White Seabass Fishery Management Plan
2016-2017 Annual Review

Prepared by

Department of Fish and Wildlife
Marine Region
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Executive Summary

The California Fish and Game Commission (Commission) adopted the White Seabass Fishery Management Plan (WSFMP) in June 2002. The WSFMP includes a provision for annual monitoring and assessment of the White Seabass (WSB) fisheries. The White Seabass Scientific and Constituent Advisory Panel (WSSCAP) was established to assist the Department of Fish and Wildlife (Department) and the Commission with the review of the fishery assessments, management proposals, and plan amendments. The annual review includes fishery-dependent data (e.g., commercial and recreational landings and length frequencies) and, if available, fishery-independent data (e.g., recruitment information) as well as documented changes within the social and economic structure of the recreational and commercial industries that utilize the WSB resource within California. The review also includes information on the harvest of White Seabass from Mexican waters and other relevant data. Based on the results of the annual review, in cooperation with the WSSCAP, the Department will provide management recommendations, if needed, to the Commission.

The Commission adopted points of concern criteria in the WSFMP framework to help determine when management measures are needed to address resource issues. The points of concern are:

1. catch is expected to exceed the current harvest guideline or quota;
2. any adverse or significant change in the biological characteristics of White Seabass (age composition, size composition, age at maturity or recruitment) is discovered;
3. an overfishing condition exists or is imminent;
4. any adverse or significant change in the availability of White Seabass forage or in the status of a dependent species is discovered;
5. new information on the status of White Seabass is discovered;
6. an error in data or stock assessment is detected that significantly changes estimates of impacts due to current management.

The Department and WSSCAP met on April 13, 2018 to review the 2016-2017 fishery season (September 1 to August 31), and together agreed that none of the points of concern were met. Additional social and economic information along with the catch information from Mexico support this conclusion. As a result, the Department does not recommend any changes to the management of WSB or to the WSFMP at this time.

Background

The WSSCAP annually reviews current information to evaluate the status of the WSB resource based on points of concern adopted to implement the WSFMP, and to consider whether current management measures provide adequate protection for the resource. If a resource conservation issue is found the WSSCAP will provide its recommendation, rationale, and analysis to the Department. The Department will evaluate the recommendation from the WSSCAP and all available information and will recommend to the Commission management measure(s) to address the issue(s).

Results

Analysis of the points of concern (Table 1) showed that none of the criteria were met in 2016-2017.

Table 1. Analysis of the points of concern.

Criteria	Analysis	Result
Catch is expected to exceed the current harvest guideline or quota.	2016-2017 total catch = 395,497 pounds; Optimum Yield = 1.2 million pounds*. Total catch is below optimum yield.	No action necessary
Any adverse or significant change in the biological characteristics of WSB (age composition, size composition, age at maturity or recruitment) is discovered.	Recreational and commercial fishery length-frequencies showed no significant change that would indicate a problem in the fishery. No new information on age composition, age at maturity, or age at recruitment.	No action necessary
An overfishing condition exists or is imminent.	See analysis in Table 2. No overall overfishing condition noted.	No action necessary
Any adverse or significant change in the availability of WSB forage or in the status of a dependent species is discovered.	Most forage species decreased in the 2016-2017 season. However, WSB are opportunistic feeders and the Department and WSSCAP feel that there are other prey items for WSB to feed on.	No action necessary
New information on the status of WSB is discovered.	The Department is currently collecting samples to investigate age/length at maturity.	No action necessary
An error in data or stock assessment is detected that significantly changes estimates of impacts due to current management.	Stock assessment was completed in May 2016.	No action necessary

*California Department of Fish and Game. 2002. Final White Seabass Fishery Management Plan, 219 pp.

Point of Concern: Expectation of optimum yield being exceeded.

The Commission established a fishing season of September 1 through August 31 of the following year. The Commission also adopted an optimum yield based on a maximum sustainable yield proxy of the unfished biomass, and it is currently set at 1.2 million pounds. In the 2016-2017 season, the total recreational and commercial harvest was 395,497 pounds, 33 percent of the allowable catch (Appendix A, Table 1).

Point of Concern: Changes in the biological characteristics of White Seabass.

The commercial fishery continues to harvest WSB across a wide size range (Appendix A, Figure 1). In 2016-2017, 281 fish were sampled from the commercial fishery. One hundred percent of the fish sampled were larger than the minimum size limit of 28 inches and approximately three fourths of the fish sampled were larger than 45 inches. Based on previous age-at-length information from reading otoliths and from a previously calculated weight/length relationship, those fish larger than 45 inches are likely more than 11 years old and weigh more than 30 pounds.

Sampled length frequency data for the recreational fishery are presented in Appendix A, Figure 2. Before the start of the 2009-2010 season the Department prepared and distributed a brochure targeting recreational anglers to improve compliance with the recreational minimum size limit for WSB. In the seasons since this brochure was distributed, less than 10 percent of the fish measured were smaller than the minimum size limit of 28 inches. This is a significant improvement from the previous seasons, in which 17-19 percent of all fish measured were less than minimum legal size. This season 93 legal-sized fish were measured from the recreational fishery. Of the legal-sized fish measured from the recreational fishery approximately one half of the fish measured were larger than 40 inches total length. Based on the previously calculated weight/length relationship, those fish larger than 40 inches are likely more than 9 years old and weigh more than 24 pounds.

Point of Concern: An overfishing condition exists or is imminent.

Three criteria (Table 2), all of which must be met to establish a point of concern, determine if an overfishing condition exists or is imminent. For the commercial fishery, there must be a 20 percent decline in landings in each of two consecutive seasons compared to the prior 5-season running average. Commercial landings of WSB (Appendix A, Table 2) totaled 217,915 pounds in the 2016-2017 season; this is a 24 percent decrease when compared to the prior 5-season running average (285,687 pounds). In the 2015-2016 season, commercial landings totaled 247,195 pounds; this is a 27 percent decrease compared to the prior 5-season running average (340,369 pounds). The WSSCAP and the Department agreed that the overfishing criterion for the commercial fishery was met. However, all three criteria must be met to establish a point of concern so no action is recommended at this time.

For the recreational fishery, the overfishing criterion is defined as a 20 percent decline in each of two consecutive seasons for both the number of fish and the average weight (Appendix A, Table 3). In the recreational fishery, the number of fish caught in the 2016-2017 season increased 50 percent when compared to the previous season. The average weight of fish caught in the 2016-2017 season decreased 1 percent when compared to the previous season. The WSSCAP and the Department agreed that the overfishing criterion for the recreational fishery was not met.

The final criterion for determining if an overfishing condition exists is a 30 percent decline in the recruitment index for juvenile WSB compared to the prior 5-season running average of recruitment. The Ocean Resources Enhancement and Hatchery Program (OREHP) had routinely conducted standardized field studies four times a year (August, October, April and June) for juvenile recruitment. However, reductions in funding curtailed survey effort. The Southern California Sport Fishing Enhancement Stamp fund was insufficient to cover all of the OREHP activities as well as the gill net recruitment surveys, and consequently there was no gill net sampling between 2009 and 2011.

In October 2012, gill net sampling similar to previous surveys was reinstated. The objective of the current sampling design seeks to resume the prior gill net sampling regime but in a reduced capacity with fewer locations surveyed and a reduction in the number of nets deployed at each site.

We used number of fish caught per set across the entire sampling year as an index to evaluate juvenile WSB recruitment. There was an increasing trend in number of juvenile WSB caught per set from 2012 to 2015. However, this trend decreased during the 2016 survey and again in 2017 (Appendix A, Figure 3). The number of fish caught per gill net set was averaged from the years 2012 to 2016, and was compared to the current year, 2017. The CPUE for juvenile WSB recruits for 2017 decreased by 17 percent from the previous 5-year average (Appendix A, Table 4).

Based on the analysis of all three overfishing criteria, the WSSCAP and the Department agreed that the overall overfishing point of concern for the fishery was not met.

Table 2. Analysis to determine if the White Seabass resource is overfished (Criteria taken from Section 51.01 (b), Title 14, California Code of Regulations).		
Criteria	Analysis	Result
A 20 percent decline in the total annual commercial landings of WSB for the past two consecutive seasons compared to the prior 5-season running average of landings, based on landing receipt data.	2016-2017 217,915 pounds = 24% decrease 5-season average = 285,687 pounds 2015-2016 247,195 pounds = 27% decrease 5-season average = 340,369 pounds	Criterion was met
A 20 percent decline in both the number of fish and the average weight of WSB caught in the recreational fishery for the same two consecutive seasons, as determined by the best available data.	2016-2017 5,675 fish = 50% increase 22.9 pound average = 1% decrease 2015-2016 3,793 fish = 21% increase 23.1 pound average = 22% increase	Criterion not met
A 30 percent decline in recruitment indices for juvenile WSB compared to prior 5-season running average of recruitment, as determined by the best available data.	2016-2017 0.88 fish/set = 17% decrease 5-season average = 1.06 fish/set	Criterion not met

Point of Concern: Any adverse or significant change in the availability of White Seabass forage or in the status of a dependent species is discovered.

Prey species (Northern Anchovy, Jack Mackerel, Market Squid, Pacific Mackerel, and Pacific Sardine) are highly mobile and their distributions are affected by oceanographic conditions. A review of WSB forage species (Appendix A, Figures 4, 5, and 6) revealed some changes in availability.

Both Pacific Mackerel and Pacific Sardine have stock assessments conducted by the National Marine Fisheries Service and these stock assessments include biomass estimates. Since 2008, Pacific Mackerel biomass estimates have been conducted every two years. Pacific Sardine biomass estimates are conducted every year. The biomass estimates for Pacific Mackerel for the 2017/2018 season showed a slight increase from their last assessment. The 2014-2015 Pacific Sardine fishery closed two months early in April, and was closed for the 2015-2016 and 2016-2017 seasons.

Since there are currently no biomass estimates or stock assessments for Northern Anchovy, Jack Mackerel, and Market Squid, commercial fishery landings were used as a proxy for their availability. Northern Anchovy, Jack Mackerel, and Market Squid availability decreased and Market Squid increased slightly from the previous year.

Based on the analysis of all of the prey species, the WSSCAP and the Department agreed that this point of concern was not met because of the opportunistic nature of WSB foraging.

Other Points of Concern:

The remaining two points of concern (Table 1) consider any new information on the status of WSB, and if any errors in data or stock assessment were found.

Currently the Department is collecting WSB samples to assess length/age at maturity.

No errors in the current stock assessment have been found.

Additional Information

The Department evaluated basic socio-economic information to characterize the commercial fishery and provided those summaries to the WSSCAP (Appendix A, Table 5). The number of vessels fishing for WSB decreased by 32 percent (60 vessels) from the 2015/16 to 2016/17 seasons. This decrease in the number of vessels occurred mostly in the hook-and-line fishery. The ex-vessel price per pound has shown a steady trend over time and is presently at $4.00 per pound for all gears combined. Limited socio-economic data are available for the recreational fleet.

Information about the take of WSB in Mexican waters was considered by the WSSCAP. California commercial fishermen are prohibited by Mexican law to fish in the territorial seas of Mexico, and no landings of WSB from Mexico by California commercial fishermen were reported in 2016-2017. Recreational anglers may fish in Mexico under the authority of a Mexican sport fishing license. During the 2016-2017 season, Commercial Passenger Fishing Vessel logbook data reported 33 WSB taken in Mexico, a decrease of 112 fish from the reported 145 taken in the prior season. No additional information about either the recreational or commercial catch of WSB in Mexico is available.

Appendix A – Data Analyses

Table 1. Total catch (pounds) of White Seabass, 2007/08 - 2016/17

Season	Recreational	Commercial	Total
2007/08	150,988	653,264	804,252
2008/09	152,799	414,459	567,258
2009/10	215,071	502,021	717,092
2010/11	306,491	520,605	827,096
2011/12	259,028	406,746	665,774
2012/13	265,816	315,533	581,349
2013/14	219,116	262,441	481,557
2014/15	63,125	196,521	259,646
2015/16	96,244	247,195	343,439
2016/17	177,582	217,915	395,497

Source: California Recreational Fisheries Survey extracted from the RecFIN database at http://www.recfin.org, California Department of Fish and Wildlife Commercial Fisheries Information System (commercial landing receipts), and Marine Log System (MLS).

Table 2. Commercial White Seabass landings in pounds, 2007/08 - 2016/17

Season	Pounds Landed	Prior 5-season average	Percent change from previous 5-season average
2007/08	653,264	377,896	73
2008/09	414,459	411,867	1
2009/10	502,021	433,621	16
2010/11	520,605	476,487	9
2011/12	406,746	502,347	-19
2012/13	315,533	499,419	-37
2013/14	262,441	431,873	-39
2014/15	196,521	401,469	-51
2015/16	247,195	340,369	-27
2016/17	217,915	285,687	-24

Source: California Department of Fish and Wildlife Commercial Fisheries Information System (includes commercial landing receipt data).

Table 3. Recreational White Seabass catch, 2007/08 - 2016/17

Season	Total number of fish caught	Percent change in number of fish from prior season	Average weight in pounds	Percent change in weight from prior season
2007/08	7,593	5	19.3	4
2008/09	6,751	-11	19.8	3
2009/10	8,788	30	24.3	23
2010/11	12,672	44	29.1	20
2011/12	9,876	-22	26.9	-8
2012/13	10,634	8	19.3	-28
2013/14	9,567	-10	22.4	16
2014/15	3,136	-67	18.9	-15
2015/16	3,793	21	23.1	22
2016/17	5,675	50	22.9	-1

Source: California Recreational Fisheries Survey extracted from the RecFIN database at http://www.recfin.org, and Marine Log System (MLS).

Table 4. Number of juvenile fish (<711 mm) caught per gill net set, 2012-2017

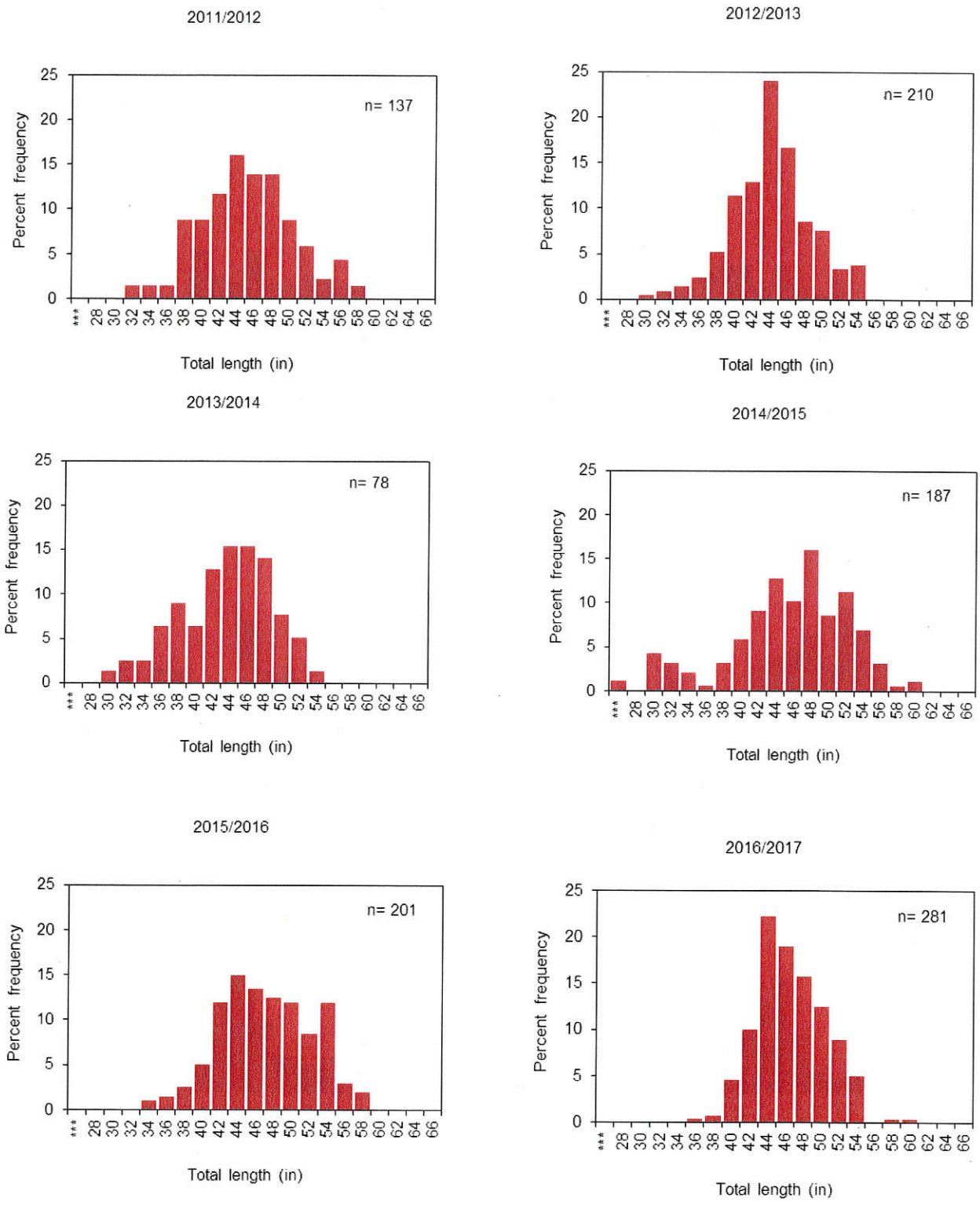
Season	Fish per set	Prior 5-year average	Percent change from previous 5-year average
2012	0.67		
2013	0.97		
2014	1.19		
2015	1.46		
2016	1.02		
2017	0.88	1.06	-17

Source: White Seabass Gill Net Survey Database. Hubbs-SeaWorld Research Institute and San Diego State University.

Table 5. Sociological and Economic Factors, 2005/06-2016/17

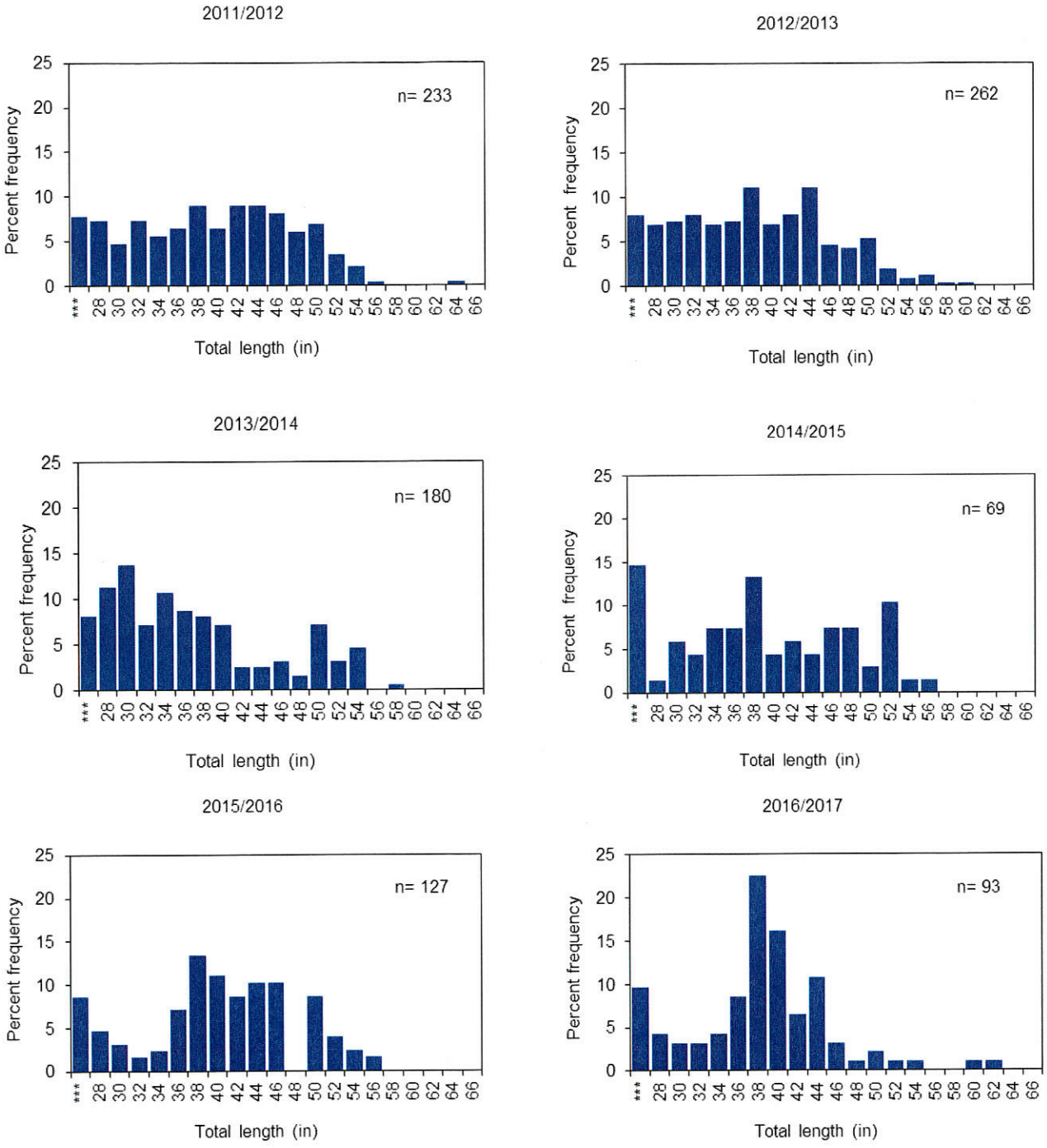
Season	Total number of vessels landing White Seabass	Most common ex-vessel price per pound
2005/06	95	$3.00
2006/07	97	$3.00
2007/08	96	$3.50
2008/09	93	$3.50
2009/10	183	$3.50
2010/11	254	$4.00
2011/12	276	$4.00
2012/13	257	$5.00
2013/14	238	$5.50
2014/15	177	$4.00
2015/16	190	$4.00
2016/17	130	$4.00

Source: California Department of Fish and Wildlife Commercial Fisheries Information System (includes commercial landing receipt data).



***all sub-legal fish were grouped together
Source: Department of Fish and Wildlife Market Sampling Program

Figure 1. Commercial White Seabass sampled length frequencies, 2011/12 – 2016/17.



***all sub-legal fish were grouped together
Source: Sampler examined landed catch data from California Recreational Fisheries Survey extracted from the RecFIN database at http://www.recfin.org.

Figure 2. Recreational White Seabass sampled length frequencies, 2011/12 – 2016/17.

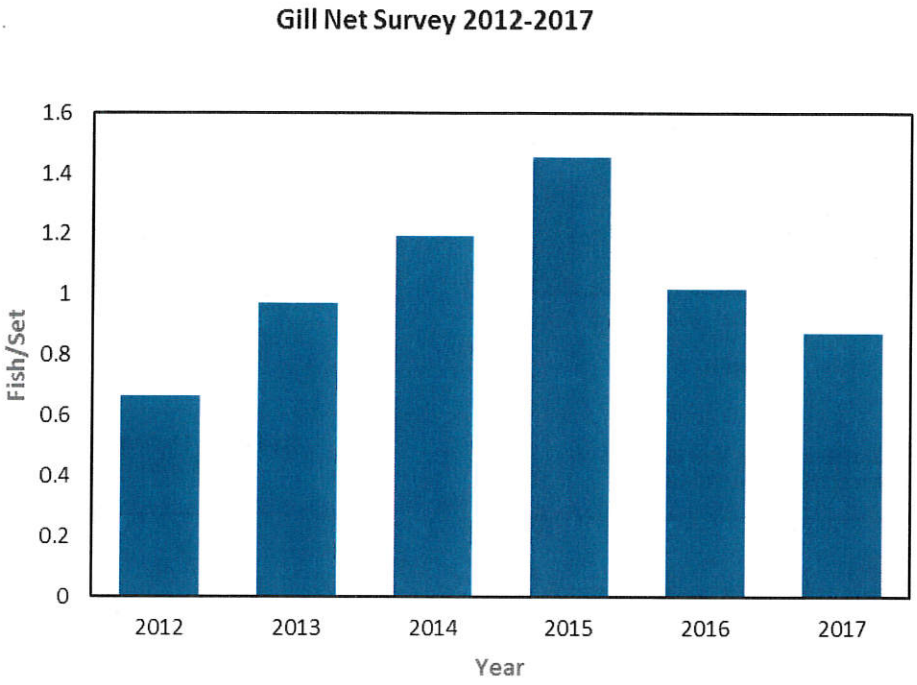
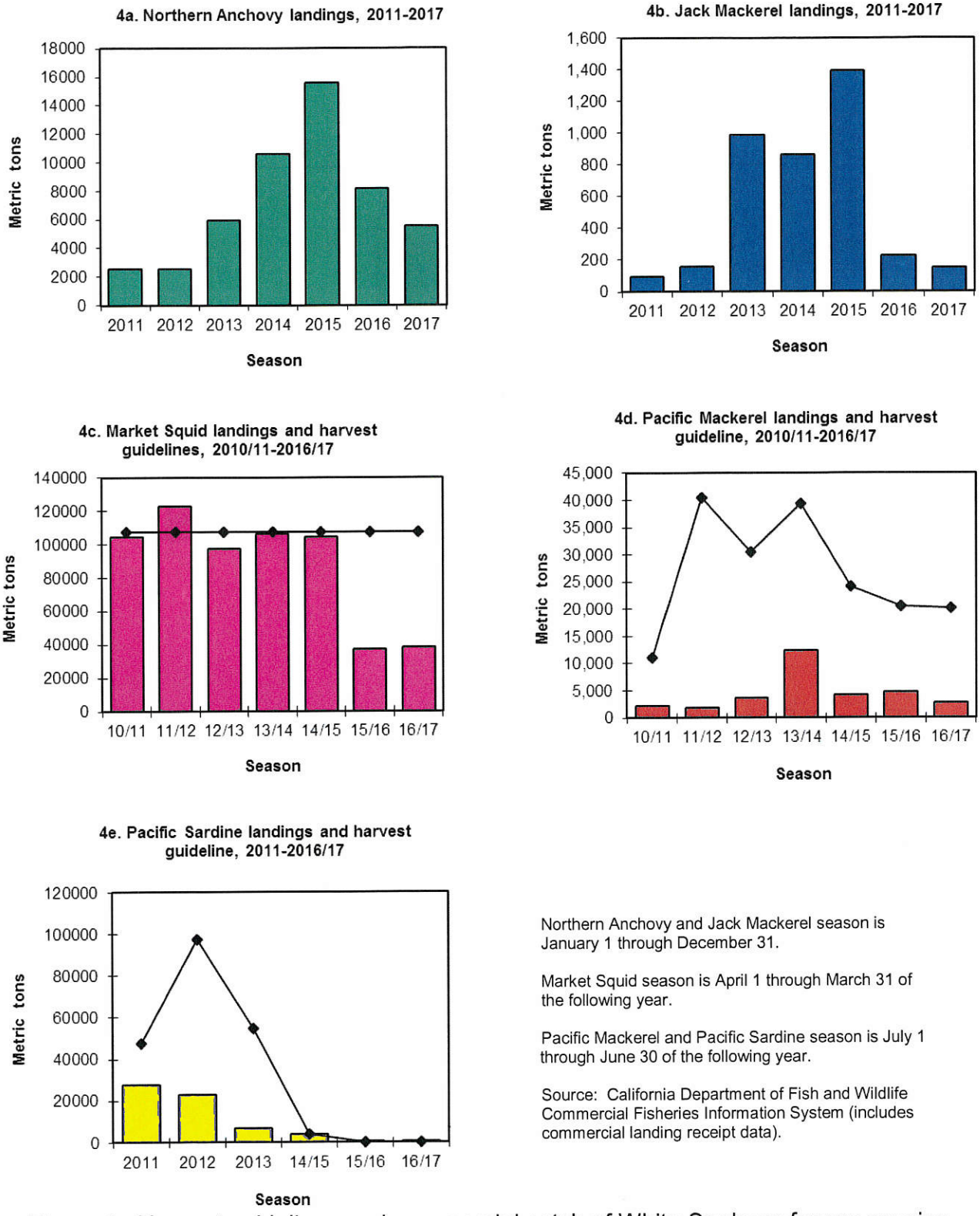


Figure 3. Recruitment data from White Seabass gill net surveys collected by Hubbs-Sea World Research Institute (HSWRI), California State University Northridge (CSUN) and San Diego State University (SDSU).



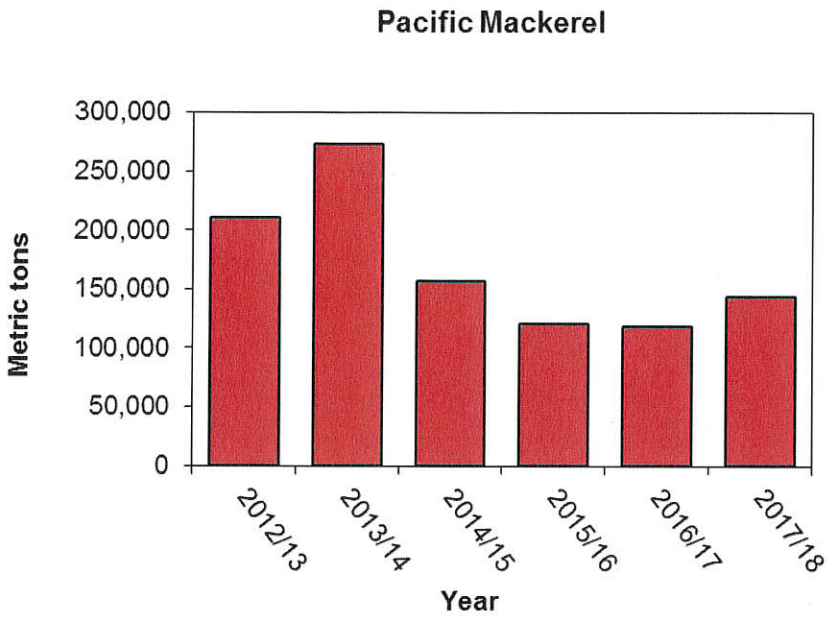
Northern Anchovy and Jack Mackerel season is January 1 through December 31.

Market Squid season is April 1 through March 31 of the following year.

Pacific Mackerel and Pacific Sardine season is July 1 through June 30 of the following year.

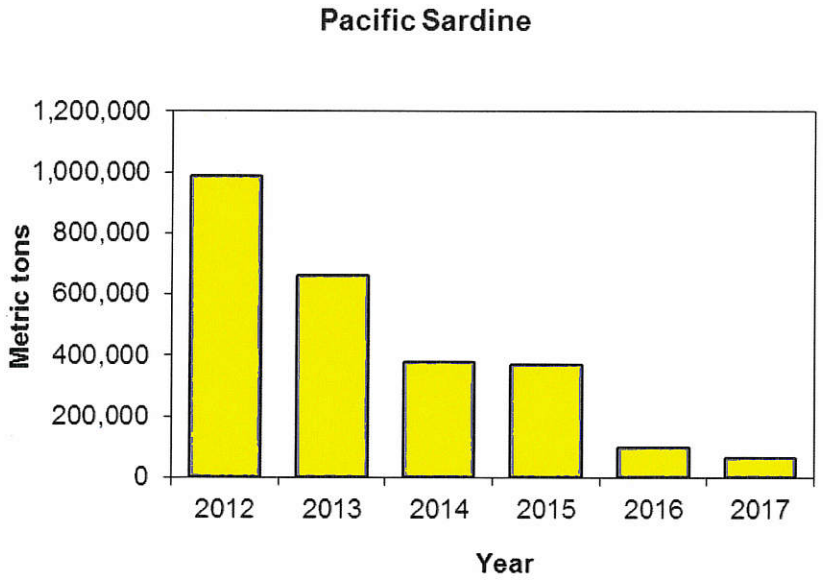
Source: California Department of Fish and Wildlife Commercial Fisheries Information System (includes commercial landing receipt data).

Figure 4. Harvest guidelines and commercial catch of White Seabass forage species.



Source: Pacific Fishery Management Council. CPS SAFE document and PFMC proceedings.

Figure 5. Biomass estimates for Pacific Mackerel in metric tons, 2012/13 – 2017/18.



Source: Pacific Fishery Management Council. CPS SAFE document and PFMC proceedings.

Figure 6. Biomass estimates for Pacific Sardine in metric tons, 2012 – 2017 season.