REVIEW OF 2021
OCEAN SALMON FISHERIES

Stock Assessment and Fishery Evaluation Document
for the Pacific Coast Salmon Fishery Management Plan

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Owing to low Chinook escapement to the Stanislaus, Tuolumne, and Merced rivers, the majority of the San Joaquin River Basin has been closed to recreational salmon fishing. However, beginning in 2012, recreational angling opportunity was reintroduced on the Mokelumne River, the first such opportunity since 2007. Estimated harvest in the Mokelumne River fishery in 2021 was not available at the time of printing.

Escapement and Management Performance

Commercial harvest in areas from Cape Falcon to latitude 40°10'N were below preseason expectations, while the Fort Bragg, San Francisco, and Monterey management areas greatly exceeded expectations (Table I-7). The June and July commercial quotas in the Oregon KMZ were not attained (Table I-6). Recreational harvest estimates for California areas north of Point Arena were below preseason expectations while more southern areas exceeded harvest expectations. In Oregon, recreational harvest between Cape Falcon and the Oregon/California border was below preseason expectations (Table I-7).

2.1.1 Sacramento River Fall Chinook

Under the 2021 regulations, the projected spawning escapement in the Sacramento River Basin was 133,913 hatchery and natural area fall Chinook adults. A total of 104,483 hatchery and natural area adult spawners were estimated to have returned to the Sacramento River Basin in 2021 (Table II-1, Figure II-1).

Fall Chinook returns to Sacramento River hatcheries in 2021 totaled 31,255 adults and 7,773 jacks, and escapement to natural areas was 73,228 adults and 9,230 jacks. Table II-1 and Figure II-1 display historical natural area and hatchery adult fall spawner escapement estimates. For a more detailed breakdown of the historical escapement see Appendix B, Table B-1. It is important to note that available data indicate that hatchery-origin fish generally constitute a large portion of the Sacramento River naturally spawning fall Chinook population.

In 2018, SRFC met the criteria for overfished status. Under the terms the salmon FMP, SRFC are considered rebuilt when the 3-year geometric mean spawning escapement exceeds the level associated with MSY (S_{MSY}) of 122,000 hatchery and natural area adults. SRFC met this criterion and were determined to be rebuilt in 2021. The geometric mean of adult spawning escapement for years 2019-2021 is 133,192 and therefore SRFC should not be considered overfished.

SRFC are considered to have been subject to overfishing if the estimated exploitation rate exceeds their maximum fishing mortality threshold (MFMT) of 0.78. An estimate of the 2021 SRFC exploitation rate is not yet available. However, fisheries in 2020 resulted in a preliminary exploitation rate of 0.61, which is below the MFMT. Therefore, overfishing did not occur in 2020 (Table II-6).

2.1.2 Sacramento River Winter and Spring Chinook

Spawner escapement of endangered SRWC in 2021 was estimated to be 10,225 adults and 281 jacks. This estimate was derived from three sources: a carcass survey conducted on the upper Sacramento River, SRWC captured in the Keswick trap which provides broodstock to Livingston Stone National Fish Hatchery, and SRWC returns to Battle Creek into and upstream of Coleman National Fish Hatchery as part of the Battle Creek "jumpstart" reintroduction effort.

SRWC spawner escapement estimates derived from Red Bluff Diversion Dam counts began in 1967, and from 1987 to 2008 the estimates were derived by expanding counts made during the period of dam operation (which overlaps with approximately 15 percent of the SRWC migration period). Escapement estimates from the carcass survey are considered to be a better representation of SRWC spawner escapement due to the small proportion of the SRWC migration sampled during the Red Bluff Diversion Dam operation period. Red Bluff Diversion Dam gates were permanently removed in 2012, and escapement estimates based on dam passage are no longer available.

Escapement of spring Chinook to the Sacramento River system in 2021 totaled 8,285 fish (jacks and adults), with an estimated return of 5,642 to upper Sacramento River tributaries and the remaining 2,643 fish returning to the Feather River Hatchery. Estimates of spring Chinook escapement to the upper mainstem Sacramento River are no longer made due to the permanent removal of the Red Bluff Diversion Dam gates in 2012. The method used to estimate the spring Chinook return to the Feather River Hatchery was modified in 2005. In previous years, the estimate was equal to the number of Chinook that entered the hatchery during the early period of Chinook spawning. Since 2005, prior to the spring run spawning period, fish that entered the hatchery are tagged and returned to the river; the number of tagged fish that re-entered the hatchery during the spring run spawning period are used as the estimate of spring Chinook escapement in the Feather River. The fish that are tagged at the hatchery and returned to the river but did not re-enter the hatchery during the spawning period are counted in the natural fall run survey and reported as Feather River fall Chinook. The natural area spawner surveys in the Feather River are not currently capable of separating the spring and fall runs.

Historical spawner escapements for SRWC and spring Chinook salmon are presented in Appendix B, Table B-3.

2.1.3 Sacramento River Late-Fall Chinook

Late-fall Chinook spawning escapement in 2021 was estimated to be 3,637 adults and 269 jacks. These Chinook returned primarily to the Coleman National Fish Hatchery and the upper Sacramento River. These numbers also include late-fall Chinook that returned to upper Sacramento River tributaries and those captured in the Keswick trap for use as broodstock at Coleman National Fish Hatchery (Appendix B, Table B-3 provides historical spawner escapement).

2.1.4 San Joaquin River Fall Chinook

San Joaquin River spawning areas are used primarily by fall Chinook. The estimated San Joaquin River fall Chinook spawning escapement in 2021 totaled 6,676 fish (jacks and adults) in natural areas, and 4,484 fish (jacks and adults) to hatcheries (Appendix B, Table B-2 provides historical spawner escapements). Salmon production in the San Joaquin River is determined largely by spring outflows three years earlier. In most years between 1986 and 2014, spawner returns to the San Joaquin River constituted less than 10 percent of the total Central Valley escapement for fall run Chinook. Since 2015, the San Joaquin contribution has exceeded 10 percent in several years with an average contribution of 14 percent. In 2021, San Joaquin fall Chinook spawners constituted 8.4 percent of the total fall run escapement to the Central Valley.

2.2 Northern California Chinook Stocks

Northern California stocks include fall and spring stocks north of the entrance to San Francisco Bay. Primary river systems in this area are (from north to south) the Smith, Klamath, Mad, Eel, Mattole, and Russian rivers. Coastal Chinook stocks south of the Klamath River were listed as threatened under the ESA in September 1999.

Management Objectives

KRFC were managed in accordance with their control rule, which in 2021 specified a maximum exploitation rate of 25.0 percent, resulting in an expected spawner escapement of 31,574 adults in natural areas. The available harvest of KRFC was shared equally between non-tribal and Klamath River tribal fisheries (tribes with federally-recognized fishing rights). The NMFS ESA consultation standard for California Coastal Chinook limited the ocean harvest rate on age-4 KRFC to a maximum of 16 percent.

Regulations to Achieve Objectives

To achieve the management objectives for KRFC and California Coastal Chinook, the adopted regulations were designed to result in: (1) a Klamath River run of 62,121 fall Chinook adults, resulting in a spawner escapement of 31,574 adults to natural areas, taking into account projected river fishery impacts of 10,089 adults and returns to basin hatcheries; (2) 50 percent (8,135) of the allowable adult harvest for tribal subsistence and commercial fisheries; (3) 15.0 percent (1,221) of the non-tribal harvest to the Klamath River recreational fishery; and (4) 7.7 percent (531) of the ocean harvest to the KMZ recreational fishery. The age-4 ocean harvest rate resulting from the above configuration was forecast to be 10.5 percent. Season and size limit details are presented in Tables I-1 and I-3.

The primary constraint to commercial and recreational fisheries south of Cape Falcon in 2021 was meeting the minimum escapement goal for KRFC.

Commercial

Oregon fisheries between Cape Falcon and the Heceta Bank line were open from March 20 through April 30. The Chinook fishery from Cape Falcon to Humbug Mountain was open from May through August with periodic closures. The fishery in this region re-opened for the months of September and October with a weekly landing and possession limit of 75 Chinook. The Oregon portion of the KMZ was open without a quota for a portion of March, all of April and portions of May. Monthly quotas, with weekly landing and possession limits, occurred in June and July (see table I-6). Quotas were adjusted in-season (see table C-9). The California portion of the KMZ was closed to commercial fishing in 2021. The Fort Bragg management area was open for the first 17 days in August and the month of September (Table I-3).

Recreational

The Chinook fishery between Cape Falcon and Humbug Mountain was open from March 15 through October 31. The Oregon KMZ was open for Chinook retention from June 19 through August 15, while the California KMZ was open from June 29 through August 1. The Fort Bragg management area was open from June 29 through October 31 (Table I-3).

Inside Harvest

Yurok and Hoopa Valley tribes shared a federally-reserved right of 50 percent (8,135) of the available harvest surplus of adult Klamath fall Chinook. Tribal adult harvest was 8,066 (Yurok: 5,440 adults; Hoopa Valley: 2,626 adults), which was 99 percent of the tribal allocation (Appendix B, Tables B-4, and B-5). An estimated 2,265 fall Chinook adults were harvested in the Klamath River basin recreational fishery in 2021, exceeding the expected harvest. Harvest estimates for streams outside the Klamath River Basin were not available.

Escapement and Management Performance

Commercial harvest in areas from Cape Falcon to latitude 40°10'N were below preseason expectations, while the Fort Bragg, San Francisco, and Monterey management areas substantially exceeded expectations (Table I-7). The June and July commercial quotas in the Oregon KMZ were not attained (Table I-6). Recreational harvest estimates for California were lower than projected north of latitude 40°10'N, while more southern areas exceeded expectations. In Oregon, recreational harvest between Cape Falcon and Humbug Mountain, and the Oregon KMZ, were below preseason expectations (Table I-7).

2.2.1 Threatened California Coastal Chinook

Historical indices of spawner abundance, or actual spawning escapement estimates, for Chinook salmon in California coastal streams outside of the Klamath River Basin have been limited. Cursory, nonsystematic surveys had been conducted on Tomki Creek (Eel River Basin), Sprowl Creek (Eel River Basin), and Cañon Creek (Mad River Basin), but the surveys on Sprowl and Cañon creeks were discontinued in 2016. However, there have been recent increases in survey effort. Video counts of Chinook passage at Mirabel Dam on the Russian River began in 2000. Additional Chinook escapement estimates or redd counts for Redwood Creek, the Mad River, the mainstem Eel River, the South Fork Eel River, and the Mattole River are now available and will be reported on an annual basis. These streams are considered important spawning habitat for California Coastal Chinook. Historical spawning stock surveys for these northern California coastal rivers are presented in Appendix B, Table B-7.

2.2.2 Klamath River Fall Chinook

The 2021 preliminary postseason river run size estimate for KRFC was 53,954 adults compared to the preseason-predicted ocean escapement (river run size) of 62,121 adults. The escapement to natural spawning areas was 29,942 adults, which was 95 percent of the preseason prediction of 31,574 adults. The estimated hatchery return was 12,850 adults. Jack returns to the Klamath Basin totaled 10,334 including 6,622 that escaped to natural spawning areas. Table II-2, Figure II-2, and Appendix B, Table B-4 present historical harvest and escapement estimates for KRFC.

Spawning escapement to the upper Klamath River tributaries (Salmon, Scott, and Shasta rivers), where spawning was only minimally affected by hatchery strays, totaled 9,169 adults. The Shasta River has historically been the most important Chinook salmon spawning stream in the upper Klamath River, supporting a spawning escapement of 27,600 adults as recently as 2012 and 63,700 in 1935. The escapement in 2021 to the Shasta River was 5,972 adults. Escapement to the Salmon and Scott rivers was 1,890 and 1,307 adults, respectively (Appendix B, Table B-6).

In 2018, KRFC met the criteria for overfished status. Under the terms of the salmon FMP, KRFC are considered rebuilt when the 3-year geometric mean spawning escapement exceeds the level associated with MSY (S_{MSY}) of 40,700 natural area adult spawners. The geometric mean of adult spawning escapement in natural areas for years 2019-2021 is 25,039, therefore KRFC remain overfished (Table II-6).

KRFC are considered to have been subject to overfishing if the estimated exploitation rate exceeds their maximum fishing mortality threshold (MFMT) of 0.71. An estimate of the 2021 KRFC exploitation rate is not yet available. However, fisheries in 2020 resulted in a preliminary exploitation rate of 0.30, which is lower than the MFMT. Therefore, overfishing did not occur in 2020 (Table II-6).

2.3 Oregon Coast Chinook Stocks

Oregon Coast Chinook stocks include all fall and spring stocks from Oregon streams south of the Columbia River. These stocks are categorized into two major subgroups based on ocean migration patterns. Although ocean harvest distributions overlap somewhat, they are categorized as either north or south/local migrating. North migrating Chinook stocks include stocks from the Elk River north, except for Umpqua River spring Chinook. South/local migrating Chinook stocks include Rogue River spring and fall Chinook, Umpqua River spring Chinook, and fall Chinook from smaller rivers south of the Elk River.

Based on CWT analysis, the populations from 10 major north Oregon Coast (NOC) river systems from the Nehalem through the Siuslaw Rivers are harvested primarily in PSC ocean fisheries off B.C., SEAK and Oregon terminal area fisheries. NOC stocks are harvested to a much lesser degree in Council-area fisheries off Washington and Oregon. Analysis of CWTs indicates the populations from five major mid-Oregon Coast (MOC) systems between the Coos and the Elk rivers are harvested primarily in ocean fisheries off B.C., Washington, Oregon, and in terminal area fisheries. Minor catches occur in California fisheries and variable catches in SEAK troll fisheries. South/local stocks are important contributors to ocean fisheries off Oregon and northern California. Another central Oregon stock, Umpqua River spring Chinook, contributes primarily to ocean fisheries off Oregon and California, and to a lesser degree, off Washington, B.C., and SEAK.

Management Objectives

The conservation objective for the northern and central Oregon Coast Chinook stock complexes was an aggregate of 150,000 to 200,000 natural adult spawners, as indicated by peak spawner counts of 60 to 90 fish per mile in standard index surveys. These stocks have been abundant historically; therefore, preseason abundance estimates were not developed, and it has not been a critical management concern. Council-area Chinook fisheries have minor impacts on most of the stocks originating from these areas, which have a northerly marine distribution pattern. For the southern Oregon Coast Chinook stock complex, the conservation objective is assessed using the escapement estimate at Huntley Park on the Rogue River. ESA consultation standards for OCN coho, LCN coho, and California Coastal Chinook, and KRFC management objectives generally result in reduced Council-area ocean fishery impacts on Oregon south/local migrating Chinook stocks.

Regulations to Achieve Objectives

The areas of primary management concern for ocean fisheries impacting Oregon Coast Chinook vary between the north and south/local migrating stocks, although there is some overlap. Preseason abundance estimates were not available for Oregon Coast Chinook; however, based on postseason abundance indicators, impacts on these stocks from Council-area fisheries have not significantly affected achievement of management objectives in recent years.

Oregon State waters terminal area fisheries to provide additional harvest on robust hatchery or naturally produced fall Chinook were not adopted in 2021 due to lower-than-average expected returns. When in place, special regulations for each of these seasons are implemented to maintain fishery impacts within conservation objectives. These regulations would include season quotas, daily and weekly landing limits in commercial fisheries, and reduced daily and season bag limits and partial mark-selective restrictions in some recreational fisheries. If fisheries occur, the season and size limit details are presented in Tables I-1 and I-3.

Inside Harvest

Inside recreational harvest of fall and spring Chinook occurred in most Oregon coastal estuaries and rivers. For the 2021 fisheries, regulations were adopted with the intention of reducing impacts on some of these stocks. Complete estimates of the 2021 recreational Chinook harvest in freshwater areas were not available.

Historical estimates of the recreational harvest of fall and spring Chinook, derived from Oregon Department of Fish and Wildlife (ODFW) salmon and steelhead angler catch record cards, are reported in Table II-3.

Escapement and Management Performance

Under the 2021 regulations, the Salmon Technical Team (STT) expected the aggregate conservation objectives for these stocks would be met with the constraints required for California Coastal Chinook and KRFC. Actual escapement was not estimated for the northern and central Oregon Coast Chinook stock aggregate; achievement of the aggregate 150,000 to 200,000 naturally spawning adults was assessed through peak spawner index counts of 60 to 90 adults per mile in nine index streams and included both spring and fall Chinook. Peak spawner index counts were based on traditional non-random surveys (e.g., stream surveys, dam counts, etc.). The aggregate northern and central Oregon Coast goal was likely met in 2021. ODFW is developing alternative methodologies for establishing escapement goals for these Oregon coastal Chinook stocks, including fall Chinook PSC indicator stocks. The aggregate southern Oregon Coast Chinook goal of at least 34,992 naturally-produced fall Chinook adults passing Huntley Park in the Rogue River was met in 2021.

2.3.1 North Migrating Chinook

Index counts of adult spawners (peak count per index mile) were conducted for six of the nine standard streams and used to measure natural spawner escapement trends for north-migrating fall Chinook in 2021. Data have been collected since about 1950 for most systems. Overall peak Chinook adult index spawner counts in 2021 were preliminarily estimated at 85 adults per mile, higher than the maximum sustainable yield (MSY) spawner escapement level of 60 adults per mile.

The geometric mean of north-migrating Oregon Coast Chinook adult escapement in 2019, 2020, and 2021 was 91 fish per mile, which exceeded both the MSST (30) and the MSY spawner escapement level. Estimates of exploitation rates were not available for 2020 or 2021, but earlier fisheries resulted in exploitation rates that were lower than the MFMT (0.78). Therefore, north-migrating Oregon Coast Chinook should not be considered overfished or subject to overfishing (Table II-6).

2.3.2 South/Local Migrating Chinook

Standard fall Chinook spawning index escapement data for the smaller southern Oregon coastal rivers (south of the Elk River) were available for the Winchuck, Chetco, and Pistol rivers (Appendix B, Table B-8). The 2021 preliminary estimate was reported at 20 adults per mile. The escapement goal prior to 2015 was assessed using this methodology.

Two trend indicators of escapement for naturally produced spring Chinook are utilized: (1) Rogue River counts at Gold Ray Dam, and (2) Umpqua River counts at Winchester Dam (Table II-4). Gold Ray Dam was removed in October 2010. For recent years, an estimate of natural spring Chinook escapement above the Gold Ray Dam site was made using the relationship of 2004-10 spawning ground surveys to the Gold Ray Dam passage (Figures II-3 and II-4).

Rogue River carcass counts were used as an indicator of trends in escapement for naturally produced fall Chinook, but these surveys have not been conducted since 2004 (Table II-4). Passage estimates of naturally produced fall Chinook at Huntley Park in the lower Rogue River are presented in Table B-10.

The geometric mean of south/local migrating Oregon Coast Chinook adult escapement in 2019, 2020, and 2021 was 30,706, which exceeded the MSST (20,500); therefore, south/local-migrating Oregon Coast Chinook should not be considered overfished. Estimates of exploitation rates were not available, so an assessment of overfishing status was not possible, but based on exploitation rates for KRFC, it is unlikely that south/local-migrating Oregon Coast Chinook were subject to overfishing (Table II-6).

2.4 Columbia River Basin Chinook Stocks

Columbia River Basin Chinook salmon stocks include fall, summer, and spring stocks. NMFS has listed five Chinook evolutionarily significant units (ESUs) within the Columbia Basin under the ESA: (1) SRW fall Chinook listed as threatened in April 1992; (2) Snake River spring/summer listed as threatened in April 1992; (3) upper Columbia River spring listed as endangered in March 1999; (4) LCR Chinook listed as threatened in March 1999; and (5) upper Willamette River spring listed as threatened in March 1999.

The assessment below focuses on the five major stock groups of Columbia Basin fall Chinook: lower river hatchery (LRH) tule stock and lower river wild (LRW) bright stock, both of which are part of the ESA-listed LCR Chinook ESU; Spring Creek Hatchery (SCH) tule stock; upriver bright (URB) stock, which includes the ESA-listed SRW Chinook ESU; and mid-Columbia bright (MCB) hatchery stock. A brief assessment of upper Columbia summer Chinook is also included. Management details for Columbia River spring Chinook stocks are not discussed. Council-managed ocean salmon fisheries have very limited impacts on these stocks (less than a 2 percent

TABLE II-5. Performance of Chinook salmon stocks in relation to 2021 preseason conservation objectives (preliminary data). (Page 1 of 2)

System and Stock	2021 Conservation/Management Objective(s)	2021 Achievement
Sacramento River Chinook		
Fall	Minimum escapement of 122,000 natural area and hatchery adults.	Preliminary estimate of 104,483 natural and hatchery adult fall Chinook is below the 2021 management objective.
Winter (Endangered)	Age-3 impact rate for the area south of Point Arena, CA no greater than 20.0% (NMFS ESA consultation standard).	Preseason projection of 14.7%; no postseason estimate was available at time of printing.
Spring (Threatened)	No management objective	No management objective
California North Coast Chinook		
Klamath River Fall	Minimum escapement of 31,574 natural area adult spawners.	Preliminary estimate of 29,942 is below the 2021 management objective.
California Coastal (Threatened)	No greater than 16.0% ocean harvest rate on age-4 Klamath River fall Chinook.	Preseason projection of 10.5%; no postseason estimate was available at time of printing.
Oregon Coast Chinook		
North Migrating Stocks	150,000-200,000 natural adult spawners (equivalent to peak spawner index counts of 60-90 adults per mile).	85 natural adult spawners per mile, within the aggregate stock index range.
South/Local Migrating Stocks	34,992 natural adult passage estimate at Huntley Park in the lower Rogue River.	48,870 natural adult passage estimate at Huntley Park, above the conservation objective.
Columbia River Basin Fall Chinook		
LRW (Component of threatened lower Columbia River Chinook ESU)	MSY objective of 5,700 natural North Lewis River adult spawners.	Preliminary estimate of 20,400, well above the conservation objective.
LCR natural tules (Component of threatened lower Columbia River	Total (ocean plus inriver) AEQ exploitation rate on ESA-listed natural tules of no more than 38.0%.	Preseason projection of 38.0%. Postseason estimate not available.
LRH	14,800 adult hatchery spawners.	Preseason LRH forecast was 73,800. Postseason estimate not available.
SCH	6,000 adult hatchery spawners.	22,057 adult hatchery spawners, above the goal.
MCB	No FMP objective; target of 7,900 hatchery adults.	Preliminary estimate of 10,674 adult hatchery spawners, above the target.
URB	Minimum 40,000 natural and hatchery adults above McNary Dam, plus meet treaty Indian obligations. *U.S. v. Oregon* parties agreed to 60,000 in 2011.	172,259 natural and hatchery adults over McNary Dam, well over the MSY target in FMP.

TABLE II-5. Performance of Chinook salmon stocks in relation to 2021 preseason conservation objectives (preliminary data). (Page 2 of 2)

System and Stock	2021 Conservation/Management Objective(s)	2021 Achievement
Columbia River Basin Fall Chinook (continued)		
Snake River Fall Chinook (Threatened; component of URB)	SRFI ≤0.700 for all ocean fisheries combined (i.e., no less than a 30.0% reduction from the 1988-1993 base period exploitation rate).	Preseason SRFI projection of 0.503. Postseason estimate was not available.
Washington Coastal Chinook		
Fall	Natural spawner escapement objectives as provided in state-tribal agreements; meet hatchery egg-take goals and meet treaty Indian obligations.	Preliminary estimates: Quillayute was above the goal. Estimates for other fall stocks were not available.
Spring/Summer	Natural spawner escapement objectives as provided in state-tribal agreements; meet hatchery egg-take goals and meet treaty Indian obligations.	Preliminary estimates: Grays Harbor was above the goal, and Quillayute was below the goal. Estimates for other spring/summer stocks were not available.
Puget Sound Chinook		
(Threatened)	Minor part of Washington ocean harvest; Council ocean management not directed at these stocks. Adult equivalent exploitation rate standard developed for some stocks:	Postseason estimates were not available. Preseason predictions of adult equivalent exploitation rates and spawner objectives were:

	Exploitation Rate	Spawner Esc.	ISBM	Exploitation Rate	Spawner Esc.	ISBM
· Nooksack spring	≤10.5% SUS	-	≤1.00	10.5%	-	0.89
· Skagit summer/fall	≤17% SUS	-	≤0.95	17.0%	-	0.66
· Skagit spring	≤10.3% SUS	-	≤0.95	10.3%	-	NA[a/]
· Stillaguamish summer/fall	≤22% Total	-	≤1.00	18.1%	-	0.58
· Snohomish summer/fall	≤8% SUS	-	≤1.00	6.3%	-	0.62
· Lake Wash. summer/fall	-	>0.500	-	-	0.547	-
· White River spring	≤22% SUS	-	-	16.6%	-	-
· Green River summer/fall	-	>1.200	-	-	1.669	-
· Puyallup summer/fall	-	>0.750	-	-	0.929	-
· Nisqually summer/fall	≤47% Total[b/]	-	-	47.7%	-	-
· Skokomish summer/fall	≤50% Total	-	-	49.2%	-	-
· Mid-Hood Canal fall	TBD	-	-	12.1%	-	-
· Dungeness spring	≤10% SUS	-	-	3.6%	-	-
· Elwha summer/fall	≤10% SUS	-	-	3.8%	-	-

a/ ISBM obligation not applicable because escapement goal expected to be met.
b/ An additional 2% ER may be added to facilitate inriver selective gear studies.

effects in individual states and communities. Tables IV-16, IV-17, and IV-18 provide greater detail on the income impacts estimated for individual port areas in the three West Coast states.

4.5.1.2 Selected Inside Fisheries

Columbia River Commercial Fisheries

Historically the non-Indian and treaty Indian Columbia River commercial salmon fisheries have generated a substantial amount of income for Oregon and Washington communities on the Columbia River. In 2021, income impacts associated with the Columbia River commercial catch (combined non-Indian and treaty Indian) were estimated at $12.2 million, 16 percent above the prior year's value of $10.6 million, more than double the estimate for 2019 of $5.9 million (which was the lowest estimated value since prior to 2010), and four percent above the recent five-year annual average of $11.8 million for the 2016-2020 period (all values adjusted for inflation) (Table IV-19).

Buoy 10

Estimated local community income impacts associated with the 2021 Columbia River Buoy 10 recreational salmon fishery were $7.8 million, 45 percent above the prior year's value of $5.4 million, 38 percent above the 2019 value of $5.6 million, 30 percent above the 2016-2020 annual average value of approximately $6.0 million, and the third highest estimated annual value since 2009 (all values adjusted for inflation) (Table IV-20).

TABLE IV-1. Average monthly exvessel troll salmon price in dollars per dressed pound for California, Oregon, and Washington in 2021.

Species/Grade	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Season[b/]
CALIFORNIA											
Chinook[a/]	-	-	10.73	7.05	8.43	6.88	10.04	11.75	-	-	8.06
Coho	-	-	-	-	-	-	-	-	-	-	-
OREGON											
Chinook											
Large (>11 Pounds)	10.00	14.10	12.65	12.62	8.32	8.03	9.27	10.97	11.00	-	9.23
Medium (7-11 Pounds)	10.00	13.91	12.38	11.57	7.49	7.03	9.00	10.48	10.50	-	9.20
Small (<7 Pounds)	-	-	12.50	13.00	10.39	6.00	8.00	10.50	-	-	11.70
Ungraded Chinook	12.01	12.79	12.90	11.11	9.09	8.48	9.50	11.59	12.60	-	10.28
Weighted Average	11.99	12.82	12.84	11.22	8.82	8.32	9.45	11.00	11.65	-	10.04
Mixed Coho	-	-	-	-	4.18	4.08	3.90	-	-	-	4.12
WASHINGTON[b/]											
Chinook											
Large (>11 Pounds)	-	-	11.70	8.35	7.81	7.59	7.40	-	-	-	8.49
Medium (8-11 Pounds)	-	-	11.79	9.03	7.11	7.05	7.42	-	-	-	8.73
Small (<8 Pounds)	-	-	10.97	9.41	7.57	7.15	7.24	-	-	-	9.50
Ungraded Chinook	-	-	-	-	-	-	-	-	-	-	-
Weighted Average	-	-	11.71	8.66	7.80	7.52	7.30	-	-	-	8.58
Mixed Coho	-	-	-	-	3.66	3.54	3.74	-	-	-	3.63

a/ Chinook salmon are sometimes sold in multiple size categories. Prices paid in these categories are not extracted from dealer ticket information.

b/ Non-Indian data only.

TABLE IV-2. Troll Chinook and coho landed in California, estimates of exvessel value, and average price (dollars per dressed pound) in nominal and real (inflation adjusted, 2021) dollars.[a/]

	Chinook				Coho				Total[b/]	
Year or Avg	Nominal Value ($*1,000)	Real Value ($*1,000)	Nominal Price Per Pound ($)	Real Price Per Pound ($)	Nominal Value ($*1,000)	Real Value ($*1,000)	Nominal Price Per Pound ($)	Real Price Per Pound ($)	Nominal Value ($*1,000)	Real Value ($*1,000)
1979	17,356	52,976	2.53	7.72	2,303	7,030	2.19	6.68	19,659	60,006
1980	12,741	35,668	2.27	6.35	408	1,142	1.36	3.81	13,149	36,810
1981-1985	10,945	25,902	2.42	5.65	554	1,326	1.62	3.80	11,499	27,228
1986-1990	21,151	42,570	2.56	5.11	490	970	1.81	3.60	21,641	43,540
1991-1995	7,335	12,555	2.28	3.94	143	257	0.63	1.12	7,478	12,812
1996	5,984	9,676	1.44	2.33	-	-	-	-	5,984	9,676
1997	7,288	11,585	1.38	2.19	-	-	-	-	7,288	11,585
1998	3,060	4,810	1.66	2.61	-	-	-	-	3,060	4,810
1999	7,429	11,515	1.93	2.99	-	-	-	-	7,429	11,515
2000	10,304	15,618	2.01	3.05	-	-	-	-	10,304	15,618
2001	4,773	7,075	1.98	2.94	-	-	-	-	4,773	7,075
2002	7,776	11,349	1.55	2.27	-	-	-	-	7,776	11,349
2003	12,181	17,435	1.91	2.73	-	-	-	-	12,181	17,435
2004	17,895	24,944	2.87	4.00	-	-	-	-	17,895	24,944
2005	12,913	17,452	2.97	4.01	-	-	-	-	12,913	17,452
2006	5,350	7,014	5.13	6.73	-	-	-	-	5,350	7,014
2007	7,902	10,088	5.18	6.61	-	-	-	-	7,902	10,088
2008	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-
2010	1,246	1,532	5.47	6.73	-	-	-	-	1,246	1,532
2011	5,133	6,184	5.18	6.24	-	-	-	-	5,133	6,184
2012	13,521	15,991	5.34	6.32	-	-	-	-	13,521	15,991
2013	23,632	27,467	6.23	7.24	-	-	-	-	23,632	27,467
2014	12,521	14,286	5.56	6.34	-	-	-	-	12,521	14,286
2015	8,347	9,429	7.03	7.94	-	-	-	-	8,347	9,429
2016	5,312	5,942	8.63	9.65	-	-	-	-	5,312	5,942
2017	4,925	5,406	9.90	10.87	-	-	-	-	4,925	5,406
2018	7,932	8,503	8.53	9.14	-	-	-	-	7,932	8,503
2019	17,209	18,124	6.61	6.96	-	-	-	-	17,209	18,124
2020	14,408	14,993	7.47	7.77	-	-	-	-	14,408	14,993
2021[c/]	18,480	18,480	8.06	8.06	-	-	-	-	18,480	18,480

a/ These exvessel values do not include the postseason settlement payments some fishers may have received from buyers, and therefore may underestimate the true payments received by fishers for their landings. Beginning circa 1999, these postseason settlements are believed to have grown for the California fishery. For 2002, the exvessel value reported here is believed to be under-reported by roughly 5 percent to 10 percent.

b/ Does not include pink salmon landings, if any.

c/ Preliminary.

TABLE IV-8. Pounds of salmon landed by the non-Indian commercial troll ocean fishery for major Washington port areas.[a/b/]

Year or Avg.	Neah Bay	La Push	Westport	Ilwaco	Coastal Community Total	Puget Sound	State Total[c/]
CHINOOK (thousands of dressed pounds)							
1991-1995[d/]	137	29	123	9	204	30	234
1996-2000[d/]	49	1	37	3	80	22	102
2001-2005	250	55	208	26	539	4	543
2005-2010	45	40	138	12	234	2	236
2011	113	44	155	11	322	-	322
2012	172	92	147	23	435	-	435
2013	85	83	275	7	450	e/	450
2014	77	93	182	112	463	e/	463
2015	61	133	383	43	621	4	625
2016	28	32	118	19	197	3	201
2017	69	22	237	6	334	-	334
2018	42	49	162	1	254	-	254
2019	133	59	105	3	300	-	300
2020[f/]	-	17	102	8	128	36	164
2021[g/]	32	9	162	4	207	9	216
COHO (thousands of dressed pounds)							
1991-1995	52	14	49	13	102	12	111
1996-2000	10	e/	8	3	22	2	24
2001-2005	7	8	23	5	40	1	41
2006-2010	8	9	17	7	41	1	42
2011	6	2	9	e/	17	-	17
2012	7	5	6	1	18	-	18
2013	5	8	18	1	31	e/	31
2014	7	22	47	12	87	-	87
2015	e/	1	10	4	15	e/	15
2016	e/	-	-	-	-	e/	e/
2017	2	1	5	1	9	-	9
2018	1	3	4	e/	9	-	9
2019	5	3	14	1	22	-	22
2020[f/]	-	e/	3	e/	3	1	4
2021[g/]	e/	1	14	2	16	1	18

a/ All values in this table are based on preliminary information available at the start of each year's salmon review.

b/ The major port areas listed may include smaller ports as follows: Neah Bay includes only Neah Bay; La Push also includes Kalaloch; Westport also includes Aberdeen, Bay City, Copalis Beach, Hoquiam, Moclips, Taholah, Bay Center, Grayland Beach, Raymond, South Bend, and Tokeland; Ilwaco also includes Long Beach, Nahcotta, Naselle, and all Columbia River Ports; Puget Sound includes all Puget Sound ports east of Neah Bay.

c/ State total includes landings where port of landing is not specified.

d/ There was no ocean commercial fishery for Chinook north of Cape Falcon in 1994-1996; however, Chinook were caught off Oregon and landed in Washington.

e/ Less than 500 pounds.

f/ The port of Neah Bay was closed to public access and the port of La Push was restricted to local access only in 2020 due to the COVID-19 pandemic. Vessels were allowed to land in the Puget Sound ports of Sekiu and Port Angeles by emergency rule. Totals include revenue from ocean troll-caught landings (36,000 pounds of Chinook, 800 pounds of coho) in Puget Sound ports authorized by the emergency rule.

g/ The port of Neah Bay was partially closed and restricted to limited local access only in 2021 due to the COVID-19 pandemic. Vessels were allowed to land in the Puget Sound ports of Sekiu and Port Angeles by emergency rule. Totals include revenue from ocean troll-caught landings (9,100 pounds of Chinook, 1,300 pounds of coho) in Puget Sound ports authorized by the emergency rule.

TABLE IV-9.Landings, exvessel values and average prices (inflation adjusted, 2021 dollars) of inriver commercial harvest of Columbia River salmon.[a/] (Page 1 of 3)

	Non-Indian Gillnet[b/]						Treaty Indian[c/] - All Gears						
	Chinook						Chinook						Col. R. Total By State
		Fall						Fall					
Year or Avg.	Spring	Brights[d/]	Tules	Coho	Chum[e/]	TOTAL	Spring	Brights[d/]	Tules	Coho	Chum[e/]	TOTAL	
Oregon													
Average Price Per Landed Pound[f/] (dollars)													
1991-1995	5.87	1.76	0.48	1.37	0.57		6.05	1.51	0.34	0.99	-		
1996-2000	4.01	1.42	0.29	1.06	0.34		4.27	1.16	0.20	0.63	-		
2001-2005	4.43	1.41	0.23	0.88	0.44		3.11	1.36	0.33	0.90	-		
2006-2010	6.49	2.94	0.51	1.73	0.68		4.76	2.55	0.43	1.59	-		
2011	6.12	2.75	0.70	1.99	0.93		4.30	2.84	0.86	1.84	-		
2012	6.88	2.61	0.64	1.90	0.58		6.53	3.03	0.88	2.19	-		
2013	7.50	2.92	0.66	2.14	0.58		6.03	2.39	0.74	1.56	-		
2014	6.14	2.09	0.65	1.33	0.57		5.74	1.96	0.65	1.04	-		
2015	6.52	2.73	0.56	1.72	0.34		4.72	2.81	0.52	1.65	-		
2016	7.93	3.59	0.70	2.06	-		6.71	3.24	0.67	1.73	-		
2017	8.22	3.49	0.68	2.23	0.55		7.87	5.38	0.66	2.15	-		
2018	11.17	3.79	0.72	2.11	-		8.52	5.00	0.74	2.25	-		
2019	11.96	2.78	0.56	1.79	-		6.41	3.77	0.53	2.09	-		
2020	7.45	2.98	0.59	1.72	-		6.62	3.54	0.42	1.77	-		
2021	9.34	3.26	0.69	1.85	-		6.90	3.79	0.50	1.68	-		
Exvessel Value (thousands of dollars)													
1991-1995	345	304	21	762	g/	1,432	1	284	34	9	-	328	1,760
1996-2000	152	108	12	393	g/	664	1	85	12	3	-	100	764
2001-2005	949	489	40	843	g/	2,322	59	213	12	6	-	290	2,611
2006-2010	1,108	961	81	857	g/	3,007	278	663	46	34	g/	1,021	4,028
2011	1,406	1,743	164	872	g/	4,185	221	720	37	36	-	1,014	5,199
2012	1,249	1,064	130	176	g/	2,620	87	414	6	13	-	520	3,140
2013	1,076	2,467	123	571	g/	4,237	104	1,205	26	7	-	1,342	5,579
2014	716	1,849	161	1,894	g/	4,620	318	1,013	16	39	-	1,386	6,006
2015	1,407	1,638	105	292	g/	3,442	481	1,111	34	2	-	1,629	5,071
2016	1,396	1,479	67	435	-	3,378	158	942	2	9	-	1,111	4,488
2017	1,611	606	33	481	g/	2,731	177	976	3	17	-	1,173	3,904
2018	1,502	330	24	150	-	2,005	474	944	2	21	-	1,441	3,447
2019	479	192	12	213	-	896	166	1,078	g/	14	-	1,258	2,154
2020	375	554	44	540	-	1,514	265	1,763	2	72	-	2,102	3,615
2021[h/]	691	545	52	1,321	-	2,611	436	1,093	4	113	-	1,645	4,256
Pounds (thousands)													
1991-1995	58	165	45	539	1	809	g/	194	113	8	-	314	1,124
1996-2000	37	80	46	395	1	559	g/	72	58	3	-	133	692
2001-2005	211	355	178	1,082	g/	1,825	24	141	73	8	-	246	2,071
2006-2010	174	342	120	517	g/	1,152	54	268	81	22	g/	425	1,577
2011	230	635	234	439	g/	1,537	51	253	43	20	-	367	1,904
2012	181	407	204	92	g/	885	13	137	7	6	-	163	1,048
2013	144	846	186	267	g/	1,442	17	503	35	5	-	560	2,002
2014	117	886	247	1,419	g/	2,669	55	516	24	38	-	634	3,302
2015	216	599	186	170	g/	1,171	102	395	64	1	-	563	1,734
2016	176	412	95	211	g/	895	24	290	3	5	-	322	1,217
2017	196	174	48	215	g/	633	22	182	4	8	-	216	850
2018	134	87	34	71	-	326	56	189	3	9	-	257	583
2019	40	69	22	119	-	250	26	286	1	7	-	319	569
2020	50	186	73	315	-	625	40	498	4	41	-	583	1,208
2021[h/]	74	167	75	713	-	1,029	63	289	8	67	-	427	1,456

TABLE IV-10. California, Oregon, and Washington ocean recreational salmon effort in thousands of angler trips and catch in thousands of fish by boat type. (Page 2 of 2)

	Angler Trips		Chinook Catch[a/]		Coho Catch[a/]	
Year or Avg.	Charter	Private	Charter	Private	Charter	Private
			WASHINGTON[g/h/]			
1981-1985	102.0	69.7	42.6	13.8	113.3	69.2
1986-1990	53.5	59.4	16.0	10.0	78.0	77.6
1991-1995	28.0	45.1	4.5	4.2	41.5	54.8
1996-2000	13.6	20.6	2.7	2.2	17.4	20.8
2001-2005	38.2	67.5	17.0	18.2	41.4	66.9
2006	24.5	39.1	4.0	6.7	16.2	19.9
2007	26.7	45.9	3.1	5.9	33.7	50.1
2008	14.2	22.2	6.0	8.6	8.3	10.5
2009	29.4	69.5	3.1	9.2	47.9	90.0
2010	26.5	54.4	15.4	21.5	14.1	22.2
2011	22.2	49.2	9.8	19.3	15.1	24.4
2012	24.5	50.5	11.8	21.8	11.8	19.3
2013	24.7	52.3	9.2	19.6	17.9	27.9
2014	34.6	78.1	12.1	27.7	46.0	73.3
2015	30.6	61.3	12.0	26.9	27.6	39.5
2016	13.7	34.0	4.5	12.3	5.8	10.1
2017	16.3	42.4	4.2	15.7	11.5	24.5
2018	14.5	33.5	3.0	7.0	11.8	22.9
2019	18.1	47.5	1.6	8.0	22.6	41.8
2020[i/]	9.5	24.3	2.2	5.3	7.0	13.2
2021[c/i/]	16.5	44.4	3.8	12.0	16.4	32.6

a/ Catch numbers may include some illegal harvest.

b/ Fewer than 50 fish.

c/ Preliminary.

d/ Estimates for private trips do not include May and June due to restrictions on sampling caused by the COVID-19 pandemic.

e/ Salmon data from surveyed ports only. These generally include Astoria, Garibaldi, Depoe Bay, Newport, Winchester Bay, Coos Bay, and Brookings. Since 1981, Pacific City and Florence have also been included. Gold Beach data are included from 1981-1987. Astoria was not included in 1994.

f/ Numbers do not include angling from the Columbia River jetty.

g/ Numbers do not include angling from the Columbia River jetty or from the late-season state waters Area 4B fishery.

h/ Values for 1982-1985 include some inriver Columbia River fishing after closure of the ocean fishery.

i/ Neah Bay and La Push were closed to public access in 2020 and Neah Bay again in 2021 due to the COVID-19 pandemic. 2020 Values for Washington include catch and effort from 7,016 ocean salmon angler trips (276 charter and 6,740 private) from Sekiu. 2021 Values for Washington include catch and effort from 10,899 ocean salmon angler trips (345 charter and 10,554 private) from Sekiu.

TABLE IV-15. Buoy 10[a/b/] and Area 4B add-on recreational salmon angler trips and catch by boat type. (Page 2 of 2)

	Angler Trips			Chinook Catch			Coho Catch			Pink Catch	
Year or Avg.	Charter	Private	Jetty	Charter	Private	Jetty	Charter	Private	Jetty	Charter	Private
					TOTAL BUOY 10						
1991-1995	5,690	63,317	10,463	588	5,029	72	6,803	46,201	2,814	0	16
1996-2000	2,583	39,712	2,877	519	6,710	27	1,157	10,070	435	0	0
2001-2005	1,634	80,878	2,122	93	14,602	8	1,173	41,541	237	0	0
2006-2010	617	45,322	929	51	5,259	5	278	14,950	117	0	0
2011	442	47,262	1,705	46	10,839	34	76	7,223	315	0	0
2012	915	62,787	1,368	103	18,425	22	124	7,157	104	0	0
2013	552	63,461	1,754	87	22,466	41	77	7,395	148	0	0
2014	416	103,077	4,029	13	26,734	41	564	54,546	2,634	0	0
2015	466	101,269	6,081	73	36,174	246	425	32,985	3,442	0	0
2016	245	88,446	6,259	12	17,348	420	75	8,251	856	0	0
2017	544	87,544	5,459	81	28,089	228	282	17,402	1,150	0	0
2018	651	64,514	2,153	85	11,469	66	127	6,177	457	0	0
2019	32	72,950	3,995	0	11,225	49	3	21,404	1,368	0	0
2020	378	66,279	5,786	42	14,535	56	66	6,227	771	0	0
2021[c/]	138	98,810	6,917	0	20,656	133	96	34,461	2,474	0	0
					TOTAL AREA 4B ADD-ON[d/]						
1989-1990	1,084	10,941	-	62	375	-	2,095	18,021	-	36	212
1991-1995	429	6,852	-	12	153	-	725	9,188	-	73	970
1996-2000[e/]	123	2,528	-	1	23	-	173	3,086	-	28	83
2001-2005	-	-	-	-	-	-	-	-	-	0	0
2006[e/]	-	-	-	-	-	-	-	-	-	0	0
2007	-	-	-	-	-	-	-	-	-	0	0
2008	-	782	-	-	11	-	-	137	-	0	0
2009[f/]	-	-	-	-	-	-	-	-	-	0	0

a/ From 2000, catch downstream of boundary line from Tongue Pt., OR to Rocky Pt., WA. Prior to 2000, only catch downstream of Astoria-Megler Br.
b/ Prior to 1987, data on charter and private anglers were combined. Total Buoy 10 catch and effort data prior to 1987 are provided in Table B-21.
c/ Preliminary.
d/ There was no Area 4B add-on fishery prior to 1989.
e/ There was no Area 4B add-on fishery opening in 1999 and 2006 as the Area 4 ocean quota was not attained.
f/ There has been no Area 4B add-on fishery planned since 2008.

TABLE IV-16. Estimates of California coastal community and state personal income impacts in thousands of real (inflation adjusted, 2021) dollars of the troll and recreational ocean salmon fishery for major port areas.[a/]

Year or Avg.	Crescent City	Eureka	Fort Bragg	San Francisco	Monterey	Coastal Community Total[b/]	State-Level Total
				OCEAN TROLL[c/]			
1991-1995	12	180	1,269	14,755	8,406	24,622	29,671
1996-2000	13	214	897	15,454	9,370	25,948	27,454
2001-2005	606	406	7,644	18,430	4,970	32,056	33,762
2006-2010	78	200	1,703	3,424	639	6,044	6,317
2011	40	485	4,664	2,954	720	8,862	11,061
2012	23	746	4,287	13,570	4,100	22,726	27,231
2013	122	1,914	11,187	21,702	2,202	37,126	43,389
2014	117	838	7,152	10,595	623	19,325	22,503
2015	30	397	4,885	5,117	943	11,371	13,849
2016	d/	63	1,725	4,969	1,043	7,800	8,842
2017[e/]	-	33	400	5,545	1,298	7,275	8,803
2018	285	365	1,023	9,124	1,192	11,988	14,210
2019	178	86	743	19,201	4,710	24,917	30,288
2020[e/]	-	24	1,131	22,035	2,233	25,423	26,671
2021[f/]	103	318	4,738	20,232	3,256	28,647	32,877
				RECREATIONAL			
1991-1995	1,049	1,129	1,705	14,477	6,933	25,294	29,697
1996-2000	486	894	1,742	14,514	6,375	24,011	27,935
2001-2005	198	951	2,316	10,301	4,148	17,914	18,994
2006-2010	48	491	788	2,962	1,223	5,512	6,094
2011	60	1,286	1,942	6,225	3,363	12,877	15,918
2012	633	2,264	1,956	11,055	5,489	21,398	26,457
2013	560	2,267	2,355	13,303	3,498	21,983	26,719
2014	364	1,643	2,361	10,788	3,261	18,416	22,320
2015	52	873	1,565	9,273	1,708	13,471	15,896
2016	44	845	1,214	8,491	865	11,459	13,459
2017	-	-	559	10,640	1,572	12,771	14,558
2018	111	589	1,337	13,091	1,512	16,641	19,248
2019	42	743	1,056	11,609	3,354	16,804	19,786
2020[e/g/]	94	362	600	8,444	472	9,971	11,480
2021[f/]	51	175	1,069	8,959	3,638	13,892	16,401

a/ Estimates of income impacts are provided from output of the Fishery Economic Assessment Model (FEAM) and IOPAC. These are the income impacts associated with expenditures in the troll and/or recreational sectors. There is no differentiation between money that may be new to the area versus money that may otherwise have been expended in other sectors. Values through 1995 are based on a 1992 run of the FEAM using 1989 IMPLAN data. Values from 1996 through 2000 are based on a 1998 run of the FEAM using 1996 IMPLAN data. Values from 2001 through 2009 are based on a run of the FEAM using 2000 PacFIN landings and 1998 IMPLAN data. Beginning with the 2010 data year, income impact estimates are based on the NWFSC's IOPAC model, which uses updated IMPLAN and landings data, and survey-based industry cost data. A description of the transition from FEAM-based to IOPAC-based impact multipliers and comparisons of results from the two models are found in Appendix E of the Review of 2014 Ocean http://www.pcouncil.org/salmon/stock-assessment-and-fishery-evaluation-safe-documents/review-of-2014-ocean-salmon-fisheries/

b/ Total personal income impacts on coastal areas. Totals do not include impacts of one coastal area on another.

c/ Excluding pink salmon.

d/ Less than 500 dollars.

e/ Eureka impacts are from fish caught in the Fort Bragg area fishery and landed in Eureka.

f/ Preliminary.

g/ California 2020 estimates do not include private trips during May and June due to restrictions on sampling caused by the COVID-19 pandemic.

TABLE IV-17. Estimates of Oregon coastal community and state personal income impacts in thousands of real (inflation adjusted, 2021) dollars of the troll and recreational ocean salmon fishery for major port areas.[a/]

Year or Avg.	Astoria	Tillamook	Newport	Coos Bay	Brookings	Coastal Community Total[b/]	State-Level Total
			OCEAN TROLL[c/]				
1991-1995	108	840	3,443	1,673	170	6,234	8,405
1996-2000	179	352	3,644	2,104	508	6,787	8,270
2001-2005	987	1,092	6,826	6,021	1,143	16,068	18,542
2006-2010	648	359	851	813	339	3,011	3,504
2011	268	64	583	2,599	290	3,804	5,005
2012	773	309	2,133	2,430	394	6,038	8,566
2013	388	544	1,721	7,319	685	10,658	14,368
2014	2,016	1,059	6,027	8,960	1,327	19,388	27,366
2015	1,068	758	2,821	3,891	574	9,112	11,320
2016	285	183	3,171	1,314	142	5,094	6,634
2017	357	166	1,782	368	103	2,776	3,648
2018	58	107	1,324	1,046	466	2,999	4,215
2019	52	150	1,616	590	198	2,605	3,561
2020	28	127	1,464	320	201	2,141	2,865
2021[d/]	83	233	1,935	635	214	3,098	4,053
			RECREATIONAL				
1991-1995	1,184	954	2,159	1,928	1,361	7,587	9,838
1996-2000	458	526	518	572	1,099	3,172	4,183
2001-2005	1,238	1,169	2,230	1,957	860	7,454	9,162
2006-2010	746	786	1,249	743	361	3,886	4,857
2011	729	558	1,129	503	314	3,233	4,443
2012	559	531	1,316	822	950	4,178	5,911
2013	649	619	1,399	1,445	1,047	5,158	7,379
2014	1,201	1,100	3,397	1,438	879	8,014	11,028
2015	870	673	1,669	707	451	4,370	5,990
2016	361	455	711	532	210	2,268	3,227
2017	702	368	793	610	101	2,574	3,475
2018	616	489	1,954	682	351	4,093	5,520
2019	1,182	942	2,736	903	223	5,986	8,037
2020	261	580	1,308	737	316	3,203	4,553
2020[d/]	981	825	3,264	924	310	6,304	8,416

a/ Estimates of income impacts are provided from output of the Fishery Economic Assessment Model (FEAM) and IOPAC. These are the income impacts associated with expenditures in the troll and/or recreational sectors. There is no differentiation between money that may be new to the area versus money that may otherwise have been expended in other sectors. Values through 1995 are based on a 1992 run of the FEAM using 1989 IMPLAN data. Values from 1996 through 2000 are based on a 1998 run of the FEAM using 1996 IMPLAN data. Values from 2001 through 2009 are based on a run of the FEAM using 2000 PacFIN landings and 1998 IMPLAN data. Beginning with the 2010 data year, income impact estimates are based on the NWFSC's IOPAC model, which uses updated IMPLAN and landings data, and survey-based industry cost data. A description of the transition from FEAM-based to IOPAC-based impact multipliers and comparisons of results from the two models are found in Appendix E of the Review of 2014 Ocean Salmon Fisheries:
http://www.pcouncil.org/salmon/stock-assessment-and-fishery-evaluation-safe-documents/review-of-2014-ocean-salmon-fisheries

b/ Total personal income impacts on coastal areas. Totals do not include impacts of one coastal area on another.

c/ Excluding pink salmon.

d/ Preliminary.

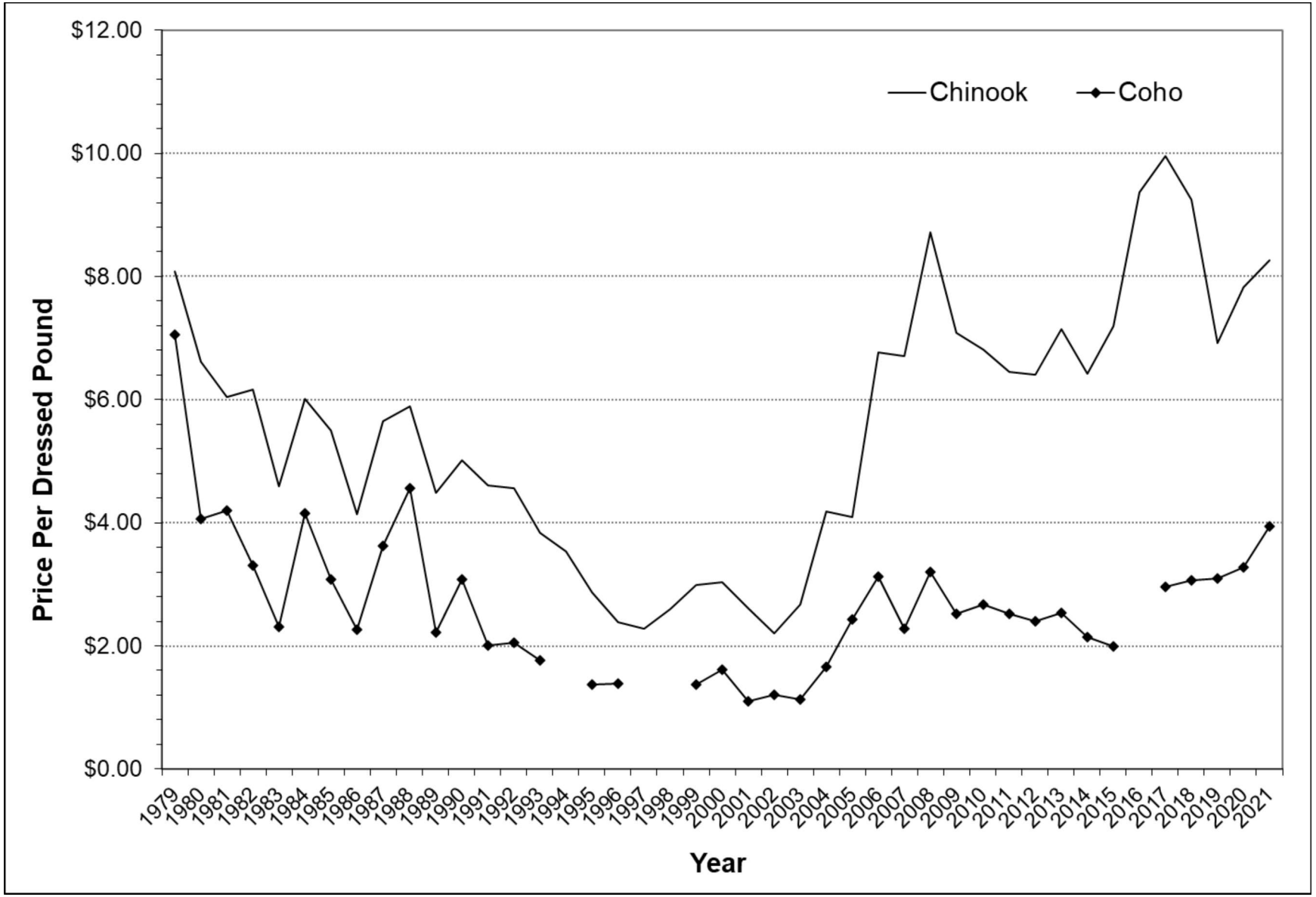

Figure IV-3. West Coast non-Indian ocean commercial salmon average annual exvessel prices (inflation adjusted, 2021 dollars).