

PRELIMINARY DRAFT SUPPLEMENT TO ECONOMIC ANALYSIS CONTAINED IN
APPENDIX H
EXECUTIVE SUMMARY OF PRELIMINARY DRAFT PACIFIC COAST SALMON PLAN
AMENDMENT 15: AN INITIATIVE TO PROVIDE FOR DE MINIMIS FISHING
OPPORTUNITY FOR KLAMATH RIVER FALL-RUN CHINOOK SALMON

I. Introduction

The economic analysis provided in Appendix H of *Executive Summary of Preliminary Draft Pacific Coast Salmon Plan Amendment 15: An Initiative to Provide for De Minimis Fishing Opportunity for Klamath River Fall-Run Chinook Salmon* (Agenda Item H.2.a, Attachment 1, September 2006 – hereafter referred to in this report as PFMC Sep 2006) discusses differences among the de minimis alternatives (status quo, 2.5%, 5%, 10%, 16%) in terms of aggregate salmon troll revenues and associated income impacts. That analysis indicated little difference among the alternatives in terms of long-term economic effects, largely due to the relative infrequency of Conservation Alert years over the 40-year projection period. The alternatives, however, indicated more substantial differences when the analysis focused on fishery outcomes in Conservation Alert years.

This analysis supplements the results of Appendix H by demonstrating potential effects of the alternatives on fishing communities and the salmon troll fleet in terms of their ability to adapt to the restrictions imposed in Conservation Alert years. The indicators of adaptability used here pertain to community and vessel dependence on the salmon fishery and the extent to which other fisheries are viable alternative sources of revenue.¹

II. Fishing Communities

The fishing communities considered in this analysis include the 16 ports in the Klamath management areas for which the annual ex-vessel value of salmon troll landings averaged at least \$100,000 during 2003-2005 (see Figure 1). Table 1 characterizes port dependence on salmon in terms of the percentage of total landings and revenues attributable to salmon, and the percentage of vessels based in the port who participate in the salmon troll fishery.² Port dependence (as reflected in the percentage of total port revenue attributable to salmon) was highest for Santa Cruz, Bodega Bay, Fort Bragg, Princeton and San Francisco. Ports with the highest absolute salmon revenues included Fort Bragg, Newport, Coos Bay, San Francisco, Bodega Bay and Princeton.

Table 2 augments the salmon revenue information in Table 1 by identifying, for each port, all non-salmon fisheries that accounted for at least 5% of of the average annual ex-vessel value of landings during 2003-2005. Average revenue values for these same fisheries during 1994-2005 are also provided. For some fisheries (e.g, non-

¹ William Dasplit and Brad Stenberg (Pacific States Marine Fisheries Commission, PacFIN Program) provided and facilitated interpretation of the data used in this analysis.

² To avoid double counting of vessels that land fish in multiple ports, each vessel was assigned to the port that accounted for the plurality of its revenue from all fisheries.

whiting groundfish trawl, which will likely continue to be restricted as it has in recent years), the 2003-2005 values are probably more reflective of future revenues than the 1994-2005 values. For other fisheries (e.g., squid seine, which experiences high inter-annual variability in landings), the 1994-2005 values may be the more appropriate indicator of future revenues. For yet other fisheries (e.g., salmon troll, crab pot), it is not clear which of the average revenue estimates is more appropriate, as these fisheries have experienced unusually high revenues in recent years which may or may not be sustainable over the long term (see Figure 2).

Table 3 predicts what salmon troll landings would be in each port in a Conservation Alert year under each of the de minimis alternatives - based on the assumed season structure scenarios described in Table ES-1 of PFMC (Sep 2006). Specifically, the projections were made by converting the low, medium and high CPUE revenue estimates contained in Table H-1 of PFMC (Sep 2006) to pounds, then allocating the resulting poundage among the ports within each management area in proportion to the 2003-2005 salmon landings for that area. To facilitate comparison of the landings projections associated with the management alternatives (which are expressed in Table H-1 in dressed weight) to recent 2003-2005 salmon troll landings, the latter values were converted to dressed weight by multiplying the corresponding round weight estimates in Table 1 by 87% (the implicit round-to-dressed weight conversion used in PacFIN).

III. Commercial Salmon Troll Fleet³

Table 4 describes the salmon troll fleet in each management area in terms of number of boats, total salmon landings and revenues made by these boats, and average salmon landings and revenues per boat. The fleet is categorized into salmon-only and multiple-fishery vessels to convey the extent to which vessels are likely to forego all or part of their fishery revenue in a Conservation Alert year. For all management areas combined, salmon-only vessels comprise 40% of all trollers, account for about 27% of total salmon landings and revenues, and make (on average) lower salmon landings and revenues than multiple fishery vessels. It should be noted that the averages provided in Table 4 obscure the considerable variation in salmon revenue observed among vessels (see Figures 3a and 3b).

The most common non-salmon fisheries targeted by multiple-fishery trollers are crab pot, albacore troll and groundfish fixed gear. Table 5 describes the extent to which multiple-fishery trollers in each management area depend on salmon relative to these other fisheries. Dependence on crab is particularly notable in virtually all management areas except Monterey, where vessels are more likely to depend on albacore and

³ For purposes of Tables 4-6, vessels were assigned to the management area associated with their port assignment. The port assignment method is described in Footnote 2.

groundfish as alternative sources of income.

Table 6 describes the number of trollers projected to participate in the salmon fishery in four management areas (Monterey, San Francisco, Coos Bay, Northern Oregon) in a Conservation Alert year under each of the de minimis alternatives. These projections were derived as follows: Using 1994-2005 data, the number of trollers associated with each management area was regressed on the number of days that the season was open in that area (see appendix A). The number of salmon fishery participants under each of the de minimis alternatives was predicted, based on the regression coefficients provided in appendix A and the season structure for each management area assumed for each of the de minimis alternatives (from Table ES-1 of PFMC Sep 2006). The medium estimates provided in Table 6 correspond to the regression coefficients and the low/high estimates correspond to the lower/upper bound of those coefficients.

Table 1. Port dependence on the salmon troll fishery, as reflected in share of port landings (1000s of pounds round weight), ex-vessel value (\$1000s, base year=2005) and vessel activity attributable to salmon.

Mgmt Area Port	2003-2005 Average								
	Landings			Ex-Vessel Value			# Vessels		
	Salmon	Total	%Sal	Salmon	Total	%Sal	Sal	Total	%Sal
Monterey:									
Monterey	147.1	5,024.1	6%	\$ 351.6	\$ 2,096.1	24%	43	65	67%
Moss Landing	449.2	40,402.9	1%	\$ 1,087.5	\$ 7,154.0	20%	74	112	66%
Santa Cruz	221.9	515.0	43%	\$ 578.5	\$ 914.9	60%	38	58	66%
SanFrancisco:									
Princeton	803.4	4,198.0	27%	\$ 2,032.7	\$ 5,158.5	41%	76	107	70%
San Francisco	1,099.4	7,259.1	20%	\$ 2,566.4	\$ 8,813.1	32%	62	153	41%
Bodega Bay	1,112.2	2,572.4	47%	\$ 2,350.2	\$ 4,591.0	55%	109	144	76%
Fort Bragg:									
Point Arena	47.5	739.9	7%	\$ 118.6	\$ 570.0	22%	8	20	40%
Fort Bragg	2,051.6	6,663.4	28%	\$ 4,213.0	\$ 7,721.4	53%	93	144	64%
KMZ-CA:									
Eureka	71.9	15,937.5	0%	\$ 177.9	\$ 10,389.8	2%	28	77	38%
Crescent City	136.1	11,386.2	1%	\$ 364.5	\$ 14,894.8	2%	31	109	28%
KMZ-OR:									
Brookings	85.5	5,134.7	2%	\$ 215.7	\$ 6,312.9	4%	22	61	36%
Coos Bay:									
Port Orford	141.2	1,937.1	8%	\$ 394.7	\$ 3,173.7	13%	26	63	42%
Coos Bay	1,259.4	26,492.1	5%	\$ 3,169.6	\$ 20,074.2	16%	123	188	65%
Winchester Bay	87.3	845.8	11%	\$ 215.9	\$ 1,386.8	16%	28	37	74%
Northern OR:									
Newport	1,451.9	96,850.9	2%	\$ 3,544.0	\$ 27,001.1	13%	147	232	63%
Tillamook	229.6	3,897.5	6%	\$ 538.8	\$ 3,594.1	15%	58	82	71%

Table 2. Port dependence on the salmon troll fishery, as reflected in ex-vessel value of landings (\$1000s, base Year=2005) in salmon troll fishery and all other fisheries that account for at least 5% of 2003-2005 average annual ex-vessel revenue.

Port Fishery	94-05 Avg		2003	2004	2005	03-05 Avg	
	\$1000s	%ofport\$				\$1000s	%ofport\$
Monterey:							
Salmon troll	\$ 1,291.8	16%	\$ 156.5	\$ 436.4	\$ 462.0	\$ 351.6	17%
Squid seine	\$ 1,846.6	23%	\$ 2,151.6	\$ 670.1	\$ 256.4	\$ 1,026.0	49%
Shrimp/prawn pot	\$ 1,157.5	14%	\$ 374.0	\$ 289.2	\$ 150.6	\$ 271.2	13%
Non-wht grdfsh trwl	\$ 943.4	12%	\$ 274.8	\$ 324.8	\$ 96.2	\$ 231.9	11%
Rock/ling fixed	\$ 798.1	10%	\$ 82.7	\$ 145.1	\$ 77.8	\$ 101.9	5%
All else	\$ 1,982.4	25%	\$ 192.4	\$ 133.1	\$ 14.7	\$ 113.4	5%
Total	\$ 8,019.8	100%	\$ 3,232.0	\$ 1,998.7	\$ 1,057.7	\$ 2,096.1	100%
Moss Landing:							
Salmon troll	\$ 1,291.8	16%	\$ 498.5	\$ 1,166.2	\$ 1,597.5	\$ 1,087.4	15%
Squid seine	\$ 1,846.6	23%	\$ 6,269.7	\$ 2,279.9	\$ 747.7	\$ 3,099.1	43%
CPS seine	\$ 1,157.5	14%	\$ 715.6	\$ 1,559.8	\$ 425.4	\$ 900.3	13%
Non-wht grdfsh trwl	\$ 943.4	12%	\$ 993.1	\$ 836.9	\$ 566.2	\$ 798.7	11%
Sablefish fixed	\$ 798.1	10%	\$ 625.1	\$ 444.1	\$ 239.6	\$ 436.3	6%
All else	\$ 1,982.4	25%	\$ 1,194.8	\$ 843.0	\$ 458.9	\$ 832.2	12%
Total	\$ 8,019.8	100%	\$10,296.7	\$ 7,129.9	\$ 4,035.4	\$ 7,154.0	100%
Santa Cruz:							
Salmon troll	\$ 606.0	47%	\$ 247.7	\$ 679.8	\$ 807.9	\$ 578.5	63%
Crab pot	\$ 116.6	9%	\$ 139.4	\$ 179.6	\$ 88.2	\$ 135.7	15%
Albacore troll	\$ 48.6	4%	\$ 67.3	\$ 56.1	\$ 7.7	\$ 43.7	5%
All else	\$ 511.7	40%	\$ 173.2	\$ 181.2	\$ 116.8	\$ 157.1	17%
Total	\$ 1,282.8	100%	\$ 627.5	\$ 1,096.7	\$ 1,020.6	\$ 914.9	100%
Princeton:							
Salmon troll	\$ 1,968.8	34%	\$ 499.9	\$ 3,389.5	\$ 2,208.7	\$ 2,032.7	39%
Crab pot	\$ 1,702.0	29%	\$ 2,717.0	\$ 2,446.0	\$ 479.3	\$ 1,880.8	37%
Non-wht grdfsh trwl	\$ 1,131.7	20%	\$ 715.3	\$ 674.9	\$ 721.8	\$ 704.0	14%
Squid seine	\$ 227.4	4%	\$ 973.2	\$ 93.7	\$ 0.0	\$ 355.6	7%
AllElse	\$ 774.7	13%	\$ 222.1	\$ 192.0	\$ 142.1	\$ 185.4	4%
Total	\$ 5,804.7	100%	\$ 5,127.6	\$ 6,796.0	\$ 3,551.9	\$ 5,158.5	100%
San Francisco:							
Salmon troll	\$ 1,432.6	13%	\$ 1,021.9	\$ 4,542.4	\$ 2,134.8	\$ 2,566.4	29%
Crab pot	\$ 2,078.1	19%	\$ 3,516.2	\$ 5,119.4	\$ 557.9	\$ 3,064.5	35%
Non-wht grdfsh trwl	\$ 1,832.1	17%	\$ 1,153.0	\$ 1,600.2	\$ 1,297.7	\$ 1,350.3	15%
Swordfish longline	\$ 220.1	2%	\$ 1,316.8	\$ 241.1	\$ 0.0	\$ 519.3	6%
Herring gillnet/dive	\$ 3,713.1	35%	\$ 726.5	\$ 475.6	\$ 36.6	\$ 412.9	5%
All else	\$ 1,427.7	13%	\$ 1,402.5	\$ 896.3	\$ 400.4	\$ 899.7	10%
Total	\$10,703.8	100%	\$ 9,136.9	\$12,874.9	\$ 4,427.4	\$08,813.1	100%

Bodega Bay:						
Salmon troll	\$ 1,397.5	27%	\$ 2,843.5	\$ 2,661.9	\$ 1,545.1	\$ 2,350.2 51%
Crab pot	\$ 1,886.5	36%	\$ 2,262.0	\$ 3,067.3	\$ 610.2	\$ 1,979.8 43%
All else	\$ 1,901.3	37%	\$ 478.8	\$ 227.3	\$ 77.1	\$ 261.0 6%
Total	\$ 5,185.3	100%	\$ 5,584.3	\$ 5,956.5	\$ 2,232.3	\$ 4,591.0 100%
Point Arena:						
Salmon troll	\$ 49.3	4%	\$ 81.6	\$ 184.3	\$ 89.7	\$ 118.6 21%
Urchin dive/net	\$ 997.7	87%	\$ 509.4	\$ 349.3	\$ 149.0	\$ 335.9 59%
Rock/ling fixed	\$ 52.2	5%	\$ 33.9	\$ 91.8	\$ 57.0	\$ 60.9 11%
Crab pot	\$ 38.6	3%	\$ 81.2	\$ 64.1	\$ 15.4	\$ 53.6 9%
All else	\$ 4.8	0%	\$ 1.4	\$ 0.6	\$ 1.3	\$ 1.1 0%
Total	\$ 1,142.6	100%	\$ 707.5	\$ 690.0	\$ 312.5	\$ 570.0 100%
Fort Bragg:						
Salmon troll	\$ 1,454.9	18%	\$ 6,818.7	\$ 3,446.0	\$ 2,374.1	\$ 4,213.0 55%
Non-wht grdfsh trwl	\$ 3,077.1	37%	\$ 1,650.2	\$ 1,457.5	\$ 1,389.9	\$ 1,499.2 19%
Crab pot	\$ 1,042.9	13%	\$ 1,000.3	\$ 1,411.3	\$ 422.2	\$ 944.6 12%
Sablefish fixed	\$ 737.7	9%	\$ 742.1	\$ 772.8	\$ 526.3	\$ 680.4 9%
All else	\$ 1,923.2	23%	\$ 554.3	\$ 367.0	\$ 231.2	\$ 384.2 5%
Total	\$ 8,235.8	100%	\$10,765.7	\$ 7,454.7	\$ 4,943.8	\$ 7,721.4 100%
Eureka:						
Salmon troll	\$ 125.4	1%	\$ 96.7	\$ 282.8	\$ 154.3	\$ 177.9 2%
Crab pot	\$ 4,021.4	44%	\$ 8,788.5	\$ 8,448.4	\$ 1,333.9	\$ 6,190.3 60%
Non-wht grdfsh trwl	\$ 2,883.7	31%	\$ 2,596.6	\$ 1,987.1	\$ 1,928.7	\$ 2,170.8 21%
Albacore troll	\$ 731.9	8%	\$ 611.1	\$ 1,018.8	\$ 274.2	\$ 634.7 6%
Shrimp trawl	\$ 596.8	7%	\$ 327.9	\$ 618.9	\$ 535.8	\$ 494.2 5%
All else	\$ 828.2	9%	\$ 645.9	\$ 881.5	\$ 638.4	\$ 721.9 7%
Total	\$ 9,187.4	100%	\$13,066.7	\$13,237.4	\$ 4,865.2	\$10,389.8 100%
Crescent City:						
Salmon troll	\$ 106.3	1%	\$ 97.1	\$ 925.3	\$ 71.0	\$ 364.5 2%
Crab pot	\$ 8,530.3	59%	\$15,398.7	\$18,170.0	\$ 4,273.9	\$12,614.2 85%
Non-wht grdfsh trwl	\$ 2,140.0	15%	\$ 1,160.5	\$ 472.9	\$ 699.3	\$ 777.6 5%
All else	\$ 3,604.5	25%	\$ 1,143.3	\$ 1,195.0	\$ 1,077.5	\$ 1,138.6 8%
Total	\$14,381.1	100%	\$17,799.5	\$20,763.1	\$ 6,121.8	\$14,894.8 100%
Brookings:						
Salmon troll	\$ 135.1	2%	\$ 99.4	\$ 357.9	\$ 189.9	\$ 215.7 3%
Crab pot	\$ 2,876.7	47%	\$ 4,954.1	\$ 7,704.1	\$ 1,769.2	\$ 4,809.1 76%
Non-wh grdfsh trwl	\$ 1,549.7	25%	\$ 1,241.2	\$ 580.5	\$ 739.0	\$ 853.6 14%
All else	\$ 1,532.6	25%	\$ 491.2	\$ 244.9	\$ 567.3	\$ 434.5 7%
Total	\$ 6,094.0	100%	\$ 6,785.9	\$ 8,887.5	\$ 3,265.4	\$ 6,312.9 100%
Port Orford:						
Salmon troll	\$ 192.4	7%	\$ 252.7	\$ 497.7	\$ 433.8	\$ 394.7 12%
Crab pot	\$ 1,213.7	41%	\$ 818.7	\$ 3,399.2	\$ 967.4	\$ 1,728.4 55%
Sablefish fixed	\$ 658.6	22%	\$ 557.9	\$ 489.1	\$ 635.4	\$ 560.8 18%
Rock/ling fixed	\$ 587.0	20%	\$ 407.1	\$ 436.2	\$ 387.8	\$ 410.4 13%
All else	\$ 312.6	11%	\$ 54.7	\$ 104.2	\$ 79.2	\$ 79.4 3%
Total	\$ 2,964.3	100%	\$02,091.1	\$ 4,926.2	\$ 2,503.6	\$ 3,173.7 100%

Coos Bay:						
Salmon troll	\$ 1,311.6	8%	\$ 2,573.3	\$ 3,941.2	\$ 2,994.4	\$ 3,169.6 16%
Crab pot	\$ 4,272.7	26%	\$ 6,468.8	\$14,594.2	\$ 5,652.5	\$ 8,905.2 44%
Non-wht grdfsh trwl	\$ 5,516.7	34%	\$ 3,759.6	\$ 2,815.8	\$ 2,395.3	\$ 2,990.2 15%
Albacore troll	\$ 1,067.4	7%	\$ 1,138.5	\$ 2,709.9	\$ 2,016.3	\$ 1,954.9 10%
Shrimp trawl	\$ 2,659.7	16%	\$ 1,595.5	\$ 417.8	\$ 1,764.8	\$ 1,259.4 6%
Sablefish fixed	\$ 985.8	6%	\$ 1,007.8	\$ 978.4	\$ 1,370.5	\$ 1,118.9 6%
All else	\$ 489.9	3%	\$ 507.0	\$ 572.9	\$ 948.0	\$ 676.0 3%
Total	\$16,303.8	100%	\$17,050.5	\$26,030.3	\$17,141.9	\$20,074.2 100%
Winchester Bay:						
Salmon troll	\$ 142.1	11%	\$ 172.7	\$ 278.2	\$ 196.8	\$ 215.9 16%
Crab pot	\$ 917.5	72%	\$ 1,030.6	\$ 784.4	\$ 1,042.8	\$ 952.6 69%
Albacore troll	\$ 111.1	9%	\$ 188.6	\$ 101.3	\$ 191.4	\$ 160.4 12%
All else	\$ 106.9	8%	\$ 110.8	\$ 31.9	\$ 30.9	\$ 57.8 4%
Total	\$ 1,277.6	100%	\$ 1,502.6	\$ 1,195.8	\$ 1,461.9	\$ 1,386.8 100%
Newport::						
Salmon troll	\$ 2,272.8	9%	\$ 3,289.3	\$ 4,061.7	\$ 3,280.9	\$ 3,544.0 13%
Crab pot	\$ 7,173.9	29%	\$10,471.9	\$12,249.3	\$ 6,766.1	\$ 9,829.1 36%
Albacore troll	\$ 3,088.7	12%	\$ 3,447.0	\$ 3,992.8	\$ 3,098.7	\$ 3,512.9 13%
Whiting trawl	\$ 3,423.0	14%	\$ 2,183.6	\$ 3,284.5	\$ 4,827.4	\$ 3,431.8 13%
Non-wht grdfsh trwl	\$ 4,418.3	18%	\$ 2,916.2	\$ 2,550.2	\$ 2,033.7	\$ 2,500.1 9%
Shrimp trawl	\$ 2,619.7	11%	\$ 1,602.5	\$ 2,294.0	\$ 2,321.7	\$ 2,072.7 8%
Sablefish fixed	\$ 1,735.0	7%	\$ 1,954.5	\$ 2,132.5	\$ 1,850.2	\$ 1,979.1 7%
All else	\$ 325.9	1%	\$ 179.5	\$ 79.2	\$ 135.9	\$ 131.5 1%
Total	\$25,057.5	100%	\$26,044.4	\$30,644.3	\$24,314.5	\$27,001.1 100%
Tillamook:						
Salmon troll	\$ 290.4	11%	\$ 468.8	\$ 422.5	\$ 725.1	\$ 538.8 15%
Crab pot	\$ 1,230.7	47%	\$ 1,963.0	\$ 2,592.2	\$ 1,531.4	\$ 2,028.8 56%
Shrimp trawl	\$ 542.5	21%	\$ 666.7	\$ 382.1	\$ 756.5	\$ 601.8 17%
Albacore troll	\$ 199.5	8%	\$ 215.5	\$ 154.8	\$ 212.0	\$ 194.1 5%
All else	\$ 651.0	25%	\$ 785.1	\$ 691.8	\$ 831.4	\$ 769.4 21%
Total	\$ 2,623.8	100%	\$ 3,630.3	\$ 3,820.9	\$ 3,331.2	\$ 3,594.1 100%

Table 3. Average 2003-2005 salmon troll landings and projected landings in Conservation Alert years (1000s of pounds dressed weight) under five alternatives (status quo, 2.5%, 5%, 10% and 16%) and three scenarios (low, medium, high CPUE) - by management area and port

Mgmt Area Port	03-05 Avg Salmon Landings (1000 lbs)		Status Quo	2.5% Alternative			5% Alternative			10% Alternative			16% Alternative		
				Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
Monterey:															
Monterey	128.0	18%	0.0	5.8	10.5	18.1	33.7	61.5	105.6	135.1	246.6	423.5	182.1	332.2	570.8
Moss Landing	390.8	55%	0.0	17.6	32.2	55.2	103.0	187.7	322.6	412.7	752.9	1,293.3	556.0	1,014.5	1,743.0
Santa Cruz	193.1	27%	0.0	8.7	15.9	27.3	50.9	92.7	159.3	203.9	371.9	638.8	274.7	501.1	860.9
Other	0.2	0%	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.2	0.3	0.6
Total	712.0	100%	0.0	32.1	58.6	100.6	187.7	342.0	587.7	751.9	1,371.6	2,356.2	1,013.0	1,848.1	3,175.3
San Francisco:															
Princeton	699.0	26%	0.0	46.2	72.2	115.5	84.2	131.9	210.5	84.2	131.9	210.5	84.2	131.9	210.5
San Francisco	956.5	36%	0.0	63.2	98.8	158.1	115.2	180.4	288.1	115.2	180.4	288.1	115.2	180.4	288.1
Bodega Bay	967.6	36%	0.0	64.0	100.0	159.0	116.5	182.8	291.5	116.5	182.8	291.5	116.5	182.8	291.5
Other	35.9	2%	0.0	0.6	1.0	1.8	3.3	6.0	10.4	3.3	6.0	10.4	3.3	6.0	10.4
Total	2,670.1	100%	0.0	176.5	275.9	441.4	321.6	503.7	804.3	321.6	503.7	804.3	321.6	503.7	804.3
Coos Bay:															
Port Orford	122.8	9%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	7.6	10.9	7.1	19.3	28.0
Coos Bay	1,095.7	82%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.6	67.4	97.4	63.0	172.2	249.9
Winchester Bay	76.0	6%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	4.7	6.8	4.4	11.9	17.3
Other	47.2	4%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.9	4.2	2.7	7.4	10.8
Total	1,341.7	100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.1	82.5	119.3	77.1	210.8	306.0
Northern OR:															
Newport	1,263.1	85%	0.0	31.8	66.2	107.3	116.0	241.3	391.7	288.5	600.2	975.5	516.0	1,074.1	1,745.6
Tillamook	199.7	14%	0.0	5.0	10.5	17.0	18.3	38.2	61.9	45.6	94.9	154.2	81.6	169.8	276.0
Other	19.2	1%	0.0	0.5	1.0	1.6	1.8	3.7	6.0	4.4	9.1	14.8	7.8	16.3	26.5
Total	1,482.0	100%	0.0	37.3	77.7	125.9	136.1	283.1	459.6	338.6	704.2	1,144.6	605.4	1,260.2	2,048.2

Table 4. Average number of salmon-only and multiple-fishery trollers who fished for salmon during 2003-2005 and 1994-2005 and associated total and average salmon landings and revenues, by management area. (Landings expressed in 1000s of pounds round weight; revenue in \$1000s, base year=2005.)

Managemt Area	# Salmon Trollers SalOnly Mult All			Total Salmon Troll Landings and Revenue						Average Salmon Landings and Revenue Per Troller					
				Landings			Revenue			Landings			Revenue		
	SalOnly	Mult	All	SalOnly	Mult	All	SalOnly	Mult	All	SalOnly	Mult	All	SalOnly	Mult	All
Monterey															
03-05 Avg	85	78	164	290.4	537.1	827.5	\$ 732.3	\$ 1,257.2	\$ 1,989.5	3.1	7.0	5.0	\$ 7.5	\$16.6	\$11.7
94-05 Avg	109	112	221	415.7	840.4	1,256.1	\$ 767.0	\$ 1,489.8	\$ 2,256.7	3.3	7.3	5.3	\$ 6.2	\$13.5	\$ 9.8
SanFran															
03-05 Avg	138	172	310	904.9	2,386.3	2,146.3	\$2,199.1	\$ 5,774.7	\$ 7,973.8	6.5	13.4	10.4	\$15.5	\$31.4	\$24.5
94-05 Avg	165	227	391	787.6	2,146.3	2,933.8	\$1,627.1	\$ 4,307.9	\$ 5,935.0	4.9	9.8	7.8	\$10.1	\$19.6	\$15.6
FortBragg															
03-05 Avg	47	68	115	699.4	1,353.7	2,053.0	\$1,447.0	\$ 2,648.8	\$ 4,095.8	13.9	16.6	15.6	\$29.8	\$34.9	\$32.9
94-05 Avg	29	39	68	218.1	483.8	701.8	\$ 435.9	\$ 906.0	\$ 1,342.0	5.3	7.8	6.8	\$10.7	\$15.2	\$13.4
KMZ-CA															
03-05 Avg	10	21	31	33.3	169.7	203.0	\$ 76.9	\$ 426.8	\$ 503.7	4.3	7.1	6.4	\$ 9.5	\$17.4	\$15.5
94-05 Avg	8	19	26	16.2	65.8	82.0	\$ 33.3	\$ 150.4	\$ 183.7	2.0	2.9	2.7	\$ 4.0	\$ 6.5	\$ 5.9
KMZ-OR															
03-05 Avg	4	12	16	5.3	54.3	59.6	\$ 14.5	\$ 130.3	\$ 144.8	1.3	4.3	3.6	\$ 3.4	\$10.1	\$ 8.6
94-05 Avg	5	14	18	4.4	47.1	51.6	\$ 10.9	\$ 94.5	\$ 105.4	1.0	3.2	2.7	\$ 2.4	\$ 6.6	\$ 5.6
CoosBay															
03-05 Avg	71	140	211	313.2	1,212.4	1,525.6	\$ 778.1	\$ 2,999.9	\$ 3,777.9	4.4	8.7	7.2	\$11.0	\$21.4	\$17.8
94-05 Avg	54	105	159	178.8	665.7	844.6	\$ 364.2	\$ 1,374.1	\$ 1,738.3	3.0	5.9	4.9	\$ 6.0	\$11.7	\$ 9.8

NorthOR															
03-05 Avg	69	152	221	778.1	2,999.9	3,777.9	\$ 811.4	\$ 3,161.0	\$ 3,972.4	5.3	8.9	7.7	\$11.7	\$20.9	\$18.0
94-05 Avg	84	125	209	364.2	1,374.1	1,738.3	\$ 661.1	\$ 1,918.5	\$ 2,579.6	4.5	8.0	6.6	\$ 8.1	\$14.7	\$12.1
Total															
03-05 Avg	423	644	1,068	2,621.1	7,013.4	9,634.4	\$6,059.3	\$16,398.7	\$22,458.1	6.3	10.9	9.1	\$14.3	\$25.2	\$20.9
94-05 Avg	453	641	1,093	1,998.2	5,257.6	7,255.9	\$3,899.6	\$10,241.3	\$14,140.8	4.5	8.2	6.7	\$ 8.7	\$15.9	\$13.0

Table 5. Average annual 2003-2005 and 1994-2005 landings and revenues by multiple-fishery salmon trollers, by management area and fishery.

Mgmt Area Fishery	Average Landings Per Troller (1000 lbs round weight)				Average Revenue Per Troller (\$1000s, Base Year=2005)			
	03-05 Average		94-05 Average		03-05 Average		94-05 Average	
Monterey:								
Salmon troll	7.0	25%	7.3	24%	\$16.6	40%	\$13.5	33%
Crab pot	2.6	7%	2.1	6%	4.8	11%	4.5	11%
Albacore line	8.9	30%	8.7	29%	7.4	19%	8.0	21%
Groundfish fixed	3.7	13%	4.0	14%	5.5	15%	5.7	16%
Other	12.9	25%	11.5	27%	7.4	17%	8.5	20%
Total	35.1	100%	33.6	100%	\$41.8	100%	\$40.2	100%
San Francisco:								
Salmon troll	13.4	34%	9.8	34%	\$31.4	46%	\$19.6	39%
Crab pot	16.7	37%	9.8	32%	28.8	38%	19.9	40%
Albacore line	6.9	15%	4.5	15%	5.9	8%	4.2	9%
Groundfish fixed	1.0	3%	1.7	7%	1.9	3%	2.6	6%
Other	5.0	12%	4.0	14%	3.5	5%	3.3	7%
Total	43.1	100%	29.8	100%	\$71.5	100%	\$49.6	100%
Fort Bragg:								
Salmon troll	16.6	36%	7.8	26%	\$34.9	47%	\$15.2	31%
Crab pot	21.6	46%	9.5	37%	35.1	44%	17.9	43%
Albacore line	0.9	2%	0.6	2%	0.8	10%	0.6	1%
Groundfish fixed	2.3	6%	3.3	17%	3.8	5%	5.3	16%
Other	4.9	11%	5.0	18%	2.3	3%	2.6	9%
Total	46.4	100%	26.2	100%	\$76.9	100%	\$41.6	100%
KMZ-CA:								
Salmon troll	7.1	12%	2.9	12%	\$17.4	15%	\$ 6.5	13%
Crab pot	41.4	76%	17.5	69%	67.6	70%	31.6	72%
Albacore line	0.8	2%	0.4	2%	0.6	1%	0.4	1%
Groundfish fixed	3.0	7%	2.4	12%	5.2	6%	3.8	10%
Other	1.4	4%	0.9	4%	5.3	8%	1.6	3%
Total	53.6	100%	24.1	100%	\$96.1	100%	\$43.8	100%
KMZ-OR:								
Salmon troll	4.3	10%	3.2	14%	\$10.1	14%	\$ 6.6	16%
Crab pot	37.0	85%	20.1	57%	60.2	82%	35.9	66%
Albacore line	0.8	1%	1.5	5%	0.7	1%	1.4	3%
Groundfish fixed	1.6	4%	4.2	14%	2.2	3%	4.6	11%
Other	0.0	0%	9.6	12%	0.0	0%	2.9	5%
Total	43.6	100%	38.6	100%	\$73.2	100%	\$51.4	100%

Coos Bay:								
Salmon troll	8.7	17%	5.9	17%	\$21.4	28%	\$11.7	23%
Crab pot	21.6	40%	11.7	32%	35.2	45%	21.8	43%
Albacore line	11.6	21%	5.3	14%	9.9	13%	4.8	9%
Groundfish fixed	4.3	9%	5.3	18%	7.5	10%	8.0	18%
Other	7.0	13%	6.2	18%	3.2	4%	3.4	8%
Total	53.2	100%	34.4	100%	\$77.1	100%	\$49.8	100%
North OR:								
Salmon troll	8.9	21%	8.0	25%	\$20.9	33%	\$14.7	30%
Crab pot	18.1	43%	11.1	34%	28.9	44%	20.6	43%
Albacore line	10.5	25%	8.0	26%	9.1	14%	7.3	16%
Groundfish fixed	2.7	6%	2.6	9%	4.8	7%	4.1	9%
Other	2.3	6%	1.9	6%	1.3	2%	1.2	3%
Total	42.4	100%	31.5	100%	\$65.0	100%	\$48.0	100%
All Areas:								
Salmon troll	10.9	24%	8.2	25%	\$25.2	36%	\$15.9	33%
Crab pot	18.5	40%	9.9	31%	30.5	43%	18.8	39%
Albacore line	8.1	18%	5.8	18%	7.0	10%	5.3	11%
Groundfish fixed	2.7	6%	3.1	10%	4.6	7%	4.6	10%
Other	5.6	12%	5.3	16%	3.3	5%	3.8	8%
Total	45.8	100%	32.3	100%	\$70.6	100%	\$48.4	100%

Table 6. Average number of trollers who landed salmon during 2003-2005 and 1994-2005, and low/medium/high number of trollers projected to participate in salmon fishery in a Conservation Alert year under each alternative (status quo, 2.5%, 5%, 10%, 16%), by management area.

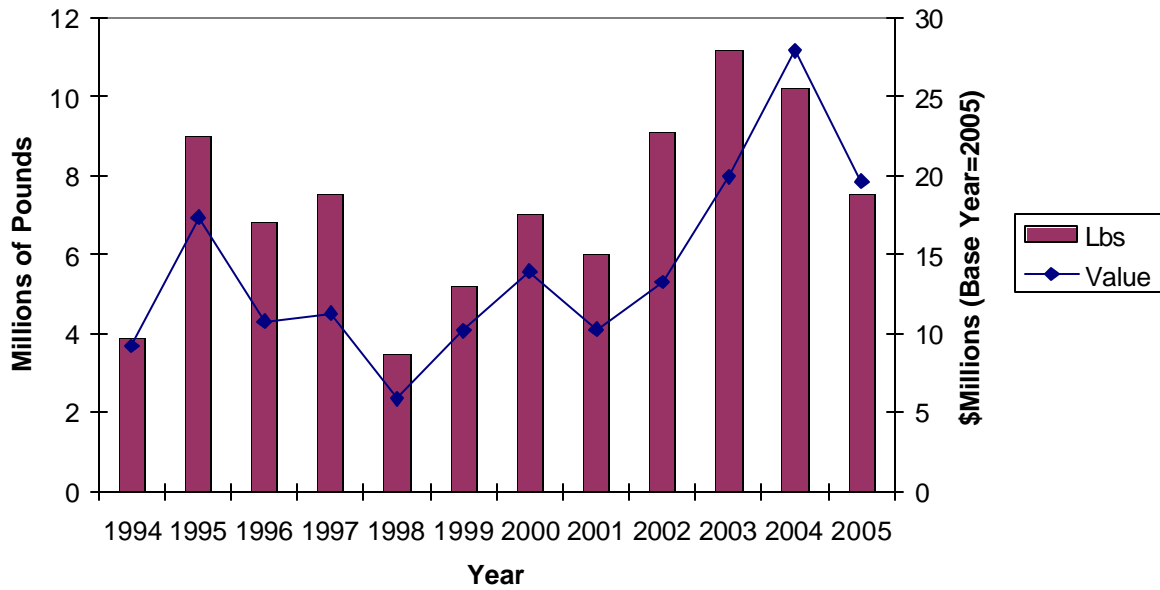
	Monterey	San Francisco	Coos Bay	North OR
Historical Average				
03-05 avg	164	310	211	221
94-05 avg	221	391	159	209
Status Quo	0	0	0	0
2.5% Alternative				
Low	21	40	0	8
Medium	28	47	0	11
High	34	53	0	14
5% Alternative				
Low	46	73	0	36
Medium	61	85	0	51
High	77	97	0	65
10% Alternative				
Low	84	73	15	82
Medium	112	85	22	111
High	140	97	30	141
16% Alternative				
Low	102	125	30	127
Medium	136	145	46	174
High	170	166	61	220

Figure 1. Major salmon ports by Klamath management area



Figure 2. Total landings and ex-vessel value of salmon troll and crab pot landings in Klamath management areas, 1994-2005.

Salmon Troll



Crab Pot

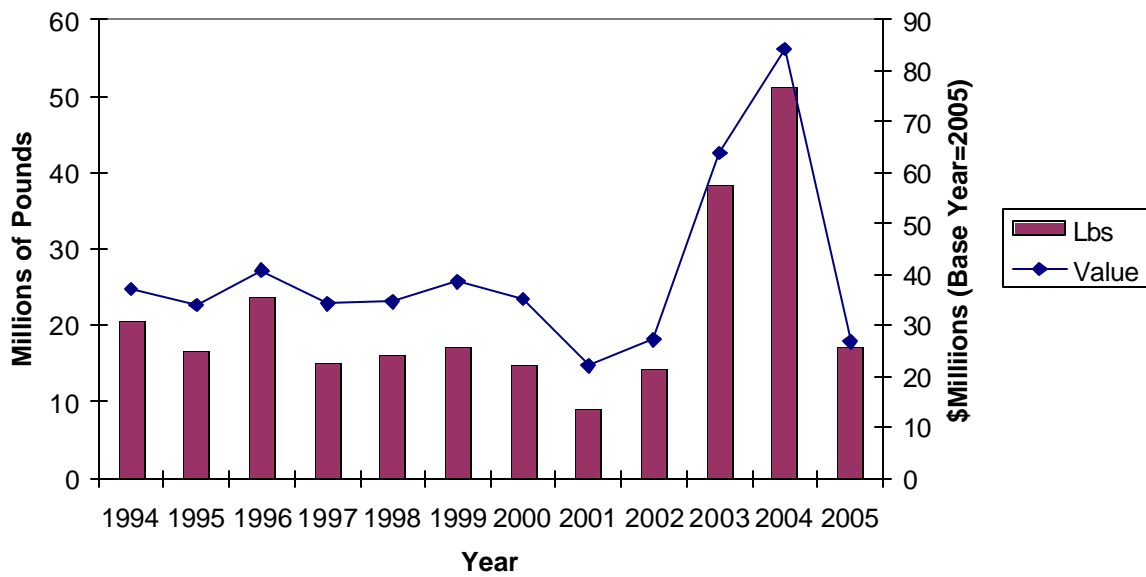


Figure 3a. Absolute distribution of salmon-only and multiple-fishery trollers in Klamath management areas by annual salmon revenue category, 2003-2005 average.

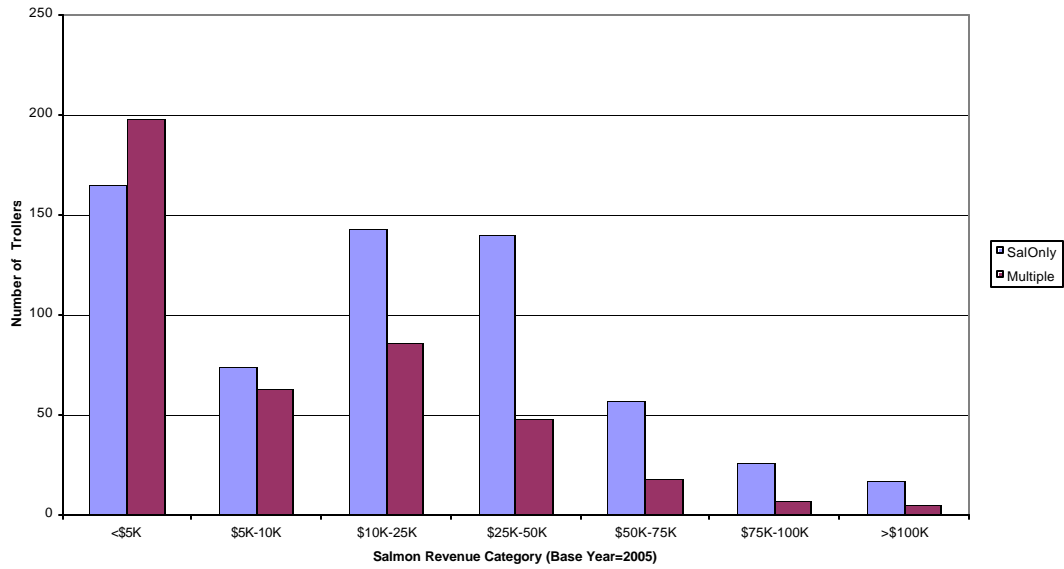
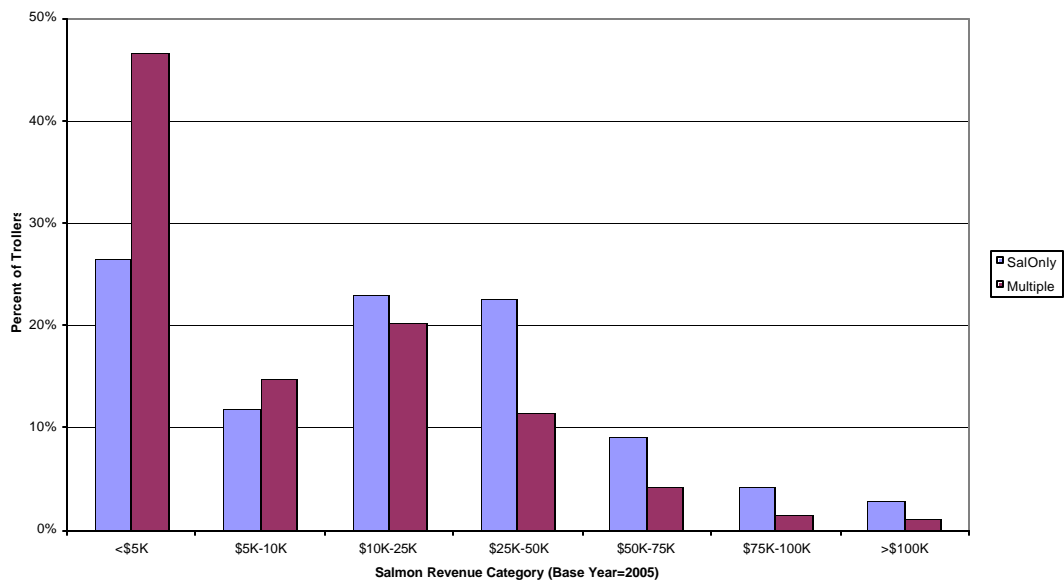


Figure 3b. Relative distribution of salmon-only and multiple-fishery trollers in Klamath management areas by annual salmon revenue category, 2003-2005 average.



Appendix A. Troller Participation Regression

Regression equation:

$$ntroller_{ij} = \beta_1 season_mnt + \beta_2 season_sf + \beta_3 season_coos + \beta_4 season_north + e_{ij}$$

where

$ntroller_{ij}$ = number of trollers who landed salmon in year i (i=1994,...,2005) and made the plurality of their revenue (all fisheries) from a port in management area j (j=mnt, sf, coos, north)

$season_mnt_{ij} = mntdum * season_{ij}$

$season_sf_{ij} = sf dum * season_{ij}$

$season_coos_{ij} = coosdum * season_{ij}$

$season_north_{ij} = northdum * season_{ij}$

$mntdum = 1$ for Monterey management area, 0 otherwise.

$sf dum = 1$ for San Francisco management area, 0 otherwise

$coosdum = 1$ for Coos Bay management area, 0 otherwise

$northdum = 1$ for Northern Oregon management area, 0 otherwise

$season_{ij}$ = salmon troll season (# days) in year i and management area j

(Note: In cases where the season varied among subareas within a management area, the subarea with the longest season was used to represent the area as a whole.)

Regression results:

$r^2_{adj}=0.881, n=48$					
Dependent Variable	Independent Variable	coefficient	t-value	95% confidence interval	
				lower bound	upper bound
Ntroller	season_mnt	1.618	8.011	1.211	2.024
	season_sf	2.741	14.217	2.352	3.129
	season_coos	0.747	5.934	0.493	1.001
	season_north	1.136	7.542	0.832	1.439

Histogram

