White Seabass Fishery Management Plan
2018-2019 Annual Review

White Seabass, *Atractoscion nobilis*.
(Photo Credit: Scott Aalbers, Pfleger Institute of Environmental Research (PIER).

Prepared by

California 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 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 fishery-independent data (e.g., recruitment information) if available, as well as documented changes within the social and economic structure of the recreational and commercial industries that utilize the White Seabass 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.

To assist the Commission in determining if management measures need to be modified or added, the WSFMP framework includes, and the Commission adopted, points of concern criteria 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 May 14, 2020, to review the 2018-2019 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 White Seabass or to the WSFMP at this time.

Background

The WSSCAP annually reviews current information to evaluate the status of the White Seabass 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 2018-2019.

Table 1. Analysis of the points of concern (2018-2019).

Criteria	**Analysis**	**Result**
Catch is expected to exceed the current harvest guideline or quota.	2018-2019 total catch = 292,955 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 White Seabass (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 published 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 White Seabass forage or in the status of a dependent species is discovered.	Four out of five forage species decreased, and one fishery remained closed in the 2018/19 season. However, White Seabass are opportunistic feeders and the Department and WSSCAP understand that there are other prey items for them to feed on.	No action necessary
New information on the status of White Seabass 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

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. The optimum yield is based on a maximum sustainable yield proxy of the unfished biomass and is currently set at 1.2 million pounds. In the 2018-2019 season, the total recreational and commercial harvest was 292,955 pounds, 24 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 White Seabass across a wide size range (Appendix A, Figure 1). In 2018-2019, 140 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 White Seabass. In the seasons immediately after this brochure was distributed (2009-2010 to 2013-2014), 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. However, in 2014-2015 and 2017-2018, greater than 10 percent of the sampled catch was sub-legal. This season, the percent of sub-legal fish decreased to 7 percent. Overall, 107 legal-sized fish were measured from the recreational fishery, and approximately one third (35 percent) 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. In the previous 2017-2018 season, commercial landings totaled 220,687 pounds; this is a 11 percent decrease compared to the prior 5-season running average (285,687 pounds). Commercial landings of White Seabass (Appendix A, Table 2) totaled 168,077 pounds in the 2018-2019 season; this is a 27 percent decrease when compared to the prior 5-season running average (229,196 pounds). The WSSCAP and the Department agreed that the overfishing criterion for the commercial fishery was not met, 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 <u>both</u> the number of fish and the average weight

(Appendix A, Table 3). In the recreational fishery, the number of fish caught in the 2018-2019 season increased by 23 percent when compared to the previous season. The estimated average weight of fish caught in the 2017-2018 season did not change compared to the previous season. However, it decreased by 12 percent in the 2018-2019 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 White Seabass compared to the prior 5-season running average of recruitment. The Ocean Resources Enhancement and Hatchery Program (OREHP) previously conducted standardized field studies four times a year (August, October, April and June) for juvenile recruitment. However, reductions in funding curtailed survey effort. The Ocean Enhancement Stamp fund was insufficient to cover all 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 plan but includes more embayment sites and less coastal sites than previously sampled.

Previously, the number of fish caught per set across the entire sampling year was used as an index to evaluate juvenile White Seabass recruitment. There was an increasing trend in number of juvenile White Seabass caught per set from 2012 to 2015. However, this trend decreased during the 2016 survey and again in 2017. In 2018, the number of juvenile White Seabass caught per set increased slightly (Appendix A, Figure 3). The number of fish caught per gill net set was averaged from the years 2012 to 2017 and was compared to 2018. The number of White Seabass caught per set for juvenile White Seabass recruits for 2018 decreased by 11 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 White Seabass for the past two consecutive seasons compared to the prior 5-season running average of landings, based on landing receipt data.	2018-2019: 168,077 pounds = 27% decrease. 5-season average = 229,196 pounds. 2017-2018: 220,687 pounds = 11% decrease. 5-season average = 247,921 pounds.	Criterion not met
A 20 percent decline in both the number of fish and the average weight of White Seabass caught in the recreational fishery for the same two consecutive seasons, as determined by the best available data.	2018-2019: 5,981 fish = 23% increase. 20.1 pound average = no change. 2017-2018: 4,874 fish = 14% decrease. 23.0 pound average = 12% decrease	Criterion not met
A 30 percent decline in recruitment indices for juvenile White Seabass compared to prior 5-season running average of recruitment, as determined by the best available data.	2018-2019: 0.98 fish/set = 11% decrease. 5-season average = 1.10 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 (*Engraulis mordax*), Jack Mackerel (*Trachurus symmetricus*), Market Squid (*Doryteuthis opalescens*), Pacific Mackerel (*Scomber japonicus),* and Pacific Sardine (*Sardinops sagax*)) are highly mobile and their distributions are affected by oceanographic conditions. A review of White Seabass forage species (Appendix A, Figures 3, 4, and 5) revealed some changes in availability.

Both Pacific Mackerel and Pacific Sardine have stock assessments conducted by the National Marine Fisheries Service (NMFS). 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 have been steady for the last five seasons. The Pacific Sardine fishery has been closed since near the end of the 2014-2015 season.

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

Relative indices of abundance are being collected by NMFS for Jack Mackerel, although comparisons from year to year would need to account for differences in the geographic

area covered by the sampling design. Jack Mackerel landings have decreased for the past three years.

Relative abundance of Northern Anchovy was estimated by NMFS in 2018 and found to be greater than a prior estimate in 2016. However, landings for Northern Anchovy in 2019 decreased but are still greater than landing from 2016 and 2017.

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

Other Points of Concern:

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

Currently, the Department, in collaboration with the Pfleger Institute of Environmental Research (PIER), is collecting White Seabass samples to assess length/age at maturity.

No errors in the current stock assessment have been found.

Additional Information

The Department has used one indicator each of some basic socioeconomic information to characterize the commercial fishery and provided those summaries to the WSSCAP (Appendix A, Table 5). As a social information indicator, the number of commercial vessels landing White Seabass has been tracked over time. In the 2018-2019 season, the number of vessels fishing for White Seabass increased by 8.7% (17 vessels). This increase in the number of vessels occurred mostly in the gill net fishery in southern California. An economic information indicator of the most frequent ex-vessel price per pound has also been tracked over time. The most common ex-vessel price per pound has shown a steady increase over time and is presently at $5.00 per pound for all gears combined. No similar social or economic data are available for the recreational fleet.

Information about the take of White Seabass 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 White Seabass from Mexico by California commercial fishermen were reported in 2018-2019. Recreational anglers may fish in Mexico under the authority of a Mexican sport fishing license. During the 2018-2019 season, Commercial Passenger Fishing Vessel logbook data reported 180 White Seabass taken in Mexico. This is the second highest number of White Seabass landed from Mexico in the past nine seasons, with the highest total being 183 in the 2012-2013 season. No additional information about either the recreational or commercial catch of White Seabass in Mexico is available.

Appendix A – Data Analyses

Table 1. Total catch (pounds) of White Seabass, 2009-2010 to 2018-2019. Source: California Recreational Fisheries Survey extracted from the RecFIN database at https://www.recfin.org, and commercial landings data extracted from the Department's Marine Landings Data System (MLDS) and Marine Logs System (MLS) (CPFV log data).

Season	Recreational	Commercial	Total
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	100,406	247,195	347,601
2016/17	177,582	217,915	395,497
2017/18	129,195	220,687	349,882
2018/19	124,878	168,077	292,955

Table 2. Commercial White Seabass landings in pounds, 2009-2010 to 2018-2019. Source: Department's MLDS.

Season	Pounds Landed	Prior 5-season average	Percent change from previous 5-season average
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
2017/18	220,687	247,921	-11
2018/19	168,077	229,196	-27

Table 3. Recreational White Seabass catch, 2009-2010 to 2018-2019. Source: California Recreational Fisheries Survey extracted from the RecFIN database at https://www.recfin.org and the Department's MLS (CPFV log data).

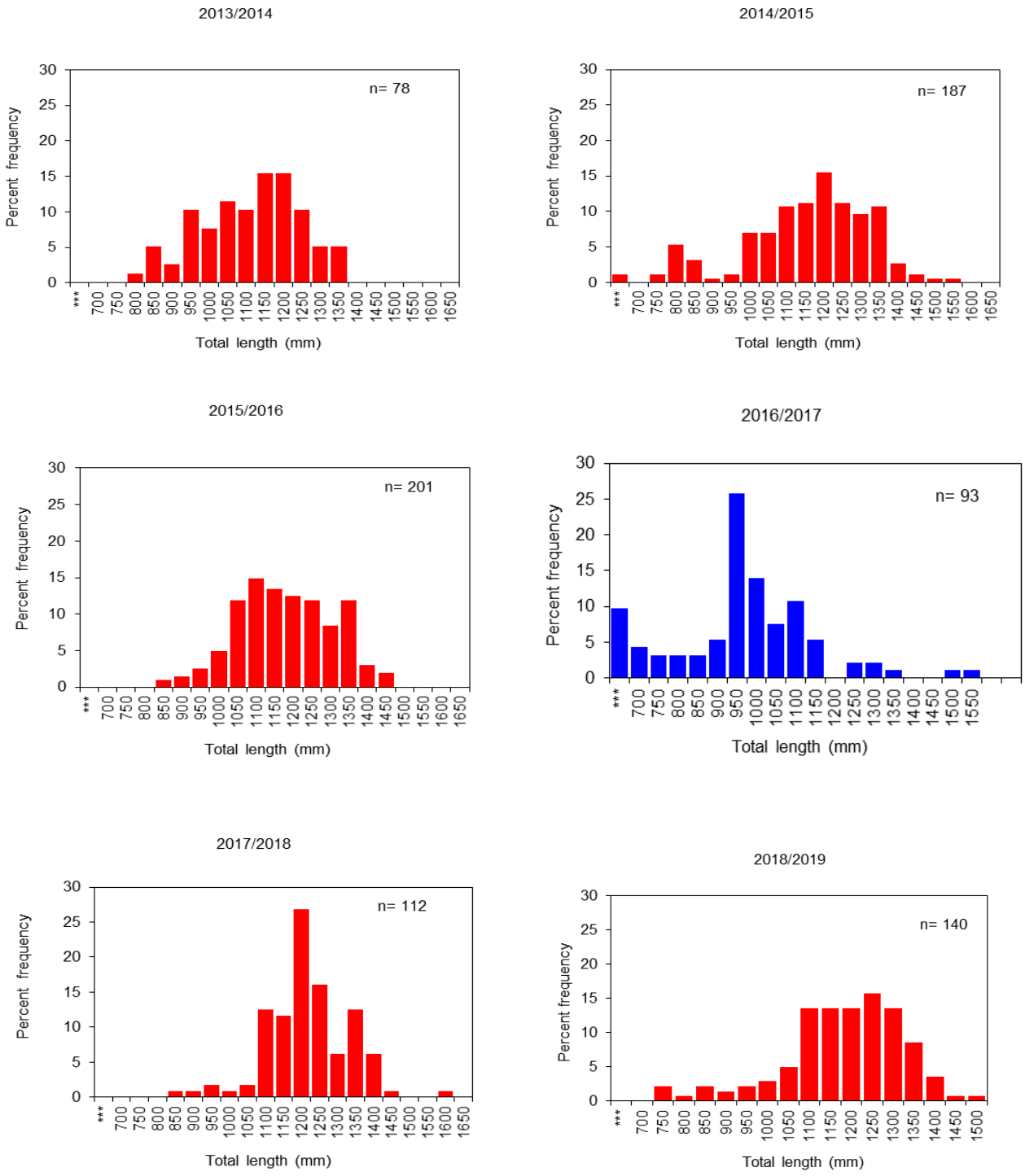
Season	Total number of fish caught	Percent change in number of fish from prior season	Average weight in pounds	Percent in weight from prior season
2009/10	8,788	30	24.3	23
2010/11	12,672	44	29.1	20
2011/12	9,876	-22	26.9	-8
2012/13	10,634	8	19.3	-28
2013/14	9,567	-10	22.4	16
2014/15	3,136	-67	18.9	-15
2015/16	3,793	21	23.1	22
2016/17	5,675	50	22.9	-1
2017/18	4,874	-14	23.0	0
2018/19	5,981	23	20.1	-12

Table 4. Number of juvenile fish (<711 mm) caught per gill net set, 2012-2018. Source: White Seabass Gill net Survey Database. Hubbs-SeaWorld Research Institute and San Diego State University.

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
2018	0.98	1.10	-11

Table 5. Socioeconomic Factors, 2009-2010 to 2018-2019. Source: Department's MLDS and MLS (CPFV log data).

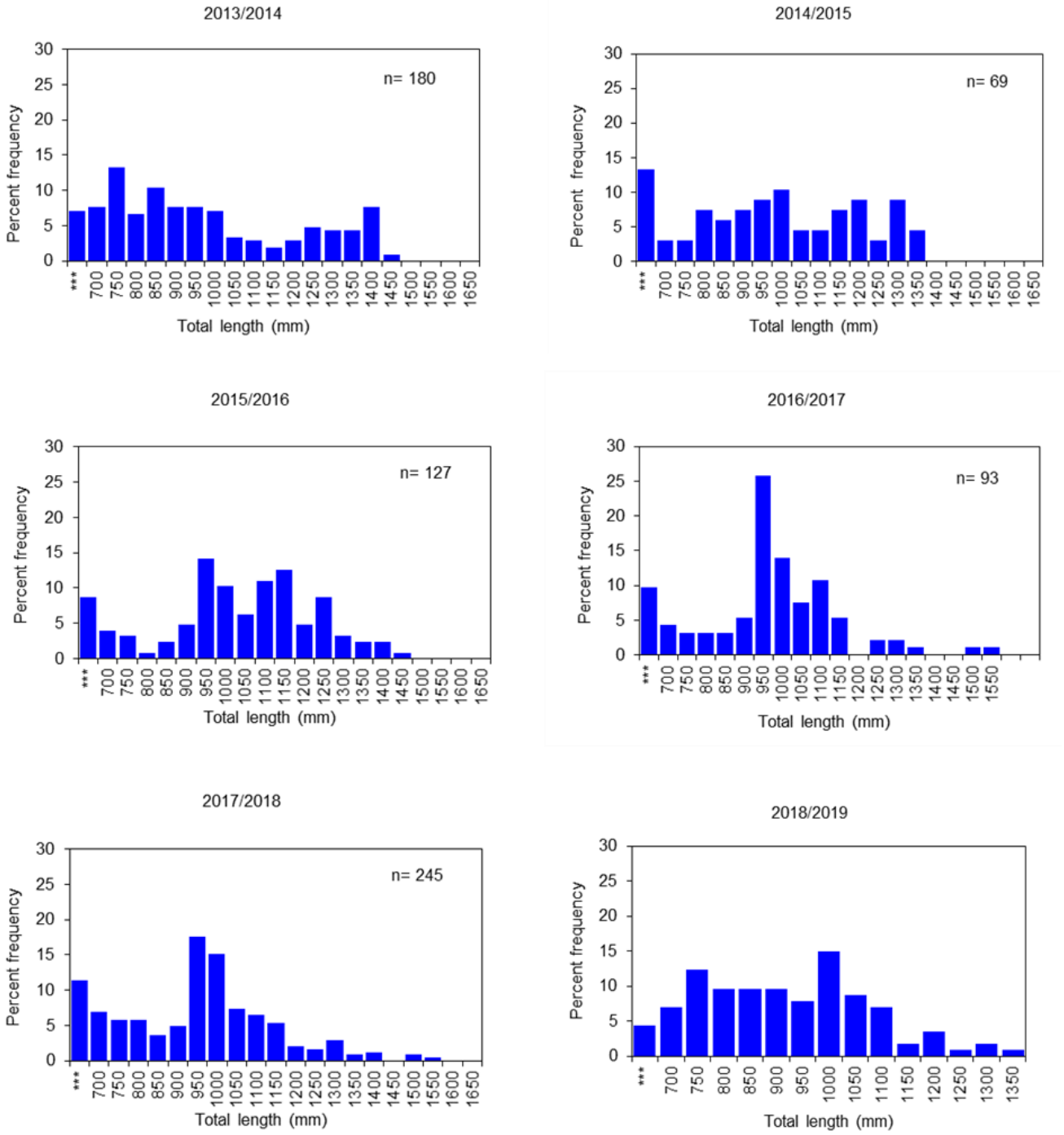
Season	Total number of vessels landing White Seabass	Most common ex-vessel price per pound
2009/10	183	$3.50
2010/11	254	$4.00
2011/12	276	$4.00
2012/13	257	$5.00
2013/14	238	$5.50
2014/15	177	$4.00
2015/16	190	$6.00
2016/17	139	$4.00
2017/18	196	$6.00
2018/19	213	$5.00



***all sub-legal fish were grouped together

Source: Department of Fish and Wildlife Market Sampling Program

Figure 1. Commercial White Seabass sampled length frequencies, 2012-2013 to 2018-2019.



***all sub-legal fish were grouped together

Source: Sampler examined landed catch data from California Recreational Fisheries Survey extracted from the RecFIN database at https://www.recfin.org

Figure 2. Recreational White Seabass sampled length frequencies, 2012-2013 to 2018-2019.

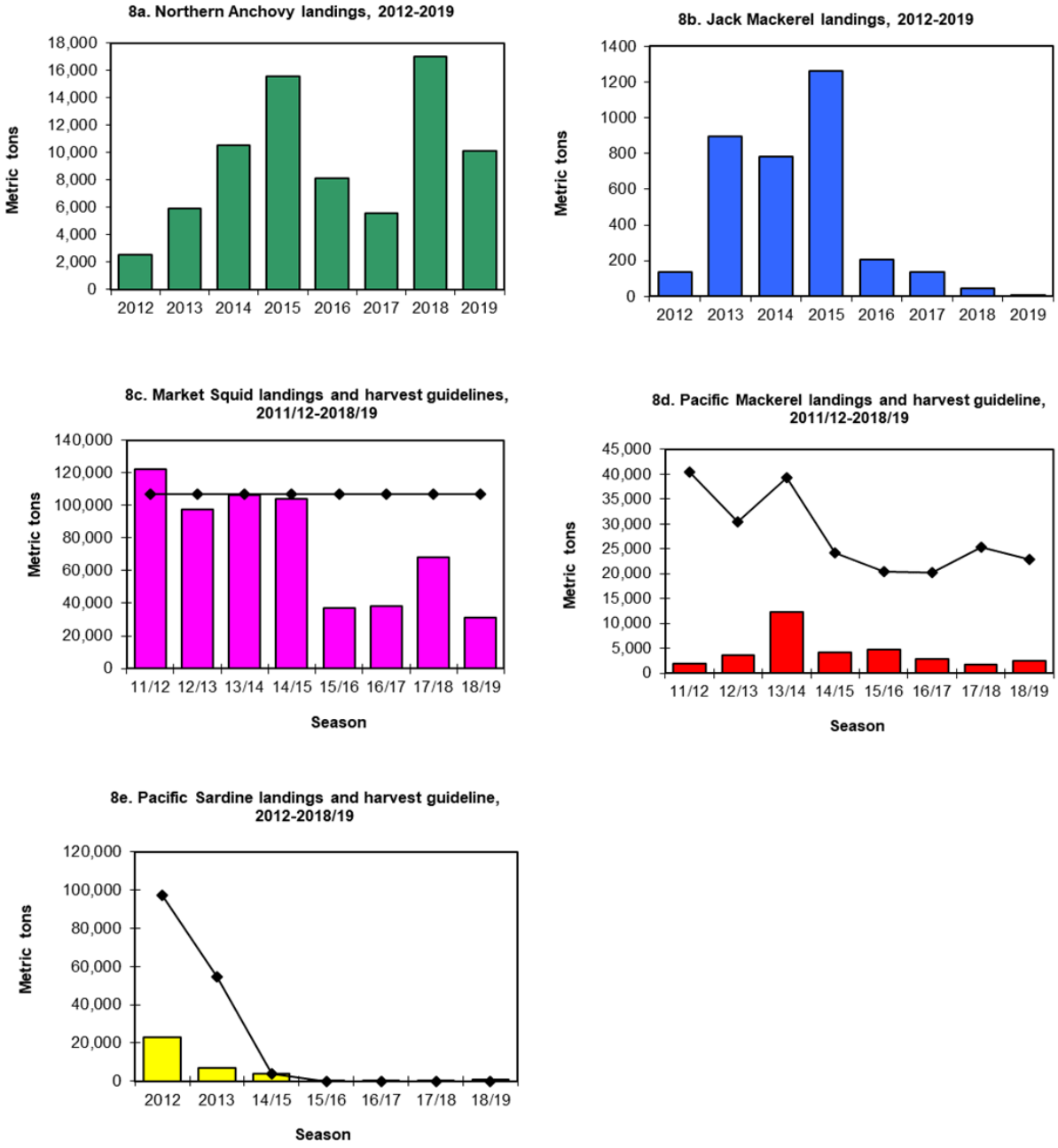
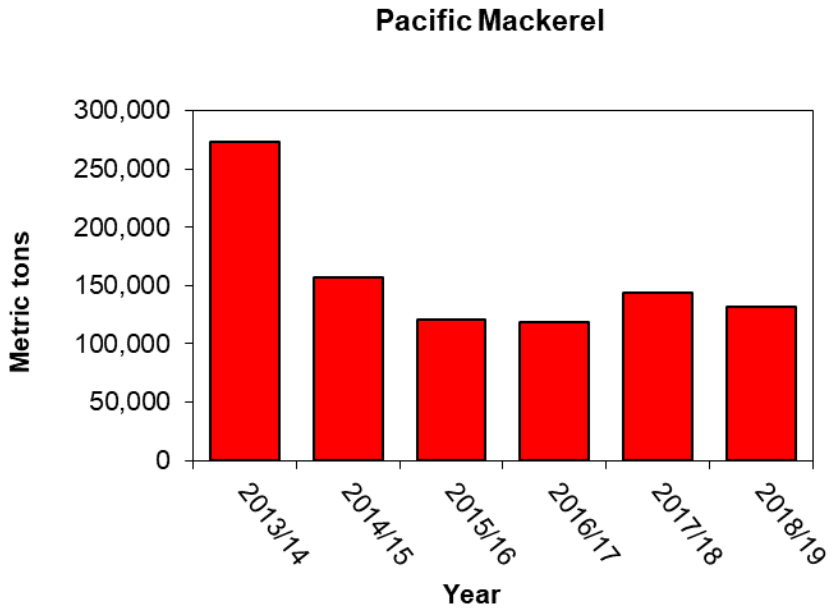
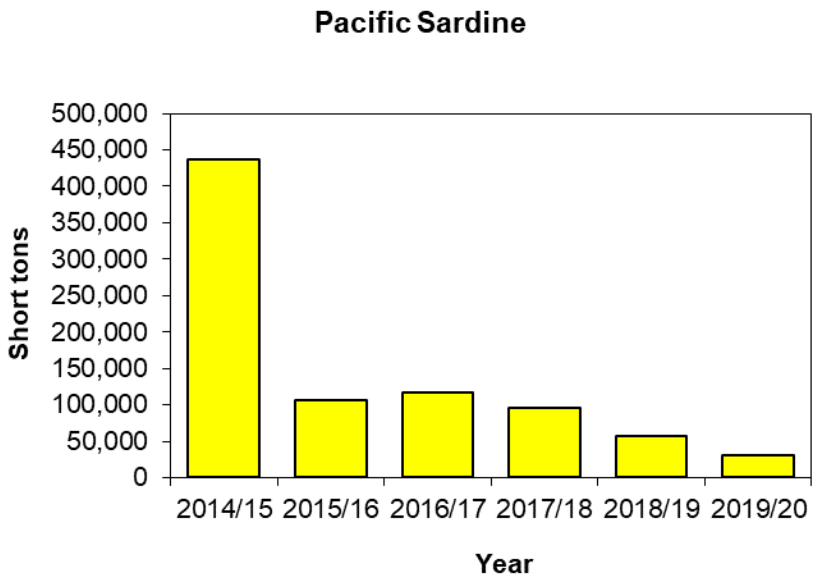


Figure 3. Harvest guidelines and commercial catch of White Seabass forage species. Northern Anchovy and Jack Mackerel season is January 1 through December 31. Market Squid season is April 1 through March 31 of the following year. Pacific Mackerel and Pacific Sardine season is July 1 through June 30 of the following year. Source: Department's MLDS.



Source: Pacific Fishery Management Council. 2017 CPS SAFE document and PFMC proceedings

Figure 4. Biomass estimates for Pacific Mackerel in short tons, 2014-2015 to 2018-2019 seasons.



Source: Pacific Fishery Management Council. 2018 CPS SAFE document and PFMC proceedings

Figure 5. Biomass estimates for Pacific Sardine in short tons, 2014-2015 to 2019-2020 seasons.