



*44th Annual Report of the*

**PACIFIC STATES  
MARINE FISHERIES  
COMMISSION**

FOR THE YEAR 1991

TO THE CONGRESS OF THE UNITED STATES AND TO THE  
GOVERNORS AND LEGISLATURES OF WASHINGTON,  
OREGON, CALIFORNIA, IDAHO AND ALASKA

# **PSMFC COMMISSIONERS 1991**

## **Paul Heikkila, Chairman**

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Alaska State Senate

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ED MANARY  
Washington Dept. Fisheries

ROBERT ALVERSON  
Governor's Appointee

***Our goal, as stated in the bylaws, is "to promote and support policies and actions directed at the conservation, development and management of fishery resources of mutual concern to member states through a coordinated regional approach to research, monitoring and utilization".***

44th Annual Report  
of the  
**PACIFIC STATES MARINE  
FISHERIES COMMISSION**  
FOR THE YEAR 1991

To the Congress of the United States and the Governors and Legislatures of the Five Compacting States, Washington, Oregon, California, Idaho, and Alaska, by the Commissioners of the Pacific States Marine Fisheries Commission in Compliance with the State Enabling Acts Creating the Commission and Public Laws 232; 776; and 315 of the 80th; 87th; and 91st Congresses of the United States Assenting Thereto.

Respectfully submitted,  
PACIFIC STATES MARINE FISHERIES COMMISSION

GUY THORNBURGH, Executive Director

Headquarters  
45 SE 82nd Drive, Suite 100  
Gladstone, Oregon 97027-2522

Al J. Didier, Jr.  
EDITOR

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# 44TH ANNUAL REPORT - 1991

## ANNUAL MEETING EVENTS

### SUMMARY

The October 1991 PSMFC Annual Meeting was held in Coos Bay, Oregon, chaired by Mr. Paul Heikkila, a commercial troller and Sea Grant extension agent from Coquille. The meeting included in-state meetings for the five member states, three half-day panel discussions, and the annual business meeting. The panels addressed Mandatory Observer and Data Gathering Programs, Limited Entry Programs, and Endangered Species.

### SPECIAL ISSUES

#### **Mandatory Observer/Data Gathering Programs.**

Panelists included Mr. Russ Nelson of the National Marine Fisheries Service, Ms. Nancy Munro of Saltwater Inc., Rick Malsed of the Fishing Vessel Owners Association and Ms. Mandy Merklein an experienced at-sea observer. Mr. Nelson described the present and proposed Mandatory Observer Program of the North Pacific Fishery Management Council (NPFMC) and its major problems and successes. Ms. Munro explained the role of private contractors in supplying observers for the NPFMC program and the pluses and minuses of utilizing private contractors for such programs. Mr. Rick Malsed described the perceptions of fishing vessel operators of the NPFMC programs including problems encountered and suggestions for improvement. Ms. Merklein described her experiences as an observer in foreign and domestic fisheries and provided recommendations to improve job satisfaction and the quality of data.

**Limited Entry Programs.** Panelists included Mr. Douglas Gordon the Executive Director of the American High Seas Fisheries Association, Mr. Bruce Turriss of the Department of Fisheries and Oceans, Canada, and Mr. Richard Schaeffer, Director of the Office of Fisheries Conservation and Management of the National Marine Fisheries Service. Mr. Gordon described New Zealand's experiences in implementing and managing an individual transferable quota system. Mr. Turriss described the development and first-year operation of the ITQ program for halibut off the coast of British Columbia. Mr. Schaeffer briefly described the current status of U.S. fisheries and the draft NMFS policy to rationalize fisheries which favor ITQ's.

Endangered Species. Panelists included Mr. Gary Miller, a biologist of the U.S. Fish and Wildlife Service, Mr. Chris Frissell a research ecologist at Oregon State University, Mr. Wally Steucke, Assistant Director of the Columbia Basin Fish and Wildlife Authority, and Mr. Jim Lichatowich, an independent contractor. Mr. Miller described the rationale for the recent proposal to list the marbled murrelet as threatened and its potential impact on commercial net fisheries. Mr. Frissell discussed the depressed stocks of salmon in Southeast Oregon and the impact poor land use practices are having on them. Mr. Steucke discussed case histories involving the Endangered Species Act, and the political problems and implications of the Act on Columbia River Salmon. Mr. Lichatowich described the depressed nature of over 100 salmonid stocks on the west coast and the implications of introducing hatchery stocks on wild salmon stocks.

Transcripts of these three panel discussions, and of the banquet presentation by Jim Martin, Chief of Fisheries for Oregon Department of Fish and Wildlife, are available from PSMFC.

### 1992 ANNUAL MEETING

The 45th Annual Meeting of PSMFC will be hosted by the state of California, October 4-6, 1992 at the Catamaran Hotel in San Diego. The meeting will focus on reauthorizations of the Magnuson Act and the Marine Mammal Protection Act; vessel safety and fees, marine habitat for fish, interjurisdictional fishery management plans, NMFS expenditures, and protected species management. Assemblyman Gerald N. Felando was elected chairman for 1992.

**ANNUAL PSMFC AWARD  
FOR CONTRIBUTION TO  
PACIFIC COAST FISHERIES**

**DR. HOWARD F. HORTON**

PSMFC is proud to acknowledge Dr. Howard F. Horton of Corvallis, Oregon as the 1991 recipient of the Outstanding Contribution to Pacific Coast Fisheries Award. Dr. Horton has made a "career - full" of outstanding contributions as a fisherman, state fishery biologist, extension agent, researcher, professor, author, and administrator. He is a former president of PFB and of the American Fisheries Society, Oregon Chapter. As director of the Oregon Marine Extension office at Oregon State University, Dr. Horton built a model program for the nation. He is respected as a teacher who influenced a generation of fisheries managers and fishermen.



**Figure 1.** Mrs. Jeannine Horton accepts the award for her husband at PSMFC's annual meeting in Coos Bay.

**ADMINISTRATIVE REPORTS AND ACTIONS**

**EXECUTIVE DIRECTOR'S REPORT**

Habitat is where it's at! At the 1991 Baltimore symposium on coastal fish habitat entitled "Stemming the Tide", the continued loss of fish habitat to development and pollution was called the "single greatest long-term threat to the future of the marine fisheries of the United States". Its greatest remedy: "Education may be the single most important consideration in halting the loss of fishery...supporting habitat...The nation's citizenry, from school children to the federal government, is in need of high-quality, factual information about the values of wetlands, clean and abundant water, and habitat capable of supporting marine wildlife and related industries."

Many people are unaware that the seafood they catch or eat isn't just out there in the ocean, but rather are dependent on the same coastal land and water resources that we too find in short supply. The continuing loss of wetland and riparian habitat threatens the survival of over half of this region's fish catch and

the fishermen dependent on them. Increasing run-off of silt, nutrients, herbicides, oil from busier roads, and discharges from over-loaded municipal sewer plants increase the incidents of shellfish bed closures and seafood consumption advisories. As population pressures increase and resources become scarcer, who will insure that water is left in the streams for fish; protect wetlands; and motivate loggers, ranchers, and property owners to protect the streams that flow through their land? Unless the connection is made between healthy fish and a healthy environment, there will never be enough public support to enact and enforce tougher laws, and to make the difficult but necessary public policy decisions.

PSMFC's F.I.S.H. Habitat Education Program was initiated in 1991 to make that connection. This program encourages recreational and commercial fishermen, teachers, and others to educate the public about fish habitat problems and remedies. The concept grew from the realization in 1990 that neither the Commission nor most sport or commercial fishing



Figure 2. Healthy coastal estuaries are essential for sustained fishery resources (WA Dept. Ecology Photo).

industry groups were participating (or were considered likely participants) in the Earth Day 20th anniversary events. This despite the fishing industry's positive response to the Commission's marine debris and recycling program efforts. Although PSMFC knew that fishermen were concerned about protecting fish habitat, fishermen were generally uninvolved and it seemed clear that the public did not consider them conservationists. PSMFC envisioned a program that would involve fishermen in habitat protection the same way that Ducks Unlimited involves duck hunters. If fish habitat is to be protected, concerned fishermen must watchdog their community's land use planning decisions, speak to their farming neighbors about the importance of keeping cows away from the stream bank, or talk to their kid's class about the value of the local marsh.

In order to support such involvement, the F.I.S.H. Habitat Education Program provides written background materials, videotapes, posters, and displays. The program produces new materials, but also distributes or promotes awareness of the many excellent programs and resources already available. Some of the available materials include: a "Save Our Schools!" poster which features the nation's wetland dependent marine fish species; a teacher's guide that has excerpted activities from various sources which focus on understanding wetlands and pollution, videotapes regarding wetlands and coastal habitat issues, "profiles" of the habitat needs of important West Coast fish, and

## What is the connection between fish and habitat?

### Consider:

- Coastal estuaries and their associated wetlands are the essential nurseries of salmon, crab, ling cod, sturgeon, striped bass, herring, anchovy, shad, starry flounder, english sole, and many other species. About 76% by weight of the commercial fish catch in Alaska, 52% in Washington and Oregon, and 18% in California is wetland dependent.
- About 60% of Washington and Oregon's, and 91% of California's coastal wetlands have already been lost. By the year 2010, California's coastal population is expected to have increased 19% from its 1990 level, Oregon's by 15%, Washington's by 20%, and Alaska's by 27%. Despite stronger laws and awareness, wetland losses are often directly related to population growth.
- 40% of the Columbia River basin's historic headwater salmon spawning areas and 3600 miles of riverine habitat in the Snake River and its tributaries have been destroyed due to dam placement. Water management policies have produced inadequate spring flows that indirectly kill 70 to 90% of juvenile salmon smolts and inhibit white sturgeon spawning. The Snake River coho are extinct, the Snake River sockeye are endangered, and spring/summer chinook and white sturgeon are threatened. Lower Columbia River coho salmon population levels are extremely low.
- About 90% of California's chinook salmon spawning habitat has been lost due to extensive water project developments throughout the Central Valley. The decline of the now-threatened Sacramento River winter chinook salmon from 87,000 in the 1960's to 500 in 1990 is blamed on the habitat loss and water diversions associated with the Shasta and Red Bluff dams.
- The survival of juvenile striped bass is directly correlated with freshwater flows into San Francisco Bay. Over 62% of the freshwater that flowed into the bay is now diverted for agriculture and municipal uses. The survival of young striped bass in two primary spawning areas in the bay has declined to levels approaching zero, and adult striped bass populations have declined 60 to 80%.
- High levels of contaminants in urban bays have led to seafood consumption warnings. Hot spots in the region include Elliott and Union Bays in Puget Sound, San Francisco Bay, Santa Monica Bay, and San Pedro. Shellfish harvests are curtailed after a rain in many coastal bays due to the release of raw sewage from overwhelmed sewage treatment plants.
- Water pollution impacts fish too! Adult English sole exposed to hydrocarbons (like those found in petroleum products) have altered egg development, delayed spawning, and deformed young. Juvenile chinook salmon that spend only a few weeks migrating through polluted areas in Puget Sound show suppressed immune system responses and genetic damage, presumably because their prey concentrates toxic compounds.

information about the actions that individuals can take to prevent pollution. These and more are available free or for nominal cost, or on loan. Call or write for a copy of the program's educational packet and videos list.

The F.I.S.H. Habitat Education Program receives programmatic guidance and support from the Fishermen Involved In Saving Habitat Aquatic Education Steering Committee chaired by Bruce Cole, publisher of National Fisherman magazine. Grants and donations finance the program. Some supporters include the National Fish and Wildlife Foundation, Sport Fish Restoration Program, National Fisherman, Harbor Seafoods, National Fisheries Institute, Pacific Coast Federation of Fishermen's Associations, the Pacific Coast Fishermen's Wives Coalition, and the west coast states.

### NEW PROJECTS

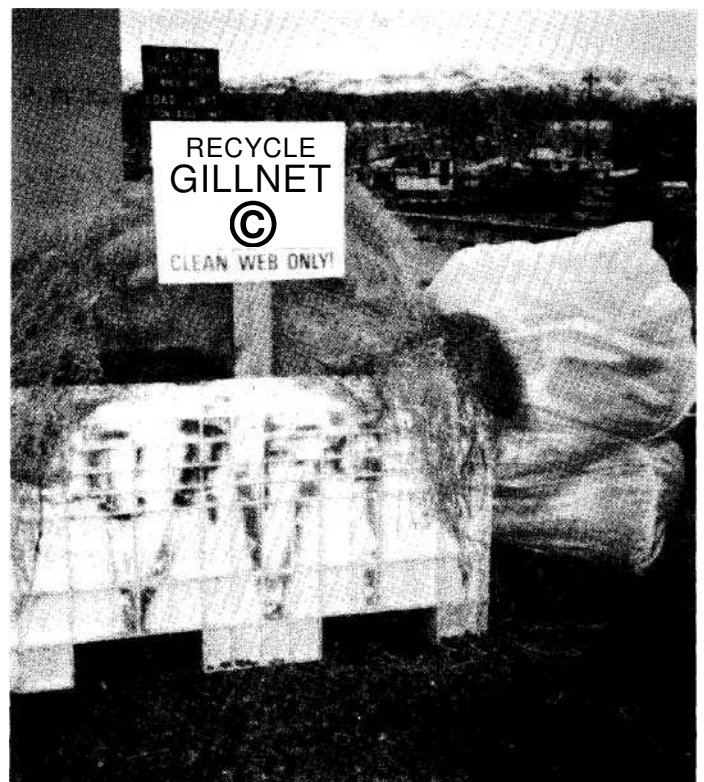
**Gill Net Recycling.** PSMFC operated gill net recycling stations at Bellingham, Anacortes, and Seattle, Washington, and at Cordova, Alaska during 1991 in the nation's first successful net recycling effort. Thanks to financial grant support and many hours of volunteer efforts, 35,000 pounds of net were collected at Puget Sound ports and 12,000 pounds were collected at Cordova. These nets were sent to Skagit River Steel and Recycling in Burlington, Washington where they were baled and stockpiled. In January 1992 they were loaded into a 40-foot container and shipped overseas. During March 1992, a factory in Taiwan melted them down, added black dye, and extruded them into bicycle seats.



**Figure 3.** PSMFC observers monitor marine mammal interactions with gillnet fisheries on the Columbia River, Willapa Bay, and Gray's Harbor.

A grant from the Saltonstall-Kennedy program, a fund generated from tariffs on foreign fish products and equipment, supported the project. Sale of the nets barely covered costs, but future separation of nets by nylon type should lead to higher prices and increased recycler interest. Prices may never be high enough to pay fishermen or ports for their collection efforts, but the cost and difficulties associated with disposing net materials and the lack of landfill space will increasingly make recycling the preferred option. Fran Recht is the project originator and manager (503) 765-2229.

**Marine Mammal Observer Program.** In a joint program with the Oregon Department of Fish and Wildlife and the Washington Department of Wildlife, PSMFC sampled the 1991 and 1992 winter fisheries in the Columbia River, the 1991 Columbia River fall fishery, and the 1991 summer fisheries in Willapa Bay and Gray's Harbor. This ongoing marine mammal sampling program has five major goals. These include: obtaining statistically reliable data on the incidental take of marine mammals in the gillnet fishery; collecting information on fishing effort and gear types by area; collection of incidentally taken and stranded marine mammals for life history information (food habits, age, and reproductive condition); assessment of damage to commercial gillnet gear and catch caused by seals and sea lions; and monitoring the abundance and distribution of seals and sea lions in the fishing areas. Russell Porter is the project manager (503) 650-5400.



**Figure 4.** PSMFC gillnet recycling station at Cordova, Alaska.



## FINANCIAL, AUDIT, AND BUDGET REPORTS

The Commission receives its financial support from contributions from its member states, grants, contracts, and indirect cost charges on external contracts. Since 1977, the states' contributions have remained level funded at \$106,000 per year. These contributions are made available from the member states in accordance with Article X of the Interstate Compact which created the Commission. The formula calls for eighty percent of the total contributions to be shared equally by those states having as a boundary the Pacific Ocean and five percent from Idaho. The fifteen percent balance is divided by the states in proportion to the primary market value of the products of their commercial fisheries on the basis of the latest 5-year catch records.

### 1991 Audit Report

To the Board of Commissioners  
Pacific States Marine Fisheries Commission  
Portland, Oregon

We have audited the accompanying general purpose financial statements of Pacific States Marine Fisheries Commission as of June 30, 1991, and for the year then ended. These general purpose financial statements are the responsibility of Pacific States Marine Fisheries Commission's management. Our responsibility is to express an opinion of these general purpose financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards, Government Auditing Standards, issued by the Comptroller General of the United States, and the provisions of Office of Management and Budget Circular A-128, "Audits of State and Local Governments." Those standards and OMB Circular A-128 require that we plan and perform the audit to obtain reasonable assurance about whether the general purpose financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall general purpose financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the general purpose financial statements referred to above present fairly, in all material respects, the financial position of Pacific States Marine Fisheries Commission, as of June 30, 1991, and the results of its operations for the year then ended in

conformity with generally accepted accounting principles.

Our audit was conducted for the purpose of forming an opinion on the general purpose financial statements taken as a whole. The supplementary information listed in the table of contents are presented for purposes of additional analysis and are not a required part of the general purpose financial statements of Pacific States Marine Fisheries Commission. Such information has been subjected to the auditing procedures applied in the audit of the general purpose financial statements and, in our opinion, is fairly presented in all material respects in relation to the general purpose financial statements taken as a whole.

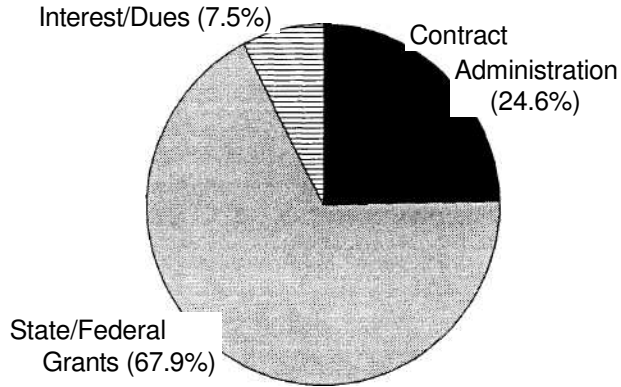
Cahall, Nolan & Co.  
October 28, 1991  
Portland, Oregon

*Editor's Note: Copies of the complete auditor's report are available upon request.*

COMBINED BALANCE SHEET - JUNE 30, 1991			
	General Fund	General Fixed Assets	Totals
<b>ASSETS</b>			
Cash	77,405		77,405
Receivables:			
Grants and Contracts	1,048,652		1,048,652
Other	16,807		16,807
Fixed Assets		1,210,078	1,210,078
<b>Total Assets</b>	<b>840,874</b>	<b>908,088</b>	<b>1,748,962</b>
<b>LIABILITIES AND FUND BALANCE</b>			
<b>Liabilities</b>			
Accounts Payable	753,947		753,947
Withholding Taxes	41		41
Capital Lease Obligations	102,174		102,174
Deferred Revenue	148,099		148,099
Other Liabilities	10,499		10,499
<b>Total Liabilities</b>	<b>1,014,760</b>		<b>1,014,760</b>
<b>Fund Equity</b>			
Investment in General Fixed Assets		1,210,078	1,210,078
Fund Balance	128,104		128,104
<b>Total Fund Equity</b>	<b>128,104</b>	<b>1,210,078</b>	<b>1,338,182</b>
<b>Total Liabilities and Fund Equity</b>	<b>1,142,864</b>	<b>1,210,078</b>	<b>2,352,942</b>

# 1991 PSMFC OPERATING BUDGET

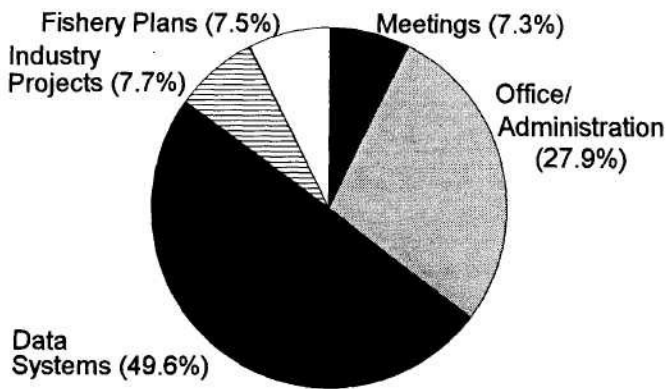
## REVENUES (\$1,607,139)



External Contracts for the Period  
July 1, 1990 - June 30, 1991

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## EXPENDITURES (\$1,607,139)



Contract	Amount	Manager/Treasurer
Administrative Support of SFFMP	\$ 18,000	
Albacore Logbook & Port Sampling	54,071	
Interjurisdictional Fisheries Program	110,000	
OCS Fishery Resource Data	124,635	
PIT Tag Data Base	229,794	
Regional Mark Processing Center	155,781	
Pacific Fisheries Information Network (PacFIN)	919,042	
SK Net Recycling	22,988	
USFWS Cooperative Interstate Fishery Management	74,699	
USFWS Stream Improvement	23,911	
AK High Seas Drift Net	50,000	
CA Northern Sportfish	6,431	
CA Ocean Salmon Stock Analysis	25,000	
CA Sea Urchin Fishery	6,020	
CA Sportfish Sampling Studies	55,072	
NWPPC Columbia Basin System	195,025	
BPA Implementation of Planning Process	232,512	
BPA Columbia River Coded Wire Tag	71 9,985	
BPA Coordinated Information System	827,911	
BPA Scientific Review Group Support	518,888	
BPA Smolt Coordination (FPC)	1,171,356	
BPA Technical Work Group Coordination	184,255	
Columbia Basin Fish & Wildlife Authority	193,464	
COE Gatewell Dipnet Sampling	34,287	
Council Support	27,750	
Fish Marking Coordinator Support	23,597	
Columbia River Gill-Net Fisheries Observer Program	635,764	
Squawfish Sport Reward Program	534,400	
<b>Total Contracts</b>	<b>7,174,638</b>	

Submitted by Pam Kahut, Fiscal

# PACIFIC COAST FISHERY REVIEW REPORTS

## DUNGENESS CRAB FISHERY IN 1990-91

### Alaska

Total landings were 9.1 million pounds, about 0.9 million pounds above 1990. In addition, there were about 46,500 pounds of deadloss statewide. Production by area was: Southeast, 7.5; Kodiak, 1.4; Prince William Sound, 0.07; Alaska Peninsula, 0.077; and Dutch Harbor, 0.007 million pounds respectively. Landings in Southeast and the Alaska Peninsula increased, while landings in all other areas declined.

### Washington

Total Dungeness crab landings were 8.9 million pounds. The coastal fishery (1 December 1990- 15 September 1991) produced 6.8 million pounds. The Puget Sound fishery (1 October 1990- 15 April 1991) produced 2.1 million pounds. The opening ex-vessel price for the coastal fishery was \$1.50/lb. Two hundred thirty five vessels made a total of 6,724 landings in the coastal fishery. One hundred seventy four of those vessels made at least five landings and delivered 2,000 pounds. In Puget Sound the Dungeness crab fishery has limited entry with 260 non-Treaty licenses participating in the fishery.

### Oregon

Ocean crab landings were 8.3 million pounds, down from 9.3 million pounds last year. Early season crab were in good condition and the December catch exceeded 5.4 million pounds. While effort was high, the number of landings was down compared to the previous December opener; catch in 1989 was 5.2 million pounds. The opening price of \$ 1.50 per pound increased to \$1.65 by mid-month and \$2.00 per pound by June. Over 80 percent of the season harvest was taken by the end of January. Three hundred and sixty eight (368) boats made 9,014 deliveries. A Tri-state Dungeness Crab Committee sponsored by PSMFC was formed to begin agency and industry discussions on regional management issues.

### California

California Dungeness crab landings were 12.0 million pounds, an increase of 162% from the previous season.

Landings for the northern California ports of Crescent City, Trinidad, and Eureka were 5.5, 1.2, and 3.6 million pounds respectively. The ex-vessel price opened at \$ 1.50, and there were 315 vessels in the fleet.

Central California landings totaled 1.4 million pounds, up 0.5 million pounds from the 1989-90 season. The ex-vessel price opened at \$1.75.

### Contributors:

Herman Savikko, Alaska Department of Fish and Game  
 Colin Wallace, Department of Fisheries and Oceans,  
 Canada  
 Paul LaRiviere, Washington Department of Fisheries  
 Jim Golden, Oregon Department of Fish and Wildlife  
 Ron Warner, California Department of Fish and Game

Alaska and British Columbia crab catches are reported on a calendar

Table 1. Annual landings of Dungeness crab by state, province, and entire Pacific coast (in 1000's of lbs.)

Year or Season*	Alaska	British Columbia	Washington	Oregon	California	Total
1952-53	3,472	4,596	6,222	6,949	8,277	29,516
1953-54	2,739	4,871	7,455	10,178	8,266	33,509
1954-55	4,384	5,064	6,755	6,106	5,853	28,162
1955-56	2,446	3,486	9,395	8,602	13,083	37,012
1956-57	552	2,873	11,327	11,560	19,279	45,591
1957-58	1,747	4,079	11,285	10,080	17,288	44,479
1958-59	3,999	4,120	8,219	7,033	17,786	41,157
1959-60	4,733	4,828	7,555	8,093	15,865	41,074
1960-61	4,592	4,284	7,388	10,816	12,446	39,526
1961-62	8,990	2,444	5,675	5,813	3,987	26,909
1962-63	12,084	3,738	5,105	3,546	2,342	26,815
1963-64	12,709	4,302	5,043	3,540	1,998	27,592
1964-65	8,895	3,501	7,715	6,221	4,749	31,081
1965-66	5,053	4,538	11,649	10,187	10,419	41,846
1966-67	11,598	5,295	9,291	9,428	10,705	46,317
1967-68	13,242	4,373	11,736	10,215	13,158	52,724
1968-69	10,886	3,705	19,250	11,965	13,685	59,491
1969-70	9,696	2,548	18,675	13,849	15,564	60,332
1970-71	3,749	1,963	13,211	14,735	8,501	42,159
1971-72	5,448	1,975	10,095	6,780	2,875	27,173
1972-73	6,423	2,580	5,583	3,143	1,500	19,229
1973-74	3,818	2,500	4,604	3,462	880	15,264
1974-75	3,036	2,513	5,896	3,335	1,816	16,596
1975-76	1,545	2,121	9,885	9,099	17,410	40,060
1976-77	1,162	2,269	14,023	16,200	26,404	60,058
1977-78	7,169	2,592	9,237	10,375	13,800	43,173
1978-79	6,334	2,599	10,362	16,352	8,300	43,947
1979-80	5,912	3,750	8,320	18,277	14,853	51,112
1980-81	15,109	2,626	4,494	9,429	12,717	44,375
1981-82	15,811	1,969	3,928	8,700	10,786	41,194
1982-83	**11,801	1,848	5,237	4,100	5,413	28,399
1983-84	9,967	1,155	6,166	4,700	5,854	27,842
1984-85	9,180	2,561	4,266	4,900	5,248	26,155
1985-86	9,358	2,913	5,430	7,171	5,990	30,862
1986-87	9,346	3,587	4,806	4,747	8,597	31,083
1987-88	10,571	3,324	17,858	8,685	8,754	49,192
1988-89	7,667	3,348	23,896	11,154	9,552	55,617
1989-90	8,145	4,648	8,629	9,236	4,548	35,206
10-year Mean	10,696	2,798	8,471	7,282	7,746	36,993
1990-91	9,062	4,250	8,883	8,248	11,956	42,399

year basis. The last year mentioned in this column is the calendar year. Washington, Oregon and California catches are reported on a season basis that begins during the first year referenced and ends during the following year. Includes all deadloss.

## SHRIMP FISHERY IN 1991

The 1991 Pacific Coast Pandalid shrimp landings in the United States and Canada totaled 55.1 million pounds (Table 2), a 13 percent decrease from 1990 landings.

### Alaska

Commercial landings of shrimp totaled 3.8 million pounds in 1991, an increase of about 19% over the 1990 season. Landings of trawl caught shrimp totaled 3.1 million pounds, and 0.7 million pounds of shrimp were caught by pot.

Southeastern Alaska landings accounted for 2.9 million pounds of trawl caught and 698,223 pounds of pot caught shrimp. The remaining Alaska landings were scattered between Prince William Sound and Cook Inlet.

### British Columbia

Total shrimp landings for west coast of Canada trap and trawl fisheries were 9.2 million pounds.

The trawl fishery consists of offshore otter trawl and inshore beam trawl operations. Offshore smooth pink shrimp, *Pandalus jordani*, landings totaled 6.3 million pounds from the Tofino and Nootka grounds (Vancouver area), an increase of 92% over 1990. Inside beam trawl landings of *P. borealis*, *P. jordani*, *P. platyceros*, and *Pandalopsis dispar* totaled 791,600 pounds from Georgia Strait and Chatham Sound (both Vancouver and Charlotte areas).

The coastwide trap fishery targets mainly on the prawn, *Pandalus platyceros*, with a small operation for coonstripe shrimp, *P. danae*, in Sooke Harbour (Vancouver area). Total

landings from these fisheries were 2.1 million pounds, an increase of 13% over 1990.

### Washington

Coastal pink shrimp landings in 1991 totaled 9.95 million pounds, a drop of 3.55 million pounds from 1990. Of this total, 94.4% were caught off the Washington coast, compared with 82.2% in 1989 and 93.9% in 1990. Ninety-three vessels made landings, the same number that made landings in 1990. Of these vessels, 46 (41 double rigged) made five or more landings, representing a 15 vessel decrease in this category from 1990. Total trawling hours decreased 15% to 32,951 double rig equivalent hours of effort expended over 848 trips (landings). Ninety percent of the landings were by double rigged vessels.

CPUE for the season averaged 302 lb/h, down from 349 lb/h in 1990 and 476 lb/h in 1989, and was the lowest since landings picked up in 1985. However, late season CPUE (August through October) actually rose somewhat over 1990 statistics in all areas.

Ex-vessel prices for shrimp began at \$0.54, nine cents higher than in 1990, and 14 cents higher than the 1989 opening price. Split pricing, (a lower price for small shrimp), a bone of contention between fishermen and processors, was eliminated. The price jumped to \$0.60 in mid-May, then dropped to \$0.53 after a strike by fishermen during the latter half of July, where it remained through the rest of the season. The mean price paid for shrimp over the entire season was \$0.542, up \$0.043 from 1990 and \$0.17 from 1989. The ex-vessel value of the 1990 landings dropped to \$5.4 million, off \$1.35 million from the value of the 1990 catch.

With the exception of April, one-year old shrimp dominated landings throughout the season. Normally one-year olds do not predominate until the latter half of the season, but the 1989 year class (two-year olds) proved weak, consistent with observations during 1990. Three- and four-year old shrimp made their greatest contribution in the early months of the fishery, as normally occurs.

As anticipated, primary transitioning (one-year old shrimp maturing directly as females) occurred in proportions larger than normal. The weak year class of two-year olds and relatively strong year class of one-year olds created a potential female to male imbalance, to which the shrimp apparently responded. The mechanism controlling the proportion of a year class which transitions to females in any given year is unknown, but appears to be somehow tied to the relative numbers of males and females present in the population.

### Oregon

The total 1991 pink shrimp, *P. jordani*, harvest in Oregon was approximately 21.7 million pounds (Table 2). The 1991 harvest was 10.2 million pounds less than was landed during the 1990 season, and well below the ten year average of 27.2 million pounds. A total of 157 vessels made 1,990 deliveries of pink shrimp into Oregon ports during 1991 compared with 179 vessels and 2,430 deliveries during 1990. CPUE decreased to its lowest level since 1984.

Table 2. Annual Pacific Coast pandalid shrimp landings (in 1000's of pounds) by state and province, 1975 - 1990.

Year	Alaska	British Columbia	Washington	Oregon	California	Total
1975	98,535	1,728	10,167	23,893	4,993	139,316
1976	129,011	7,723	9,261	25,392	3,400	174,787
1977	116,011	6,176	11,803	48,580	15,633	198,203
1978	73,293	3,460	12,298	56,997	13,167	159,215
1979	50,916	1,578	12,135	29,579	4,992	99,200
1980	52,568	1,500	12,629	30,152	5,050	101,899
1981	28,029	1,841	10,055	25,918	3,670	69,513
1982	16,987	1,200	5,000	18,462	4,550	46,199
1983	7,458	1,200	5,656	6,547	1,132	21,993
1984	9,539	2,009	3,423	4,844	1,485	21,300
1985	4,204	2,969	9,118	14,848	3,293	34,432
1986	4,064	2,400	17,400	33,798	6,800	64,462
1987	2,457	4,700	15,900	44,800	7,800	75,657
1988	2,773	5,600	18,300	41,484	11,100	79,257
1989	2,000	6,300	15,870	49,083	13,314	86,567
1990	3,197	5,845	13,504	31,883	8,684	63,113
10-yr Mean	8,071	3,406	11,423	27,167	6,183	56,249

1991 3,794 9,244 9,949 21,720 10,358 55,065

Table 3. Oregon landings (pounds) of pink shrimp and effort (hours) during 1990 and 1991, by PSMFC area of harvest.

PSMFC Area	Geographic Boundaries	1991		1990	
		Pounds	Hours	Pounds	Hours
72	Cape Flattery to Cape Elizabeth	2,182,819	6,202	3,056,228	6,969
74	Cape Elizabeth to Willapa Bay	2,533,790	7,581	4,115,172	10,029
75	Willapa Bay to Columbia River	148,463	611	174,436	634
82	Columbia River to Cape Falcon	2,629,854	9,447	2,593,487	6,371
84	Cape Falcon to Cape Perpetua	2,930,908	12,886	8,061,216	24,661
86	Cape Perpetua to Cape Blanco	5,172,638	17,558	8,828,111	22,331
88	Cape Blanco to California border	4,769,334	11,282	4,223,482	8,144
92	California border to Cape Mendocino	1,351,853	2,575	830,652	1,706
Total		21,719,659	68,142	31,882,784	80,845

The total effort (hours) expended to harvest the landed catch was 68,142 h, a decrease of 12,703 h over 1990 (Table 3). Total CPUE was 319 lb/h in 1991, considerably less than the 394 lb/h seen in 1990. PSMFC area 86 had the most pounds harvested and the most effort expended.

The 1991 season began quickly with no price related delays. The opening price was \$.54/lb for legal grade shrimp, an increase of \$.09/lb over last years opener. Fishing proceeded normally until mid-July with the ex-vessel price rising to \$.60/lb during the last week of May. Nearly all shrimp fishing stopped coastwide after about 17 July when fishermen tied up in response to a price decline. The dispute lasted into the first week of August when fishermen accepted a price of \$.53/lb. The price remained stable through the remainder of the season. Split pricing did not occur this year.

Monthly landing totals were below the ten year average for each month except August, when landings peaked at about 4.1 million pounds. The 1991 season was unusual in that early season landings were depressed, making monthly landings more uniform throughout the season. The effects of the 1989 year class failure were apparent in the poor showing of two year old shrimp. In recent years, early season (April, May and June) landings have typically been composed primarily of age-1 and age-2 shrimp. The relative absence of age-2 shrimp this year meant that fishermen had a harder time finding large volumes of shrimp while still maintaining an average count below 160 shrimp/lb. The low landings shown for July probably resulted mostly from the prolonged tie-up over price.

Count-per-pound was an important issue during 1991. The potential for violations was high due to the high proportions of small age-1 shrimp in the population. The Oregon State Police (OSP) and ODF&W actively monitored count-per-pound in all major ports. Two citations were issued by OSP, one each in Astoria and Coos Bay. The potential for violations had decreased sharply by July as age-1 shrimp grew and achieved legal grade.

The mean carapace lengths of age-1 shrimp in 1991 were generally smaller than in 1990. Mean carapace lengths at age-1 were generally at or below the lower end of the range seen since 1978. Age-2 shrimp were slightly larger at age than in 1990 but were still at the lower end of the size range seen since 1978.

Age-zero shrimp were observed in all areas sampled during October 1991 with levels suggesting better recruitment than in 1990. The percentage of age-zero shrimp in areas 19 and 20 reached 16.8% and 24.0% respectively during October 1991, much higher than in 1990. Samples from areas 30 and 32 showed a slight decrease from 1990 levels of 2.1% and 0.7% respectively.

The sex composition of pink shrimp in the fall of 1991 was characterized by moderate levels of primary females when compared to recent years, and was much higher than the low levels seen in 1990. This increase was expected due to the low abundance of age-2 and age-3 shrimp at the end of the season. However, the moderate levels seen in 1991 may be further evidence that the 1990 brood was not exceptionally strong.

#### California

California statewide landings of Pacific Ocean shrimp, *P. jordani*, for the 1991 season totaled 10.4 million pounds, an increase of 19.3 percent over the 8.7 million pounds landed in 1990. The 1991 season landings were the fifth largest since the beginning of the fishery in 1952. There were only two areas of production in 1991; area 92 (Oregon border to False Cape) accounted for 99 percent of the catch, and area 94 (False Cape to Point Arena).

#### AREA 92

Shrimp landings at area 92 ports totaled 10.2 million pounds, a 25 percent increase over the 8.16 million pounds landed in 1990. Like the statewide landings, landings in area 92 were the fifth largest on record. The area 92 landings included 0.19 millions pounds caught in area 94, 0.45 million pounds caught off southern Oregon, and 9.56 million pounds caught in area 92. Shrimpers were receiving \$0.54 per pound when the season opened on April 1. The ex-vessel price increased to \$0.55 per pound on July 17, but dropped to \$0.53 per pound on July 29 were it stayed until the end of the season.

A total of 86 boats (54 single-rigged and 32 double-rigged) made shrimp deliveries to area 92 ports during 1991. This was an increase of 29 boats from 1990 and the greatest number of vessels to make deliveries in area 92. Single-rigged vessels had an average seasonal catch rate of 342 pounds per hour, a two percent decrease from 1990. Double-riggers

averaged 556 pounds per hour, a 12 percent decrease from the previous season.

The biological statistics for the 1991 catch returned to near normal (1980-89 average) after the anomalies of 1990. One-year old shrimp comprised 85.7 percent of the season catch, compared to 18.8 percent in the 1990 season and 80.5 percent in the 1980-89 average. The count per pound average 113. Some anomalies were present, however, as females made up only 7.1 percent of the catch, compared to the ten-year average of 39.5 percent.

#### AREA 94

Shrimp landings at area 94 ports were 137 thousand pounds, down 74 percent from the 519 thousand pounds of 1990. Over 95 percent of the season landings were made during the first month. The ex-vessel price was the same as in area 92.

A total of 34 landings, down 53 percent from 1990, were made by six single-rigged vessels. These vessels had an average catch rate of 364 pounds per hour, a decrease of 17 percent from last season. The count per pound was 85 in April and 110 in August. One-year old shrimp made up 25 percent of the sampled catch in April and 51 percent in August.

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## SEA URCHIN FISHERY IN 1991

### Alaska

The Alaskan sea urchin fishery landings totaled 225,100 pounds, live weight, in 1991. This is up from the 100,300 pounds landed in 1990 but down from the peak historic catch of 757,100 pounds landed in 1987. In the green urchin fishery, 50,900 pounds were harvested by 10 divers near the communities of Homer in Cook Inlet and Kodiak on Kodiak Island. Logistical and weather considerations were important factors during the fall and winter period when the fishery occurs. In Southeast Alaska, where the harvest is made up primarily of red urchins, harvests occurred throughout the region prior to 1991. In 1991, 6 divers harvested 174,200 pounds of red urchins from Sitka Sound in the late winter to early spring fishing period as part of a Department of Fish and Game research project sponsored by PSMFC.

### British Columbia

Preliminary 1991 landings of sea urchins in British Columbia were 16.1 million pounds, and most of these were red sea urchins (14.8 million pounds). Nearly 80% of 1991 red urchin landings were in North Coast management areas. Green sea urchin landings were 1.3 million pounds in 1991, and most of these were from East Coast Vancouver Island management areas.

### Washington

Total red urchin landings were 5.4 million pounds, with an average ex-vessel price of \$0.60 per pound. The total landed valued of \$3.3 million is the highest since the fishery began in 1971. Seventy-six boats made landings, compared to 77 last season. Limited entry, which went into effect in 1989/90, reduced the fleet from 197 boats the previous season to 64 boats; the increase since 1989/90 is due to the entry of vessels that won court cases challenging their eligibility to fish under limited entry.

The season was opened November 1, 1991 through April 15, 1992 for three days per week in Districts 1 (Northern San Juans) and 4 (Sekiu). The Washington Department of Fisheries (WDF) set this schedule with a goal of approximately 4 to 5 million pounds, amounting to roughly half the landings taken in

these two districts the last time they were fished (1988/89 season). The rationale for the significantly reduced catch goal was that neither district had fully recovered from the 1988/89 fishery, which was closed by emergency after only three months. In summer 1991, WDF biologists estimated that the total urchin abundance had declined in these two districts roughly 32% since 1984, when surveys were made prior to an intensive fishery; no significant declines were noted during surveys prior to the 1988/89 fishery. Upper and lower size

Table 4. Annual landings of sea urchins by state, province, and entire Pacific coast (in 1000's of pounds).

Year	Alaska	British Columbia	Washington	Oregon	California	Total
1971		t	1.8		0.2	2.0
1972		t	2.5		76.5	79.0
1973		802.5	14.7		3,594.7	4,411.9
1974		t	57.4		7,107.8	7,165.2
1975		t	31.0		7,567.2	7,598.2
1976		t	1,544.4		11,106.4	12,650.8
1977		154.5	1,045.6		16,536.3	17,736.4
1978		165.3	471.4		14,424.3	15,061.0
1979		701.5	697.0		20,544.2	21,942.7
1980		733.7	132.9		22,167.1	23,033.7
1981	*	254.2	304.2		26,333.7	26,892.1
1982	*	351.2	40.6		18,403.9	18,795.7
1983	*	2,173.3	497.2		15,809.4	18,479.9
1984	107.4	3,890.1	604.5		14,746.5	19,348.5
1985	126.0	4,001.2	878.8		19,994.9	25,000.9
1986	282.4	4,556.7	3,436.1	55.8	34,130.7	42,461.7
1987	757.1	4,935.0	4,475.0	202.8	45,636.8	56,006.7
1988	244.9	5,644.5	8,092.4	1,947.3	51,988.0	67,917.1
1989	187.0	7,201.2	5,242.4	7,842.6	51,187.3	71,660.5
1990	100.3	8,008.5	6,612.8	9,317.2	45,269.7	69,308.5
1991**	225.1	16,105.2	5,419.2	4,722.5	41,449.6	67,921.6
5-year	302.9	8,378.9	5,968.4	4,806.5	47,106.3	66,562.9
Avg.						

\* Confidential information: fewer than four fishermen with landings.

\*\* All 1991 data are preliminary.

t Data from 1971-73 combined.

f Data from 1974-77 combined.

limits were adjusted in District 4 to protect a greater percentage of recruits.

Catch-per-diver-hour was 455 pounds, an 11 % decline compared to the 1988/89 season in the same districts, and probably reflects reduced urchin densities as well as the more restrictive size limits in District 4. Fifty-nine percent of the catch came from District 1, with the remainder coming from District 4. Within District 1, most fishing took place in areas previously fished in 1988/89; in District 4, there was a slight shift in effort from the eastern portion of the district to the western portion.

### **Oregon**

Red sea urchins (*Strongylocentrotus franciscans*) were first commercially harvested in Oregon in 1986. The first five years of the fishery saw much growth and development: from 55 thousand pounds landed the first year to over 9 million pounds in 1990; from essentially no regulations to a detailed limited entry system. Data from 1990 and 1991 indicate we are beginning to see the effects of several years of intense fishing on the resource.

Total landings and numbers of harvesters peaked in 1990 at 9.3 million pounds and 61 harvesters. Landings and effort dropped in 1991 to 4.7 million pounds and 57 harvesters. Port Orford continues to be the major port of landing. However, landings into other ports have increased each year as the pressure in the Port Orford area continues. A greater portion of the harvest has occurred during the summer months than we had anticipated. Closures in other states have created a higher demand for Oregon urchins even though the quality and price is lower during this time of year.

A joint Oregon Department of Fish and Wildlife (ODFW), Oregon State University, and Oregon urchin industry survey of Orford Reef was completed in 1991. The methods developed during this pilot project are being applied to an ODFW five-year coastwide urchin survey. Research findings to date include: Average density of all sizes of red urchins at Orford Reef was low, 0.89 per square meter; Approximately 61 % of all urchins by number were in a single size mode, probably the 1988 year-class; Few younger urchins were detected below the dominant size mode (only 5.4% of the red urchins measured 2 inches or less); The proportion of urchins in older year-classes declined as the fishery proceeded through the year.

In 1988, a limited entry permit system went into effect for the commercial sea urchin fishery. At that time, the maximum number of permits was set at 92; fishermen were required to have landed 20,000 pounds of urchins in the each of the previous two years in order to renew their permit. Permits were non-transferable; any unissued permits were to be reissued through a lottery held each spring. Since the beginning of the limited entry system, the Oregon Fish and Wildlife Commission has directed that the number of permits be reduced through attrition to 46, and has changed the permit renewal requirement to 20,000 pounds annually. Temporary transfers of permits for medical reasons are allowed.

Other regulations include a minimum size limit (3 inches originally, 3.5 inches currently), a minimum harvest depth of 10 feet from mean-lower-low water, a logbook requirement, a maximum of two divers allowed in the water at the same time from any one boat, and three seasonal 1,000 foot buffer zones around sea lion pupping rocks.

### **California**

Landings declined to their lowest levels in the past five years as increasingly restrictive fishing effort limitations took effect. Prior to June 1990, fishing was allowed daily unless the previous year's landings exceeded 10 million pounds in northern California or 18 million pounds in southern California, in which case the second full week of each month from May through September would be closed. The June 1990 regulations provided for a four day (Monday through Thursday) open season from May through September and a complete closure in July in addition to the aforementioned weekly closure. Also, there was an increase in the minimum size limit, from three to three and one-half inches, in northern California.

The 1991 fishery was marked by a shift of effort from northern to southern California, in part prompted by the July closure in the north. This led to an increase in southern California landings compared to 1990. Northern California landings declined in 1991, compared to 1990, as a result of the effort shift, the increased minimum size limit, and the fishing-down of virgin stocks.

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## ALBACORE FISHERY IN 1991

Commercial albacore landings fell to a new low in 1991. Only 3.7 million pounds were landed by California, Oregon and Washington. This represents a 44% decrease from last year and a 23% decline from the record low experienced in 1989. The average fish weight decreased from 16 pounds in 1990 to 12.5 pounds in 1991. Fishing effort was centered off Vancouver Island, Canada, following the trend of the last three seasons. The probable cause for the decline in landings is the unavailability of larger fish to the north Pacific albacore fishery.

Pan Pacific Cannery and the Western Fishboat Owners Association (WFOA) did not reach a price agreement until September. The price agreement was \$1,000 for fish less than nine pounds and \$1,700 per ton for fish greater than nine pounds. WFOA agreed to pay shipping fees of \$100 per ton when fish were landed at buying stations.

In July, biologists from California, Oregon, Washington, National Marine Fisheries Service, the Inter-American Tropical Tuna Commission, and the Far Seas Fisheries Research Center, Japan attended the 12th North Pacific Albacore workshop held in Shimizu, Japan. The status of the north Pacific albacore population was the main topic.

### California

The first landings of the 1991 albacore season occurred in August, when boats from the mid-Pacific unloaded at California ports. Most of these boats had been fishing north of the Hawaiian Islands. Fish averaged between 12 to 28 pounds with several 45-pound fish taken as well. The fishing was fair with scores of 100 fish/day/boat. Some localized fishing activity occurred around Point Sur but catch levels were low (2 fish/day/boat). Fifteen landings totaled 223,092 pounds in August.

By September fishing effort had moved north and was centered off Vancouver Island, Canada. In this area, catch rates remained good (30 to 105 fish/day/boat) with fish sizes similar to the previous month. Fishing activity off the California coast increased. Jig boats and jig/drift gill net boats working 50 to 150 miles off the coast between Eureka and Morro Bay reported average scores of 40 fish/day/boat. The catches were composed of 6 to 12 pound fish or "peanuts". A total of 107 landings during September equalled 1,080,001 pounds.

In October, the weather began interrupting fishing along the Pacific coast and caused daily fishing scores to decline. Vessels working off Canada had scores of 58 fish/day/boat and along the California coast scores dropped to 6 fish/day/boat. The fish continued to average 12 pounds. From a total of 157 landings, only 173,697 pounds of albacore were caught in October.

By November, most of the California albacore fleet had quit for the season. A limited number of jig boats continued to fish at traditional spots off the California coast, including Pioneer and Guide seamounts, Sur canyon, and the "1908" spot. Although albacore continued to be available, bad weather and the small size of the fish eventually discouraged the die-hards. Sixty-six landings totaled 13,005 pounds during November.

Albacore landings in California totaled 1.5 million pounds in 1991. This was a 23% decrease from 1.9 million landed in 1990, and was only 10% of the previous 25-year average (15

million pounds). The number of boats from California that participated in the 1991 fishery decreased by 15% from 1990. Fishing success was poor; only 47 out of 133 vessels landed over one ton of albacore.

### Oregon

There were no landings or reported catches off Oregon in July. Catches started the second week of August off the southern and central Oregon coast. Catches were spotty with scores as high as 200 fish/day/boat mostly from 100 to 250 miles offshore. Fish were reported off the Columbia River by mid-month as the center of catch moved rapidly northward. August catch totaled 712,952 pounds from 37 landings.

Table 5. Albacore landings in California, Oregon and Washington (in thousands of pounds).

Year	California	Oregon	Washington	Total
1960	35,113	4,563	526	40,202
61	29,123	3,250	456	32,829
62	36,622	8,949	365	45,936
63	48,860	11,400	527	60,787
64	42,551	4,452	1,055	48,058
65	23,218	12,122	2,048	37,388
66	18,189	18,041	1,101	37,331
67	17,858	29,243	1,240	48,341
68	15,077	37,752	3,050	55,879
69	14,722	29,828	1,240	45,790
1970	29,932	21,782	4,390	56,104
71	36,117	8,420	5,250	49,787
72	21,001	23,056	16,238	60,295
73	8,641	16,350	14,446	39,437
74	11,806	25,225	17,983	55,014
75	15,413	17,166	16,297	48,876
76	27,754	5,934	7,202	40,890
77	15,905	4,420	4,948	25,273
78	21,549	11,285	5,008	37,842
79	8,508	3,107	830	12,445
1980	11,958	3,505	1,299	16,762
81	20,584	7,727	1,928	30,239
82	9,439	1,913	586	11,938
83	16,732	3,410	1,168	21,310
84	26,520	1,631	147	28,298
85	14,410	1,525	379	16,314
86	7,018	2,461	1,862	11,341
87	3,090	2,279	1,167	6,536
88	2,665	3,952	4,197	10,814
89	1,819	1,050	1,882	4,751
1990	1,942	2,079	2,542	6,563
25-year Mean	15,146	11,326	4,655	31,127
1991*	1,494	1,226	943	3,663

\*Preliminary

September catches off Oregon were spotty and scattered from 50 to 350 miles offshore. Many small fish were reported ("peanuts") by mid-month and effort slowed significantly. Most fishing was reported to be off British Columbia. Oregon landings during September were 416,986 pounds from 44 landings.

October saw scattered catches off Oregon with 24 landings totaling 96,021 pounds. The total season landings amounted to 1.2 million pounds. This was a 41% decrease from last year (2.1 million pounds) and represented only 10% of the previous 25-year average.

### Washington

The first landing (360 pounds) was made in early August. The fish were taken 300-600 miles off the Oregon coast where most of the fishing effort was centered. It was reported that albacore caught in this area ranged from 10-15 pounds. A total of 396,075 pounds was landed by 17 vessels during August.

Due to unseasonably good weather, jig vessels continued to fish through September. By mid-month, the fishing fleet had moved north, concentrating effort 100 to 300 miles off Vancouver Island, Canada. The average weight of the fish increased to 15-20 pounds. Twenty-five landings totaled 387,413 pounds during September.

Good weather prevailed through mid-October and all of the fishing effort was centered off Vancouver Island. By October's end, a total of 12 landings equalling 158,433 pounds had been made. A single landing of 1,321 pounds was reported during November.

The most productive fishing (300-400 fish/day/boat) was reported between July 25th and August 6th at 43° N and 144° W. Due to low availability of fish for the remainder of the season, catch rates were much lower and Washington albacore landings totaled only 943,242 pounds. Approximately 28% of the total fish landed in Washington during 1991 were caught off of Vancouver Island. This year's total albacore landings were 63% less (1.6 million pounds) than last year's total landings (2.5 million pounds). This represented only 20% of Washington's previous 25-year average of 4.6 million pounds.

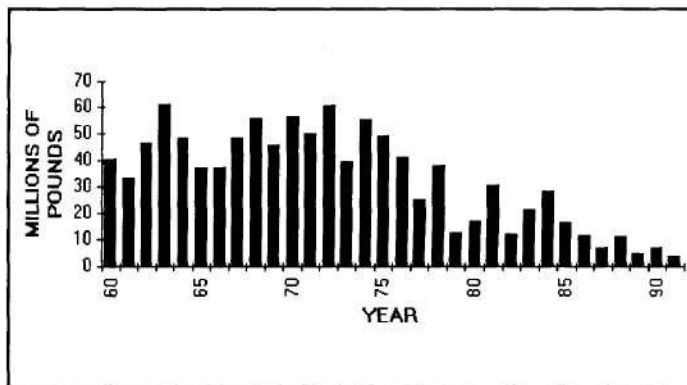


Figure 5. Combined annual landings of albacore in California, Oregon, and Washington, 1960-1991.

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## TROLL SALMON FISHERY IN 1991

### Southeast Alaska

The commercial troll fishery in Southeast Alaska and Yakutat occurs in State of Alaska waters and in the Federal Exclusive Economic Zone (EEZ) east of the longitude of Cape Suckling. The EEZ waters are those more than 3 miles west of the surf line. All other waters of Alaska are closed to commercial trolling.

The commercial troll fishery harvests primarily chinook and coho salmon. Other species of salmon harvest by trollers are normally considered incidental, although targeting of pink and chum salmon has increased in recent years. The troll fishery normally harvests about 90 percent of the chinook salmon and 50-75 percent of the coho salmon taken in Southeast Alaska commercial fisheries.

Commercial trolling for chinook salmon occurs in two seasons; winter (October 1 through April 14) and summer (April 15 to September 30). The summer season is divided into

four fisheries: 1) June experimental fishery; 2) hatchery access fishery; 3) terminal fishery; and 4) general summer fishery. The first three are designed to maximize the catch of Alaska origin hatchery chinook. A quota on the number of non-Alaskan chinook salmon is set yearly under the U.S./Canada Pacific Salmon Treaty. Time and area openings are set by the Alaska Board of Fisheries. The season for coho salmon is from June 15 to September 20. There are no season restrictions for other species of salmon.

The 1991 experimental fishery included more areas and more time than any previous year. A total of 8 areas were open for 9 days during June. The purpose of all experimental areas (except the Cross Sound fishery for pink and chum salmon) was to increase the take of Alaska origin chinook. A total of 13,872 chinook salmon were taken, of which 5,336 (38 percent) were of Alaskan hatchery origin.

Hatchery access fisheries were conducted in most of the inside waters. The purpose was to compare the catch and percentage of catch of Alaskan hatchery produced chinook salmon with the catch and percentage of catch in other troll fisheries, primarily the experimental fishery. The hatchery access fishery was managed so that the total June harvest of chinook salmon would not exceed 40,000 non-Alaskan hatchery chinook. A three day opening occurred June 5 through 7, during which 22,500 chinook salmon were harvested. Based on the catch rate during those three days, a second opening of only 1 and 112 days took place on June 20 and 21. The catch during this period exceeded that of the previous period by about 1,000 fish. In District 13 (near Sitka), almost 11,000 were harvested during that opening. Of the 46,000 chinook salmon caught during the hatchery access fishery, only 8,099 were from Alaska hatcheries. The catch in District 13 was responsible for the low percentage and as a result, the 40,000 cap was exceeded by 6,700 chinook salmon.

Three terminal fisheries also occurred in June and harvested a total of 5,966 chinook salmon.

The general summer season troll harvest target was determined by subtracting the base catches in the winter and June troll fisheries along with the expected net and recreational harvest from the existing Treaty ceiling. Opening of the 1991 general summer trolling season was again delayed until July 1. This reduced the duration of the chinook salmon non-retention fishery which occurs after the allowable chinook salmon catch has been taken. Last year, trollers were able to fish for 24 days for chinook salmon during the summer season. In 1991, the summer troll fishery only continued through noon of July 8. This 7.5 day summer troll season for chinook was the shortest on record, and compares to 12 days that were fished in 1988 and 169 days fished annually prior to 1980. The fleet catch rate of 20,500 per day substantially exceeded the previous high of about 13,500 per day taken during the 1988 season. The 1991 summer chinook catch totalled about 154,000 fish (2.6 million pounds dressed weight), bringing the 1991 chinook salmon total troll landings to about 263,749 fish (4.5 million pounds dressed weight, or approximately 4.89 million pounds round weight).

The coho salmon harvest of 1,299,033 fish (8.1 million pounds dressed weight, or approximately 9.2 million pounds round weight) was slightly below the 1980-90 average of 1.5 million fish.

The estimated ex-vessel value for the chinook salmon troll fishery for 1991 was approximately \$9.6 million (\$2.13 per pound). The coho salmon fishery was valued at about \$9.1 million (\$0.97 per pound). Both decreased slightly from last year, because of reduced catches and reduced prices.

#### Washington

Washington non-Indian trollers targeted on chinook salmon in a coho salmon non-retention fishery that was open from Cape Falcon, Oregon, north to the U.S.-Canada border. The fishery opened on May 1 and closed permanently on June 15. There were no evaluation closures during this fishery.

Three all-species fisheries occurred in 1991. The first was from Cape Falcon, Oregon north to Leadbetter Point, Washington. The fishery opened on August 10 and closed permanently on August 11 for a total of 2 open days. The second all-species fishery was a pink-directed fishery from Carroll Island, Washington north to the U.S.-Canada border.

The fishery operated on a schedule of 4 open days followed by 3 day evaluation closures in the time frame from August 16-September 15. The fishery was open for a total of 20 days on August 16-August 19, August 23-August 26, August 30-September 2, September 6-September 9 and September 13-September 15. The third all-species fishery occurred from Cape Falcon, Oregon north to Copalis Head, Washington. The fishery opened on September 1 and closed permanently on September 2 for a total of 2 open days.

Landings from these fisheries, combined with those from the treaty Indian commercial troll fishery, totaled 0.8 million pounds round of chinook salmon and 0.7 million pounds round of coho salmon. Chinook salmon landings in 1991 were 33% above the 1990 landings of 0.6 million pounds round and were

Year	Alaska	British Columbia	Washington	Oregon	California	Total
1956	3.9	9.8	4.0	4.4	11.3	33.4
1957	5.1	9.7	4.8	3.0	5.3	27.9
1958	5.7	9.1	3.3	1.8	4.1	24.0
1959	6.7	8.7	2.7	0.5	7.5	26.1
1960	4.8	6.4	1.7	1.5	7.0	21.4
1961	2.9	6.0	2.5	1.4	9.3	22.1
1962	3.9	5.9	2.4	0.7	7.2	20.1
1963	4.1	6.8	2.8	1.6	7.9	23.2
1964	6.0	8.5	2.1	0.7	8.7	26.0
1965	5.1	8.8	1.3	0.7	9.3	25.2
1966	4.8	11.4	2.0	0.9	6.9	26.0
1967	4.3	10.4	1.7	1.3	4.4	22.1
1968	5.8	10.8	1.9	1.1	5.3	24.9
1969	5.1	10.8	2.3	1.4	5.6	25.2
1970	5.1	9.9	2.5	1.9	6.1	25.5
1971	4.9	15.2	3.1	1.2	5.7	30.1
1972	3.3	14.1	2.6	1.5	6.2	27.7
1973	5.0	12.7	3.8	4.0	8.7	34.2
1974	5.1	13.5	4.3	2.6	5.8	31.3
1975	4.4	12.6	3.3	3.0	6.6	29.9
1976	3.5	13.8	4.4	2.2	5.7	29.6
1977	4.7	12.1	3.3	4.0	6.6	30.7
1978	6.8	13.2	2.4	2.2	6.0	30.6
1979	6.0	11.1	2.0	3.0	7.9	30.0
1980	5.5	11.6	1.9	2.5	6.4	27.9
1981	4.7	10.2	1.4	1.8	6.8	24.9
1982	4.5	11.9	1.9	2.7	8.5	29.5
1983	4.9	6.5	0.8	0.8	2.4	15.4
1984	4.4	9.8	0.2	0.6	2.3	17.3
1985	4.0	9.8	0.6	2.3	5.2	21.9
1986	4.7	8.6	0.7	3.9	7.6	25.5
1987	5.3	11.6	1.1	6.0	9.5	33.5
1988	4.3	11.2	1.5	5.0	16.5	38.5
1989	5.2	8.6	1.2	4.1	6.2	25.3
1990	5.6	9.2	0.6	2.5	4.7	22.6
10-yr	4.8	9.7	1.0	3.0	7.0	25.4
Mean						
1991	5.2	8.3	0.8	0.8	3.7	13.6

\* Troll-caught salmon are landed dressed. Round weights are projected.

20% below the 10 year mean of 1.0 million pounds round. Coho salmon landings in 1991 were 30% below the 1990 landings of 1.0 million pounds round, and 22% below the 10 year average of 0.9 million pounds round.

### Oregon

The area from Cape Falcon north to the Canadian border opened for all species except coho salmon on May 1 and stayed open through its shielded closing date of June 15. August 10 and 11 were open for all salmon with a restriction of 100 coho salmon per open period from Cape Falcon to Leadbetter Point. A third, north coast, season extended from Cape Falcon to Copalis Beach and was open September 1 and

2. A landing limit of 75 coho salmon was in effect for this open period.

The all-species-except-coho season from Cape Falcon to Cascade Head was open May 1 through June 30, July 15 through 23, and August 1 through October 31. During May and June a four spread per wire gear restriction was in place to reduce coho salmon hooking mortality. The all-species fishery in this area was open from July 1 through 14.

Cascade Head to Cape Arago was open from June 24 through July 11 for an all-salmon fishery.

Florence South Jetty to Cape Arago was open for all-species-except-coho fishing from July 12 through 14 and August 1 through 9.

The area from the Florence South Jetty to Humbug Mountain was open from September 1 through October 31 for all species except coho salmon.

The Klamath Management Zone was closed except for an all-salmon-except-coho fishery within 6 miles of shore from Sisters Rock to Mack Arch.

Troll chinook salmon landings continued a downward trend. The 0.8 million pounds (round weight) landed in 1991 was 68% below 1990 and 74% below the 1981-90 average of 3.0 million pounds. The 1991 coho salmon harvest of 1.6 million pounds was 66% above 1990 levels and only 20% below the 1981-90 mean of 2.0 million pounds.

Table 7. Pacific Coast commercial troll coho salmon landings in millions of ; round weight, 1956-1991. All 1991 data are preliminary.

Year	Alaska	British Columbia	Washington	Oregon	California	Total
1956	3.9	12.9	5.3	3.2	0.5	25.8
1957	7.5	14.4	5.0	3.9	0.6	31.4
1958	5.2	15.6	4.7	1.3	0.1	26.9
1959	5.8	11.7	3.7	1.0	0.3	22.5
1960	2.5	9.3	1.5	0.8	0.1	14.2
1961	3.6	14.8	4.2	2.3	0.6	25.5
1962	5.2	16.4	4.7	2.2	0.4	28.9
1963	6.3	16.1	4.0	3.0	1.2	30.6
1964	5.7	20.5	4.6	4.2	2.2	37.2
1965	6.2	23.5	7.4	4.8	1.8	43.7
1966	4.7	24.3	6.1	5.2	4.0	44.3
1967	4.2	14.1	6.2	8.3	3.9	36.7
1968	5.8	22.6	4.5	5.1	2.7	40.7
1969	3.1	12.7	3.3	3.6	1.4	24.1
1970	2.2	17.3	6.1	8.7	1.5	35.8
1971	3.1	21.4	7.9	10.1	3.7	46.2
1972	5.7	15.9	3.9	5.6	1.2	32.3
1973	4.5	16.2	4.3	5.9	2.3	33.2
1974	6.7	15.6	6.4	8.3	4.3	41.3
1975	1.5	9.5	5.1	4.7	1.3	22.1
1976	4.3	15.3	7.2	10.4	3.3	40.5
1977	4.9	14.4	4.3	3.0	0.2	26.8
1978	8.0	14.9	3.2	3.2	1.5	30.8
1979	7.1	17.7	4.2	5.3	1.2	35.5
1980	5.0	15.3	2.3	2.5	0.3	25.4
1981	6.7	11.3	2.0	3.8	0.5	24.3
1982	10.2	15.8	2.2	3.1	0.6	31.9
1983	9.3	13.3	0.3	1.3	0.3	24.5
1984	10.0	17.3	0.3	0.1	0.4	28.1
1985	12.6	17.3	0.6	0.6	0.1	31.2
1986	16.6	23.0	0.7	2.2	0.8	43.3
1987	8.0	18.5	0.7	2.2	0.3	29.7
1988	4.2	13.1	0.3	3.8	0.4	21.8
1989	9.9	15.1	0.7	2.3	0.3	28.3
1990	13.2	19.5	1.0	0.7	0.4	34.8
10-yr	10.1	16.4	0.9	2.0	0.4	29.8
Mean						
1991	11.9	19.0	0.7	1.6	0.5	33.7

\* Troll-caught salmon are landed dressed. Round weights are projected.

### California

The troll season north of Horse Mountain was closed the entire season except for a special troll fishery with a 15,000-fish chinook salmon quota open September 1 through October 31 that extended from Punta Gorda to Trinidad Head (centering on the Eel River mouth), inside 6 miles. From Horse Mountain to Point Arena, the salmon season extended from August 1 through September 30. Between Point Arena and Point San Pedro (approximately 15 miles south of the Golden Gate) troll fishing was permitted May 1 through May 31, June 6 through June 12, June 26 through July 2, July 11 through July 15, and August 1 through September 30. South of Point San Pedro, the troll season was open from May 1 through September 30. On June 1 Coho fishing opened south of Horse Mountain, but closed on July 11 when the subarea impact ceiling of 271,000 was reached south of Cascade Head. The 5,000 coho salmon reserve, south of Horse Mountain, permitted coho salmon fishing from August 1 through August 2 and August 12 through August 27. Statewide, the minimum size limits for chinook and coho salmon were 26 and 22 inches total length, respectively, and barbless hooks were required.

California's preliminary troll chinook salmon landings were 3.7 million pounds round weight, approximately 53% of the previous 10-year average of 7.0 million pounds. In contrast, preliminary landings of coho salmon were 0.5 million pounds round, 125% of the previous 10-year average of 0.4 million pounds.

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## SALMON AND STEELHEAD SPORT CATCHES IN 1990

### Alaska

Alaska anglers harvested an estimated 909,089 salmon and 5,645 steelhead in 1990. The Salmon harvest was down 17% from the record 1989 harvest, but was 30% above the 10-year average. The harvest of steelhead was down 13% from 1989, but was 6% above the 10-year average.

### Washington

Marine recreational anglers caught a total of 155,504 Chinook salmon, 542,028 coho salmon, and 42 pink salmon in 1990.

The 1990 Washington sport catch of steelhead was 103,014 fish. This year's catch was 29% below the ten year mean of 145,200 fish.

### Oregon

Ocean salmon angler effort was down 8% in 1990 compared to 1989; 246,500 angler trips versus 266,600 in 1989. The ocean recreational catch of 226,800 salmon was down 26% from 1989 levels, reflecting lower stock sizes and more restrictive seasons.

Chinook salmon catches continued a downward trend with 26,500 fish landed in 1990 compared to 32,100 in 1989 and the 1980-89 average of 33,600 Chinook.

Coho salmon catches also dropped in 1990; 200,300 fish compared to 272,200 in 1989 and the 1980-89 average of 204,100 coho.

Table 8. Salmon and steelhead sport harvest, 1990.

State/Province	Chinook	Coho	Pink	Other *	Steelhead	Total
Alaska	123,908	325,936	205,602	253,643	5,645	914,734
British Columbia	143,881	720,233	30,845	31,554	9,395	935,908
Washington	155,504	542,028	42	1,795	103,014	802,383
Oregon	26,500	200,300	-	-	142,300	369,100
Idaho	934	-	-	-	30,563	31,497
California	139,800	51,600	-	-	**	191,400
<b>Total</b>	<b>590,527</b>	<b>1,840,097</b>	<b>236,489</b>	<b>286,992</b>	<b>290,917</b>	<b>3,245,022</b>

\* Sockeye and chum salmon

\*\* Unavailable

Table 9. Salmon and steelhead sport catches (1000's of fish) for the Pacific Coast States, 1975 to 1989 and 10-year (1979-1988) averages.

Year	Alaska		Washington		Oregon		Idaho		California		Total	
	Salmon	Steelhead	**Salmon	Steelhead	**Salmon	Steelhead	Salmon	Steelhead	**Salmon	Steelhead	Salmon	*Steelhead
1975	178.0	2.2	1,399.4	92.9	329.1	185.5	0.0	0.0	125.0	Steelhead	2,031.5	280.6
1976	200.6	2.3	1,749.6	89.1	580.7	118.3	0.0	2.0	139.0	catches	2,669.9	211.7
1977	381.1	3.7	1,191.4	100.0	260.7	145.1	3.5	13.0	117.8	are	1,954.5	261.8
1978	525.4	4.3	1,107.9	163.1	282.6	200.6	7.0	11.5	114.0	not	2,036.9	379.5
1979	361.2	3.0	1,123.9	94.8	202.3	122.4	closed	5.7	140.9	estimated	1,828.3	225.9
1980	531.8	4.8	852.9	151.1	344.9	203.7	closed	9.1	106.4	in	1,836.0	368.7
1981	379.5	3.3	760.1	125.1	230.6	155.0	closed	13.0	94.6	California	1,464.8	296.4
1982	597.3	3.7	736.9	104.2	213.9	135.1	closed	20.5	165.4		1,713.5	263.5
1983	532.5	5.4	860.6	78.6	171.7	84.2	closed	32.2	91.1		1,655.9	200.4
1984	625.8	6.5	561.4	149.5	140.3	198.4	closed	25.1	106.8		1,434.3	379.5
1985	619.2	4.7	686.3	165.8	246.1	188.4	2.5	34.5	186.9		1,741.0	393.4
1986	720.5	5.8	830.6	168.5	234.0	149.5	4.0	40.0	160.3		1,949.4	363.8
1987	969.9	5.9	782.8	134.5	236.0	161.0	0.7	30.2	239.8		2,229.2	331.6
1988	907.8	6.3	746.6	138.0	265.0	174.1	0.7	21.3	206.1		2,126.2	339.7
1989	1,097.2	6.4	645.9	236.2	305.6	112.8	closed	38.6	237.0		2,285.7	394.0
<b>10-year Mean</b>	<b>698.2</b>	<b>5.3</b>	<b>746.4</b>	<b>145.2</b>	<b>238.8</b>	<b>156.2</b>	<b>0.8</b>	<b>26.5</b>	<b>159.4</b>		<b>1,843.6</b>	<b>333.1</b>
1990	909.1	5.6	699.4	103.0	226.8	142.3	0.9	30.6	191.4		2,027.6	281.5

\* Excluding California catch

\*\* Marine fishery data only

The steelhead catch of 142,300 fish in 1990 was 21% above the 1989 catch of 112,800 but below the 1980-89 average of 156,200 fish. Only a fraction of this catch is made in the ocean.

**Idaho**

A spring Chinook salmon sport fishery was opened in 1990 on the Little Salmon River targeting on surplus fish returning to Rapid River Hatchery. Also, a sport fishery was opened on the Clearwater River targeting on hatchery fish returning to Dworshak Hatchery. Salmon anglers harvested 934 spring chinook in 1990. This harvest represents a 12.5% increase above the 10-year average, although over the 10-year period (1980-90) no sport fishery was opened in six of the years due to poor returns to Idaho.

Steelhead anglers harvested 30,563 fish in 1990; 20,067 were harvested during the fall season (1990-91 run year). The 1990 harvest was 21 % less than the 1989 harvest and 15% greater than the 10-year average.

**California**

In 1990, ocean sport anglers caught 191,400 salmon off the coast of California. This harvest was 20% above the ten-year average, and 19% below the 1989 total catch. Chinook were the most frequently caught species, composing 73% of the total ocean catch. Coho accounted for the remaining 27% of the total.

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**PACIFIC HALIBUT FISHERY IN 1991**

Commercial Pacific halibut fishing in 1991 continued a recent trend of declining catches (Table 10). Preliminary landings and number of fishing days are presented by management area in Table 11. The fishery landed 57.0 million

pounds dressed weight (34,381 mt round weight), compared to the 55.2 million pound (33,284 mt) combined catch limit set by the International Pacific Halibut Commission. Largest abundance and majority of the catch occurred in the Gulf of Alaska (Alaska Peninsula through Southeast Alaska).

The 1991 halibut fishery was highlighted by the installation in Canada of an Individual Vessel Quota (IVQ), which commenced May 1 and ended November 30 in British Columbia waters. Each of the 435 vessels licensed in Canada

Table 10. Pacific Coast halibut landings of the United States and Canada (millions of pounds).

Year	Canadian	U.S.	Total
71	25.5	21.2	46.7
72	22.5	20.4	42.9
73	14.4	17.3	31.7
74	7.4	13.9	21.3
75	11.3	16.3	27.6
76	12.0	15.5	27.5
77	8.8	13.1	21.9
78	8.6	13.4	22.0
79	6.6	15.9	22.5
80	7.6	14.3	21.9
81	5.6	20.1	25.7
82	5.5	23.5	29.0
83	5.4	33.0	38.4
84	8.9	35.9	44.8
85	10.4	45.7	56.7
86	11.0	58.0	69.0
87	12.3	55.9	68.2
88	12.9	61.4	74.3
89	10.1	56.5	66.6
90	8.6	53.0	61.6
91*	7.2	49.8	57.0

Preliminary

Table 11. Preliminary catch summary of the 1990 Pacific halibut fishery.

Regulatory Area	Fishing Days		Catch (millions lbs.)
	Catch Limit (millions lbs.)		
2A	0.1685	0.4	0.233
2A*	0.1025	14	0.122
2B	7.4	213	7.168
2C	7.4	2	8.687
3A	26.6	2	22.858
3B	8.8	2	11.934
4A	1.7	1.5	2.255
4B	1.7	4	1.513
4C	0.6	8	0.678
4D	0.6	2	1.437
4ENW	0.07	50	0.078
4ESE	0.03	16	0.026
<b>Total</b>	<b>55.171</b>		<b>56.989</b>

The United States Government allocated a portion of the Area 2A catch limit to twelve Northwest Indian treaty tribes (102,500 pounds to commercial and 10,000 pounds to subsistence) .

was allowed to catch a predetermined poundage calculated by the Canadian Department of Fisheries and Oceans (DFO), based on the 7.4 million pound catch limit approved by the IPHC for Area 2B. The total catch for Area 2B was 7.2 million pounds, 0.2 million pounds under the catch limit.

Additional enforcement costs in administering the IVQ program were covered by a flat administration fee of \$250 (Canadian dollars) and a landing tax of approximately nine cents per pound of IVQ share. First year impressions were generally favorable by managers and fishermen alike.

A developing fishery of concern to the IPHC is a U.S./Russia joint venture fishery taking place in Russian waters of the western Bering Sea. An estimated 3 to 6 million pounds of halibut were caught, without size restriction, by U.S. longline and trawl vessels and landed in U.S. ports. The effects of this fishery on U.S./Canadian stocks are uncertain, as are enforcement problems created by sublegal halibut on the market. The Commission staff has started to investigate the effects of this fishery on Pacific halibut management.

Compiled by Calvin L. Blood, International Pacific Halibut Commission.

## GROUND FISH FISHERY IN 1991

The estimated 1991 groundfish landings by North American fishermen operating in the North Pacific Ocean is 2,135,684 metric tons (mt) a 9% decrease from 1990 (Table 12). Landings by at-sea processors off Alaska decreased 9%, and there was no US Joint Venture Fishery in 1991. Alaska and California landings decreased 1% and 9%, respectively. However, the Canadian domestic fishery increased 21% and the Canadian Joint Venture Fishery increased 10%. There were substantial increases in Washington-Oregon-California at-sea processing, which totaled 188,553 mt. Landings to Oregon ports increased 40%. Trawl fisheries accounted for 93% (1,912,973 mt) of the aggregate domestic catch, followed by longline 6% (115,981 mt), pot 1% (21,599 mt) and other gear 0.4% (8,012 mt) (Table 13).

Statistics by state or province presented in this report are from the Pacific Fisheries Information Network (PacFIN), and reflect first port of landing. Catches by geographic area are different, and those statistics are also available from PacFIN.

### Alaska

The 1991 total Alaska groundfish landings from at-sea processors and Alaskan ports combined were down 7% from 1990 levels. Of the 1,691,119 mt landed, 27% were landed at Alaskan ports, and the remaining 73% were delivered to at-sea processors. This compares to the 1990 distribution of 26% to Alaskan ports and 74% to at-sea processors.

Landings to Alaskan ports (Table 14) decreased by 1% from 1990 levels. This decrease was due primarily to a 4% decrease in trawl landings. Longline landings increased 22% and pot landings increased 91% over 1990 levels. The trawl decrease was due primarily to a 24% decrease in Pacific cod catch, and despite a 3% increase in landings of walleye pollock. The longline increase was primarily due to greater catches of Pacific cod, rockfish, and sablefish; the pot increase was due primarily to increased catches of Pacific cod.

Catches by at-sea processors (Table 15) declined by 9% from 1990 levels. A 10% decrease for trawl gear was caused primarily by a reduced walleye pollock catch. Trawl harvests of Pacific Ocean perch, sablefish, and Pacific cod by at-sea processors also decreased. Longline and pot harvests by at-sea processors increased 11% and 170%, respectively (primarily Pacific cod).

Factors affecting landings in 1991 included 1) prohibited species caps being reached, 2) the changing total allowable catch of various species, 3) the designation of the Bogoslof Islands area in the Bering Sea as a distinct management area, and 4) the division of the pollock harvest into two separate seasons.

### British Columbia

Landings of groundfish (excluding halibut) to Canadian ports were 55,759 mt in 1991 (Table 16), an increase of 21% from 1990 levels. Trawlers landed 45,066 mt, 81% of the total catch and 13% above 1990 levels. Major species in the trawl landings were "other rockfish" (30%), Pacific cod (24%) and Pacific whiting (15%).

Canadian landings of groundfish caught by gear other than trawl totalled 10,692 mt. Sablefish traps accounted for 3,925 mt (99.9% sablefish) and smaller Korean-type traps accounted for 23 mt (100% hagfish). Longline and handline accounted for 6,520 mt (34% rockfish, 33% dogfish, 18% sablefish and 15% lingcod). Miscellaneous gear, including troll gear and shrimp trawls accounted for 224 mt (84% lingcod).

Table 12. Total commercial groundfish landings in metric tons (mt) for 1989 and 1990 by port of landing with

Region	1990		1991 (mt)	Percent Change
	(mt)	percent change.		
Alaska	462,909		458,532	-1
Alaska At-Sea	1,348,081		1,232,587	-9
Washington	34,358		37,424	9
Oregon	35,548		49,905	40
California	39,149		35,806	-9
WOC At-Sea	4,735		188,553	3,882
Joint Venture	304,675		0	-100
Total U.S.	2,229,455		2,002,807	-10
Canada (B.C.)	45,929		55,759	21
Canada Joint Venture	70,130		77,118	10
Total Canada	116,059		132,877	14
Total U.S.-Canada	2,345,514		2,135,684	-9

Each year, Fisheries Branch (DFO) conducts creel surveys of the recreational angling fishery in the Strait of Georgia (Area 4B). Principal target species are Chinook and coho salmon. Provisional estimates of 1991 catches were 8,214 fish for lingcod, 173,383 fish for all rockfish species and 4,972 fish for dogfish.

In 1991, three foreign nations, Poland, China and Japan, were involved in joint venture fisheries for Pacific whiting off the southwest coast of Vancouver Island (Area 3C). Forty-four Canadian catcher vessels delivered Pacific whiting and incidental species to sixteen processing vessels. A total of 76,254 mt of Pacific whiting was processed by 13 Polish vessels, 2 Chinese vessels and one Japanese vessel (Table 17). There were no directed national fisheries in 1991, but twelve of the Polish processing vessels involved in the joint-venture fishery occasionally fished directly (supplemental fishing) when domestic vessels could not supply sufficient quantities of Pacific whiting. This supplemental catch of 6,043 mt is considered to be the national catch.

### Washington

Total groundfish landings in Washington increased by 9% from 34,358 in 1990 to 37,424 metric tons in 1991 (Table 13). Trawl landings made up 77% of the total, and increased 4% from 27,806 mt in 1990 to 28,911 mt in 1991 (Table 18). By species, the 1991 landings were similar to 1990 levels, with the exception of Pacific cod and domestic Pacific whiting and Walleye pollock, which increased considerably on a percentage basis.

### Oregon

Total commercial groundfish landings in Oregon in 1991 were 49,905 mt. (Table 19). This was a 40% increase from 1990 landings. Trawl landings accounted for 95% of the total and were 43% above those for 1990. All but the "rockfish" (excludes Pacific Ocean perch) and sablefish categories showed an increase in 1991 from 1990. Those categories declined 5% and 3%, respectively, and were the result of continued restrictive regulations. Pacific whiting landings increased 475% from 1990. This large increase was due to the continued expansion of shore based processing capabilities and an allocation dedicating fish to the shore-based fishery.

Pot and miscellaneous gear landings were down 9% and 23%, respectively. Longline landings were up 41% over 1990 landings. The recreational catch showed an increase of 31 %.

### California

Total commercial landings in California in 1991 were 35,806 mt (Table 20), with an ex-vessel value of approximately \$27,190,000. All-species 1991 landings decreased approximately 9% or 3,343 mt from the 1990 level. Rockfish, Dover sole, sablefish, whiting, and thornyheads were the principle species harvested in 1991. Increases in harvest were noted for Dover sole and whiting while the other categories remained the same or declined.

The general distribution of 1991 landings by gear remained similar to 1990. Bottom and midwater trawl landings continued to dominate total landings at 79% in 1991 compared to 77% in 1990. The trap component dropped slightly from 2% to 1% and setnet landings decreased from 7% to 5% of the total. The line portion of the catch continued to increase; from 8% in 1989 to 9% in 1990 and to 12% in 1991.

### Contributors:

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Table 13. Domestic groundfish landings in metric tons for 1990 and 1991 by gear and first port of landing.

Region	Trawl		Longline		Pots		Other Gear <sup>1</sup>		Total	
	1990	1991	1990	1991	1990	1991	1990	1991	1990	1991
Alaska	428,714	412,565	26,600	32,483	6,948	13,249	647	235	462,909	458,532
Alaska At-Sea	1,286,460	1,162,447	60,393	66,824	1,229	3,315	0	0	1,348,081	1,232,587
Washington	27,806	28,911	3,434	4,454	117	5	3,001	4,055	34,358	37,424
Oregon	33,095	47,229	1,055	1,485	784	716	614	475	35,548	49,905
California	29,767	28,202	3,601	4,215	626	366	5,155	3,023	39,149	35,806
WOC At-Sea	4,735	188,553	0	0	0	0	0	0	4,735	188,553
Total U.S.	1,810,577	1,867,907	95,083	109,461	9,704	17,651	9,417	7,788	1,924,780	2,002,807
Canada (B.C.)	39,967	45,066	2,592	6,520	3,366	3,948	4	224	45,929	55,759
Total U.S. - Canada	1,850,544	1,912,973	97,675	115,981	13,070	21,599	9,421	8,012	1,970,709	2,058,566

Other Gear includes the following PSMFC Gear groupings: Nets, Trolls, Shrimp Trawls, and Other.



Table 14. Landings (metric tons) into Alaska ports during 1991 by gear and by species.

SPECIES	LONGLINE	OTHER	NETS	POTS	TRAWLS	TOTAL
ARROWTOOTH FLOUNDER	78	0		TR	1,586	1,663
ALASKA PLAICE					803	803
DOVER SOLE					1,914	1,914
ENGLISH SOLE					2	2
FLATHEAD SOLE	0	2			1,754	1,756
GREENLAND TURBOT	217	0			153	370
REX SOLE		1			1,762	1,763
ROCK SOLE	5	TR			2,645	2,650
STARRY FLOUNDER					82	82
YELLOWFIN SOLE	TR			0	3,971	3,971
OTHER FLATFISH	0				142	142
UNSP. DEEP-91 FLOUNDER	10				97	106
UNSP. SHALLOW-91 FLOUNDER	0			0	68	68
UNSP. FLATFISH	12				633	644
BLACK ROCKFISH	512		0	1	4	518
BOCACCIO	1					1
CANARY ROCKFISH	3					3
CHINA ROCKFISH	2					2
COPPER ROCKFISH	1				2	2
DARKBLOTCHED ROCKFISH	0					0
DUSKY ROCKFISH	14				29	43
NORTHERN ROCKFISH	0	TR			100	100
QUILLBACK ROCKFISH	89	6				95
REDBANDED ROCKFISH	15				TR	15
REDSTRIPE ROCKFISH	2					2
ROSETHORN ROCKFISH	3					3
ROUGHEYE ROCKFISH	108	TR	TR	0	8	116
SHARPCHIN ROCKFISH	TR				0	0
SHORTRAKER ROCKFISH	29			0	7	36
SILVERGREY ROCKFISH	15					15
TIGER ROCKFISH	4	0				4
YELLOWEYE ROCKFISH	549	5	TR		1	555
YELLOWTAIL ROCKFISH	3					3
PACIFIC OCEAN PERCH	14	0		0	124	139
THORNYHEADS	351		TR		237	588
WIDOW ROCKFISH	TR					TR
SHORTRAKER + ROUGHEYE	5					5
UNSP. DEMERSAL-91 ROCKFISH	100	1	0	TR		101
UNSP. PELAGIC ROCKFISH	66				52	117
UNSP. SLOPE-91 ROCKFISH	119			TR	48	168
UNSP. ROCKFISH	27				245	271
ATKA MACKEREL	0			TR	80	80
CAPELIN					0	0
EULACHON					1	1
LINGCOD	531	0	0	2	0	534
PACIFIC COD	7,745	6	15	13,234	67,122	88,123
SABLEFISH	21,404	0		1	662	22,067
WALLEYE POLLOCK	302	197	TR	0	327,189	327,688
UNSP. ROUND FISH	0					0
UNSPECIFIED SMELT					7	7
SPINY DOGFISH	2				0	3
UNSPECIFIED OCTOPUS	0			3	1	4
UNSPECIFIED SCULPIN	3	TR		1	453	457
UNSPECIFIED SHARK	56	TR			18	74
UNSPECIFIED SKATE	79	0	-	TR	203	282

Table 14. - continued.

SPECIES	LOONGLINE	OTHER	NETS	POTS	TRAWLS	TOTAL
UNSPECIFIED SQUID	0	1	-	-	306	307
OTHER GROUND FISH	-	-	-	6	-	6
UNSP. GROUND FISH	9	TR	-	-	56	65
ALL GROUND FISH	32,483	219	16	13,249	412,565	458,532

Table 15. Landings (metric tons) to domestic at-sea processors during 1991 by area, gear, and species.

SPECIES	ALASKA				WASHINGTON OREGON CALIFORNIA AT-SEA	TOTAL DOMESTIC AT-SEA PROCESSING
	LOONGLINE	POTS	TRAWLS	TOTAL		
ARROWTOOTH FLOUNDER	87	-	4,951	5,038	1	5,039
UNSPECIFIED TURBOTS	74	-	5,182	5,256	-	5,256
FLATHEAD SOLE	-	-	282	282	-	282
REX SOLE	-	-	-	-	TR	TR
ROCK SOLE	1	-	22,634	22,634	-	22,634
YELLOWFIN SOLE	-	-	69,873	69,873	-	69,873
UNSP. DEEP-91 FLOUNDER	0	-	4,645	4,645	-	4,645
UNSP. SHALLOW-91 FLOUNDER	-	-	744	744	-	744
UNSP. FLATFISH	26	-	7,039	7,065	1	7,066
BOCACCIO	-	-	-	-	2	2
CANARY ROCKFISH	-	-	-	-	2	2
CHILIPEPPER	-	-	-	-	63	63
YELLOWTAIL ROCKFISH	-	-	-	-	83	83
OTHER ROCKFISH	-	-	-	-	68	68
PACIFIC OCEAN PERCH	53	-	10,345	10,398	23	10,421
SHORTEBELLY ROCKFISH	-	-	-	-	1	1
THORNYHEADS	32	-	618	650	TR	650
SHORTRAKER + ROUGH EYE	9	-	1,162	1,170	-	1,170
SRKR + REYE + NRCK + SHRP	18	-	732	750	-	750
UNSP. DEMERSAL-91	29	-	81	110	-	110
UNSP. PELAGIC ROCKFISH	10	-	1,513	1,522	-	1,522
UNSP. SLOPE-91	10	-	4,068	4,079	-	4,079
UNSP. ROCKFISH	252	-	221	473	-	473
WIDOW ROCKFISH	-	-	-	-	150	150
ATKA MACKEREL	-	-	25,587	25,587	-	25,587
JACK MACKEREL	-	-	-	-	120	120
CAPELIN	-	-	TR	TR	-	TR
EULACHON	-	-	5	5	-	5
LINGCOD	-	-	TR	TR	TR	TR
PACIFIC COD	61,959	3,312	76,983	142,255	15	142,270
PACIFIC WHITING	-	-	-	-	187,910	187,910
SABLEFISH	3,103	0	2,238	5,341	13	5,354
WALLEYE POLLOCK	78	-	921,647	921,725	-	921,725
UNSPECIFIED SMELT	-	-	27	27	-	27
UNSPECIFIED OCTOPUS	7	3	43	53	-	53
UNSPECIFIED SCULPIN	1	-	763	764	-	764
UNSPECIFIED SHARK	0	-	11	11	-	11
UNSPECIFIED SKATE	1,075	-	1,031	2,105	-	2,105
UNSPECIFIED SQUID	-	-	25	25	-	25
OTHER GROUND FISH	-	-	-	-	102	102
ALL GROUND FISH	66,824	3,315	1,162,447	1,232,587	188,553	1,421,140

NOTE: 0 = landed catch less than 0.5 metric tons; TR = landed catch less than 0.05 metric tons

Table 16. Landings (metric tons) into British Columbia ports during 1991 by gear and by species.

SPECIES	LONGLINE	NETS	POTS	TROLLS	TRAWLS	SHRIMP TRAWLS	TOTAL
ARROWTOOTH FLOUNDER	-	-	-	-	954	-	954
DOVER SOLE	-	-	-	-	1,208	-	1,208
ENGLISH SOLE	-	-	-	-	1,084	-	1,084
PETRALE SOLE	-	-	-	-	586	-	586
REX SOLE	-	-	-	-	55	-	55
ROCK SOLE	-	-	-	-	3,049	-	3,049
STARRY FLOUNDER	-	-	-	-	130	-	130
OTHER FLATFISH	-	-	-	-	73	-	73
UNSP. FLATFISH	2	-	-	-	0	-	2
BLACK ROCKFISH	-	-	-	-	4	-	4
BOCACCI	-	-	-	-	775	-	775
CANARY ROCKFISH	-	-	-	-	963	-	963
DARKBLOTCHED ROCKFISH	-	-	-	-	24	-	24
REDSTRIPE ROCKFISH	-	-	-	-	951	-	951
ROUGHEYE ROCKFISH	-	-	11	-	674	-	684
SHARPCHIN ROCKFISH	-	-	-	-	74	-	74
SHORTRAKER ROCKFISH	-	-	-	-	57	-	57
SILVERGREY ROCKFISH	-	-	-	-	1,119	-	1,119
SPLITNOSE ROCKFISH	-	-	-	-	100	-	100
YELLOWEYE ROCKFISH	-	-	-	-	22	-	22
YELLOWMOUTH ROCKFISH	5	-	-	-	801	-	806
YELLOWTAIL ROCKFISH	22	-	-	-	3,215	1	3,237
OTHER ROCKFISH	2,151	1	-	18	484	2	2,656
PACIFIC OCEAN PERCH	-	-	-	-	2,867	-	2,867
THORNYHEADS	9	-	-	-	85	-	94
WIDOW ROCKFISH	-	-	-	-	1,361	-	1,361
LINGCOD	995	1	-	176	3,717	7	4,895
PACIFIC COD	21	-	-	3	10,789	1	10,814
PACIFIC WHITING	-	-	-	-	6,807	-	6,807
SABLEFISH	1,179	-	3,915	-	335	-	5,428
WALLEYE POLLOCK	-	-	-	-	1,714	-	1,714
SPINY DOGFISH	2,119	-	-	9	801	-	2,929
UNSPECIFIED SHARK	1	-	-	-	-	-	1
UNSPECIFIED SKATE	16	-	-	-	-	-	16
OTHER GROUND FISH	-	-	-	-	114	-	114
UNSP. GROUND FISH	1	5	23	1	76	-	106
ALL GROUND FISH	6,520	7	3,948	207	45,066	11	55,759

Table 17. Landings (metric tons) by British Columbia joint-venture and foreign directed fisheries during 1991.

SPECIES	JOINT-VENTURE	FOREIGN
PACIFIC WHITING	76,254	6,043
WALLEYE POLLOCK	349	1
PACIFIC OCEAN PERCH	3	1
ROCKFISH	510	136
OTHER FISH	2	TR
TOTAL	77,118	6,181

NOTE: 0 = landed catch less than 0.5 metric tons; TR = landed catch less than 0.05 metric tons

Table 18. Landings (metric tons) into Washington ports during 1991 by gear and species.

SPECIES	LONGLINE	NETS	POTS	TROLLS	TRAWLS	SHRIMP TRAWLS	TOTAL
ARROWTOOTH FLOUNDER	14	-	-	TR	3,885	19	3,919
DOVER SOLE	1	TR	-	-	2,509	4	2,515
ENGLISH SOLE	TR	0	-	-	797	TR	797
PETRALE SOLE	TR	-	-	-	436	TR	437
REX SOLE	-	-	-	-	120	0	120
ROCK SOLE	0	0	-	TR	359	TR	359
STARRY FLOUNDER	TR	1	-	-	522	-	523
OTHER FLATFISH	TR	0	-	TR	97	TR	98
BOCACCIO	-	-	-	-	226	-	226
CANARY ROCKFISH	-	-	-	-	741	-	741
YELLOWTAIL ROCKFISH	-	-	-	-	1,157	-	1,157
OTHER ROCKFISH	-	-	-	-	868	-	868
PACIFIC OCEAN PERCH	TR	-	-	-	1,826	1	1,827
SHORTBELLY ROCKFISH	-	-	-	-	1	-	1
WIDOW ROCKFISH	-	-	-	-	1,305	-	1,305
UNSP. ROCKFISH	286	0	-	36	5,159	367	5,848
LINGCOD	108	0	-	31	1,234	4	1,376
PACIFIC COD	9	TR	-	0	2,440	1	2,451
PACIFIC WHITING	-	-	-	-	2,943	-	2,943
SABLEFISH	2,168	-	-	TR	411	5	2,584
WALLEYE POLLOCK	-	-	-	-	462	TR	462
OTHER ROUND FISH	TR	1,370	-	-	-	-	1,370
SPINY DOGFISH	1,836	297	-	0	1,250	-	3,383
UNSPECIFIED SQUID	TR	-	-	-	0	0	0
OTHER GROUND FISH	32	1,916	5	0	162	0	2,115
UNSP. GROUND FISH	TR	-	-	-	1	-	1
ALL GROUND FISH	4,454	3,585	5	68	28,911	402	37,424

NOTE: 0 = landed catch less than 0.5 metric tons; TR = landed catch less than 0.05 metric tons

Table 19. Landings (metric tons) into Oregon ports during 1991 by gear and species.

SPECIES	LONGLINE	NETS	POTS	TROLLS	TRAWLS	SHRIMP TRAWLS	TOTAL
ARROWTOOTH FLOUNDER	0	-	1	TR	2,083	5	2,089
DOVER SOLE	0	-	TR	-	8,794	19	8,813
ENGLISH SOLE	-	-	-	-	845	1	846
PETRALE SOLE	0	-	-	TR	931	0	932
REX SOLE	-	-	-	-	430	1	430
ROCK SOLE	TR	-	-	-	2	-	2
STARRY FLOUNDER	-	1	0	-	325	TR	326
OTHER FLATFISH	TR	-	TR	TR	605	1	605
BLACK ROCKFISH	103	-	-	-	1	-	104
BOCACCIO	-	-	-	-	368	11	379
CANARY ROCKFISH	35	-	-	-	1,810	24	1,868
CHILIPEPPER	-	-	-	-	6	TR	6
DARKBLOTCHED ROCKFISH	0	-	-	-	758	3	762
REDSTRIPE ROCKFISH	-	-	-	-	202	TR	202
SHARPCHIN ROCKFISH	-	-	-	-	165	1	166
SILVERGREY ROCKFISH	0	-	-	-	320	0	320
SPLITNOSE ROCKFISH	-	-	-	-	147	-	147
YELLOWEYE ROCKFISH	37	-	-	-	120	-	156
YELLOWMOUTH ROCKFISH	-	-	-	-	599	-	599
YELLOWTAIL ROCKFISH	50	-	-	0	1,709	293	2,052
OTHER ROCKFISH	21	-	-	-	456	4	480
PACIFIC OCEAN PERCH	0	-	-	-	854	2	857
SHORTBELLY ROCKFISH	-	-	-	-	2	-	2
THORNYHEADS	4	-	0	-	3,503	2	3,509
WIDOW ROCKFISH	5	-	-	-	4,375	25	4,406
UNSP. ROCKFISH	402	TR	1	21	40	29	494
JACK MACKEREL	-	-	-	-	19	-	19
LINGCOD	58	-	0	3	1,409	16	1,486
PACIFIC COD	0	-	-	-	513	2	514
PACIFIC WHITING	-	-	-	-	13,204	-	13,204
SABLEFISH	761	-	713	TR	2,449	12	3,935
WALLEYE POLLOCK	-	-	-	-	0	-	0
OTHER ROUND FISH	-	1	-	-	-	-	1
UNSP. ROUND FISH	TR	-	-	-	TR	-	TR
SPINY DOGFISH	0	-	-	-	66	0	66
OTHER GROUND FISH	8	-	0	0	119	0	127
UNSP. GROUND FISH	1	-	-	TR	3	-	4
ALL GROUND FISH	1,485	1	716	25	47,229	449	49,905

NOTE: 0 = landed catch less than 0.5 metric tons; TR = landed catch less than 0.05 metric tons

Table 20. Landings (metric tons) into California ports during 1991 by gear and by species.

SPECIES	LOGLINE	OTHER	NETS	POTS	TROLLS	TRAWLS	SHRIMP TRAWLS	TOTAL
ARROWTOOTH FLOUNDER	-	1	TR	-	-	156	0	157
DOVER SOLE	1	262	31	2	TR	7,424	1	7,721
ENGLISH SOLE	3	48	4	1	-	757	-	812
PETRALE SOLE	4	35	28	1	-	668	TR	735
REX SOLE	1	32	1	1	-	587	TR	621
ROCK SOLE	0	0	TR	-	TR	6	-	7
STARRY FLOUNDER	2	1	1	-	-	43	-	47
OTHER FLATFISH	15	12	3	0	-	597	TR	627
UNSP. FLATFISH	3	2	5	TR	-	31	-	42
BLACK ROCKFISH	-	-	-	-	-	2	TR	2
BOCACCIO	131	94	203	0	1	688	0	1,117
CANARY ROCKFISH	28	-	-	-	-	205	2	236
CHILIPEPPER	243	-	-	-	-	1,646	4	1,893
DARKBLOTCHED ROCKFISH	-	-	-	-	-	201	4	206
REDSTRIPE ROCKFISH	-	-	-	-	-	7	TR	7
SHARPCHIN ROCKFISH	-	-	-	-	-	45	TR	45
SPLITNOSE ROCKFISH	1	-	-	-	-	79	0	81
YELLOWEYE ROCKFISH	12	-	-	-	-	17	0	28
YELLOWTAIL ROCKFISH	123	-	-	-	-	233	5	360
OTHER ROCKFISH	154	0	TR	TR	-	481	2	637
PACIFIC OCEAN PERCH	-	-	-	-	-	7	0	7
SHORTBELLY ROCKFISH	-	-	-	-	-	1	-	1
THORNYHEADS	17	70	5	0	0	2,773	TR	2,866
WIDOW ROCKFISH	52	8	117	1	-	1,025	0	1,203
UNSP. ROCKFISH	2,465	456	1,143	11	8	1,046	1	5,129
LINGCOD	182	28	150	1	1	424	3	788
PACIFIC COD	TR	-	-	-	-	0	-	0
PACIFIC WHITING	3	49	0	-	-	6,841	-	6,893
SABLEFISH	744	77	34	347	16	2,093	1	3,312
OTHER ROUND FISH	TR	-	-	-	-	-	-	TR
OTHER GROUND FISH	28	6	56	2	0	15	TR	107
UNSP. GROUND FISH	2	8	7	TR	-	104	-	122
ALL GROUND FISH	4,215	1,187	1,787	366	27	28,202	22	35,806

NOTE: 0 = landed catch less than 0.5 metric tons; TR = landed catch less than 0.05 metric tons

## PERSONNEL

### COMMISSIONERS

The following were commissioners during all or part of 1991:

#### Alaska

Richard Eliason, Sitka  
Pete Isleib, Juneau  
Chuck Meachum, Jr., Juneau

#### California

Pete Bontadelli, Sacramento  
Gerald Felando, Sacramento  
Donald Hansen, Dana Point

#### Idaho

Ron Beitelspacher, Grangeville  
Jerry Conley, Boise  
Norman Guth, Salmon

#### Oregon

Bill Bradbury, Bandon  
Paul Heikkila, Coquille  
Jim Martin, Portland

#### Washington

Robert Alverson, Seattle  
Ed Manary, Olympia  
Brad Owen, Shelton

### ADVISORS

The Advisory Committee is composed of representatives of the major user groups in each State. The following were Advisory Committee members during all or part of 1991: Alaska

Chris Blackburn, Kodiak  
Jim Green, Ketchikan  
Paul Gronholdt, Sand Point  
Henry Mitchell, Anchorage  
Doug Ogden, Anchorage  
Harold Thompson, Sitka  
Bruce Wallace, Ketchikan

#### California

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Zeke Grader, Sausalito  
Harold Olsen, Torrance  
Charles Platt, Fort Bragg  
Robert Ross, Sacramento  
Roger Thomas, Sausalito  
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Harriet Engblom, Astoria  
Herb Goblirsch, Otter Rock  
John Marincovich, Astoria  
Ron Sparks, Monmouth  
Frank Warrens, Portland

#### Washington

Donald Bevan, Seattle Ben  
Deeble, Seattle Steve  
Hughes, Seattle "Buzz"  
Johnson, Olympia Rudy  
Peterson, Seattle Terry  
Wright, Olympia Robert  
Zuanich, Seattle

### COORDINATORS

PSMFC Coordinators facilitate all aspects of PSMFC programs within their State. The following were PSMFC Coordinators in 1991: Alaska

Fred Gaffney, Alaska Dept. Fish & Game

#### California

Susan Wright, Assemblyman Felando's Staff

#### Idaho

Steve Huffacker, Idaho Dept. Fish & Game

#### Oregon

Kay Brown, Oregon Dept. Fish & Wildlife

#### Washington

Greg Hueckel, Washington Dept. of Fisheries

### PSMFC EXECUTIVE STAFF

Guy Thornburgh, Executive Director  
Russell Porter, Assistant Director  
David Hanson, Fisheries Coordinator  
Pam Kahut, Fiscal Manager/Treasurer  
Mary Washkoske, Payroll/Personnel Assistant  
Renee Barrett, Accounting Technician  
Theresa Fogg, Secretary  
Lori Johnson, Receptionist  
J. Kenneth Johnson, RMPC Manager  
James Longwill, RMPC Computer Specialist  
Will Daspit, PacFIN Data Manager  
Ed Kiel, PacFIN Computer Aide  
Judith Cress, PIT Tag Administrator  
Dan Currier, Electronics Specialist/Programmer  
Fran Recht, Habitat Specialist