

# **APPENDIX A: SAFE TABLES**

## TABLE 2-1. HISTORY OF COUNCIL ACTIONS

*For history of Council actions prior to June 2013, see prior SAFE documents*

The Council initiated development of the FMP for northern anchovy in January of 1977. The FMP was submitted to the Secretary in June of 1978. Regulations implementing the FMP were published in the *Federal Register* on September 13, 1978 (43FR40868). This Table includes approximately the past five years of Council actions. Prior Council activities related to CPS management can be found in previous [SAFE documents](#).

- At the June 2013 meeting, the Council adopted Pacific mackerel management measures and harvest specifications for the 2013-2014 fishing year. These included an overfishing limit of 57,316 mt, a P\* choice of 0.45, acceptable biological catch and annual catch limit (ACL) set equal to 52,358 mt, and an annual catch target (ACT) equal to 39,268 mt. The 13,089 mt difference between the ACL and ACT is an incidental catch buffer. The Council also approved a “check in” at the subsequent April meeting, to consider re-allocating some of the incidental catch to the directed fishery, in the case that landings are significantly up, and approaching the initial directed allocation.

The Council also voted to amend the management and assessment schedule for Pacific mackerel. The new schedule calls for full stock assessments every four years starting in 2015, alternating with catch-only projection estimates every four years, in off-science years. Biennial harvest specifications will be made for two years at a time.

Also at the June meeting, the Council voted to change the fishery start date for Pacific sardine to July 1, starting in 2014. A biomass projection estimate was to be used to set harvest specifications for the January 1-June 30 period during the 2014 transition year, and the Council anticipated a full stock assessment would be available to inform annual harvest specifications for the fishing year beginning July 1, 2014.

- At the November 2013 meeting, the Council adopted Pacific sardine management measures for the six-month period January 1-June 30, 2014. This includes approving a biomass estimate of 378,120 metric tons (mt) and an Overfishing Limit of 59,214 mt. Based on a P\* choice of 0.4, the Acceptable Biological Catch and Annual Catch Limit were set at 54,052 mt. The annual Harvest Guideline was set at 29,770 mt, with an Annual Catch Target set at 19,846 mt. Accounting for a 1,000 mt Tribal allocation and a 500 mt incidental set-aside, the January 1-June 30 allocation was set at 5,446 mt. Other management measures were to be consistent with the 2012 fishery, with the exception of (1) the incidental landing allowance that was set at 45 percent for mixed loads, after the directed fishery closes, and (2) there would be no rollover of uncaught fish from the first six-month period into the following fishing period.

The Council considered a letter of intent from the Northwest Aerial Sardine Survey, LLC to conduct survey research during summer 2014. The Council adopted the request for public review and scheduled a final determination, including the final tonnage amount, at the April 2014 Council meeting. (The request for an EFP set-aside was subsequently withdrawn).

The Council established a Maximum Sustainable Yield (MSY) reference point for the northern subpopulation of northern anchovy. Based on information that northern anchovy are subject to large population fluctuations and have relatively high productivity, the Council selected annual fishing rate:  $F_{msy} = 0.3$  as the appropriate MSY reference point.

The Council also endorsed methodology reviews of the California Department of Fish and Wildlife/California Wetfish Producers Association aerial survey methodology for the Southern California Bight, of the Northwest Aerial Sardine Survey, and the NMFS acoustic sardine survey. The methodology review was to be coordinated with the Southwest Fisheries Science Center to optimize logistical and financial contingencies. The Council also tasked the Coastal Pelagic Species (CPS) Management Team and CPS Advisory Subpanel with reviewing the draft Council Operating Procedure for a CPS methodology review process and with providing their recommendations at a future Council meeting.

- At the March 2014 meeting, the Council adopted the technical change of using the CalCOFI temperature index, rather than the Scripps Pier temperature recordings, in calculating the annual overfishing limit (OFL) for Pacific Sardine. The new temperature index and new temperature-productivity relationship was to be used for establishing the OFL starting with the April 2014 meeting, when the Council established annual harvest specifications and management measures for the fishing year beginning July 1, 2014. The Council directed the CPSMT and NMFS to further evaluate alternatives for applying the new temperature index and  $F_{msy}$  relationship to annual harvest specifications, and to report back to the Council at the September 2014 meeting.
- At the April 2014 meeting, the Council adopted harvest specifications and management measures for Pacific sardine, for the fishing year running July 1, 2014 through June 30, 2015. This included an OFL of 39,210 mt and an ABC of 35,792 mt, based on a  $P^*$  value of 0.40. The Council set the ACL and the ACT both to 23,293 mt, and adopted a 500 mt incidental set aside for each of the three fishing periods. Accounting for a Quinault Indian Nation allotment of 4,000 mt and a total of 1,500 mt incidental set aside, the period allocations were set to 7,218 mt in Period 1 (July 1 – September 14), 4,323 mt for Period 2 (September 15 – December 31), and 6,252 mt for Period 3 (January 1 – June 30, 2015). The Council approved rollovers from Periods 1 and 2 into the subsequent Period, with no rollover from Period 3 into the next fishing year. The Council also adopted a mixed load allowance of up to 45 percent sardines caught in other CPS fisheries, after directed Pacific sardine fishing closes.
- At the June 2014 meeting, the Council adopted harvest specifications and management measures for Pacific mackerel. Based on a catch-only projection estimate of 157,106 mt, the Council adopted an OFL of 32,992 mt, an ABC and ACL both equal to 30,138 mt, an HG of 29,170 mt, and an ACT of 24,170 mt. The difference between the HG and the ACT is a 5,000 mt incidental set aside. Should the directed fishery realize the ACT (24,170 mt), the directed fishery will close, and shift to an incidental only fishery, with a 45 percent incidental landing allowance when Pacific mackerel are landed with other CPS, with the exception that up to 1 (one) mt of Pacific mackerel may be landed without landing any other CPS. The Council also adopted a check in provision, to consider reallocating a portion of the set aside to the directed fishery, should the directed fishery attain the ACT.

- At the November 2014 meeting, the Council adopted the technical change of using the CalCOFI temperature index, rather than the Scripps Pier temperature recordings, in calculating annual harvest specifications for Pacific Sardine; and adopted an accompanying harvest FRACTION term ranging between five and 20 percent. This replaces the current range of five and fifteen percent. This change also incorporated a new temperature-productivity relationship.
- At its March 2015 meeting, the Council took final action to protect a suite of currently [unmanaged forage fish](#) species and prohibit the development of new directed commercial fisheries. Although incidental retention of these shared species is allowed, directed commercial take is not allowed. A Council process to develop an exempted fishing permit must be completed prior to allowing directed take on any of the shared EC species, which are: round herring, thread herring, mesopelagic fishes, Pacific sand lance, Pacific saury, silversides, smelts in the family *Osmeridae*, and pelagic squids (except Humboldt squid).
- At its April 2015 meeting, the Council adopted Pacific sardine harvest specifications and management measures for the 2015 – 2016 fishery. Because the estimated biomass fell below the Cutoff of 150,000 metric tons, a directed fishery was precluded. Therefore the Council adopted an HG of zero, with a 7,000 mt ACL to allow for tribal harvest, incidental landings, live bait, research, and other minor sources of mortality. For incidental catches, the Council adopted an incremental approach, with 40% mixed loads allowed until 1,500 mt are landed. Then the mixed load amount drops to 30% until 4,000 mt are landed, and dropped to 5% until the ACL is met.
- At that same meeting, the Council took emergency action to close the current (2014 – 2015) fishery as soon as possible, to stay within the remaining quota, and urged NMFS to immediately assess landings and catch rate, to determine a closure date associated with the remaining available quota.
- At its June 2015 meeting, the Council adopted the Pacific mackerel stock assessment for management in both the 2015-16 and the 2016-17 fishing years. A projection estimate of biomass was used to estimate the second year biomass, assuming the full HG would be taken. The Council adopted the following harvest specifications and management measures:

|                           | <b>2015-16 (mt)</b> | <b>2016-17 (mt)</b> |
|---------------------------|---------------------|---------------------|
| <b>Biomass</b>            | 120,425             | 118,968             |
| <b>OFL</b>                | 25,291              | 24,983              |
| <b>ABC<sub>0.45</sub></b> | 23,104              | 22,822              |
| <b>ACL</b>                | 23,104              | 22,822              |
| <b>HG</b>                 | 21,469              | 21,161              |
| <b>ACT</b>                | 20,469              | 20,161              |

The Council also adopted a 45 percent incidental landing allowance once the directed fishery is closed, and up to three mt of Pacific mackerel per landing to be allowed in non-CPS fisheries.

- At its April 2016 meeting, the Council adopted Pacific sardine harvest specifications and management measures for the 2016 – 2017 fishery. Because the 106,137 mt estimated biomass again fell below the Cutoff of 150,000 metric tons, a directed fishery was precluded. Therefore the Council adopted an HG of zero, with a 8,000 mt ACL to allow for tribal harvest, incidental

landings, live bait, research, and other minor sources of mortality. For incidental catches, the Council adopted an incremental approach, with 40% mixed loads allowed until 2,000 mt are landed. Then the mixed load amount drops to 20% until 5,000 mt are landed, and dropped to 10% until the ACL is met. The Council also adopted an OFL of 23,085 mt and an ABC of 19,236 mt.

- At its April 2017 meeting, the Council adopted Pacific sardine harvest specifications and management measures for the 2017 – 2018 fishery. The biomass estimate of again fell below the Cutoff value of 150,000 mt, thereby precluding a directed sardine fishery. The Council adopted an HG of zero and an ACL of 8,000 mt to allow for tribal harvest (up to 800 mt), incidental landings, live bait, small scale fishing, and other minor sources of mortality. For incidental catches, the Council adopted an incremental approach, with 40% mixed loads allowed until 2,000 mt are landed. Then the mixed load amount drops to 20% until 5,000 mt are landed, and dropped to 10% until the ACL is met. The Council also adopted an OFL of 16,957 mt and an ABC of 15,479 mt.
- Also at the April 2017 meeting, the Council adopted FMP Amendment 16, which allows for minor directed fishing on CPS stocks when the directed fishery is closed. A handful of operators along the west coast use beach seine nets, small purse seines, or hook and line gear to harvest small quantities of CPS, typically for bait or for the restaurant market. The landings in this sector are expected to be de minimis. The Council adopted a trip limit of one metric ton, and a limit of one trip per day.
- At its June 2017 meeting, the Council adopted Pacific mackerel harvest specifications and management measures, for two consecutive years. A projection estimate of biomass was used to estimate the second year biomass, assuming the full HG would be taken. The Council adopted the following harvest specifications and management measures:

|                           | <b>2017-18 (mt)</b> | <b>2018-19 (mt)</b> |
|---------------------------|---------------------|---------------------|
| <b>Biomass</b>            | 143,403             | 131,724             |
| <b>OFL</b>                | 30,115              | 27,662              |
| <b>ABC<sub>0.45</sub></b> | 27,510              | 25,269              |
| <b>ACL</b>                | 27,510              | 25,269              |
| <b>HG</b>                 | 26,293              | 23,840              |
| <b>ACT</b>                | 26,293              | 23,840              |
| <b>Incidental</b>         | 1,000               | 1,000               |

- At its April 2018 meeting the Council adopted Pacific sardine harvest specifications and management measures for the 2018 – 2019 fishery. The biomass estimate (52,065 mt) again fell below the Cutoff value of 150,000 mt, thereby precluding a directed sardine fishery. The Council adopted an ACL of 7,000 mt to accommodate incidental landings, tribal harvest, and the live bait fishery. Further details can be found in the Council’s decision summary [document](#).
- At its November 2018 meeting the Council took final action on CPS FMP Amendment 17, which addresses live bait landings when a CPS stock is overfished. The amendment process was initiated in June 2018. Amendment 17 removes the pre-determined incidental landing limit of a maximum

15 percent in the live bait fishery. Live bait fishing will still be subject to annual catch limits and other management measures, and the Council may enact further restrictions once a stock falls below the overfished threshold.

## TABLE 2-2. REGULATORY ACTIONS SINCE 2008

*For regulatory actions prior to January 31, 2008, see prior SAFE documents*

**January 31, 2008** NMFS issued the final rule to implement the annual HG for Pacific mackerel for the fishing season of July 1, 2007 through June 30, 2008. The HG for the 2007–2008 fishing season is 40,000 mt. If this total was reached, Pacific mackerel fishing would be closed to directed harvest and only incidental harvest would be allowed at a 45 percent by weight incidental catch rate when landed with other CPS, except that up to one mt of Pacific mackerel could be landed without landing any other CPS. (73 *FR* 5760).

**August 20, 2008** NMFS proposed a regulation to implement the annual HG for Pacific mackerel in the EEZ off the Pacific coast for the fishing season of July 1, 2008 through June 30, 2009. (73 *FR* 49156).

**August 20, 2008** NMFS issued a final rule that noticed effectiveness of reporting requirements of interactions that may occur between a CPS vessel and/or fishing gear and sea otters originally published on May 30, 2007 (see above). The May 30<sup>th</sup> final rule contained information collection requirements that at the time of publication had not yet been approved by OMB. The final rule stated that NMFS would publish a subsequent Federal Register notice announcing the effectiveness of those requirements. Therefore NMFS announces that OMB approved the collection of information requirements contained in the May 30, 2007, final rule under Control Number 0648-0566 with an expiration date of August 31, 2010. (73 *FR* 60191).

**October 10, 2008** NMFS issued a final rule that notices effectiveness of reporting requirements of interactions that may occur between a CPS vessel and/or fishing gear and sea otters originally published on May 30, 2007 (see above). The May 30<sup>th</sup> final rule contained information collection requirements that at the time of publication had not yet been approved by OMB. The final rule stated that NMFS would publish a subsequent Federal Register notice announcing the effectiveness of those requirements. Therefore NMFS announces that OMB approved the collection of information requirements contained in the May 30, 2007, final rule under Control Number 0648-0566 with an expiration date of August 31, 2010. (73 *FR* 60191).

**November 18, 2008** NMFS issued a final rule to implement the annual HG for Pacific mackerel in the EEZ off the Pacific coast for the fishing season of July 1, 2008, through June 30, 2009. The HG for the 2008–2009 fishing season is 40,000 mt. If this total is reached, Pacific mackerel fishing will be closed to directed harvest and only incidental harvest will be allowed at a 45 percent by weight incidental catch rate when landed with other CPS, except that up to one mt of Pacific mackerel can be landed without landing any other CPS. (73 *FR* 68362).

**January 5, 2009.** NMFS proposed a regulation to implement the annual harvest guideline (HG) for Pacific sardine in the U.S. exclusive economic zone (EEZ) off the Pacific coast for the fishing season of January 1, 2009, through December 31, 2009. This HG was proposed according to the regulations implementing the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP) and established allowable harvest levels for Pacific sardine off the Pacific coast. The proposed initial HG for the 2009 fishing year was 65,732 mt and was proposed to be divided across the seasonal allocation periods in the following way: January 1-June 30, 22,006 mt was allocated for directed harvest with an incidental set-aside of 1,000 mt; July 1-September 14, 25,293 mt was allocated for directed harvest with an incidental set-aside of 1,000 mt; September 15-December 31, 11,933 mt was to be allocated for directed harvest with an incidental set-aside of 4,500 mt. If during any of

the seasonal allocation periods the applicable adjusted directed harvest allocation was projected to be taken, fishing would be closed to directed harvest and only incidental harvest would be allowed. (74 FR 252).

**May 6, 2009.** NMFS proposed a regulation to adjust the harvest specifications for Pacific sardine in the U.S. exclusive economic zone (EEZ) off the Pacific coast for the fishing season of January 1, 2009, through December 31, 2009. The proposed action increased the tonnage of Pacific sardine allocated for industry conducted research from 1200 metric tons (mt) to 2400 mt and decreases the second and third period directed harvest allocations by 750 mt and 450 mt, respectively. (74 FR 20897).

**June 30, 2009.** NMFS issued a final rule to adjust the harvest specifications for Pacific sardine in the U.S. exclusive economic zone (EEZ) off the Pacific coast for the fishing season of January 1, 2009, through December 31, 2009. This final rule increased the tonnage of Pacific sardine allocated for industry-conducted research from 1200 metric tons (mt) to 2400 mt and decreases the second and third period directed harvest allocations by 750 mt and 450 mt, respectively. (74 FR 31199).

**July 13, 2009.** NMFS issued a final rule to implement Amendment 12 to the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP) which would provide protection for all species of krill off the West Coast (i.e., California, Oregon and Washington). This rule would prohibit the harvest of all species of krill by any fishing vessel operating in the Exclusive Economic Zone (EEZ) off the West Coast, and would also deny the use of exempted fishing permits to allow krill fishing (74 FR 33372).

**July 17, 2009.** NMFS prohibited directed fishing for Pacific sardine off the coast of Washington, Oregon and California. This action was necessary because the directed harvest allocation total for the second seasonal period (July 1– September 14) was projected to be reached by the effective date of the rule. From the effective date of the rule until September 15, 2009, Pacific sardine could only be harvested as part of the live bait fishery or incidental to other fisheries; the incidental harvest of Pacific sardine is limited to 20–percent by weight of all fish per trip. Fishing vessels had to be at shore and in the process of offloading at 12:01 am Pacific Daylight Time on date of closure. (74 FR 34700).

**September 23, 2009.** NMFS issued a temporary rule prohibiting directed fishing for Pacific sardine off the coasts of Washington, Oregon and California. This action was necessary because the directed harvest allocation total for the third seasonal period (September 15–December 31) was projected to be reached by the effective date of the rule. From the effective date of this rule until December 31, 2009, Pacific sardine could only be harvested as part of the live bait fishery or incidental to other fisheries; the incidental harvest of Pacific sardine was limited to 20–percent by weight of all fish per trip. Fishing vessels had to be at shore and in the process of offloading at 12:01 am Pacific Daylight Time on date of closure. (74 FR 48421)

**September 29, 2009.** NMFS issued a proposed regulation to implement the annual harvest guideline (HG) for Pacific mackerel in the U.S. exclusive economic zone (EEZ) off the Pacific coast. This HG is proposed according to the regulations implementing the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP) and establishes allowable harvest levels for Pacific mackerel off the Pacific coast. The proposed total HG for the 2009–2010 fishing year was 10,000 metric tons (mt) and was proposed to be divided into a directed fishery HG of 8,000 mt and an incidental fishery of 2,000 mt. (74 FR 49845).



**December 22, 2009.** NMFS issued a temporary rule prohibiting the incidental harvest of Pacific sardine off the coasts of Washington, Oregon and California. This action was necessary because the incidental set aside for the third allocation period of the 2009 Pacific sardine season was reached. From the effective date of this rule until January 1, 2010, Pacific sardine can only be harvested as part of the live bait fishery. (FR 74 67986).

**January 13, 2010.** NMFS issued a proposed rule to implement annual harvest specifications for the 2010 sardine fishery off the U.S. West Coast. NMFS proposed a regulation to implement the annual harvest guideline (HG) and seasonal allocations for Pacific sardine in the U.S. exclusive economic zone (EEZ) off the Pacific coast for the fishing season of January 1, 2010, through December 31, 2010. This rule is proposed according to the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP). The proposed 2010 acceptable biological catch (ABC) or maximum HG is 72,039 mt. 5,000 mt of this 72,039 mt would initially be set aside for use under an Exempted Fishing Permit (EFP), if issued, leaving the remaining 65,732 mt as the initial commercial fishing HG. That HG would be divided across the seasonal allocation periods in the following way: January 1–June 30, 22,463 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; July 1–September 14, 25,861 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; September 15–December 31, 11,760 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt with an additional 4,000 mt set aside to buffer against reaching the ABC. (75 FR 1744).

**March 10, 2010.** NMFS issued the sardine Final Rule to implement the annual harvest specifications for the 2010 sardine fishery off the U.S. West Coast. The proposed allocation of the overall HG over three fishing periods, were identical to those proposed on January 13, 2010 (above). (75 FR 11068).

**June 15, 2010.** NMFS issued a temporary rule announcing the closure of the first period sardine fishery, effective at 12:01am Pacific Daylight Time June 12. From 12:01 am on the date of closure through June 30, 2010, Pacific sardine may be harvested only as part of the live bait fishery or incidental to other fisheries, with the incidental harvest of Pacific sardine limited to 30 percent by weight of all fish caught during a trip. (75 FR 33733).

**July 22, 2010.** NMFS issued a temporary rule announcing the closure of the second period sardine fishery, effective at 12:01am Pacific Daylight Time July 22. From 12:01 am on the date of closure through September 14, 2010, Pacific sardine may be harvested only as part of the live bait fishery or incidental to other fisheries, with the incidental harvest of Pacific sardine limited to 30 percent by weight of all fish caught during a trip. (75 FR 42610).

**September 27, 2010.** NMFS issued a temporary rule announcing the closure of the third period sardine fishery, effective at 12:01am Pacific Daylight Time September 24. From 12:01 am on the date of closure through December 31, 2010, Pacific sardine may be harvested only as part of the live bait fishery or incidental to other fisheries, with the incidental harvest of Pacific sardine limited to 30 percent by weight of all fish caught during a trip. (75 FR 59156).

**January 27, 2011.** NMFS issued a proposed rule on annual specifications and management measures for Pacific sardine, under the CPS FMP. The proposed 2011 maximum HG for Pacific sardine was 50,526 metric tons (mt), of which 4,200 mt was initially set aside for potential use under an Exempted Fishing Permit (EFP). The remaining 46,326 mt, constituting the initial commercial fishing HG, would be divided across the seasonal allocation periods in the following way: January 1–June 30: 16,214 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; July 1–September 14: 18,530 mt would be allocated for directed harvest with an

incidental set-aside of 1,000 mt; September 15– December 31: 11,582 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt, plus an additional 2,000 mt set aside to buffer against reaching the total HG. (76 FR 4854).

**March 4, 2011.** NMFS issued a temporary emergency rule to close first period directed sardine fishery, anticipating that the first period allocation of 15,214 metric tons would have been harvested by then. Under this rule, Pacific sardine could have been harvested only as part of the live bait fishery or incidental to other fisheries; and the incidental harvest of Pacific sardine was limited to 30-percent by weight of all fish caught per trip. The effective date was 12:01 a.m. March 5, 2011. (76 FR 11969).

**May 25, 2011.** The Final Rule implementing the closure of the first period directed sardine fishery (see above) was issued. (76 FR 30276).

**June 28, 2011.** NMFS issued a Proposed Rule to implement parts of proposed Amendment 13 to the CPS FMP, which is intended to ensure the FMP is consistent with advisory guidelines published in Federal regulations. NMFS also issued a request for comments, which were due by July 28, 2011. Amendment 13 revises the framework process that was in place to set and adjust fishery specifications and management measures and modifies this framework to include the specification new reference points such as annual catch limit (ACL).

**November 14, 2011.** NMFS issued a final rule to implement parts of Amendment 13 to the CPS FMP, which is intended to ensure the FMP is consistent with advisory guidelines published in Federal regulations. Amendment 13 revised the framework process that was in place to set and adjust fishery specifications and management measures and modified this framework to include the specification new reference points such as annual catch limit (ACL). (76 FR 70362).

**April 3, 2012.** NMFS issued a proposed rule on annual specifications and management measures for Pacific sardine, under the CPS FMP. The proposed 2012 maximum HG for Pacific sardine was 109,409 metric tons (mt), of which 3,000 mt was initially set aside for potential use under an Exempted Fishing Permit (EFP) and 9,000 mt for potential harvest by the Quinault Indian Nation. The remaining 97,409 mt, constituting the initial commercial fishing HG, would be divided across the seasonal allocation periods in the following way: January 1–June 30: 34,093 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; July 1–September 14: 38,964 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; September 15–December 31: 24,352 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt. (77 FR 19991).

**April 12, 2012.** NMFS issued a proposed rule on annual specifications and management measures for Pacific mackerel, under the CPS FMP. The proposed 2011-2012 maximum HG for Pacific mackerel was 40,514 metric tons (mt), and the ACT was 30,386 mt. If the ACT was attained, the directed fishery would close, and the difference between the ACL and the ACT (10,128 mt) would be reserved as a set aside for incidental landings in other CPS fisheries and other sources of mortalities. (77 FR 21958).

**August 8, 2012.** NMFS issued a final rule on annual specifications and management measures for Pacific sardine, under the CPS FMP. The final 2012 maximum HG for Pacific sardine was 109,409 metric tons (mt), of which 3,000 mt was initially set aside for potential use under an Exempted Fishing Permit (EFP) and 9,000 mt for potential harvest by the Quinault Indian Nation. The remaining 97,409 mt, constituting the initial commercial fishing HG, would be divided across the seasonal allocation periods in the following way: January 1–June 30: 34,093 mt would be allocated

for directed harvest with an incidental set-aside of 1,000 mt; July 1–September 14: 38,964 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; September 15– December 31: 24,352 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt. (77 FR 47318).

**June 18, 2012.** NMFS issued a final rule on annual specifications and management measures for Pacific mackerel, under the CPS FMP. The final 2011-2012 maximum HG for Pacific mackerel was 40,514 metric tons (mt), and the ACT was 30,386 mt. If the ACT is attained, the directed fishery would close, and the difference between the ACL and the ACT (10,128 mt) would be reserved as a set aside for incidental landings in other CPS fisheries and other sources of mortalities. (77 FR 36192).

**August 20, 2012.** NMFS issued a temporary rule announcing the closure of the second period sardine fishery, effective at 12:01am Pacific Daylight Time August 22. From 12:01 am on the date of closure through September 14, 2012, Pacific sardine may be harvested only as part of the live bait fishery or incidental to other fisheries, with the incidental harvest of Pacific sardine limited to 40 percent by weight of all fish caught during a trip. (78 FR 51097).

**August 23, 2012.** NMFS issued a temporary rule announcing the closure of the second period sardine fishery, effective at 12:01am Pacific Daylight Time August 23. From 12:01 am on the date of closure through September 14, 2012, Pacific sardine may be harvested only as part of the live bait fishery or incidental to other fisheries, with the incidental harvest of Pacific sardine limited to 30 percent by weight of all fish caught during a trip. (77 FR 50952).

**December 7, 2012.** NMFS issued a proposed rule on annual specifications and management measures for Pacific mackerel, under the CPS FMP. The proposed 2012-2013 maximum HG for Pacific mackerel was 40,514 metric tons (mt), and the ACT was 30,386 mt. If the ACT was attained, the directed fishery would close, and the difference between the ACL and the ACT (10,128 mt) would be reserved as a set aside for incidental landings in other CPS fisheries and other sources of mortalities. (77 FR 73005).

**January 31, 2013.** NMFS issued a proposed rule on annual specifications and management measures for Pacific sardine, under the CPS FMP. The proposed 2013 maximum HG for Pacific sardine was 66,495 metric tons (mt), of which 3,000 mt was initially set aside for potential use under an Exempted Fishing Permit (EFP) and 6,000 mt for potential harvest by the Quinault Indian Nation. The remaining 57,495 mt, constituting the initial commercial fishing HG, would be divided across the seasonal allocation periods in the following way: January 1–June 30: 19,123 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; July 1–September 14: 22,998 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; September 15– December 31: 12,374 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt. (78 FR 6794).

**March 26, 2013.** NMFS issued a final rule on annual specifications and management measures for Pacific mackerel, under the CPS FMP. The final 2012-2013 maximum HG for Pacific mackerel was 40,514 metric tons (mt), and the ACT was 30,386 mt. If the ACT was attained, the directed fishery would close, and the difference between the ACL and the ACT (10,128 mt) would be reserved as a set aside for incidental landings in other CPS fisheries and other sources of mortalities. (78 FR 18249).

**June 17, 2013.** NMFS issued a final rule on annual specifications and management measures for Pacific sardine, under the CPS FMP. The final 2013 maximum HG for Pacific sardine was

66,495 metric tons (mt), of which 3,000 mt was initially set aside for potential use under an Exempted Fishing Permit (EFP) and 6,000 mt for potential harvest by the Quinault Indian Nation. The remaining 57,495 mt, constituting the initial commercial fishing HG, would be divided across the seasonal allocation periods in the following way: January 1–June 30: 19,123 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; July 1–September 14: 22,998 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt; September 15–December 31: 12,374 mt would be allocated for directed harvest with an incidental set-aside of 1,000 mt. (78 FR 36117).

**December 23, 2013.** NMFS issued a proposed rule to change the starting date of the annual Pacific sardine fishery from January 1 to July 1. This would change the fishing season from one based on the calendar year to one based on a July 1 through the following June 30th schedule. No other changes to the annual allocation structure are proposed and the existing seasonal allocation percentages would remain as specified in the FMP; as would the current quota roll-over provisions. (78 FR 77413).

**February 28, 2014.** NMFS issued a final rule to change the starting date of the annual Pacific sardine fishery from January 1 to July 1. This changed the fishing season from one based on the calendar year to one based on a July 1 through the following June 30th schedule. No other changes to the annual allocation structure were made and the existing seasonal allocation percentages remain as specified in the FMP; as do the current quota roll-over provisions. (78 FR 11343).

**February 6, 2015.** NMFS issued a final rule on annual specifications and management measures for Pacific mackerel, under the CPS FMP. The final 2014-2015 HG for Pacific mackerel was 29,170 mt, with an ACT of 24,170 mt. The directed fishery would be closed if the ACT was attained, with the remaining 5,000 mt representing a set aside for incidental landings in other CPS fisheries and other sources of mortality. (80 FR 6662).

**March 23, 2015.** NMFS announced the approval of Amendment 14 to the CPS FMP, specifying an estimate of MSY for the NSNA. At its November 2013 meeting, the Council adopted an FMSY of 0.3 as the best MSY estimate for NSNA, and voted to include this reference point as part of Amendment 14 to the CPS FMP. This action was based on data compiled by the CPSMT and recommended by the Council's SSC.

**June 29, 2015.** NMFS issued a final rule to implement annual management measures and harvest specifications to establish the allowable catch levels of Pacific sardine in waters off the U.S. West Coast. The annual biomass estimate of 96,688 mt fell below the Cutoff value of 150,000, thereby precluding directed non-tribal harvest. NMFS set an ACL of 7,000 mt and an ACT of 4,000, to account for incidental harvest, tribal harvest, live bait, and other minor sources of mortality. NMFS implemented an OFL of 13,227 mt, and ABC of 12,074 mt, and the following conservation measures: incidental catch shall not exceed 40 percent by weight, until 1,500 mt of sardine are harvested, at which time the incidental allowance will become 30 percent. When 4000 mt has been harvested, the percent allowance will be reduced to five percent for the remainder of the fishing year. The Council also adopted a two mt incidental per landing allowance in non-CPS fisheries.

**June 23, 2016.** NMFS issued a proposed rule on annual specifications and management measures for Pacific mackerel under the CPS FMP. The proposed 2016-2017 HG for Pacific mackerel was 21,161 mt, with an ACT of 20,161 mt. The directed fishery would be closed if the ACT was attained, with the remaining 1,000 mt representing a set aside for incidental landings in other CPS fisheries and other sources of mortality (81FR40844).

**June 24, 2016.** NMFS issued a final rule to implement annual harvest specifications and management measures to establish the allowable catch levels of Pacific sardine in waters off the U.S. West Coast for the 2016-2017 fishing year. The annual biomass estimate of 106,137 mt fell below the Cutoff value of 150,000mt, thereby precluding directed non-tribal harvest. NMFS set an ACL of 8,000 mt to account for incidental harvest, tribal harvest, live bait, and other minor sources of mortality. NMFS implemented an OFL of 23,085 mt, an ABC of 19,236 mt and the following conservation measures: incidental catch shall not exceed 40 percent by weight until 2,000 mt of sardine are harvested, at which time the incidental allowance will become 30 percent. When 5,000 mt has been harvested, the percent allowance will be reduced to 10 percent for the remainder of the fishing year (81FR41251).

**August 25, 2016.** NMFS issued a final rule to implement annual specifications and management measures for Pacific mackerel under the CPS FMP. The 2016-2017 HG for Pacific mackerel was 21,161 mt, with an ACT was 20,161 mt. The directed fishery would be closed if the ACT was attained, with the remaining 1,000 mt representing a set aside for incidental landings in other CPS fisheries and other sources of mortality (81FR57489).

**June 30, 2017.** NMFS issued a final rule to implement annual harvest specifications and management measures to establish the allowable catch levels of Pacific sardine in waters off the U.S. West Coast for the 2017-2018 fishing year. The annual biomass estimate of 86,586 mt fell below the Cutoff value of 150,000mt, thereby precluding directed non-tribal harvest. NMFS set an ACL of 8,000 mt to account for incidental harvest, tribal harvest, live bait, and other minor sources of mortality. NMFS implemented an OFL of 16,957 mt, an ABC of 15,497 mt and the following conservation measures: incidental catch shall not exceed 40 percent by weight until 2,000 mt of sardine are harvested, at which time the incidental allowance will become 20 percent. When 5,000 met has been harvested, the percent allowance will be reduced to 10 percent for the remainder of the fishing year (82FR29777).

**August 1, 2017.** NMFS issued a final rule changing the management framework for Pacific mackerel so harvest specifications are set biennially instead of on an annual basis (82FR35687).

**November 28, 2017.** NMFS issued a proposed rule on annual specifications and management measures for Pacific mackerel under the CPS FMP. The proposed 2017-2018 HG for Pacific mackerel was 26,923 mt, with an ACT of 25,293 mt. The proposed 2018-2019 HG for Pacific mackerel was 23,840 mt with an ACT of 22,840 mt. The directed fishery would be closed if the ACT was attained in either fishing year, with the remaining 1,000 mt representing a set aside for incidental landings in other CPS fisheries and other sources of mortality (82FR56204).

**January 9, 2018.** NMFS issued a proposed rule to amend the regulations governing the fisheries for CPS off the West coast to include ACLs for certain monitored finfish stocks (jack mackerel, central population of northern anchovy, northern subpopulation of northern anchovy) under the CPS FMP. A final rule published October 26, 2016, established these ACLs for the 2017 fishing year only; the purpose of this proposed rule was to codify these ACLs so they would remain effective until revised through some future rulemaking (83FR1009).

**February 14, 2018.** NMFS published a final rule implementing Amendment 16, which allows for very small amounts of directed, non-live bait fishing (referred to as “minor directed fishing”) on CPS finfish to occur when a fishery is otherwise closed to directed fishing. Prior to this amendment, when directed fishing was closed, a small sector of the CPS fishery that is not part of the primary commercial directed fishery was precluded from landing even minor amounts because this activity does not fall under the existing exemptions for incidental harvest or for harvesting CPS to be sold

as live bait. This rule allows this sector to continue directed fishing after other directed fisheries are closed, unless otherwise specified in a closure notice published by NMFS or if an applicable ACL is anticipated to be exceeded. To prevent exploitation of this rule to make large aggregate harvests, “minor directed fishing” is not allowed to exceed landings of 1 mt per day per vessel or person or one fishing trip per day by any vessel. The purpose of this rule is to provide greater flexibility to small fishing operations, while continuing to conserve the target CPS fish stocks. The Notice of Availability for Amendment 16 (82FR29777) was published on November 6, 2018, and the proposed rule to implement Amendment 16 (82FR55551) was published on November 22, 2018.

**June 21, 2018.** NMFS issued a final rule to implement biennial specifications and management measures for Pacific mackerel under the CPS FMP. The 2017-2018 HG for Pacific mackerel was 26,293 mt, with an ACT was 25,293 mt. The 2018-2019 HG for Pacific mackerel was 23,840 mt with an ACT of 22,840 mt. The directed fishery would be closed if the ACT was attained in either fishing year, with the remaining 1,000 mt representing a set aside for incidental landings in other CPS fisheries and other sources of mortality (83FR28783).

**June 25, 2018.** NMFS issued a final rule to implement annual harvest specifications and management measures to establish the allowable catch levels of Pacific sardine in waters off the U.S. West Coast for the 2018-2019 fishing year. The annual biomass estimate of 52,065 mt fell below the Cutoff value of 150,000mt, thereby precluding directed non-tribal harvest. NMFS set an ACL of 7,000 mt to account for incidental harvest, tribal harvest, live bait, and other minor sources of mortality. NMFS implemented an OFL of 11,324 mt, an ABC of 9,436 mt and the following conservation measures: incidental catch shall not exceed 40 percent by weight until 2,500 mt of sardine are harvested, at which time the incidental allowance will become 20 percent for the remainder of the fishing year (83FR29461).

TABLE 2-3. Coastal pelagic species 2017 federal limited entry permit vessel listing<sup>4</sup> with calculated gross tonnage (GT) values for each vessel. (Page 1 of 2)

| Vessel Name              | Permit No. | Coast Guard Number/<br>Vessel ID | Calculated Vessel GT/1 | Permit GT Endorsement | Permit Transfer Allowance/2 |
|--------------------------|------------|----------------------------------|------------------------|-----------------------|-----------------------------|
| PROVIDER                 | 1          | 572344                           | 70.1                   | 63.8                  | 70.2                        |
| MERVA W                  | 2          | 532023                           | 82.9                   | 43.5                  | 47.9                        |
| SHEYMA                   | 3          | 1104597                          | 92.6                   | 98.4                  | 108.2                       |
| BARBARA H                | 4          | 643518                           | 121.1                  | 121.1                 | 133.2                       |
| KAREN MARIE              | 5          | 593871                           | 64.8                   | 82.0                  | 90.2                        |
| CACHALOT                 | 6          | 654091                           | 106.8                  | 98.1                  | 107.9                       |
| SAN PEDRO PRIDE          | 7          | 549506                           | 182.5                  | 160.7                 | 176.8                       |
| FERRIGNO BOY             | 8          | 602455                           | 139.3                  | 139.3                 | 153.2                       |
| KING PHILIP              | 9          | 1061827                          | 156.9                  | 156.9                 | 172.6                       |
| SEA WAVE                 | 10         | 951443                           | 115.0                  | 206.9                 | 227.6                       |
| UNASSOCIATED             | 11         | ---                              | ---                    | 56.2                  | 61.8                        |
| OPTIMU                   | 12         | 1244552                          | 99.0                   | 114.8                 | 126.3                       |
| OCEAN ANGEL iii          | 13         | OR108ADL                         | 82.0                   | 141.9                 | 156.1                       |
| TRITON                   | 14         | CF7218UH                         | 92.2                   | 89.3                  | 98.2                        |
| SAINT JOSEPH             | 15         | 633570                           | 84.4                   | 84.4                  | 92.8                        |
| ----                     | 16         | ---                              | ---                    | 137.5                 | 151.3                       |
| RISING SPIRIT            | 17         | WN0416RK                         | 60.2                   | 61.9                  | 68.1                        |
| ST KATHERINE             | 18         | 542513                           | 59.9                   | 63.8                  | 70.2                        |
| SEA PEARL                | 19         | CF7336UH                         | 97.3                   | 124.6                 | 137.1                       |
| UNASSOCIATED             | 20         | ---                              | ---                    | 111.9                 | 123.1                       |
| SPERANZA MARIE           | 21         | 643138                           | 77.0                   | 77.0                  | 84.7                        |
| OCEAN ANGEL IV           | 22         | OR868ADK                         | 74.1                   | 63.5                  | 69.9                        |
| MONA LISA                | 23         | 28853288532                      | 34.3                   | 97.7                  | 107.5                       |
| OCEAN ANGEL I            | 24         | 584336                           | 63.8                   | 63.8                  | 70.2                        |
| SEA DIAMOND              | 25         | 509632                           | 68.1                   | 68.1                  | 74.9                        |
| MANANA                   | 26         | 253321                           | 26.7                   | 23.8                  | 26.2                        |
| INVINCIBLE               | 27         | 1244073                          | 101.4                  | 55.5                  | 61.1                        |
| MINEO BROS. <sup>β</sup> | 28         | CF0163TF                         | 104.0                  | 73.4                  | 80.7                        |
| INVINCIBLE               | 29         | 1244073                          | 101.4                  | 42.0                  | 46.2                        |
| MINEO BROS. <sup>β</sup> | 30         | CF0163TF                         | 104.0                  | 40.8                  | 44.9                        |
| SEA VENTURE              | 31         | WN4232NW                         | 118.2                  | 340.2                 | 374.2                       |
| ELDORADO                 | 32         | 690849                           | 79.1                   | 54.9                  | 60.4                        |
| SEA PRINCESS             | 33         | 630024                           | 81.1                   | 194.0                 | 213.4                       |
| KAREN SUE                | 34         | 1211776                          | 116.3                  | 125.6                 | 138.2                       |
| ENDURANCE                | 35         | 613302                           | 42.0                   | 42.0                  | 46.2                        |
| EL DORADO                | 36         | 690849                           | 79.1                   | 27.0                  | 29.7                        |
| CALOGERA A               | 37         | 984694                           | 85.7                   | 85.3                  | 93.8                        |
| EILEEN                   | 38         | 252749                           | 119.9                  | 119.9                 | 131.9                       |
| PAMELA ROSE              | 39         | 693271                           | 61.9                   | 61.9                  | 68.1                        |
| NEW STELLA               | 40         | 598813                           | 71.8                   | 71.8                  | 79.0                        |
| TRAVELER                 | 41         | 661936                           | 44.0                   | 44.0                  | 48.4                        |
| LUCKY STAR               | 42         | 295673                           | 46.2                   | 41.5                  | 45.7                        |
| OCEAN ANGEL II           | 43         | 622522                           | 176.6                  | 149.5                 | 164.5                       |
| CRYSTAL SEA              | 44         | 1061917                          | 142.1                  | 137.0                 | 151.7                       |
| TRIONFO                  | 45         | 625449                           | 96.8                   | 79.2                  | 87.1                        |
| RELENTLESS               | 46         | CF2009TK                         | 78.3                   | 85.0                  | 93.5                        |
| HEAVY DUTY               | 47         | 655523                           | 84.4                   | 84.4                  | 92.8                        |
| NATALIE ROSE             | 48         | 685870                           | 107.2                  | 107.2                 | 117.9                       |
| LADY J                   | 49         | 647528                           | 60.2                   | 40.7                  | 44.8                        |
| SYDNEY MORGAN            | 50         | 1225596                          | 50.1                   | 50.2                  | 55.2                        |
| BUENA VENTURA            | 51         | CF159VH                          | 55.6                   | 72.3                  | 79.5                        |

TABLE 2-3. Coastal pelagic species 2017 federal limited entry permit vessel listing<sup>4</sup> with calculated gross tonnage (GT) values for each vessel. (Page 2 of 2)

| Vessel Name     | Permit No. | Coast Guard Number/<br>Vessel ID | Calculated Vessel GT <sup>1</sup> | Permit GT Endorsement | Permit Transfer Allowance <sup>2</sup> |
|-----------------|------------|----------------------------------|-----------------------------------|-----------------------|--|
| ANTOINETTE W    | 52         | 606156                           | 37.0                              | 37.0                  | 40.7                                   |
| CAPE BLANCO     | 53         | 648720                           | 158.2                             | 158.2                 | 174.0                                  |
| ERIN CARROLL    | 54         | WN8521SF                         | 123.7                             | 126.5                 | 139.2                                  |
| UNASSOCIATED    | 55         | ---                              | ---                               | 40.4                  | 44.4                                   |
| KATHY JEANNE    | 56         | 507798                           | 86.3                              | 86.3                  | 95                                     |
| MERVA W         | 57         | 532023                           | 82.9                              | 54.4                  | 59.8                                   |
| ALICE ANNE      | 58         | WN3306SF                         | 75.5                              | 91.1                  | 100.2                                  |
| UNASSOCIATED    | 59         | ---                              | 10.6                              | ---                   | ---                                    |
| PACIFIC KNIGHT  | 60         | OR155ABZ                         | 63.1                              | 63.4                  | 69.7                                   |
| ALEUTIAN SPIRIT | 61         | 621542                           | 63.8                              | 59.9                  | 65.9                                   |
| UNASSOCIATED    | 62         | ---                              | ---                               | 39.7                  | 43.7                                   |
| EMERALD SEA     | 63         | 626289                           | 86.7                              | 86.3                  | 94.9                                   |
| ANGEL'S GATE    | 64         | CF1927VH                         | 53.7                              | 54.5                  | 60.0                                   |
| BOUNTY          | 65         | 629721                           | 26.4                              | 26.4                  | 29.0                                   |

<sup>1</sup> Vessel Gross Tonnage  $GT=0.67(\text{Length}*\text{Breadth}*\text{Depth})/100$ . See 46 CFR 69.209.

<sup>2</sup> Maximum transfer allowance is based on permit GT + 10%.

<sup>3</sup> Vessel Mineo Bros is associated with permits 28 and 30

<sup>4</sup> Several CPS permit transfers occurred in 2013. The above list includes vessels with permits at the end of December 2013 that received renewal permit applications. Vessels that had permits earlier in the year but transferred their permit to other vessels were not included

TABLE 2-4. Vessel age and calculated gross tonnage (GT) for the initial and current Federal limited entry fleet.

|                                  | Initial Fleet  | Current Fleet |
|----------------------------------|----------------|---------------|
| Number of Vessels                | 65             | 55            |
| Average Vessel Age               | 35 years       | 34 years      |
| Range of Ages                    | 12 to 66 years | 4 to 71 years |
| Average GT                       | 71.3           | 86.2          |
| Range of GT                      | 12.8 to 206.9  | 10.6 to 182.5 |
| Sum of Fleet GT                  | 4,635.9        | 5,105.4       |
| Capacity Goal (GT) <sup>1/</sup> | ---            | 5,650.9       |
| Transferability Trigger          | ---            | 5,933.5       |

<sup>1/</sup> Established in Amendment 10 to the CPS FMP.



TABLE 2-5. Oregon state limited entry sardine permit vessels landing sardine.

The directed sardine fishery has been closed since 2015. A table of Oregon LE permits will be included when the directed sardine fishery reopens.

TABLE 2-6. Washington state limited entry sardine licenses.

The directed sardine fishery has been closed since 2015. A table of Washington LE permits will be included when the directed sardine fishery reopens.

Table 4-1. Preliminary catch summary for vessels targeting Pacific sardine from NMFS-SWR coastal pelagic species pilot observer program, 2004-2008.

| <b>Target species - Pacific sardine</b> |                     |                         |                         |             |                |
|---|---------------------|-------------------------|-------------------------|-------------|----------------|
| <b>Species</b>                          | <b>Target Catch</b> | <b>Incidental Catch</b> | <b>Bycatch Returned</b> |             |                |
|   |                     |                         | <b>Alive</b>            | <b>Dead</b> | <b>Unknown</b> |
| Sardine                                 | 1495 mt             |                         | 80 mt                   | 100 lbs     | 100 lbs        |
| Anchovy                                 |                     | 9 mt                    | 82                      | 1300 lbs    |                |
| Bat Ray                                 |                     | 1                       | 143                     | 14          | 1              |
| Bat Star                                |                     |                         | 5                       |             |                |
| CA Barracuda                            |                     | 2                       | 1                       | 3           |                |
| CA Halibut                              |                     | 9                       |                         | 4           |                |
| Giant Sea Bass                          |                     |                         | 2                       |             |                |
| Jacksmelt                               |                     | 1                       |                         |             |                |
| Jack Mackerel                           |                     | 2 mt                    |                         |             |                |
| Midshipman                              |                     |                         | 1                       | 13          | 1              |
| Moon Jelly                              |                     | 1                       |                         |             |                |
| Pacific Bonito                          |                     | 10 lbs                  |                         |             |                |
| Pacific Butterfish                      |                     | 3                       |                         |             |                |
| Pacific Electric Ray                    |                     |                         | 2                       |             |                |
| Pacific Mackerel                        |                     | 1 mt                    | 100 lbs                 |             |                |
| Pacific Tomcod                          |                     | 1                       |                         |             |                |
| Pompano                                 |                     | 167                     |                         |             |                |
| Queenfish                               |                     | 49                      |                         |             |                |
| Sanddab                                 |                     |                         | 25 lbs                  | 10 lbs      |                |
| Scorpionfish                            |                     | 1                       |                         |             | 1              |
| Sculpin                                 |                     |                         |                         | 1           | 3              |
| Shovelnose Guitarfish                   |                     |                         | 1                       |             |                |
| Spanish Mackerel                        |                     | 100 lbs                 |                         |             |                |
| Squid                                   |                     | 1 mt                    | 2 mt                    |             |                |
| Starry Flounder                         |                     |                         | 2                       |             |                |
| Stingray                                |                     | 2                       |                         |             |                |
| Thornback Ray                           |                     |                         | 2                       |             |                |
| Unid. Crab                              |                     |                         | 1                       |             | 1              |
| Unid. Croaker                           |                     | 40                      |                         |             |                |
| Unid. Flatfish                          |                     | 78                      | 8                       | 130         | 12             |
| Unid. Jellyfish                         |                     | 3                       | 3                       |             |                |
| Unid. Mackerel                          |                     | 8 mt                    | 12 mt                   |             |                |
| Unid. Octopus                           |                     |                         |                         |             | 2              |
| Unid. Ray                               |                     |                         |                         |             | 2              |
| Unid. Rockfish                          |                     | 2                       | 1                       |             |                |
| Unid. Seastar                           |                     |                         | 41                      | 135         | 1              |
| Unid. Scorpionfish/Sculpin              |                     |                         |                         |             | 1              |
| Unid. Shark                             |                     |                         |                         | 2           |                |
| Unid. Skate                             |                     |                         |                         | 3           |                |
| Unid. Smelt                             |                     | 2                       |                         |             |                |
| Unid. Surf Perch                        |                     | 1                       |                         |             |                |
| Unid. Turbot                            |                     |                         |                         | 60          |                |

TABLE 4-1 (continued). Preliminary catch summary for vessels targeting Pacific sardine from NMFS-SWR coastal pelagic species pilot observer program, 2004-2008.

| Species           | Target Catch | Incidental Catch | Bycatch Returned |      |         |
|-------------------|--------------|------------------|------------------|------|---------|
|                   |              |                  | Alive            | Dead | Unknown |
| White Croaker     |              | 31 lbs           | 50 lbs           |      |         |
| Yellowfin Croaker |              | 10 lbs           |                  |      |         |
| CA Sea Lion       |              |                  | 49               |      |         |
| Harbor Seal       |              |                  | 1                |      |         |
| Unid. Gull        |              |                  | 3                | 2    | 4       |

TABLE 4-2. Preliminary catch summary for vessels targeting market squid from NMFS-SWR coastal pelagic species pilot observer program, 2004-2008.

| <b>Target species - Squid</b> |                     |                         |                         |             |                |
|-------------------------------|---------------------|-------------------------|-------------------------|-------------|----------------|
| <b>Species</b>                | <b>Target Catch</b> | <b>Incidental Catch</b> | <b>Bycatch Returned</b> |             |                |
|                               |                     |                         | <b>Alive</b>            | <b>Dead</b> | <b>Unknown</b> |
| Squid                         | 1274 mt             |                         | 28 mt                   | 350 lbs     | 2 mt           |
| Anchovy                       |                     | 100 lbs                 | 120 lbs                 |             |                |
| Jack Mackerel                 |                     | 2 mt                    | 18 lbs                  | 2 lbs       |                |
| Pacific Mackerel              |                     | 20 mt                   | 20 mt                   | 180 lbs     | 1 lb           |
| Sardine                       |                     | 12 mt                   | 13 mt                   | 1077 lbs    | 3 lbs          |
| Spanish Mackerel              |                     | 20 lbs                  |                         |             |                |
| Bat Ray                       |                     |                         | 53                      |             | 1              |
| Bat Star                      |                     |                         | 1                       |             |                |
| Blue Shark                    |                     |                         | 2                       |             |                |
| Common Mola                   |                     |                         | 1                       |             |                |
| Pelagic Stingray              |                     |                         | 60                      |             |                |
| Pacific Butterfish            |                     | 19                      |                         |             | 1              |
| Sunstar                       |                     | 30                      | 4                       |             |                |
| Squid Eggs                    |                     |                         |                         |             | 505 lbs        |
| Lobster                       |                     |                         | 3                       |             |                |
| Brittle Star                  |                     |                         |                         | 3000        |                |
| Unid. Batfish                 |                     |                         |                         | 2 lbs       |                |
| Unid. Crab                    |                     | 1                       | 1                       |             | 93             |
| Unid. Croaker                 |                     | 3                       | 2                       | 16 lbs      |                |
| Unid. Flatfish                |                     | 1                       | 1                       | 6           | 2              |
| Unid. Jellyfish               |                     | 4                       |                         |             |                |
| Unid. Mackerel                |                     | 2 lbs                   | 102 lbs                 |             |                |
| Unid. Octopus                 |                     | 1                       |                         |             |                |
| Unid. Rockfish                |                     | 1                       | 1                       | 4           |                |
| Unid. Ray                     |                     |                         | 4                       |             | 1              |
| Unid. Sanddab                 |                     | 4                       | 3                       |             | 4              |
| Unid. Seastar                 |                     | 1                       |                         |             |                |
| Unid. Seaslug                 |                     |                         |                         |             | 21             |
| Unid. Scorpionfish            |                     | 1                       |                         |             |                |
| Unid. Surfperch               |                     |                         |                         | 3           |                |
| Unid. Skate                   |                     | 3                       |                         | 1           |                |
| Unid. Smelt                   |                     | 49                      |                         |             |                |
| Unid. Stingray                |                     | 9                       | 17                      |             |                |
| Unid. Shark                   |                     |                         |                         |             | 1              |
| Thresher Shark                |                     | 1                       |                         |             |                |
| CA Sea Lion                   |                     |                         | 98                      |             |                |
| Harbor Seal                   |                     |                         | 3                       |             |                |
| Common Dolphin                |                     |                         |                         | 1           |                |
| Unid. Gull                    |                     |                         | 16                      | 1           |                |

TABLE 4-3. Preliminary catch summary for vessels targeting Pacific mackerel from NMFS-SWR coastal pelagic species pilot observer program, 2004-2008.

| <b>Target species - Pacific mackerel</b> |                     |                         |                         |             |                |
|--|---------------------|-------------------------|-------------------------|-------------|----------------|
| <b>Species</b>                           | <b>Target Catch</b> | <b>Incidental Catch</b> | <b>Bycatch Returned</b> |             |                |
|  |                     |                         | <b>Alive</b>            | <b>Dead</b> | <b>Unknown</b> |
| Pacific Mackerel                         | 40 mt               | 16 mt                   |                         |             |                |
| Bat Ray                                  |                     |                         | 2                       |             |                |
| CA Yellowtail                            |                     |                         | 1                       |             |                |
| Midshipman                               |                     |                         | 1                       |             |                |
| Sardine                                  |                     |                         |                         |             |                |
| Sea Cucumber                             |                     |                         | 5                       |             |                |
| Unid. Crab                               |                     |                         | 1                       |             |                |
| Unid. Flatfish                           |                     |                         | 3                       |             |                |
| Unid. Jellyfish                          |                     |                         | 3                       |             |                |
| Unid. Shark                              |                     |                         | 1                       |             |                |

TABLE 4-4. Preliminary catch summary for vessels targeting northern anchovy and northern anchovy/Pacific sardine from NMFS-SWR coastal pelagic species pilot observer program, 2004-2008.

| <b>Target species - Anchovy and Anchovy/Sardine</b> |                     |                         |                         |             |                |   |    |
|---|---------------------|-------------------------|-------------------------|-------------|----------------|---|----|
| <b>Species</b>                                      | <b>Target Catch</b> | <b>Incidental Catch</b> | <b>Bycatch Returned</b> |             |                |   |    |
|   |                     |                         | <b>Alive</b>            | <b>Dead</b> | <b>Unknown</b> |   |    |
| Anchovy   | 373 mt              | 21 mt                   | 2 mt                    | 1 mt        |                |   |    |
| Sardine   |                     |                         | 2 mt                    |             |                |   |    |
| Bat Ray   |                     |                         | 4                       |             |                |   |    |
| CA Lizardfish                                       |                     |                         | 4                       |             |                |   |    |
| Kelp Bass   |                     |                         | 1                       |             |                |   |    |
| Midshipman  |                     |                         |                         |             |                | 5 |    |
| Pacific Bonito                                      |                     |                         |                         |             | 20 lbs         |   |    |
| Pacific Mackerel                                    |                     |                         | 2                       |             |                |   |    |
| Queenfish   |                     |                         | 50 lbs                  |             | 11 lbs         |   |    |
| Round Stingray                                      |                     |                         |                         |             | 1              |   |    |
| Sculpin   |                     |                         | 2                       |             |                |   |    |
| Spiny Dogfish                                       |                     |                         |                         |             | 1              |   |    |
| Unid. Croaker                                       |                     |                         | 20                      |             | 45             |   |    |
| Unid. Flatfish                                      |                     |                         | 10                      |             |                |   |    |
| Unid. Hake  |                     |                         | 4                       |             |                |   |    |
| Unid. Seastar                                       |                     |                         |                         |             | 1              |   |    |
| Unid. Smelt   |                     |                         | 2                       |             |                |   |    |
| Unid. Turbot  |                     |                         |                         |             | 1              | 1 | 20 |
| White Croaker                                       |                     |                         | 50 lbs                  |             | 35 lbs         |   |    |
| Yellowfin Croaker                                   |                     |                         | 50 lbs                  |             | 10 lbs         |   |    |
| CA Sea Lion   |                     |                         |                         |             | 5              |   |    |
| Sea Otter   |                     |                         |                         |             | 1              |   |    |

Table 4-5. Percent frequency by occurrence of incidental catch in sampled Pacific sardine, Pacific mackerel, and Northern anchovy landings, by California ports, 2013-2017. Table values represent proportion of each incidental species out of total incidental observed each year. (Collection of Northern anchovy samples began in 2014).

| Common Name           | All Ports Combined |      |      |      |      | Monterey/Moss Landing |      |      |      |      | Ventura/Port Hueneme/Terminal Island/San Pedro |      |      |      |      |
|-----------------------|--------------------|------|------|------|------|-----------------------|------|------|------|------|--|------|------|------|------|
|                       | 2013               | 2014 | 2015 | 2016 | 2017 | 2013                  | 2014 | 2015 | 2016 | 2017 | 2013   | 2014 | 2015 | 2016 | 2017 |
| <b>Finfish</b>        |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Anchovy, northern     | 0.9                | 7.9  | 0.2  |      |      | 3.6                   | 12.1 | 0.3  |      |      | 0.4  | 1.1  |      | 0.5  |      |
| Barracuda, California |                    | 0.6  | 0.7  | 0.3  | 2.4  |                       | 0.2  | 0.9  |      |      |  | 1.1  |      | 1.1  | 3.1  |
| Bass, barred sand     | 0.3                | 0.1  | 0.2  | 0.6  |      |                       |      |      |      |      | 0.4  | 0.4  | 0.9  | 0.5  |      |
| Bass, kelp            | 4.4                | 1.9  | 0.2  | 0.3  | 2.4  |                       |      |      |      |      | 5.3  | 4.9  | 0.9  |      | 3.1  |
| Bass, striped         |                    |      |      |      |      |                       |      |      |      |      |  |      |      | 0.5  |      |
| Blacksmith            | 0.3                | 0.1  |      | 0.3  |      |                       |      |      |      |      | 0.4  | 0.4  |      | 1.6  |      |
| Bonito, Pacific       | 3.8                | 0.4  | 1.3  | 1    |      |                       | 0.5  | 0.3  |      |      | 4.6  | 0.4  | 4.3  | 4.4  | 3.1  |
| Butterfish            | 1.5                | 3.2  | 6.7  | 4.3  |      | 3.6                   | 4.8  | 8.2  | 4.3  |      | 1.1  | 0.8  | 2.6  |      |      |
| Cabazon               |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Combfish, longspine   |                    |      |      |      |      |                       |      |      |      |      |  |      |      | 0.5  |      |
| Corbina, California   |                    |      |      | 0.3  |      |                       |      |      |      |      |  |      |      |      |      |
| Croaker, unspecified  | 0.3                |      |      |      |      |                       |      |      |      |      | 0.4  |      |      | 2.7  |      |
| Croaker, white        | 0.9                | 1.2  | 0.4  | 2.3  |      | 5.4                   | 1.4  | 0.3  | 1.7  |      |  | 0.8  | 0.9  | 2.2  |      |
| Croaker, yellowfin    |                    | 0.4  | 0.2  | 1.3  |      |                       | 0.5  |      |      |      |  | 0.4  | 0.9  | 1.1  |      |
| Cusk eel, basketweave |                    | 0.3  | 0.4  | 0.6  |      |                       |      | 0.3  |      |      |  | 0.8  | 0.9  |      |      |
| Cusk-eel, spotted     |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Eel, unspecified      |                    |      | 0.2  |      |      |                       |      | 0.3  |      |      |  |      |      |      |      |
| Eel, wolf (wolf-eel)  |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Eel, yellow snake     |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Fish, unspecified     |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Flatfish, unspecified | 0.6                | 0.6  | 0.4  |      | 2.4  |                       | 1    | 0.6  |      |      | 0.7  |      |      | 0.5  | 3.1  |
| Flounder, starry      |                    | 0.1  |      | 0.3  |      |                       | 0.2  |      |      |      |  |      |      |      |      |
| Flounder, unspecified |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Flyingfish            | 0.3                | 0.1  |      |      |      |                       |      |      |      |      | 0.4  | 0.4  |      |      |      |
| Greenling, kelp       |                    | 0.1  |      |      |      |                       |      |      |      |      |  | 0.4  |      |      |      |
| Grunion, California   |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Hagfish               |                    |      |      |      |      |                       |      |      |      |      |  |      |      |      |      |
| Halfmoon              |                    |      | 0.4  |      |      |                       |      | 0.3  |      |      |  |      | 0.9  | 3.8  |      |
| Halibut, California   | 1.8                | 0.4  | 0.9  | 3    |      | 1.8                   |      | 0.3  | 1.7  |      | 1.8  | 1.1  | 2.6  |      |      |
| Herring, Pacific      |                    |      |      | 1.3  |      |                       |      |      | 3.4  |      |  |      |      | 3.8  |      |
| Jacksmelt             | 0.9                | 0.1  | 0.7  | 3.3  | 4.9  | 5.4                   | 0.2  | 0.9  | 2.6  |      |  |      |      |      |      |
| Kelpfish, giant       | 0.6                | 0.1  |      |      |      |                       |      |      |      |      | 0.7  | 0.4  |      | 0.5  |      |

|                          |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
|--------------------------|------|-----|-----|-----|-----|-----|-----|------|------|--|------|------|-----|-----|-----|
| Lingcod                  |      |     |     | 1   |     |     |     |      | 1.7  |  |      |      |     | 4.4 |     |
| Lizardfish, California   | 1.2  | 2.3 | 2.2 | 3.6 |     | 5.4 | 3.3 | 2.4  | 2.6  |  | 0.4  | 0.8  | 1.7 | 0.5 |     |
| Mackerel, jack           | 13.5 | 4.5 | 9.4 | 2   |     |     | 0.2 | 12.7 | 4.3  |  | 16.1 | 11.3 |     | 6.6 | 6.3 |
| Midshipman, plainfin     | 0.6  | 0.6 | 2.5 | 13  |     |     | 1   | 2.1  | 23.3 |  | 0.7  |      | 3.5 |     |     |
| Midshipman, specklefin   | 1.8  | 0.7 | 0.7 | 0.6 |     |     |     |      | 1.7  |  | 2.1  | 1.9  | 2.6 | 1.1 |     |
| Midshipman, unspecified  |      |     |     | 0.6 |     |     |     |      |      |  |      |      |     |     |     |
| Opaleye                  |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Perch-like, unspecified  |      |     | 0.2 |     |     |     |     | 0.3  |      |  |      |      |     |     |     |
| Pipefish, bay            |      |     |     |     |     |     |     |      |      |  |      |      |     | 0.5 |     |
| Pipefish, kelp           |      | 0.1 |     | 0.3 |     |     |     |      |      |  | 0.4  |      |     |     |     |
| Poacher, unspecified     |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Queenfish                |      |     | 0.7 |     |     |     |     | 0.6  |      |  |      |      | 0.9 |     |     |
| Rockfish, chilipepper    |      | 0.4 | 0.2 |     |     |     | 0.7 | 0.3  |      |  |      |      |     | 0.5 |     |
| Rockfish, unspecified    |      | 0.1 |     | 0.3 |     |     | 0.2 |      |      |  |      |      |     |     |     |
| Salema                   |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Salmon, Chinook          |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Sanddab, longfin         |      | 0.1 |     | 0.3 |     |     |     |      | 0.9  |  |      | 0.4  |     |     |     |
| Sanddab, Pacific         | 5    | 6.1 | 8.1 | 2   |     | 7.1 | 6.4 | 9.7  | 5.2  |  | 4.6  | 5.7  | 3.5 |     |     |
| Sanddab, speckled        | 0.3  | 0.9 |     |     |     | 1.8 | 1.4 |      |      |  |      |      |     |     |     |
| Sanddab, unspecified     |      |     | 0.4 |     |     |     |     | 0.6  |      |  |      |      |     | 6   |     |
| Scorpionfish, California | 2.6  | 3.2 | 1.8 | 9.7 |     |     |     |      | 15.5 |  | 3.2  | 8.3  | 7   | 1.1 |     |
| Sculpin, pithead         |      |     |     | 0.6 |     |     |     |      |      |  |      |      |     |     |     |
| Sculpin, roughback       |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Sculpin, staghorn        | 0.6  |     | 0.9 |     |     | 3.6 |     | 1.2  |      |  |      |      |     |     |     |
| Sculpin, unidentified    |      | 0.1 |     |     |     |     | 0.2 |      |      |  |      |      |     |     |     |
| Sculpin, yellowchin      |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Seabass, giant (black)   |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Shad, American           |      |     | 0.2 |     |     |     |     | 0.3  |      |  |      |      |     |     |     |
| Sheephead, California    |      | 0.1 |     |     |     |     |     |      |      |  | 0.4  |      |     |     |     |
| Silversides              |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Smelt, surf              |      | 0.3 |     |     |     |     |     |      |      |  | 0.8  |      |     |     |     |
| Smelt, true              |      |     |     |     | 2.4 |     |     |      |      |  |      |      |     |     | 3.1 |
| Snapper, Mexican         |      |     |     |     |     |     |     |      |      |  |      |      |     |     |     |
| Sole, C-O                | 0.9  | 0.7 | 0.2 |     |     |     |     |      |      |  | 1.1  | 1.9  | 0.9 |     |     |

|                           |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
|---------------------------|------|------|------|------|------|-----|-----|------|------|--|------|------|------|------|------|
| Sole, English             |      | 0.1  | 0.2  |      |      |     | 0.2 | 0.3  |      |  |      |      |      |      |      |
| Sole, fantail             | 1.8  | 0.4  | 0.2  | 0.3  |      |     |     |      | 0.9  |  | 2.1  | 1.1  | 0.9  | 1.1  |      |
| Sole, petrale             | 0.3  |      | 0.2  | 0.6  |      |     |     | 0.3  |      |  | 0.4  |      |      |      |      |
| Sole, rock                |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Sole, sand                | 1.5  | 0.4  |      |      |      | 8.9 | 0.7 |      |      |  |      |      |      |      |      |
| Sole, slender             |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Sole, unspecified         |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Sunfish, ocean            |      | 0.1  |      |      |      |     | 0.2 |      |      |  |      |      |      |      |      |
| Surfperch, barred         |      |      |      | 0.3  |      |     |     |      | 0.9  |  |      |      |      |      |      |
| Surfperch, black          | 0.6  |      |      | 0.3  |      |     |     |      | 0.9  |  | 0.7  |      |      |      |      |
| Surfperch, kelp           |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Surfperch, pink           |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Surfperch, rainbow        |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Surfperch, rubberlip      | 0.3  | 0.1  |      |      |      |     |     |      |      |  | 0.4  | 0.4  |      |      |      |
| Surfperch, shiner         | 0.9  | 0.4  | 0.4  |      |      |     | 0.2 | 0.3  |      |  | 1.1  | 0.8  | 0.9  |      |      |
| Surfperch, unspecified    | 0.6  | 0.1  | 0.2  | 0.3  | 2.4  |     | 0.2 |      | 0.9  |  | 0.7  |      | 0.9  | 3.1  |      |
| Surfperch, walleye        |      |      |      | 0.6  |      |     |     |      | 1.7  |  |      |      |      |      |      |
| Tonguefish                |      | 0.3  | 0.2  |      |      |     | 0.5 | 0.3  |      |  |      |      |      | 3.3  |      |
| Topsmelt                  |      |      |      | 2.6  |      |     |     |      | 1.7  |  |      |      |      | 2.2  |      |
| Turbot, curlfin           | 0.3  | 0.9  | 0.2  | 1.3  |      | 1.8 | 1.4 | 0.3  |      |  |      |      |      |      |      |
| Turbot, diamond           |      |      |      | 0.6  |      |     |     |      | 1.7  |  |      |      |      | 1.6  |      |
| Turbot, hornyhead         | 4.4  | 2.2  | 1.3  | 1    |      | 1.8 | 0.2 | 0.3  |      |  | 4.9  | 5.3  | 4.3  | 2.2  |      |
| Turbot, spotted           | 0.6  |      |      | 2    |      |     |     |      | 1.7  |  | 0.7  |      |      | 2.2  |      |
| Turbot, unspecified       | 0.6  | 0.3  | 0.2  | 1.3  |      |     | 0.5 | 0.3  |      |  | 0.7  |      |      |      |      |
| Whiting, Pacific          |      | 0.7  |      |      |      |     | 1.2 |      |      |  |      |      |      |      |      |
| Total % Freq. Incidents   | 54.5 | 44.8 | 54.9 | 65.9 | 16.9 | 50  | 40  | 57.5 | 79.3 |  | 55.4 | 52.5 | 46.4 | 57.4 | 24.9 |
| <b>Elasmobranchs</b>      |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Guitarfish, shovelnose    |      |      |      | 0.3  |      |     |     |      |      |  |      |      |      |      | 0.5  |
| Ratfish, spotted          |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Ray, bat                  | 1.2  | 0.1  | 1.8  | 4.6  |      | 1.8 | 0.2 | 1.2  | 3.4  |  | 1.1  |      | 3.5  | 5.5  |      |
| Ray, California butterfly | 0.3  |      | 0.4  | 1    |      |     |     |      |      |  | 0.4  |      | 1.7  | 1.6  |      |
| Ray, Pacific electric     | 1.5  | 4.2  | 4.9  | 1.3  |      | 3.6 | 6.7 | 6.4  | 3.4  |  | 1.1  | 0.4  | 0.9  |      |      |
| Ray, unspecified          |      | 0.1  | 0.2  |      |      |     | 0.2 | 0.3  |      |  |      |      |      |      |      |
| Shark, brown smoothhound  |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Shark, gray smoothhound   |      |      |      |      |      |     |     |      |      |  |      |      |      |      |      |
| Shark, horn               | 0.3  | 0.7  | 0.2  | 0.6  | 2.4  |     |     |      |      |  | 0.4  | 1.9  | 0.9  | 1.1  | 3.1  |
| Shark, leopard            |      | 0.3  |      | 0.3  |      |     | 0.2 |      |      |  |      | 0.4  |      | 0.5  |      |



|                                   |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
|-----------------------------------|------|------|-----|-----|-----|-----|------|------|-----|--|------|------|------|------|------|
| Shark, Pacific angel              | 1.5  | 0.6  | 0.7 |     | 2.4 |     |      |      |     |  | 1.8  | 1.5  | 2.6  |      | 3.1  |
| Shark, pelagic thresher           |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Shark, smooth hammerhead          |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Shark, spiny dogfish              |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Shark, unspecified                |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Skate, big                        | 0.3  |      |     |     |     | 1.8 |      |      |     |  |      |      |      |      |      |
| Skate, California                 | 0.9  | 0.1  | 0.4 |     |     |     |      | 0.3  |     |  | 1.1  | 0.4  | 0.9  |      |      |
| Skate, long-nosed                 |      |      |     | 0.3 |     |     |      |      |     |  |      |      |      |      | 0.5  |
| Skate, thornback                  | 2.1  | 0.9  | 1.1 | 2   | 2.4 | 5.4 |      | 0.6  | 0.9 |  | 1.4  | 2.3  | 2.6  | 2.7  | 3.1  |
| Skate, unspecified                |      | 0.1  | 0.2 | 0.3 |     |     |      | 0.2  |     |  |      |      | 0.9  | 0.5  |      |
| Stingray, round                   |      | 0.3  | 0.4 | 2   |     |     |      |      |     |  |      | 0.8  | 1.7  | 3.3  |      |
| Total % Freq. Incidents           | 7.9  | 7.6  | 8.5 | 13  | 7.2 | 7   | 7.6  | 6.8  | 7.6 |  | 7    | 7.5  | 14.4 | 16.2 | 59.1 |
| <b>Invertebrates &amp; Plants</b> |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Algae, marine                     |      |      | 1.6 |     |     |     |      | 0.5  | 2.1 |  |      |      |      |      |      |
| Bryozoan                          |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Crab shells                       | 0.6  |      | 0.7 | 0.3 |     | 1.8 |      | 0.9  | 0.9 |  | 0.4  |      |      |      |      |
| Crab, box                         |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Crab, decorator                   |      | 3.5  |     | 0.6 |     |     |      |      |     |  |      |      |      |      | 1.1  |
| Crab, Dungeness                   | 1.2  |      | 1.3 | 0.3 |     | 7.1 | 5.5  | 1.8  | 0.9 |  |      | 0.4  |      |      |      |
| Crab, globe                       | 0.6  |      |     |     |     |     |      |      |     |  | 0.7  |      |      |      |      |
| Crab, rock unspecified            | 0.3  | 0.3  |     | 0.3 |     | 1.8 |      |      |     |  |      |      |      |      | 0.5  |
| Crab, sheep                       | 2.3  |      |     | 1   |     |     |      |      | 0.9 |  | 2.8  | 0.8  |      |      | 1.1  |
| Crab, slender                     |      |      |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Crab, spider                      |      | 1.9  |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Crab, swimming                    | 1.2  | 0.6  | 1.1 | 4   | 2.4 |     | 0.2  |      |     |  | 1.4  | 4.5  | 4.3  | 6.6  | 3.1  |
| Crab, unspecified                 | 0.9  | 1    | 2.2 | 0.3 |     |     |      | 1.2  | 0.9 |  | 1.1  | 1.5  | 5.2  |      |      |
| Eelgrass                          |      |      | 1.6 |     | 2.4 |     |      | 1    | 0.3 |  |      | 1.1  | 5.2  |      | 3.1  |
| Gorgonians (sea fans)             |      |      | 0.4 |     |     |     |      |      |     |  |      |      | 1.7  |      |      |
| Invertebrate, unspecified         |      | 6.4  |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Jellyfish                         | 0.6  | 11.8 | 1.6 | 0.3 |     | 3.6 | 10.5 | 2.1  | 0.9 |  |      |      |      |      |      |
| Kelp                              | 11.4 | 0.6  | 16  | 5   |     | 5.4 | 9.3  | 15.2 | 0.9 |  | 12.6 | 15.8 | 18.3 | 7.7  | 12.5 |
| Kelp, feather boa                 |      | 0.4  | 0.9 | 0.3 |     |     | 1    | 1.2  | 0.9 |  |      |      |      |      |      |
| Lobster, California spiny         | 1.2  |      |     | 0.3 |     |     |      |      |     |  | 1.4  | 1.1  |      |      | 0.5  |
| Nudibranch                        |      | 1    |     |     |     |     |      |      |     |  |      |      |      |      |      |
| Octopus, unspecified              | 3.8  |      | 0.4 | 1   |     |     | 8.9  | 0.7  | 0.3 |  | 2.8  | 1.5  | 0.9  | 1.6  |      |

|                           |      |      |      |      |      |      |      |      |      |    |      |     |      |      |      |
|---------------------------|------|------|------|------|------|------|------|------|------|----|------|-----|------|------|------|
| Pleurobranch              |      | 0.3  |      |      |      |      |      |      |      |    |      |     |      |      |      |
| Prawn, ridgeback          |      | 0.4  |      | 2.6  |      |      | 0.5  |      | 0.9  |    |      |     |      | 3.8  |      |
| Prawn, spot               |      | 1.6  |      |      |      |      | 0.5  |      |      |    |      | 0.4 |      |      |      |
| Salps                     |      | 1.5  | 0.7  |      |      |      |      | 0.9  |      |    |      | 4.2 |      |      |      |
| Sea cucumber              | 0.6  |      | 0.4  |      |      |      | 1.7  |      |      |    | 0.7  | 1.1 | 1.7  |      |      |
| Sea pansy                 |      |      |      |      |      |      |      |      |      |    |      |     |      |      |      |
| Sea stars                 | 1.2  |      | 0.2  | 0.3  |      | 3.6  |      | 0.3  |      |    | 0.7  |     |      |      | 0.5  |
| Shrimp,black-spotted bay  |      | 0.1  | 0.2  | 0.3  |      |      |      | 0.3  | 0.9  |    |      |     |      |      |      |
| Shrimp, unspecified       | 0.3  |      | 3.1  | 0.3  |      |      |      | 2.7  |      |    | 0.4  | 0.4 | 4.3  | 0.5  |      |
| Snail, top                |      |      |      |      |      |      |      |      |      |    |      |     |      |      |      |
| Snail, unspecified        |      | 0.3  |      |      |      |      |      |      |      |    |      |     |      |      |      |
| Sponge, unspecified       |      |      |      |      |      |      | 0.5  |      |      |    |      |     |      |      |      |
| Squid, jumbo              |      | 15   |      |      |      |      |      |      |      |    |      |     |      |      |      |
| Squid, market             | 11.4 |      | 11.2 | 3    | 7.3  | 5.4  | 20   | 14.8 | 5.2  |    | 12.6 | 7.2 | 0.9  | 1.6  | 9.4  |
| Squid, market (Egg Cases) |      |      |      |      |      |      |      |      |      |    |      |     |      |      |      |
| Surfgrass                 |      | 0.4  |      |      |      |      |      |      |      |    |      |     |      |      |      |
| Tunicates                 |      |      | 1.3  | 0.3  |      |      | 0.7  | 1.8  |      |    |      |     |      | 0.55 |      |
| Turkish Towel             |      |      |      |      |      |      |      |      |      |    |      |     |      |      |      |
| Total % Freq. Incidents   | 37.5 | 47.6 | 36.4 | 21.1 | 12.1 | 37.5 | 53.4 | 35.7 | 12.9 | 0  | 37.5 | 40  | 39.2 | 26.2 | 28.1 |
| Total All Incidents       | 56   | 685  | 551  | 299  | 41   | 285  | 420  | 426  | 116  | 9  | 341  | 265 | 125  | 183  | 32   |
| Total Observed Landings   | 7    | 100  | 162  | 72   | 47   | 110  | 24   | 108  | 25   | 23 | 118  | 76  | 54   | 47   | 24   |

Table 4-6. Incidental catch reported on California landing receipts with greater than fifty percent market squid (by tonnage per landing) from the 2013-2014 through 2017-2018 season for round haul gear.

| Common Name       | 2013 - 2014        |             | 2014 - 2015        |             | 2015 - 2016        |             | 2016 - 2017        |             | 2017-2018          |             |
|-------------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|
|                   | Number of Landings | Metric Tons | Number of Landings | Metric Tons | Number of Landings | Metric Tons | Number of Landings | Metric Tons | Number of Landings | Metric Tons |
| Anchovy, northern | 4                  | 5           | 1                  | 0           | 5                  | 136         | 5                  | 2           | 11                 | 16          |
| Bonito, Pacific   | 0                  | 0           | 0                  | 0           | 1                  | 5           | 1                  | 0           | 2                  | 1           |
| Mackerel, jack    | 29                 | 27          | 33                 | 21          | 45                 | 61          | 43                 | 58          | 35                 | 21          |

|                   |    |     |     |     |     |     |     |     |     |     |
|-------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Mackerel, Pacific | 66 | 274 | 154 | 359 | 126 | 348 | 140 | 512 | 195 | 230 |
| Sardine, Pacific  | 71 | 403 | 46  | 50  | 27  | 23  | 102 | 89  | 130 | 152 |

TABLE 4-7. Percent frequency by occurrence of bycatch in observed loads of California market squid by California port, 2013-2017. Table values represent proportion of each incidental species out of total incidental observed each year.

| Common Name                  | Total All Ports |      |      |      |      | San Pedro/Terminal Island |      |      |      |      | Ventura/Port Hueneme |      |      |      |      | Monterey/Moss Landing |      |      |      |      |  |
|------------------------------|-----------------|------|------|------|------|---------------------------|------|------|------|------|----------------------|------|------|------|------|-----------------------|------|------|------|------|--|
|                              | 2013            | 2014 | 2015 | 2016 | 2017 | 2013                      | 2014 | 2015 | 2016 | 2017 | 2013                 | 2014 | 2015 | 2016 | 2017 | 2013                  | 2014 | 2015 | 2016 | 2017 |  |
| <b>Finfish</b>               |                 |      |      |      |      |                           |      |      |      |      |                      |      |      |      |      |                       |      |      |      |      |  |
| Anchovy, northern            | 3.5             | 3.2  | 4    | 4.3  | 4.4  | 2.9                       | 3.6  |      | 4.1  | 1.8  | 4.3                  | 4    | 1.8  | 7    | 3.3  | 2.7                   | 2.8  | 5.4  | 3    | 7.7  |  |
| Barracuda, California        | 0.4             | 0.4  | 0.6  | 1.9  | 0.74 |                           | 1    |      | 3.1  | 1.8  | 0.8                  |      |      | 2.3  |      |                       |      | 0.9  |      |      |  |
| Bass, kelp                   | 0.3             | 0.5  |      |      | 0.19 | 1                         | 1.5  |      |      | 0.44 | 0.3                  |      |      |      |      |                       |      |      |      |      |  |
| Blacksmith                   | 0.1             | 0.2  |      | 0.5  | 0.19 |                           | 0.5  |      | 1    |      | 0.3                  |      |      |      | 1.1  |                       |      |      |      |      |  |
| Bonito, Pacific              | 0.1             | 0.2  | 0.9  | 1.4  | 0.37 | 1                         |      | 4.2  | 3.1  | 0.88 |                      | 2    | 1.8  |      |      |                       |      |      |      |      |  |
| Butterfish (Pacific pompano) | 10              | 4.6  | 5.2  | 3.4  | 3    | 10.7                      | 1.5  | 4.2  |      | 1.3  | 11.6                 | 2    | 1.8  | 4.7  |      | 7.7                   | 6.7  | 6.3  | 7.6  | 5.9  |  |
| Combfish, longspine          | 0.1             | 0.2  |      |      |      |                           |      |      |      |      | 0.3                  |      |      |      |      |                       | 0.3  |      |      |      |  |
| Croaker, white (kingfish)    | 1               | 0.4  | 0.6  | 1.4  | 0.93 |                           | 0.5  |      |      |      | 0.5                  |      |      |      |      | 2                     | 0.3  | 0.9  | 4.5  | 2.3  |  |
| Eel, wolf (wolf-eel)         | 0.5             | 0.2  |      |      |      |                           |      |      |      |      |                      |      |      |      |      | 1.3                   | 0.3  |      |      |      |  |
| Fish, unspecified            |                 |      |      |      |      |                           |      |      |      |      |                      |      |      |      |      |                       |      |      |      |      |  |
| Flatfish, unspecified        | 0.3             | 0.9  | 1.5  |      | 2.6  | 1                         |      | 2.1  |      | 4.4  |                      | 2    |      |      |      | 0.3                   | 1.2  | 1.8  |      | 1.8  |  |
| Flounder, starry             | 0.1             | 0.4  |      | 0.5  |      |                           |      |      |      |      |                      |      |      |      |      | 0.3                   | 0.6  |      | 1.5  |      |  |

|                         |     |     |      |      |      |  |     |      |      |      |      |  |      |     |      |      |      |     |     |     |      |      |      |
|-------------------------|-----|-----|------|------|------|--|-----|------|------|------|------|--|------|-----|------|------|------|-----|-----|-----|------|------|------|
| Flyingfish              | 0.6 | 0.2 |      | 0.5  | 0.56 |  | 1   | 0.5  |      | 1    | 1.3  |  | 1.1  |     |      |      |      |     |     |     |      |      |      |
| Halibut, California     | 0.1 | 0.2 |      |      | 0.74 |  | 1   |      |      |      | 0.44 |  |      |     |      |      |      | 0.3 |     |     |      | 1.4  |      |
| Herring, Pacific        | 1.3 | 0.5 |      |      | 0.19 |  |     |      |      |      | 0.44 |  |      |     |      |      | 3.4  | 0.9 |     |     |      |      |      |
| Jacksmelt               | 2.5 | 3   | 4.3  | 4.3  | 4.8  |  | 1   | 0.5  | 2.1  | 1    |      |  | 0.3  |     |      | 2.3  | 1.1  |     | 5.7 | 4.9 | 5.8  | 10.6 | 11.3 |
| Lizardfish, California  | 2.8 | 2.3 | 0.6  | 1    | 0.74 |  | 3.9 |      | 2.1  |      | 1.3  |  | 3    |     |      |      |      | 2.3 | 4   | 0.4 | 3    | 0.45 |      |
| Mackerel, jack          | 2.6 | 4.9 | 12.5 | 11.1 | 8.3  |  | 2.9 | 10.3 | 10.4 | 15.3 | 10.5 |  | 3    | 6   | 10.5 | 9.3  | 7.7  |     | 2   | 1.5 | 13.5 | 6.1  | 6.33 |
| Mackerel, Pacific       | 4.3 | 8.4 | 14.9 | 14.5 | 15.2 |  | 3.9 | 12.9 | 14.6 | 17.3 | 19.3 |  | 5.4  | 16  | 33.3 | 18.6 | 30.8 |     | 3   | 4.6 | 10.3 | 7.6  | 4.5  |
| Mackerel, unspecified   |     |     |      |      |      |  |     |      |      |      |      |  |      |     |      |      |      |     |     |     |      |      |      |
| Midshipman, plainfin    | 1.7 | 1.8 | 1.2  | 0.5  | 1.1  |  | 1   |      |      |      | 0.88 |  | 1.9  |     |      |      | 2.2  |     | 1.7 | 3.1 | 1.8  | 1.5  | 0.9  |
| Midshipman, specklefin  | 0.8 | 0.2 | 0.6  |      |      |  | 2.9 | 0.5  | 2.1  |      |      |  | 0.8  |     |      |      |      |     |     |     | 0.4  |      |      |
| Midshipman, unspecified |     | 0.2 |      |      |      |  |     | 0.5  |      |      |      |  |      |     |      |      |      |     |     |     |      |      |      |
| Poacher, unspecified    |     |     |      |      |      |  |     |      |      |      |      |  |      |     |      |      |      |     |     |     |      |      |      |
| Rockfish, Blue          | 0.6 | 0.4 | 0.3  |      |      |  |     |      |      |      |      |  |      |     |      |      |      | 1.7 | 0.6 | 0.4 |      |      |      |
| Rockfish, chilipepper   | 0.9 | 0.9 |      |      |      |  |     |      |      |      |      |  |      |     |      |      |      | 2.3 | 1.5 |     |      |      |      |
| Rockfish, unspecified   | 0.5 | 0.2 | 0.3  |      |      |  | 1   |      |      |      |      |  |      |     |      |      |      | 1   | 0.3 | 0.4 |      |      |      |
| Salmon, Chinook         | 0.5 |     |      |      | 0.19 |  |     |      |      |      |      |  |      |     |      |      |      | 1.3 |     |     |      |      | 0.45 |
| Sanddab, longfin        | 0.1 | 0.2 |      |      | 0.56 |  | 1   | 0.5  |      |      | 1.3  |  |      |     |      |      |      |     |     |     |      |      |      |
| Sanddab, Pacific        | 2.7 | 5.3 | 6.4  | 2.4  | 2    |  | 5.8 | 4.1  | 4.2  |      |      |  | 2    |     |      | 1.1  |      | 5   | 6.4 | 8.5 | 7.6  | 4.5  |      |
| Sanddab, speckled       | 0.9 | 2.5 | 0.6  | 1.4  | 0.37 |  |     |      |      |      |      |  | 8    | 3.5 | 7    | 1.1  |      | 2.3 | 3.1 |     |      | 0.45 |      |
| Sanddab, unspecified    | 5.6 | 0.4 |      | 0.5  | 0.37 |  |     | 1    |      |      | 0.44 |  | 11.3 |     |      |      |      | 0.3 |     |     |      | 1.5  | 0.45 |

|                          |      |      |      |      |           |  |      |      |      |      |           |  |      |    |      |      |      |  |      |      |      |      |           |
|--------------------------|------|------|------|------|-----------|--|------|------|------|------|-----------|--|------|----|------|------|------|--|------|------|------|------|-----------|
| Sardine, Pacific         | 5.3  | 4.4  | 9.8  | 14   | 10.6      |  | 1.9  | 2.6  | 8.3  | 19.4 | 14.0      |  | 4    | 2  | 7    | 16.3 | 11   |  | 8.1  | 5.8  | 10.8 | 4.5  | 6.8       |
| Scorpionfish, California | 0.6  | 0.2  | 0.3  | 2.4  | 1.1       |  | 2.9  | 0.5  | 2.1  | 5.1  | 2.2       |  | 0.5  |    |      |      | 1.1  |  |      |      |      |      |           |
| Sculpin, pithead         |      |      |      |      |           |  |      |      |      |      |           |  |      |    |      |      |      |  |      |      |      |      |           |
| Sculpin, staghorn        | 0.5  | 0.2  |      |      |           |  |      |      |      |      |           |  | 0.5  |    |      |      |      |  | 0.7  | 0.3  |      |      |           |
| Sculpin, unidentified    | 0.3  | 0.4  |      |      |           |  |      |      |      |      |           |  | 0.3  |    |      |      |      |  | 0.3  | 0.6  |      |      |           |
| Silversides              |      |      |      |      |           |  |      |      |      |      |           |  |      |    |      |      |      |  |      |      |      |      |           |
| Sunfish, ocean           | 0.1  | 0.2  |      |      |           |  |      |      |      |      |           |  | 0.3  |    |      |      |      |  |      | 0.3  |      |      |           |
| Surfperch, shiner        | 1.2  | 0.4  | 0.3  |      |           |  | 1.9  |      | 2.1  |      |           |  | 1.9  | 2  |      |      |      |  |      | 0.3  |      |      |           |
| Topsmelt                 | 0.4  |      |      | 0.5  | 0.18      |  |      |      |      | 1    | 0.44      |  | 0.8  |    |      |      |      |  |      |      |      |      |           |
| Turbot, hornyhead        | 3.4  | 1.4  | 0.6  | 0.5  | 1.3       |  | 4.9  | 1.5  | 2.1  |      | 1.8       |  | 3.5  |    |      |      | 1.1  |  | 2.7  | 1.5  | 0.4  | 1.5  | 0.9       |
| Turbot, spotted          |      |      |      |      |           |  |      |      |      |      |           |  |      |    |      |      |      |  |      |      |      |      |           |
| Turbot, unspecified      | 0.4  | 0.4  |      |      | 0.19      |  |      |      |      |      |           |  | 0.8  |    |      |      |      |  |      | 0.6  |      |      | 0.45      |
| Whiting, Pacific         | 0.4  | 0.2  |      |      |           |  |      |      |      |      |           |  |      |    |      |      |      |  | 1    | 0.3  |      |      |           |
| Total % Freq. Incidents  | 57.6 | 49.6 | 65.5 | 67.1 | 60.9<br>1 |  | 53.4 | 44.3 | 60.4 | 71.4 | 64.9<br>6 |  | 57.3 | 46 | 59.6 | 67.4 | 61.6 |  | 59.4 | 53.2 | 68.2 | 60.6 | 56.5<br>8 |
| <b>Elasmobranchs</b>     |      |      |      |      |           |  |      |      |      |      |           |  |      |    |      |      |      |  |      |      |      |      |           |
| Ray, bat                 | 3.8  | 1.4  | 3.4  | 4.3  | 2.8       |  | 10.7 | 2.6  | 2.1  | 2    | 4.8       |  | 4    | 6  | 10.5 | 11.6 | 3.3  |  | 1    |      | 1.8  | 3    | 0.45      |
| Ray, Pacific electric    | 1.9  | 1.8  | 0.6  | 1.4  | 1.3       |  |      |      |      |      |           |  | 0.8  |    |      |      |      |  | 4    | 3.1  | 0.9  | 4.5  | 3.2       |
| Shark, horn              | 0.1  |      |      |      | 0.19      |  |      |      |      |      | 0.44      |  | 0.3  |    |      |      |      |  |      |      |      |      |           |
| Shark, unspecified       |      |      |      |      |           |  |      |      |      |      |           |  |      |    |      |      |      |  |      |      |      |      |           |
| Skate, long-nosed        |      |      |      |      | 0.19      |  |      |      |      |      |           |  |      |    |      |      |      |  |      |      |      |      | 0.45      |

|                                   |      |      |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      |     |      |      |     |     |      |
|-----------------------------------|------|------|------|-----|------|--|------|------|-----|------|------|-----|-----|----|------|------|------|-----|------|------|-----|-----|------|
| Skate, unspecified                |      | 0.2  |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      | 0.3 |      |      |     |     |      |
| Stingray, round                   |      |      |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      |     |      |      |     |     |      |
| Total % Freq. Incidents           | 5.8  | 3.3  | 3.9  | 5.8 | 4.48 |  | 10.7 | 2.6  | 2.1 | 2    | 5.24 |     | 5.1 | 6  | 10.5 | 11.6 | 3.3  |     | 5    | 3.4  | 2.7 | 7.6 | 4.1  |
|                                   |      |      |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      |     |      |      |     |     |      |
| <b>Invertebrates &amp; Plants</b> |      |      |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      |     |      |      |     |     |      |
| Algae, marine                     | 0.3  | 0.4  | 1.2  | 0.5 | 0.37 |  |      |      |     |      | 0.88 |     |     |    |      |      |      |     | 0.7  | 0.6  | 1.8 | 1.5 |      |
| Cnidaria (Sea Anemones)           |      |      |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      |     |      |      |     |     |      |
| Crab, box                         |      |      |      |     | 0.19 |  |      |      |     |      | 0.44 |     |     |    |      |      |      |     |      |      |     |     |      |
| Crab, Dungeness                   | 0.9  | 3.5  | 1.8  | 1   | 1.1  |  |      |      | 2.1 |      |      |     |     |    |      |      |      |     | 2.3  | 6.1  | 2.2 | 3   | 2.7  |
| Crab, rock unspecified            | 0.3  | 0.5  | 0.6  |     |      |  |      | 1    | 2.1 |      |      |     | 0.3 | 2  | 1.8  |      |      |     | 0.3  |      |     |     |      |
| Crab, sheep                       | 0.1  |      | 0.3  | 0.5 |      |  | 1    |      |     | 1    |      |     |     |    |      |      |      |     |      |      | 0.4 |     |      |
| Crab, Shore                       |      |      |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      |     |      |      |     |     |      |
| Crab, swimming                    |      | 0.2  | 0.9  | 2.9 | 0.55 |  |      |      | 4.2 | 4.1  | 0.88 |     |     |    | 1.8  | 4.7  | 1.1  |     |      | 0.3  |     |     |      |
| Crab, unspecified                 | 0.1  | 0.7  | 0.9  |     |      |  | 1    | 1.5  | 2.1 |      |      |     |     | 2  |      |      |      |     |      |      | 0.9 |     |      |
| Eelgrass                          | 3.2  | 1.9  | 0.9  | 0.5 | 1.5  |  | 1    | 3.6  | 6.3 |      | 3.5  | 0.8 |     |    |      |      |      |     | 7    | 1.2  |     | 1.5 |      |
| Gorgonians (sea fans)             |      |      |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      |     |      |      |     |     |      |
| Grass, Turtle                     |      |      |      |     |      |  |      |      |     |      |      |     |     |    |      |      |      |     |      |      |     |     |      |
| Jellyfish                         | 1.9  | 5.4  | 3    | 2.9 | 6.3  |  |      | 0.5  |     |      |      | 0.3 |     |    |      |      |      |     | 4.7  | 9.2  | 4.5 | 9.1 | 15.4 |
| Kelp                              | 12.8 | 15.9 | 10.1 | 7.7 | 15.5 |  | 13.6 | 24.2 | 8.3 | 12.2 | 16.7 |     | 14  | 22 | 14   | 7    | 25.3 |     | 11.1 | 10.1 | 9.4 | 1.5 | 12.7 |
| Kelp, feather boa                 | 1.2  | 1.1  | 1.2  |     | 0.19 |  |      |      |     |      | 0.44 |     |     |    |      |      |      |     | 3    | 1.8  | 1.8 |     |      |
| Lobster, California spiny         | 0.1  |      |      | 1   | 0.19 |  | 1    |      |     | 2    | 0.44 |     |     |    |      |      |      |     |      |      |     |     |      |
| Salps                             | 4.4  | 3.2  |      |     | 0.19 |  |      | 5.2  |     |      | 0.44 |     | 9.1 | 16 |      |      |      |     |      |      |     |     |      |

|                           |      |      |      |      |      |  |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |
|---------------------------|------|------|------|------|------|--|------|------|------|------|------|-----|------|-----|------|------|------|-----|------|------|------|------|------|
| Sea cucumber              | 0.4  |      |      |      | 0.19 |  |      |      |      |      | 0.44 |     | 0.8  |     |      |      |      |     |      |      |      |      |      |
| Sea Cucumber, warty       |      |      |      | 0.5  |      |  |      |      | 1    |      |      |     |      |     |      |      |      |     |      |      |      |      |      |
| Sea Hare                  | 0.5  |      | 0.9  |      | 0.56 |  |      | 2.1  |      | 0.88 |      | 1.1 |      | 3.5 |      | 1.1  |      |     |      |      |      |      |      |
| Sea Slug                  |      |      |      |      |      |  |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |
| Sea stars                 | 2.5  | 1.2  | 1.2  |      | 0.56 |  | 0.5  | 2.1  |      | 0.88 |      | 3.5 |      | 3.5 |      | 1.1  |      | 2   | 1.8  | 0.4  |      |      |      |
| Squid, jumbo              |      |      |      |      |      |  |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |
| Squid, market (Egg Cases) | 6.7  | 8.4  | 3.7  | 7.7  | 3.7  |  | 18.4 | 16.5 | 8.3  | 6.1  | 3.94 |     | 6.7  | 6   | 5.3  | 9.3  | 5.5  |     | 2.7  | 4    | 2.2  | 9.1  | 2.7  |
| Surfgrass                 | 1    | 4.7  | 3.7  | 1.9  | 2.4  |  |      |      |      |      |      | 1.1 |      |     |      |      |      | 1.3 | 8.3  | 5.4  | 6.1  | 5.8  |      |
| Tunicates                 | 0.1  |      |      |      | 0.19 |  |      |      |      |      |      |     |      |     |      |      | 1.1  |     | 0.3  |      |      |      |      |
| Urchin, Purple            |      |      |      |      |      |  |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |
| Total % Freq. Incidents   | 36.6 | 47.1 | 30.5 | 27.1 | 33.6 |  | 35.9 | 53.1 | 37.5 | 26.5 | 29.8 |     | 37.6 | 48  | 29.8 | 20.9 | 35.2 |     | 35.6 | 43.4 | 29.1 | 31.8 | 39.3 |
|                           |      |      |      |      |      |  |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |
| Total All Incidents       | 773  | 571  | 328  | 207  | 540  |  | 103  | 194  | 48   | 98   | 228  |     | 372  | 50  | 57   | 43   | 91   |     | 298  | 327  | 223  | 66   | 221  |
| Total Observed Landings   | 196  | 135  | 103  | 95   | 181  |  | 92   | 72   | 8    | 40   | 71   |     | 64   | 22  | 58   | 41   | 59   |     | 40   | 41   | 37   | 14   | 51   |

TABLE 4-8. Expanded salmonid bycatch in Pacific sardine fisheries in Oregon and Washington, 2006-2017/2018<sup>4</sup>

|                   | Oregon <sup>1</sup> |        |        |        |        |        |             | Washington <sup>2</sup> |        |        |        |        |        |             |
|-------------------|---------------------|--------|--------|--------|--------|--------|-------------|-------------------------|--------|--------|--------|--------|--------|-------------|
|                   | Chinook             |        | Coho   |        | Total  |        | Grand Total | Chinook                 |        | Coho   |        | Total  |        | Grand Total |
|                   | (live)              | (dead) | (live) | (dead) | (live) | (dead) |             | (live)                  | (dead) | (live) | (dead) | (live) | (dead) |             |
| 2015-2018         | -                   | -      | -      | -      | -      | -      | -           | -                       | -      | -      | -      | -      | -      | -           |
| 2014/15           |                     |        |        |        | 17     | 7      | 24          | 44                      | 146    | 27     | 166    | 71     | 312    | 383         |
| 2014 <sup>3</sup> |                     |        |        |        | 0      | 0      | 0           | 6                       | 21     | 4      | 24     | 10     | 45     | 55          |
| 2013              |                     |        |        |        | 117    | 81     | 198         | 207                     | 683    | 125    | 779    | 332    | 1,462  | 1,794       |
| 2012              |                     |        |        |        | 61     | 64     | 125         | 244                     | 806    | 148    | 919    | 392    | 1,725  | 2,117       |
| 2011              |                     |        |        |        | 35     | 37     | 72          | 56                      | 186    | 34     | 212    | 90     | 398    | 488         |
| 2010              |                     |        |        |        | 110    | 76     | 186         | 87                      | 288    | 53     | 328    | 140    | 616    | 756         |
| 2009              |                     |        |        |        | 126    | 115    | 241         | 56                      | 186    | 34     | 212    | 90     | 398    | 488         |
| 2008              |                     |        |        |        | 123    | 75     | 198         | 45                      | 149    | 27     | 170    | 72     | 319    | 391         |
| 2007              |                     |        |        |        | 349    | 170    | 519         | 33                      | 108    | 20     | 124    | 53     | 232    | 285         |
| 2006              |                     |        |        |        | 164    | 93     | 257         | 31                      | 101    | 19     | 116    | 50     | 217    | 267         |

1 Oregon salmon bycatch data for 2000-2001 are expanded from a bycatch rate of salmon/trip based on vessel observation program.

Oregon salmon bycatch data for 2002-2015 are from logbooks. No sardine fishery landings were made in Oregon during January 1-June 30, 2014.

2 Washington totals calculated from observed 2000-2004 observed bycatch rates.

3 January 1, 2014 – June 30, 2014.

4 The directed sardine fishery has been closed since June 30, 2015.

TABLE 4-9. Reported logbook catches of non-target species caught in Oregon sardine fishery since 2007. There were no sardine fishery landings in Oregon during the 2014 Interim Fishery, January 1-June 30, 2014. The directed fishery for sardines has been closed since June 30, 2015.

| Species        | 2007                    | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 Interim Fishery | 2014-2015 | 2015 - 2018 |
|----------------|-------------------------|------|------|------|------|------|------|----------------------|-----------|-------------|
| Blue Shark     | 0                       | 1    | 0    | 0    | 0    | 0    | 0    | 0                    | 0         | -           |
| Thresher Shark | 3<br>(2 released alive) | 0    | 0    | 0    | 0    | 0    | 0    | 0                    | 0         | -           |



|               |                               |                               |                               |                               |                              |                               |                               |   |                              |   |
|---------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|-------------------------------|-------------------------------|---|------------------------------|---|
| Unknown Shark | 5                             | 0                             | 0                             | 0                             | 0                            | 0                             | 0                             | 0 | 0                            | - |
| Salmonids     | 519<br>67% alive;<br>33% dead | 198<br>62% alive;<br>38% dead | 248<br>53% alive;<br>47% dead | 186<br>59% alive;<br>41% dead | 72<br>49% alive;<br>51% dead | 125<br>49% alive;<br>51% dead | 198<br>59% alive;<br>41% dead | 0 | 24<br>71% alive;<br>29% dead | - |
| Mackerel      | 473,441 lbs                   | 59,205 lbs                    | 30,872 lbs                    | 15,280 lbs                    | 20 lbs                       | 947,200 lbs                   | 569,650 lbs                   | 0 | 1,146,300 lbs                | - |
| Anchovy       | 500 lbs                       | 8,300 lbs                     | 12,045 lbs                    | 20,450 lbs                    | 0                            | 0                             | 15,000 lbs                    | 0 | 0                            | - |
| Herring       | 0                             | 52,200 lbs                    | 2,000 lbs                     | 0                             | 0                            | 6,000 lbs                     | 3,000 lbs                     | 0 | 0                            | - |
| Hake          | 0                             | 525 lbs                       | 0                             | 0                             | 0                            | 0                             | 0                             | 0 | 0                            | - |
| Squid         | 0                             | 225 lbs                       | 0                             | 30 lbs                        | 0                            | 0                             | 0                             | 0 | 200 lbs                      | - |
| Jellyfish     | 0                             | 0                             | 0                             | 0                             | 0                            | 0                             | 0                             | 0 | 0                            | - |
| Dogfish       | -                             | -                             | 200 lbs                       | 0                             | 0                            | 0                             | 0                             | 0 | 0                            | - |
| Shad          | 0                             | 0                             | 0                             | 0                             | 0                            | 0                             | 2 lbs                         | 0 | 0                            | - |

TABLE 4-10. Recorded incidental catch (mt) in Oregon sardine fishery since 2010 (from fish ticket data). Excludes species landed under an Exempted Fishery Permit. There were no sardine fishery landings in Oregon during the 2014 Interim Fishery, January 1-June 30, 2014. The directed fishery for sardines has been closed since June 30, 2015.

| Species          | 2010  | 2011 | 2012    | 2013  | 2014<br>Interim<br>Fishery | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|------------------|-------|------|---------|-------|----------------------------|-----------|-----------|-----------|-----------|
| Pacific mackerel | 39.2  | 5.2  | 1,585.8 | 435.6 | 0                          | 1,008.1   | -         | -         | -         |
| Jack mackerel    | <0.01 | 0    | 70.9    | 60.1  | 0                          | 245.0     | -         | -         | -         |
| Pacific herring  | 0     | 0    | 0.35    | 0     | 0                          | 0         | -         | -         | -         |
| Northern anchovy | 1.2   | 21.2 | 0       | 12.5  | 0                          | 0         | -         | -         | -         |
| American shad    | 0     | 0    | 0.005   | 0.02  | 0                          | 0.001     | -         | -         | -         |
| Sablefish        | 0     | 0    | 0       | 0.01  | 0                          | 0         | -         | -         | -         |

Table 4-11. Species noted as encountered on CDFW Live Bait Logs, 2007-2017, in units of day-encounters.

| Year | Days Fished | Jack Mackerel | Pacific Mackerel | Barracuda | Herring | Grunion | Smelts (Atherinids) | Shiner Surfperch | White Croaker | Queenfish | Market Squid | Pacific Bonito |
|------|-------------|---------------|------------------|-----------|---------|---------|---------------------|------------------|---------------|-----------|--------------|----------------|
| 2017 | 586         | 1             | 35               |           |         |         | 1                   |                  |               |           | 3            |                |
| 2016 | 630         | 10            | 48               |           |         |         |                     |                  |               |           | 1            |                |
| 2015 | 833         | 20            | 99               |           |         |         | 4                   |                  |               |           | 3            | 6              |
| 2014 | 794         | 15            | 98               |           |         | 1       | 4                   |                  |               |           | 1            | 1              |
| 2013 | 752         | 2             | 43               |           |         |         | 1                   |                  |               |           | 47           |                |
| 2012 | 762         | 1             | 27               | 7         |         |         |                     |                  |               |           | 41           |                |
| 2011 | 896         | 4             | 34               | 2         |         |         | 1                   |                  |               |           | 31           |                |
| 2010 | 673         | 1             | 69               |           |         |         |                     |                  |               |           | 9            | 1              |
| 2009 | 965         | 2             | 77               | 6         |         |         |                     |                  |               | 1         |              |                |
| 2008 | 957         |               | 92               | 9         |         |         |                     |                  |               |           | 2            | 6              |
| 2007 | 954         | 2             | 88               | 27        |         |         |                     |                  |               |           | 6            | 12             |

TABLE 4-12. Estimates of Pacific sardine and Northern anchovy live bait harvest in California, 2007 - 2017. Data from CDFW live bait logs. Values are in metric tons with the assumption that 1 scoop =12.5 lbs. Beginning in 2016, revised log forms include reported estimated catch in lbs.

| Year | Anchovy | Sardine |
|------|---------|---------|
| 2007 | 708     | 3,395   |
| 2008 | 723     | 2,989   |
| 2009 | 833     | 2,820   |
| 2010 | 704     | 2,249   |
| 2011 | 1,045   | 2,057   |
| 2012 | 350     | 2,497   |
| 2013 | 745     | 1,849   |
| 2014 | 1,142   | 1,562   |
| 2015 | 723     | 1,996   |
| 2016 | 266     | 1,208   |
| 2017 | 155     | 1465    |

Table 4-13. Ratio of anchovy to sardine in reported live bait catch in California, 2007-2017. Values are in metric tons with the assumption that 1 scoop =12.5 lbs. Beginning in 2016, revised log forms include reported estimated catch in lbs.

| Year | Anchovy | Sardine | Total | Proportion Anchovy | Proportion Sardine |
|------|---------|---------|-------|--------------------|--------------------|
| 2017 | 155     | 1,465   | 1,620 | 0.10               | 0.90               |
| 2016 | 266     | 1,208   | 1,475 | 0.18               | 0.82               |
| 2015 | 723     | 1,996   | 2,719 | 0.27               | 0.73               |
| 2014 | 1,157   | 1,567   | 2,742 | 0.42               | 0.58               |
| 2013 | 739     | 1,847   | 2,586 | 0.29               | 0.71               |
| 2012 | 356     | 2,594   | 2,950 | 0.12               | 0.88               |
| 2011 | 1,053   | 2,073   | 3,126 | 0.34               | 0.66               |
| 2010 | 504     | 1,860   | 2,364 | 0.21               | 0.79               |
| 2009 | 774     | 2,702   | 3,476 | 0.22               | 0.78               |
| 2008 | 719     | 2,968   | 3,687 | 0.20               | 0.80               |
| 2007 | 699     | 3,352   | 4,051 | 0.17               | 0.83               |

TABLE 4-14. Directed Sardine Fishery Incidental Catch (metric tons) from fish tickets in Washington.

|                        | 2007 | 2008  | 2009 | 2010 | 2011 | 2012  | 2013 | 2014<br>Interim | 2014-<br>2015 | 2015-<br>2016     | 2016-<br>2017     | 2017-<br>2018     |
|------------------------|------|-------|------|------|------|-------|------|-----------------|---------------|-------------------|-------------------|-------------------|
| Arrowtooth<br>Flounder |      |       |      |      |      |       | 0.02 |                 |               | Fishery<br>closed | Fishery<br>closed | Fishery<br>closed |
| American<br>Shad       |      | <0.01 |      |      |      | 0.01  | 0.02 |                 |               |                   |                   |                   |
| Chinook                |      |       |      |      |      | 0.03  | 0.12 |                 | <0.01         |                   |                   |                   |
| Chum                   |      |       |      |      |      | <0.01 |      |                 |               |                   |                   |                   |
| Coho                   |      |       |      |      |      | 0.29  | 0.08 |                 |               |                   |                   |                   |

|                  |       |       |      |      |      |        |        |  |      |  |  |  |
|------------------|-------|-------|------|------|------|--------|--------|--|------|--|--|--|
|                  |       |       |      |      |      |        |        |  | 0.01 |  |  |  |
| Mackerel         | 35.73 | 6.32  | 4.45 | 2.09 | 0.43 | 636.17 | 195.95 |  |      |  |  |  |
| Misc             |       |       | 2.34 |      |      |        | 0.01   |  |      |  |  |  |
| Northern Anchovy |       |       |      | 5.44 |      |        |        |  |      |  |  |  |
| Pacific Herring  |       | 4.69  |      |      |      | <0.01  | <0.01  |  |      |  |  |  |
| Pink Salmon      |       |       |      |      |      | <0.01  | <0.01  |  |      |  |  |  |
| General Shark    |       |       | 0.01 |      |      |        |        |  |      |  |  |  |
| Sole Rex         |       |       |      |      |      |        | <0.01  |  |      |  |  |  |
| Spiny Dogfish    |       | <0.01 |      |      |      | <0.01  | <0.01  |  |      |  |  |  |
| Starry Flounder  |       |       |      |      |      |        |        |  |      |  |  |  |

Table 6.1. West coast landings (mt) and real<sup>1</sup> exvessel revenues (2017 \$) for Pacific sardine, Pacific mackerel<sup>2</sup>, jack mackerel, anchovy and market squid, 2008-2017<sup>3</sup>.

| Year | Pacific<br>Sardine mt | Pacific<br>Sardine Rev | Pacific<br>Mackerel mt | Pacific<br>Mackerel Rev | Jack<br>Mackerel mt | Jack<br>Mackerel Rev | Anchovy<br>mt | Anchovy<br>Rev | Squid<br>mt | Squid<br>Rev   |
|------|-----------------------|------------------------|------------------------|-------------------------|---------------------|----------------------|---------------|----------------|-------------|----------------|
| 2008 | 87,190                | \$16,691,633           | 3,597                  | \$797,988               | 322                 | \$61,395             | 14,654        | \$1,897,261    | 38,101      | \$30,291,099   |
| 2009 | 67,084                | \$14,202,144           | 5,138                  | \$1,253,971             | 121                 | \$21,855             | 3,480 *       | \$575,304 *    | 93,107      | \$64,622,825   |
| 2010 | 66,892                | \$13,816,975           | 2,107 *                | \$465,993 *             | 314 *               | \$70,372 *           | 1,284         | \$631,897      | 130,864     | \$79,924,954   |
| 2011 | 46,746                | \$10,709,240           | 1,364 *                | \$359,745 *             | 104                 | \$20,604             | 2,792 *       | \$754,480 *    | 121,557     | \$73,236,574   |
| 2012 | 101,555               | \$22,859,803           | 6,070                  | \$1,343,477             | 271                 | \$42,107             | 2,705         | \$491,463      | 97,734      | \$69,113,387   |
| 2013 | 63,895                | \$15,729,326           | 8,704 *                | \$1,744,235 *           | 1,095               | \$222,155            | 6,049 *       | \$1,163,192 *  | 104,405     | \$78,221,680   |
| 2014 | 23,344                | \$9,230,393            | 7,157                  | \$1,786,050             | 1,837               | \$370,965            | 10,625        | \$1,747,626    | 104,093 *   | \$75,906,562 * |
| 2015 | 3,864                 | \$1,203,905            | 5,731                  | \$1,266,064             | 1,538               | \$258,598            | 17,398 *      | \$2,146,507 *  | 36,807      | \$25,204,637   |
| 2016 | 522                   | \$107,311              | 1,830                  | \$492,514               | 374                 | \$63,556             | 13,959        | \$2,441,611    | 38,350      | \$41,005,612   |
| 2017 | 433                   | \$61,465               | 2,299                  | \$658,803               | 468                 | \$52,054             | 5,613         | \$857,229      | 62,364      | \$68,634,882   |

Source: PacFIN. Extraction dates: 2008-11, 10/22/2013; 2012, 3/2/2015; 2013-14, 10/20/2017; 2015-17, 9/17/2018.

\* Denotes that the reported figure in this cell is underreported due to confidentiality guidance.

<sup>1</sup> Revenue is reported in real dollars to account for inflation using the GDP implicit price deflator with a 2017 base year.

<sup>2</sup> Pacific mackerel landings and revenues also include landings and revenues of unspecified mackerel.

<sup>3</sup> 2017 data are 90% complete at time of data extraction.

Table 6.2. West coast landings (mt) and real<sup>1</sup> exvessel revenues (2017 \$) for Pacific sardine, Pacific mackerel<sup>2</sup>, jack mackerel, anchovy and market squid by fishery sector, 2008-2017<sup>3,4</sup>.

| Year                       | Landings (mt) |             |             |         |         | Exvessel Revenues (2017 \$) |             |             |             |              |
|----------------------------|---------------|-------------|-------------|---------|---------|-----------------------------|-------------|-------------|-------------|--------------|
|                            | Sardine       | P. Mackerel | J. Mackerel | Anchovy | Squid   | Sardine                     | P. Mackerel | J. Mackerel | Anchovy     | Squid        |
| <b>Southern California</b> |               |             |             |         |         |                             |             |             |             |              |
| 2008                       | 31,094        | 3,324       | 214         | 2,069   | 38,035  | \$3,978,923                 | \$747,699   | \$48,508    | \$296,559   | \$30,239,644 |
| 2009                       | 12,565        | 5,066       | 119         | 1,690   | 91,924  | \$2,031,231                 | \$1,244,327 | \$21,855    | \$298,342   | \$63,587,948 |
| 2010                       | 29,353        | 2,056       | 310         | 308     | 110,719 | \$4,260,788                 | \$462,060   | \$70,359    | \$151,689   | \$67,509,020 |
| 2011                       | 17,642        | 1,343       | 80          | 779     | 107,070 | \$2,644,308                 | \$357,739   | \$11,315    | \$361,248   | \$64,492,378 |
| 2012                       | 18,803        | 3,499       | 145         | 214     | 80,871  | \$3,565,988                 | \$956,575   | \$30,452    | \$76,833    | \$57,071,319 |
| 2013                       | 6,250         | 8,072       | 892         | 384     | 83,441  | \$1,421,414                 | \$1,613,278 | \$189,485   | \$243,557   | \$62,292,332 |
| 2014                       | 1,537         | 5,195       | 704         | 133     | 49,848  | \$347,737                   | \$1,206,882 | \$140,098   | \$105,950   | \$35,449,510 |
| 2015                       | 966           | 5,140       | 387         | 106     | 16,995  | \$213,042                   | \$1,154,364 | \$75,363    | \$77,855    | \$11,509,563 |
| 2016                       | 186           | 1,798       | 204         | 4,546   | 24,601  | \$32,086                    | \$480,900   | \$49,408    | \$561,379   | \$27,269,179 |
| 2017                       | 262           | 2,248       | 110         | 242     | 53,782  | \$32,701                    | \$653,990   | \$29,595    | \$103,702   | \$59,214,794 |
| <b>Northern California</b> |               |             |             |         |         |                             |             |             |             |              |
| 2008                       | 26,712        | 207         | 59          | 12,216  | 66      | \$4,694,507                 | \$38,678    | \$12,413    | \$1,495,422 | \$51,454     |
| 2009                       | 25,012        | 14          | 0           | 978     | 1,183   | \$4,267,659                 | \$2,577     | \$0         | \$122,545   | \$1,034,878  |
| 2010                       | 4,305         | Conf        | Conf        | 718     | 20,137  | \$643,091                   | Conf        | Conf        | \$367,959   | \$12,415,934 |
| 2011                       | 10,072        | 15          | 0           | 1,822   | 14,487  | \$2,194,731                 | \$1,597     | \$0         | \$318,277   | \$8,744,195  |
| 2012                       | 4,241         | 100         | 0           | 2,274   | 16,862  | \$1,020,436                 | \$29,955    | \$0         | \$325,567   | \$12,042,069 |
| 2013                       | 896           | Conf        | 0           | 5,549   | 20,964  | \$188,134                   | Conf        | \$0         | \$869,309   | \$15,929,348 |
| 2014                       | 6,234         | 243         | 89          | 10,379  | 54,246  | \$1,739,225                 | \$79,203    | \$16,609    | \$1,582,283 | \$40,457,051 |
| 2015                       | 736           | 545         | 897         | 17,149  | 19,812  | \$140,321                   | \$98,905    | \$146,462   | \$1,984,435 | \$13,695,074 |
| 2016                       | 246           | 3           | 3           | 3,822   | 12,489  | \$65,389                    | \$7,088     | \$5,117     | \$549,126   | \$12,593,881 |
| 2017                       | 170           | 2           | 4           | 5,208   | 8,582   | \$28,752                    | \$4,232     | \$11,988    | \$677,083   | \$9,420,088  |

Table 6.2 continues next page.

Table 6.2. (Continued). West coast landings (mt) and real<sup>1</sup> exvessel revenues (2017 \$) for Pacific sardine, Pacific mackerel<sup>2</sup>, jack mackerel, anchovy and market squid by fishery sector, 2008-2017<sup>3,4</sup>.

| Year                     | Landings (mt) |             |             |         |       | Exvessel Revenues (2017 \$) |             |             |             |             |
|--------------------------|---------------|-------------|-------------|---------|-------|-----------------------------|-------------|-------------|-------------|-------------|
|                          | Sardine       | P. Mackerel | J. Mackerel | Anchovy | Squid | Sardine                     | P. Mackerel | J. Mackerel | Anchovy     | Squid       |
| <b>Pacific Northwest</b> |               |             |             |         |       |                             |             |             |             |             |
| 2008                     | 29,384        | 67          | 48          | 369     | <1    | \$8,018,202                 | \$11,611    | \$475       | \$105,280   | <\$1        |
| 2009                     | 29,507        | 58          | 2           | 812 *   | <1    | \$7,903,253                 | \$7,067     | \$0         | 154417 *    | \$0         |
| 2010                     | 33,233        | 51          | 4           | 258     | 8     | \$8,913,097                 | \$3,933     | \$13        | \$112,249   | \$0         |
| 2011                     | 19,032        | 7 *         | 24          | 191 *   | <1    | \$5,870,201                 | 409 *       | \$9,289     | 74954 *     | \$1         |
| 2012                     | 78,511        | 2,471       | 126         | 217     | <1    | \$18,273,378                | \$356,947   | \$11,655    | \$89,063    | \$0         |
| 2013                     | 56,750        | 632         | 203         | 116 *   | <1    | \$14,119,778                | \$130,956   | \$32,670    | 50326 *     | \$0         |
| 2014                     | 15,573        | 1,718       | 1,043       | 112     | Conf  | \$7,143,432                 | \$499,965   | \$214,259   | \$59,393    | Conf        |
| 2015                     | 2,162         | 46          | 253         | 144 *   | 0     | \$850,542                   | \$12,794    | \$36,773    | 84217 *     | \$0         |
| 2016                     | 89            | 30          | 167         | 5,590   | 1,260 | \$9,837                     | \$4,526     | \$9,031     | \$1,331,106 | \$1,142,552 |
| 2017                     | <1            | 50          | 355         | 164     | <1    | \$12                        | \$580       | \$10,471    | \$76,445    | \$0         |

Source: PacFIN. Extraction dates: 2008-11, 10/22/2013; 2012, 3/2/2015; 2013-14, 10/20/2017; 2015-17, 9/17/2018.

"Conf" denotes that the cell figures are not reported due to 2 or fewer vessels.

\* Denotes that the reported figure in this cell is underreported due to confidentiality guidance.

"0" indicates no landings/revenues were reported.

"<1" indicates that non-zero and less than 1 metric ton of landings and/or \$1 of revenues were reported.

<sup>1</sup>Revenue is reported in real dollars to account for inflation using the GDP implicit price deflator with a 2017 base year.

<sup>2</sup> Pacific mackerel landings and revenues also include landings and revenues of unspecified mackerel.

<sup>3</sup> 2017 data are 90% complete at time of data extraction.

<sup>4</sup> Previous versions included reporting for an Other sector; landings and revenues are now fully assigned.

Table 6.3. Average annual real<sup>1</sup> exvessel prices (2017 \$) for Pacific sardine, Pacific mackerel<sup>2</sup>, jack mackerel, anchovy and market squid, 2008-2017<sup>3</sup>.

| <b>Year</b> | <b>Pacific<br/>Sardine<br/>\$/lb</b> | <b>Pacific<br/>Mackerel<br/>\$/lb</b> | <b>Jack<br/>Mackerel<br/>\$/lb</b> | <b>Anchovy<br/>\$/lb</b> | <b>Squid<br/>\$/lb</b> |
|-------------|--------------------------------------|---------------------------------------|------------------------------------|--------------------------|------------------------|
| 2008        | \$0.09                               | \$0.10                                | \$0.09                             | \$0.06                   | \$0.36                 |
| 2009        | \$0.10                               | \$0.11                                | \$0.08                             | \$0.07 *                 | \$0.31                 |
| 2010        | \$0.09                               | \$0.10 *                              | \$0.10 *                           | \$0.22                   | \$0.28                 |
| 2011        | \$0.10                               | \$0.12 *                              | \$0.09                             | \$0.12 *                 | \$0.27                 |
| 2012        | \$0.10                               | \$0.10                                | \$0.07                             | \$0.08                   | \$0.32                 |
| 2013        | \$0.11                               | \$0.09 *                              | \$0.09                             | \$0.09 *                 | \$0.34                 |
| 2014        | \$0.18                               | \$0.11                                | \$0.09                             | \$0.07                   | \$0.33 *               |
| 2015        | \$0.14                               | \$0.10                                | \$0.08                             | \$0.06 *                 | \$0.31                 |
| 2016        | \$0.09                               | \$0.12                                | \$0.08                             | \$0.08                   | \$0.49                 |
| 2017        | \$0.06                               | \$0.13                                | \$0.05                             | \$0.07                   | \$0.50                 |

Source: PacFIN. Extraction dates: 2008-11, 10/22/2013; 2012, 3/2/2015; 2013-14, 10/20/2017; 2015-17, 9/17/2018.

\* Denotes that the reported figure in this cell is underreported due to confidentiality guidance.

<sup>1</sup> Revenue is reported in real dollars to account for inflation using the GDP implicit price deflator with a 2017 base year.

<sup>2</sup> Pacific mackerel landings and revenues also include landings and revenues of unspecified mackerel.

<sup>3</sup> 2017 data are 90% complete at time of data extraction.



Table 6.4. West coast landings (mt) and real<sup>1</sup> exvessel revenues (2017 \$) for Pacific sardine, Pacific mackerel<sup>2</sup>, jack mackerel, anchovy and market squid by state, 2008-2017<sup>3</sup>.

| Year              | Pacific<br>Sardine mt | Pacific<br>Sardine<br>Rev | Pacific<br>Mackerel<br>mt | Pacific<br>Mackerel<br>Rev | Jack<br>Mackerel<br>mt | Jack<br>Mackerel<br>Rev | Anchovy<br>mt | Anchovy<br>Rev | Squid<br>mt | Squid<br>Rev |
|-------------------|-----------------------|---------------------------|---------------------------|----------------------------|------------------------|-------------------------|---------------|----------------|-------------|--------------|
| <b>California</b> |                       |                           |                           |                            |                        |                         |               |                |             |              |
| 2008              | 57,806                | \$8,673,430               | 3,531                     | \$786,377                  | 274                    | \$60,921                | 14,285        | \$1,791,981    | 38,101      | \$30,291,099 |
| 2009              | 37,577                | \$6,298,890               | 5,080                     | \$1,246,904                | 119                    | \$21,855                | 2,668         | \$420,887      | 93,107      | \$64,622,825 |
| 2010              | 33,659                | \$4,903,878               | 2,056 *                   | \$462,060 *                | 310 *                  | \$70,359 *              | 1,026         | \$519,649      | 130,857     | \$79,924,954 |
| 2011              | 27,714                | \$4,839,039               | 1,357                     | \$359,336                  | 80                     | \$11,315                | 2,601         | \$679,525      | 121,557     | \$73,236,573 |
| 2012              | 23,044                | \$4,586,425               | 3,599                     | \$986,530                  | 145                    | \$30,452                | 2,488         | \$402,400      | 97,733      | \$69,113,387 |
| 2013              | 7,146                 | \$1,609,548               | 8,072 *                   | \$1,613,278 *              | 892                    | \$189,485               | 5,933         | \$1,112,866    | 104,405     | \$78,221,680 |
| 2014              | 7,771                 | \$2,086,961               | 5,439                     | \$1,286,085                | 794                    | \$156,707               | 10,512        | \$1,688,233    | 104,093     | \$75,906,562 |
| 2015              | 1,701                 | \$353,363                 | 5,685                     | \$1,253,269                | 1,284                  | \$221,825               | 17,255        | \$2,062,290    | 36,807      | \$25,204,637 |
| 2016              | 433                   | \$97,475                  | 1,801                     | \$487,988                  | 207                    | \$54,525                | 8,368         | \$1,110,505    | 37,090      | \$39,863,060 |
| 2017              | 432                   | \$61,453                  | 2,249                     | \$658,223                  | 114                    | \$41,583                | 5,450         | \$780,785      | 62,364      | \$68,634,882 |
| <b>Oregon</b>     |                       |                           |                           |                            |                        |                         |               |                |             |              |
| 2008              | 22,949                | \$6,486,283               | 58                        | \$8,942                    | 46                     | \$475                   | 260           | \$64,887       | <1          | <\$1         |
| 2009              | 21,481                | \$6,011,461               | 53                        | \$5,415                    | 2                      | \$0                     | Conf          | Conf           | <1          | \$0          |
| 2010              | 20,852                | \$5,899,225               | 49                        | \$3,226                    | 3                      | \$0                     | 138           | \$32,425       | 8           | \$0          |
| 2011              | 11,023                | \$3,511,340               | 7                         | \$409                      | 14                     | \$3,122                 | Conf          | Conf           | <1          | \$1          |
| 2012              | 42,619                | \$9,690,311               | 1,779                     | \$184,783                  | 95                     | \$5,810                 | 0             | \$0            | <1          | \$0          |
| 2013              | 26,289                | \$6,682,727               | 439                       | \$84,690                   | 123                    | \$13,110                | Conf          | Conf           | <1          | \$0          |
| 2014              | 7,789                 | \$3,666,738               | 1,172                     | \$337,988                  | 800                    | \$152,611               | 0             | \$0            | Conf        | Conf         |
| 2015              | 2,131                 | \$837,025                 | 45                        | \$12,562                   | 117                    | \$4,826                 | Conf          | Conf           | 0           | \$0          |
| 2016              | 4                     | \$263                     | 8                         | \$1,520                    | 116                    | \$2,049                 | 5,313         | \$1,174,677    | 1,260       | \$1,142,552  |
| 2017              | <1                    | \$8                       | 45                        | \$390                      | 303                    | \$7,801                 | <1            | \$0            | <1          | \$0          |

Table 6.4 continues next page.

Table 6.4 (continued). West coast landings (mt) and real<sup>1</sup> exvessel revenues (2017 \$) for Pacific sardine, Pacific mackerel<sup>2</sup>, jack mackerel, anchovy and market squid by state, 2008-2017<sup>3</sup>.

|             | <b>Pacific</b>    | <b>Pacific</b> | <b>Pacific</b>  | <b>Pacific</b>  | <b>Jack</b>     | <b>Jack</b>     | <b>Anchovy</b> | <b>Anchovy</b> | <b>Squid</b> | <b>Squid</b> |
|-------------|-------------------|----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|--------------|--------------|
| <b>Year</b> | <b>Sardine</b>    | <b>Sardine</b> | <b>Mackerel</b> | <b>Mackerel</b> | <b>Mackerel</b> | <b>Mackerel</b> | <b>mt</b>      | <b>Rev</b>     | <b>mt</b>    | <b>Rev</b>   |
|             | <b>Washington</b> |                |                 |                 |                 |                 |                |                |              |              |
| 2008        | 6,435             | \$1,531,920    | 9               | \$2,669         | 3               | \$0             | 109            | \$40,393       | 0            | \$0          |
| 2009        | 8,026             | \$1,891,792    | 4               | \$1,651         | <1              | \$0             | 812            | \$154,417      | 0            | \$0          |
| 2010        | 12,381            | \$3,013,872    | 2               | \$707           | 1               | \$13            | 120            | \$79,823       | 0            | \$0          |
| 2011        | 8,009             | \$2,358,861    | Conf            | Conf            | 10              | \$6,167         | 191            | \$74,954       | 0            | \$0          |
| 2012        | 35,892            | \$8,583,067    | 692             | \$172,164       | 31              | \$5,844         | 217            | \$89,063       | 0            | \$0          |
| 2013        | 30,461            | \$7,437,050    | 193             | \$46,266        | 80              | \$19,560        | 116            | \$50,326       | 0            | \$0          |
| 2014        | 7,784             | \$3,476,694    | 545             | \$161,977       | 243             | \$61,648        | 112            | \$59,393       | 0            | \$0          |
| 2015        | 31                | \$13,518       | 1               | \$233           | 136             | \$31,947        | 144            | \$84,217       | 0            | \$0          |
| 2016        | 85                | \$9,574        | 22              | \$3,006         | 51              | \$6,982         | 277            | \$156,430      | 0            | \$0          |
| 2017        | <1                | \$3            | 4               | \$190           | 52              | \$2,670         | 164            | \$76,444       | 0            | \$0          |

Source: PacFIN. Extraction dates: 2008-11, 10/22/2013; 2012, 3/2/2015; 2013-14, 10/20/2017; 2015-17, 9/17/2018.

"Conf" denotes that the cell figures are not reported due to 2 or fewer vessels.

\* Denotes that the reported figure in this cell is underreported due to confidentiality guidance.

"0" indicates no landings/revenues were reported.

"<1" indicates that non-zero and less than 1 metric ton of landings and/or \$1 of revenues were reported.

<sup>1</sup> Revenue is reported in real dollars to account for inflation using the GDP implicit price deflator with a 2017 base year.

<sup>2</sup> Pacific mackerel landings and revenues also include landings and revenues of unspecified mackerel.

<sup>3</sup> 2017 data are 90% complete at time of data extraction.

Table 6.5. West coast CPS landings and real<sup>1</sup> exvessel revenues (2017 \$) by gear group<sup>2</sup>, 2008-2017<sup>3</sup>.

| Year                          | Roundhaul<br>or Lampara | Dip Net     | Pot or<br>Trap | Trawl      | Hook and<br>Line | Gillnet |
|-------------------------------|-------------------------|-------------|----------------|------------|------------------|---------|
| <b>Landings (metric tons)</b> |                         |             |                |            |                  |         |
| 2008                          | 143,364                 | 444         | Conf           | 51         | 3                | <1      |
| 2009                          | 167,133 *               | 1,831       | Conf           | 2          | 3                | <1      |
| 2010                          | 198,085                 | 3,304       | Conf           | 12         | 2 *              | 2       |
| 2011                          | 168,258 *               | 4,301       | 0              | 25 *       | <1               | Conf    |
| 2012                          | 202,889                 | 5,318       | <1             | 47         | 7                | <1      |
| 2013                          | 180,745 *               | 3,223       | 43             | 126 *      | 22               | <1      |
| 2014                          | 146,339 *               | 303         | <1             | 316 *      | 56               | Conf    |
| 2015                          | 65,329 *                | 70          | <1             | 257        | 5                | Conf    |
| 2016                          | 54,122                  | 671         | <1             | 173        | 65               | <1      |
| 2017                          | 69,798                  | 943         | 1              | 407        | 15               | <1      |
| <b>Revenues (2017 \$)</b>     |                         |             |                |            |                  |         |
| 2008                          | \$49,382,896            | \$339,061   | Conf           | \$1,934    | \$12,248         | \$44    |
| 2009                          | \$79,472,744 *          | \$1,188,458 | Conf           | \$536      | \$20,785         | \$208   |
| 2010                          | \$92,841,996            | \$2,017,209 | Conf           | \$1,090    | \$13,275 *       | \$1,176 |
| 2011                          | \$82,113,612 *          | \$2,961,140 | \$0            | \$9,970 *  | \$34             | Conf    |
| 2012                          | \$89,824,294            | \$3,941,373 | \$260          | \$6,397    | \$20,825         | \$3,712 |
| 2013                          | \$94,579,330 *          | \$2,430,205 | \$32,317       | \$20,325 * | \$18,549         | \$409   |
| 2014                          | \$88,685,902 *          | \$231,646   | \$688          | \$43,939 * | \$42,392         | Conf    |
| 2015                          | \$30,014,641 *          | \$63,309    | \$1,019        | \$38,036   | \$5,263          | Conf    |
| 2016                          | \$43,285,752            | \$744,845   | \$114          | \$12,559   | \$55,623         | \$310   |
| 2017                          | \$69,167,512            | \$1,021,033 | \$2,456        | \$14,840   | \$28,554         | \$1,683 |

Source: PacFIN. Extraction dates: 2008-11, 10/22/2013; 2012, 3/2/2015; 2013-14, 10/20/2017; 2015-17, 9/17/2018.

"Conf" denotes that the cell figures are not reported due to 2 or fewer vessels.

\* Denotes that the reported figure in this cell is underreported due to confidentiality guidance.

"0" indicates no landings/revenues were reported.

"<1" indicates that non-zero and less than 1 metric ton of landings and/or \$1 of revenues were reported.

<sup>1</sup> Revenue is reported in real dollars to account for inflation using the GDP implicit price deflator with a 2017 base year.

<sup>2</sup> A column for other or unknown gears is not included.

<sup>3</sup> 2017 data are 90% complete at time of data extraction.

TABLE 8-1. Commercial landings (metric tons) of CPS in Ensenada, Baja California, Mexico since 2008<sup>1/2</sup>. Sardine landings include both southern and northern subpopulations.

| Year | Pacific sardine | Northern anchovy | Pacific mackerel | Jack mackerel | Market squid |
|------|-----------------|------------------|------------------|---------------|--------------|
| 2008 | 66,866          | 991              | 180              | 0             | 5,378        |
| 2009 | 55,911          | 2,444            | 8                | 0             | 3,685        |
| 2010 | 56,821          | 3,139            | 85               | 0             | 10,991       |
| 2011 | 70,336          | 1,760            | 2,601            | 0             | 15,091       |
| 2012 | 59,069          | 1,809            | 186              | 0             | 4,802        |
| 2013 | 51,413          | 2,428            | 327              | 0             | 16,707       |
| 2014 | 90,396          | 539              | 975              | 0             | 2,978        |
| 2015 | 37,468          | 26,143           | 1,418            | 0             | 63           |
| 2016 | 66,069          | 5,008            | 9,880            | 0             | 294          |
| 2017 | 130,463         | 15,725           | 902              | 0             | 55           |

1/ Data for 2005-2014 from CONAPESCA

([http://www.conapesca.sagarpa.gob.mx/wb/cona/cona\\_anuario\\_estadistico\\_de\\_pesca](http://www.conapesca.sagarpa.gob.mx/wb/cona/cona_anuario_estadistico_de_pesca)).

2/ Landings for 2015 and 2016 from Concepcion Enciso-Enciso (pers. comm.)

TABLE 8-2. Pacific sardine northern subpopulation biomass-at-age and summary biomass since 2008 (Hill et al. 2018).

| Model<br>year<br>(July-1) | POPULATION BIOMASS-AT-AGE (metric tons) |         |         |         |         |         |        |        |        |           | SUMMARY<br>BIOMASS |  |
|---------------------------|---|---------|---------|---------|---------|---------|--------|--------|--------|-----------|--------------------|--|
|                           | 0                                       | 1       | 2       | 3       | 4       | 5       | 6      | 7      | 8+     | Ages 0+   | Ages 1+            |  |
| 2008                      | 25,428                                  | 166,867 | 148,263 | 345,660 | 237,398 | 181,671 | 11,973 | 2,597  | 3,307  | 1,123,165 | 1,097,736          |  |
| 2009                      | 48,678                                  | 81,411  | 125,221 | 95,495  | 214,409 | 133,375 | 96,305 | 6,190  | 2,966  | 804,049   | 755,371            |  |
| 2010                      | 54,360                                  | 155,308 | 61,344  | 82,235  | 58,661  | 116,802 | 67,856 | 47,737 | 4,398  | 648,703   | 594,343            |  |
| 2011                      | 4,283                                   | 179,048 | 124,429 | 41,047  | 49,535  | 29,729  | 54,644 | 30,795 | 23,000 | 536,509   | 532,226            |  |
| 2012                      | 1,000                                   | 14,010  | 139,616 | 80,221  | 24,078  | 23,892  | 13,155 | 23,445 | 22,457 | 341,875   | 340,875            |  |
| 2013                      | 1,322                                   | 3,123   | 10,361  | 92,177  | 38,667  | 7,132   | 5,778  | 3,050  | 10,346 | 171,955   | 170,633            |  |
| 2014                      | 7,186                                   | 4,051   | 2,218   | 6,750   | 47,369  | 13,673  | 2,134  | 1,668  | 3,785  | 88,834    | 81,648             |  |
| 2015                      | 3,024                                   | 24,193  | 3,316   | 1,438   | 3,999   | 23,067  | 6,153  | 930    | 2,308  | 68,429    | 65,405             |  |
| 2016                      | 3,523                                   | 10,345  | 21,518  | 2,467   | 964     | 2,508   | 13,852 | 3,593  | 1,818  | 60,590    | 57,067             |  |
| 2017                      | 8,856                                   | 9,776   | 6,122   | 13,662  | 1,524   | 576     | 1,394  | 7,589  | 2,841  | 52,339    | 43,483             |  |
| 2018                      | 5,165                                   | 25,697  | 6,266   | 3,959   | 8,564   | 919     | 326    | 776    | 5,558  | 57,230    | 52,065             |  |

TABLE 8-3. U.S. Pacific sardine landings (PacFIN) and harvest guidelines (HG) in metric tons since 2008 under the federal CPS-FMP. Landings include both the southern and northern subpopulations. The fishery year was January 1 – December 31, until 2014 when it was changed to a July 1 – June 30 fishing year.

| Management year |        |        |        |            | HARVEST LIMITS |         |         |
|-----------------|--------|--------|--------|------------|----------------|---------|---------|
|                 | CA     | OR     | WA     | U.S. Total | OFL            | ABC     | HG/ACL  |
| 2008            | 57,805 | 22,949 | 6,435  | 87,189     | n/a            | n/a     | 89,093  |
| 2009            | 37,577 | 21,482 | 8,026  | 67,085     | n/a            | n/a     | 66,932  |
| 2010            | 33,658 | 20,853 | 12,392 | 66,903     | n/a            | n/a     | 72,039  |
| 2011            | 27,715 | 11,023 | 8,009  | 46,747     | 92,767         | 84,681  | 50,526  |
| 2012            | 23,044 | 42,666 | 35,739 | 101,448    | 154,781        | 141,289 | 109,409 |
| 2013            | 7,146  | 26,288 | 30,461 | 63,895     | 103,284        | 94,281  | 66,495  |
| 2014 (Jan-Jun)  | 5,647  | 0      | 908    | 6,555      | 59,214         | 54,052  | 6,966   |
| 2014-15         | 3,754  | 9,920  | 6,907  | 20,581     | 39,210         | 35,792  | 23,293  |
| 2015-16         | 164    | 1      | 0      | 165        | 13,227         | 12,074  | 7,000   |
| 2016-17         | 514    | 3      | 85     | 602        | 23,085         | 19,236  | 8,000   |
| 2017-18         | 275    | 3      | 0      | 279        | 16,957         | 15,479  | 8,000   |
| 2018-19         | ---    | ---    | ---    | ---        | 11,324         | 9,436   | 7,000   |

TABLE 8-4. West Coast Pacific sardine landings (metric tons) by country. Landings include both the southern and northern subpopulations, since 2008.

| Year | Ensenada | United  | B.C.   | Total   |
|------|----------|---------|--------|---------|
|      | México   | States  | Canada |         |
| 2008 | 66,866   | 87,186  | 10,425 | 164,477 |
| 2009 | 55,911   | 67,083  | 15,334 | 138,328 |
| 2010 | 56,821   | 66,892  | 22,223 | 145,936 |
| 2011 | 70,336   | 46,746  | 20,719 | 137,802 |
| 2012 | 59,069   | 101,148 | 19,172 | 179,389 |
| 2013 | 51,413   | 63,892  | 0      | 115,304 |
| 2014 | 90,396   | 22,744  | 0      | 113,140 |
| 2015 | 37,468   | 3,833   | 0      | 41,301  |
| 2016 | 66,069   | 522     | 0      | 66,591  |
| 2017 | 130,463  | 433     | 0      | 130,896 |

TABLE 8-5. RecFIN estimated recreational harvest of Pacific (chub) mackerel by state (type ‘A+B1’ estimate in metric tons), 2008-2017.

| Calendar year | CA     | OR   | WA | Total  |
|---------------|--------|------|----|--------|
| 2008          | 312.40 | 0.01 | 0  | 312.41 |
| 2009          | 237.41 | 0.04 | 0  | 237.45 |
| 2010          | 233.56 | 0.00 | 0  | 233.56 |
| 2011          | 163.81 | 0.00 | 0  | 163.81 |

|      |        |      |   |        |
|------|--------|------|---|--------|
| 2012 | 138.11 | 0.21 | 0 | 138.32 |
| 2013 | 108.49 | 0.27 | 0 | 108.76 |
| 2014 | 170.92 | 0.14 | 0 | 171.05 |
| 2015 | 302.65 | 0.59 | 0 | 303.24 |
| 2016 | 175.92 | 0.10 | 0 | 176.02 |
| 2017 | 93.85  | 0.03 | 0 | 93.89  |

TABLE 8-6. RecFIN estimated recreational harvest of Pacific (chub) mackerel by fishing mode (type 'A+B1' estimate in metric tons), 2008-2017.

| Calendar year | Shore Modes | Party/ Charter | Private/ Rental | Total  |
|---------------|-------------|----------------|-----------------|--------|
| 2008          | 272.19      | 19.68          | 20.53           | 312.41 |
| 2009          | 183.92      | 13.35          | 40.18           | 237.45 |
| 2010          | 199.78      | 9.08           | 24.70           | 233.56 |
| 2011          | 139.02      | 6.51           | 18.28           | 163.81 |
| 2012          | 119.41      | 7.07           | 11.83           | 138.32 |
| 2013          | 79.31       | 16.53          | 12.92           | 108.76 |
| 2014          | 101.23      | 35.98          | 33.84           | 171.05 |
| 2015          | 208.65      | 32.37          | 62.21           | 303.24 |
| 2016          | 138.56      | 13.30          | 24.17           | 176.02 |
| 2017          | 85.27       | 2.04           | 6.61            | 93.92  |

TABLE 8-7. Pacific mackerel harvest specifications and commercial and recreational landings in the U.S. (metric tons) by July-June management years since 2008.

| Mgmt year | HARVEST LIMITS |        |        |              | U.S. Landings |
|-----------|----------------|--------|--------|--------------|---------------|
|           | OFL            | ABC    | HG/ACL | Directed/ACT |               |
| 2008-09   | n/a            | n/a    | 51,772 | 40,000       | 4,567         |
| 2009-10   | n/a            | n/a    | 55,408 | 8,000        | 3,281         |
| 2010-11   | n/a            | n/a    | 55,408 | 11,000       | 2,304         |
| 2011-12   | 44,336         | 42,375 | 40,514 | 30,386       | 2,003         |
| 2012-13   | 44,336         | 42,375 | 40,514 | 30,386       | 5,514         |
| 2013-14   | 57,316         | 52,358 | 52,538 | 39,269       | 12,007        |
| 2014-15   | 32,992         | 30,138 | 29,170 | 24,170       | 5,579         |
| 2015-16   | 25,291         | 23,104 | 21,469 | 20,469       | 4,675         |
| 2016-17   | 24,983         | 22,822 | 21,161 | 20,161       | 2,495         |
| 2017-18   | 30,115         | 27,510 | 26,293 | 25,293       | 1,270         |
| 2018-19   | 27,662         | 25,269 | 23,840 | 22,840       | ---           |

Table 9-1. Total landings (mt) of sardines and other species, and number of vessels and processors that participated under Exempted Fishery Permits in the Pacific Northwest during 2009-2018. (Source: ODFW and WDFW fish ticket records). No EFPs were issued during 2014 – 2018.

| <b>Species</b>    | <b>2009</b> | <b>2010</b> | <b>2011</b> | <b>2012</b> | <b>2013</b> | <b>5-Year Total</b> |
|-------------------|-------------|-------------|-------------|-------------|-------------|---------------------|
| Sardines          | 1,178.0     | 2,013.9     | 2,699.7     | 2,914.4     | 1,526.9     | 10,333.0            |
| Pacific Mackerel  | 3.8         | 9.3         | 1.2         | 200.6       | 13.6        | 228.4               |
| Jack Mackerel     | 0.0         | 0.0         | 0.0         | 1.5         | 0.0         | 1.5                 |
| Jellyfish         | 2.0         | 0.0         | 0.0         | 0.0         | 0.0         | 2.0                 |
| Number Vessels    | 2           | 3           | 4           | 5           | 2           | 7                   |
| Number Processors | 1           | 1           | 1           | 3           | 1           | 3                   |

Table 9-2. EFP landings in California. Total landings (mt) of sardines and other species, and number of vessels and processors that participated under Exempted Fishing Permits during 2009-2012. (Sources: Northwest Aerial Sardine Survey, LLC; \* NMFS WCR; \*\*CWPA).

| <b>Species</b>       | <b>2009</b> | <b>2010</b> |
|----------------------|-------------|-------------|
| Sardines             | 1685mt*     | 1,218.2mt   |
| Pacific Mackerel     | 756.0mt     | 9.8mt       |
| Jacksmelt            | 40.00mt     |             |
| Kingfish             | 412.0mt     |             |
| Other spp            |             | 0.0         |
| Number Vessels **    | 2           | 3           |
| Number Processors ** | 2           | 2           |