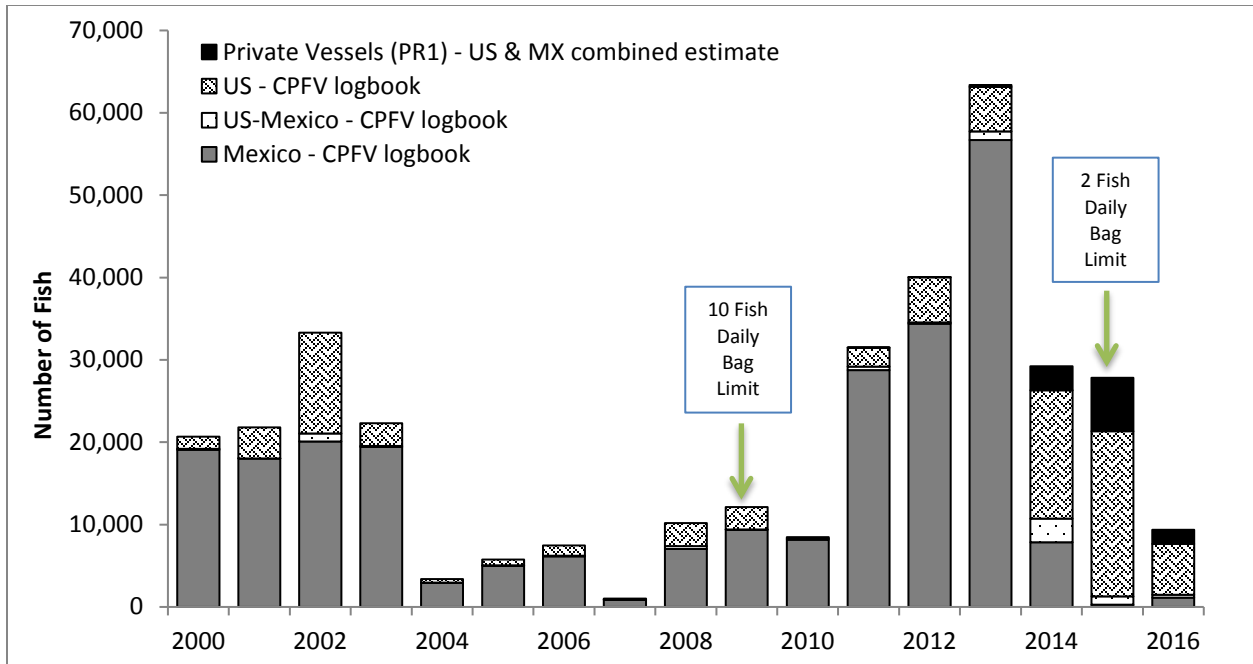
Diego counties for trips fishing in US and Mexican waters, covering a range of trip types from day trips to long range trips into Mexico. Since CDFW CRFS samplers do not collect much if any length information for PBF taken in the CPFV fishery given the CRFS sampling design, SAC began the pilot study in 2015 with a goal of collecting length information from the CPFV fleet while at sea. The sampling regime is both random and stratified, and CDFW expects the data collected from this pilot study are likely to be representative of all PBF taken in the 2015 and 2016 CPFV fisheries, respectively.



**Figure 1. Summary of preliminary biological length-weight data for Pacific bluefin tuna as collected by multiple sources.** Data Source: IATTC dockside sampling (1993-2012); CDFW CRFS Data Portal (PR1 sample data 2012-2016, extracted 10/10/16); Sportfishing Association of California (SAC) CPFV sampling (2015-2016); CDFW Commercial port sampling (2015-2016).

CRFS PR1 sample data depicted in Figure 1 represents only a minor component of the recreational catch of PBF, as the majority of catches are made by the CPFV fleet (Figure 2). However, it should be noted that biological data collection for the PR1 mode occurs only at public launch ramps for trips into Mexico and US waters. Moreover, CRFS samplers do not survey public launch ramp activity during nighttime hours, and it is likely that a number of tuna trips returning from distant fishing grounds are missed.

Notably, PR1 estimates and data do not include catch from private docks or marinas. CDFW is not able to estimate PBF catch from these locations, and cannot conduct any biological sampling due to lack of access to these sites. Private marina vessels may be accessing larger PBF due to their more extensive fishing range, larger vessel size, different targeting strategies, and longer trip capacity.

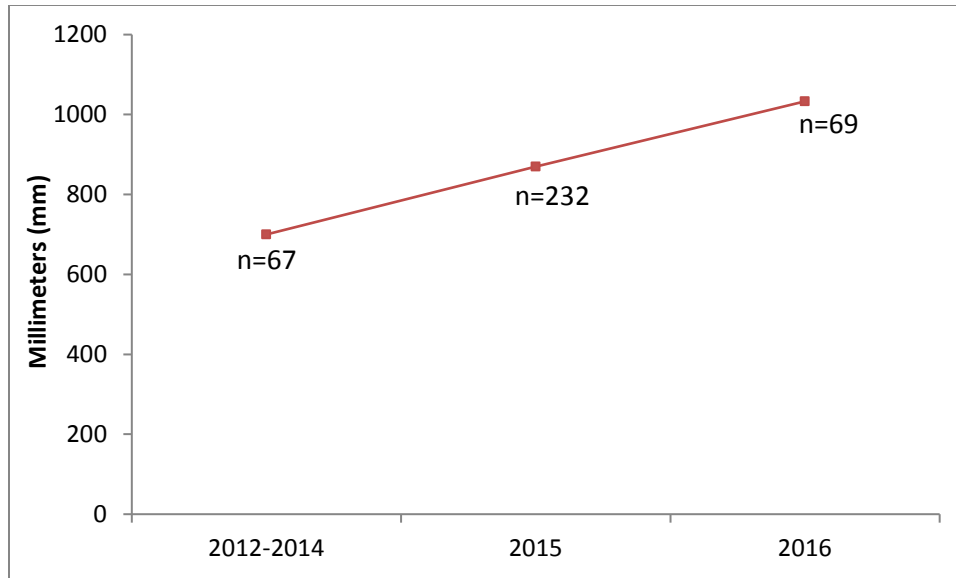


**Figure 2. Annual recreational bluefin tuna catch in CA.**  
 Data source: CDFW Marine Logs System (MLS), extracted 10/07/16 for CPFV landed catch tallies. Area of fishing is determined by CDFW fishing block; US/Mex includes those blocks straddling the border of the U.S. and Mexico EEZ; CRFS Data Portal, extracted 10/29/16 for private vessel catch estimates.

### Current Trends in the Sport Fishery for PBF

Bluefin have been unusually available and relatively abundant in California waters over the last few years, and we have seen an increase in the size of fish available to anglers within that time period. CRFS sampled catch by anglers fishing from public launch ramps and have encountered an increasing number of bluefin over the last five years. The average length of all sampled fish in this mode for 2016 was 1033mm (range: 600-1829mm, n=69), which converts to an estimate average weight of 22kg based on the new length-weight curve in Figure 1 (24kg using the IATTC algorithm). This represents a 48 percent increase from the average length of samples taken from the same sector from 2012-2014 (Figure 3). CRFS PR sampling methods have remained the same since 2004, and did not encounter PBF at launch ramps prior to 2011.

In addition to the increase in the average size of PBF taken by private boaters in 2016, there is other evidence indicating larger fish are more available and are being taken in the recreational sector. There were a number of California state sport fish landing record applications submitted in 2015-2016 for recreational PBF taken by both hook-and-line and spear gear. Several of these applications were submitted for fish in the 250 to 270 lb range.



**Figure 3. Average length of recreational private boat caught bluefin tuna in CA.**  
*Data Source: CDFW CRFS Data Portal (PR1 sample data 2012-2016, extracted 10/10/16).*

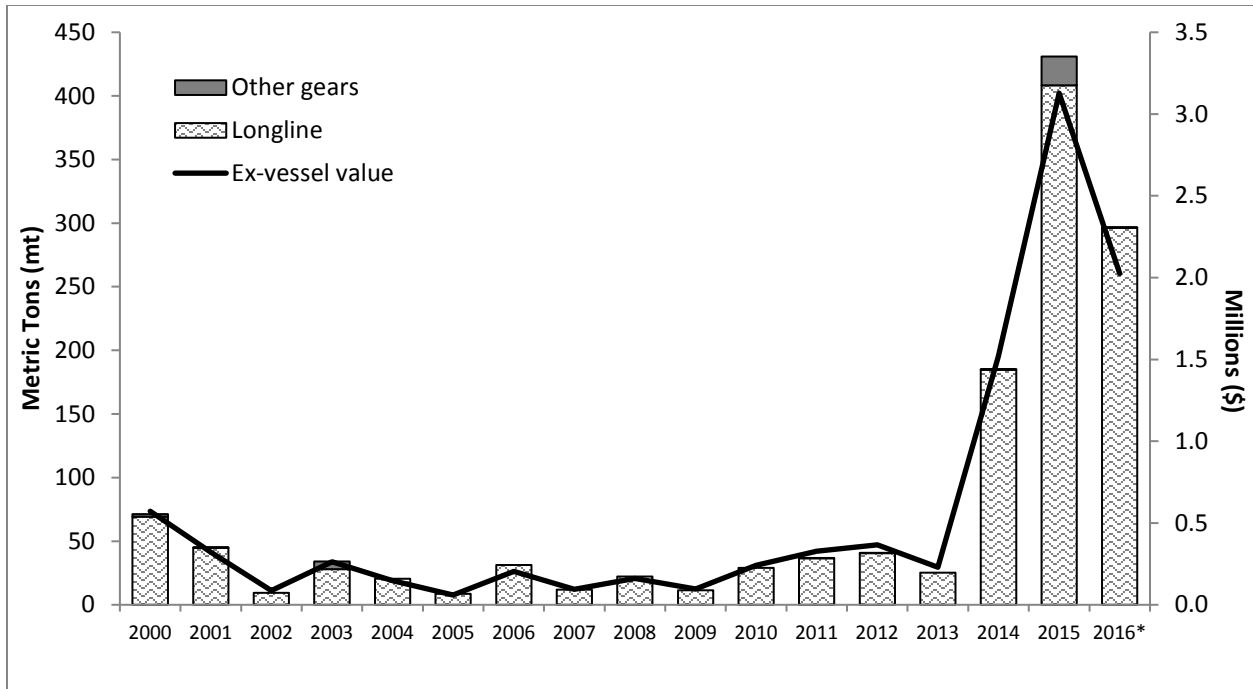
As schools of larger fish have become available to anglers in California waters closer to shore we have seen changes in recreational fishing practices that allow anglers to target these larger fish. One example is the use of technology to update kite fishing by replacing the kite with a drone that allows the angler much more control over where their gear is placed.

### **Update on Other Highly Migratory Species**

As a result of changes in oceanic conditions, fisheries and market demands, CDFW continues to monitor changes in the composition and quantities of pelagic species being landed in California ports. Notably, there has been a significant increase in commercial landings from the Hawaiian high-seas pelagic longline fleet of bigeye tuna (BET), swordfish, and opah.

#### **Bigeye Tuna**

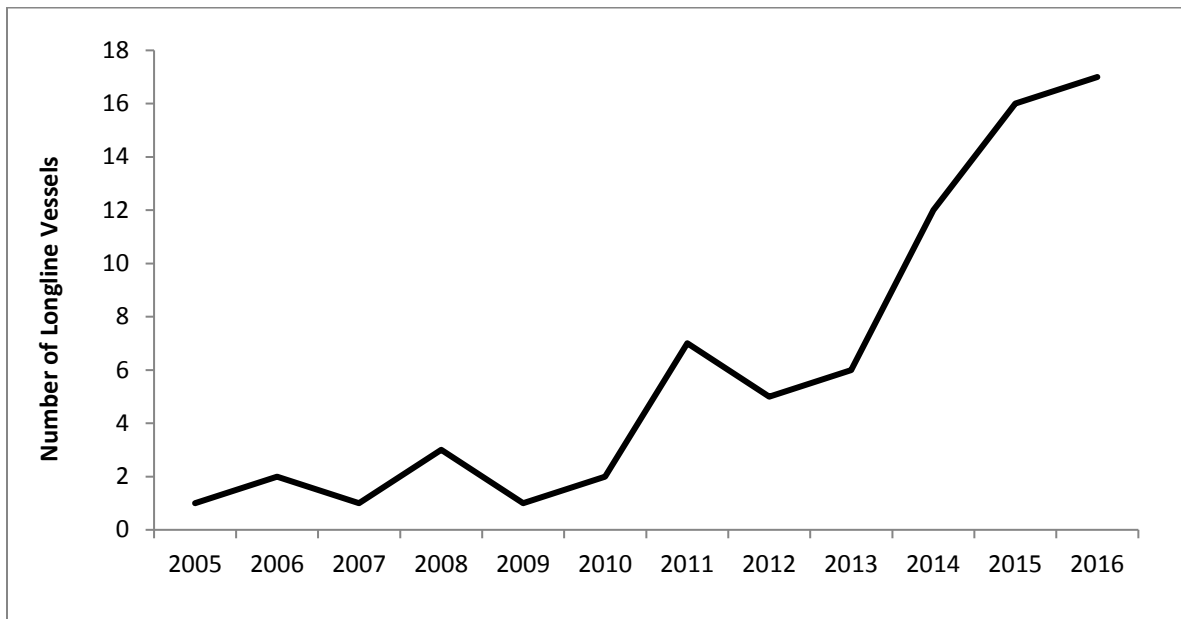
Landings of bigeye tuna in California have increased substantially over the last three years, mainly from Hawaiian pelagic longline vessels landing into California ports (Figure 4). While pelagic longline is not an authorized fishing gear inside the U.S. Exclusive Economic Zone (EEZ) off the West Coast, Hawaiian and High Seas-permitted vessels with California commercial fishing licenses can fish outside the EEZ and make landings in California ports. Most landings occur in San Francisco, Los Angeles and San Diego.



**Figure 4. Bigeye tuna landings and ex-vessel value into California ports by gear, 2000-2016. \*Note 2016 data are preliminary.**

Data source: CDFW Commercial Fisheries Information System (CFIS) extracted 10/10/16.

With the increase in landings and revenue there have also been significant increases in the number of longline vessels making bigeye landings into California ports since 2009 (Figure 5).

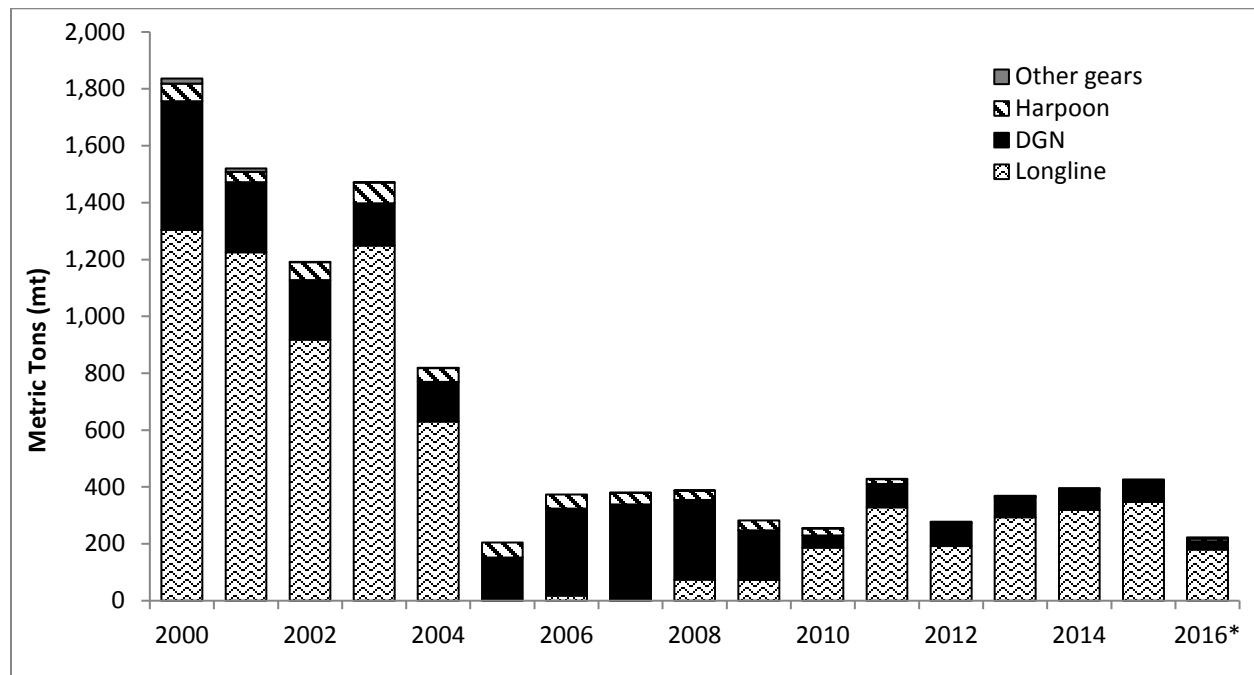


**Figure 5. Number of longline vessels landing bigeye tuna into California ports, 2005-2016. \*Note 2016 data are preliminary.**

Data source: CDFW Commercial Fisheries Information System (CFIS) extracted 10/10/16.

## Swordfish

Large mesh drift gillnet (DGN) and harpoon-caught swordfish landings have remained relatively stable over the last 4 years (DGN landings from 2012 to 2015 ranged between 68.4 and 81.5mt annually, and harpoon landings over this time ranged between 3.7mt and 4.4mt per year). However, there has been a slight, but steady increase in the landings and value of swordfish landed into California ports by high-seas longline vessels (Figures 6 & Table 3) and it is unknown if this increase will continue in 2016 because the fishery is still ongoing. These landings may not represent additional catch or effort by the longline fleet, but likely represent a shift in landing activity, from Hawaiian ports to those in California, similar to BET.



**Figure 6. Swordfish landings (mt) in California ports by gear type, 2000-2016\***

Data source: CDFW Commercial Fisheries Information System (CFIS), extracted 10/10/16. All 2016 data are preliminary, and the DGN swordfish season begins in the fall.

**Table 3. Ex-vessel value of swordfish landings by gear in California ports, 2000-2016\***

	Longline	DGN	Harpoon	DSBG	Other Gears
<b>2000</b>	8,097,557	2,838,557	642,909	0	126,502
<b>2001</b>	6,669,295	1,566,485	468,268	0	37,802
<b>2002</b>	4,190,647	1,533,125	677,637	0	3,855
<b>2003</b>	5,886,379	1,108,148	844,368	0	9,289
<b>2004</b>	3,182,790	976,516	670,592	0	5,127
<b>2005</b>	4,939	1,181,331	709,115	0	0
<b>2006</b>	68,508	1,990,390	683,162	0	0

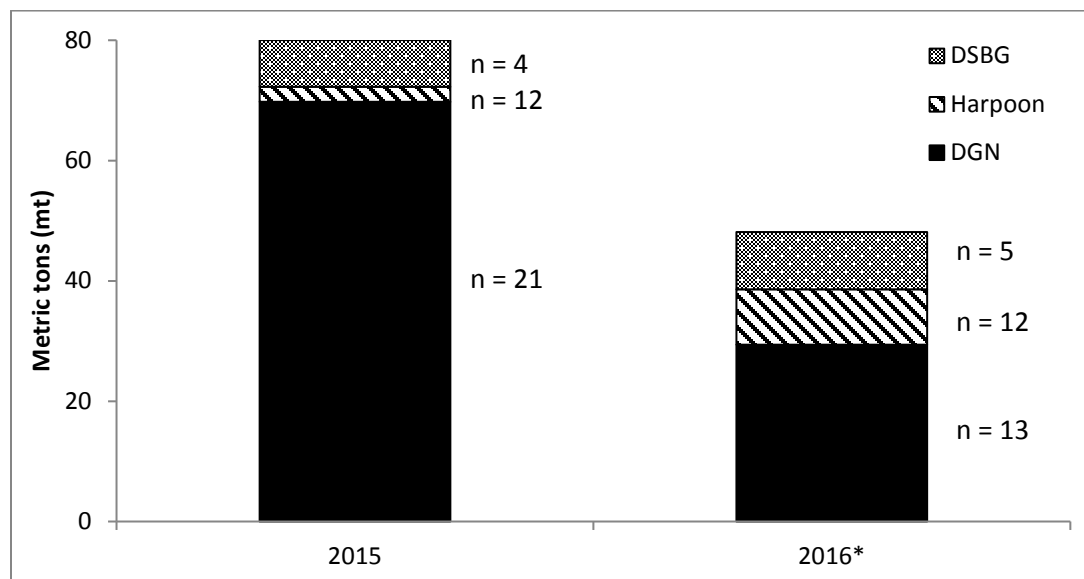


<b>2007</b>	3,992	2,523,472	596,409	0	1,063
<b>2008</b>	259,291	1,704,054	457,045	0	8,642
<b>2009</b>	386,008	1,080,136	466,633	0	0
<b>2010</b>	1,434,006	398,544	369,960	0	4,730
<b>2011</b>	2,325,267	767,835	252,287	0	5,000
<b>2012</b>	1,221,618	803,086	76,663	0	0
<b>2013</b>	1,939,129	676,221	86,326	0	710
<b>2014</b>	2,231,378	702,053	83,374	*	52,309
<b>2015</b>	2,854,957	598,942	61,266	105,719	0
<b>2016</b>	1,318,396	280,703	151,023	160,290	0

Data source: CDFW Commercial Fisheries Information System (CFIS), extracted 10/10/16. All 2016 data are preliminary.

### Deep Set Buoy Gear Experimental Fishery

The development and testing of deep-set buoy gear (DSBG) under federal exempted fishing permits (EFPs) has added a new source of swordfish landings to California markets. Four vessels fishing under an EFP approved in 2015 landed 7.76mt of swordfish. So far in 2016, 9.54mt of swordfish have been landed by five vessels (Figure 7). In comparison to swordfish landed by the DGN fleet, fish taken with DSBG bring in a higher ex-vessel price per pound, from \$3-\$11 (average \$7/lb), versus an average of \$4/lb for DGN. Looking at the volume landed per active vessel, in 2015 and 2016, DGN brought in an average of 3.32mt and 2.26mt respectively of swordfish per active vessel, compared to 1.94mt and 1.91mt respectively for DSBG, and 0.21mt in 2015 and 0.77mt in 2016 for harpoon gear. Data from 2016 for all three gear types is preliminary and not complete.



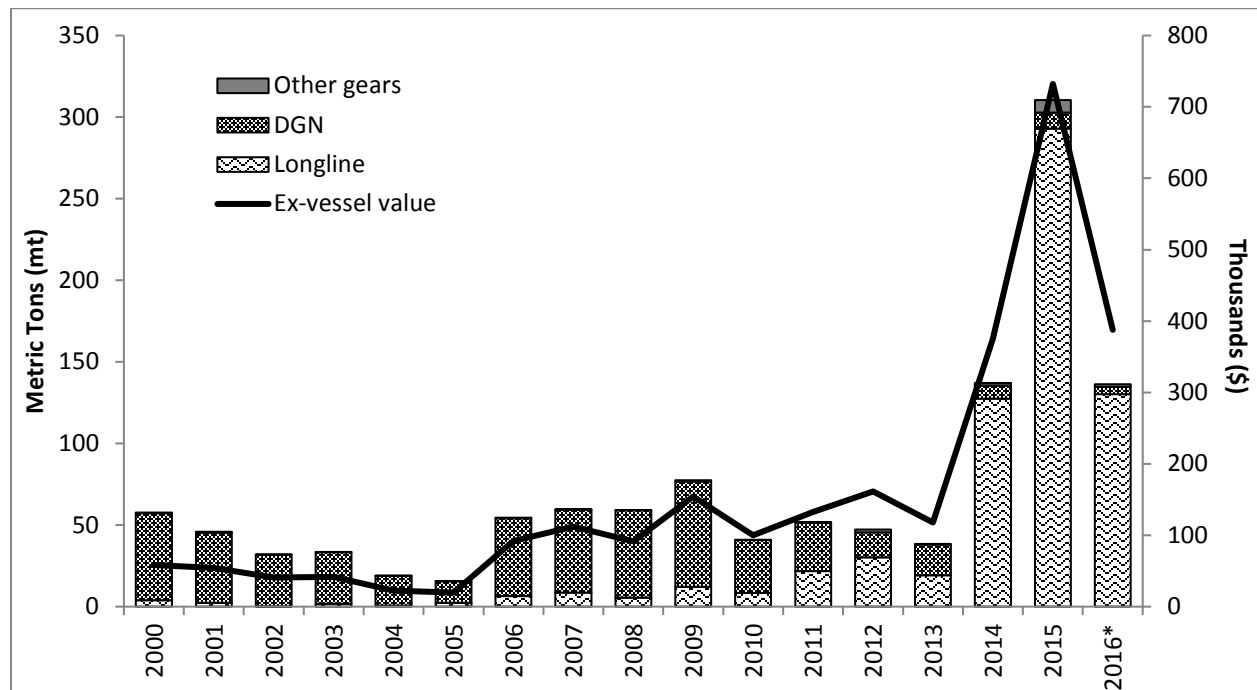
**Figure 7. Swordfish landings by DGN, Harpoon and DSBG in California ports, 2015-2016.**

Data source: CDFW Commercial Fisheries Information System (CFIS) extracted 10/13/16. All 2016 data are preliminary. n = Active vessels

### Opah

One of the main non-target marketable species caught in the DGN and longline fisheries, as well as by DSBG, is opah. Industry has voiced the importance of this species as a profitable component of HMS fisheries and has expressed interest in expanding existing markets or developing new markets for higher quality fish brought in by DSBG. Opah is a popular food fish and can bring in upwards of \$6/lb at market when available.

Like BET and swordfish, there have been increases in pelagic longline landings of opah to California ports since 2014, based on available information to date (Figure 8). These landings largely correspond with the increase in longline landings into California and do not reflect targeted effort on opah alone.



**Figure 8. Opah landings and ex-vessel value into California ports by gear, 2000-2016. \*Note 2016 data are preliminary.**

Data source: CDFW Commercial Fisheries Information System (CFIS) extracted 10/10/16.