

## HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM REPORT ON MANAGEMENT MEASURES FOR 2015-2016 FISHERIES: RECREATIONAL BLUEFIN TUNA FISHERY

### **Introduction**

The Council received notice on April 8, 2012, that the Secretary of Commerce had determined Pacific bluefin tuna was subject to overfishing and was overfished. As part of the current biennial management cycle, the Council is considering management measures to reduce recreational fishing mortality on Pacific bluefin by domestic fishing vessels landing on the West Coast. The U.S. commercial fishery is currently subject to a conservation measure adopted by the IATTC which limits catch to 500 mt annually (Resolution C-13-02). Recreational fisheries have not been included in past measures and are not covered by this IATTC measure, and in recent years recreational catch has exceeded commercial catch. The proposed action would reduce U.S. west coast recreational fishing mortality on Pacific bluefin tuna consistent with MSA Section 304(i)(A) which requires that the Council “develop recommendations for domestic regulations to address the relative impact of fishing vessels of the United States on the stock and, if developed by a Council, the Council shall submit such recommendations to the Secretary.” Any such regulations that were adopted would come into effect on or about April 1, 2015, the start of the next 2-year management period.

The Highly Migratory Species Management Team (HMSMT) met via webinar on July 29, 2014 and met again in La Jolla, California on August 12-14, 2014 to develop a proposed range of alternatives for Council consideration to address mortality of bluefin tuna in recreational fisheries. In developing these alternatives, the HMSMT considered available information on catch and effort trends in the recreational fisheries. The HMSMT also considered potential impacts to the recreational fishing industry associated with implementing recreational bluefin tuna management measures. The work of the HMSMT was conducted with input from the Highly Migratory Species Advisory Subpanel and the public. At each of these meetings, the HMSMT received California Department of Fish and Wildlife (CDFW) presentations by Elizabeth Hellmers describing preliminary work on a CDFW report to the Council, particularly focusing on draft recreational bag limit analyses of California Passenger Fishing Vessel (CPFV) logbook data.

### **Alternatives**

All the alternatives apply only to Federal waters off California. Although Pacific bluefin are occasionally caught in Oregon and Washington, the numbers are so small that regulating catch in waters off those states is not justified. It is the HMSMT’s understanding that CDFW regulations do not automatically conform to Federal regulations for Highly Migratory Species. However, all proposed alternatives and analyses are based on the assumption that California would adopt regulations that conform to changes in Federal regulations for the EEZ off California. In addition, the HMSMT proposes alternatives (suboptions) that apply to possession in U.S. waters and landings in U.S. ports of fish legally caught in Mexico.

## **No Action Alternative**

Currently the daily bag limit for bluefin tuna in Federal waters off California is 10 fish and the possession limit for multi-day trips is up to three times the daily bag limit (30 fish maximum). Anglers fishing in Mexico waters may retain their daily bag (5 bluefin) and possession limits (15 bluefin) allowable under Mexico regulations and land those fish into U.S. ports. Anglers may also retain bluefin caught off Mexico, return to U.S. waters and continue to fish until they attain the applicable U.S. daily bag and possession limits for bluefin tuna.

## **Alternative 2: Harmonize U.S. daily bag and possession limits for Federal waters off California with Mexico's current regulations for bluefin tuna.**

Under this alternative, the bag limit for bluefin tuna in Federal waters off California would be reduced from 10 to 5 bluefin per day and the maximum possession limit for multi-day trips ( $\geq 3$  days) would be reduced from 30 to 15 bluefin.

## **Alternative 3: Reduce daily bag and possession limits to below 5 fish per day and 15 fish in possession for Federal waters off California, and as a potential suboption, limit possession of fish caught in Mexico to no more than the corresponding U.S. possession limits.**

Under this alternative, daily bag limits for bluefin caught in Federal waters off California may be reduced to either 4 fish, 3 fish, 2 fish or 1 fish, with corresponding possession limits of up to 3 times the daily bag limit for multi-day trips ( $\geq 3$  days). The intent of this alternative is also to allow limitation of U.S. landings of fish legally caught in Mexico. However at this time, it is unclear whether the possession limit for fish caught in U.S. waters also automatically applies to fish caught in Mexico waters, under both NMFS and CDFW regulations. For example, if the U.S. possession limit were reduced below 15 fish, it is uncertain if landings of 15 fish legally taken in Mexico waters could be possessed in U.S. waters and landed in U.S. ports. HMSMT inquiries to these agencies are pending. Until this uncertainty is resolved, a potential suboption is included under this alternative to limit possession and landings of fish caught in Mexico to the lower of the applicable possession limit in U.S. or Mexico waters.

## **Alternative 4: Prohibit retention of bluefin tuna by recreational fisheries**

Under this alternative, any bluefin caught incidentally while fishing for other species in Federal waters off California would be required to be released immediately to minimize mortality. As noted under Alternative 3, a similar potential suboption may be proposed in order to prohibit retention in Federal waters off California and also prohibit landings in the U.S. of bluefin caught in waters off Mexico.

## **Other Potential Alternatives**

The HMSMT may modify or propose additional alternatives in a supplemental report to the Council in September, especially if the issue of possession limits for fish caught in Mexico is resolved. Furthermore, information to evaluate the proposed alternatives above was not available in time to allow full consideration by the HMSMT when developing the range of alternatives, other than for bag and possession limit reductions. For example, other management measures, such as season limits, may be considered in combination with bag and possession limit reductions.

The HMSMT considered a number of additional potential management measures which were rejected from consideration, including size limits, inseason quota management and sliding bag

limits. Size limits are impractical because of the need to bring fish aboard to measure them, which causes currently unknown levels of post-release mortality. Quotas would require inseason management, and existing monitoring systems are not adequate to the task. Sliding bag limits would similarly require intensive inseason management, which is not currently feasible. CPFV logbooks, the primary source of CPFV catch information are not available in real time. Similar reporting protocols are not available for the private vessel recreational fleet.

## **Description of West Coast Recreational Fisheries for Pacific Bluefin Tuna**

### **Fishery Catch and Effort**

The California CPFV fleet lands the majority of bluefin into U.S. ports, and for most years, 80% or more is caught in waters off Mexico (Table 1). For simplicity in this report, the minor landings from fishing activities in the statistical blocks straddling the U.S.-Mexico border are included in the landings reported from U.S. waters, unless otherwise noted. Since 2000, the number of CPFV vessels targeting HMS in California waters has varied without trend, ranging from a high of 206 vessels in 2001 to a low of 113 vessels in 2011. The number of CPFV vessels was 158 in 2012 and 127 in 2013 (CFIS, CPFV logbook data, CDFW, personal communication). Landings by the California private (& rental) vessel fishery are very small and are not included in the analyses of the alternatives. Oregon and Washington landings of bluefin tuna are negligible and fisheries off these states are not considered in this report.

Corresponding angler effort (number of days) by the California CPFV and private vessel fleets are presented in Table 2. For the CPFV fleet, effort represents tuna targeted days and includes days when tuna were identified as the target, regardless of whether bluefin were landed, and days with bluefin catch regardless of the species targeted.

(not adjusted for non-compliance). Landings for the private vessel fishery are estimated from a custom CDFW analysis for 2008-2013 (Michelle Horezcko, CDFW, personal communication).

**Table 1. Estimated landings of Pacific bluefin tuna (numbers of fish) by private and charter vessels fishing off California and off Mexico, 2000–2013. Landings for the CPFV fishery are estimated from CPFV logbooks received (not adjusted for non-compliance). Landings for the private vessel fishery are estimated from a custom CDFW analysis for 2008-2013 (Michelle Horezcko, CDFW, personal communication).**

Year	U.S. Waters off California			Mexico Waters			U.S. and Mexico Waters Combined		
	Private Fishery	CPFV Fishery	Total	Private Fishery	CPFV Fishery	Total	Private Fishery	CPFV Fishery	Total
2000	-	1,564	-	-	19,100	-	-	20,664	-
2001	-	3,829	-	-	18,078	-	-	21,907	-
2002	-	13,245	-	-	20,153	-	-	33,398	-
2003	-	2,858	-	-	19,433	-	-	22,291	-
2004	-	485	-	-	2,906	-	-	3,391	-
2005	-	723	-	-	5,034	-	-	5,757	-
2006	-	1,349	-	-	6,124	-	-	7,473	-
2007	-	187	-	-	841	-	-	1,028	-
2008	399	3,159	3,558	499	7,028	7,527	898	10,187	11,085
2009	210	2,788	2,998	420	9,350	9,770	630	12,138	12,768
2010	20	306	326	377	8,153	8,530	397	8,459	8,856
2011	28	2,743	2,771	114	28,751	28,865	142	31,494	31,636
2012	10	5,627	5,637	0	34,386	34,386	10	40,013	40,023
2013	234	6,473	6,707	324	56,877	57,201	558	63,350	63,908

**Table 2 Angler effort (tuna target days) for the California CPFV fishery in U.S. and Mexico waters during 2000-2013 are estimated from CPFV logbooks received (Elizabeth Hellmers, personal communication). Estimated angler effort (days) for the private vessel fishery in U.S. and in Mexico waters are from a custom analysis by CDFW (Michelle Horezcko, CDFW, personal communication).**

Year	U.S. Waters off California			Mexico Waters			U.S. and Mexico Waters Combined		
	Private Fishery	CPFV Fishery	Total	Private Fishery	CPFV Fishery	Total	Private Fishery	CPFV Fishery	Total
2000	-	41,545	-	-	176,845	-	-	218,390	-
2001	-	66,808	-	-	160,821	-	-	227,629	-
2002	-	80,898	-	-	138,911	-	-	219,809	-
2003	-	39,009	-	-	158,296	-	-	197,305	-
2004	-	24,318	-	-	176,420	-	-	200,738	-
2005	-	26,127	-	-	109,649	-	-	135,776	-
2006	-	24,665	-	-	132,477	-	-	157,142	-
2007	-	25,377	-	-	81,387	-	-	106,764	-
2008	34,265	27,479	61,744	16,075	131,814	147,889	50,340	159,293	209,633
2009	30,960	20,634	51,594	14,287	129,512	143,799	45,247	150,146	195,393
2010	16,290	7,903	24,193	7,863	59,398	67,261	24,153	67,301	91,454
2011	11,211	5,443	16,654	1,068	72,664	73,732	12,279	78,107	90,386
2012	27,627	21,325	48,952	0	136,545	136,545	27,627	157,870	185,497
2013	15,806	17,812	33,618	817	137,248	138,065	16,623	155,060	171,683

The seasonal pattern in CPFV landings (numbers) of bluefin tuna has not been consistent in recent years, likely due to the unpredictable availability of bluefin tuna related to suitable environmental conditions, as well as the relative availability of other desirable species. During 2007-2010, the pattern in monthly landings varied markedly among years, sometimes with most of the landings in July and August and other times with most during June and September (Figure 1). During 2011-2013, bluefin landings increased substantially and the monthly landing pattern was much more consistent among years (Figure 2). Landings were always highest in August, with substantial amounts also landed in July and September.

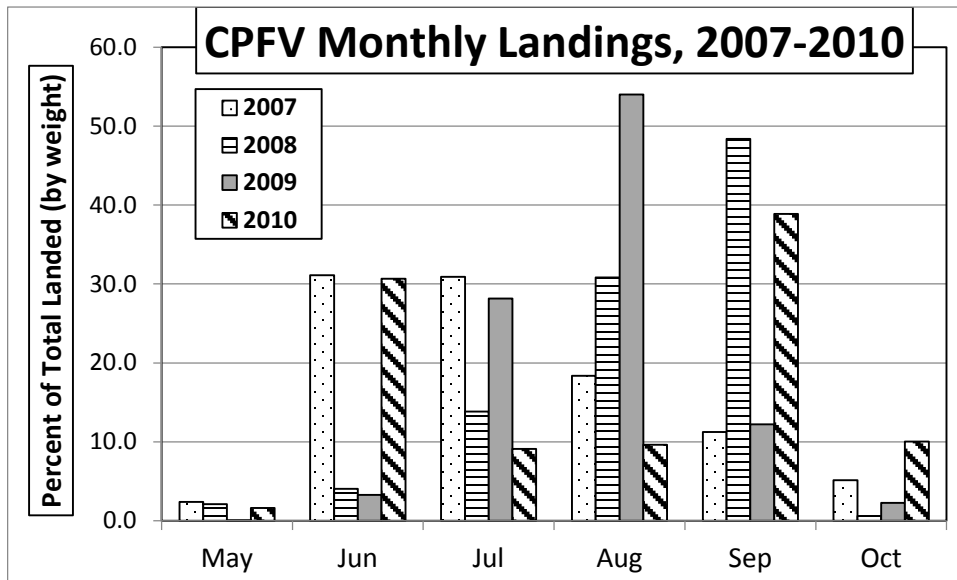


Figure 1. Monthly percentage of annual bluefin landings by CPFV vessels fishing in U.S. and Mexico waters, 2007-2010. (Source: CPFV logbook data, Elizabeth Hellmers, personal communication).

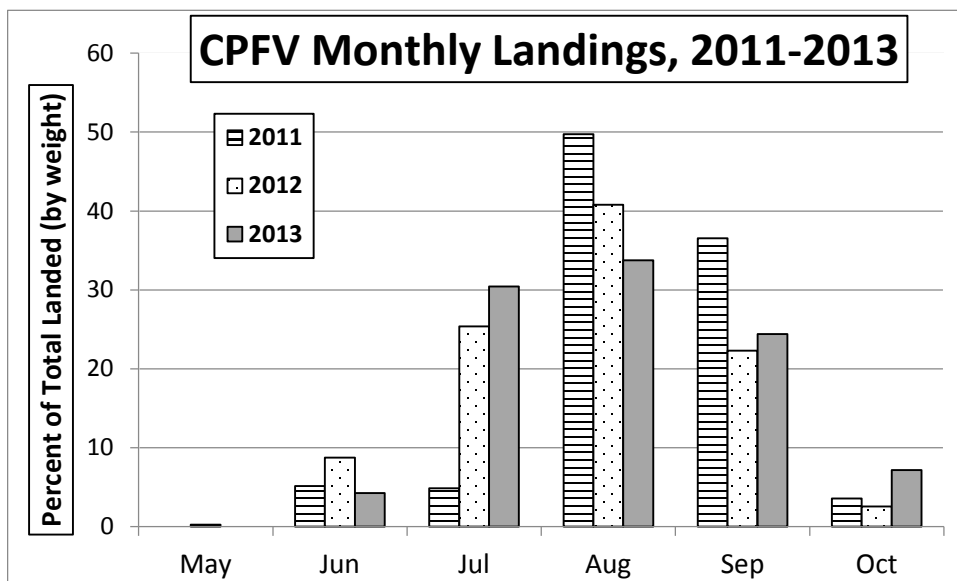
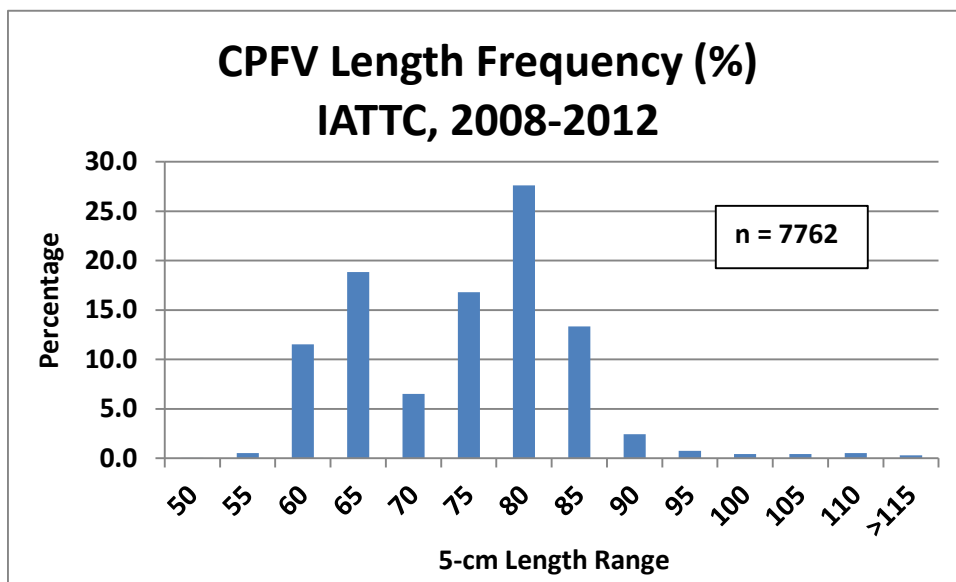


Figure 2. Monthly percentage of annual bluefin landings by CPFV vessels fishing in U.S. and Mexico waters, 2011-2013. (Source: CPFV logbook data, Elizabeth Hellmers, personal communication).

## Bluefin Tuna Size Composition

Most bluefin tuna landed by recreational fisheries from U.S. and Mexico waters are juveniles. Recreational landings by weight for the CPFV fishery are estimated from monthly numbers of bluefin landings reported in CPFV logbooks and a monthly estimate of average weight from IATTC sampling data.<sup>1</sup> IATTC sampling was limited in geographic coverage and time of day, and was discontinued in 2012. Samplers measured fish lengths and average weights were computed by applying a length-weight formula.

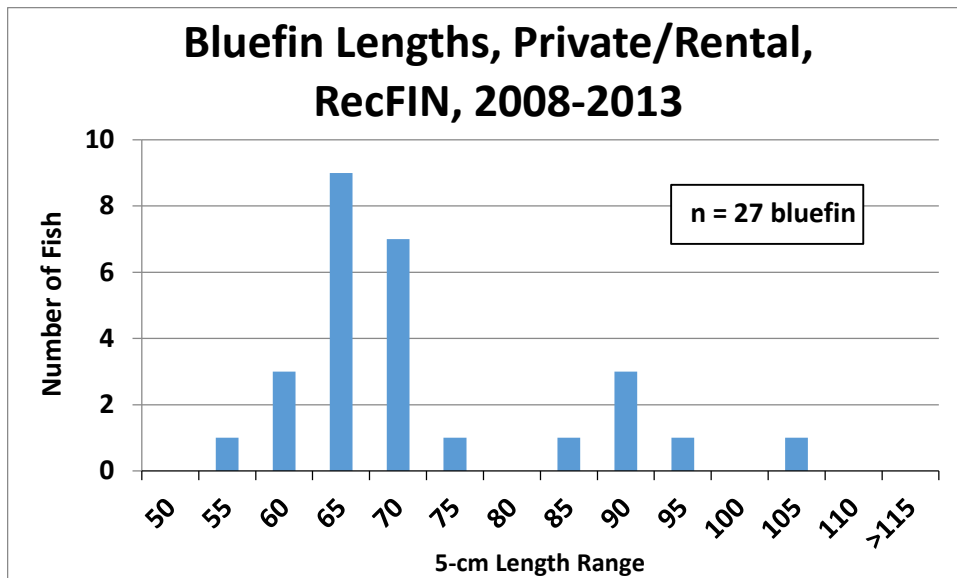
The length composition (percentage) of IATTC fish length measurements during 2008-2012 are summarized by 5-cm size categories in Figure 3. These are not applied to the catches, but provide an indication of the size of bluefin landed by the CPFV fishery in recent years. Over 7,700 fish were measured and half were smaller than 79 cm and half were larger than 79 cm.



**Figure 3.** Length composition (percent by 5-cm categories) of bluefin tuna measured in CPFV landings from fishing activities in U.S. and Mexico waters during 2008-2013. The length composition represents only measured fish and is not expanded to the catch. (Source: Jenny Suter, NMFS, personal communication, with permission of IATTC).

Information on the size of fish landed by private/rental vessel anglers is minimal, due to limited recreational fishery monitoring activities and fish often being filleted at sea. During 2008-2013, lengths were measured for only 27 bluefin tuna landed by private or rental vessels in California ports from fishing activities in U.S. and Mexico waters (Figure 4). Meaningful estimates of the length composition of the private vessel fishery cannot be produced from these few lengths.

<sup>1</sup> United States Catch Time Series for Pacific Bluefin Tuna in the North Pacific Ocean, A.L. Coan, Jr., and J.F. Childers, Dec. 2007. A Working document submitted to the sixth meeting of the Pacific Bluefin Tuna Working Group of the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC), 11-19 December 2007, Shimizu, Japan. Document not to be cited without author's permission.



**Figure 4. Length frequency of bluefin tuna measured in landings by the private vessel fishery in U.S. and Mexico waters during 2008-2013. (Source: RecFIN, Ed Hibs, personal communication.)**

**Relative Impact of West Coast Fisheries on Pacific Bluefin Stock Status**

An indication of the impact of the U.S. recreational fishery (including landings of fish caught in Mexico) can be obtained from information in the 2014 bluefin stock assessment and ISC bluefin catch data. Catch data updated through 2013 is presented in Table 3.

**Table 3. Range in annual commercial landings (mt) of Pacific bluefin tuna by nation during 2000-2013 and in 2012 and 2013, the most recent years these statistics were available. U.S. recreational landings (mt) are also in the last row. (Sources: Catch estimates for 2007-2012 from ISC Plenary Report, Table 14-2, July 2013; preliminary catch estimates for 2013 from Heidi Taylor, NMFS, personal communication).**

Nation (Commercial)	Landings Range (mt) 2000-2013	Landings (mt) in 2012	Landings (mt) in 2013
Chinese -Taipei	213 – 2,782	213	334
Japan	6,283 – 24,579	6,283	7,014
Korea	604 – 2,601	1,422	604
Mexico	863 – 9,927	6,668	3,154
United States	1 – 754	43	10
<b>All Nation Commercial Total</b>	12,100 – 29,106	14,629	12,100
<b>U.S. Recreational Total</b>	14 – 984	617	984

The relative impact of fisheries in the Eastern Pacific Ocean (EPO) compared to those in the Western Pacific Ocean (WPO) on bluefin spawning stock biomass is shown in Figure 5,

excerpted from the 2014 bluefin stock assessment. For recent years (2007-2012), EPO fisheries account for approximately 20% of the impacts of all fisheries on the bluefin spawning stock biomass. EPO fisheries include the Mexico commercial fishery, the U.S. commercial fishery and the U.S. recreational (sport) fishery. The majority of bluefin tuna caught in these fisheries are juveniles (recruits), not adults of spawning size or age. However, the harvest of juvenile fish affects the production potential of the stock, as shown by the estimated impacts on spawning stock biomass. Because the stock assessment assumes that the size selectivities are the same for all three fisheries, their impacts on the spawning stock are proportional to their catches. Therefore, the U.S. recreational fishery proportion of EPO fisheries impacts on the spawning stock is equivalent to the percentage of the U.S. recreational catch of the total EPO catch. Furthermore, because EPO fisheries account for approximately 20% of all fisheries impacts, the proportional impact by the U.S. recreational fishery of all fisheries is one-fifth of its percentage of the EPO fisheries landings by weight.

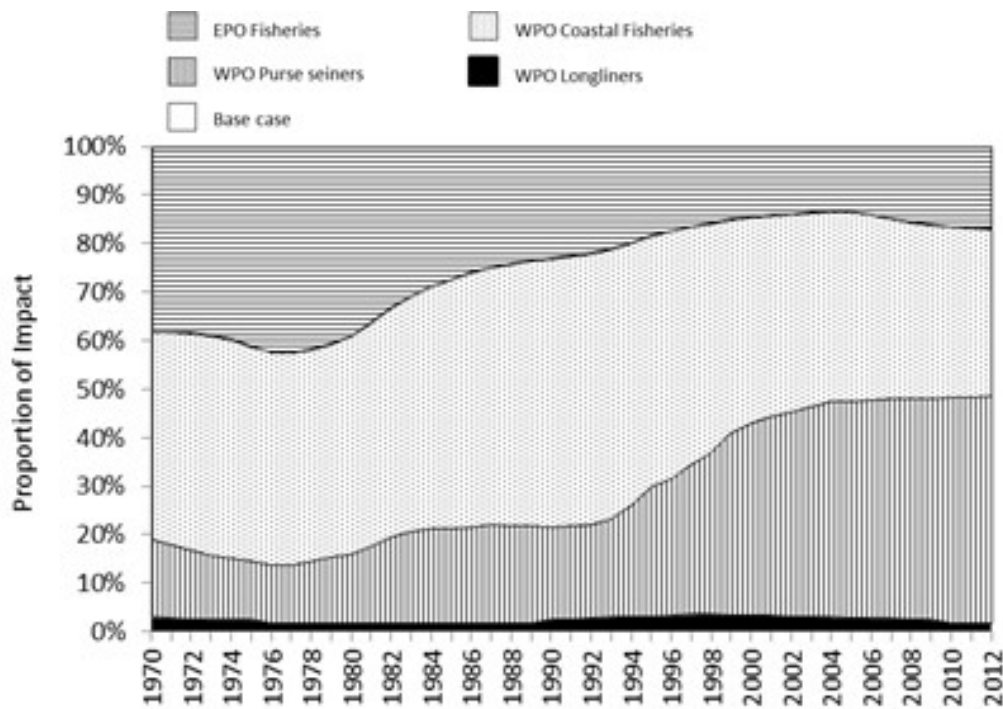


Figure 5. The proportion of the impact on the Pacific bluefin tuna (*Thunnus orientalis*) spawning stock biomass by each group of fisheries. (Excerpted from the Executive Summary to the Stock Assessment for Bluefin Tuna, 2014, by the Bluefin Tuna Working Group, ISC).

Approximate estimates of the conservation impacts of No Action are shown in Table 4. The impacts of the U.S. recreational fishery on the spawning stock biomass have increased in recent years, from <5% of EPO fisheries and <1% of all fisheries during 2007-2010 to 24% and 5%, respectively, in 2013.



**Table 4. Approximate proportion of fishery impacts by the U.S. recreational (sport) fishery on the Pacific bluefin spawning stock, 2007-2013. (Sources: Catch estimates for 2007-2012 from ISC Plenary Report, Table 14-2, July 2013; preliminary catch estimates for 2013 from Heidi Taylor, NMFS, personal communication).**

Year	ISC Reported Catches (mt)				U.S. Sport Percent of Impacts	
	Mexico Comm	U.S. Comm.	U.S. Sport	Total EPO	For EPO Impacts	For All Impacts
2007	4,147	44	14	4,205	0.3	0.1
2008	4,407	1	93	4,501	2.1	0.4
2009	3,019	415	176	3,610	4.9	1.0
2010	7,746	1	122	7,869	1.6	0.3
2011	2,731	120	499	3,350	14.9	3.0
2012	6,668	43	617	7,328	8.4	1.7
2013	3,154	10	984	4,148	23.7	4.7

### Current Regulatory Environment

The Pacific Fishery Management Council (Council), established by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) has the authority to recommend a management regime for commercial passenger fishing vessels (CPFV) and private vessels fishing for Pacific bluefin tuna. Under Section 304(i) of the MSA, where a fishery is overfished or approaching a condition of being overfished due to excessive international fishing pressure, the Council (within one year) shall: (a) develop recommendations for domestic regulations to address the relative impact of U.S. fishing vessels, and (b) provide to Congress and the Secretary of State recommendations for international actions that will end overfishing and rebuild affected stocks. Under Section 304(e), for a fishery within the Council’s geographical area of authority that has been classified as overfished or approaching a condition of being overfished, the Council (or Secretary) shall: (a) prepare and implement proposed regulations that end overfishing immediately in the fishery, and (b) rebuild affected stocks of fish, or prevent overfishing from occurring when the fishery is identified as approaching an overfished condition.

CPFV fishing for highly migratory species (HMS) are subject to Federal and state regulations, in addition to the laws and regulations of Mexico when fishing in Mexico’s EEZ. Typically, CPFV fishing for Pacific bluefin tuna occurs in U.S. West Coast waters off of California and in Mexico’s EEZ; therefore, regulations pertaining to waters off of California are discussed in more detail than waters off of Oregon and Washington. These regulations include permit and logbook requirements, and bag, possession, and boat limits (Table 5). Daily bag limits apply within each 24-hour period per person. Possession limits may be considered trip limits per person (e.g., U.S. anglers fishing on multi-day trips in Mexican waters are allowed to retain, under Mexican regulations, a maximum of three daily limits as a possession limit regardless of the duration of an individual trip). Boat limits are the number of licensed anglers multiplied by the daily bag limits.

To fish and/or land HMS, an angler on board a vessel must have a valid state license (unless they are fishing in Mexican waters exclusively), and the vessel operator must have a Federal HMS permit and submit a logbook. A HMS permit is required to fish for HMS in the U.S. EEZ off of and/or land HMS in California, Oregon, and Washington (50 CFR §660.707). A sport fishing license is required by the state of California to take any fish (14 CCR §700). CPFVs are required to submit logbooks, which may be the same logbooks required by the states of California,

Oregon or Washington by both Federal (50 CFR §660.708) and California requirements (California Fish and Game Code §7923 and §8026).

Federal bag, possession, and boat limits (50 CFR §660.721) for bluefin tuna are specific to the waters off of California and/or defer to California regulations (14 CCR §28.38b). The Federal bag limit, as well as the California bag limit, is ten bluefin tuna off the coast of California. In California, the limit of ten bluefin tuna is in addition to a 20-fish bag limit of any finfish (i.e., up to 30 fish total); the additional 20 finfish may consist of up to ten of a single species of tuna. The Federal possession limit indicates that if California requires a multi-day possession permit of bluefin tuna landed in California, which it does, then it is deemed consistent with Federal law. California’s possession limit is three times the daily bag limit, therefore an angler may land up to 30 bluefin tuna per trip that is three days or longer in duration; vessel owner/operators must have filed a Declaration for Multi-Day Fishing trip in order for the possession limit per person (3x daily bag limit) to apply. Federal boat limits are the combined daily limits of HMS for all licensed anglers. In California, the boat limit does not apply to fishing trips originating in California where fish are taken in other jurisdictions (e.g., Mexico) (14 CCR §27.60c, c(1)-c(4)).

In addition to U.S. regulations, because CPFVs frequently fish in Mexico’s waters, CPFVs must also adhere to Mexico’s regulations, which include a bag limit of five bluefin tuna and a possession limit of 15 bluefin tuna. A Mexican fishing license is required from each person on the fishing vessel, regardless of age or whether fishing<sup>2</sup>. Currently, the bag limits in Mexico are stricter than both Federal and California regulations. However, note that per U.S. Federal regulations, it is prohibited to take and retain, possess on board, or land, fish in excess of any bag limit specified in Federal regulations (i.e., 10 bluefin tuna) (50 CFR §660.705).

**Table 5. Current bag (daily catch) and possession limits in different regulatory areas.**

<b>Regulatory Area</b>	<b>Daily Catch Limit</b>	<b>Possession Limit</b>
Mexico EEZ	5	15
U.S. West Coast EEZ	10 off of CA	30 off of CA
California	10	30
Oregon	Up to 25 in aggregate limit	Up to 50 in aggregate limit
Washington	2	No limit

### **Summary of the Effects of the Action Alternatives**

Compared to No Action, the other alternatives are intended to provide greater conservation benefits by successively reducing mortality of bluefin tuna, as current daily bag limits and possession limits are decreased to zero (prohibit retention). Conservation benefits for these alternatives cannot be reliably estimated, because actual catches and mortalities depend upon future levels of fishing effort and catch, which may differ from current levels. Furthermore, under the Alternative 3 suboption, possession limits (rather than daily bag limits) would be implemented for landings of fish caught in Mexico waters to match possession limits in U.S. waters. Estimating the impact of these possession limits is problematic, and bag limit analyses, like those conducted for fishing in U.S. waters, are used to approximate the potential catch savings from such possession limits. Given these shortcomings, the results of bag limit analyses

<sup>2</sup> CONAPESCA San Diego: <http://www.conapescasandiego.org>

can yield useful projections to compare potential catch savings among alternatives, but the actual savings achieved may differ substantially from the estimates.

### Catch Reduction

Potential conservation benefits from the bag limit and possession limit changes included in the proposed alternatives are estimated from the reductions in bluefin tuna landings (in numbers and weight) based on bag limit analyses of CPFV logbooks received and average fish weight from IATTC sampling. Catch savings from the private vessel fishery are likely to be minor because landings by this fishery are small (558 fish landed in 2013 from U.S. and Mexico waters) and nearly all fish are taken in 1-fish bags. Consequently, catch savings from the private vessel fishery in U.S. and Mexico waters are not estimated and not included in the bag analyses and comparisons among alternatives.

Estimated reductions from CPFV bag limit analyses are very consistent among areas and years (Table 6). Cumulative reductions for successively lower bag limits from No Action (10-fish bag) for 2013 are very similar to those estimated from 2008-2013 logbook data. The 10-fish daily bag limit for bluefin tuna adopted in 2007 became effective in 2008, so data for the 2008-2013 time period were analyzed to cover period when the 10-fish bag limit has been in effect. To compare to the baseline fishery in 2013, catch savings from the alternatives are estimated from reductions in bluefin landings (bag limit analyses) for 2013 CPFV logbook data. Cumulative reductions for CPFV fishing in U.S. waters are also very similar to those for Mexico waters. In general, a bag limit change from 10 to 4 fish results in a catch reduction of 5-10% (by number), a bag limit of 3 fish results in approximately a 15% reduction; a bag limit of 2 fish results in about a 30% reduction, and a bag limit of 1 fish results in roughly a 50% reduction.

**Table 6. For the CPFV fishery, estimated cumulative percentage reductions in number of Pacific bluefin landings with successive reductions from a 10-fish bag limit for U.S waters, Mexico waters, and all waters, during 2013 and during 2008-2013. (Source: Elizabeth Hellmers, CDFW, personal communication).**

CPFV No. Bags	2013 Percentage Reductions			2008-2013 Percentage Reductions		
	4,037	762	25,986	17,438	2,900	133,735
Bag Size	U.S. Waters	U.S. - Mexico	Mexico Waters	U.S. Waters	U.S.- Mexico	Mexico Waters
0	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
1	54.6%	52.8%	54.2%	51.3%	39.7%	51.5%
2	32.3%	30.5%	29.5%	29.3%	19.4%	27.9%
3	18.2%	16.1%	14.9%	16.6%	9.6%	14.2%
4	9.4%	5.9%	5.9%	9.1%	3.7%	5.8%
5	3.7%	0.0%	0.6%	4.4%	0.4%	0.6%
6	2.0%	0.0%	0.3%	2.5%	0.0%	0.3%
7	0.8%	0.0%	0.2%	1.1%	0.0%	0.2%
8	0.1%	0.0%	0.1%	0.3%	0.0%	0.1%
9	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

To approximate total catch savings by weight, the reduction in number of fish from the bag limit analysis for the CPFV fishery is multiplied by an average weight of fish (14.3kg per fish). This average is the simple average of the six estimated annual average weights of bluefin landed by

CPFV vessels during 2008-2013, estimated from IATTC fish measurements during 2008-2012 (Jenny Suter and John Childers, NMFS, personal communication). Monthly average weights of fish from 2011 and 2012 were applied to monthly CPFV landings (numbers) of bluefin to obtain a total weight (mt) of 2013 landings. Because these averages have ranged from a low of 10.2kg per fish in 2008 to a high of 15.9kg per fish in 2011, and therefore, a range of potential catch savings in weight are also estimated, based on these high and low annual values. CDFW staff also indicates that the logbook compliance rate is approximately 80%; the bag limit analyses and potential reductions are not expanded to account for non-compliance.

Table 7 presents the estimated potential catch savings in numbers and weight (mt) of fish for the CPFV fishery in U.S. waters, in Mexico waters, and combined U.S. and Mexico waters, for the 2013 fishery only, the baseline for comparison to No Action. For U.S. waters, an estimated 6,473 fish and 93 mt (based on a 14.3kg average) represent the baseline fishery harvest for No Action. For U.S. and Mexico waters combined, an estimated 63,350 fish and 985 mt represent the baseline fishery harvest for No Action.

**Table 7. Potential bluefin catch savings in total number and total weight (mt) of fish for the CPFV fishery. (Source: Analysis by Elizabeth Hellmers, CDFW, personal communication.)**

Potential Bag Reductions	U.S. Waters			Mexico Waters			U.S. & Mexico Waters Combined		
	Number of Fish	Weight (mt)		Number of Fish	Weight (mt)		Number of Fish	Weight (mt)	
		Average	Range		Average	Range		Average	Range
10 fish to 5 fish	201	3	2-3	320	5	3-5	521	8	5-8
10 fish to 4 fish	571	9	6-9	3,318	52	34-53	3,889	60	40-62
10 fish to 3 fish	1,155	18	12-18	8,425	131	86-134	9,580	149	98-152
10 fish to 2 fish	2,073	32	21-33	16,745	260	171-266	18,818	292	192-299
10 fish to 1 fish	3,514	55	36-56	30,726	477	313-489	34,240	532	349-544

Under Alternative 2, a bag limit reduction from 10 fish to 5 fish daily for U.S. waters to match Mexico's bag limit, achieves a potential catch savings of 521 fish (8 mt) and provides negligible conservation benefits. Occasionally, more fish than the 5 fish allowed in Mexico waters were landed, according to logbook records, and therefore, a catch savings of bluefin from Mexico waters is included in the estimated catch savings under Alternative 2.

Under Alternative 3, reductions in daily bag limits from 10 fish to as low as 1 fish provide only modest conservation benefits if these bag limits only apply to fishing in U.S. waters. Potential catch savings for a 1-fish bag limit is estimated at 3,514 fish and 55 mt from 2013 levels.

Under Alternative 3, substantial catch savings from No Action may be achieved through bag limit reductions below 4 fish if these bag limits (or corresponding possession limits) apply to Mexico waters or to both U.S. and Mexico waters. As shown in Table 7, projected catch savings achieved through a bag limit reduction to 4 fish in U.S. and Mexico waters combined (60 mt) is approximately the same as catch savings achieved through a 1-fish bag limit for U.S. waters (55 mt). A bag limit of 3 fish for U.S. and Mexico waters combined achieves a 15% reduction from the No Action Alternative; a 2-fish bag limit achieves a 30% reduction and a 1-fish bag limit achieves a 54% reduction. The potential maximum

reduction under this alternative is estimated to be 34,240 fish and 532 mt for a 1-fish bag limit in U.S. and Mexico waters combined.

Compared to No Action, the most restrictive measure in Alternative 3, a 1-fish bag limit applicable to U.S. and Mexico waters (i.e., 3-fish possession limit for Mexico-caught fish) would result in CPFV fishery annual landings of 29,110 bluefin tuna, weighing approximately 453 mt. Additional measures would be necessary to reduce annual bluefin landings to a maximum of 208 mt, as recommended by the IATTC scientific staff.

Alternative 4, no retention of bluefin tuna, provides the most conservation benefits of all the alternatives. Compared to No Action, nearly the entire 2013 landing (985 mt) would be realized as catch savings. Some mortality of incidentally caught fish may occur, although estimates of release mortality are not known. Presumably, recreational anglers would no longer target bluefin tuna and therefore, may catch few bluefin tuna, resulting in very low release mortality.

### **Socioeconomic Impacts**

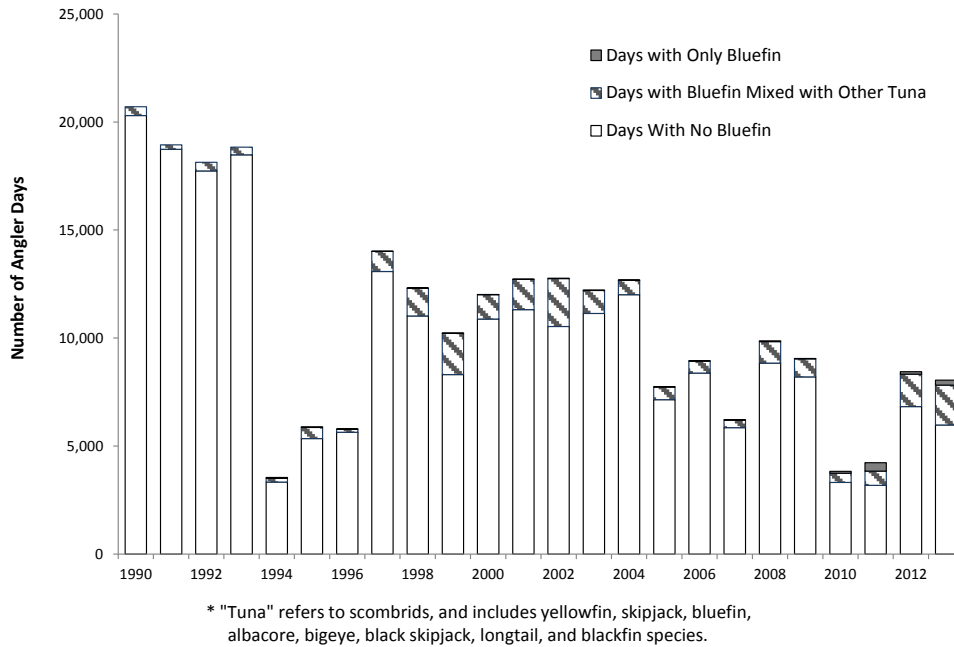
The HMSMT discussed the potential costs and benefits of recreational management measures for bluefin tuna. Short run costs of recreational bluefin regulation would primarily impact the Southern California private vessel and CPFV fishing fleets, the community of anglers that catch bluefin tuna, and related industries which supply goods and services to the portion of the recreational HMS fishery which includes bluefin among its targets. These costs could include loss of consumer and producer surplus and negative economic benefits in exchange for long-term conservation benefits. Specific impacts might include a substitution of other recreational target species for bluefin, reduced angler satisfaction, lower willingness to pay for CPFV trips, fewer customers, and negative economic impacts in terms of jobs and revenues in the CPFV fishery and other industries which support them. Additional short-run costs not borne by the west coast fishery and related industries could include potential agency monitoring, management and enforcement costs for in-season actions.

Benefits to the stock would likely be different for bag limits than for retention limits. Bag limits would only apply to effort inside the US EEZ, while retention limits would pertain to all retained catch landed in the U.S. including for effort in Mexico waters brought back to the U.S. Since only around ten percent of recreational CPFV bluefin tuna catch in recent years occurred inside U.S. EEZ waters, a bag limit would potentially have a limited effect on overall U.S. recreational catch unless commensurate limits applied to U.S. catch in Mexico waters. Whether regulation of the US recreational fleet would significantly benefit the stock would depend on implementation of beneficial regulatory measures in other nations' North Pacific bluefin tuna fisheries.

Stock recovery due to successful conservation management may provide long-term economic benefits, in the form of potentially higher future catch and retention of bluefin tuna for both recreational and commercial west coast fisheries. Whether Council constituents would be able to recapture the value of any future improvements in the status of the Pacific bluefin tuna stock would depend on the flexibility of future management to relax regulations in case warranted by stock conditions.

Figure 6 shows a breakdown of CPFV fishing days by whether bluefin tuna were caught exclusively, in combination with other tuna species, or not at all. The figure only includes CPFV days in US and Mexico waters for which at least 1 fish of the listed tuna species were reported caught on the trip log. The vast majority of CPFV fishing days with tuna catch included no bluefin. However, it is not clear without further information what effect reducing bluefin tuna bag or retention limits would have on substitution of other catch for bluefin tuna or on reduced demand for CPFV or private vessel trips. Since current bag and retention limits are set at levels which affect a very low percentage of west coast CPFV angler bags, existing data are not representative of economic impacts which could result from a significant reduction in bluefin tuna bag or retention limits.

**CPFV Fishing Days with Tuna\* Species Caught in US and Mexico Waters**



**Figure 6. Number of CPFV angler days with tuna species landed from fishing in U.S. and Mexico waters. (Source: CFIS, CPFV logbook data, Elizabeth Hellmers, CDFW, personal communication.)**

The importance of bluefin to the CPFV fishery can also be characterized by the proportion of bluefin tuna in the landings, compared to landings of other HMS FMP species (other tunas, sharks, swordfish and dorado). During 2000-2010, bluefin generally accounted for less than 10% of the landings (by number) of all HMS species (Figure 7). Since then, the percentage of bluefin increased substantially, to about 45% of all species in 2013 landings from California waters, from Mexico waters, and for all waters combined.

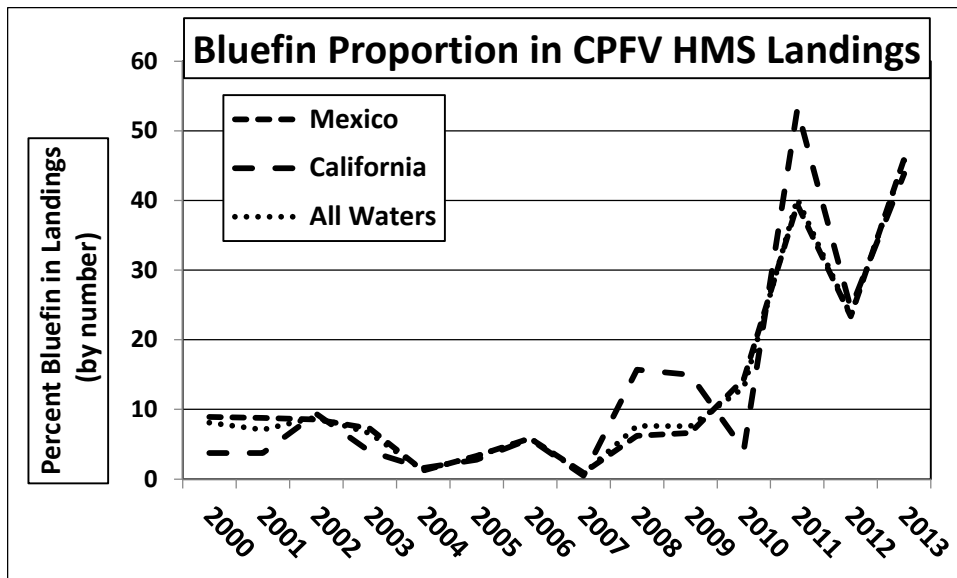


Figure 7. Proportion (by number) of Pacific bluefin in CPFV landings of HMS species from U.S. and Mexico waters combined, 2000-2013. Data for 2013 are preliminary. (Source: CFIS, Elizabeth Hellmers, CDFW, personal communication).

However, the trends in percentages of bluefin in the landings are influenced by the abundance of other species in the landings. For example, the number of bluefin landed in 2002 is only slightly smaller than the number landed in 2012 (Figure 8), although bluefin account for a much smaller percentage of total HMS landings in 2002. Very large numbers of albacore were landed during 2002, in comparison to albacore landings in recent years, resulting in the comparatively low percentage of bluefin tuna that year.

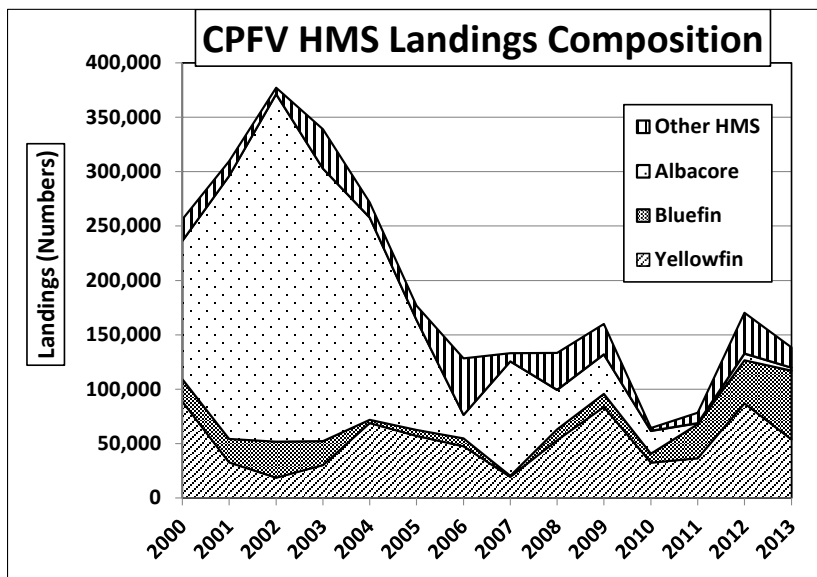


Figure 8. CPFV landings for HMS species (number of fish) from U.S. and Mexico waters combined, 2000-2013. Data for 2013 are preliminary. (Source: CFIS, Elizabeth Hellmers, CDFW, personal communication).

## **Other Impacts of the Proposed Action**

None of the alternatives are expected to have meaningful impacts on protected resources. Bag limit reductions for bluefin tuna or a prohibition on retention may not result in less recreational fishing for tunas in U.S. or Mexico waters. Any interactions with protected resources that may occur in association with recreational fishing for bluefin tuna are expected to occur with recreational fisheries targeting other tunas. Similarly to the impacts on protected resources, none of the alternatives are expected to have meaningful impacts on habitat.