COMMERCIAL AND RECREATIONAL HARVEST OF ALBACORE TUNA (*Thunnus alalunga*) IN OREGON

2018 Annual Report
Oregon Albacore Port Sampling Program

Oregon Department of Fish and Wildlife
Marine Resources Program
2040 SE Marine Science Drive
Newport, OR 97365

Prepared by:
Keith Matteson
Albacore Tuna Sampling Coordinator
April 1, 2019

ANNUAL REPORT
ALBACORE PORT SAMPLING PROGRAM
Pacific States Marine Fisheries Commission Contract No. 17-40C; Amendment 2
Subcontract of NOAA Award Number NA16NMF4370321
July 1, 2016 through June 30, 2019

INTRODUCTION

Albacore tuna (*Thunnus alalunga*) is a highly migratory species found worldwide in temperate seas. Albacore caught off Oregon belong to the North Pacific stock and are generally juvenile or sub-adult fish that have not spawned. During their trans-Pacific migrations, vessels of several nations target albacore including the United States, Canada, Taiwan, and Japan. The United States West Coast fishery harvests this stock during the summer and early fall months.

Albacore has been harvested commercially off Oregon since 1929 when the fishery expanded north from the traditional Southern California grounds. Originally, both bait-boats and jig-boats fished for albacore off Oregon, but in recent years, jig-caught (troll-caught) albacore have predominated. Bait fishing with live anchovies is once again beginning to gain some popularity, especially late in the season, but is still less common in Oregon due to live anchovies being unavailable in Oregon ports. The west coast fleet consists primarily of 20 to 60 foot boats with multiple permits to fish crab, salmon, or groundfish at other times of the year. There are also several large freezer boats (>60 ft.) that travel the North Pacific year-round while primarily fishing for albacore. An agreement under the US/Canada Albacore treaty allows up to 45 Canadian vessels to fish and land tuna in the US EEZ, between June 15 and September 15.

Commercial albacore landings in Oregon have been highly variable through the years, ranging from a low of 27,600 pounds in 1936 to a high of almost 38 million pounds in 1968. In the last decade, landings in Oregon have averaged 8.8 million pounds per year. Beginning in 2005 under the Highly Migratory Species Fisheries Management Plan, the National Marine Fisheries Service (NMFS) required vessels to submit logbook data while fishing for albacore inside the 200 mile Economic Exclusive Zone (EEZ). Prior to this, the logbook program was voluntary and only vessels fishing outside the EEZ were required to submit logbooks under the High Seas Fishing Compliance Act.

Sampling of Oregon's commercial albacore fishery is a cooperative effort between the Oregon Department of Fish and Wildlife (ODFW), the NMFS Southwest Fisheries Science Center (SWFSC) and the Pacific States Marine Fisheries Commission (PSMFC). This report documents the progress of the 2018 fishery off Oregon and associated sampling activities.

The Oregon Department of Fish and Wildlife's Ocean Recreational Boat Survey (ORBS) adjusted sampling protocol beginning in 2000 to better estimate effort and catch in the growing recreational albacore fishery off Oregon. Sport fishing for albacore off Oregon has grown in popularity since 2000, especially in the past decade.

2018 ALBACORE COMMERCIAL FISHERY

The 2018 albacore season was favored with generally good weather and a lack of wind strong enough to deter fishing at any point. Warm water first appeared off the north Oregon coast in late June, and spread along the coast (Figure 1), reaching a high of 17.2°C (63° F) at buoy station 46050, 20 nautical miles west of Newport, Oregon, and 19.2°C (67° F) further offshore at buoy 46089, 85 nautical miles west-northwest of Tillamook. Upwelling along the Oregon coast in mid-October cooled the coastal ocean temperatures and brought the 2018 season to a close.

After a difficult 2017 season, fishing in 2018 began in a much more normal fashion, with fish moving into the coastal area as waters warmed, and the bite being relatively good. Still, vessels reported fewer than expected congregations of fish along temperature breaks or shears. As in the previous year, the common advice was that once tuna were found, stay on them and do not spend valuable fishing time looking for bigger schools or denser congregations. Fishing generally occurred within 50 miles north or south of a given port, but boats were ranging up to 150 miles offshore, and spent most of the season 80-120 miles out, with smaller boats also working farther than normal offshore. The consensus from albacore fishers suggested somewhat below average daily catches throughout the fishing season, yet still very productive fishing.

The key feature that marked this season was the huge number of small "peanut" albacore that overwhelmed the fleet in the latter half of the season. Beginning in August, increasing numbers of small fish under 60 cm began to be seen, and in September and October most boats reported whole schools of small albacore, and of having to "shake off" a large number of these peanuts while looking for marketable fish. The overall length-frequencies of sampled fish during these months are strongly influenced by these small fish, and a lower price for these meant that boats were paid less overall for their fishing trip.

2018 Albacore Landings

The first landings of albacore in Oregon for the 2018 season occurred in June, with nearly sixty thousand pounds for the month. Landings continued to build, peaking with 114 trips during the last week of July. Fishing effort declined after the July peak, and hovered between 50 and 75 trips per week throughout August and September (Figure 2). Like last year, Astoria experienced a drop in landings in September, while the number of offloads in Newport and Charleston remained relatively strong into early October. The season ended with the last recorded landing made on October 25th in Garibaldi.

The 2018 landings in Oregon represent a slight uptick from last year's low (Figure 3). Tuna fishers collectively made 890 trips on 317 different commercial vessels (Figures 3 and 4) and landed just over 5.8 million pounds of albacore in Oregon during 2018. The total number of different vessels targeting albacore, as well as the number of tuna trips, were lower than the 10-year averages of 390 and 1,250, respectively.

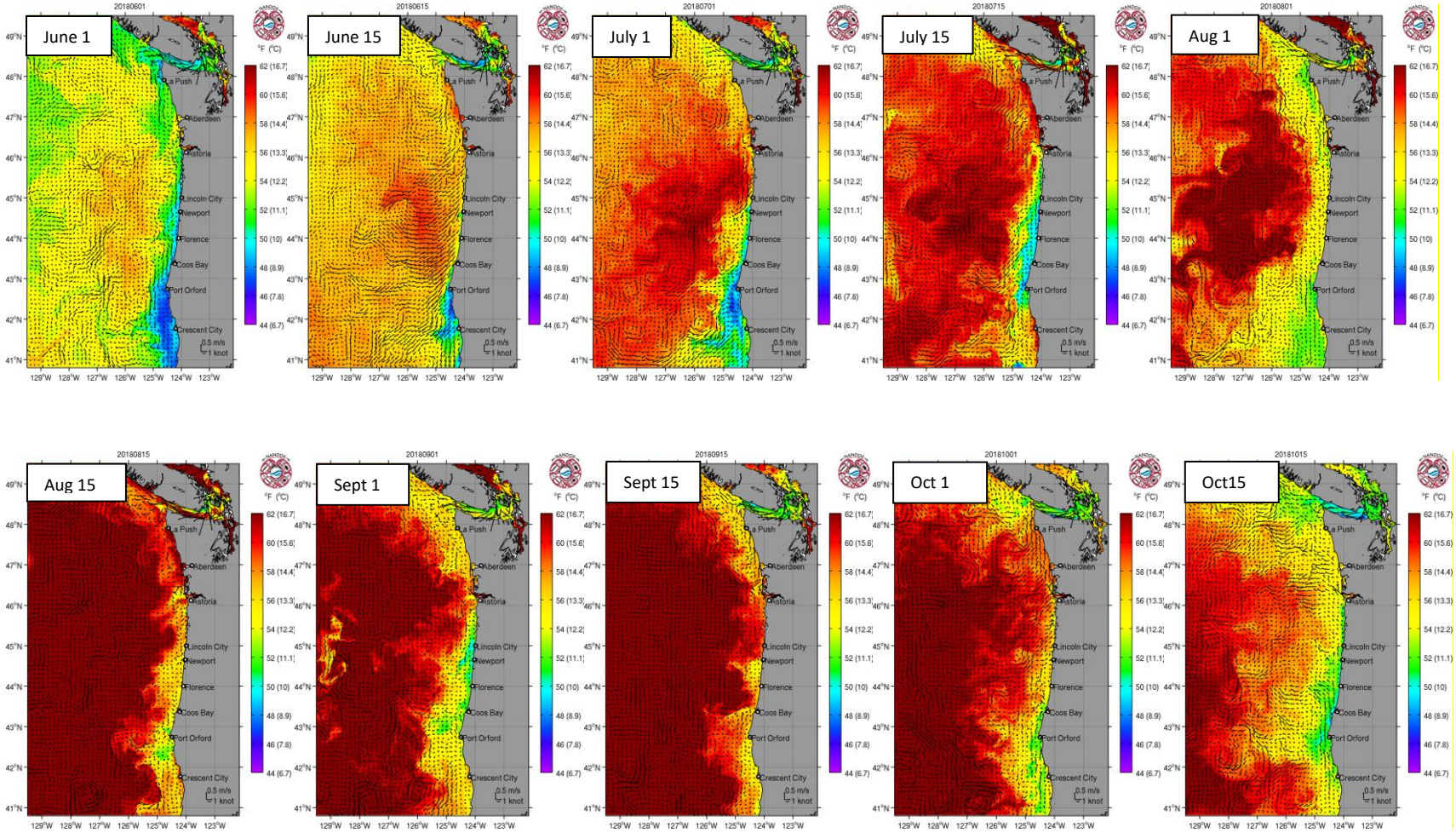

Figure 1. Sea surface temperature plots off Oregon and Washington out to 129°W from June 1 through October 15, 2018. Dark red areas indicate the warmest surface waters at around 17° C (62° F), and lighter green and blue areas the colder waters. Images courtesy Craig Risien, Oregon State University, Northwest Association of Networked Ocean Observing Systems (NANOOS).

http://agate.coas.oregonstate.edu/data/ocs_tuna_nowcast.html

http://nvs.nanoos.org/TunaFish

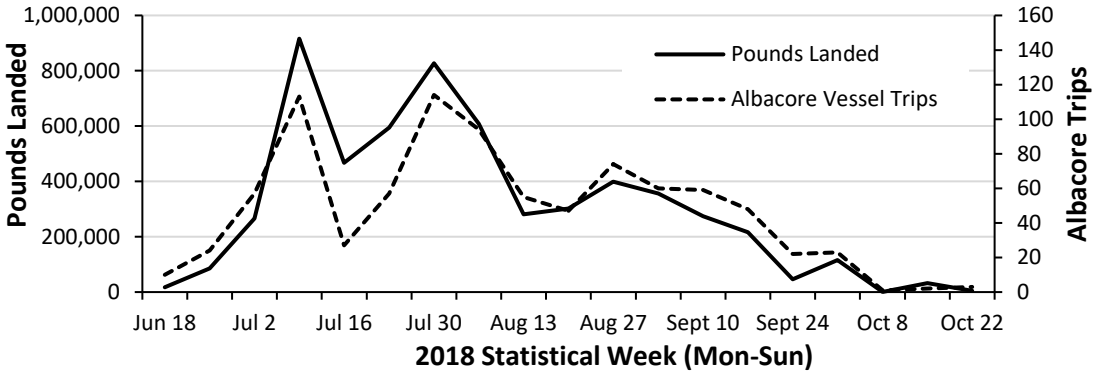

Figure 2. Total pounds of albacore landed (left axis) and number of albacore vessel trip landings (right axis) per week in 2018.

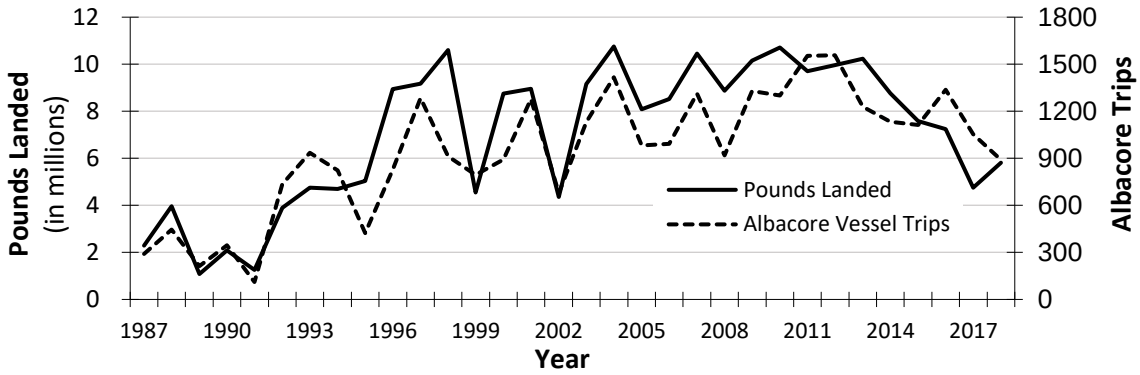

Figure 3. Total pounds of albacore landed (left axis) and number of albacore vessel trip landings (right axis) in Oregon by year, 1987-2018.

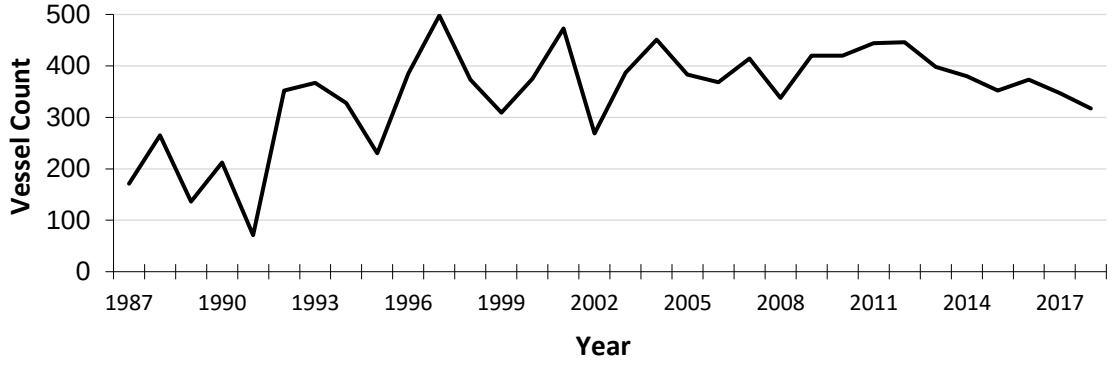

Figure 4. Total number of different vessels landing albacore in Oregon by year, 1987-2018

July was the peak month for albacore landings in 2018, yielding 2,648,744 pounds, or 45.6% of the total landings for the year (Figure 5). Historically, August has yielded the highest quantity of tuna and profit for fishers.

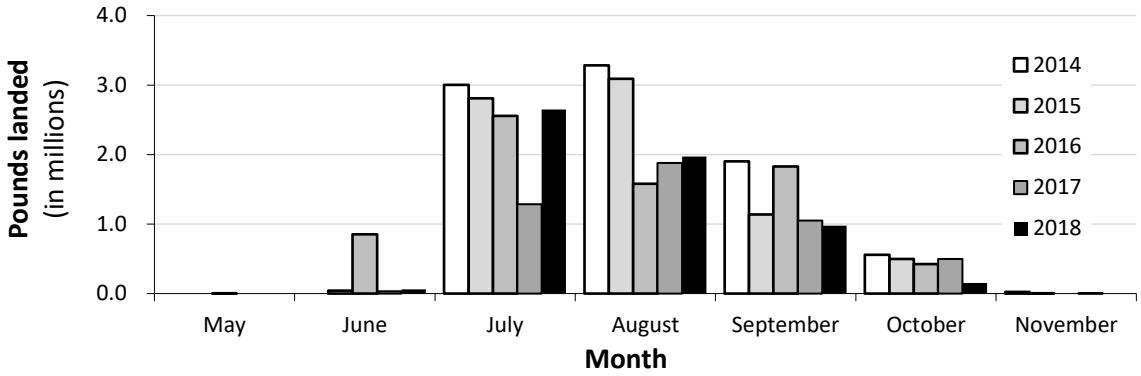

Figure 5. Total pounds of albacore landings by month; 2014-18. There were no tuna landed in November in 2018.

The preliminary total for 2018 commercial landings is 5,812,180 pounds. This is an improvement over 2017 by over 22%, yet is still only 68.4% of the ten-year average (2009-18) of 8.5 million pounds (Table 1).

Eight Canadian vessels made 17 landings, totaling 420,046 total pounds of blast-frozen albacore in Oregon during their three-month eligibility in 2018, with an ex-vessel value of $718,200.

Newport had the highest albacore landings of any Oregon port in 2018, with 47.4% of the total weight (Table 2). Charleston landed 28.4% of the total weight, followed by Astoria. Other ports showing landings tallies of over 100,000 pounds were Garibaldi and Winchester Bay.

Table 1. Annual albacore landings (pounds) and percentage of the 10-year average (2009-2018).

Year	Total Landings (lbs)	% of 10-yr Average
2018	5,812,180	68.4%
2017	4,744,814	55.9%
2016	7,249,854	85.4%
2015	7,584,044	89.3%
2014	8,770,100	103.3%
2013	10,228,014	120.4%
2012	9,964,238	117.3%
2011	9,699,216	114.2%
2010	10,713,209	126.2%
2009	10,156,183	119.6%
Average	**8,492,185**	

Table 2. Albacore landings by port for 2018 (pounds and percentage) and average landings (pounds and percentage) across 10 years (2009-18).

2018			10-Year Average		
Port	**Landings (lbs)**	**Landing %**	**Port**	**Landings (lbs)**	**Landing %**
Newport	2,754,048	47.4%	Newport	3,600,700	42.4%
Charleston	1,651,705	28.4%	Charleston	1,932,900	22.8%
Astoria	677,101	11.6%	Astoria	2,408,335	28.4%
Garibaldi	382,646	6.6%	Garibaldi	230,802	2.7%
Winchester Bay	201,983	3.5%	Winchester Bay	142,719	1.7%
Brookings	77,417	1.3%	Brookings	111,206	1.3%
Port Orford	41,660	0.7%	Port Orford	23,431	0.3%
Florence	16,284	0.3%	Florence	21,742	0.3%
Pacific City	818	0.0%	Pacific City	7,808	0.1%
Depoe Bay	0	0.0%	Depoe Bay	5,412	0.1%

The average landing in Oregon for 2018 was 5,332 pounds, an improvement on 2017's average landing by 826 pounds, or 18% (Table 3). Although the largest landing was over 110,000 pounds, only two landings exceeded 60,000 pounds, and 28 exceeded 30,000 pounds out of 890 albacore landings.

The albacore fishery engages a wide range of vessel sizes and refrigeration types, some able to freeze fish and stay out for indefinite periods, while others employing ice can only remain at sea a few days at a time. Quartile partitioning of the landing weights shows that 50% of all vessel trips landed 1,892 pounds or less, and 75% of the landings were 5,404 pounds or less, which helps us understand how many small and moderate-sized vessels make up the bulk of the fleet.

Table 3. Quartile partition and mean of 2018 Oregon albacore landings.

All Landings		
Quartile		**Pounds**
100%	**Max**	110,150
75%	**Quartile**	5,404
50%	**Median**	1,892
25%	**Quartile**	674
0%	**Min**	9
	Average	5,332

2018 Albacore Prices and Value

Albacore prices were well below the record highs of 2017. July saw a blast-frozen price per pound of $1.87, dipping to $1.63 in August and recovering to around $1.71 in September. Fresh and brine-frozen albacore displayed a similar price pattern through the season, with a mid-season dip followed by a price recovery in September. Public sales of tuna began the season around $3-3.50 per pound from vessels and retailers dockside, and held steady at that price.

The pulse of small "peanuts" that began to appear in the catch mid-season played a significant role in prices paid to vessels. Albacore are sorted into three size grades upon unloading from the boat, and a separate lower price given for the smaller fish. This price

could vary, and some boats with only a few small fish might not be penalized, but others with a significant percentage of peanuts in their load might only be paid $1.00 per pound for them, sometimes drastically reducing the value of their fishing trip. Buyers generally did not want these small fish, claiming that they were more difficult to market. During September and October, all boats reported having to evade or continually "shake off" small fish, and constantly be on the lookout for a larger grade.

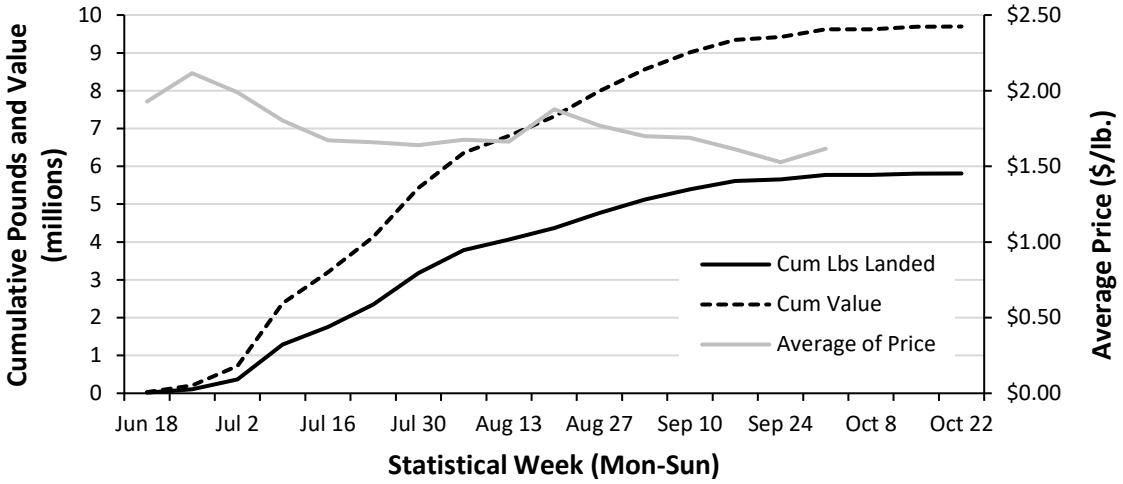

Figure 6. Cumulative landings, cumulative ex-vessel revenue, and average price by week in 2018.

Ex-vessel revenue generated from albacore in 2018 totaled $9,697,002 (Figure 7). The average price for 2018 was $1.67 per pound, quite a bit below the 2017 record high of $2.27, but well above the ten-year average of $1.48 per pound.

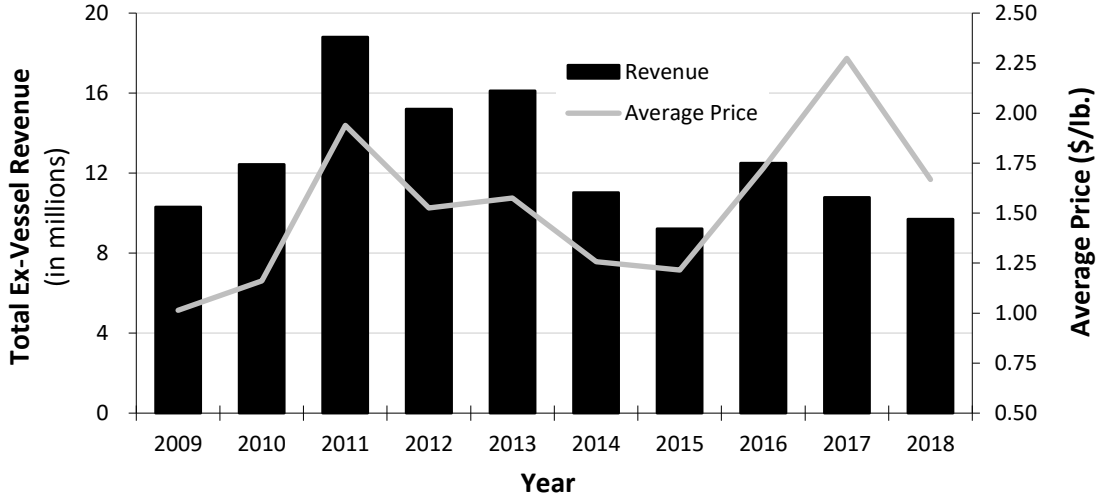

Figure 7. Total revenue (ex-vessel) and average price by year for Oregon commercial albacore.

Albacore has in the past typically ranked fourth or fifth for total annual revenues generated in Oregon marine fisheries. This year, like last year, albacore tuna revenue ranked sixth relative to other Oregon fisheries, representing 5.6% of the total annual revenue (Table 4).

Table 4. Oregon annual marine fish revenue (ex-vessel) for calendar year 2018 ranked by ex-vessel revenue.

Fishery Species	Pounds Landed	Revenue	Revenue Percentage
Dungeness Crab[o]	23,136,734	$74,527,009	43.1%
Pink Shrimp	35,872,602	$26,907,941	15.6%
Groundfish[x]	45,126,100	$19,713,511	11.4%
Pacific Whiting	185,554,139	$16,397,677	9.5%
Sablefish	5,680,737	$11,927,103	6.9%
Albacore Tuna	5,812,401	$9,722,621	5.6%
Salmon	956,919	$5,676,607	3.3%
All Other Marine Species[xx]	11,161,752	$7,982,704	4.6%
Total	**313,301,384**	**$172,855,173**	**100.0%**

[o] Includes Bay and Ocean Dungeness fisheries, Jan 1 – Dec. 31, 2018.
[x] Groundfish excluding Pacific Whiting and Sablefish.
[xx] Including Pacific Halibut.

2018 Sampling & Coverage Rate Analysis

The sampling rate goals for the 2018 albacore port samplers in Oregon were again set at 20% for Astoria and Newport and 10% for Charleston, unchanged from 2016-17. Sampling coverage rate is the percentage of the total albacore trips with landings sampled for length frequency for each required port (Astoria, Newport, and Charleston). Port sampling coverage rates were well above the specified goals (Table 5). The average number of fish per length-frequency sample more than doubled the 20 fish minimum. In addition, port samplers acquired samples from Garibaldi, Port Orford, and Brookings.

The funding for tuna samplers is allocated to cover the months of July through October, so port biologists and ODFW staff arranged to collect albacore samples from the June landings, and the assigned tuna samplers began sampling in July. Samplers in Astoria (4 months), Newport (4 months), and Charleston (4 months at half time) were trained, prepared, and stationed on site, and achieved an overall statewide 2018 coverage rate of 29%. Sampling activities included measuring 20-100 albacore for fork length, collecting information on fishing patterns, distributing logbooks to vessels, and providing information to fishers. Table 5 presents a summary of commercial sampling rates and coverage rates for the 2018 season. Appendix A presents additional summary information required by the contractual agreement with NMFS and PSMFC for albacore sampling.

Table 5. 2018 preliminary Oregon commercial albacore sampling season summary. Gearhart, Seaside, Pacific City, Depoe Bay, Florence, Bandon, Port Orford, Gold Beach, and Brookings combined as "Other Ports" due to low number of landings.

Port	Total Pounds Landed	Pounds Sampled	Commercial Albacore Trips	Albacore Trips Sampled	Total Fish Sampled	Average # of tuna sampled	Coverage Rate (sampled trips/ total trips)
Astoria	677,101	565,888	65	37	1,426	38.5	56.9%
Garibaldi	382,646	14,982	72	6	174	29.0	8.3%
Newport	2,754,048	1,698,851	378	134	7,137	53.3	35.4%
Winchester Bay	201,983	-	55	-	-	-	-
Charleston	1,651,705	762,028	262	78	2,681	34.4	29.8%
Other Ports	144,697	5020	58	3	71	23.7	5.2%
Total	**5,812,180**	**3,046,769**	**890**	**258**	**11,489**	**44.5**	**29.0%**

Examination of the landing weights of sampled trips against all commercial landing weights helps our understanding of potential sampling bias with regard to landing size (Table 6). Large landings are defined as those with weights greater than 75% of all individual albacore trip landing weights (5,404 lbs.), while small landings are defined as total trip landing weights less than 25% of all individual albacore trip landing weights. For 2018, 58% of sampled landings were from landings greater than 5,404 pounds, suggesting that again this year, our sampling was skewed toward larger landing sizes. Comparing the average landing weight to the average sampled landing weight also suggests that our sampling was biased towards larger landings. An average sample size of 44.5 fish per sampled boat, plus an overall sample rate of 29% (258 of 890 landings) mitigates this to a large degree.

Table 6. Quartile partition for all Oregon albacore landings and sampled landings in 2018.

All Landings			Sampled Landings		
Quartile		**Pounds**	**Quartile**		**Pounds**
100%	**Max**	110,150	100%	**Max**	110,150
75%	**Quartile**	5,404	75%	**Quartile**	15,315
50%	**Median**	1,892	50%	**Median**	7,049
25%	**Quartile**	674	25%	**Quartile**	3,775
0%	**Min**	9	0%	**Min**	194
	Average	5,332		**Average**	11,809

Recommendation for 2019 sampling: Samplers, while not ignoring the usual opportunities at processors and buying stations, must also focus on the smaller buyers operating from trucks or skiffs, and supplying local retailers and restaurants. Make efforts to establish solid communications with these smaller buyers as early as possible in the season. Do not wait for the convenient landings at the plants to diminish in late September before beginning to work more with the smaller boats and buyers. Treat all landings as equally important throughout the season.

A large challenge for samplers in 2018 was the varying and often-sizable proportions of small fish in most offloads. Most boats just mixed them in the hold randomly as they were caught and brought on board. However, on many vessels, small fish were placed in a separate section of the hold and brought off either first or last. It is crucial to ask if the catch has been sorted in the hold before you begin your sample, and to ask when they are going to be taking the sorted fish off. If a sampler feels that larger or smaller fish are coming off at different times, they should select random buckets as they come off the boat from throughout the offloading. *If you feel you cannot obtain a representative sample of the albacore aboard a vessel, do not sample it unless you can measure every fish in the load.*

2018 Length Frequency Analysis

Albacore samplers collected fork length measurements from unsorted commercially harvested albacore during offloading from June through October of 2018. Samplers measured 11,489 albacore tuna in the ports of Astoria, Newport, Charleston, Garibaldi, Port Orford, and Brookings. A frequency distribution of the length data displays a tri-

modal distribution (Figure 8). The major mode centered around 66 cm represents an age-class of 2-3 year-old tuna, the minor mode around 57 cm represents a younger age-class of 1-2 year-old tuna, and another minor mode represents the oldest age-class of 4-6 year-old tuna (Wells, 2013). Although the number of fish sampled in each port varied, the distribution and trend appear to be very similar among the three primary sampled ports for all months combined (Figure 9).

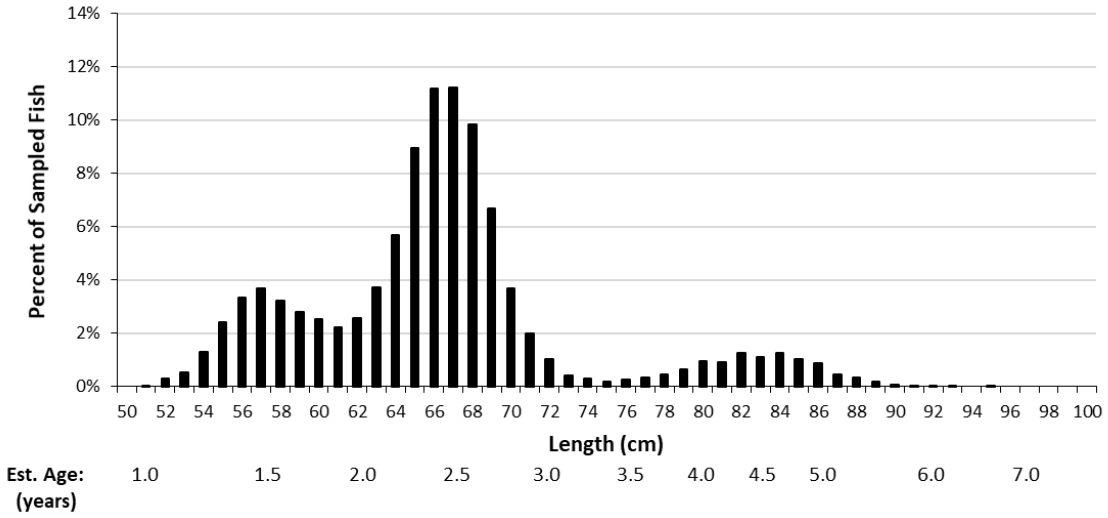

Figure 8. Length frequency data for all sampled ports, all months combined in 2018. Average length = 66.3 cm, N = 11,489. Estimated age at length from Wells, 2013.

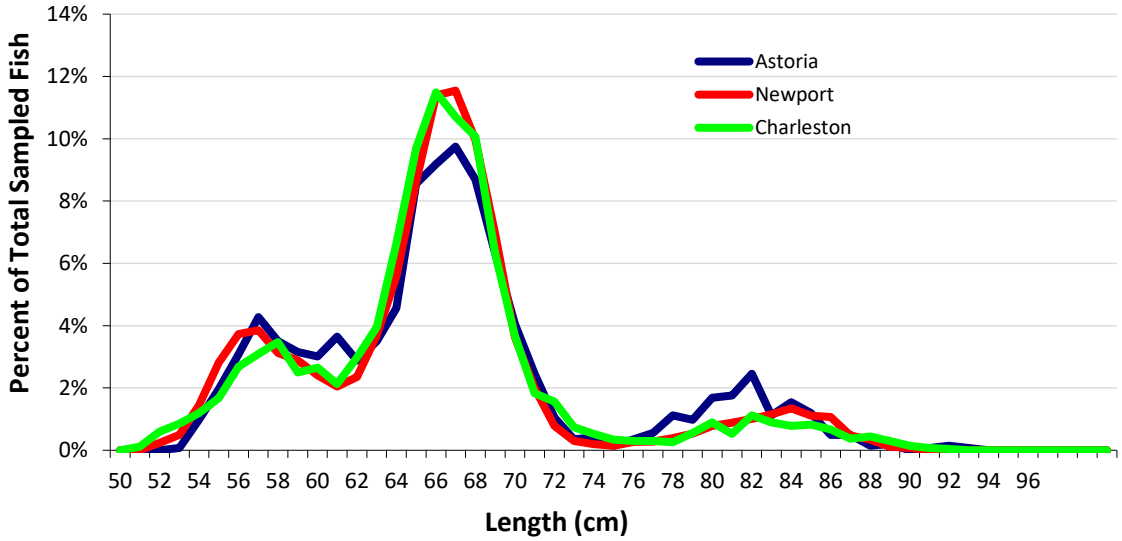

Figure 9. Length frequency data for all sampled months by port in 2018. Astoria n = 1,426. Newport n = 7,137. Charleston n = 2,681.

Most buyers sort albacore into three grades upon offloading: Small, under 9 lbs. (<59 cm), Medium, 9-15 lbs. (59-73 cm) and Large, over 15 lbs. (>73 cm). The needs of

customers from day-to-day may cause the buyer to shift the large-grade breakpoint to 14 or 16 pounds. Catches during the early season were mostly medium-grade "schoolers" representing 73% and 87% of the June and July sampled harvest, respectively. Large fish over 73 cm made up 26% of the catch in June, dropping off to 10% in July (Figure 10).

In contrast to previous seasons, small "peanuts" under 9 lbs. began to make up more and more of the catch as August progressed, and in September the peanuts formed nearly 40% of the landings. This trend continued into October, with small fish making up 33% of the month's sampled landings. Tuna under nine pounds can be difficult to market and these "peanuts" are typically avoided and/or released at sea by fishers. The latter half of the 2018 season found vessels working hard to avoid small fish, reporting that they "were everywhere." Boats were shaking small fish off the hook, looking for different schools of fish, or running north-south in response to reports of larger grades in other areas. Most vessels were bringing at least some small fish in, and many loads contained significant portions of these small fish, sometimes kept in separate sections of the hold and brought off either first or last.

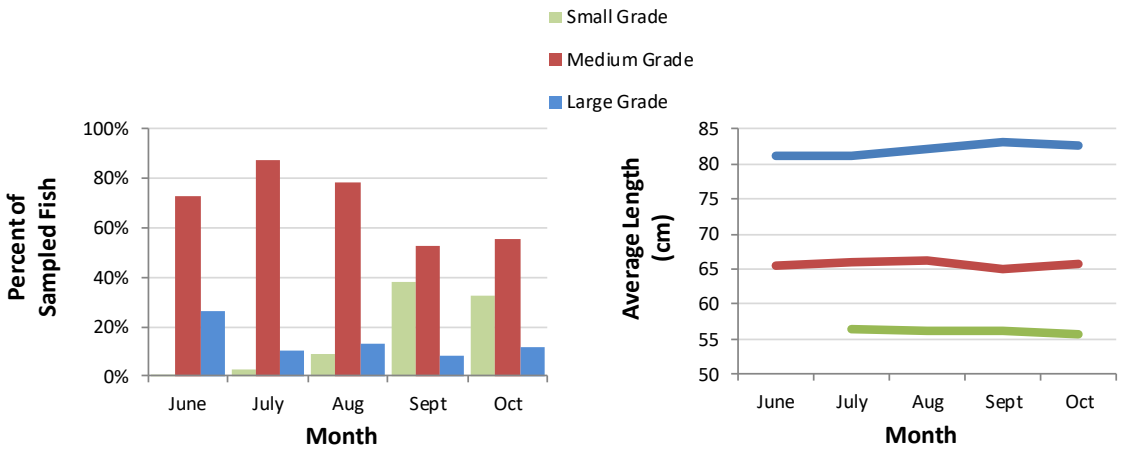

Figure 10. 2018 proportion (left) & average length (right) of small, medium & large grade fish sampled each month. June n = 130; July n = 3,979; August n = 4,055; September n = 2,814; October n = 511.

2018 ALBACORE RECREATIONAL FISHERY

Access to albacore for recreational vessels off Oregon can be highly variable, depending on weather conditions and distance offshore to the fish. This year, tuna arrived off the Oregon coast during the third week of June, but remained further offshore than was practical and safe for most sport boats, and effort remained scattered and very low. While albacore were available to the commercial fleet, they remained frustratingly far offshore for recreational anglers, generally at least 80 miles out. Recreational charter vessels attempted trips throughout the summer and fall, but catch was poor.

ODFW's Ocean Recreational Boat Survey (ORBS) deploys samplers to monitor Oregon's sport fisheries and provide estimates of overall effort and catch. Peak recreational albacore effort and catch occurred during the 1st week of July, with an estimate of 9,102 albacore tuna landed for the month. Tuna harvest continued through the middle of October, but in lower and variable amounts (Figure 11).

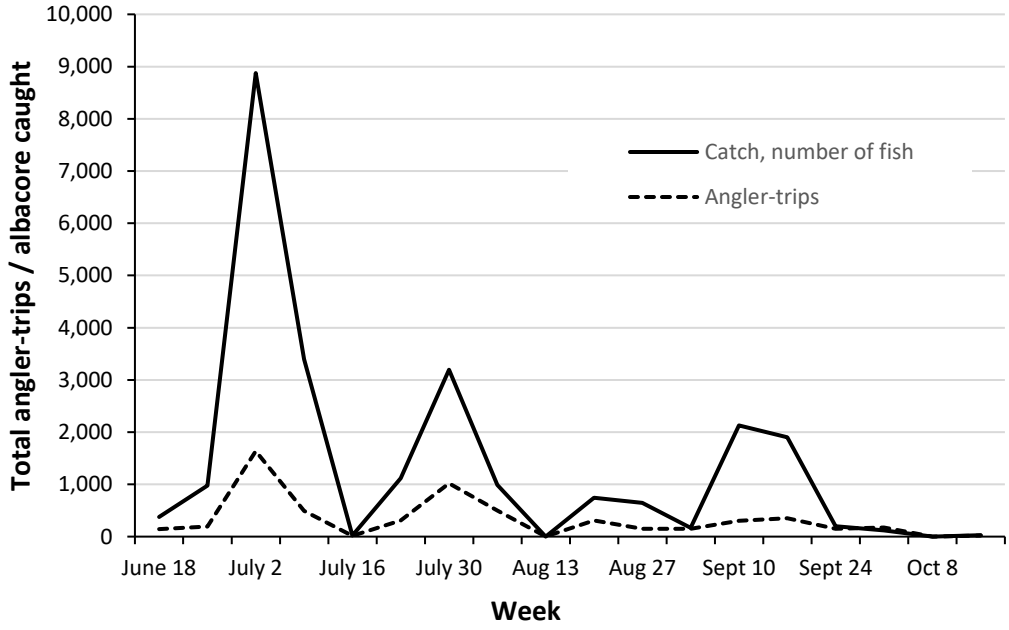

Figure 11. Oregon recreational albacore catch (number of tuna landed) and angler-trips by week from tuna-specific fishing trips in 2018. Charter and private vessels are combined.

The total estimated recreational fishing effort for albacore was 5,912 angler trips in 2018, a little more than half the ten-year average of 10,329 angler trips (Table 7). The number of albacore tuna landed from tuna-specific trips was 24,865 fish. Anglers caught an additional 641 albacore on either a bottomfish trip, halibut trip, or "combo" trip (salmon & other fish) for an estimated total of 25,506 albacore tuna during five months of fishing in 2018, 73.7% of the 10-year average 2009-18.

Charleston was the top port with 40.7% of the total combined charter and private recreational catch, followed by Winchester Bay, Newport, and Garibaldi, which together accounted for another 45.1% of the statewide recreational landings (Table 9).

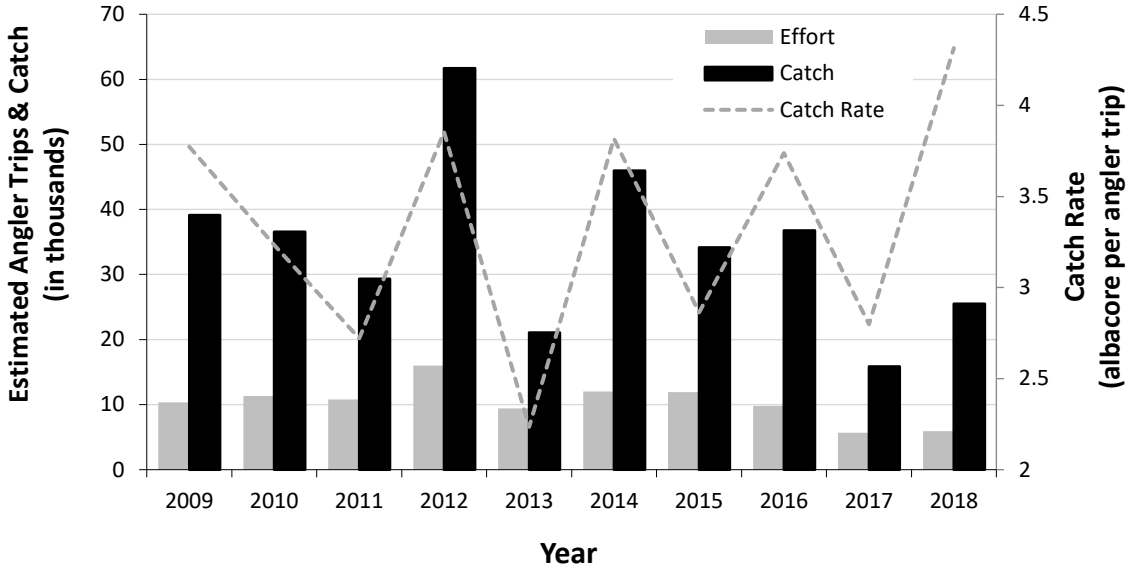

Figure 12. Oregon recreational albacore fishing effort (number of angler trips), catch (number of tuna landed) and catch rate (albacore per angler trip) from tuna-specific fishing trips 2009-18.

While the effort and total catch might not have been as high as years such as 2012, the overall catch rate for those that went fishing was higher than in any of the past ten years. (Figure 12). Catch-per-unit-effort (CPUE) for albacore is defined as the number of albacore per angler trip. Charter vessel CPUE in 2018 was 2.0 albacore per angler trip, while the private vessel CPUE was 4.5 trip (Table 10), both significant improvements over 2017. The combined CPUE for Oregon's recreational albacore season for charter and private was 4.3 albacore per angler trip, a full fish above the ten-year average of 3.3.

Table 7. Oregon recreational albacore fishing effort (angler trips) by port, 2009-18. NS indicates no port samplers present that year.

Port	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10-Year Average
Astoria	390	640	290	564	404	560	284	164	169	34	350
Garibaldi	1,176	2,685	728	2,385	2,214	1,845	1,662	1,586	826	941	1,605
P. City	93	254	80	337	132	265	247	239	140	72	186
D. Bay	1,138	1,661	1,433	2,930	2,489	1,760	2,117	936	386	454	1,530
Newport	3,251	3,929	3,734	5,201	3,368	2,823	4,080	2,760	765	1,083	3,099
Florence	15	16	24	28	NS	20	17	7	0	26	17
W. Bay	382	177	474	403	302	547	158	520	444	907	431
Charleston	3,202	1,667	3,076	3,744	427	4,049	2,650	3,470	2,387	2,005	2,668
Bandon	461	168	207	399	7	173	152	108	116	145	194
Port Orford	NS	NS	56	0	NS	NS	NS	NS	NS	NS	-
G. Beach	76	0	108	0	6	0	51	4	12	18	28
Brookings	183	114	577	21	85	0	514	36	419	227	218
Total	**10,367**	**11,311**	**10,787**	**16,012**	**9,434**	**12,042**	**11,932**	**9,830**	**5,664**	**5,912**	**10,329**

Table 8. Oregon recreational albacore catch (number of fish) by port, 2009-18. NS indicates no port samplers present that year.

Port	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10-Year Average
Astoria	1,176	1,598	556	2,272	1,060	2,092	660	661	229	9	730
Garibaldi	4,203	10,734	683	6,841	6,373	6,597	4,800	3,874	1,629	1,743	3,729
P. City	771	1,476	383	1,712	163	872	637	1,026	222	48	561
D. Bay	4,011	5,001	3,114	10,336	5,271	6,401	5,523	2,730	420	1,562	3,327
Newport	12,298	11,536	8,043	21,512	7,026	9,143	12,746	6,837	1,193	4,249	6,834
Florence	27	22	11	36	NS	56	39	20	0	13	26
W. Bay	983	516	1,275	1,229	169	2,006	212	1,863	1,474	5,519	2,215
Charleston	12,733	5,016	11,166	15,558	817	17,913	7,519	19,261	7,953	10,387	12,607
Bandon	2,508	496	1,149	2,194	30	888	365	419	130	661	493
Port Orforc	NS	NS	455	0	NS	NS	NS	NS	NS	NS	-
G. Beach	182	0	967	0	0	0	65	0	76	27	34
Brookings	225	187	1,546	9	176	0	1,590	50	2,528	1,288	1,091
Total	**39,117**	**36,582**	**29,348**	**61,699**	**21,085**	**45,968**	**34,156**	**36,741**	**15,854**	**25,506**	**34,606**
CPUE	**3.8**	**3.2**	**2.7**	**3.9**	**2.2**	**3.8**	**2.9**	**3.7**	**2.8**	**4.3**	**3.3**

Table 9. Preliminary percentage of Oregon's recreational albacore catch by port in 2018, for tuna-specific trips.

Port	Landing %
Charleston	40.7%
Winchester Bay	21.6%
Newport	16.7%
Garibaldi	6.8%
Depoe Bay	6.1%
Brookings	5.0%
Bandon	2.6%
Pacific City	0.2%
Gold Beach	0.1%
Astoria	<0.1%

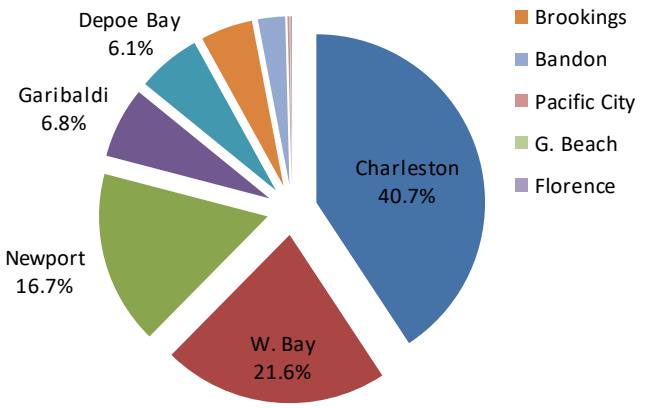

Table 10. Oregon's preliminary 2018 recreational catch, effort, and CPUE by vessel type, port total, and statewide total. CPUE calculated as number of albacore caught divided by the number of angler trips for each category and port.

	Catch (No. of Albacore)			Effort (Angler Trips)			Catch per Unit of Effort		
Port	**Private**	**Charter**	**Total**	**Private**	**Charter**	**Total**	**Private**	**Charter**	**Total**
Astoria	9	0	9	34	0	34	0.3	--	0.3
Garibaldi	1,716	27	1,743	904	37	941	1.9	0.7	1.9
Pacific City	48	0	48	72	0	72	0.7	--	0.7
Depoe Bay	1,403	159	1,562	380	74	454	3.7	2.1	3.4
Newport	4,124	125	4,249	990	93	1,083	4.2	1.3	3.9
Florence	13	0	13	26	0	26	0.5	--	-
W. Bay	5,519	0	5,519	907	0	907	6.1	--	6.1
Charleston	10,086	301	10,387	1,887	118	2,005	5.3	2.6	5.2
Bandon	572	89	661	115	30	145	5.0	3.0	4.6
G. Beach	27	0	27	18	0	18	1.5	--	1.5
Brookings	1,288	0	1,288	227	0	227	5.7	--	5.7
Total	**24,805**	**701**	**25,506**	**5,560**	**352**	**5,912**	**4.5**	**2.0**	**4.3**

Recreational Albacore Length Frequency Analysis

ORBS samplers collected length frequency information on 894 recreationally caught albacore in 2018. Figure 13 shows the length frequency distribution of non-sorted, randomly sampled albacore during the 2018 recreational season. The length data suggests a tri-modal distribution, similar to the commercially caught samples, where the major mode represents the age-class of approximately 2-1/2 year-old tuna (Wells, 2013).

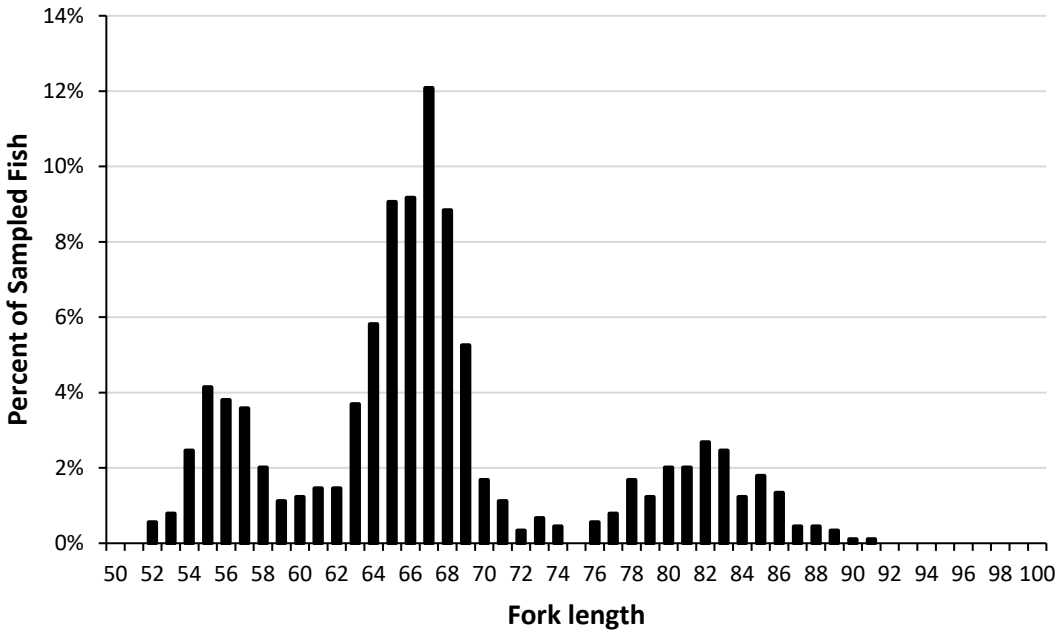

Figure 13: Length frequency data for all ports sampled for recreationally caught tuna by ORBS in 2018. Average Length = 67.4cm, N = 894.

To investigate any difference between commercially and recreationally caught albacore, we compared the as well as the overall length frequency curves each size class. The means of each size grade of albacore in 2018 differed less than one standard deviation (Table 11), and the overall length frequency distributions compared well (Figure 14).

Table 11. Comparison of means by size grade between commercially and recreationally caught albacore landed in Oregon in 2018.

Grade	Commercial Mean ± 1 Standard Deviation	Recreational Mean ± 1 Standard Deviation
Small	56.2 ±1.5 cm	55.7 ±1.5 cm
Medium	66.0 ±3.0 cm	66.1 ±2.6 cm
Large	82.3 ±3.6 cm	81.9 ±3.4 cm

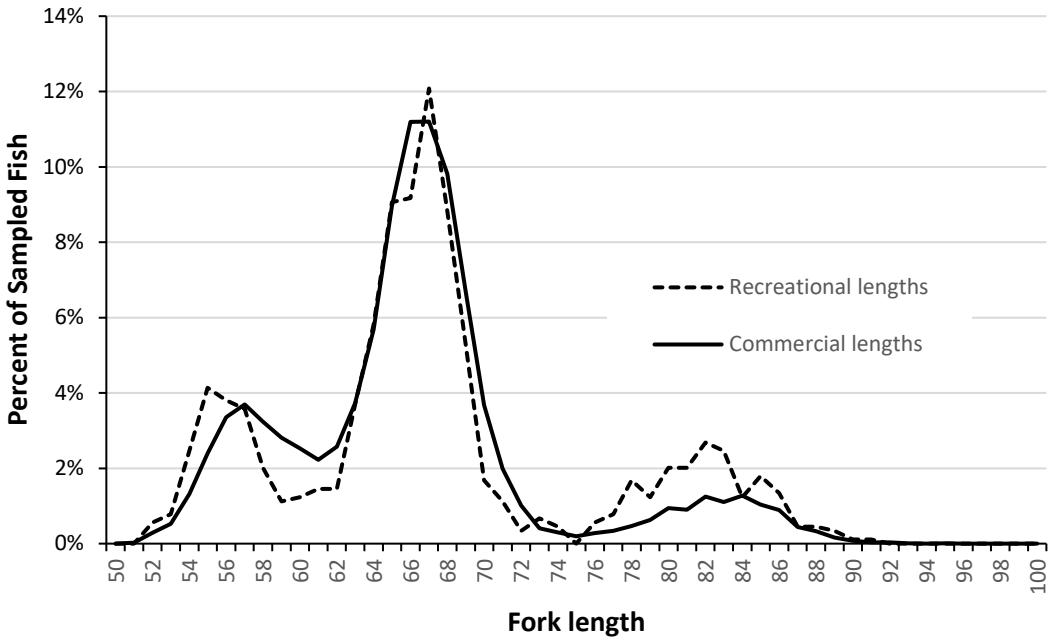

Figure 14. Comparison of length-frequencies of commercially caught and recreationally caught albacore landed in Oregon in 2018.

SUMMARY

The preliminary total for Oregon commercial landings in 2018 is 5,812,180 pounds, 68.5% of the ten-year average (2009-2018) of 8.5 million pounds. Ex-vessel revenue generated from albacore in 2018 totaled $9.7 million, or 76.9% of the 10-year average. Sampling coverage rates exceeded the goals set for the three primary ports, and was 29.0% for Oregon overall.

Eight Canadian vessels made 17 landings in Oregon, totaling 420,046 total pounds of blast-frozen albacore with a value of $718,200.

Recreational tuna fishers had a below-average fishing season, landing an estimated 25,506 albacore tuna, 73.7% of the ten-year average from 2009-18.

ACKNOWLEDGEMENTS

Thank you to all the albacore fishing vessel operators and crew who cooperatively provided fishing information during the 2018 sampling project, as well as fish plant staff and buyers who supported and assisted with efficient sampling on their property. Many thanks go to Valerie Miranda in Astoria and Dean Headlee in Charleston as primary albacore samplers. Thanks also to ODFW port biologists and staff for collecting additional length frequencies and distributing logbooks: Sheryl Flores, Scott Malvitch, Nick Wilsman, Craig Good, Brooke Watkins, Marissa Paulling, Jonathan LaTour, Wesley Shum, Kylee Mroz, and Robin Koeller-Nakazawa. I am grateful to Mark Freeman, Ted Calavan and Nadine Hurtado for their support with fish ticket data and databases. Thanks to Ellen Veile-Smuts and Amanda Reich for their assistance in the

office setting. Thank you to Eric Schindler and Jessica Moll for providing the ORBS recreational data component for monthly and annual reports. Many thanks to Ranelle Reber of Washington Department of Fish & Wildlife for assisting with information on Canadian vessels and Washington albacore sampling, and to Craig Risien of OSU/NANOOS for the sea-surface temperature images in Figure 1. In addition, many thanks to John Childers and Yuhong Gu of the NMFS Southwest Fisheries Science Center for technical and data support. Finally, a special thanks to Justin Ainsworth, Cameron Sharpe, and Cyreis Schmitt of ODFW for their professional assistance and support.

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APPENDIX A

2018 Summary Statistics for Oregon's Albacore Port Sampling Program

PORT NAME	Astoria	Garibaldi	Newport	W. Bay	Charleston	Other Ports	TOTAL
Logbooks issued	2	0	14	0	0	3	**19**
Lbs. landed by commercial sampled vessels	565,888	14,982	1,698,851	0	762,028	5,020	**3,046,769**
Total number of commercial fish measured	1,426	174	7,137	0	2,681	71	**11,489**
No. commercial trips sampled	37	6	134	0	78	3	**258**
Total no. of commercial trips/landings	65	72	378	55	262	58	**890**
Total no. of commercial vessels*	39	25	144	16	107	34	**317**
Lbs. landed by US vessels	677,101	382,646	2,334,002	201,983	1,651,705	144,697	**5,392,134**
Lbs. landed by Canadian vessels	0	0	420,046	0	0	0	**420,046**
Total lbs. landed by all commercial vessels	677,101	382,646	2,754,048	201,983	1,651,705	144,697	**5,812,180**
Lbs. landed by sport vessels**	122	23,531	57,362	74,507	140,225	48,587	**344,331**
Percent commercial sampling coverage (trips)	**56.9%**	8.3%	**35.4%**	0.0%	**29.8%**	15.0%	**26.9%**

* Several vessels made trips into multiple ports, so total numbers of vessels at each port will add up to more than Oregon's total.
** Number of albacore landed in each port multiplied by the 13.5 lb. overall weighted average.