



Published April 2023

**COMMERCIAL AND RECREATIONAL HARVEST OF
ALBACORE (*Thunnus alalunga*) IN OREGON**
Oregon Albacore Port Sampling Program
2022 Annual Report

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ANNUAL REPORT, ALBACORE PORT SAMPLING PROGRAM

Pacific States Marine Fisheries Commission Contract 23-005C, Amendment 1
Subcontract of NOAA Award Number 1305M322CNFFR0042

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.

Commercial harvest of hook-and-line caught, or “troll-caught” albacore tuna has occurred 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 boats have predominated. Bait fishing with live anchovies remains desirable, especially late in the season, but is much less common in Oregon due to live anchovies being unavailable in Oregon ports. The west coast fleet consists primarily of vessels ranging from 20 to 60 feet in length, with multiple permits to harvest crab, salmon, or groundfish at other times of the year. Crews range in size from single-handed small boats up to large freezer boats with a crew of 10 or more, but on most boats, there are two to four aboard. Albacore boats employ several methods of preservation including ice for one to three-day fishing trips, and blast- or brine-freezing equipment for indefinite excursions at sea. Some of the larger freezer boats (>60 ft.) travel the North Pacific year-round while primarily fishing for albacore.

An agreement under the 1981 US/Canada Albacore treaty allows up to 45 Canadian vessels to fish and land tuna in the US Exclusive Economic Zone (EEZ), between June 15 and September 15. Authorized ports for Canadian vessels landing albacore in Oregon are Astoria, Newport, and Charleston.

Commercial albacore landings in Oregon have been highly variable long-term ([Figure 1](#)). This includes zero landings in the early 1930s to over 22 million pounds in 1944. Landing volume dropped to near 500 thousand pounds in the mid-1950s before reaching its peak of almost 38 million pounds in 1968. Over the last 30 years (1992-2022), landings in Oregon have averaged 7.6 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 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.

This report summarizes information about Oregon’s commercial albacore fishery, sampling data for the 2022 albacore season, and information from the recreational albacore fishery. 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). ODFW’s Ocean Recreational Boat Survey (ORBS) conducts recreational albacore fishery sampling. Sport fishing for albacore off Oregon has grown in popularity since 2000, especially in the past decade. All results in this report are preliminary as of December 8, 2022.

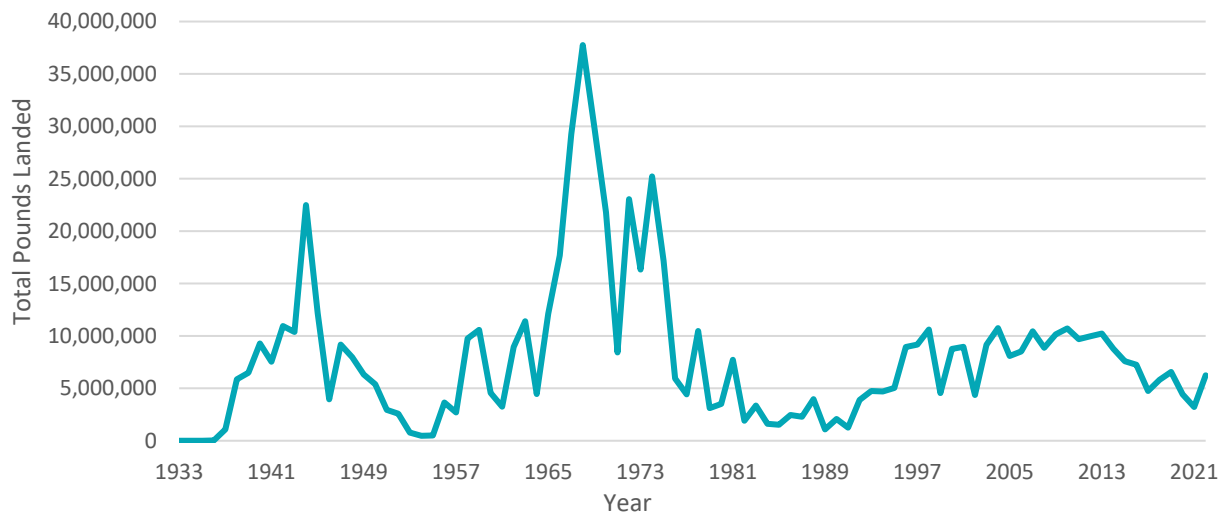


Figure 1. Historical landings of albacore tuna into Oregon from 1933-2022.

2022 COMMERCIAL ALBACORE FISHERY

Ocean Conditions and Fleet Activity

Warm sea surface temperatures approached from the southwest and settled along the Oregon coast in early July (Figure 2). After the slow start of the 2021 season, many fishers among the fleet were unprepared for reliable albacore catch at the beginning of July in 2022. The California fleet had yet to arrive in their usual Oregon ports and many vessels were still participating in other fisheries. As warm temperatures continued to fill in along the coast, and reports of unusually high catch rates spread from the south coast, most vessels shifted focus to albacore by the end of July. Conditions remained ideal through mid-August and many fishers reported record breaking catch days that had not been experienced in years. Around the third week of August, a wide chlorophyll band is suspected to have caused the catch rate to drop significantly and temporarily stalled landing rates. This effect was fleeting and did not deter the fleet as reports of high catch rates along the south coast were prominent. In early September the market became saturated, and many fishers had to wait on buyers to offload their fish. This affected their

ability to complete as many trips as conditions would have allowed. Fishing and ocean conditions remained optimal into October with the usual fall weather patterns yet to appear, but the persisting market conditions had a significant impact on the fishery and ultimately signaled the end of the 2022 season. By mid-October, warm sea surface temperatures began retreating from the coast and most of the fleet had shifted focus to other fisheries.

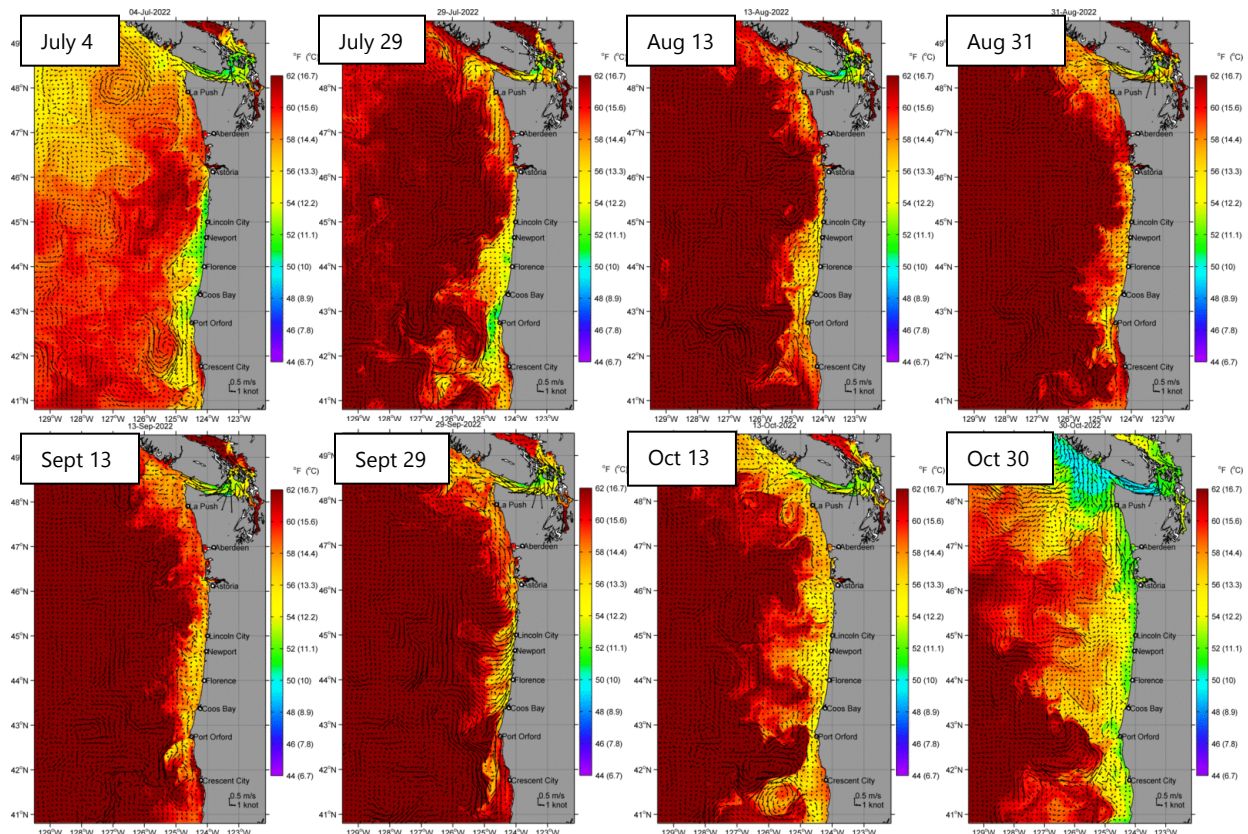


Figure 2. Sea surface temperature plots off Oregon and Washington July 4 – October 30, 2022. Images courtesy of Craig Risien, Oregon State University, Northwest Association of Networked Ocean Observing Systems (NANOOS).

Albacore Landings

The preliminary estimate of total albacore volume landed in Oregon during the 2022 season is 6,239,053 pounds. This reflects 91% of the prior ten-year average of 6.86 million pounds from 2012-2021. When comparing the 2022 season to the prior five-year average from 2017-2021, landed volume represents an increase of 26%, which translated to many content fishers and eventually a saturated market. The landings occurred over 692 total trips, reflecting 65% of the ten-year average of 1,063 trips from 2012-2021 and 81% of the five-year average of 853 trips from 2017-2021 (Figure 3). When analyzing the 2022 season against the prior five years, the 26% increase in average volume coupled with a 19% decrease in average trip count, indicates a high catch rate that corroborates reports from the fleet.

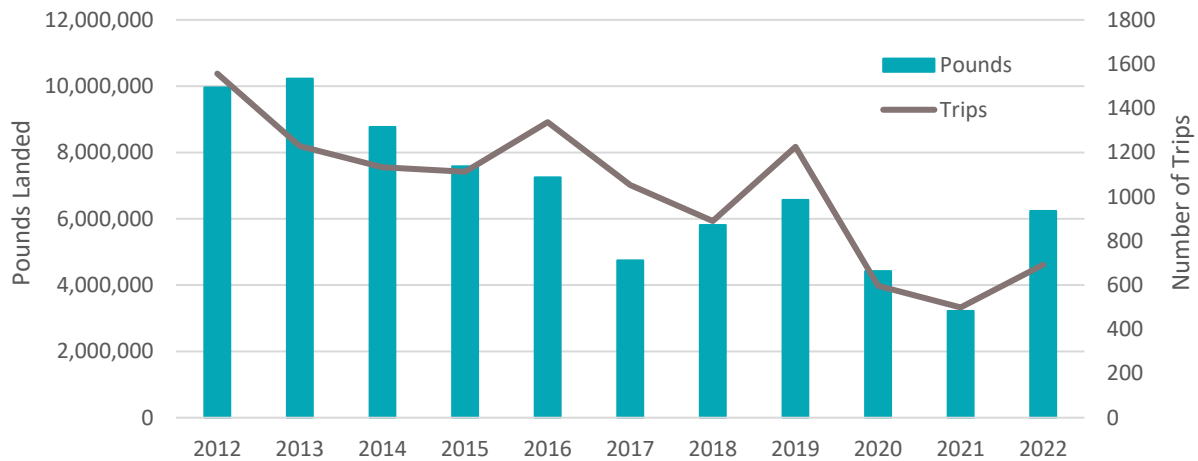


Figure 3. Total pounds of albacore landed (left axis) and number of albacore vessel trips (right axis) in Oregon by year, 2012-2022.

There were 251 unique vessels that targeted albacore over the 2022 season. This represents 76% of the ten-year average of 329 vessels and 93% of the five-year average of 269 vessels. This year’s participating fleet was up 31% from 2021, an increase of 59 vessels (Figure 4).

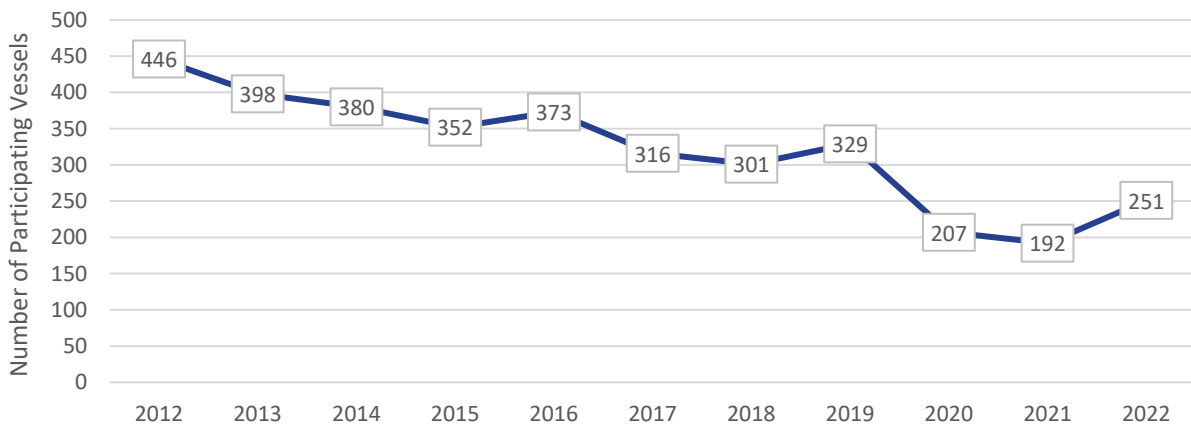


Figure 4. Total number of unique vessels landing albacore in Oregon, 2012-2022.

The first landing among the Oregon fleet took place on June 30 in Charleston, which initiated the 2022 season along the Oregon coast. As warm sea surface temperatures moved up the coast, the first offload in Newport was on July 10, followed by Garibaldi on July 17 and Astoria on July 22. Landing rate quickly accelerated in August fueled by reports of very high catch rates coastwide. Peak season volume occurred during the week of August 15, with 934,000 pounds landed (Figure 5). The chlorophyll event in late August noted above likely caused landings to decline sharply as reports of fish dispersion and

significantly lower catch rates were numerous. However, as September approached, reports of improved catch rates along the south coast spread northward and landings spiked again at the beginning of the month. It was also around this time that the market became saturated, and many vessels had trouble selling their fish, limiting their ability to make additional trips. This is evident in Figure 5 by the trip line plateau at the start of September and eventual decline as the month progressed. With good weather and fishing conditions persisting into October, the saturated market initiated the end of the season, with the last landing occurring on October 21 in Charleston, and rounding out the season at 6.2 million pounds.

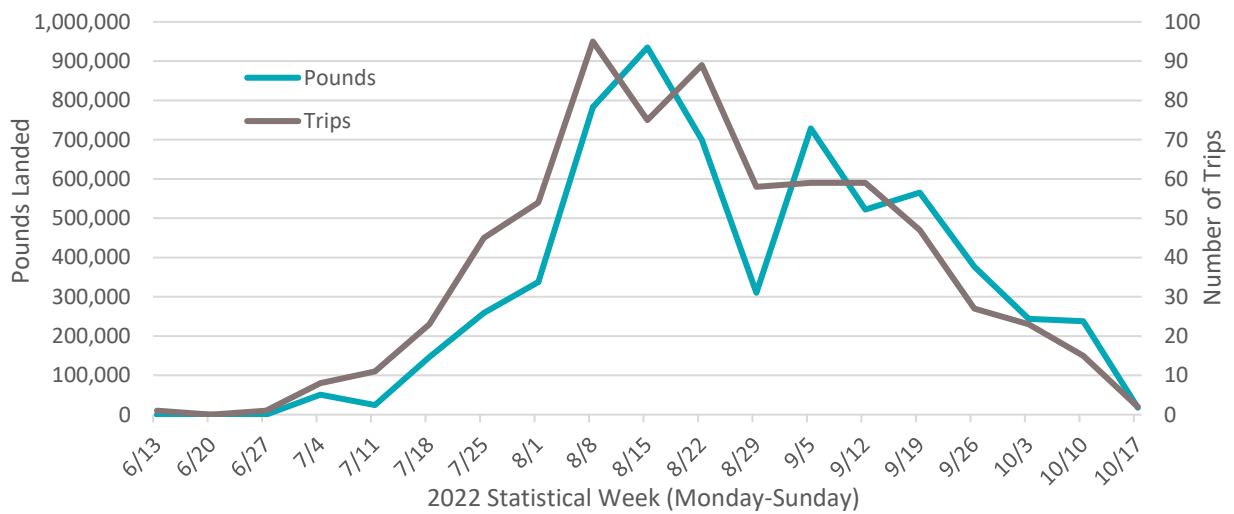


Figure 5. Total pounds of albacore landed (left axis) and number of albacore vessel trips (right axis) per week in 2022.

The temporal distribution of landings is indicative of a typical albacore season, with a slower start in July of 480,000 pounds landed, representing 7.7% of the season total (Figure 6). August was again the highest producing month at 2.88 million pounds landed and 46% of the total season volume. September ended strong with 2.38 million pounds landed and accounts for 38% of the season’s total volume. If not for the stalled and saturated market, September may have rivaled August for the top volume month of the season. October, which found fishers still dealing with the effects of a slow market and weather patterns in the forecast, accounts for 8.1% of the season’s volume at 503,000 pounds landed.

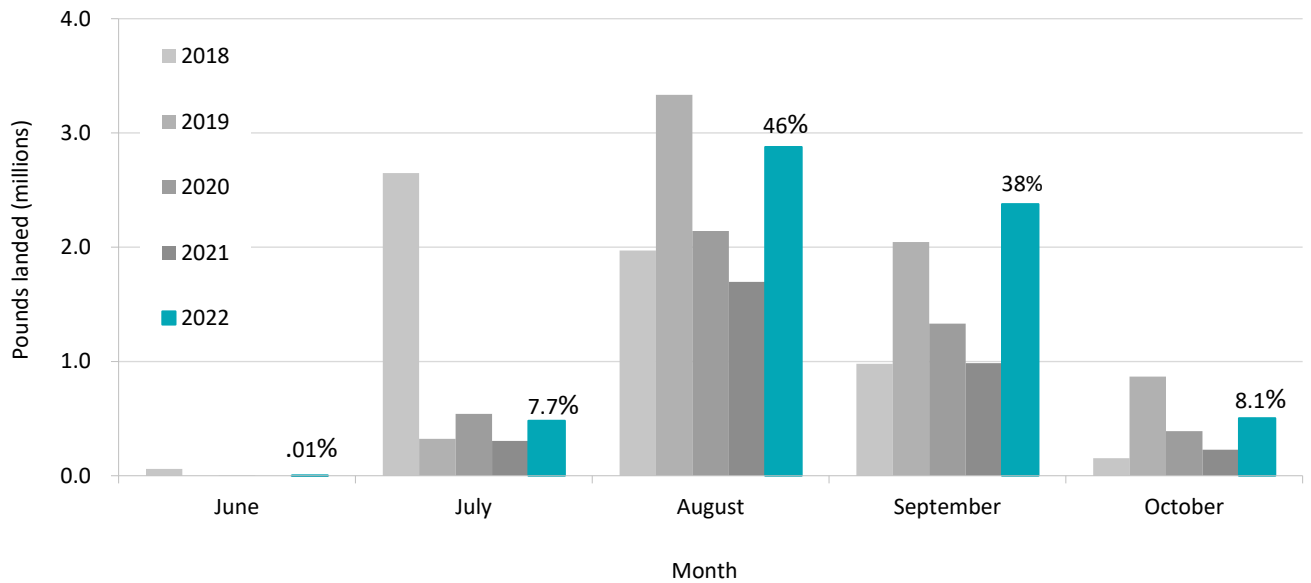


Figure 6. Monthly distribution of pounds landed over the albacore season, 2018-2022.

Albacore landings were spatially distributed along the coast with 61% (3.8M lbs.) of the volume offloaded in Newport. Charleston comes in at a distant second with 20% of the season’s volume total (1.28M lbs.). Garibaldi again surpassed Astoria’s landing volume, coming in at 10% (616k lbs.) and 5% (293k lbs.), respectively. Winchester Bay accounts for 2% of landing volume. ‘Other’, which consists of ports Gearhart-Seaside, Pacific City, Salmon River, Depoe Bay, Florence, Bandon, Port Orford, Gold Beach, and Brookings also accounts for 2% of the total season volume. (Figure 7).

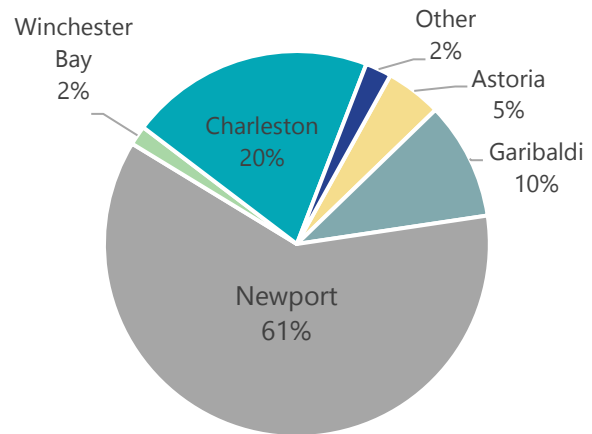


Figure 7. Landing volume percent by port, 2022.

Over the 2022 season, Garibaldi landing volume reached a record high for the port (Table 1), beating out the previous record from 1994 of 438,000 pounds. This continues the recent trend of the stark decrease of landings in Astoria coupled with an increase into Garibaldi. This trend is examined in more detail in the [2021 annual report](#)¹.

Table 1. Albacore landings by port for 2022 (pounds and percentage) and average landings (pounds and percentage), 2012-2021.

Port	2022		10-Year Average	
	Landings (lbs)	Landing %	Landings (lbs)	Landing %
Newport	3,809,687	61.06%	2,955,806	43.11%
Charleston	1,280,876	20.53%	1,777,669	25.93%
Astoria	293,530	4.70%	1,547,266	22.57%
Garibaldi	616,437	9.88%	265,629	3.87%
Winchester Bay	101,861	1.63%	140,826	2.05%
Brookings	75,066	1.20%	109,333	1.59%
Port Orford	33,462	0.54%	26,958	0.39%
Gold Beach	15,318	0.25%	4,018	0.06%
Bandon	4,876	0.08%	4,651	0.07%
Gearhart-Seaside	4,022	0.06%	3,143	0.05%
Florence	1,693	0.03%	15,417	0.22%
Pacific City	1,420	0.02%	6,476	0.09%
Depoe Bay	410	0.01%	3,326	0.05%
Salmon River	395	0.01%	314	0.00%

The average size of all albacore landings in 2022 was 9,017 pounds, a 42% increase from the average landing size from 2013-2021 of 6,321 pounds. This indicates that either larger vessels participated in the fishery this season, or participating vessels returned to port with more volume in their fish holds than previous years. Overall, vessels of all sizes were able to make trips this season and there were no substantial limiting factors, such as weather or distance to the fishing grounds, that kept the smaller vessels in port.

Dividing all landings into quartiles by total pounds reveals the wide range of landing size in this fishery. While the largest landing of the season was over 100,000 pounds, the median landing was only 3,923 pounds. 75% of all landings were 10,829 pounds or less (Table 2). This highlights that, while there may have been an influx of slightly larger vessels this season, the fishery is still largely dominated by medium and small vessels.

¹

<https://www.dfw.state.or.us/MRP/publications/docs/2021%20OR%20Annual%20Albacore%20Report.pdf>

Table 2. Quartile ranges of all commercial albacore landings, 2022.

All Landings		
Quartile		Pounds
100%	Max	116,335
75%	Quartile	10,829
50%	Median	3,923
25%	Quartile	1,323
0%	Min	26
	Average	9,017

Albacore Prices and Value

The albacore fishery experienced the highest average price per pound in its history over the 2022 season at \$2.28, beating out the 2017 season by fractions of a cent. The first landings of the season are typically rewarded with the highest prices of the season, but this trend continued through August, which kept the average price around \$2.50 per pound. The price began to decrease as market saturation took effect in early September and continued its overall decline until season’s end (Figure 10).

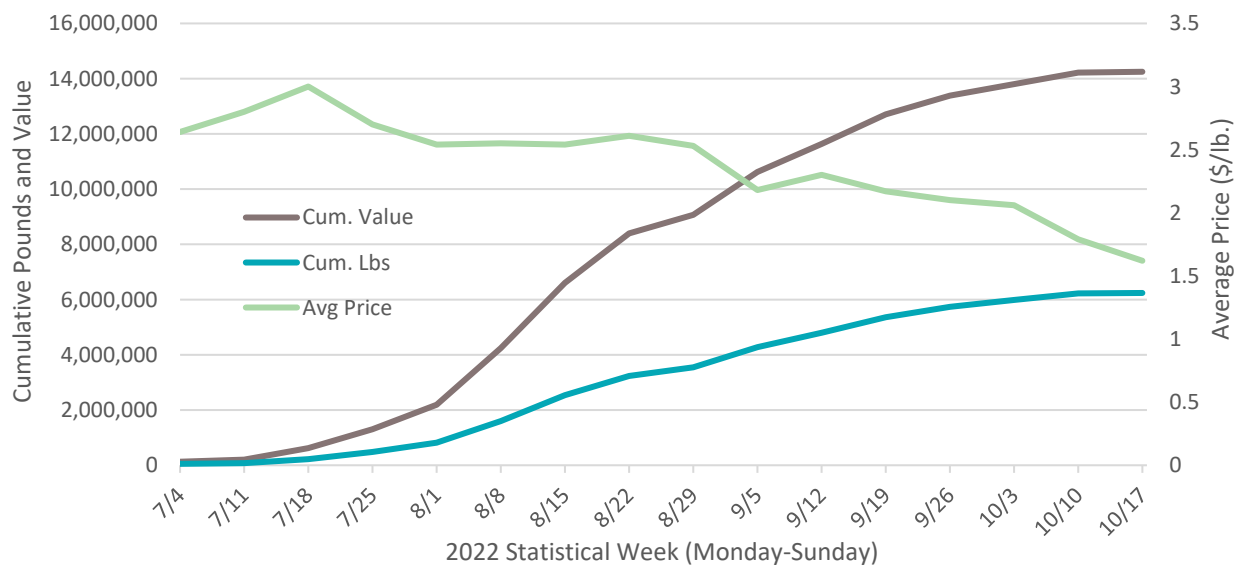


Figure 10. Cumulative landings, cumulative ex-vessel value, and average price by week in 2022. The week of June 13 and June 27 had less than three landings and have been omitted for confidentiality purposes.

The 2022 Oregon albacore season generated \$14,250,000 in total gross value paid to vessels (Figure 11), a 31% increase from the prior ten year average of \$10,911,514. The average ex-vessel trip values at just over \$20,000, a 53% increase from the average trip valued at \$13,000 in 2021.

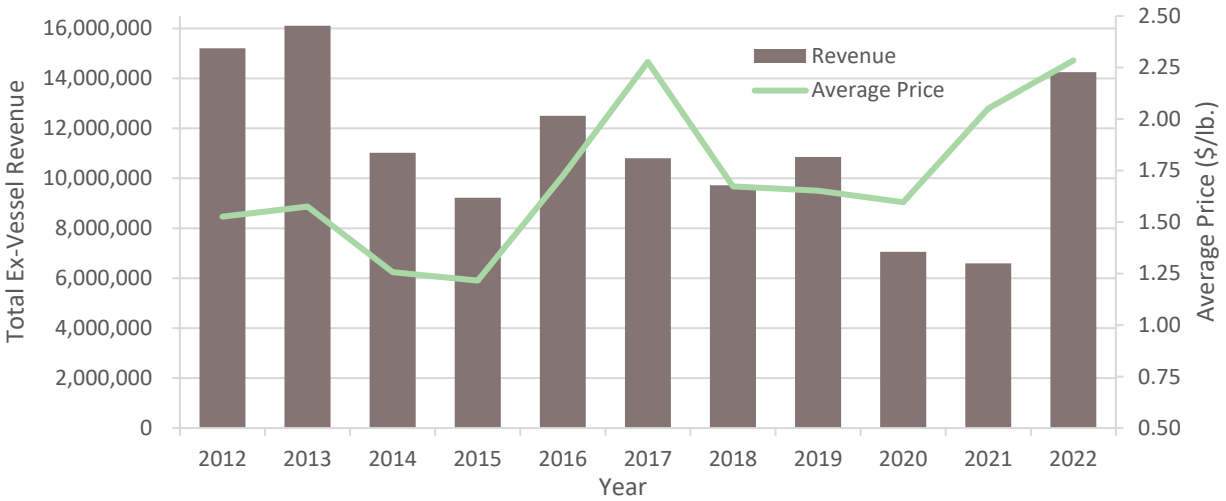


Figure 11. Total revenue (ex-vessel) and average price of Oregon albacore landings, 2012-2022.

Albacore typically ranks fourth or fifth for total annual revenues generated in Oregon marine fisheries. This year, albacore revenue ranks fifth relative to other Oregon fisheries, representing 10.9% of the total annual revenue (Table 3).

Table 3. Oregon annual marine fish revenue (ex-vessel) for calendar year 2022 through December 31 for all fishery species except for albacore, which is through December 8, 2022, for reporting consistency.

Fishery Species	Pounds Landed	Revenue	Revenue Percentage
Dungeness Crab^o	4,924,436	\$31,441,407	24.1%
Groundfish^x	43,964,130	\$20,203,425	15.5%
Pacific Whiting	170,337,147	\$18,885,096	14.5%
Pink Shrimp	41,218,469	\$18,788,254	14.4%
Albacore Tuna	6,239,053	\$14,250,000	10.9%
Sablefish	6,666,222	\$10,846,097	8.3%
Salmon	2,096,143	\$7,562,046	5.8%
All Other Marine Species^{xx}	5,568,877	\$5,329,181	4.1%
Market Squid	5,521,326	\$3,376,634	2.6%
Total	286,535,803	\$130,682,140	100.0%

^oIncludes Bay and Ocean Dungeness fisheries, Jan 1 – Dec. 31, 2022.

^x Groundfish excludes Pacific Whiting and Sablefish.

^{xx} Other marine species includes Pacific Halibut.

Sampling Rate & Coverage Analysis

The sampling rate goals for the 2022 albacore season were negotiated under the contract with NMFS and PSMFC, resulting in a 20% sampling goal for the ports of Astoria, Newport, and Charleston. Sampling rate is the percentage of total albacore trips with landings sampled for length frequency in each required port (Astoria, Newport, and Charleston). Sampling coverage rates in the major ports have exceeded contract requirements, with an overall sampling rate of 51% (Table 4). Appendix A presents additional summary information required by the contractual agreement with NMFS and PSMFC for albacore sampling.

Table 4. 2022 preliminary Oregon commercial albacore sampling season summary. Gearhart-Seaside, Pacific City, Salmon River, Depoe Bay, Florence, Bandon, Port Orford, Gold Beach, and Brookings are combined as "Other Ports."

Port	Pounds Landed	Pounds Sampled	Albacore Trips	Trips Sampled	Total Fish Sampled	Average Sample Size	Coverage Rate
Astoria	293,530	187,615	54	24	562	23	44%
Garibaldi	616,437	1,530	72	1	20	20	1%
Newport	3,809,687	3,275,373	346	242	8,079	33	70%
Winchester Bay	101,861	47,748	17	4	95	32	24%
Charleston	1,280,876	1,027,851	129	79	3,028	38	61%
Other Ports	136,662	8,095	74	3	86	29	4%
Total	6,239,053	4,548,212	692	353	11,870	34	51%

The funding for albacore samplers is allocated to cover July through October and allows for samplers in Astoria, Newport, and Charleston. Sampling activities include measuring 20-100 albacore per landing for fork length, collecting information on fishing patterns, distributing logbooks to vessels, and providing information to fishers.

Comparing quartile divisions of all landing weights to sampled landing weights highlights potential sampling bias regarding landing size (Table 5). Large landings are defined as those with weights greater than 75% of all individual albacore trip landing weights (10,829 lbs and up). This year, 40% of sampled landings came from the large landing size, or top 25%, of all landings. While this indicates there continues to be some bias toward sampling larger landings, the trend has decreased from 50% over the last two years. This shows that samplers have effectively captured smaller landings throughout the season. Landings from larger vessels are much easier to predict and access, hence the skewed percentages toward larger landings.

Table 5. Quartile points for all Oregon albacore landings and sampled landings, 2022.

All Landings			Sampled Landings		
Quartile		Pounds	Quartile		Pounds
100%	Max	116,335	100%	Max	116,335
75%	Quartile	10,829	75%	Quartile	18,841
50%	Median	3,923	50%	Median	7,716
25%	Quartile	1,323	25%	Quartile	2,444
0%	Min	26	0%	Min	101
	Average	9,017		Average	12,887

Recommendation for 2023 sampling: Although the rates show improvement as stated above, all samplers should remain cognizant of the tendency to sample larger landings over smaller. Samplers should actively work to form and reinforce connections with fishers operating mid to smaller sized vessels that participate in the fishery. Samplers should also familiarize themselves with mobile buyers that operate from trucks and/or skiff early in the season. Good rapport with local restaurants that purchase albacore may also lead to an increase in smaller landings sampled. For vessels that sell their catch off the boat to the public, samplers should emphasize establishing rapport with these skippers early in the season. These samples often must occur in shifts as fish are unloaded from the boat for purchase in smaller numbers. Often there are frames (carcasses) that can be measured post-sale if the fish were filleted, and the vertebrae were not damaged.

Length Frequency Analysis

Albacore samplers collected fork length measurements from unsorted commercially harvested albacore during offloading from July through October of 2022. Samplers measured 11,870 albacore over the course of the 2022 season. The frequency distribution of 2022 length data shows a unimodal distribution with its center at 69 cm and a larger tail to the right indicating the presence of larger fish among the catch (Figure 13). The overall average length is 70.3 cm, representing fish weighing approximately 16.2 pounds and aged roughly 2.8 years. Notable this season was the presence of an albacore that measured 104 cm (approximately 46.6 lbs. and 8.9 years), which sets a new maximum size record for commercially sampled albacore in Oregon. The length frequencies obtained from all major ports form similar distributions (Figure 14), indicating no substantial variation in catch coastwide.

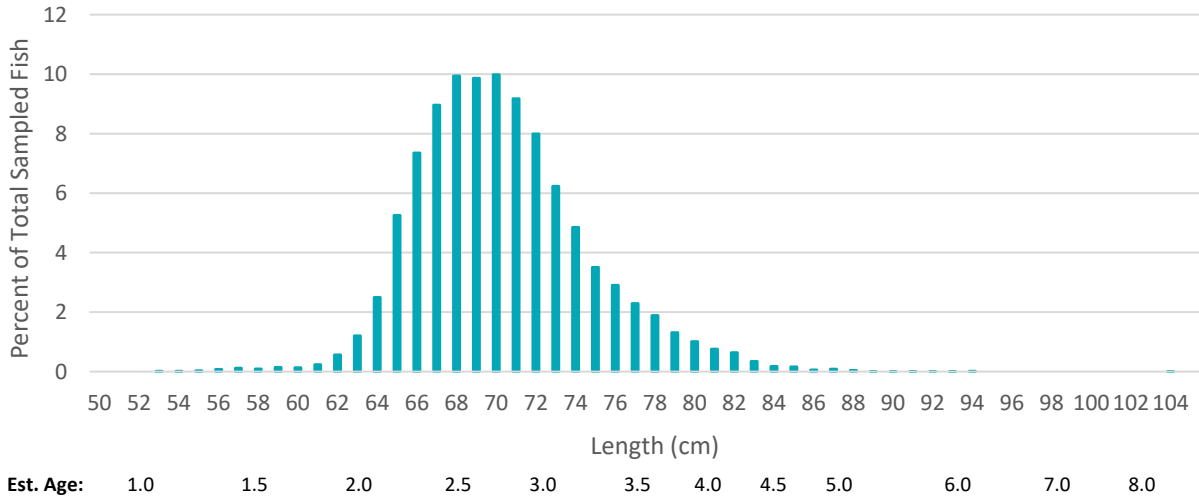


Figure 13. Length frequency data for all sampled ports and all months combined, 2022. Average length = 70.3 cm, n=11,870. Estimated age at length from Wells, 2013.

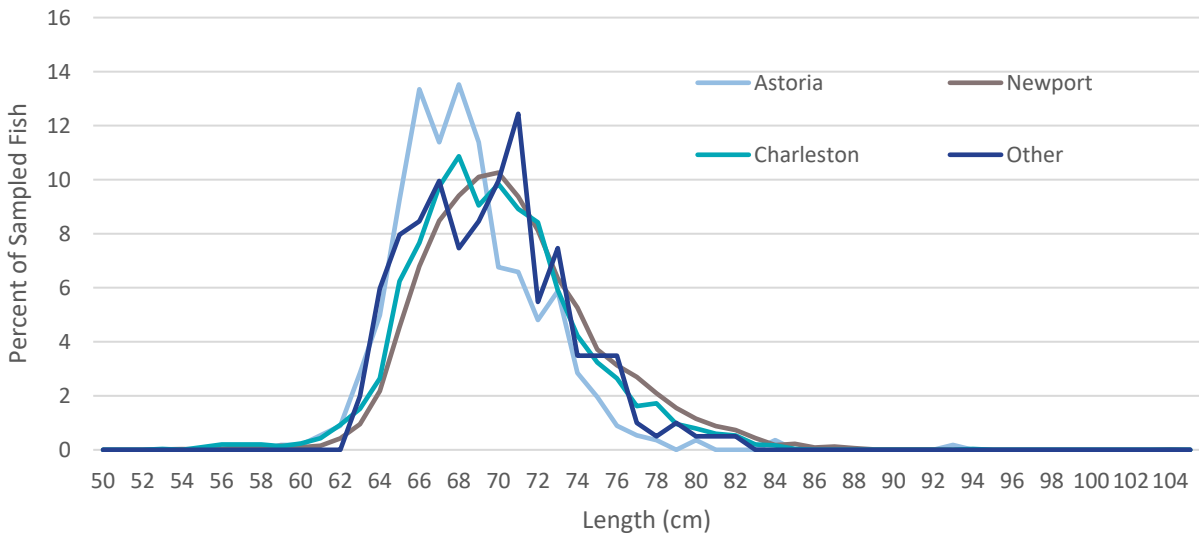


Figure 14. Length frequency data by port for albacore landed in Oregon in 2022. 'Other' consists of samples taken in Garibaldi, Winchester Bay, Port Orford, and Brookings. Average length and sample size by port: Astoria 68.4 cm, n = 562; Newport 70.6 cm, n = 8,079; Charleston 69.8 cm, n = 3,028; Other 69.6 cm, n = 201.

Many buyers sort albacore into three grades upon offloading: small are typically 9 pounds and under (<59 cm), medium range from 9-17 pounds (59-72 cm) and large are typically over 17 pounds (>72 cm). These variations are based on buyer needs and are subject to fluctuation. The grade sizes stated above were used for analysis in [Figure 15](#).

Changes in size grade throughout the season were marked by a large percentage of medium grade fish early in the season that declined as the season progressed. This was

coupled with a steady increase in the proportion of large grade fish through September and October, with the largest fish observed in October. Small grade fish were nearly nonexistent this season, only appearing in October as 2% of the sampled catch (Figure 15).

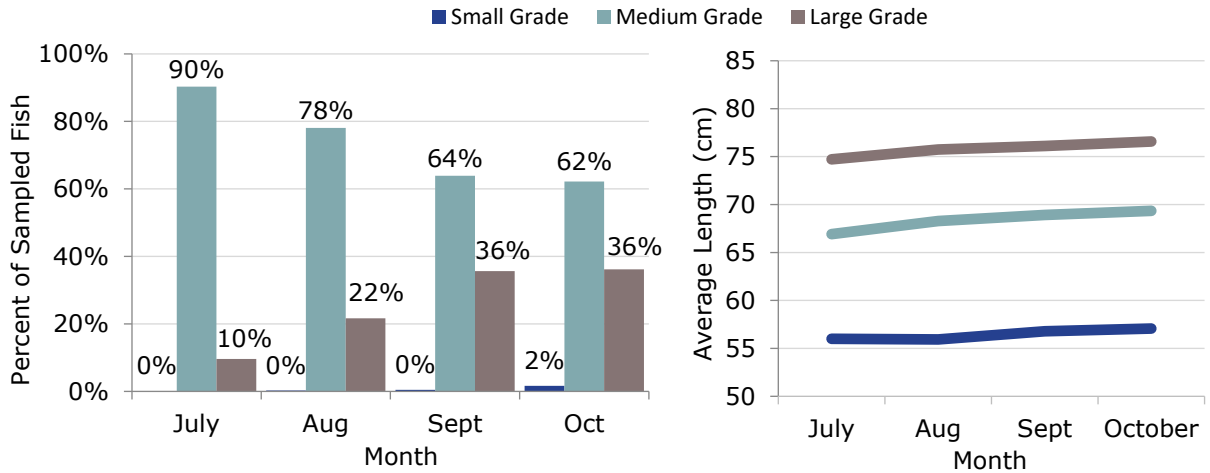


Figure 15. Proportion (left) and average length (right) of small, medium, and large grade fish sampled per month in 2022. Small: n = 42; Medium: n = 8,706; Large: n = 3,122.

Plotting these length frequencies by month allows visualization of age class shifts that occur among the samples throughout the season. The larger fish arrive later in the season, coupled with a slight increase in younger, small grade fish (Figure 16). A minimum monthly average length of 67.6 cm was recorded in July and a maximum monthly average of 71.7 cm was recorded in October.

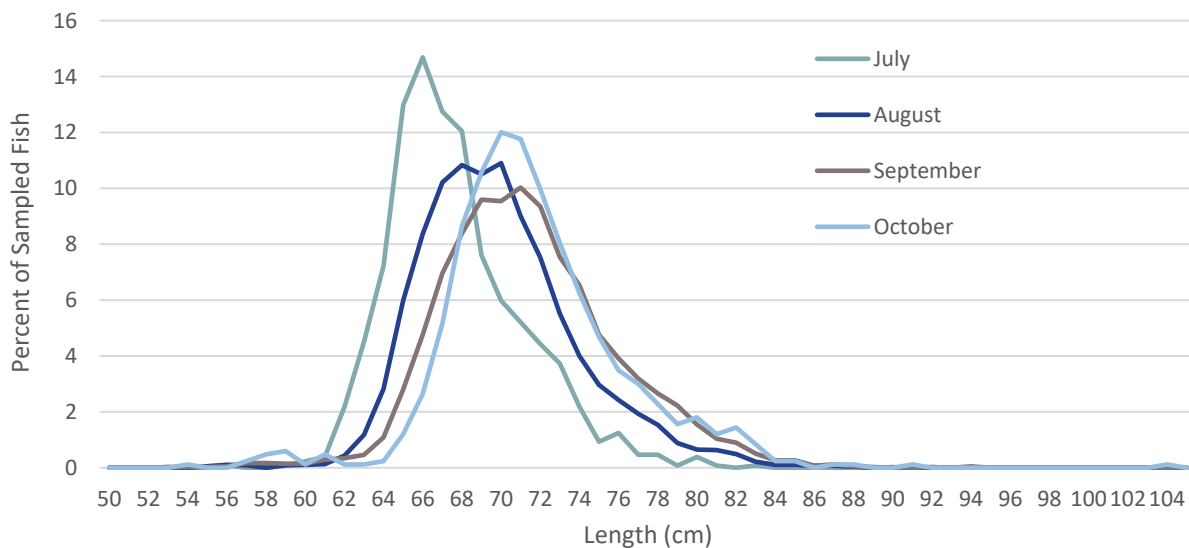


Figure 16. Comparison of length frequency distributions by month from July-October 2022 for all ports. Average length and sample size by month: July 67.6 cm, n = 1,287; August 69.9 cm, n = 5,532; September 71.4 cm, n = 4,139; October 71.7 cm, n = 912.

During the 2021 season, there was concern among the fleet regarding the stark bimodal distribution of fish in the small and large size grades, with few medium sized fish among the catch. Figure 17 plots the 2021 length distributions as a backdrop to the length distributions observed this year, which shows an apparent natural age progression and robust medium size grade among the albacore that were landed and sampled during the 2022 season.

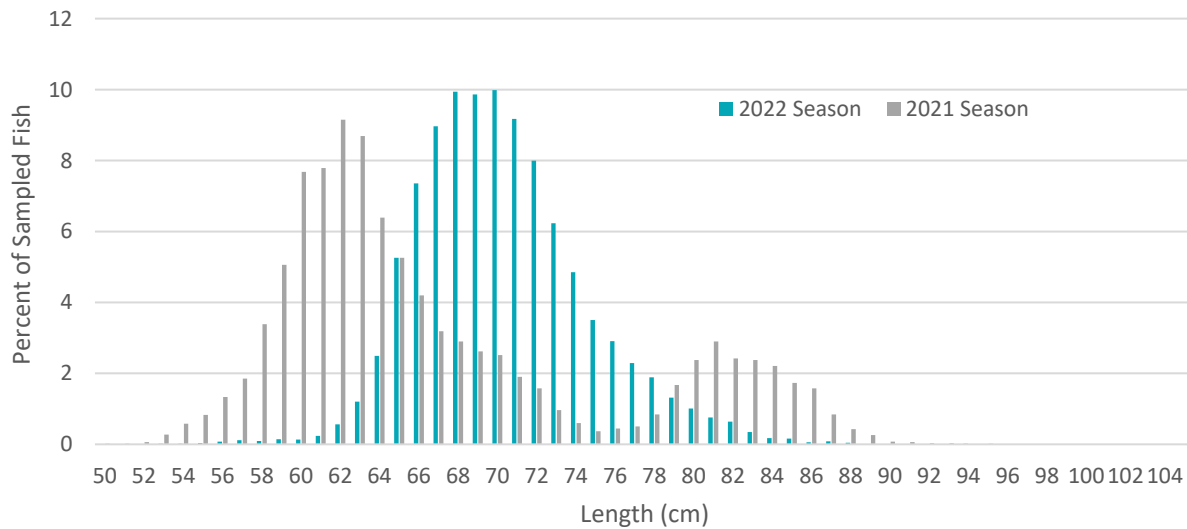


Figure 17. Length frequency data for 2022 plotted against 2021 length frequencies. Average length and sample size: 2021 67.2 cm, n = 6,524; 2022 70.3 cm, n = 11,870.

2022 RECREATIONAL ALBACORE FISHERY

ODFW’s Ocean Recreational Boat Survey (ORBS) deploys samplers to monitor Oregon’s sport fisheries and provide estimates of overall effort and catch. In this report, we combine the charter and private effort and catch estimates for the recreational fishery. There were an estimated 29 charter trips and 1,476 private recreational trips over the 2022 season. An estimated total of 21,823 albacore were caught in the recreational fishery and 944 of those were measured for fork length.

Access to albacore for recreational vessels in Oregon can be highly variable, depending on weather conditions and distance offshore to the fishing grounds. A potential limiting factor during the 2022 season was the cost of fuel, which reached a record average high in

Oregon of \$5.54 on June 15. The cost of fuel slowly declined as the season continued but remained above average throughout. Recreational activity was largely unimpeded by weather events until late September when winds and swell became precarious for the smaller vessels that comprise the recreational fleet. Recreational catch was likely also impacted by the same chlorophyll band that affected the commercial fishery, but overall, distance to the fishing grounds remained favorable for the small boat fleet throughout the season.

Recreational catch occurred in June, July, August, and September and like the commercial fishery, the highest catch volume took place in August (Table 6). The CPUE seen in August and September further confirms the high catch rate seen in the commercial fishery. There was little effort observed in October (10 anglers) and no sampled or estimated catch to report.

Table 6. Recreational catch, effort (number of anglers), and CPUE per month, 2022.

Month	Catch	Effort	CPUE
June	30	5	6.00
July	1,657	599	2.77
August	14,174	3,577	3.96
September	4,740	1,131	4.19
October	0	10	0.00

Recreational activity occurred in nearly every Oregon port, although data reported is limited to the ports that had recreational samplers during the albacore season. Garibaldi had the highest estimated volume at 5,066 albacore caught when targeted (Table 6) and Brookings had the highest catch rate with a CPUE of 7.17 (Figure 18). There was an estimated 20,601 albacore caught when targeted and 1,222 estimated albacore caught from non-albacore directed trips.

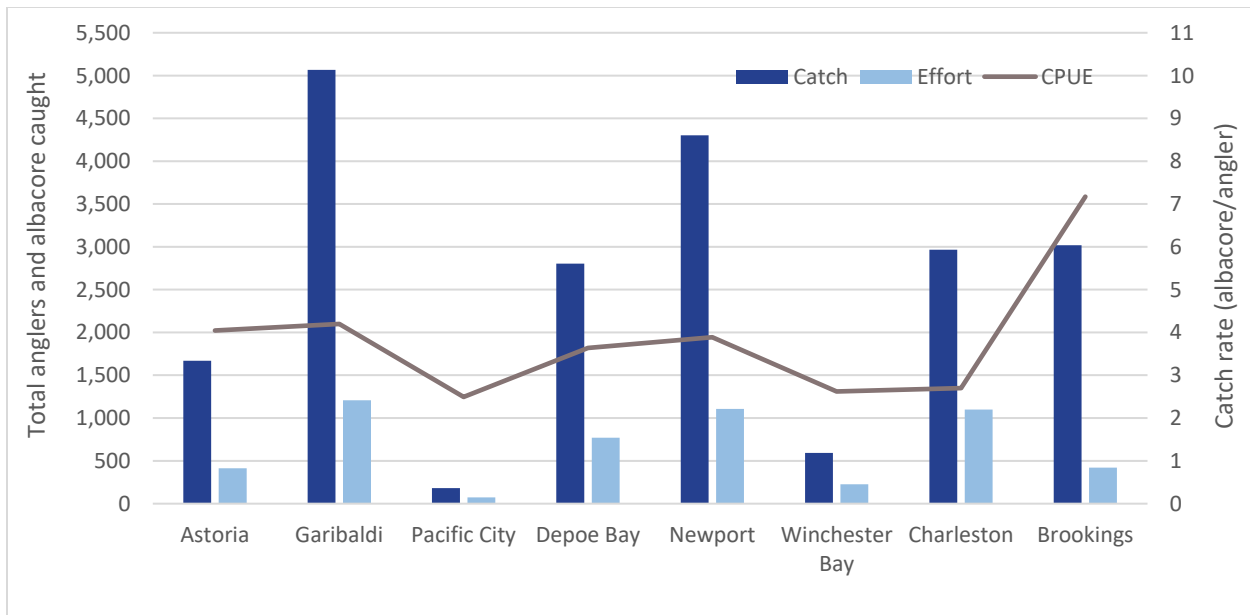


Figure 18. Recreational catch, effort (number of anglers), and CPUE by port, 2022.

Table 7. Estimated recreational albacore catch for each sampled port for albacore directed trips in 2022.

Port	Estimated # of fish	Landing %	CPUE
Astoria	1,670	8.1%	4.04
Garibaldi	5,066	24.6%	4.20
Pacific City	182	0.9%	2.49
Depoe Bay	2,803	13.6%	3.64
Newport	4,302	20.9%	3.89
Winchester Bay	592	2.9%	2.62
Charleston	2,967	14.4%	2.70
Brookings	3,019	14.7%	7.17

The CPUE for all sampled ports combined over the 2022 season is 3.87, which is a 9% increase from the prior ten-year average CPUE of 3.55 (Figure 19).

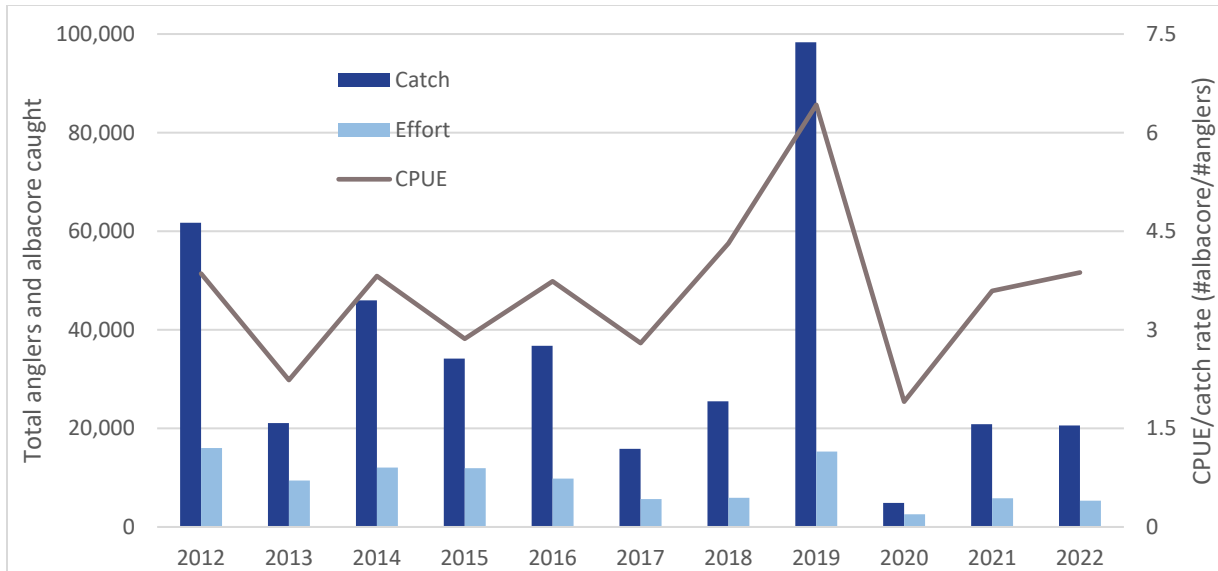


Figure 19. Recreational albacore fishing effort (number of anglers), catch (number of albacore landed) and catch per unit effort (CPUE or albacore per angler) from trips targeting albacore, 2012-2022.

ORBS samplers collected length data on 944 recreationally harvested albacore in 2022. Figure 20 shows the length frequency distribution of non-sorted, randomly sampled albacore during the 2022 recreational season. The length distribution is similar to the commercial fishery with a single mode around 69 cm and a larger tail trailing to the right. The overall average length is 70.3 cm, which is the same as the commercial results (Figure 20).

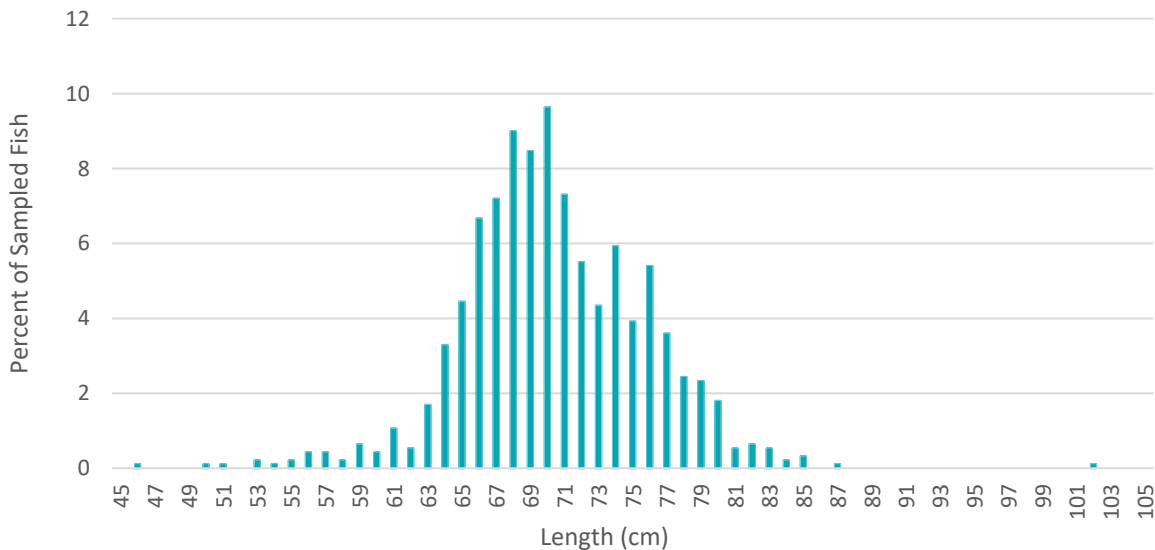


Figure 20. Length frequency data for all ports sampled for recreationally caught albacore by ORBS, 2022. Average length = 70.3 cm, n = 944.

ACKNOWLEDGEMENTS

Thank you to all albacore fishing vessel operators and crew who cooperatively provided fishing information during the 2022 season, as well as fish plant staff and buyers who supported and assisted with efficient sampling on their property. Many thanks to Joel Prickett in Charleston and Alexis Fulcer and Jim Marketti in Astoria as primary albacore samplers. Thanks also to ODFW Port Biologists and staff for collecting additional samples and distributing logbooks: Sheryl Flores, Jonathan LaTour, Scott Malvitch, Lauren Meader, Katlyn Haven, Valerie Miranda, and Camille Ayrea. I am grateful to Nadine Hurtado for her support with fish ticket data and reconciliation. Thanks to Ellen Veile-Smuts and Amanda Reich for their assistance in the office setting. Thank you to Jessica Moll and Justine Kenyon-Benson for providing the ORBS recreational data component for monthly and annual reports. Many thanks to Craig Risien of OSU/NANOOS for the sea-surface temperature images in figure 2. In addition, many thanks to Yuhong Gu of the NMFS Southwest Fisheries Science Center for technical and data support and to Chris Wheaton and Kate Al-Sheikhly of Pacific States Marine Fisheries Commission for contract administration support. A special thanks to Cameron Sharpe and Jessica Watson of ODFW for their steady professional assistance and support. Finally, a huge and warm thank you to Keith Matteson for his continued guidance and advice.

Cover photo: Sammi Cadwallader shows off an albacore she hauled in and a full deck after a busy, high catch day during the 2022 season.

REFERENCES

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APPENDIX A

2022 Summary Statistics for Oregon's Albacore Port Sampling Program

PORT NAME	Astoria	Garibaldi	Newport	W. Bay	Charleston	Other Ports	TOTAL
Logbooks issued	1	0	6	0	2	1	10
Lbs. landed by commercial sampled vessels	187,615	1,530	3,275,373	47,748	1,027,851	8,095	4,548,212
Total number of commercial fish measured	562	20	8,079	95	3,028	86	11,870
No. commercial trips sampled	24	1	242	4	79	3	353
Total no. of commercial trips/landings	54	72	346	17	129	74	692
Total no. of commercial vessels*	22	29	139	10	56	37	293
Lbs. landed by US vessels	293,530	616,437	3,625,980	101,861	1,280,876	136,662	6,055,346
Lbs. landed by Canadian vessels	0	0	183,707	0	0	0	183,707
Total lbs. landed by all commercial vessels	293,530	616,437	3,809,687	101,861	1,280,876	136,662	6,239,053
Lbs. landed by sport vessels**	26,052	79,030	67,111	9,235	46,285	93,662	321,375
Percent commercial sampling coverage (trips)	44%	1%	70%	24%	61%	4%	51%

* Several vessels made trips into multiple ports, so total numbers of vessels at each port will add up to more than Oregon's total.

** Estimated number of albacore landed in each port multiplied by the 15.6 lb. overall average weight.