FINAL ENVIRONMENTAL ASSESSMENT FOR

A PROPOSED EMERGENCY RULE IMPLEMENTING

NON-INDIAN OCEAN SALMON HARVEST ALLOCATION NORTH OF CAPE FALCON, OREGON

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LIST OF ACRONYMS

Council	Pacific Fishery Management Council
CVM	contingency valuation method
EA	Environmental Assessment
EIS	Environmental Impact Statement
FMP	fishery management plan
I/O	input/output
NEPA	National Environmental Protection Agency
NEV	net economic value
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
ODFW	Oregon Department of Fish and Wildlife
SAS	Salmon Advisory Subpanel
SPDT	Salmon Plan Development Team

INTRODUCTION

This document presents and analyzes the environmental issues and impacts of a proposed emergency rule to implement the 1988 allocation of chinook and coho salmon harvests between non-Indian commercial and recreational ocean salmon fisheries off the coasts of Washington and Oregon north of Cape Falcon, Oregon. The proposed emergency rule resulted from a review of this issue which the Council directed in April 1987 and which should culminate in implementation of a salmon FMP amendment for 1989. An emergency rule is necessary to resolve the problems identified in the review in time for the 1988 salmon season.

In contrast to the current regulation at 50 CFR 661 (Appendix II.B.2.[a]), the proposed emergency rule allocates a larger share of coho and chinook salmon to the recreational fishery at low stock levels and provides fewer coho but more chinook to the commercial fishery at higher stock levels. Amendment of the salmon framework amendment harvest allocation south of Cape Falcon, which was implemented in 1987, also resulted in an increased recreational share for that area.

Allocation of the ocean salmon harvest is an issue primarily of socio-economic concern. It may have important consequences for the economic well-being of the coastal communities which depend on the commercial and recreational fishing industries for a large part of their economic base and stability.

PURPOSE AND NEED FOR ACTION

Statement of the Problem

Non-Indian commercial and recreational ocean salmon fisheries north of Cape Falcon have been severely limited since the early 1980s (Table 1). Reduced allowable harvests for both fisheries have significantly shortened seasons, reduced landings, and had negative socio-economic impacts within the coastal communities which depend on the recreational and commercial fishing industries.

The 1986-1987 average total allowable harvest of coho and chinook salmon for the non-Indian ocean fisheries north of Cape Falcon was less than one-third of the 1976-1980 average. The 14-day commercial season in 1987 compares to a 146 day season in 1981, while the maximum duration for the 1987 recreational fishery was 40 days compared to 96 days in 1981 (Council, 1988a). In addition to shortening of recent seasons, area closures and species restrictions have been instituted to help reduce or shape catch rates for the two salmon species.

Not only have the allowable harvests been greatly reduced in recent years, but large percentages of the allowable harvests have gone unharvested, due in some part, to the limited flexibility in the allocation schedule of the framework amendment (Table 2). In 1986, the commercial fishery harvested only 76 percent of its chinook quota and 85 percent of its coho quota. In 1987, the commercial fishery exceeded its chinook quota by 9 percent, but was only able to harvest 43 percent of its coho quota, forfeiting over 80,000 coho. The 1986 recreational fishery harvested 103 percent of its coho quota while landing 84 percent of the chinook quota. In 1987, the sport fishery was

Table 1. Non-Indian commercial and recreational ocean salmon harvest and season length north of Cape Falcon.

Year	Commercial Fishery			Recreational Fishery		
	Landings (thousands of fish)		Total Season (in days)[a/]	Landings (thousands of fish)		Total Season (in days)[a/]
	Chinook	Coho		Chinook	Coho	
Average						
1976-1980	269	780	132	132	576	153
1981	92	349	146	96	292	96
1982	136	276	47	115	242	83
1983	56	28	62	52	246	107
1984	13	37	11	7	51	55
1985	43	169	29[b/]	30	199	51
1986	39	120	25	31	213	37
1987	62	61	14	45	148	40

a/ Sum of consecutive subarea seasons.
b/ There was an additional pink salmon season which is not included in this number.

Table 2. Preseason catch quotas and actual harvests in thousands of fish for non-Indian ocean salmon fisheries north of Cape Falcon, 1984-1987.

Year	Chinook			Coho		
	Quota	Catch	Catch/Quota	Quota	Catch	Catch/Quota
			COMMERCIAL			
1984	17	13	0.76	25	37	1.48
1985	47	43	0.91	91	169	1.86
1986	51	39	0.76	141	120	0.85
1987	57	62	1.09	141	61	0.43
			RECREATIONAL			
1984	10	7	0.70	50	51	1.02
1985	37	30	0.81	198	199	1.01
1986	37	31	0.84	207	213	1.03
1987	45	45	1.0	201	148	0.74

unable to harvest 26 percent of its coho quota while landing 100 percent of its chinook quota (Council, 1987 and 1988a).

There are several reasons for the reduced non-Indian ocean fisheries north of Cape Falcon. Certain weak chinook and coho salmon stocks have limited the ocean harvest rate in recent years. Constraints and adjustments under the U.S.-Canada Pacific Salmon Treaty, treaty Indian and non-Indian allocation, and inside/outside sharing have all had a part in the harvest changes. Managers and users are working with these issues on an annual and long-term basis to assure increased allowable harvest and equitable harvest allocation for the future. However, significant increases in available non-Indian ocean harvest are not likely for some years. The present total allowable ocean harvest is simply not sufficient to provide more than near minimal needs of the recreational and commercial fisheries as presently allocated.

The problem of incompletely harvesting quotas relates to the tremendous fishing power of the commercial fishery, the unpredictability of its harvest potential in one- and two-day seasons, the variability in relative chinook and coho abundance, and the inflexibility of the present allocation schedule to transfer fish between commercial and recreational fisheries inseason. Coho and chinook are caught concurrently in this area and fishermen have only limited ability to target on one species without impacting the other. When the quota of one species is taken, the fishery must close for both species. The present allocation does not allow for adjusting quotas inseason between recreational and commercial fisheries to take advantage of possible variations in species harvest rates between the two fisheries. Therefore, both fisheries may be closed with a considerable portion of a quota unharvested. The limited inseason management measures, such as area closures and bag limit changes, which have been implemented to correct for imbalances in quota attainment, have been largely ineffective. They have served to increase confusion and dissatisfaction among the fishermen.

Identification of Alternatives

Given the problems cited above and a related controversy (which later resulted in a lawsuit) over the accounting of near ocean harvest within internal state waters, the Council approved a motion in April 1987 directing the States of Oregon and Washington to review the harvest allocation schedule north of Cape Falcon. This review was intended to result in updating the present framework amendment allocation schedule as necessary to reflect an equitable and optimum allocation of the salmon resource given the present constraints in allowable harvest. In addition, the Council also used this review to consider whether or not the harvest in Area 4B near Cape Flattery, Washington and the Buoy 10 recreational fishery at the mouth of the Columbia River should be counted within the ocean or inside allocations.

Washington Department of Fisheries and ODFW held a user group meeting on October 12-13, 1987 in Olympia, Washington to begin review of the harvest allocation schedule north of Cape Falcon (an earlier start was precluded as fishery representatives were involved in the fishery). Users at this meeting formed a smaller group known as the North of Cape Falcon Allocation Work Group. About 200 people attended the first day of the meeting with the problems and perceived inequities of the recent fishing season well in mind. Preliminary new allocation proposals were drafted on the second day of the meeting.

On November 9-10, 1987 the work group, consisting of key user delegates (including appropriate SAS members) and technical personnel from the agencies, met in Portland, Oregon to complete drafting of the new allocation alternatives. The alternatives developed at this meeting were reviewed further on November 17 at a meeting in Portland, Oregon. A final package of allocation alternatives, including options for management of the Buoy 10 fishery was presented to the Council on November 19.

The Council adopted the work group's options for public review and scheduled hearings for January 6 in Seattle, Washington and January 7 in Astoria, Oregon. The review document prepared for the public hearings (Council, 1987b) displayed five options, including status quo. Two of the options concerned alternative ways of accounting for the Buoy 10 recreational harvest.

The work group met again on December 22 and January 11 to explore reaching a consensus position for the January Council meeting. The commercial and recreational representatives of the work group identified several areas of agreement, including flexibility in preseason and inseason harvest allocations to allow for species substitutions and transfers between fisheries. However, the work group could not agree on a specific allocation schedule.

On January 13, the Council reviewed the public comments and final recommendations of the work group before adopting the allocation described below for implementation in the 1988 season. The proposed allocation includes inseason flexibility to transfer fish between fisheries and incorporates the allocation schedule supported by the recreational representatives. In the same action, the Council affirmed its position that the Buoy 10 harvest accounting should not be changed and should remain separate from the total ocean allocation.

Need for Emergency Action

The current harvest allocation schedule north of Cape Falcon is specified in Appendix II.B.2.(a) of the framework amendment implementing regulations (50 CFR Part 661). A regular amendment of the framework amendment cannot be accomplished prior to the 1988 ocean salmon season. Therefore, to resolve the problems cited above, including achievement of a predictable base-level sport season at the expected low levels of allowable coho harvest for 1988, and to prevent the continuation of negative socio-economic impacts to coastal communities inherent in the present allocation schedule, the Council proposes implementation of an emergency rule to establish harvest allocation for the 1988 season.

PROPOSED ACTION

The following interim harvest allocation for non-Indian commercial and recreational salmon fisheries north of Cape Falcon was adopted by the Council on January 13, 1988 for implementation by emergency rule for the 1988 season. On an emergency basis it replaces "Option 5" of Section 3.7.1.1. of the framework amendment (pages 3-39 and 3-40) and Appendix II.B.2.(a) of the framework regulations (50 CFR Part 661).

Allocation Objectives

The goal of allocating ocean harvest north of Cape Falcon is to achieve, to the greatest degree possible, the objectives for the commercial and recreational fisheries as follows.

1. Provide recreational opportunity by maximizing the duration of the fishing season while minimizing daily closures, restrictions on gear and daily limits, and particularly area restrictions.

2. Maximize the value of the commercial harvest while providing fisheries of reasonable duration.

Allocation will be expressed in terms of quotas based on the schedule in Table 3 which is presumed to best achieve the allocation goal. However, these quotas are neither guaranteed catches nor inflexible ceilings. Only the total ocean harvest quota is a maximum allowable catch. Additional flexibility inseason may be utilized to adjust individual quotas if:

> The inseason adjustment will increase the degree to which the allocation goal is achieved; for example, if it is apparent that the harvest of an individual quota by one fishery will not be achieved and that the other fishery can pursue the harvestable fish.

Allocation Schedule

Table 3 provides the commercial and recreational allocation percentages for the range of total allowable ocean harvest of chinook and coho salmon. Figures 1 and 2 compare the present framework amendment allocation (implemented in 50 CFR 661) with the proposed interim allocation for 1988.

IMPACT ANALYSIS

In selecting its proposed allocation scheme for 1988, the Council reviewed and rejected several alternatives. The Council selected an allocation with inseason flexibility to trade species between fisheries. Public comment and representatives from both user groups strongly supported a flexible alternative. A fixed allocation could contribute to incomplete harvest of quotas and prevent inseason action which might help extend the season or increase landings in each fishery. For certain combinations of quota levels there may be a number of coho salmon allocated to the troll fishery which are unharvestable because there are too few to provide for a complete days fishery. When this situation occurs, inseason or preseason trades can be used to move fish between user groups. Under the status quo option, these preseason trades are limited to a maximum of 25 percent of the allocation except that quota adjustments must increase the degree to which the allocation goal is achieved. There are no limits to the inseason trades allowed under the proposed allocation. The importance of this flexibility provision in providing fuller utilization of the fishery resources and the consequent positive net impacts in moving from the status quo to the proposed schedule are described specifically for Council management Option 2 later in this analysis.

Table 3. Interim 1988 harvest allocation schedule for non-Indian commercial and recreational salmon fisheries north of Cape Falcon to the U.S.-Canada border.[a/]

Coho			Chinook		
Harvest (thousands of fish)	Percentage		Harvest (thousands of fish)	Percentage	
	Troll	Recreational		Troll	Recreational
0-300	25	75	0-100	50	50
>300	60	40	>100-150	60	40
			>150	70	30

a/ In this schedule the percentage allocation is tiered and must be calculated in additive steps when the harvest level exceeds the initial tier. For example, the recreational allocation for a total allowable coho harvest of 350,000 would be composed of two parts. The first part would be calculated of multiplying 300,000 by 75 percent. The result of this calculation would be added to the product of multiplying 50,000 by 40 percent (225,000 + 20,000 = 245,000 or 70 percent).

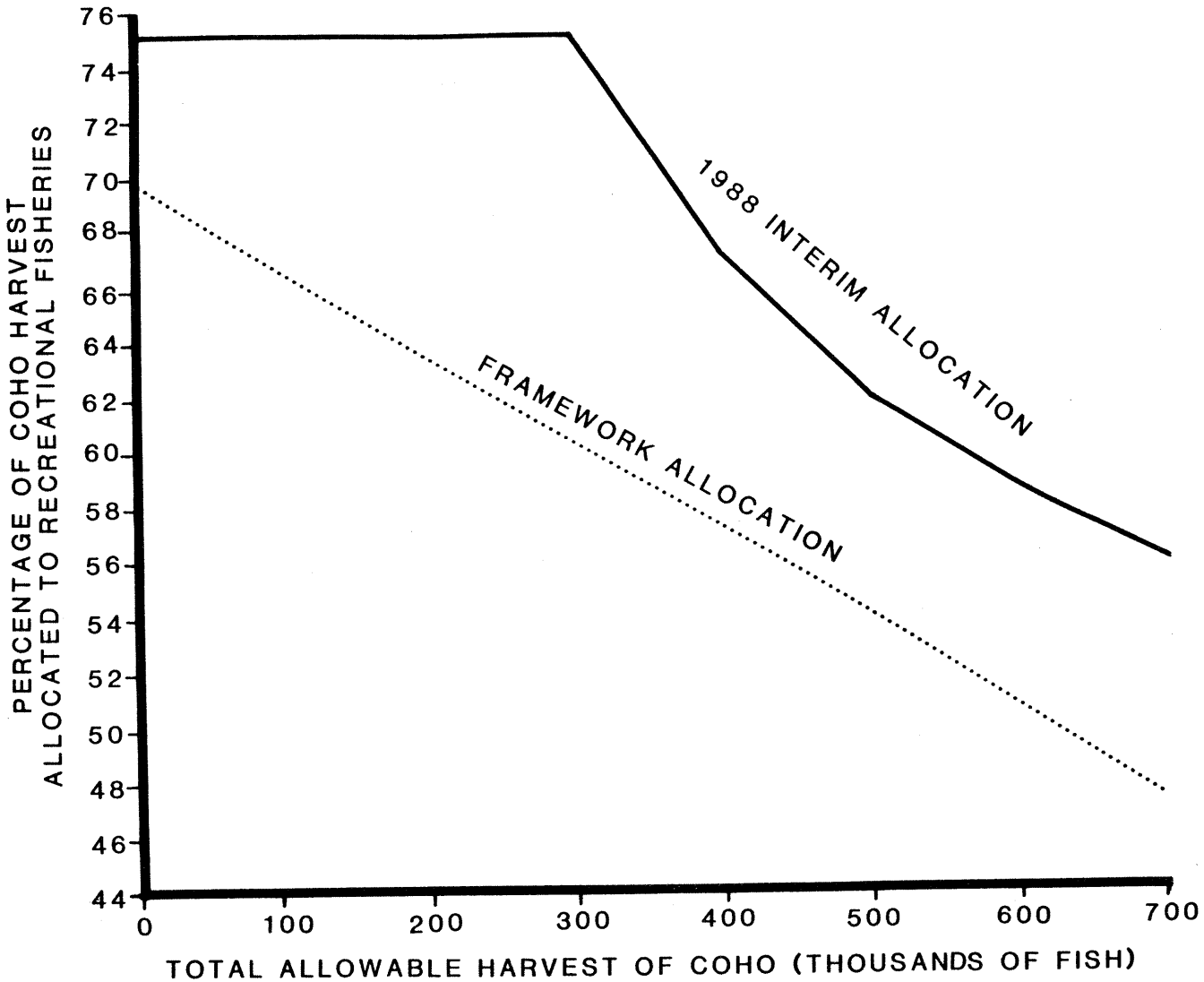

Figure 1. Proposed 1988 ocean allocation for harvest of coho salmon north of Cape Falcon compared to present framework amendment allocation.

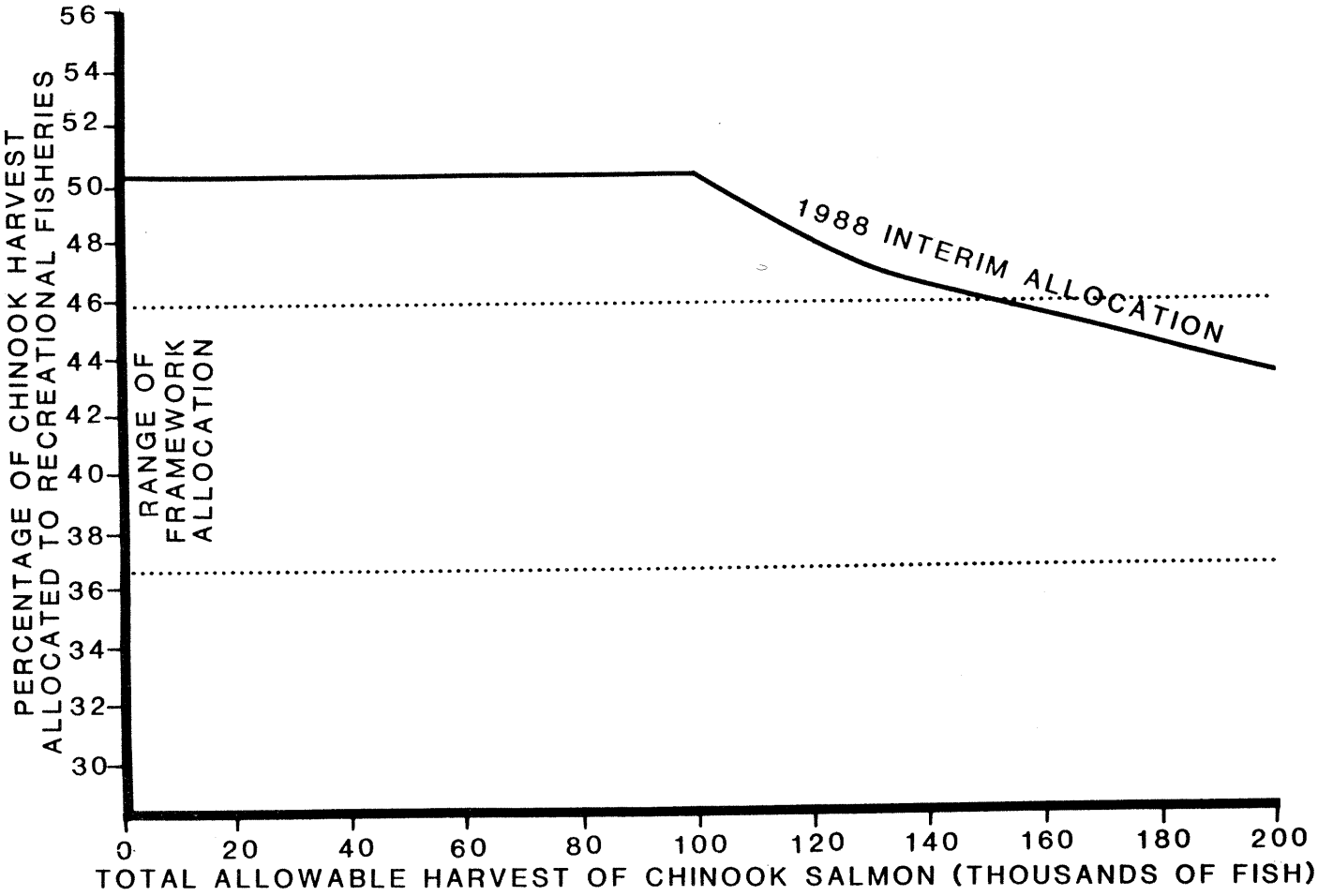

Figure 2. Proposed 1988 ocean allocation for harvest of chinook salmon north of Cape Falcon compared to present framework amendment allocation.

The Council reviewed five separate allocation schedules, including status quo, before selecting the schedule which provided the greatest transfer of harvest to the recreational fishery (Table 4). In arriving at its decision, the Council weighed the basic needs of each fishery and the limits of recent and expected total allowable ocean harvest, now greatly reduced from historic levels, to meet those needs. Under the present allocation, the Council has been unable to provide more than relatively uncertain and minimal commercial seasons and extremely short recreational seasons with unpredictable early closures and inseason regulation changes. The proposed interim allocation will provide more stability to the recreational season and thereby provide more certainty for business and vacation planning by assuring at least a portion of the historic Labor Day to Memorial Day season. The interim allocation is based to provide, on average, at least a July 1 through Labor Day, five-day per week recreational season at recent stock levels. The impacts of the selected alternative relative to the status quo are analyzed below.

Biological Impacts

None of the alternatives reviewed for this action would have an impact on the salmon stocks or their habitat that is different from those occurring under the current framework regulation. Allocation merely divides the allowable harvest among the user groups. To the degree they are known, differential stock impacts by different fisheries are accounted for in the Council's harvest impact models which are used to establish total allowable harvest within the Council's stock management objectives.

Socio-Economic Impacts

Economic Methodology and Assumptions

Two basic concepts, NEV and local personal income impact, are used to estimate the effects of the revised schedule for the recreational/commercial split of the coho and chinook quotas. NEV refers to the difference between the gross value of an economic activity and the costs (properly defined and measured) of carrying out that activity. Local personal income impact measures the change in wages, salaries, and proprietary income and profits that people will receive within a region or community. NEV measures the value of the allocation from a national income perspective, while local personal income impacts measures the value from a regional accounting perspective. Appendix A contains a complete description of the evaluation methodology and assumptions.

The economic analysis of the proposed change in allocation covers the range of chinook and coho harvest level combinations within the limits identified by 1988 management Options 2, 3, and 4, adopted by the Council on March 11, 1988 for public review (Council 1988a). Option 1 is not included in the analysis as it provides for no ocean fishery and would have no allocation. The proposed total allowable harvests under each option are:

Option 2 - 68,800 chinook and 75,000 coho
Option 3 - 157,100 chinook and 342,100 coho
Option 4 - 238,000 chinook and 342,100 coho

Table 4. Comparison of numbers of chinook and coho salmon available for harvest to non-Indian ocean troll and recreational fisheries north of Cape Falcon under the interim 1988 allocation schedule and the framework allocation schedule.

Total Harvest	Framework Schedule		Interim 1988 Schedule	
	Troll	Recreational	Troll	Recreational
		COHO		
75,000	24,950	50,050	18,750	56,250
100,000	34,000	66,000	25,000	75,000
200,000	74,000	126,000	50,000	150,000
300,000	120,000	180,000	75,000	225,000
350,000	145,250	204,750	105,000	245,000
450,000	200,250	249,750	165,000	285,000
600,000	294,000	306,000	255,000	345,000
		CHINOOK		
80,000	46,200[a/]	33,800[a/]	40,000	40,000
100,000	57,750[a/]	42,250[a/]	50,000	50,000
130,000	75,075[a/]	54,925[a/]	68,000	62,000
150,000	86,625[a/]	63,375[a/]	81,000	69,000
170,000	98,175[a/]	71,825[a/]	94,000	76,000
200,000	115,500[a/]	84,500[a/]	115,000	85,000
250,000	148,125[a/]	101,875[a/]	150,000	100,000

a/ Under the current framework allocation schedule, chinook allocation is dependent upon the total allowable harvest of coho salmon. The numbers listed for comparison purposes are based on a hypothetical total allowable harvest of 350,000 coho salmon.

It is impossible to know at this time exactly what harvest levels may emerge in the Council's final recommendations in April. Economic impact values have been calculated to indicate the relative economic impact of the interim allocation for several combinations of the coho and chinook quotas within the range of options. These calculations assume that both chinook and coho quotas are completely harvested. However, the reviewer is cautioned that due to the fixed, but annually variable proportions in which coho and chinook are jointly harvested, the actual harvest impacts for the 1988 season may be quite different from those displayed in the impact assessment tables. These impacts may also vary when there are too few fish to allow a complete day's harvest by the commercial fishery. Under this circumstance, the possibility of inseason species trades between fisheries, allowed by the interim allocation schedule and the allowance for preseason trades (within specific limits) in the framework allocation schedule, would allow for balancing chinook and coho quotas to better match the actual harvest ratio of the fisheries in 1988. This could significantly affect the calculation of economic impacts and alter the relative gains and losses for any specific combination of chinook and coho quotas. A significant example of this effect is provided in the analysis of management Option 2.

Benefit Cost Analysis

This analysis focuses on the combined economic value of the harvest of both chinook and coho because the species are harvested jointly in fixed proportions. With respect to status quo, Table 5 summarizes the change in the distribution of the allocation of salmon and Table 6 summarizes some of the consequent changes in commercial and recreational NEVs under the interim allocation schedule. Table 7 summarizes the total changes in NEV likely to result from the regulation.

In general, Table 6 indicates approximate losses in the commercial fishery sector of $207,000 to $695,000 and gains in the recreational sector of $290,000 to $938,000 for the 1988 levels of harvest proposed in Options 2, 3, and 4. Total net gains for this range are between $-107,000 and $486,000 (Table 7). While these values are representative of the impacts under the harvest levels specified by the options, the actual fisheries may not be able to achieve the species harvest proportions allowed by each option. Without any increase in allowable coho harvest, the actual chinook harvest under Option 4 may be far short of the allowable harvest.

The estimated net losses to the commercial sector may not be the actual net changes experienced. In recent years, the commercial sector has not been able to harvest its full quota and therefore the status quo levels of harvest have not been reached (Table 2). Thus the reduction in the allocation to the commercial fisheries under the proposed schedule will probably not be as great as one would expect from comparison to the status quo allocations. The development of the option for inseason flexibility (discussed below) may allow fuller utilization of the allocated quota and may reduce the losses of the commercial fishermen under the proposed allocation.

The actual combination of chinook and coho quotas selected for 1988 as a result of species abundance, fisheries impacts, and allocation adjustments by preseason or inseason trades, under either allocation schedule, cannot be determined. However, over most of the range of options this is not particularly important to the economic analysis as the economic impacts of the

Table 5. Changes in the allocation of chinook and coho in thousands of fish to the recreational fishery under the proposed interim schedule.

Total Coho Quota	Increase In Recreational Coho	Change in Recreational Chinook Total Chinook Quota[a/] 70	100	150	200	250
350	40	5.43	7.75	6.63	0.50	-5.63
300	45	5.95	8.50	7.75	2.00	-3.75
200	24	7.00	10.00	10.00	5.00	0.00
75	6	8.31	11.88	12.81	8.75	4.69

a/ Under the framework allocation schedule (status quo), the percentage share of chinook for each fishery varies with the total allowable harvest of coho.

Table 6. Total changes in chinook and coho NEVs by commercial and recreational sectors under the proposed interim schedule.[a/]

Total Coho Quota	Total Chinook Quota 70 Troll	70 Sport	100 Troll[b/]	100 Sport[c/]	150 Troll	150 Sport	200 Troll	200 Sport	250 Troll	250 Sport
350	$-648	$ 914	$-740	$ 960	$-695	$ 938	$-451	$816	$-207	$693
300	$-720	$1,020	$-821	$1,071	$-791	$1,056	$-562	$941	$-333	$826
200	$-536	$ 621	$-656	$ 681	$-656	$ 681	$-456	$581	$-257	$480
75	$-398	$ 290	$-540	$ 362	$-577	$ 380	$-415	$299	$-253	$218

a/ All numbers expressed in thousands of fish or dollars.
b/ Change in the NEV generated through the commercial sector.
c/ Change in the NEV generated through the recreational sector.

Table 7. Net change in NEV under the proposed interim allocation schedules.[a/]

Total Coho Quota	Total Chinook Quota				
	70	100	150	200	250
350	$ 267	$ 221	$ 243	$ 364	$486
300	$ 301	$ 250	$ 265	$ 379	$493
200	$ 84	$ 25	$ 25	$ 124	$223
75	$-107	$-178	$-197	$-116	$-35

a/ All numbers expressed in thousands of fish or dollars. The values presented in this table provide a relative comparison of the alternative allocation schedules and assume complete harvest of each quota with no preseason or inseason adjustment of allocations. In actuality, the quotas may not be harvested completely and preseason or inseason trades of species between fisheries may be utilized differentially under the interim and status quo allocation schedules. These differences may not be signifcant to the analysis which shows significantly positive values over most of the range of options. However, at threshold levels, where the net impacts of implementing the interim allocation approach zero or appear to be negative, the affect of allowable allocation adjustments may be worth noting. A discussion of some possible adjustments, that might be utilized in 1988, which could change the relative value of implementing the interim allocation schedule at the Option 2 quota levels is provided in the text.

interim allocation are significantly positive. Within this significantly positive range, preseason or inseason allocation adjustments, provided differentially in the alternative schedules, would serve only to lower or raise the relative economic impact within a positive range of values. However, at certain low levels of allowable coho and chinook harvests, the impact of the interim schedule appears to be only slightly positive or negative (e.g. Option 2). At these threshold levels, the allocation adjustments specified for each allocation schedule may be significant. An example of how this might work is provided below for Option 2.

Whenever there is less than 30,000 coho to be harvested in a day, it is difficult to have a full day's commercial fishery. Whenever there is a quota of less than 90,000 coho under the status quo and 120,000 under the interim allocation, there will be less than 30,000 coho for a troll all-species season. It is at these low allocation levels that the proportion based trade restriction (25 percent of the allocation) often makes it impossible to transfer all the unusable coho quota from the troll to sport fishery under the status quo allocation.

Under management Option 2 (70,000 chinook and 75,000 coho), the proposed allocation schedule results in about a $107,000 loss in terms of NEV when compared to the status quo, if it is presumed that all fish will be caught (Table 7). However, under neither allocation alternative is there enough coho for one full day of commercial fishery. If the commercial all-species season is eliminated under both schedules, with no trading, there would be an expected gain of $39,000. With inseason trades, however, there could be a $268,000 gain relative to the status quo. Using the initial allocation under the status quo and proposed schedules, one possible trade is calculated on the following basis.

There are 24,900 and 18,800 coho allocated to the troll fishery under the status quo and interim allocation, respectively. Neither of these is enough for a full day's commercial fishery. Six thousand two hundred coho, the maximum allowable under the 25 percent restriction, are transferred to the recreational fishery under the 4 coho to 1 chinook trade ratio mandated in the current framework. The remaining 18,700 coho go unharvested. Under the proposed allocation, all 18,800 coho may be transferred to the recreational fishery (inseason). Since no proportion is mandated, a similar 4 to 1 trade ratio is assumed (any ratio above 1.5 to 1 will result in a positive net change in NEV). It is assumed that a May chinook only recreational season will absorb any excess chinook in the recreational fishery. If there is no May recreational fishery, the relative results vary little as the numbers of excess chinook are comparable under both fisheries, 8,700 and 8,300 chinook for the status quo and interim allocation, respectively.

Thus, in the above example, the interim proposal results in a gain compared to status quo. This gain is primarily attributable to the ability to use all of the coho resources (given sufficient numbers of chinook) under the interim flexibility. With the 25 percent trade limit under status quo, some coho go unused. At allocation levels where desirable transfers can be accomplished under either allocation schedule, coho will not go unused. At these levels, any losses predicted under the full catch utilization assumption (Table 7) will not be compensated for by the increased flexibility of the interim schedule.

The percentage change in gross ex-processor receipts for the likely range of harvests ran between -3 and -24 percent for the commercial sector. The percentage change in gross receipts is the maximum change that those firms fully dependent on catching and processing salmon will experience. Firms for which north of Cape Falcon salmon do not constitute the entire fish input will experience a lesser proportional impact on gross receipts. This shows significant small business impacts for purposes of classification of the action. The impacts on recreational sector businesses are not as clear cut. However, based on the increase in allocation of fish and assumptions listed above one would expect maximum average revenue increases of 11 to 17 percent. The next two sections discuss impacts on business in more detail. The overall impacts of reallocation on personal income in coastal communities north of Cape Falcon are examined below. The use of I/O modeling to assess these impacts is discussed in an ODFW economics report (ODFW, 1985) and the recent Council documents (Council, 1986a and 1986b).

Distributional Effects and Impact on Community Income

Tables 8 and 9 show estimated potential changes in coastal community personal income from adopting the proposed allocation alternative. In general, Table 8 indicates approximate losses to the commercially dependent sectors of $318,000 to $1,053,000 and gains to the recreationally dependent firms of $522,000 to $1,687,000 for the levels of 1988 harvest proposed by the Council in public review Options 2, 3, and 4. It must be emphasized that some of the sectors experiencing these losses will be the same ones to experience the gains. Total net gains for this range, under the proposed allocations, are between $-77,000 and $928,000 (Table 9).

As noted above in the previous section, differential allocation adjustments could be utilized under the alternative allocation schedules to arrive at somewhat different personal income impacts for Option 2 than displayed in Table 9. Utilizing the same preseason and inseason allocation adjustments described above in the analysis of Option 2 NEV impacts, it can be shown that community impacts would actually be expected to increase around $478,000 under the proposed interim allocation.

For the most probable allowable harvest levels of chinook and coho, total community income impacts from recreational fishing activities increased between 11 and 17 percent while impacts from commercial fishing activities decreased between 3 and 25 percent. Companies in the retail sector and support industries will be at least partially affected by both the decrease in the commercial fishing activity and the increase in recreational activities. These companies will be benefited or hurt depending on their mix of goods and services and their clientele. Over a longer run they may be able to recover any losses through market repositioning or by adjusting their product mix and targeted customers. Firms more fully dependent on the north of Cape Falcon salmon fishery will be more directly impacted by the change in allocation. The degree of impact will depend on their degree of reliance on the north of Cape Falcon fishery. Processors handle multiple products and may be able to get product from outside the area, vessels licensed in other areas can move up and down the coast and fish other species, recreational fishing businesses are more location dependent.

Table 8. Total changes in chinook and coho local personal income impacts under the proposed interim schedule.[a/]

Total Coho	Total Chinook Quota									
	70		100		150		200		250	
Quota	Troll	Sport	Troll[b/]	Sport[c/]	Troll	Sport	Troll	Sport	Troll	Sport
350	$- 981	$1,644	$-1,120	$1,727	$-1,053	$1,687	$-685	$1,466	$-318	$1,246
300	$-1,090	$1,834	$-1,243	$1,925	$-1,198	$1,898	$-853	$1,691	$-508	$1,484
200	$- 811	$1,116	$- 991	$1,224	$- 991	$1,224	$-691	$1,044	$-391	$ 864
75	$- 599	$ 522	$- 813	$ 650	$- 869	$ 684	$-626	$ 538	$-382	$ 391

a/ All numbers expressed in thousands of fish or dollars.
b/ Change in the personal income generated through the commercial sector.
c/ Change in the personal income generated through the recreational sector.

Table 9. Net change in personal income impacts under the proposed interim allocation schedule.[a/]

Total Coho Quota	Total Chinook Quota				
	70	100	150	200	250
350	$663	$607	$634	$781	$928
300	$744	$ 683	$ 701	$839	$977
200	$305	$ 233	$ 233	$353	$473
75	$-78	$-163	$-186	$-88	$ 9

a/ All numbers expressed in thousands of fish or dollars. The values presented in this table provide a relative comparison of the alternative allocation schedules and assume complete harvest of each quota with no preseason or inseason adjustment of allocations. In actuality, the quotas may not be harvested completely and preseason or inseason trades of species between fisheries may be utilized differentially under the interim and status quo allocation schedules. These differences may not be signifcant to the analysis which shows significantly positive values over most of the range of options. However, at threshold levels, where the net impacts of implementing the interim allocation approach zero or appear to be negative, the affect of allowable allocation adjustments may be worth noting. A discussion of some possible adjustments, that might be utilized in 1988, which could change the relative value of implementing the interim allocation schedule at the Option 2 quota levels is provided in the text.

Administrative Costs

Administrative costs under the interim schedule are not likely to be higher than under status quo. Inseason actions possible under the interim schedule may reduce the need for more numerous and less effective actions which have been implemented in previous years.

Agencies and Persons Consulted

Representatives of the following agencies were consulted in formulating the proposed action, considering alternatives, and preparing this document.

California Department of Fish and Game
Oregon Department of Fish and Wildlife
National Marine Fisheries Service
Pacific Fishery Management Council
Washington Department of Fisheries
U.S. Fish and Wildlife Service

Representatives of the Council's SAS for the area north of Cape Falcon developed the alternative allocation options through the North of Cape Falcon Allocation Work Group.

Public Hearings and Comments

Public hearings were held in Seattle, Washington at the Seattle Airport Hilton, January 6, 1988 and in Astoria, Oregon at the Astoria Middle School, January 7, 1988.

A total of approximately 159 people attended the two hearings and testimony was received from 50 commenters. Of the 50 commenters, 28 spoke in favor of the allocation schedule eventually adopted by the Council, 15 spoke in favor of other specific Council proposed options and 7 spoke on various aspects of the issues without identifying preference for a specific option. The Council also received 128 letters with comments on the proposed allocation schedule alternatives. Of these written comments, 112 expressed support for the option eventually adopted by the Council.

Consistency With Federal and State Coastal Zone Management Programs

The Council has determined that this rule is consistent to the maximum extent practicable with the approved coastal zone management programs of Washington and Oregon. This determination has been submitted for review by the responsible agencies under Section 307 of the Coastal Zone Management Act.

Finding of No Significant Environmental Impact

This document has been prepared according to 40 CFR 1501.3 and 1508.9 and NOAA Directive 02-10 in order to determine whether an EIS normally is required by Section 102(2)(C) of the NEPA. An EIS normally is required for any major action that will have a significant impact on the quality of the human environment. An EIS is not required if the EA concludes that there is no significant impact.

With regard to the five criteria listed in Appendix 13(b) of NOAA Directive 02-10 the proposed action has the following effects.

1. The proposed action will not change the ocean or spawning escapement goal for Council managed salmon stocks. Therefore, it will not jeopardize the productive capability of the target resource or any other related stocks that may be affected by the action.

2. The proposed action has no effect on ocean or coastal habitat.

3. The allocation change will not increase negative impacts on health or safety or increase the need for access opportunity denied by adverse weather due to extremely short commercial seasons. Under either allocation schedule, at the current low levels of total allowable coho harvest, the all-salmon troll season will be approximately two days or less. Through reduced area closures for the recreational fishery, the interim schedule may increase safety by allowing more nearshore fisheries.

4. The proposed action does not change the total allowable harvest impacts under the framework amendment and will not adversely effect any endangered or threatened species or marine mammal population.

5. The proposed action does not have cumulative adverse impacts that could have an effect on target resource species or any related stocks (see number 1 above).

The actions implemented by this amendment will have no significant or adverse effect on flood plains or wetlands and trails and rivers listed or eligible for listing on the National Trails and Nationwide Inventory of Rivers.

For the reasons discussed and referenced above, it is determined that neither approval nor disapproval of the reported emergency rule would significantly affect the quality of the human environment in a way that has not already been contemplated in the supplemental EIS for the FMP. Accordingly, preparation of a supplemental EIS on these issues is not required by Section 102(2)(C) of the NEPA or its implementing regulations.

_____ _____

Assistant Administrator for Fisheries, NOAA Date

References

Council. 1985. Final Framework Amendment for Managing the Ocean Salmon Fisheries Off the Coasts of Washington, Oregon, and California Commencing in 1985, October 1984.

Council. 1986a. Review of 1985 Ocean Salmon Fisheries.

_____. 1986b. Preseason Report II Analysis of Proposed Regulatory Options for 1986 Ocean Salmon Fisheries.

_____. 1987a. Review of 1986 Ocean Salmon Fisheries.

_____. 1987b. Non-Indian Ocean Salmon Harvest Allocation North of Cape Falcon, Oregon, 12 pp.

_____. 1988a. Review of 1987 Ocean Salmon Fisheries.

_____. 1988b. Preseason Report II Analysis of Proposed Regulatory Options for 1988 Ocean Salmon Fisheries, March 1988.

ODFW. 1985. Progress Report on the Economic Aspects of the Recreational-Commercial Allocation of Coho Salmon in the Ocean Fisheries.

APPENDIX A
DESCRIPTION OF ECONOMIC METHODOLOGY AND ASSUMPTIONS USED TO ANALYZE ALTERNATIVE HARVEST ALLOCATIONS NORTH OF CAPE FALCON, OREGON, 1988

Two basic concepts, NEV and local personal income impact, are used to estimate the effects of the revised schedule for the recreational-commercial split of the coho and chinook quotas. NEV refers to the "difference between the gross value of an economic activity and the costs (properly defined and measured) of carrying out that activity" (Rettig, 1984). Local personal income impact measures the change in wages, salaries, and proprietary income and profits that people will receive within a region or community. NEV measures the value of the allocation from a national income perspective, while local personal income impacts measures the value from a regional accounting perspective.

Estimate of NEV

Recreational Methodology

Because recreational fishing occurs in public areas, prices for the use of the fishing area play an insignificant role in the valuation process. The opportunity to participate in the ocean recreational fishery is essentially a nonmarket good.

There are three widely used methods for inferring monetary values of nonmarket goods: travel cost, hedonic price, and contingency valuation. Welsh and Bishop (1986), in a survey of comparisons of these methods concluded in summary that ". . . comparison studies generally found that different valuation methods provide reasonably similar estimates of value."

The most recent valuation for ocean fisheries located in the north of Cape Falcon area was a 1978 study by Crutchfield and Shelle (1979). This study relied on the CVM to derive values for participation in the ocean salmon fisheries on the Washington coast. The CVM is based on survey-derived measures of willingness to sell or willingness to pay for the right to use a nonmarket good.

Crutchfield and Shelle (1979) estimate the average NEV per day for ocean salmon fishing to be $29.63 (adjusted to 1987 dollars) using the willingness to pay criteria. A valuation based on willingness to accept compensation was also made, however in studies sighted by Welsh and Bishop (1987) it was generally shown that CVM studies overestimated willingness to accept compensation while more accurately measuring willingness to pay. We therefore rely on willingness to pay criteria.

The $29.63 value represents an average value per day. Conversion of this number to a marginal value associated with any significant decrease or increase of fish requires additional assumptions about the number of angler days supported by each additional fish. Recreational rates are not completely predictable. However, since 1981 the annual catch rates north of Cape Falcon for chinook and coho combined have varied between 1.24 and 1.81 fish per day. The simple average of these annual catch rates is 1.51 fish per day. For this analysis, we have assumed that each additional fish allocated will allow close to two-thirds of an additional angler day. Further assumptions necessary for the analysis are discussed below.

Commercial Methodology

To compute the net economic benefits from commercial fishing the variable costs of harvest (fuel, repairs, etc.) should be subtracted from the gross revenues (ex-vessel price). In the short run, at low levels of total salmon harvest and with small incremental changes in salmon production, it is often argued that any increase or decrease in harvest will be taken with almost the same amount of variable expenses as before.

The assumption of full employment is implicit in most benefit and cost analysis. But unemployment and excess fishing capacity, both transitory and chronic, seem to prevail in many Pacific coastal communities dependent on commercial fishing. Changes in markets or fishing opportunities may make it necessary for people and capital to change occupations or locations. Various factors make it difficult for this to happen quickly enough to prevent a period of unemployment and idle capacity. The U.S. Water Resources Council (1983) suggests that when "idle boats" are available, the only incremental costs of increased harvest will be the operating costs.

Since the harvesting and processing sectors of the current fisheries are greatly overcapitalized, it is a plausible assumption that additional capital investment will not occur. With changes in the harvest size, variable costs will not vary much, and with capital costs nearly fixed, gross benefits will be close to net benefits.

Rettig and McCarl (1984) make recommendations on the calculation of commercial fisheries NEVs. Using the most liberal extremes of their recommendations (90 percent of ex-vessel and 90 percent of processor margins) the NEV per fish can be calculated. The "90 percent rule" has been employed for the purposes of this analysis because the incremental harvest costs appear to be minimal.

It should be noted that as the total salmon harvest increases by significant amounts it would not be appropriate to use higher percentage levels. A more appropriate level might be the 50 percent level (the lower level recommended by Rettig and McCarl). In a situation where new resources are needed to harvest and process a greater amount of salmon, the actual additional costs of harvesting and processing would have to be deducted from the ex-vessel price and the processors' margin in order to arrive at the NEV for the additional salmon harvest. Within the ranges to be considered for the 1988 season, the commercial allocation will not increase.

Overall Assumptions

Certain factors make it difficult to predict with certainty the change in NEVs which will result from adoption of the revised allocation schedule.

1. The exact extent to which the fishery will utilize all of both quotas and the consequent trades under inseason flexibility are uncertain.

2. Recreational catch rates are not completely predictable.

3. The 1988 allowable harvest levels have not yet been determined.

With these difficulties in mind, it is possible to suggest a potential range of change in NEV. Several key assumptions must be made in order to carry out the analysis of NEV.

- Implicit in the numerical results of the analysis is the assumption that every fish allocated at the given harvest level will be caught.

- The marginal NEV per additional recreational day in the north of Cape Falcon area is about $29.63, the same as the estimated average NEV per angler day (Crutchfield and Shelle, 1979). The assumption is justified under the modest reallocation schedule proposed. By dividing the success rate for salmon a NEV per recreational fish harvested is calculated to be $20.02.

- Bag limits are set and the allocation is set at a level where the recreational fishery is not "saturated" in terms of the ability to utilize its allocation.

- The improved ability of recreational users to plan and of charter boat and recreational support businesses to "guarantee" their customers an open fishery will increase the angler use and tourism in coastal communities.

- The marginal NEV per commercial coho and chinook are about $10.72 and $39.85, respectively. This represents the high end of estimates of potential NEV, which is reasonable only under the assumptions discussed above.

Throughout the analysis simple averages of the 1979-1987 real values were used as the best estimates for 1988 prices. A simple average of the annual average dressed weights was used to derive an expected weight for 1988.

Methodology for Distributional Effects and Impact on Community Income

The amount that a commercial fisherman spends to prepare a consumer-ready product for market or a recreationalist spends to take part in ocean fishing, has an important impact on the local and regional economy. In addition, purchases made by the harvester, processor, or tourist-related businesses will cause suppliers to purchase additional inputs in the form of labor, more inventory, and other items. As workers and entrepreneurs receive wages, salaries, and profits from these activities; they spend money in the local area for a variety of goods and services. The total effect on the local economy depends upon the the original dollar expenditures and the amount which is spent for subsequent purchases within the local economy. Economic I/O models are often used to estimate the impact of resource changes on the local economy.

The U.S. Forest Service has developed a computer program called IMPLAN which can be used to construct county or multicounty I/O models for any region in the U.S. I/O models have been constructed for many of the Pacific coast communities that are dependent on commercial and recreational fishing. Representative budgets from the fish harvesting and processing sectors and impact assessment models are taken from studies developed by Radtke and Jensen (1987). The budgets used in these reports reflect the expenditure patterns of

salmon fishermen that harvest the majority of the fish. These expenditures determine the economic impacts that the commercial fishery has on the community.

It was assumed that composition of the firms in the community and proportion of recreationalists using charter vessels will be the same as in 1987. Average real fish prices and weights for the 1979-1987 period were used to derive expected 1988 values for use in the I/O model. Assuming further that both recreational and commercial fishing activities will be distributed in the north of Cape Falcon area in the same proportions that they were in 1987, a weighted average was used to derive the local income impacts per commercial fish for the entire north of Cape Falcon area. Under these assumptions and those listed above for the NEV analysis, an analysis of the likely impacts on coastal community income is possible.

The resulting estimates are that an average recreationally harvested coho will generate $36.40 in coastal community personal income and $16.28 if harvested commercially. A chinook on the other hand will generate $60.00 when harvested commercially compared to the $36.40 when harvested recreationally.

Description of the Fishery

The commercial troll fleet is mobile, but vessels primarily from Washington and Oregon land fish north of Cape Falcon. The structure of the Washington commercial fleet is shown in Table A-1. A breakdown of the fleet making landings in Oregon north of Cape Falcon is not presently available, but less than one percent of the Oregon 1987 commercial troll deliveries were made north of Cape Falcon. Many commercial fishermen also maintain multiple state licenses. With the very short commercial seasons north of Cape Falcon they move to those areas where harvests are available. Additional details are presented in the "Review of 1987 Ocean Salmon Fisheries" (Council, 1988).

Information on the number of charter and private recreational salmon fishing vessels is not as detailed as the data on the commercial fleet. For the years between 1975 and 1987, the number of Washington licensed charter vessels ranged from 569 down to 272 in the most recent year (Table A-2). Washington has a moratorium in place on the issuance of licenses and has just completed the buy-back program responsible for bringing these numbers down. Some of these Washington vessels may operate within Puget Sound or the Columbia River areas. No breakdown is available, but 84 percent of the combined ocean and Columbia River charter trips actually take place on the ocean. Many of the vessels operating in the ocean also operate in the Columbia River. For these vessels, any percent change in the ocean harvest will result in a smaller proportional change in their gross receipts.

Reliable estimates of the number of private recreational vessels engaged in ocean sport salmon fishing are also not available. We do know that 47 percent of the 101,000 1987 Washington ocean angler trips were taken on private pleasure craft.

There is no detailed data presently available for vessels taking part in the Oregon recreational fishery north of Cape Falcon. Table A-3 presents the numbers of licensed charter vessels for 1976-1987. Seven percent of the 255,000 1987 Oregon ocean angler trips took place north of Cape Falcon.

Table A-1. Washington salmon troll catch statistics in pounds of fish landed by boat size category, 1987.

Year	Length Category (feet)	Vessels		Poundage	
		Number	Percentage	Number	Percentage
1987[a/]	<25	375	42.5	131,629	17.2
	25-36	224	25.4	184,442	24.2
	>36	212	24.0	396,937	52.0
	Unknown	72	8.2	49,866	6.5
Totals		883		762,874	

a/ Preliminary.

Table A-2. Numbers of charter boats licensed in Washington, 1975-1987.

Year	Number of Licenses Issued
1975	404
1976	427
1977[a/]	569
1978	535
1979	516
1980	510
1981	478
1982	414
1983	363
1984	355[b/c/]
1985	316[d/]
1986	298[e/]
1987	272

a/ First year moratorium in effect.
b/ Vessel license refund program participated in by 85 boats in 1984.
c/ Buy-back program purchased 21 percent of the 355 total licenses issued during 1984.
d/ Buy-back program purchased 19 licenses of the total 316 issued during 1985.
e/ Buy-back program purchased 14 licenses of the total 298 issued during 1986.

Table A-3. Numbers of charter boats licensed in Oregon, 1980-1987.

Year	Total Number Licensed Charter Boats	Licensed by Oregon Residents	Licensed by Washington Residents	Licensed by Residents of Other States
1980	194	192	2	0
1981	248	213	34	1
1982	253	212	40	1
1983	255	206	47	2
1984	218	185	31	2
1985	226	198	25	3
1986	247	216	26	5
1987[a/]	254	226	23	5

a/ Preliminary.

References

Council. 1988. "Review of 1987 Ocean Salmon Fisheries."

Crutchfield, James A. and Kurt Shelle. 1979. An Economic Analysis of Washington Ocean Recreational Salmon Fishery With Particular Emphasis on the Role Played by the Charter Vessel Industry. Prepared for the Pacific Fishery Management Council.

Radtke, Hans and William Jensen. 1987. "Fisheries Economic Assessment Model." West Coast Fisheries Development Foundation. (Funded by the S-K program through NMFS).

Rettig, R. Bruce. 1984. A Comprehensive Economic Study of the Ocean Salmon Fisheries Off the Coasts of California, Oregon, and Washington and Related Inside Impacts. Prepared for the Pacific Fishery Management Council.

Rettig, R. Bruce and Bruce A. McCarl. July 1984. "Potential and Actual Benefits from Commercial Fishing Activities in Making Information More Useful for Salmon and Steelhead Production Decisions." NOAA Technical Memorandum, NMFS F/NWR-8.

Water Resources Board. 1983. Economic and Environmental Principles and Guidelines for Water Related Land Resources, Implementation Studies.

Welsh, Michael P. and Richard C. Bishop. 1986. "An Assessment of Nonmarket Valuation Methods With Emphasis on State, Local and Legal Application." In: Proceedings of a Workshop on Economic Nonmarket Evaluation of Losses to Fish, Wildlife, and Other Environmental Resources. Eds., Philip A. Meyer and Stephen O. Anderson. Bay Institute of San Francisco, Sausalito.