

REVIEW OF  
1985  
OCEAN SALMON FISHERIES

Pacific Fishery Management Council  
Metro Center, Suite 420  
2000 SW. First Avenue  
Portland, Oregon 97201

March 1986

### ACKNOWLEDGMENTS

This review was prepared by a team of scientists with special expertise in the salmon resources and by the Pacific Fishery Management Council's staff economist. Special recognition of the contributions of other Council staff is also due.

### PLAN DEVELOPMENT TEAM

Mr. L. B. Boydston	California Department of Fish & Game, Rancho Cordova, CA
Dr. Ken Henry	National Marine Fisheries Service, Seattle, WA
Mr. Rod Kaiser	Oregon Department of Fish & Wildlife, Newport, OR
Dr. Gary Morishima	Indian Tribes, Mercer Island, WA
Mr. Pat Pattillo	Washington Department of Fisheries, Olympia, WA
Mr. Tim Roth	U. S. Fish & Wildlife Service, Vancouver, WA

### COUNCIL STAFF

Mr. John Coon	Ms. Dorothy Lowman	
Mrs. Beth Onnigian	Mrs. Michelle Perry Sailer	Mrs. Renee Barrett

Funded by NOAA/NMFS Cooperative Agreement No. 86-ABH-00004

## TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION.....	1
I. SUMMARY OF 1985 OCEAN SALMON MANAGEMENT.....	I-1
Troll Fishing Regulations.....	I-1
Recreational Fishing Regulations.....	I-4
Fishing Effort and Harvest.....	I-4
Coastwide Summary.....	I-4
Quota Attainment.....	I-11
Non-treaty.....	I-11
Treaty Indian Troll.....	I-11
California Troll Fishery.....	I-11
California Recreational Fishery.....	I-11
Oregon Troll Fishery.....	I-13
Oregon Recreational Fishery.....	I-13
Washington Troll Fishery.....	I-13
Non-treaty.....	I-13
Treaty Indian.....	I-13
Washington Recreational Fishery.....	I-13
Pacific Salmon Treaty.....	I-14
II. CHINOOK MANAGEMENT ASSESSMENT.....	II-1
South of Point Delgada	
Management Goals and Preseason Expectations.....	II-1
Ocean Fisheries.....	II-1
Troll.....	II-1
Recreational.....	II-1
Inside Fisheries and Spawning Escapement.....	II-1
Sacramento River Fall Chinook.....	II-1
Upper Sacramento River Late Fall, Winter, and	
Spring Chinook.....	II-4
San Joaquin River Chinook.....	II-4
Goal Assessment.....	II-4
Point Delgada to Cape Blanco.....	II-8
Management Goals and Preseason Expectations.....	II-8
Ocean Fisheries.....	II-8
Troll.....	II-8
Recreational.....	II-9
Inside Fisheries and Spawning Escapement.....	II-9
Klamath River Chinook.....	II-9
Other Northern California Chinook.....	II-9
Southern Oregon Chinook.....	II-14
Goal Assessment.....	II-15
Klamath River Chinook.....	II-15
Southern Oregon Chinook.....	II-15

Cape Blanco to Cape Falcon.....	II-15
Management Goals and Preseason Expectations.....	II-15
Ocean Fisheries.....	II-15
Troll.....	II-15
Recreational.....	II-16
Inside Fisheries.....	II-16
Spawning Escapement.....	II-16
Goal Assessment.....	II-18
North of Cape Falcon.....	II-18
Management Goals and Preseason Expectations.....	II-18
Ocean Fisheries.....	II-18
Non-treaty Troll.....	II-18
Treaty Indian Troll Fishery.....	II-19
Recreational.....	II-19
Columbia River Fall Chinook.....	II-20
Inside Fisheries.....	II-20
Escapement.....	II-21
Goal Assessment.....	II-21
Upper Columbia River Spring and Summer Chinook.....	II-21
Inside Fisheries.....	II-21
Escapement.....	II-22
Goal Assessment.....	II-22
Lower Columbia River Spring Chinook.....	II-22
Inside Fisheries and Spawning Escapement.....	II-22
Goal Assessment.....	II-22
Willapa Bay Chinook.....	II-22
Inside Fisheries and Spawning Escapement.....	II-22
Goal Assessment.....	II-23
Grays Harbor.....	II-23
Inside Fisheries and Spawning Escapement.....	II-23
Goal Assessment.....	II-23
Washington North Coastal Chinook.....	II-23
Inside Fisheries and Spawning Escapement.....	II-23
Quinault River.....	II-23
Queets River.....	II-24
Hoh River.....	II-24
Quillayute River.....	II-24
Goal Assessment.....	II-25
Puget Sound.....	II-25
Inside Fisheries and Spawning Escapement.....	II-25
Goal Assessment.....	II-26
Coastwide Goal Assessment Summary.....	II-26
III. COHO AND PINK SALMON MANAGEMENT ASSESSMENT.....	III-1
Oregon Production Index Area Coho Management.....	III-1
Management Goals and Preseason Expectations.....	III-1
Ocean Fisheries.....	III-1
Troll.....	III-1
Recreational.....	III-2
Ocean Catch of Private Hatchery Stock.....	III-2
Inside Fisheries.....	III-4

Spawning Escapement.....	III-4
Public Hatchery Escapements.....	III-4
Private Hatchery Escapements.....	III-4
OCN Escapements.....	III-4
Goal Assessment.....	III-4
Coho Management North of Cape Falcon.....	III-9
Management Goals and Preseason Expectations.....	III-9
Ocean Fisheries.....	III-9
Non-treaty Troll.....	III-9
Treaty Indian Troll.....	III-10
Recreational.....	III-10
Columbia River Coho.....	III-11
Inside Fisheries.....	III-11
Spawning Escapement.....	III-11
Goal Assessment.....	III-11
Washington Coastal Coho.....	III-11
Inside Fisheries and Spawning Escapements.....	III-11
Willapa Bay.....	III-11
Grays Harbor.....	III-12
Quinault River.....	III-12
Queets River.....	III-12
Hoh River.....	III-12
Quillayute River.....	III-12
Goal Assessment.....	III-13
Puget Sound Coho.....	III-13
Inside Fisheries.....	III-13
Commercial Fishery.....	III-13
Recreational Fishery.....	III-13
Spawning Escapements.....	III-13
Goal Assessment.....	III-13
Coastwide Summary for Coho.....	III-14
Pink Salmon Management.....	III-14
IV. SOCIO-ECONOMIC ASSESSMENT OF THE 1985 OCEAN SALMON FISHERIES....	IV-1
Overview of 1985 Market Conditions.....	IV-1
Strength of the U.S. Dollar Relative to Foreign Currencies.....	IV-1
Competition from Pen-reared Atlantic Salmon.....	IV-1
Conditions in the Alaskan Salmon Fisheries.....	IV-4
Ex-vessel Prices and Values for the 1985 Ocean Troll Fishery.....	IV-4
Seasonal Trends.....	IV-4
California.....	IV-4
Oregon.....	IV-4
Washington.....	IV-4
Annual Trends.....	IV-8
California.....	IV-8
Oregon.....	IV-8
Washington.....	IV-8

Columbia River Fishery.....	IV-13
Ex-vessel Prices.....	IV-13
Ex-vessel Value.....	IV-13
Oregon.....	IV-13
Washington.....	IV-13
Trends in Ocean Troll Effort.....	IV-15
Total Effort Employed in the Fishery.....	IV-15
Progress of State Buy-Back Programs.....	IV-15
Landing by Vessel Size Class.....	IV-15
More Productive Segments of the Fleet.....	IV-19
Mobility Patterns.....	IV-19
Participation in Other Fisheries.....	IV-23
Albacore.....	IV-23
Crab.....	IV-24
Halibut.....	IV-24
Groundfish.....	IV-24
Treaty Indians.....	IV-24
Assessment of 1985 Ocean Recreational Fishery.....	IV-24
California.....	IV-24
Oregon.....	IV-29
Washington.....	IV-29
Buoy 10 Fishery.....	IV-29
Community Impact of the 1985 Ocean Troll and Recreational Fisheries on Coastal Communities.....	IV-30
Input/Output Models.....	IV-30
Sales and Local Income Multipliers.....	IV-31
Fisheries Economic Assessment Model for Communities on the West Coast.....	IV-31
Commercial Ocean Troll Landings and Ocean Recreational Fishing Impacts by Areas on the West Coast.....	IV-32
California.....	IV-32
Oregon.....	IV-36
Washington.....	IV-36
Sectoral Analysis of Impacts.....	IV-37
V. ASSESSMENT OF ABUNDANCE ESTIMATES.....	V-1
California Chinook Estimates.....	V-1
Sacramento River.....	V-1
Klamath River.....	V-1
Oregon Coastal Chinook Estimates.....	V-1
Columbia River Chinook Estimates.....	V-4

Oregon Production Index Area Coho Estimates.....	V-5
Preseason Estimates.....	V-5
Framework Amendment Methodology.....	V-5
Private Hatchery Estimate.....	V-6
Determination of OPI Allowable Harvest.....	V-6
Preseason Forecast.....	V-6
Alternative Partitioning Methodology.....	V-6
Preseason Forecast.....	V-11
Postseason Evaluation.....	V-11
Framework Amendment OPI Area Abundance Predictor.....	V-11
Private Hatchery.....	V-11
Framework Amendment Method Versus Partitioning Method.....	V-15
Columbia River Late Coho Estimates.....	V-15
Washington Coastal and Puget Sound Coho Estimates.....	V-17
VI. MANAGEMENT CONCERNS.....	VI-1
Quotas .....	VI-1
Columbia River Estuary (Buoy 10) Sport Fishery.....	VI-2
Timing of Data Availability and Conflicting Meeting Schedules.....	VI-5

## LIST OF TABLES

		<u>Page</u>
I-1.	Summary of actual ocean troll salmon fishing regulations for 1985.....	I-2
I-2.	Summary of actual treaty Indian troll seasons for 1985.....	I-3
I-3.	Summary of actual ocean recreational salmon fishing regulations for 1985.....	I-5
I-4.	Coastwide chinook catches (thousands of fish) in the ocean troll and ocean sport fisheries, 1971-1985 and the 1971-1975 average.....	I-6
I-5.	Coastwide coho catches (thousands of fish) in the ocean troll and ocean sport fisheries, 1971-1985 and 1971-1975 average....	I-7
I-6.	Coastwide pink salmon catches (thousands of fish) in the ocean troll and ocean sport fisheries, 1971-1985 and 1971-1975 average.....	I-8
I-7.	Ocean salmon troll effort and landings for California, Oregon, and Washington, 1976-1985 and 1971-1975 averages.....	I-9
I-8.	Ocean salmon recreational effort and catch off California, Oregon, and Washington, 1976-1985 and 1971-1975 average.....	I-10
I-9.	The PFMC 1985 coho and chinook quotas and actual harvest, in numbers of fish by management area and fishery.....	I-12
I-10.	Actual catches (thousands of fish) compared to Pacific Salmon Treaty harvest ceilings for 1985.....	I-15
II-1.	Sacramento River natural and hatchery fall chinook escapements in 1984 and 1985 compared with the 1971-1975 average (thousands of fish).....	II-5
II-2.	Indices of annual abundance and ocean fishery impacts on California Central Valley chinook, 1970-1985 (thousands of fish).....	II-6
II-3.	Klamath River adult inriver fall chinook run size, spawning escapement, sport catch, and Indian net harvest (in numbers and percent of the total inriver run size), 1978-1985.....	II-12
II-4.	Number of salmon returned to Oregon private hatchery facilities, 1978-1985.....	II-17
II-5.	Summary of 1985 performance for chinook salmon by river system and stock in relation to escapement goals (1985 data preliminary).....	II-27



III-1.	Ocean harvest and hooking mortality impacts for coho salmon by all fisheries in the OPI area during the 1985 season with comparable catches for 1984 and 1983 in thousands of fish.....	III-3
III-2.	Estimated effort and catch in the 1985 Buoy 10 sport fishery by weekly and open fishing periods.....	III-5
III-3.	Preliminary 1985 adult escapement (thousands of fish) to ODFW salmon hatcheries on the Columbia River and Oregon coastal streams and CDFG hatcheries on the Klamath River compared with recent escapements from 1972-1984 and the 1985 management goal.....	III-6
III-4.	Estimated escapement (thousands of fish) of Oregon coastal adult coho, 1971-1985.....	III-7
III-5.	OPI adult coho returns (thousands of fish), 1970-1985.....	III-8
III-6.	Summary of 1985 performance for coho salmon by river system and stock in relation to escapement goals (1985 data preliminary).....	III-15
IV-1.	U.S. exports to Japan and to all nations, prior and current year through November 1985.....	IV-2
IV-2.	Major U.S. imports of fresh salmon by country, prior and current year through October 1985.....	IV-3
IV-3.	Average monthly ex-vessel price.....	IV-5
IV-4.	Average monthly ex-vessel price, Oregon.....	IV-6
IV-5.	Average monthly prices in 1985 in Westport and Ilwaco.....	IV-7
IV-6.	Estimates of ex-vessel value (in dollars) of California troll landings and average price (dollars/lb.), 1979-1985.....	IV-9
IV-7.	Estimates of ex-vessel value (in dollars) of Oregon troll landings and average price (dollars/lb.) in 1971-1985.....	IV-10
IV-8.	Estimates of ex-vessel value (in dollars) of Washington non-Indian troll landings and average price (dollars/lb.), 1971-1985.....	IV-11
IV-9.	Ex-vessel values of inriver harvest of Columbia River chinook and coho, 1983-1985.....	IV-14
IV-10.	Troll and charter boat participation in Washington state's buy-back program.....	IV-16
IV-11.	Landings and ex-vessel values by vessel size categories for selected California ports, 1985.....	IV-17

IV-12.	Landings and ex-vessel values by vessel size categories for selected Washington ports, 1985.....	IV-18
IV-13.	California troll fleet by home state and salmon landings, 1985.....	IV-20
IV-14.	Oregon troll fleet by home state and salmon landings, 1985....	IV-21
IV-15.	Washington troll fleet by home state and landings, 1985.....	IV-22
IV-16.	Number of licensed treaty Indian ocean salmon vessels, 1977-1985.....	IV-25
IV-17.	California ocean recreational catch (thousands of fish) and effort (thousands of angler trips) by boat type, 1976-1985 with 1971-1975 average.....	IV-26
IV-18.	Oregon ocean recreational catch (numbers of fish) and effort (angler trips) by boat type, 1979-1985.....	IV-27
IV-19.	Washington ocean recreational salmon catch (numbers of fish) and effort (angler trips by boat type), 1979-1985.....	IV-28
IV-20.	Local personal income impacts of commercial and recreational ocean salmon fishery for major California areas, 1984, 1985, and annual average for years, 1976-1985.....	IV-33
IV-21.	Local personal income impacts of commercial and recreational ocean salmon fishery for major Oregon areas, 1984, 1985, and annual average for years, 1976-1985.....	IV-34
IV-22.	Local personal income impacts of commercial and recreational ocean salmon fishery for major Washington areas, 1984, 1985, and annual average for years, 1976-1985.....	IV-35
V-1.	Assessment of 1985 preseason stock estimates for California chinook.....	V-2
V-2.	Expected and actual escapements of selected chinook stocks in 1985 (thousands of fish).....	V-3
V-3.	Relationship of Columbia River and Oregon coastal coho jack index to the OPI for coho adults (thousands of fish), 1970-1985	V-7
V-4.	Adult escapement of natural spawning stocks of Oregon coastal coho in thousands of fish. Parentheses indicate rebuilding schedule goals.....	V-9
V-5.	OPI area origin coho stock components used in the WDF/NBS model.....	V-12

V-6.	Comparison of the preseason estimate and actual observed abundance of OPI coho and the ocean catch of private hatchery fish in the OPI area in 1985.....	V-13
V-7.	Comparison of preseason projection and actual ocean contribution and return of Oregon private hatchery adult coho (thousands of fish), 1981-1985.....	V-14
V-8.	Comparison of preseason and postseason estimates for the 1984 and 1985 OPI area harvests, harvest impacts, and escapements (thousands of coho).....	V-16
V-9.	Preseason expected and preliminary postseason estimates of escapement for critical coho stocks in 1985 (thousands of fish)	V-18
VI-1.	Estimated Buoy 10 coho stock catch composition for 1985 and 1984 season total.....	VI-3
VI-2.	Estimated season total Buoy 10 chinook stock catch composition for 1985 and 1984.....	VI-4

LIST OF FIGURES

II-1.	Ocean chinook salmon landings south of Point Delgada by fishery, 1952-1985.....	II-2
II-2.	Sacramento River adult fall-run chinook salmon escapements, 1970-1985, including hatchery counts and the 1985 escapement goal range.....	II-3
II-3.	Indices of annual abundance and ocean harvest rate of California Central Valley chinook salmon, 1970-1985.....	II-7
II-4.	Ocean chinook salmon landings between Cape Blanco (southern Oregon) and Point Delgada (Shelter Cove) by fishery, 1952-1985	II-10
II-5.	Klamath River adult fall-run chinook salmon escapements and inland landings, 1978-1985.....	II-11
II-6.	Shasta River adult fall-run chinook salmon counts, 1930-1985..	II-13
IV-1.	Ex-vessel value of troll landings (1985 dollars).....	IV-12
V-1.	Relationship of the Oregon production coho index to the Columbia River and Oregon-California coastal coho jack index for the base years 1977-1982 plus 1984.....	V-8
V-2.	Relationship between the natural adult coho escapement of Oregon coastal rivers and the measured escapement of adult coho to the OPI, 1979-1984.....	V-10

- APPENDIX A Historical Record of Ocean Salmon Fishery Effort and Landings
- APPENDIX B Historical Record of Escapements to Inland Fisheries and Spawning Areas
- APPENDIX C Historical Record of Ocean Salmon Fishery Regulations and a Chronology of 1984 Management Events
- APPENDIX D Historical Economic Data
- APPENDIX E Sales and Local Income Multipliers

## LIST OF ACRONYMS AND ABBREVIATIONS

BPH	Bonneville Pool Hatchery (Columbia River Fall Chinook Salmon Stock)
CDFG	California Department of Fish and Game
CIF	Cost, Insurance, and Freight
Council	Pacific Fishery Management Council
FCZ	Fishery Conservation Zone (3 to 200 Miles Offshore)
GSI	Genetic Stock Identification (Technical Procedure)
I/O	Input/Output (Economic Model)
IPSF	International Pacific Salmon Fisheries Commission (The "Sockeye" Commission)
LRH	Lower River Hatchery (Columbia River Salmon Stock)
LRW	Lower River Wild (Columbia River Salmon Stock)
mt	Metric Tons
ODFW	Oregon Department of Fish and Wildlife
OCN	Oregon Coastal Natural (Coho Salmon Stock)
OPI	Oregon Production Index (Coho Salmon Stock Index South of Leadbetter Point)
PFMC	Pacific Fishery Management Council
SPDT	Salmon Plan Development Team
URB	Upper River Brights (Columbia River Fall Chinook Stock)
WDF	Washington Department of Fisheries

## INTRODUCTION

This postseason review of the 1985 ocean salmon fisheries off the coasts of Washington, Oregon, and California has been prepared in accordance with section 3.10 of the Pacific Fishery Management Council's (Council) salmon framework amendment which became effective in 1985. This annual evaluation will be reviewed formally by the Council at its March meeting in Portland, Oregon prior to the development of management recommendations for the 1986 fishing season.

The 1985 review provides a summary of important biological and socio-economic data from which the Council can assess the impacts of its past management actions, determine how well management objectives are being met, and improve regulations for 1986. To assist the Council in its development of 1986 management recommendations, the Salmon Plan Development Team (SPDT) will produce three preseason reports for 1986. These reports will provide estimates of stock abundance and analyses of the impacts of the Council's proposed and final adopted management recommendations.

Chapter I of this review describes the ocean salmon fishery regulations implemented in 1985, provides a summary of the ocean troll and recreational salmon fishing effort and harvests, and discusses the recently ratified Pacific Salmon Treaty. Chapters II and III provide a stock-by-stock assessment of the impacts of the 1985 management measures on chinook and coho salmon stocks with regard to management objectives and preseason expectations, ocean and inland harvests, spawning escapements, and management goal assessment. Socio-economic impacts of the regulations are discussed in Chapter IV. Chapter V contains an assessment of the abundance estimation procedures used by the SPDT and Chapter VI discusses special management problems and concerns which were important to salmon management in 1985 and may need further resolution in 1986. Four appendices (A through D) provide historical data on ocean landings, inland landings and escapements, regulations, and fishery related socio-economics. A fifth appendix (E) contains a discussion of the concept of income multipliers which is useful in understanding the economic evaluation in Chapter IV.

