STATUS OF THE PACIFIC COAST GROUNDFISH FISHERY THROUGH 1990 AND RECOMMENDED ACCEPTABLE BIOLOGICAL CATCHES FOR 1991

Stock Assessment and Fishery Evaluation

Pacific Fishery Management Council
Metro Center, Suite 420
2000 S.W. First Avenue
Portland, Oregon

October 1990

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Stock Assessment and Fishery Evaluation

This is the seventh of a series of documents which review past years' fishery performance and Council management actions, in addition to assessing the status of a number of groundfish stocks off Washington, Oregon, and California.

Several of the Appendices to this document were prepared by scientists other than Groundfish Management Team members. The Groundfish Management Team and the Council are deeply indebted to these individuals and gratefully acknowledge the excellent cooperation and diligent efforts that resulted in these documents.

Groundfish Management Team (1990)

Robert Demory, Oregon Department of Fish and Wildlife, Newport, OR
Francis Henry, California Department of Fish and Game, Menlo Park, CA
Joseph Hightower, National Marine Fisheries Service, Tiburon, CA
Katherine A. King, National Marine Fisheries Service, Seattle, WA
Richard Methot, National Marine Fisheries Service, Seattle, WA
Alan Millikan, Washington Department of Fisheries, Seattle, WA
Wesley Silverthorne, National Marine Fisheries Service, Terminal Island, CA
Dale Squires, National Marine Fisheries Service, La Jolla, CA

Assisting the Team

James Glock, Pacific Fishery Management Council, Portland, OR

This document may be cited in the following manner:

> Pacific Fishery Management Council, 1990. "Status of the Pacific Coast Groundfish Fishery Through 1990 and Recommended Acceptable Biological Catches for 1991: Stock Assessment and Fishery Evaluation." (Document prepared for the Council and its advisory entities.) Pacific Fishery Management Council, Metro Center, Suite 420, 2000 S.W. First Avenue, Portland, Oregon 97201

Funded by NOAA/NMFS Cooperative Agreement Number NA-90-ABH-00033

PACIFIC FISHERY MANAGEMENT COUNCIL

CHAIRMAN
Richard A. Schwarz

Metro Center, Suite 420
2000 SW First Avenue
Portland, Oregon 97201

Phone: Commercial (503) 326-6352
FTS 423-6352

EXECUTIVE DIRECTOR
Lawrence D. Six

October 30, 1990

Dear Reviewer:

At its November 13-16, 1990 meeting, the Pacific Fishery Management Council (Council) will establish 1991 catch limits for several groundfish species managed under the Pacific coast groundfish fishery management plan (FMP). The Council's Groundfish Management Team has prepared a document entitled "Status of the Pacific Coast Groundfish Fishery Through 1990 and Recommended Acceptable Biological Catches for 1991: Stock Assessment and Fishery Evaluation," or SAFE document, for the Council to use in establishing these catch quotas and harvest guidelines. The Council is distributing a summary of this document to the groundfish industry and other interested persons so that you may review the available information on the fishery and various species. The Council may establish an acceptable biological catch (ABC) for any groundfish species or species group for which there is stock condition information. New stock status reports, which provide the technical documentation for most changes from the 1990 ABC estimates, were prepared for Pacific whiting, sablefish, Dover sole, thornyheads, widow rockfish, yellowtail rockfish, canary rockfish, Pacific ocean perch, and bocaccio. Additional reports provide information on mean length and exploitation of California rockfish, the joint venture fishery, and the economic status of the west coast groundfish industry. These reports are available individually upon request from the Council office.

Amendment 4 to the FMP authorizes the Council to set target harvest levels (either harvest guidelines or quotas) for any groundfish species or species complex in need of individual management attention. Prior to Amendment 4, the FMP designated only six species for individual management, which was in the form of numerical optimum yields. Amendment 4 also authorizes establishment of management measures to assure that harvest targets are achieved.

Comments on this document and recommendations to the Council will be accepted until November 15. Written comments may be sent to the Council headquarters and should arrive no later than November 8. The public will also have an opportunity to comment to the Council in person on November 15. If you have any comments, recommendations, questions concerning this document, or if your would like a copy of any of the individual assessment reports, please contact the Council office at Metro Center, Suite 420, 2000 S.W. First Avenue, Portland, Oregon 97201; telephone (503) 326-6352.

Sincerely,

Lawrence D. Six
Executive Director

JWG

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ABC	acceptable biological catch
Council	Pacific Fishery Management Council
EEZ	exclusive economic zone
FMP	fishery management plan
GMT	Groundfish Management Team
GSG	Groundfish Select Group
INPFC	International North Pacific Fishery Commission
MFCMA	Magnuson Fishery Conservation and Management Act
MSY	maximum sustainable yield
mt	metric ton
NMFS	National Marine Fisheries Service
OY	optimum yield
PacFIN	Pacific Coast Fisheries Information Network
PSMFC	Pacific States Marine Fisheries Commission
TALFF	total allowable level of foreign fishing

STATUS OF THE PACIFIC COAST GROUNDFISH FISHERY ADJACENT TO WASHINGTON, OREGON, AND CALIFORNIA

Introduction

This is the seventh annual status of the Pacific coast groundfish fishery document prepared for the Council. The purpose of this report is to briefly summarize the development of the FMP and to describe the history of the fishery and its management since enactment of the MFCMA in 1976.

Included in this report are a description of landings, fishing patterns, estimates of the status of stocks (including appended status of stocks analyses for major species), and ABCs for 1984, 1985, 1986, 1987, 1988, 1989, and 1990 as well as those proposed for 1991.

History of the Fishery

Domestic groundfish landings in the Pacific region (Washington, Oregon, and California) are reported by INPFC statistical areas (Figure 1). Landings were relatively stable until the early 1970s, averaging about 30,000 mt. Pacific ocean perch stocks were depleted in the late 1960s by foreign fishing, but other groundfish stocks were apparently healthy. By 1977, when work on the FMP was initiated, landings had increased to 60,000 mt and by 1982 they peaked at 116,000 mt (Figure 2).

Since the early 1980s, there have been major changes in the fishery. The fishery has matured and landings of several species have reached or exceed maximum sustainable production levels. Although landings increased in several management areas, the greatest and most rapid growth occurred in the large Columbia area (Figure 1 and Tables 1 through 6). Annual domestic landings of groundfish in the Columbia area were approximately 14,000 mt in 1977 and by 1982 had increased to about 47,000 mt--an increase of 33,000 mt (Figure 3). Landings have been maintained in the 27,000 - 42,000 mt range since that time.

During this growth period, the species composition of landings changed notably. Rockfish landings increased from 42 percent of total landings to 70 percent; flatfish landings increased but decreased in percent composition of total landings; and roundfish (e.g., lingcod, Pacific cod, sablefish) landings actually doubled but decreased as a percentage of the total.

Although the rockfish group provided most of the increased landings, widow, canary, and yellowtail rockfish were the major contributors. By 1982, widow and yellowtail rockfish appeared to be overharvested in some areas and the GMT declared these species biologically stressed.[1/] The GMT predicted continued biological stress in 1983 and recommended that landings of these species be reduced. An analysis by the GMT indicated canary rockfish landings also should be reduced in 1983, since the annual catch exceeded the ABC in the Columbia area.

Reasons for increased total groundfish landings included fishing fleet harvesting capacity that far exceeded the sustainable production capacity of the groundfish

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1/ GMT report to the Groundfish Task Group. January 1983.

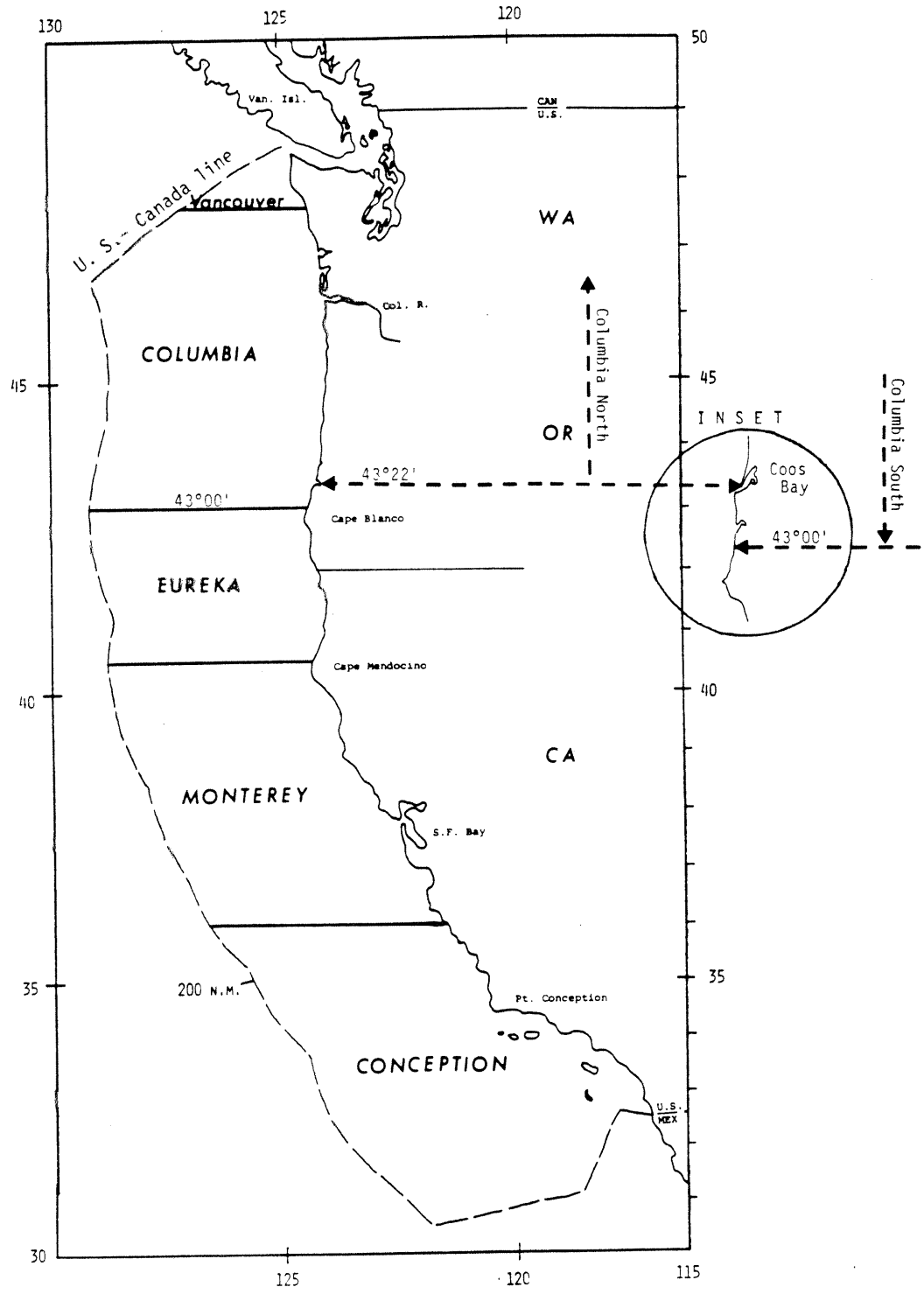

Figure 1. INPFC statistical areas in the U.S. EEZ seaward of Washington, Oregon, and California. Inset: Description of Columbia North and Columbia South.

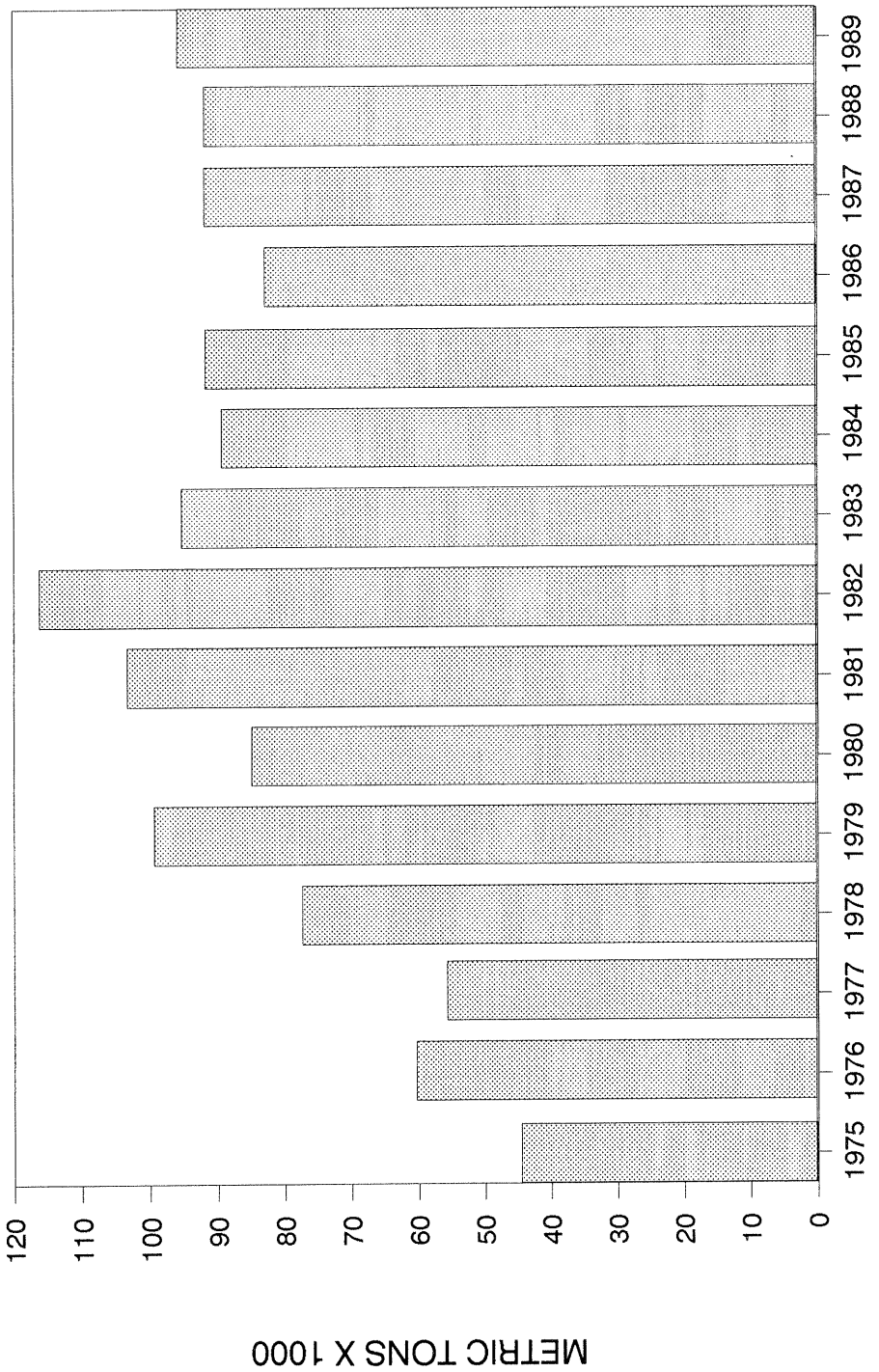

Figure 2. Pacific coast domestic commercial groundfish landings, 1975-1988.

Table 1. Estimated commercial groundfish landings (mt) for all INPFC areas, 1982–1989.[a/] (Excludes joint venture and foreign catches.)

Species	All Areas							
	1982	1983	1984	1985	1986	1987	1988	1989
Roundfish								
Lingcod	3,733	4,088	4,043	3,906	1,882	2,585	2,628	3,447
Pacific Cod	909	597	576	460	333	2,270	3,332	2,184
Pacific Whiting	1,021	1,026	2,718	3,893	3,462	4,768	6,876	7,418
Sablefish	18,379	14,059	13,929	14,283	13,144	12,794	10,789	10,255
Total Roundfish	24,042	19,770	21,266	22,542	18,821	22,417	23,625	23,304
Rockfish								
Pacific Ocean Perch	1,035	1,621	1,553	1,273	1,431	1,010	803	1,456
Shortbelly	4	0	1	11	2	0	0	2
Widow	25,954	10,482	9,759	8,915	9,358	12,231	10,887	12,722
Other Rockfish								
Bocaccio	3,669	4,237	2,992	1,421	1,033	1,264	1,307	868
Canary	5,200	3,983	2,081	2,245	1,910	2,751	1,699	2,230
Chilipepper	1,496	1,423	1,665	1,315	669	971	1,194	724
Thornyheads	2,143	2,654	3,144	4,113	3,638	3,739	5,592	7,925
Yellowtail	8,101	8,722	4,963	3,062	3,970	3,950	4,652	4,217
Remaining Rockfish[b/]	6,121	7,400	4,735	5,872	4,232	5,446	9,889	4,593
Unspecified Rockfish	6,961	5,246	9,090	9,579	10,686	9,008	4,571	9,140
Total Rockfish	60,684	45,768	39,983	37,806	36,929	40,370	40,594	43,877
Flatfish								
Dover Sole	19,928	19,604	18,940	20,719	17,286	18,442	18,002	18,797
English Sole	2,712	2,272	1,716	1,947	2,029	2,472	2,094	2,396
Petrale Sole	2,086	2,194	1,724	1,869	1,732	2,204	2,131	2,135
Other Flatfish[c/]	3,950	3,205	2,654	3,486	3,279	2,916	2,711	6,513
Total Flatfish	28,676	27,275	25,034	28,021	24,326	26,034	24,938	29,841
Other Fish								
Jack Mackerel	4	0	0	0	0	0	65	0
Others	2,924	2,577	3,086	3,448	2,646	3,502	2,499	694
Total Other Fish	2,928	2,577	3,086	3,448	2,646	3,502	2,564	694
GRAND TOTAL	116,330	95,390	89,369	91,817	82,722	92,323	91,721	97,716

Data Source: These data represent the sum of the estimated landings reported on Tables 2 through 6, extracted from PacFIN October 4, 1990.

[a/] The data in Tables 1 through 6 are preliminary. There are minor discrepancies in landings due to deficiencies in data supplied by the three states, difficulties in determining where actual catches were made when the port of landing was in another catch reporting area, adjustments made on the basis of logbook information, inaccuracies in estimates of rockfish species composition, and other factors. Minor corrections may be necessary each year.

[b/] Remaining rockfish are all species of rockfish not specifically listed on this page.

[c/] Arrowtooth flounder landings are included with "Other Flatfish". Prior to 1989, arrowtooth flounder landings were recorded under "Other Fish".

Table 2. Estimated commercial groundfish landings (mt) for the U.S. portion of the INPFC Vancouver area, 1982–1989. (Excludes joint venture and foreign catches.)

Species	U.S.–Vancouver Area							
	1982	1983	1984	1985	1986	1987	1988	1989
Roundfish								
Lingcod	746	1,237	1,757	1,854	569	713	459	808
Pacific Cod	828	538	485	359	297	1,384	1,474	917
Pacific Whiting	0	7	2	0	0	0	0	0
Sablefish	2,578	2,673	3,717	2,968	1,700	1,772	1,640	1,653
Total Roundfish	4,152	4,455	5,961	5,181	2,566	3,869	3,573	3,378
Rockfish								
Pacific Ocean Perch	279	323	573	420	681	349	122	338
Shortbelly	0	0	0	0	0	0	0	0
Widow	3,918	1,646	594	449	574	501	304	603
Other Rockfish								
Bocaccio	47	168	148	130	84	107	47	162
Canary	504	647	567	963	850	934	154	796
Chilipepper	0	1	0	0	0	0	0	0
Thornyheads	43	105	219	89	64	71	66	111
Yellowtail	3,342	2,865	980	942	1,537	1,188	1,305	1,077
Remaining Rockfish[a/]	472	1,035	990	925	683	548	1,353	639
Unspecified Rockfish	251	458	229	545	598	585	138	297
Total Rockfish	8,856	7,248	4,300	4,463	5,071	4,283	3,489	4,023
Flatfish								
Dover Sole	2,451	3,106	3,187	2,577	1,593	1,305	1,261	1,519
English Sole	311	247	316	303	293	398	287	429
Petrale Sole	254	422	366	267	238	271	185	183
Other Flatfish[b/]	236	274	184	390	683	115	102	2,215
Total Flatfish	3,252	4,049	4,053	3,537	2,807	2,089	1,835	4,346
Other Fish								
Jack Mackerel	0	0	0	0	0	0	0	0
Others	1,636	1,526	2,149	1,977	1,151	2,074	1,351	360
Total Other Fish	1,636	1,526	2,149	1,977	1,151	2,074	1,351	360
GRAND TOTAL	17,896	17,278	16,463	15,158	11,595	12,315	10,248	12,107

Data Source: PacFIN data extracted October 4, 1990.

[a/] Remaining rockfish are all species of rockfish not specifically listed on this page.

[b/] Arrowtooth flounder landings are with "Other Flatfish". Prior to 1989, arrowtooth flounder landings were recorded under "Other Fish".

Table 3. Estimated commercial groundfish landings (mt) for the INPFC Columbia area, 1982–1989. (Excludes joint venture and foreign catches.)

Species	Columbia Area							
	1982	1983	1984	1985	1986	1987	1988	1989
Roundfish								
Lingcod	1,442	1,877	1,247	1,257	734	905	1,183	1,431
Pacific Cod	81	59	89	30	36	794	1,843	1,267
Pacific Whiting	0	39	355	881	480	250	335	116
Sablefish	6,017	4,819	4,659	5,165	4,937	6,110	5,153	4,284
Total Roundfish	7,540	6,794	6,350	7,333	6,187	8,059	8,514	7,098
Rockfish								
Pacific Ocean Perch	531	1,205	924	756	714	559	650	1,104
Shortbelly	4	0	1	11	2	0	0	2
Widow	10,871	4,648	5,864	5,104	6,142	9,304	8,628	10,250
Other Rockfish								
Bocaccio	515	723	253	476	272	234	191	289
Canary	3,045	2,821	1,145	1,078	892	1,475	1,368	1,319
Chilipepper	18	11	2	3	1	0	0	4
Thornyheads	76	716	726	876	521	578	713	1,661
Yellowtail	4,324	5,383	3,421	1,824	2,336	2,592	3,182	2,886
Remaining Rockfish[a/]	3,163	2,749	1,988	3,080	2,304	2,296	2,808	3,145
Unspecified Rockfish	1,260	982	620	790	1,206	1,712	2,678	943
Total Rockfish	23,807	19,238	14,944	13,998	14,390	18,750	20,218	21,603
Flatfish								
Dover Sole	7,301	6,777	5,271	4,780	3,976	5,571	7,953	9,016
English Sole	825	692	357	513	641	705	708	907
Petrale Sole	991	1,001	703	617	720	979	1,111	1,085
Other Flatfish[b/]	2,094	1,598	1,157	1,182	892	1,058	904	2,566
Total Flatfish	11,211	10,068	7,488	7,092	6,229	8,313	10,676	13,574
Other Fish								
Jack Mackerel	0	0	0	0	0	0	48	0
Others	880	696	623	904	790	928	841	49
Total Other Fish	880	696	623	904	790	928	889	49
GRAND TOTAL	43,438	36,796	29,405	29,327	27,596	36,050	40,297	42,324

Data Source: PacFIN data extracted October 4, 1990.

[a/] Remaining rockfish are all species of rockfish not specifically listed on this page.

[b/] Arrowtooth flounder landings are included with "Other Flatfish". Prior to 1989, arrowtooth flounder landings were recorded under "Other Fish".

Table 4. Estimated commercial groundfish landings (mt) for the INPFC Eureka area, 1982–1989. (Excludes joint venture and foreign catches.)

Species	Eureka Area							
	1982	1983	1984	1985	1986	1987	1988	1989
Roundfish								
Lingcod	553	347	282	239	207	324	316	378
Pacific Cod	0	0	0	0	0	82	15	0
Pacific Whiting	1,014	977	2,338	3,009	2,978	4,508	6,527	7,292
Sablefish	3,791	2,118	2,263	2,530	2,534	1,930	1,558	1,643
Total Roundfish	5,358	3,442	4,883	5,778	5,719	6,844	8,416	9,313
Rockfish								
Pacific Ocean Perch	225	93	53	97	34	101	31	14
Shortbelly	0	0	0	0	0	0	0	0
Widow	4,102	2,615	2,296	2,308	1,683	1,572	1,315	1,299
Other Rockfish								
Bocaccio	677	463	268	181	90	126	91	52
Canary	901	515	220	182	139	195	91	71
Chilipepper	225	22	98	75	79	82	81	43
Thornyheads	1,149	1,011	1,020	1,502	1,670	1,659	3,832	4,398
Yellowtail	285	474	410	273	76	90	87	125
Remaining Rockfish[a/]	1,275	412	694	844	367	1,820	719	315
Unspecified Rockfish	0	499	359	606	542	572	959	928
Total Rockfish	8,839	6,104	5,418	6,068	4,680	6,217	7,206	7,245
Flatfish								
Dover Sole	5,838	5,331	4,856	5,924	5,110	5,098	4,545	3,789
English Sole	591	712	514	408	340	623	399	304
Petrale Sole	263	384	307	386	241	400	322	317
Other Flatfish[b/]	666	558	573	744	571	755	565	542
Total Flatfish	7,358	6,985	6,250	7,462	6,262	6,876	5,831	4,952
Other Fish								
Jack Mackerel	3	0	0	0	0	0	17	0
Others	157	98	94	143	123	324	174	107
Total Other Fish	160	98	94	143	123	324	191	107
GRAND TOTAL	21,715	16,629	16,645	19,451	16,784	20,261	21,644	21,617

Data Source: PacFIN data extracted October 4, 1990.

[a/] Remaining rockfish are all species of rockfish not specifically listed on this page.

[b/] Arrowtooth flounder landings are included with "Other Flatfish". Prior to 1989, arrowtooth flounder landings were recorded under "Other Fish".

Table 5. Estimated commercial groundfish landings (mt) for the INPFC Monterey area, 1982–1989. (Excludes joint venture and foreign catches.)

Species	Monterey Area							
	1982	1983	1984	1985	1986	1987	1988	1989
Roundfish								
Lingcod	829	581	736	492	355	625	654	807
Pacific Cod	0	0	2	1	0	10	0	0
Pacific Whiting	7	3	23	3	3	9	14	0
Sablefish	5,047	2,526	2,220	3,221	3,570	2,807	2,428	2,606
Total Roundfish	5,883	3,110	2,981	3,717	3,928	3,451	3,096	3,413
Rockfish								
Pacific Ocean Perch	0	0	3	0	2	1	0	0
Shortbelly	0	0	0	0	0	0	0	0
Widow	6,997	1,554	937	1,050	953	849	634	547
Other Rockfish								
Bocaccio	2,430	2,883	2,084	569	490	761	953	323
Canary	750	0	149	21	28	138	81	29
Chilipepper	1,253	1,389	1,318	1,027	524	872	1,096	652
Thornyheads	875	726	867	1,247	1,284	1,373	980	1,731
Yellowtail	150	0	127	22	9	79	75	127
Remaining Rockfish[a/]	1,192	3,192	848	882	609	573	4,108	320
Unspecified Rockfish	1,112	252	5,971	5,182	5,721	4,200	678	6,002
Total Rockfish	14,759	9,996	12,304	10,000	9,620	8,846	8,605	9,731
Flatfish								
Dover Sole	4,229	4,021	4,340	5,544	6,125	6,323	4,239	4,464
English Sole	837	564	497	654	713	697	675	741
Petrale Sole	408	313	298	454	439	500	506	537
Other Flatfish[b/]	846	635	669	960	1,040	930	1,108	1,165
Total Flatfish	6,320	5,533	5,804	7,612	8,317	8,450	6,528	6,907
Other Fish								
Jack Mackerel	1	0	0	0	0	0	0	0
Others	141	174	113	119	85	79	68	85
Total Other Fish	142	174	113	119	85	79	68	85
GRAND TOTAL	27,104	18,813	21,202	21,448	21,950	20,826	18,297	20,136

Data Source: PacFIN data extracted October 4, 1990.

[a/] Remaining rockfish are all species of rockfish not specifically listed on this page.

[b/] Arrowtooth flounder landings are included with "Other Flatfish". Prior to 1989, arrowtooth flounder landings were recorded under "Other Fish".

Table 6. Estimated commercial groundfish landings (mt) for the INPFC Conception area, 1982–1989. (Excludes joint venture and foreign catches.)

Species	Conception Area							
	1982	1983	1984	1985	1986	1987	1988	1989
Roundfish								
Lingcod	163	46	21	21	16	17	16	21
Pacific Cod	0	0	0	0	0	0	0	0
Pacific Whiting	0	0	0	0	1	1	0	8
Sablefish	946	1,923	1,070	269	359	64	10	29
Total Roundfish	1,109	1,969	1,091	290	376	82	26	58
Rockfish								
Pacific Ocean Perch	–	–	0	0	0	0	0	0
Shortbelly	–	–	0	0	0	0	0	0
Widow	66	19	68	4	5	0	6	14
Other Rockfish								
Bocaccio	–	–	239	65	97	34	25	39
Canary	–	–	0	1	1	9	5	13
Chilipepper	–	–	247	210	65	16	17	24
Thornyheads	–	96	312	399	98	44	1	11
Yellowtail	–	–	25	1	12	0	3	2
Remaining Rockfish[a/]	19	12	215	141	236	209	901	164
Unspecified Rockfish	4,338	3,055	1,911	2,112	2,575	1,909	118	932
Total Rockfish	4,423	3,182	3,017	2,933	3,089	2,221	1,076	1,199
Flatfish								
Dover Sole	109	369	1,286	1,576	480	134	4	5
English Sole	148	57	32	40	42	49	25	15
Petrale Sole	170	74	50	88	94	54	7	13
Other Flatfish[b/]	108	140	71	143	93	57	32	23
Total Flatfish	535	640	1,439	1,847	709	294	68	56
Other Fish								
Jack Mackerel	0	0	0	0	0	0	0	0
Others	110	83	107	116	91	91	65	80
Total Other Fish	110	83	107	116	91	91	65	80
GRAND TOTAL	6,177	5,874	5,654	5,186	4,265	2,688	1,235	1,393

Data Source: PacFIN data extracted October 4, 1990.

[a/] Remaining rockfish are all species of rockfish not specifically listed on this page.

[b/] Arrowtooth flounder landings are included with "Other Flatfish". Prior to 1989, arrowtooth flounder landings were recorded under "Other Fish".

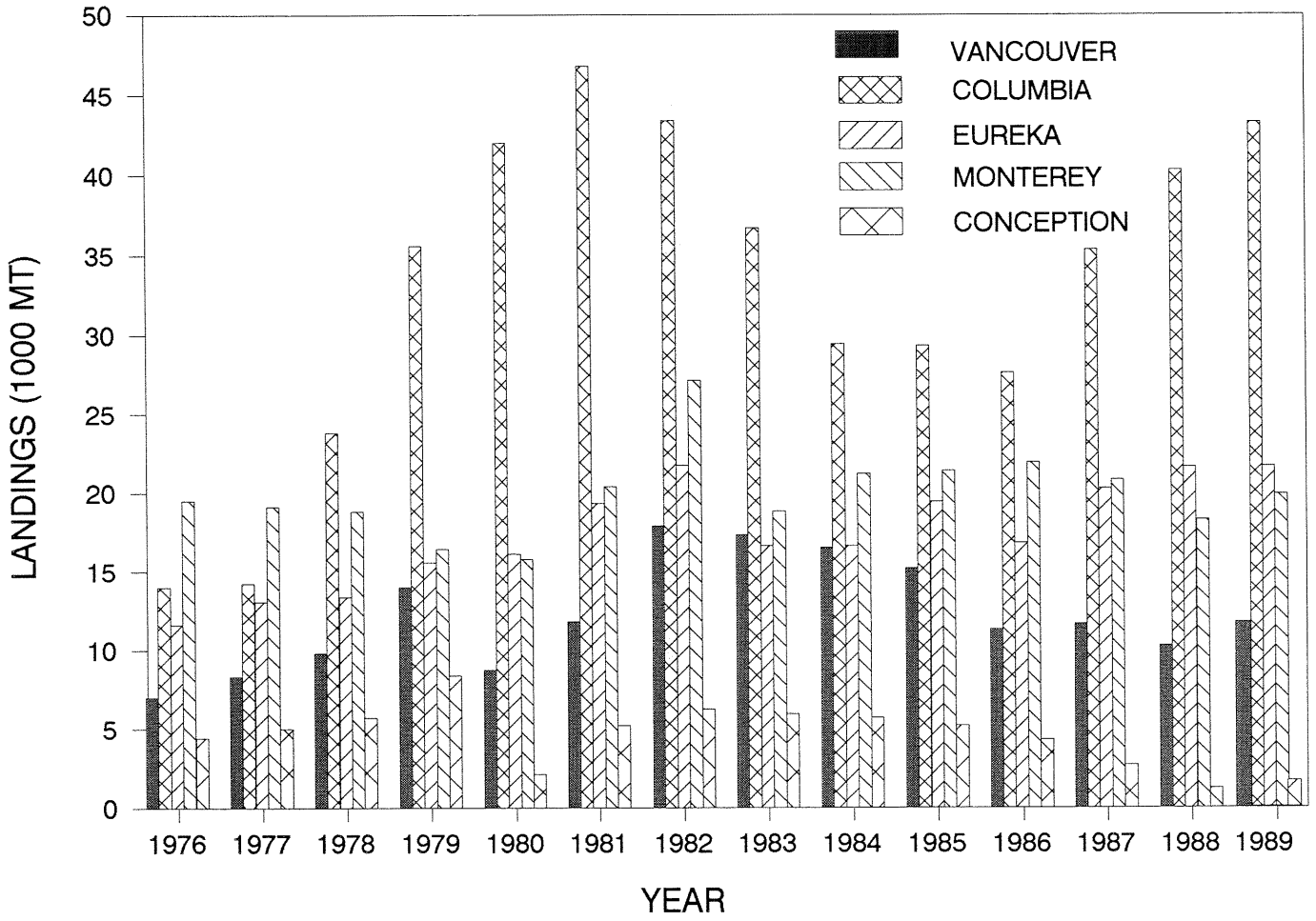

Figure 3. Pacific coast groundfish landings by area.

resource taken in traditional fisheries. As early as 1980, the draft FMP contained the following statements.

> . . . recently a series of events have occurred which are creating dramatic changes and are threatening the efficacy of the existing management regime. Regulatory and economic displacement of vessels from other fisheries and new vessels entering the fishery during the past years have resulted in substantial increases in fishing effort in the Washington, Oregon, and California groundfish fisheries . . . . New technology, improved electronic navigating, and fish-finding equipment have tended to increase harvesting ability . . . .

In addition, a 1982 report on the development potential of the west coast groundfish industry[2/] concluded that:

> . . . the groundfish resources in the West Coast region, with exception of Pacific whiting and shortbelly rockfish, are already heavily utilized and there is little room for expansion . . . .

In summary, the Pacific coast groundfish fishery expanded from a relatively small fishery harvesting surplus production from generally healthy or underharvested stocks of fish to one with excessive effort with limited room for long-term expansion of the traditional fisheries.

History of Management

Prior to FMP Implementation

Prior to implementation of the FMP in September 1982, management of domestic groundfish fisheries was under the jurisdiction of the States of Washington, Oregon, and California. State regulations have been in effect on the domestic fishery for about 80 years, and each state acted independently in both management and enforcement. However, many fisheries overlapped state boundaries and were participated in by citizens of two or more states. Management and uniformity of regulation became a difficult problem which stimulated the formation of PSMFC in 1947. PSMFC had no regulatory power but acted as a coordinating entity with authority to submit specific recommendations to states for their adoption.

Early regulations took the form of area closures (e.g., San Francisco Bay was closed to trawling in 1906) because of concerns about stock depletion. Minimum trawl mesh sizes were adopted in the early 1930s in California as the production of flatfish decreased. During 1935-1940, voluntary mesh size limits were adopted by the trawl industry after markets imposed minimum size limits on certain flatfishes and gear-saving studies demonstrated that a larger mesh size (five inches) caught fewer unmarketable fish. Shortly thereafter, mandatory minimum

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2/ West Coast Ports and Development of the Groundfish Fishery. July 1982. A consultants report prepared by Kramer, Chin, and Mayo, Inc., Seattle, Washington.

mesh sizes were adopted by California. Mesh regulations have since been in effect in all three coastal states.

Subsequent to implementation of the MFCMA in 1977 (but prior to the implementation of the FMP in 1982), state agencies worked with the Council to address conservation issues. Specifically, in 1981 the Council proposed a rebuilding program for Pacific ocean perch. To implement this program, the States of Oregon and Washington established landing limits for Pacific ocean perch in the Vancouver and Columbia areas. These limits were revised in January 1982 prior to enactment of the FMP in September, but the 20-year rebuilding program remained unchanged.

Under FMP Jurisdiction

The FMP became effective September 30, 1982. Management actions recommended by the Council and implemented by NMFS from September 1982 through October 1990 are summarized in Table 7. Those management actions included establishing final OYs for the six species designated for numerical OY management. OYs and the corresponding ABCs are listed in Table 8.

1983 Fishery

For all practical purposes, full-time active management of the Pacific coast groundfish fishery under the FMP began in 1983. The Council approved ABCs (Table 9); established regulatory management regimes for widow rockfish and sablefish for the entire region, the Sebastes complex, and rockfish in the Vancouver and Columbia areas; and continued the rebuilding program for Pacific ocean perch.

A coastwide OY of 10,500 mt was set for widow rockfish and a vessel trip limit of 30,000 pounds was imposed in an attempt to prevent an early closure of the fishery. A harvest guideline of 14,000 mt was established for the Sebastes complex in the combined Vancouver and Columbia areas. The Council had set an ABC of 9,500 mt as the GMT recommended. The Sebastes landings in this area in 1982 were 18,500 mt. In choosing a 14,000 mt harvest guideline halfway between the 1982 landings and the 1983 ABC, the Council acted to bring production gradually without undue economic hardship. In an attempt to spread the landings over the entire year, coastwide vessel trip limits of 40,000 pounds were imposed.

The fishery for the Sebastes complex in the Vancouver and Columbia areas and for widow rockfish in the entire region quickly adjusted to the new trip limits by changing traditional fishing patterns. In June, the GMT projected that the Sebastes complex landings would reach the 14,000 mt harvest guideline by early August unless action was taken. The Council increased the harvest guideline to 18,500 mt (almost twice the 9,500 mt ABC) and limited vessels to 1 trip per week, effective June 13. Landings declined somewhat but not to levels that would allow the fishery to continue for the entire year. In September, the Council recommended the trip limit be reduced to 3,000 pounds, effectively eliminating the directed fishery, and announced that all landings of Sebastes complex caught in the Vancouver and Columbia areas would be prohibited if the 18,500 mt harvest guideline was reached. This action drastically reduced the rate of landings; total 1983 Sebastes complex landings in the Vancouver and Columbia areas were nearly 18,000 mt.

Table 7. Council groundfish management/regulatory actions since FMP implementation in 1982.

Regulations in a given year continue until modified, superseded, or rescinded.

Effective October 13, 1982

- Recommended 75,000 pound trip limit on widow rockfish for remainder of 1982 (coastwide OY = 26,000 mt).
- Sablefish OY exceeded; 3,000 pounds trip limit imposed (coastwide OY = 13,400 mt).

Effective November 30, 1982

- Recommended extension of widow rockfish trip limits of 75,000 pounds to January 31, 1983 (effective January 1, 1983).
- Recommended extension of sablefish trip limit of 3,000 pounds for remainder of 1982.
- Sablefish OY increased 30 percent to 17,400 mt for 1982 and recommended this to be the preliminary specification for 1983 (ABC = 13,400 mt).

Effective January 1, 1983

- Recommended extension of widow rockfish trip limits of 75,000 pounds until superseded.
- Adopted policy to continue groundfish fishery over the entire year.
- Recommended coastwide trip limit of 30,000 pounds on widow rockfish; adjust in midseason as necessary so that 10,500 mt OY is not reached prior to year end (the coastwide widow rockfish ABC and OY were 10,500 mt in 1983).
- Recommended 40,000 pound coastwide trip limit on Sebastes complex; adjust as necessary in midseason so that annual catch in the Vancouver and Columbia areas falls about halfway between the 1982 catch and the 1983 aggregate ABC (about 14,000 mt). (Vancouver and Columbia areas ABC = 9,500 mt.)
- Recommended 22 inch total length size limit on sablefish in all areas north of Point Conception (excluding Monterey Bay). Permit incidental trip limit for fish smaller than 22 inches of 333 fish, 1,000 pounds, or 10 percent of weight of all sablefish on board. Adjust as necessary to stay within the 17,400 mt OY (ABC = 13,400 mt).

Effective June 28, 1983

- Recommended increase in Vancouver and Columbia areas Sebastes complex harvest guideline for 1983 from 14,000 mt to 18,500 mt; retain 40,000 pounds trip limit; trip frequency in Vancouver and Columbia areas set at one per week; when 18,500 mt quota is achieved, fishery closes (Vancouver and Columbia areas ABC = 9,500 mt).
- Recommended that harvest guidelines for the Vancouver and Columbia areas Sebastes complex and all flatfish managed under the FMP shall not be permitted to exceed 130 percent of the respective summed ABCs in 1984.
- Recommended retention of 22-inch size limit on sablefish as before, but set incidental allowance of small fish (<22 inches) at 5,000 pounds per trip.

Effective September 10, 1983

- Recommended 1,000 pounds trip limit on coastwide widow rockfish to avoid reaching OY; if 10,500 mt OY reached, fishery closes.
- Recommended 3,000 pounds trip limit on Sebastes complex in Vancouver and Columbia areas; if 18,500 mt quota is reached, fishery closes. One per week trip frequency limit is removed.
- Recommended continuing 40,000 pounds trip limit on Sebastes complex south of 43°N; no limit on number of trips.

Effective November 10, 1983

- Recommended closure of Columbia Area to Pacific ocean perch fishing until the end of the year as 950 mt OY for this species has been reached; retain 5,000 pounds trip limit or 10 percent of total trip weight on landings of Pacific ocean perch in Vancouver Area.

Effective January 1, 1984

- Recommended coastwide widow rockfish trip limit of 50,000 pounds; trip frequency limited to one per week; if OY of 9,300 mt is reached, fishery closes.
- Harvest guideline for Sebastes complex in the Vancouver and Columbia areas established at 10,100 mt (110 percent of the summed ABCs).
- Recommended 30,000 pounds trip limit on Sebastes complex from Vancouver and Columbia areas; one trip per week north of 43°N (changed to Cape Blanco, 42°50', on February 12, 1984).
- Recommended continuance of 40,000 pound trip limit on Sebastes complex south of 43° changed to 42°50 on February, 12, 1984); no limit on trip frequency.
- Recommended continuance of 22-inch size limit on sablefish as in 1983; retain 5,000 pounds incidental allowance of small fish (<22 inches); fishery closes when coastwide OY of 17,400 mt is reached (ABC = 13,400 mt).
- Continuation of 5,000 pound trip limit or 10 percent of total trip weight on Pacific ocean perch as specified in FMP. Fishery closes when area OYs are reached (see action effective November 10, 1983 above).

Effective February 12, 1984

- Southern boundary of Vancouver and Columbia areas shifted south, from 43°00' to 42°50' for management of Sebastes complex; application of Sebastes complex regulations clarified.

Table 7. Council groundfish management/regulatory actions (continued).

Effective May 6, 1984

- Recommended reduction in coastwide widow rockfish trip limit from 50,000 pounds once per week to 40,000 pounds once per week.
- Recommended reduction in Vancouver and Columbia areas Sebastes complex from 30,000 pounds once per week to 15,000 pounds once per week; fishermen have option to land 30,000 pounds once-every-two weeks with appropriate advance declaration of intent.
- Fishing for groundfish on a Sebastes complex trip may occur on only one side of Cape Blanco (42°50') which allows southern caught fish to be landed north of Cape Blanco using southern trip limit of 40,000 pounds with appropriate declaration of intent.
- Recommended no change in Sebastes complex trip limit of 40,000 pounds in Eureka, Monterey, Conception areas.

Effective August 1, 1984

- Recommended cessation of directed fishing for widow rockfish when 9,200 mt of the 9,300 mt OY is landed. Remaining 100 mt is a quota for incidental landings, to be taken in incidental landing limits of 1,000 pounds per trip. The fishery for this species will close when the 9,300 mt quota is taken.
- Recommended immediate reduction in trip limit for Pacific ocean perch in the Vancouver and Columbia areas to 20 percent by weight of all fish on board, not to exceed 5,000 pounds per vessel per trip. When OY is reached in either area, landings of Pacific ocean perch will be prohibited in that area (Oregon and Washington implemented Pacific ocean perch recommendation in mid-July).
- Recommended reduction in landings of Vancouver and Columbia areas Sebastes complex to 7,500 pounds once each week or 15,000 pounds once-every-two weeks with appropriate advance declaration of intent. When the 10,100 mt harvest guideline is reached, a 3,000 pounds trip limit will be imposed.
- Recommended allowing vessel operators on combined groundfish/Sebastes complex trips to fish on both sides of a line at 42°50'N (Cape Blanco) but landing of Sebastes complex in excess of 3,000 pounds to be controlled by the trip limit/trip frequency in effect north of the line (Vancouver and Columbia areas). Appropriate advance declaration of intent is required.

Automatic Closure (effective August 16, 1984)

- Commercial fishing for Pacific ocean perch in Columbia Area closed for remainder of the year. (See items regarding this species effective January 1 and August 1, 1984 above.)

Automatic Action (effective September 9, 1984)

- Recommended cessation of directed fishing for widow rockfish; incidental catch trip limit reduced to 1,000 pounds (based on action effective August 1, 1984), fishery for this species closed on November 28.

Effective January 10, 1985

- Recommended coastwide widow rockfish trip limit of 30,000 pounds; trip frequency limited to one per week (or 60,000 pounds once-every-two weeks with appropriate declaration to state in which fish are landed); adjust after first trimester, as necessary (OY = 9,300 mt).
- Harvest guideline for Sebastes complex in Vancouver and Columbia areas fixed at 10,100 mt.
- For Sebastes complex north of Cape Blanco (42°50'N): recommended 30,000 pound weekly trip limit of which no more than 10,000 pounds may be yellowtail rockfish (or 60,000 pounds once-every-two weeks of which no more than 20,000 pounds may be yellowtail rockfish with appropriate declaration to state in which fish are landed).
- For Sebastes complex south of Cape Blanco: recommend 40,000 pound trip limit without a trip frequency.
- Recommended that if fishermen fish on both sides of the Cape Blanco line during a trip, the northern (more restrictive) limit on Sebastes complex will apply.
- Recommended that landings of Sebastes complex and widow rockfish smaller than 3,000 pounds be unrestricted.
- Recommended continuing 22-inch size limit on sablefish in all areas north of Point Conception (abolishes Monterey Bay exclusion); retain 5,000 pound limit incidental landing limit for sablefish less than 22 inches.
- Recommended Vancouver and Columbia areas Pacific ocean perch trip limit of 20 percent by weight of all fish on board (no 5,000 pound limit as specified in last half of 1984).

Effective April 28, 1985

- Recommended retention of the coastwide widow rockfish trip limit of 30,000 pounds once per week, but rescinded the option to land 60,000 pounds once-every-two weeks.
- Recommended reduction in the coastwide widow rockfish trip limit to 10 percent by weight of all fish on board not to exceed 3,000 pounds if 90 percent of the OY (about 8,400 mt) is reached before the Council's July meeting (under this incidental limit, landings of widow rockfish less than 1,000 pounds will be unrestricted).
- For the Sebastes complex north of Cape Blanco (42°50'N): recommended reduction in the current trip limit to 15,000 pounds once per week of which no more than 5,000 pounds may be yellowtail rockfish (or 30,000 pounds once-every-two weeks of which no more than 10,000 pounds may be yellowtail rockfish). Recommended a third option to land 7,500 pounds twice each week of which no more than 3,000 pounds in each landing may be yellowtail rockfish; landings declaration applies.
- Recommended the Vancouver and Columbia areas Pacific ocean perch trip limit be reduced to 5,000 pounds or 20 percent by weight of all fish on board, whichever is less. Landings of Pacific ocean perch less than

Table 7. Council groundfish management/regulatory actions (continued).

1,000 pounds will be unrestricted. The fishery for this species will close when the OY in each area is reached.

Effective June 10, 1985

- Recommended landings of Pacific ocean perch up to 1,000 pounds per trip will be unrestricted regardless of the percentage of these fish on board.

Effective July 21, 1985

- Recommended reduction of the coastwide widow rockfish trip limit to 3,000 pounds per trip without a trip frequency.

Effective July 25, 1985

- Recommended that "tickler chains" which contact the sea floor ahead of the rollers may not be used with a roller or bobbin trawl.

Effective September 1, 1985

- Recommended changing the management boundary line separating northern and southern trip limits for the Sebastes complex from Cape Blanco (42°50'N) northward 30 miles to the north jetty at Coos Bay (43°22'N).

Effective October 6, 1985

- Recommended increasing the Vancouver and Columbia areas Sebastes complex trip limit to 20,000 pounds once per week except that no more than 5,000 pounds may be yellowtail rockfish (or one landing once-every-two weeks of 40,000 pounds of which no more than 10,000 pounds may be yellowtail rockfish, or two landings per week of 10,000 pounds each of which no more than 3,000 pounds per landing may be yellowtail rockfish; landings declaration apply).

Effective November 25, 1985

- Established that 90 percent of sablefish quota had been reached and recommended a trip limit of 13 percent sablefish in all trawl landings containing sablefish.

Effective December 6, 1985

- Established that sablefish quota (OY) had been exceeded on November 22, 1985; recommended that landings of sablefish be prohibited until January 1, 1986.

Effective January 1, 1986

- Recommended coastwide widow rockfish trip limit of 30,000 pounds per week; no biweekly option (coastwide OY = 10,200 mt; ABC = 9,300 mt).
- Harvest guideline for Sebastes complex north of Coos Bay, Oregon (43°22'N) fixed at 10,100 mt.
- For Sebastes complex north of Coos Bay; recommended 25,000 pound weekly trip limit of which no more than 10,000 pounds may be yellowtail rockfish (or 50,000 pounds biweekly of which no more than 20,000 pounds may be yellowtail rockfish; or 12,500 pounds twice per week of which no more than 5,000 pounds may be yellowtail rockfish--biweekly and twice weekly landings require appropriate declaration to state in which fish are landed).
- For Sebastes complex south of Coos Bay: recommended 40,000 pound trip limit; no trip frequency.
- Recommended landings of Sebastes complex and widow rockfish be unrestricted if less than 3,000 pounds.
- Recommended that fishermen fishing the Sebastes complex on both sides of the Coos Bay line during a trip must conform with the northern (more restrictive) trip limit.
- Recommended continuance of 22-inch size limit on sablefish in all areas north of Point Conception; retain 5,000 pound incidental landing limit for sablefish smaller than 22 inches; coastwide OY = 13,600 mt; ABC = 10,300 mt.
- Recommended the Pacific ocean perch limit in the area north of Cape Blanco (42°50'N) should be 20 percent (by weight) of all fish on board or 10,000 pounds whichever is less; landings of Pacific ocean perch be unrestricted if less than 1,000 pounds regardless of percentage on board; Vancouver Area OY = 600 mt; Columbia Area OY = 950 mt.
- Recommended an ABC and OY of 227,500 mt for Pacific whiting.
- Recommended an ABC of 3,900 mt for yellowtail rockfish.

Effective April 11, 1986

- Recommended increasing Pacific whiting ABC and OY to 295,800 mt, up 30 percent from 227,500 mt established at the beginning of 1986.
- Recommended increasing yellowtail rockfish ABC to 4,000 mt, up 100 mt from 3,900 mt established at beginning of 1986. (Yellowtail rockfish is in the multispecies Sebastes complex and does not have a numerical OY.) The 100 mt increase is assigned entirely to the Columbia Area north of Coos Bay.

Table 7. Council groundfish management/regulatory actions (continued).

Automatic Action (See September 28, 1986 below)

- Recommended in April to impose a 3,000 pound trip limit without a trip frequency to be implemented when the widow rockfish ABC is reached.

Effective August 22, 1986 (Emergency Regulation)

- Recommended allocating the estimated remaining sablefish OY between trawl and fixed gear at 55 and 45 percent, respectively.
- Recommended an 8,000 pound sablefish trip limit on trawl gear.
- Recommended retention of the current regulation of a 5,000 pound trip limit on sablefish smaller than 22 inches.
- Recommended prohibition of any further landings of sablefish by trawl gear after trawl quota is reached.
- Recommended prohibition of any further landings of sablefish by fixed gear after fixed gear quota is reached.
- Recommended prohibition of any further landings of sablefish after the coastwide OY is reached.

Effective August 26, 1986 (See August 22, 1986 Emergency Regulation)

- Announced amounts of sablefish quota under emergency regulations (2,915 mt trawl; 2,385 mt fixed gear).

Effective August 31, 1986

- For Sebastes complex north of Coos Bay, Oregon: recommended the following increase in trip limits: weekly--30,000 pounds of which no more than 12,500 pounds may be yellowtail rockfish; biweekly--60,000 pounds of which no more than 25,000 pounds may be yellowtail rockfish; and twice-weekly--15,000 pounds of which no more than 6,500 pounds may be yellowtail rockfish.

Effective September 28, 1986

- Widow rockfish ABC reached; coastwide 3,000 pound trip limit without trip frequency imposed (see Automatic Action above).

Effective October 23, 1986 (See August 22, 1986 Emergency Regulation)

- Fixed gear sablefish quota reached; fixed gear fishery closed.
- Trawl gear trip limit increased to 12,000 pounds for remainder of year or until trawl quota is reached.
- Sablefish quotas revised (2,800 mt trawl; 2,300 mt fixed gear).

Effective November 20, 1986 (See August 22, 1986 Emergency Regulation)

- Extension of sablefish emergency regulation until the end of the year.

Effective December 1, 1986

- OY quota for Pacific ocean perch reached in the Vancouver Area; fishery closed until January 1, 1987.

Effective January 1, 1987

- Recommended a coastwide widow rockfish trip limit of 30,000 pounds per week with no biweekly option. Only one landing per week above 3,000 pounds (coastwide OY = 12,500 mt; ABC = 12,100 mt).
- Harvest guideline for Sebastes complex north of Coos Bay, Oregon (43°21'34"N) set at 10,200 mt.
- For Sebastes complex north of Coos Bay: recommended 25,000 pound weekly trip limit of which no more than 10,000 pounds may be yellowtail rockfish (or 50,000 pounds biweekly of which no more than 20,000 pounds may be yellowtail rockfish; or 12,500 pounds twice per week, of which no more than 5,000 pounds may be yellowtail rockfish--biweekly and twice weekly landings require appropriate declaration to state in which fish are landed); no restriction on landings less than 3,000 pounds.
- For Sebastes complex south of Coos Bay: recommended 40,000 pound trip limit; no trip frequency limit.
- Recommended allocating the sablefish OY between trawl and fixed gear at 52 (6,200 mt) and 48 percent (5,800 mt), respectively; if the quota for either gear type is reached, sablefish becomes a prohibited species for that gear; coastwide OY and ABC = 12,000 mt.
- Recommended 5,000 pound trawl and 100 pound fixed gear trip limits (round weights) for sablefish smaller than 22 inches total length (16 inches dorsal total length), and apply coastwide.
- Recommended the coastwide Pacific ocean perch limit should be 20 percent of all legal fish on board or 5,000 pounds whichever is less (in round weight); landings of Pacific ocean perch unrestricted if less than 1,000 pounds regardless of percentage on board; Vancouver Area OY = 500 mt; Columbia Area OY = 800 mt.
- Recommended an ABC and OY of 195,000 mt for Pacific whiting.
- Recommended an ABC of 4,000 mt for yellowtail rockfish.

Effective April 5, 1987

- Recommended that the size limit for processed sablefish be changed from 16.0 inches to 15.5 inches (dorsal total length).

Table 7. Council groundfish management/regulatory actions (continued).

Effective April 27, 1987

- Recommended that the trip limit for sablefish smaller than 22 inches (total length) caught by fixed gear be increased from 100 pounds to 1,500 pounds coastwide.

Effective May 3, 1987

- Recommended changing the definition of fishing week from Sunday through Saturday to Wednesday through Tuesday for Sebastes complex and widow rockfish.

Effective July 22, 1987

- Recommended that the weekly trip limit for yellowtail rockfish caught north of Coos Bay be reduced to 7,500 pounds (or 15,000 pounds biweekly; or 3,750 pounds twice weekly).

Effective August 14, 1987

- Coastwide ABCs for widow and chilipepper rockfish increased to 12,500 mt and 3,600 mt, respectively.

Effective October 2, 1987

- Recommended that the trawl trip limit for sablefish be 6,000 pounds or 20 percent of the legal fish on board, whichever is greater, including no more than 5,000 pounds of sablefish under 22 inches.

Effective October 14, 1987

- Recommended that the weekly trip limit for widow rockfish be reduced from 30,000 pounds to 5,000 pounds when 95 percent of the widow rockfish OY is projected to be reached (i.e., at 11,875 mt). Closure of the nontrawl (fixed gear) sablefish fishery because the nontrawl allocation of 5,800 mt was reached.

Effective October 22, 1987

- Closure of sablefish trawl fishery because the trawl allocation of 6,200 mt was reached.

Effective November 25, 1987

- Closure of widow rockfish fishery because 12,500 mt was reached.

Effective January 1, 1988

- Recommended a coastwide widow rockfish trip limit of 30,000 pounds per week. Only one landing per week above 3,000 pounds. No restriction on landings less than 3,000 pounds (coastwide OY/ABC = 12,100 mt).
- Harvest guideline for Sebastes complex north of Coos Bay, Oregon (43°21'34"N) fixed at 10,200.
- For Sebastes complex north of Coos Bay: recommended 25,000 pound weekly trip limit of which no more than 10,000 pounds may be yellowtail rockfish (or 50,000 pounds biweekly of which no more than 20,000 pounds may be yellowtail rockfish; or 12,500 pounds twice per week, of which no more than 5,000 pounds may be yellowtail rockfish--biweekly and twice weekly landings require appropriate declaration to state in which fish are landed). No restriction on landings less than 3,000 pounds.
- For Sebastes complex south of Coos Bay: recommended 40,000 pound trip limit; no trip frequency restriction.
- Recommended allocating the sablefish OY between trawl and nontrawl (fixed gear) at 5,200 mt and 4,800 mt, respectively; if the quota for nontrawl gear is reached, sablefish becomes a prohibited species for that gear; manage the trawl fishery to achieve the trawl allocation, provided that up to an additional 800 mt may be added to the trawl allocation for unavoidable incidental catch; coastwide OY = 9,200 - 10,800 mt; ABC = 10,000 mt.
- For trawl-caught sablefish, recommended trip limit of 6,000 pounds or 20 percent of legal fish on board, whichever is greater, with only two landings above 1,000 pounds allowed per vessel per week; no restriction on landings less than 1,000 pounds.
- Recommended continuance of 22-inch total length size limit (15.5 inch dorsal length) on sablefish in all areas; 5,000 pound trawl and 1,500 pound nontrawl incidental landing limits for sablefish smaller than the minimum size limit.
- Recommended the coastwide Pacific ocean perch trip limit should be 20 percent (by weight) of all fish on board or 5,000 pounds, whichever is less; landings of Pacific ocean perch be unrestricted if less than 1,000 pounds regardless of percentage on board; Vancouver OY = 500 mt; Columbia OY = 800 mt.
- Recommended an ABC and OY of 232,000 mt for Pacific whiting.
- Recommended an ABC of 4,000 mt for yellowtail rockfish.

Effective August 3, 1988

- Recommended the trawl sablefish allocation be increased to 6,000 mt; reduce the trawl trip limit to one landing per week, not to exceed 2,000 pounds (including sablefish smaller than 22 inches).
- Recommended changing the nontrawl trip limit for sablefish smaller than 22 inches to 1,500 pounds or 3 percent of all sablefish on board, whichever is greater.

Effective August 26, 1988

- Closure of the nontrawl sablefish fishery because the nontrawl allocation of 4,800 mt was reached.

Table 7. Council groundfish management/regulatory actions (continued).

Effective September 21, 1988

- Recommended lowering the trip limit for widow rockfish to 3,000 pounds (with no restriction on the number of landings per week) on September 21, the date when just enough of the OY remains to allow continuation of this trip limit through the end of the year.

Effective October 5, 1988

- Recommended lifting the restriction that no more than one landing of sablefish by trawlers may be made during any week; reduce the weekly trip limit for yellowtail rockfish north of Coos Bay from 10,000 pounds to 7,500 pounds (biweekly and twice weekly options to remain in effect).

Effective January 1, 1989

- Recommended a coastwide widow rockfish trip limit of 30,000 pounds per week. Only one landing per week above 3,000 pounds. No restriction on landings less than 3,000 pounds (coastwide OY/ABC = 12,400 mt).
- Harvest guideline for Sebastes complex north of Coos Bay, Oregon (43°21'34"N) set at 10,200 mt.
- For Sebastes complex north of Coos Bay: recommended 25,000 pound weekly trip limit of which no more than 7,500 pounds may be yellowtail rockfish (or 50,000 pounds biweekly of which no more than 15,000 pounds may be yellowtail rockfish; or 12,500 pounds twice per week, of which no more than 3,750 pounds may be yellowtail rockfish--biweekly and twice weekly landings require appropriate declaration to state in which fish are landed). No restriction on landings less than 3,000 pounds.
- For Sebastes south of Coos Bay: recommended 40,000 pound trip limit; no trip frequency restriction.
- For coastwide sablefish, management measures will be designed to achieve the low end of the OY range (10,400 to 11,000 mt). After 22 mt are set aside from the 10,400 mt harvest guideline for the Makah Indian fishery, the remaining 10,378 mt allocated 5,397 mt (52 percent) for trawl gear and 4,981 mt (48 percent) for nontrawl (fixed) gear.
- Established a coastwide trawl trip of 1,000 pounds or 45 percent of the deepwater complex (consisting of sablefish, Dover sole, arrowtooth flounder, and thornyheads), whichever is greater. Within the 45 percent trawl limit, no more than 5,000 pounds of sablefish smaller than 22 inches (total length) may be taken per trip. If fishing under the 1,000 pound limit, all sablefish may be smaller than 22 inches. The coastwide nontrawl trip limit for sablefish smaller than 22 inches set at the greater of 1,500 pounds or 3 percent of all sablefish on board.
- The harvest guideline may be increased by up to 600 mt to enable small fisheries to continue operating after a gear allocation is met and to allow for landings of sablefish caught incidentally while fishing for other species. If the upper end of the OY range (11,000 mt) is reached, all further landings will be prohibited. (coastwide ABC = 9,000 mt; OY = 10,400 to 11,000 mt).
- Established the coastwide Pacific ocean perch trip limit at 20 percent (by weight) of all fish on board or 5,000 pounds whichever is less; landings of Pacific ocean perch unrestricted if less than 1,000 pounds regardless of percentage on board. (Vancouver OY = 500 mt; Columbia OY = 800 mt).
- ABC and OY set at 225,000 mt for Pacific whiting.
- ABC set at 4,300 mt for yellowtail rockfish.

Effective April 26, 1989

- Established coastwide weekly trip limit on the deepwater complex (consisting of sablefish, Dover sole, arrowtooth flounder, and thornyheads) of only 1 landing above 4,000 pounds per week, not to exceed 30,000 pounds. No limit on the number of landings of deepwater complex less than 4,000 pounds. For each landing of the deepwater complex, no more than 1,000 pounds or 25 percent of the deepwater complex, whichever is greater, may be sablefish. If fishing under the 25 percent limit, no more than 5,000 pounds may be sablefish under 22 inches (total length). If fishing under the 1,000 pound limit, all sablefish may be under 22 inches. Biweekly and twice weekly trip limit options for trawl-caught sablefish are available but require appropriate declaration to state in which fish are landed.
- Revised the gear quotas for the remainder of the year by reducing the nontrawl quota 400 mt (to 4,581 mt) and increasing the trawl quota by 1,000 mt (400 mt from nontrawl gear plus the 600 mt reserve) so it totals 6,397 mt. If either gear quota is reached, further landings by that gear will be prohibited for the remainder of the year.
- Reduced the coastwide weekly trip limit for widow rockfish to 10,000 pounds.

Effective July 17, 1989

- Established a coastwide nontrawl sablefish trip limit of 100 pounds with no frequency limit for the remainder of the year, until the nontrawl allocation is reached, or until OY is reached, whichever occurs first. Because the trip limit is smaller than the limit on fish less than 22 inches, the 22-inch minimum size provision is rescinded.

Effective July 26, 1989

- Reduced the trip limit for yellowtail rockfish to 3,000 pounds or 20 percent of the Sebastes complex, whichever is greater.
- Reduced the coastwide trip limit for Pacific ocean perch to 2,000 pounds or 20 percent of all fish on board, whichever is less, with no trip frequency restriction.
- Increase the Columbia area Pacific ocean perch OY from 800 mt up to 1,040 mt.

Table 7. Council groundfish management/regulatory actions (continued).

Effective October 4, 1989

- Removed the overall trawl poundage and trip frequency limits for the deepwater complex, while retaining the separate trip limit for sablefish at 25 percent of the deepwater complex or 1,000 pounds, whichever is greater.
- Increased the nontrawl trip limit to 2,000 pounds or 20 percent of all groundfish on board, whichever is less, when more than 100 pounds of sablefish on board. Because the trip limit remains small, the entire landing may be made up of sablefish less than 22 inches.

Effective October 11, 1989

- Reduced the trip limit for widow rockfish to 3,000 pounds (with no restriction on the number of landings per week) on October 11, the date when just enough of the OY remained to allow continuation of this trip limit through the end of the year.

Effective December 13, 1989

- Closure of Pacific ocean perch fishery in the Columbia area because 1,040 mt OY reached.

Effective January 1, 1990

- Established a coastwide widow rockfish trip limit of 15,000 pounds per week. Only 1 landing per week above 3,000 pounds. No restriction on landings less than 3,000 pounds (coastwide ABC = 8,900 mt; OY = 9,800 to 10,000 mt).
- Harvest guideline for Sebastes complex north of Coos Bay, Oregon (43°21'34"N) set at 10,200 mt.
- For Sebastes complex north of Coos Bay, the weekly trip limit established at 25,000 pounds of which no more than 7,500 pounds may be yellowtail rockfish (or 50,000 pounds biweekly of which no more than 15,000 pounds may be yellowtail rockfish; or 12,500 pounds twice per week, of which no more than 3,750 pounds may be yellowtail rockfish--biweekly and twice weekly landings require appropriate declaration to state in which fish are landed). No restriction on landings less than 3,000 pounds.
- For Sebastes south of Coos Bay, the trip limit established at 40,000 pound; no trip frequency restriction.
- Established the coastwide Pacific ocean perch trip limit at 20 percent (by weight) of all fish on board or 5,000 pounds whichever is less; landings of Pacific ocean perch be unrestricted if less than 1,000 pounds regardless of percentage on board. (Vancouver OY = 500 mt; Columbia OY = 1,040 mt).
- The ABC and OY for Pacific whiting set at 225,000 mt.
- The ABC for yellowtail rockfish set at 4,300 mt.
- [NMFS did not approve the Council's recommendations for sablefish management. The trawl and nontrawl restrictions in effect at the end of 1989 continued in effect on January 1, 1990. Specifically, the nontrawl trip limit was remained at 2,000 pounds or 20 percent of all fish on board, which ever is greater, for all landings greater than 100 pounds. The trawl trip limit remained as the greater of 1,000 pounds or 25 percent of the deepwater complex.]

Effective January 31, 1990

- NMFS disapproved the Council's recommendations to modify the trawl/nontrawl sablefish allocations and management measures to achieve them.
- The nontrawl sablefish trip limit was rescinded as a result of NMFS' disapproval of the Council's recommendations. Thus, the nontrawl fishery was unlimited by any catch restrictions. The limit on sablefish less than 22 inches was not reinstated. A nontrawl trip limit of 500 pounds will go into effect when 300 mt of the nontrawl quota remains.
- The estimated tribal sablefish catch to the end of the year (300 mt) subtracted from the OY of 8,900 mt.
- The remaining 8,600 mt was allocated 58 percent (4,988 mt) to trawl gear and 42 percent (3,612 mt) to nontrawl gears.
- Continued in effect: the coastwide trawl trip of 1,000 pounds or 25 percent of the deepwater complex (consisting of sablefish, Dover sole, arrowtooth flounder, and thornyheads), whichever is greater. Within the 25 percent trawl limit, no more than 5,000 pounds of sablefish smaller than 22 inches (total length) may be taken per trip. If fishing under the 1,000 pound limit, all sablefish may be smaller than 22 inches.

Effective March 21, 1990

- Re-established the nontrawl trip limit for sablefish less than 22 inches total length at 1,500 pounds or 3 percent of all sablefish on board, whichever is greater.

Effective June 24, 1990

- Established a nontrawl sablefish trip limit of 500 pounds when 300 mt of the nontrawl quota remained. The 500 pound limit replaces the trip limit for sablefish smaller than 22 inches.

Effective July 25, 1990

- Reduced the weekly trip limit for yellowtail rockfish caught with any gear north of Coos Bay to 3,000 pounds or 20 percent of the Sebastes complex, whichever is greater. Biweekly and twice weekly landing options remain in effect.
- Reduced the nontrawl sablefish trip limit to 200 pounds because GMT projections indicate the quota has been nearly reached.

Table 7. Council groundfish management/regulatory actions (continued).

Effective October 3, 1990

- In order to reduce trawl sablefish landings so the trawl quota would not be exceeded, established a 15,000 pound trip limit on the deepwater complex (sablefish, Dover sole, and thornyheads); allowed only 1 landing per week of the deepwater complex above 1,000 pounds; and maintained the current sablefish trip limit of 1,000 pounds or 25 percent of the deepwater complex, whichever is greater. Biweekly and twice weekly landing options are provided. The 5,000 pound trip limit for sablefish smaller than 22 inches remained in effect for landings made under the biweekly option.
- Relaxed the nontrawl sablefish trip limit to 2,000 pounds per trip to enable the entire nontrawl quota to be taken. Reinstated the limit on sablefish less than 22 inches of 1,500 pounds or 3 percent of all sablefish on board.

Table 8. Final OY and ABC specifications made under the FMP, 1982–1990. Includes inseason adjustments, if any in thousands of mt.

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Pacific Whiting									
OY	175.5	175.5	175.5	175.0	295.8	195.0	232.0	225.0	196.0
ABC	175.5	175.5	175.5	175.0	295.8	195.0	232.0	225.0	196.0
Sablefish									
OY	17.4	17.4	17.4	13.6	13.6	12.0	9.2–10.8	10.4–11.0	8.9
ABC	13.4	13.4	13.4	12.3	10.6	12.0	10.0	9.0	8.9
Pacific Ocean Perch									
OY	1.55	1.55	1.55	1.55	1.55	1.3	1.3	1.54	1.54
ABC	0.00–1.55	1.55	1.55	1.55	1.55	0.0	0.0	0.0	0.0
Shortbelly Rockfish									
OY	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	13.0
ABC	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	13.0
Widow Rockfish									
OY	26.0	10.5	9.3	9.3	10.2	12.5	12.1	12.4	9.8–10.0
ABC	18.3	10.5	9.3	7.4	9.3	12.5	12.1	12.4	8.9
Jack Mackerel									
OY	NA	NA	12.0	12.0	12.0	12.0	12.0	12.0	12.0
ABC	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0

Sources: 1982 – 47 FR 43964 (October 5, 1982) and 48 FR 8542 (February 14, 1983)
1983 – 48 FR 6715 (February 15, 1985)
1984 – 49 FR 1060 (January 9, 1984) and 49 FR 27518 (July 5, 1984)
1985 – 50 FR 471 (January 4, 1985)
1986 – 51 FR 1255 (January 10, 1986) and 51 FR 12622 (April 14, 1986)
1987 – 52 FR 682 (January 8, 1987) and 52 FR 31034 (August 19, 1987)
1988 – 53 FR 248 (January 6, 1988)
1989 – 54 FR 32 (January 3, 1989)
1990 – 55 FR 1036 (January 11, 1990)

Table 9. ABCs for 1983 in mt for the California–Washington region by INPFC areas.

Species	Vancouver	Columbia	Eureka	Monterey	Conception	Total
Roundfish						
Lingcod	1,000	4,000	500	1,100	400	7,000
Pacific Cod	2,200	900	a/	a/	a/	3,100
Pacific Whiting	–	–	–	–	–	175,500[b/]
Sablefish	–	–	–	2,500[c/]	–	13,400[b/]
Rockfish						
Pacific Ocean Perch	600	950	a/	a/	a/	1,550
Shortbelly	–	–	–	–	–	10,000[b/]
Widow	*400*	*N 1,600** *S 4,900*	*1,500*	*2,100*	*d/*	*10,500*
Other Rockfish[e/]						
Bocaccio	a/	a/	a/	4,100	2,000	6,100
Canary	800	1,300	600	a/	a/	2,700
Chilipepper	b/	b/	b/	1,300	1,000	2,300
Yellowtail	*1,400*	*1,500*	300	a/	a/	*3,200*
Remaining Rockfish	2,000	2,500	1,900	4,300	3,300	14,000
Flatfish						
Dover Sole	1,000	4,000	8,000	5,000	1,000	19,000
English Sole	600	2,000	800	900	200	4,500
Petrale Sole	600	1,100	500	800	200	3,200
Other Flatfish (Except Arrowtooth Flounder)	700	3,000	1,700	1,800	500	7,700
Other Fish[f/]						
Jack Mackerel	–	–	–	–	–	12,000[g/]
Others	3,000	7,000	2,000	2,000	2,000	16,000

* Split into northern and southern Columbia subareas. *Italics denotes changes.*

[a/] These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.

[b/] Total all areas.

[c/] Monterey Bay only.

[d/] There are insufficient data to calculate an ABC.

[e/] "Other Rockfish" means rockfish species which do not have a numerical OY.

[f/] Includes sharks, skates, rays, ratfish, morids, grenadiers, jack mackerel, and arrowtooth flounder.

[g/] All areas north of 39°N latitude.

Widow rockfish landings also proceeded at a rapid pace. The directed (target) fishery was closed on September 10 but a 1,000 pound incidental catch per trip was permitted. Total 1983 widow rockfish landings were over 10,300 mt, about 1 percent below the OY.

Pacific ocean perch landings in the Columbia area exceeded the 950 mt OY level in November and the fishery was closed beginning December 6. Total 1983 Columbia area Pacific ocean perch landings were 1,205 mt.

Because it was feared that excessive amounts of juvenile sablefish were being landed, a 22-inch size limit was imposed on sablefish caught north of Point Conception (except Monterey Bay). About 14,500 mt of sablefish were harvested in 1983, about 1,100 mt above the 13,400 mt ABC and 2,900 mt below the 17,400 mt OY. A much reduced market in Japan during 1983 helped to reduce the 1983 catch below the 1982 catch.

1984 Fishery

The ABCs for the 1984 fishery were approved by the Council at the November meeting (Table 10). Management actions in 1984 (Table 7) involved widow rockfish, the Sebastes complex (rockfish), and Pacific ocean perch. The size and trip limits set for sablefish in 1983 continued throughout 1984.

The OY for widow rockfish was reduced to 9,300 mt in 1984 from 10,500 mt in 1983. On January 1, 1984, the trip limit was set at 50,000 pounds. In addition, a trip frequency limit was set allowing only 1 landing of widow rockfish above 3,000 pounds in a week. In early May, the trip limit for widow rockfish was reduced to 40,000 pounds and the trip frequency restriction (1 landing per week above 3,000 pounds) was maintained. The Council announced in July that when 9,200 mt of widow rockfish were landed, a trip limit of 1,000 pounds would be imposed (with no frequency restriction) for the remaining 100 mt of the quota. In early September, the 1,000 pound trip limit was imposed, and all landings for widow rockfish were prohibited on November 28 when the quota was expected to be reached.

After having been closed the last two months of 1983 in the Columbia area, the Pacific ocean perch fishery resumed January 1, 1984 in both the Vancouver and Columbia areas under the 5,000 pounds or 10 percent by weight (whichever is greater) trip limit established in the FMP. Projections made in July indicated landings under this limit would exceed the 950 mt Columbia area OY by the first week in August if current landing rates continued.

On July 16, the States of Oregon and Washington changed the Pacific ocean perch trip limits to 20 percent of all fish on board (by weight), not to exceed 5,000 pounds. Despite these restrictions, landings were not adequately slowed. The Columbia area was closed for Pacific ocean perch on August 16 when OY was reached. The Vancouver area OY, however, was not reached before year's end.

Management of the Sebastes complex of rockfish was the most complicated groundfish issue facing the Council in 1984. South of the Columbia area, the species' ABCs were unchanged from 1983. The 40,000 pound trip limit (with no trip frequency restriction) was constant throughout 1984 and was the same as in 1983. However, in the Vancouver and Columbia areas, the summed ABCs were lower in 1984

Table 10. ABCs for 1984 in mt for the California–Washington region by INPFC areas.

Species	Vancouver[a/]	Columbia	Eureka	Monterey	Conception	Total
Roundfish						
Lingcod	1,000	4,000	500	1,100	400	7,000*
Pacific Cod	2,200	900	b/	b/	b/	3,100*
Pacific Whiting[c/]	–	–	–	–	–	175,500*
Sablefish	–	–	–	2,500[d/]	–	13,400*
Rockfish						
Pacific Ocean Perch	600	950	b/	b/	b/	1,550*
Shortbelly[c/]	–	–	–	–	–	10,000*
Widow	300	5,400	1,800	1,800	b/	9,300
Other Rockfish						
Bocaccio	b/	b/	b/	4,100	2,000	6,100*
Canary	800	1,300	600	b/	b/	2,700*
Chilipepper	b/	b/	b/	1,300	1,000	2,300*
Yellowtail	1,400	1,500	300	b/	b/	3,200*
Remaining Rockfish	500	3,700	1,900	4,300	3,300	13,700
Flatfish						
Dover Sole	2,400	7,200	8,000	5,000	1,000	23,600
English Sole	600	2,000	800	900	200	4,500*
Petrale Sole	600	1,100	500	800	200	3,200*
Other Flatfish	700	3,000	1,700	1,800	500	7,700*
Other Fish[e/]						
Jack Mackerel[f/]	–	–	–	–	–	12,000*
Others	2,500	7,000	1,200	2,000	2,000	14,700

* No change from 1983.

[a/] U.S. portion.

[b/] These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.

[c/] Total all areas.

[d/] Monterey Bay only.

[e/] Includes sharks, skates, rays, ratfish, morids, grenadiers, jack mackerel, and arrowtooth flounder.

[f/] All areas north of 39°N latitude.

and trip limit and trip frequency restrictions changed twice during the year. The way these limits were applied changed three times.

The sum of the ABCs for the Sebastes complex in the Vancouver and Columbia areas was set at 9,200 mt. The Council acknowledged the industry's difficulty in adjusting to such a sharp decline (from 1983) and set a harvest guideline of 10,100 mt as the goal for 1984 landings from the Vancouver and Columbia areas. On January 1, 1984, a trip limit of 30,000 pounds was imposed and allowed only 1 landing per week above 3,000 pounds for the Sebastes complex in the Vancouver and Columbia areas. The trip limit was reduced by half in May and again in August in an attempt to keep landings from exceeding the harvest guideline in 1984. To soften the impact of these severe restrictions, fishermen were given the choice of reducing either the size or the frequency of their Sebastes landings. (Throughout the year, landings less than 3,000 pounds were not counted toward trip frequency limits to minimize discards of rockfish caught incidentally while targeting on other species.) No further regulations were promulgated for the Sebastes complex in the Vancouver and Columbia areas.

1985 Fishery

The ABCs for the 1985 fishery were approved by the Council at the November 28-29, 1984 meeting in Seattle, Washington (Table 11). OY levels were set equal to ABC for all species except widow rockfish and sablefish. The coastwide widow rockfish OY was set at 9,300 mt, compared with an ABC of 7,400 mt and the sablefish OY was set at 13,600 mt, or approximately 10 percent above the 12,300 mt ABC.

Vessel trip limits were once again the basic regulatory mechanism preferred by fishing industry representatives advising the Council. Accordingly, the Council adopted trip limits (Table 7) in an effort to extend the fishery throughout the year without exceeding quotas or harvest guidelines.

Coastwide widow rockfish trip limits were set at 30,000 pounds once per week with an option to land 60,000 pounds once every two consecutive weeks (biweekly). The biweekly trip limit option was rescinded by the Council effective April 28, 1985 in an attempt to reduce the rate of landings. Effective July 21, 1985, the trip limit for widow rockfish was reduced to 3,000 pounds, without a limit on the frequency of landings. The trip limit was imposed to discourage directed fishing while permitting retention and sale of fish caught incidental to fishing for other species. Total landings of widow rockfish for 1985 were 9,087 mt, slightly below the 9,300 mt quota.

Management of the Sebastes complex was again the most complicated groundfish management issue in 1985. In the Vancouver and Columbia areas, more restrictive trip limits were implemented to reduce yellowtail rockfish landings and encourage landings of "remaining rockfish". A Sebastes complex trip limit of 30,000 pounds, 1 landing per week, was imposed, of which no more than 10,000 pounds could be yellowtail rockfish. An option of one landing once every two consecutive weeks of double the amount was also adopted, but the fishermen were required to notify in writing seven days prior to fishing the state in which landings would occur.

Effective April 28, 1985, the Council reduced the weekly trip limit to 15,000 pounds, of which no more than 5,000 pounds could be yellowtail rockfish.

Table 11. ABCs for 1985 in mt for the California–Washington region by INPFC areas.

Species	Vancouver[a/]	Columbia	Eureka	Monterey	Conception	Total
Roundfish						
Lingcod	1,000	4,000	500	1,100	400	7,000
Pacific Cod	2,200	900	b/	b/	b/	3,100
Pacific Whiting[c/]	–	–	–	–	–	175,000
Sablefish	–	–	–	2,500[d/]	–	12,300
Rockfish						
Pacific Ocean Perch	600	950	b/	b/	b/	1,550
Shortbelly[c/]	–	–	–	–	–	10,000
Widow	–	–	–	–	b/	7,400
Other Rockfish						
Bocaccio	b/	b/	b/	4,100	2,000	6,100
Canary	800	2,100	600	b/	b/	3,500
Chilipepper	b/	b/	b/	1,300	1,000	2,300
Yellowtail	600	2,100	300	b/	b/	3,000
Remaining Rockfish	800	3,700	1,900	4,300	3,300	14,000
Flatfish						
Dover Sole	2,400	11,500	8,000	5,000	1,000	27,900
English Sole[c/]	–	–	–	–	–	1,500
Petrale Sole	600	1,100	500	800	200	3,200
Other Flatfish	700	3,000	1,700	1,800	500	7,700
Other Fish[e/]						
Jack Mackerel[f/]	–	–	–	–	–	12,000
Others	2,500	7,000	1,200	2,000	2,000	14,700

[a/] U.S. portion.

[b/] These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.

[c/] Total all areas.

[d/] Monterey Bay only.

[e/] Includes sharks, skates, rays, ratfish, morids, grenadiers, jack mackerel, and arrowtooth flounder.

[f/] All areas north of 39°N latitude.

The biweekly landing option of double the amount was again adopted as was a third option to land 7,500 pounds twice each week (semiweekly) of which not more than 3,000 pounds in each landing could be yellowtail rockfish.

By early September, GMT projections indicated that yellowtail rockfish landings would approximate the ABC and that Sebastes complex landings as a whole would fall about 1,000 mt below the harvest guideline. Effective October 6, the Sebastes complex trip limits were increased to 20,000 pounds per trip with respective biweekly and semiweekly adjustments. Yellowtail rockfish trip limits were not changed.

The size and trip limits specified for sablefish in 1984 continued until November 25. At that time, it was determined that 90 percent OY had been reached October 21. As specified in the FMP, the remaining portion of the OY was allocated on a 50:50 basis to the fixed gear and trawl fleets (680 mt to each gear type). The trawl fleet was put on a trip limit of 13 percent total round weight on board. By December 6, the OY had been reached and all landings of sablefish were prohibited.

Pacific ocean perch landings in the Columbia area exceeded the 950 mt quota in 1983 and 1984 under a trip limit of 5,000 pounds or 10 percent of the total weight of fish on board, whichever was greater. Landings of Pacific ocean perch were prohibited during the latter part of both years. Beginning in 1985, the trip limits were changed to a maximum of 20 percent of the total weight of the fish on board in an effort to discourage targeting and thus reduce landings. The regulation was effective in the Columbia area, but not in the Vancouver area. Effective April 28, 1985, the Council modified the Pacific ocean perch trip limit regulation to 5,000 pounds or 20 percent of the total weight of the fish on board, whichever was less, thus prohibiting large landings of these species. This regulation was effective in reducing landings, and total landings of Pacific ocean perch were 424 mt in the Vancouver area and 886 mt in the Columbia area. The 1985 landings of Pacific ocean perch were below OY in both areas.

On September 1, 1985 the management boundary line separating northern and southern trip limits for the Sebastes complex was shifted approximately 30 miles northward to the jetty on the north side of Coos Bay, Oregon. The move was approved by the Council to minimize management and catch reporting problems which arose earlier when the management line was moved to Cape Blanco, Oregon. Coos Bay fishermen testified that moving the line to the north jetty of Coos Bay would simplify and enhance the operations of fishermen who were required to contend with two different trip limits and trip frequencies adjacent to their port of landing.

In March 1985, the Council provisionally approved issuance of up to 18 experimental set net permits for sablefish. Two permits were issued by NMFS in 1983 and three in 1984 despite recommended disapproval by the Council. The expanded experimental fishery was intended to evaluate gear conflicts and the effects of the set net fishery on fully utilized stocks of fish. Twelve vessels actually fished in 1985 with most of the effort centered off northern Washington.

1986 Fishery

The ABCs for the 1986 fishery were approved by the Council at the November 13-14, 1985 meeting in Seattle (Table 12). As in previous years, the OY was set at ABC

Table 12. ABCs for 1986 in mt for the California–Washington region by INPFC areas.

Species	Vancouver[a/]	Columbia	Eureka	Monterey	Conception	Total
Roundfish						
Lingcod	1,000	4,000	500	1,100	400	7,000
Pacific Cod	2,200	900	b/	b/	b/	3,100
Pacific Whiting[c/]	–	–	–	–	–	300,000
Sablefish[c/]	–	–	–	–	–	10,600
Rockfish						
Pacific Ocean Perch	600	950	b/	b/	b/	1,550
Shortbelly[c/]	–	–	–	–	–	10,000
Widow[c/]	–	–	–	–	–	9,300
Other Rockfish						
Bocaccio	b/	b/	b/	4,100	2,000	6,100
Canary	800	2,100	600	b/	b/	3,500
Chilipepper	b/	b/	b/	1,300	1,000	2,300
Yellowtail	1,100	2,600	300	b/	b/	4,000
Remaining Rockfish	800	3,700	1,900	4,300	3,300	14,000
Flatfish						
Dover Sole	2,400	11,500	8,000	5,000	1,000	27,900
English Sole[c/]	–	–	–	–	–	1,500
Petrale Sole	600	1,100	500	800	200	3,200
Other Flatfish	700	3,000	1,700	1,800	500	7,700
Other Fish[d/]						
Jack Mackerel[e/]	–	–	–	–	–	12,000
Others	2,500	7,000	1,200	2,000	2,000	14,700

[a/] U.S. portion.

[b/] These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.

[c/] Total all areas.

[d/] Includes sharks, skates, rays, ratfish, morids, grenadiers, jack mackerel, and arrowtooth flounder.

[e/] All areas north of 39°N latitude.

except for widow rockfish and sablefish. The coastwide widow rockfish OY was set at 10,200 mt compared with an ABC of 9,300 mt. The coastwide OY for sablefish was set at 13,600 mt, or about 30 percent above the 10,600 mt ABC.

Management measures established by the Council (Table 7) were similar to those of the past three years. Industry advisors to the Council reaffirmed their support of vessel trip limits for the few species which require regulation to prevent over exploitation. It was their view that vessel trip limits are more likely to achieve the objective of extending the fishery throughout the year without exceeding quotas or harvest guidelines.

Coastwide domestic commercial groundfish landings is projected to be down slightly from 1985. A decline in Dover sole landings accounted for the majority of the decrease but rockfish and lingcod landings also were down. The decrease in rockfish landings was attributed to regulatory actions. Directed effort for Dover sole decreased in 1986 as many trawlers shifted to the rapidly improving coastal pink shrimp fishery. Lack of availability also was a factor in the Vancouver area with many fishermen reporting poor success for Dover sole.

A coastwide widow rockfish trip limit was set at 30,000 pounds once per week. The option to permit one 60,000 pound landing once every two consecutive weeks was rejected because industry advisors and the Council concluded this option would increase landings early in the season and result in a premature closure of the fishery. Good fishing during the early part of the year precluded the intent to extend the fishery throughout the year. GMT landing projections in early April indicated that ABC would be reached by late summer or early fall. After hearing industry testimony that smaller trip limits were not practicable, the Council opted to retain the 30,000 pound trip limit until ABC was reached. At that time, the trip limit would be reduced to 3,000 pounds per trip without a limit on the frequency of landings. The Council reaffirmed the regulation at its September 17-18 meeting and the 3,000 pound trip limit was imposed on September 28.

In contrast to previous years, management of the Sebastes complex presented no major problems. Trip limits south of the Columbia area were set at 40,000 pounds for the third consecutive year, with no limit on the frequency of trips. The Vancouver and Columbia areas harvest guideline was set at 10,200 mt. Weekly trip limits were set at 25,000 pounds of which no more than 10,000 pounds could be yellowtail rockfish. Biweekly and semiweekly options in the same proportions were also set to provide fishermen with additional options. From the start of the year, landing rates were down from previous years. Reasons were a more normal weather pattern than the excellent weather encountered early in 1985, poorer availability of rockfish early in the year, and less directed rockfish effort later in the spring as many vessels converted to shrimp fishing or entered the joint venture fishery for whiting. On August 31, after the GMT reported the harvest guideline would not be achieved with the lower trip limits, the Council increased trip limits to 30,000 pounds once per week of which not more than 12,500 pounds could be yellowtail rockfish. Similar adjustments were made to biweekly and semiweekly options.

Several different management measures have been tried for Pacific ocean perch since 1983. The regulations implemented during the past few years have either resulted in exceeding the OY and closing one area and taking less than the OY in the other; or underharvesting in both areas. The 1986 Pacific ocean perch trip

limit was set at 10,000 pounds per trip or 20 percent of the weight on board, whichever was less. This regulation apparently will result in landings less than the OY in the Columbia area. In the Vancouver area, where large landings of other species of groundfish are common, many vessels targeted on Pacific ocean perch to bring their catches up to the maximum allowed under the regulation. As a result, the OY was expected to be reached in mid-November and landings of Pacific ocean perch from the Vancouver area would be prohibited for the remainder of the year. It is apparent from the experiences of the past four years that a single trip limit regulation for both the Vancouver and Columbia areas cannot meet conservation and harvest goals for each area. Conversely, regulations which differ between areas may meet the desired objective for each area but cannot be effectively enforced because some vessels commonly fish both areas on a single trip.

The initial 1986 sablefish regulations were unchanged from the past three years. The fishery was unrestricted except that landings of fish less than 22 inches were limited to 5,000 pounds per trip. During the early part of the year, landings were similar to 1985 and it was evident that the 13,600 mt quota could be reached before the end of the year. In early April, both trawl and fixed gear fishermen expressed an interest in revising the management regime in the FMP which required the catch be allocated between fixed and trawl gear when 90 percent of the quota was reached, and established trip limits for trawlers by predetermined formula. There was a common desire to establish shares earlier in the year to permit fixed gear fishermen adequate time to plan vessel operations and to set trip limit regulations for trawlers which would be significantly greater than those which would be set under the FMP scenario. In July, the GSG recommended to the Council that the remaining unharvested balance of the 1986 OY be allocated between trawl and fixed gear based on the share of total sablefish landings for a five year (1981-1985) average. The GSG further proposed that fixed gear landings continue without restriction until the fixed gear allocation is reached, and trawl trip limits be set at levels which would allow trawl fishermen to continue to land sablefish for the remainder of the year without exceeding the trawl allocation. Either gear would be prohibited from further sablefish landings after the gear allocation was reached and all landings would be prohibited when the OY was reached. The rationale for the proposals was that fixed gear fishermen landed only sablefish, had no alternative fishery, and could not operate economically under trip limits. Conversely, sablefish are primarily an incidental species in the multispecies trawl fishery, and wastage would occur if landings were prohibited and catches were discarded at sea.

The allocation proposal was adopted by the Council and implemented on August 22. GMT landing projections developed in early October indicated that trawl landing rates were at a level which might not reach the trawl allocation by the end of the year. The fixed gear allocation, however, was projected to be reached by late October, at which time landings of sablefish by this gear would be prohibited for the remainder of the year.

The FMP prohibits the use of set net gear for groundfish north of 38°N latitude. In an effort to evaluate the impacts and success of a set net fishery, the director of NMFS, Northwest Region issued experimental permits to harvest groundfish with set nets in the EEZ adjacent to Washington, Oregon, and California each year from 1982 to 1985. In March 1986, the Council reviewed the results of the experimental fishery and the implications of legalizing set net gear in the prohibited area. The Council reaffirmed its position that set nets

should be prohibited north of 38°N latitude and recommended that no experimental permits be issues in 1986. NMFS concurred with the recommendation and the experimental fishery was terminated.

1987 Fishery

For each species managed by a numerical OY, the 1987 OY was set at the estimated ABC (Table 13). An interim coastwide ABC/OY for sablefish was set at 12,000 mt until a review of all stock assessment data could be completed by an ad hoc stock assessment work group.

Management measures established by the Council were similar to those of the past four years (Table 7). Industry advisors to the Council reaffirmed their support of vessel trip limits for the species which required regulation to prevent overexploitation. It was their view that vessel trip limits were likely to achieve the objective of extending the fishery throughout the year without exceeding quotas or harvest guidelines. No abnormal or extreme environmental conditions were encountered in 1987 and fishing patterns, fluctuations in landings, and fleet size were well within expectations.

The increased Pacific cod landings in the northern areas and reports of small cod as far south as northern California were encouraging and may indicate that cod abundance is increasing after several years of apparent low abundance.

The decline in Dover sole landings for the second year in a row could be attributed primarily to decreased directed effort, but a lack of availability in the northern areas also impacted the total landings. The reasons for decreases in the other species were less clear but were probably a result of decreased abundance.

Increased widow rockfish landings were directly related to the 3,200 mt increase in OY for 1987. Trip limits were once again set at 30,000 pounds, once per week. Fishing was good coastwide and many vessels consistently landed limits each week until early May when widow rockfish became less available to trawls. At the September Council meeting, the GMT projected the 12,500 mt OY would be reached in late November. The Council approved a 5,000 pound weekly trip limit when 95 percent of the OY (11,875 mt) was landed. The lower trip limit was not effective and landings were prohibited on November 25, 1987.

Management of the Sebastes complex was similar to 1986. South of the Columbia area, trip limits were set at 40,000 pounds for the fourth consecutive year, with no limit on the frequency of trips. The Vancouver and Columbia areas harvest guideline was set at 10,200 mt. Weekly trip limits were set at 25,000 pounds of which no more than 10,000 pounds could be yellowtail rockfish. Biweekly and semiweekly options in the same proportions were also set to provide fishermen with an option which best fit into their overall fishing operations.

Fishing success for the Sebastes complex was improved over 1986. It was reported that because of good catch rates, some fishermen targeted on the Sebastes complex early in the year rather than fishing for widow rockfish. The greatest improvement was noted early in the year in the Vancouver area where fishermen reported excellent availability of yellowtail rockfish and complained that they discarded fish to prevent exceeding the landing limit. In late July, the Council reduced the weekly yellowtail rockfish landing limit from 10,000 pounds

Table 13. ABCs for 1987 in mt for the California–Washington region by INPFC areas.

Species	Vancouver[a/]	Columbia	Eureka	Monterey	Conception	Total
Roundfish						
Lingcod	1,000	4,000	500	1,100	400	7,000
Pacific Cod	2,200	900	b/	b/	b/	3,100
Pacific Whiting[c/]	–	–	–	–	–	195,000
Sablefish	–	–	–	–	–	12,000
Rockfish						
Pacific Ocean Perch	0	0	b/	b/	b/	0
Shortbelly[c/]	–	–	–	–	–	10,000
Widow[c/]	–	–	–	–	–	12,500
Other Rockfish						
Bocaccio	b/	b/	b/	4,100	2,000	6,100
Canary	800	2,100	600	b/	b/	3,500
Chilipepper[c/]	–	–	–	–	–	3,600
Yellowtail	1,100	2,600[d/]	300	b/	b/	4,000
Remaining Rockfish	800	3,700	1,900	4,300	3,300	14,000
Flatfish						
Dover Sole	2,400	11,500	8,000	5,000	1,000	27,900
English Sole[c/]	–	–	–	–	–	1,900
Petrale Sole	600	1,100	500	800	200	3,200
Other Flatfish	700	3,000	1,700	1,800	500	7,700
Other Fish[e/]						
Jack Mackerel[f/]	–	–	–	–	–	12,000
Others	2,500	7,000	1,200	2,000	2,000	14,700

[a/] U.S. portion.

[b/] These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.

[c/] Total all areas.

[d/] Includes 100 mt allocated to southern most portion of Columbia area not subject to trip limit regulations.

[e/] Includes sharks, skates, rays, ratfish, morids, grenadiers, jack mackerel, and arrowtooth flounder.

[f/] All areas north of 39°N latitude.

to 7,500 pounds in an attempt to prevent landings from exceeding the ABC for this species in the Vancouver and Columbia areas.

The 1987 ABC for Pacific ocean perch in the Vancouver and Columbia areas was set at zero because stocks were stressed and had not recovered since being overexploited in the late 1960s. The OYs were set at 500 mt for the Vancouver area and 800 mt for the Columbia area to permit retention of fish harvested incidentally while fishing for other species. To discourage directed fishing, the Council established a trip limit of 20 percent of the total weight of legal fish on board, not to exceed 5,000 pounds per trip. Landings of Pacific ocean perch were well below the OY.

Difficulties with sablefish stock assessment and management continued to plague the Council in 1987. Efforts to develop scientifically credible estimates of coastwide sablefish abundance and ABC were unsuccessful, primarily due to the lack of an adequate and comprehensive historical data base. The Council established an interim 1987 ABC/OY of 12,000 mt based on the best information available. Despite several efforts by the GMT and an ad hoc stock assessment work group, no better estimate was developed and the 12,000 mt OY was not revised during the year. Trawl gear was allocated 52 percent of the OY and nontrawl gear 48 percent to assure historical and equitable sharing of the harvest. Landing by both gear types lagged behind 1986. Decreased effort early in the year by nontrawl gear and decreased trawl effort were undoubtedly major factors in decreased landings. Nontrawl fishermen, however, reported fewer large sablefish and indicated that fishing success was generally poorer than in previous years. Although landings were lower, both gear types were projected to achieve their allocation before the end of the year. A trip limit of 6,000 pounds or 20 percent of the total weight of legal fish on board was implemented for trawl gear on October 2 in an attempt to extend the fishery and to prevent discards. In October, the nontrawl fishery was projected to reach its allocation in mid-October, at which time sablefish landings by nontrawl gear would be prohibited for the remainder of 1987. The trawl fishery for sablefish was closed October 22, 1987.

1988 Fishery

The ABCs and numerical OYs for the 1988 fishery were approved by the Council at the November 18-19, 1987 meeting in Portland, Oregon (Table 14). Most management measures established by the Council (Table 7) were similar to those of recent years. However, for the first time, trawl trip limits for sablefish were implemented on January 1 in order to prevent the trawl fleet from exceeding its allocation quota. Industry advisors to the Council reaffirmed their support of vessel trip limits for the few species which require additional regulation to prevent overexploitation. Vessel trip limits were implemented with the objective of extending the fishery throughout the year without exceeding quotas or harvest guidelines. No abnormal or extreme environmental conditions were encountered in 1988. However, unsteady fishing patterns and landings fluctuations resulted from erratic market conditions. Fleet size was well within expectations.

One major management problem in 1988 was the temporary loss of PacFIN funding for port samplers and data processors. This impaired the accuracy of landings projections and future stock assessments which rely on biological sampling.

Table 14. ABCs for 1988 in mt for the California–Washington region by INPFC areas.

Species	Source[a/]	Vancouver[b/]	Columbia	Eureka	Monterey	Conception	Total
Roundfish							
Lingcod	FMP	1,000	4,000	500	1,100	400	7,000
Pacific Cod	FMP	2,200	900	c/	c/	c/	3,100
Pacific Whiting[d/]	FMP	–	–	–	–	–	327,000
Sablefish[e/]	1987	–	–	–	–	–	10,000
Rockfish							
Pacific Ocean Perch	1987	0	0	c/	c/	c/	0
Shortbelly[e/]	FMP	–	–	–	–	–	10,000
Widow[e/]	1987	–	–	–	–	–	12,100
Other Rockfish							
Bocaccio	FMP	c/	c/	c/	4,100	2,000	6,100
Canary		800	2,100	600	c/	c/	3,500
Chilipepper[e/]	1986	–	–	–	–	–	3,600
Yellowtail	1985	1,100	2,600[f/]	300	c/	c/	4,000
Remaining Rockfish	1984	800	3,700	1,900	4,300	3,300	14,000
Flatfish							
Dover Sole	1984	2,400	11,500	8,000	5,000	1,000	27,900
English Sole[e/]	1986	–	–	–	–	–	1,900
Petrale Sole	1987	600	1,100	500	800	200	3,200
Other Flatfish	FMP	700	3,000	1,700	1,800	500	7,700
Other Fish[g/]							
Jack Mackerel[h/]	FMP	–	–	–	–	–	12,000
Others	1984	2,500	7,000	1,200	2,000	2,000	14,700

[a/] Date refers to the date of the Council status of stocks document.
[b/] U.S. portion.
[c/] These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.
[d/] Total U.S and Canada all areas.
[e/] Total all areas.
[f/] Includes 100 mt allocated to southern most portion of Columbia area not subject to trip limit regulations.
[g/] Includes sharks, skates, rays, ratfish, morids, grenadiers, jack mackerel, and arrowtooth flounder.
[h/] All areas north of 39°N latitude.

The continued increase in Pacific cod landings in the northern areas and reports of cod as far south as northern California were encouraging and may indicate that cod abundance has increased after several years of apparent low abundance.

Widow rockfish landing rates varied greatly through the season as a result of unstable market factors. Trip limits were once again set at 30,000 pounds once per week. Fishing was good coastwide and many vessels consistently landed limits. At the July 13-14 Council meeting, the GMT projected the 12,100 mt OY would be reached in early October. The Council approved a 3,000 trip limit to go into effect when just enough of the OY remained to allow this trip limit to remain in effect until December 31. The intent of the Council was achieved.

Management of the Sebastes complex presented no major problems in 1988. South of Coos Bay, trip limits were set at 40,000 pounds for the fifth consecutive year, with no limit on the frequency of trips. North of Coos Bay, the harvest guideline was set at 10,200 mt. Weekly trip limits were set at 25,000 pounds of which no more than 10,000 pounds could be yellowtail rockfish. Biweekly and semiweekly options in the same proportions were also set to provide fishermen with an option which best fits into their overall fishing operations.

Fishing success for the Sebastes complex was similar to 1987. Increased landings were noted primarily in the Vancouver area where fishermen reported excellent availability of yellowtail rockfish and complained that they discarded fish to prevent exceeding the landing limit. GMT projections in July indicated that ABC would be reached in mid-August unless effort was reduced. Preliminary assessment results indicated that ABC could increase significantly and management action was postponed pending review and approval of the new stock assessment. However, the completed assessment indicated that ABC should be increased only 300 mt. Subsequent to receiving the assessment, the Council reduced the weekly yellowtail rockfish landing limit from 10,000 pounds to 7,500 pounds. The Council's intent was to reduce targeted fishing on yellowtail rockfish in the Vancouver and Columbia areas without forcing a significant increase in discards. Despite trip limit reductions, yellowtail rockfish landings exceeded ABC.

The 1988 ABC for Pacific ocean perch in the Vancouver and Columbia areas was set at zero because stocks were stressed and had not recovered since being overexploited in the late 1960s. As in 1987, the OYs were set at 500 mt for the Vancouver area and 800 mt for the Columbia area to permit retention of fish harvested while fishing for other species. To discourage directed fishing, the Council established a trip limit of 20 percent of the total weight of fish on board, not to exceed 5,000 pounds per trip. Landings of Pacific ocean perch were again below OY.

Difficulties with sablefish stock assessment and management continued to plague the Council in 1988. Efforts to develop scientifically credible estimates of coastwide sablefish abundance and ABC were unsuccessful until late in the year, primarily due to the lack of an adequate model to analyze the diverse historical data base. The Council established an ABC of 10,000 mt and an OY range of 9,200 to 10,800 mt based on the best information available. Trawl gear was allocated 5,200 mt and nontrawl gear was allocated 4,800 mt in an attempt to maintain an equitable sharing of the harvest. An additional 800 mt was held in reserve in case the trawl fishery unavoidably exceeded its allocation. To achieve the 5,200 mt allocation, a trawl trip limit of 6,000 pounds or 20 percent of the fish on board, whichever is greater, was implemented on January 1. Due to lack of

PacFIN data, landings were difficult to monitor. Early in the year trawl landings were high in spite of the trip limit. The trip limit was reduced to 2,000 pounds once per week on August 3 and the 800 mt reserve was released to the trawl quota to extend the fishery throughout the year. While this trip limit substantially impacted the landing rate, fishermen reported that discards also increased significantly. Projections by the GMT in September indicated that the 2,000 pound once per week trip limit had slowed landings to the extent that the original 5,200 mt allocation would not be achieved. The Council removed the trip frequency restriction in early October in an attempt to reduce the amount of forced discarding. Nontrawl landings were also substantially above the 1987 rate and the fishery was closed on August 25.

1989 Fishery

The ABCs and numerical OYs for the 1989 fishery were approved by the Council at the November 16-18, 1987 meeting in Portland, Oregon (Table 15). For those species requiring a numerical OY, levels were set at the estimated ABC, except for Pacific ocean perch and sablefish. Most management measures established by the Council were similar to those of recent years (Table 7). Industry advisors to the Council reaffirmed their support of vessel trip limits for the few species which require additional regulation to prevent overexploitation. Vessel trip limits were implemented with the objective of extending the fishery throughout the year without exceeding quotas or harvest guidelines.

No abnormal or extreme environmental conditions were encountered in 1989. However, there were some periods of landing fluctuations caused by erratic market conditions. Fleet size was within expectations.

Coastwide domestic commercial groundfish landings were 88,282 mt, down slightly from 1988. Landings of Dover sole were less in 1989, 17,123 mt as opposed to 18,000 mt in 1988, but in the Columbia area a new catch record was established at 8,226 mt (based on logbook adjusted data). Landings of arrowtooth flounder also increased in 1989 to 3,540 mt, even though regulations inhibited some activity on this species. Thornyhead landings increased in 1989 as the deepwater fishery for longspine thornyheads continued to increase. Landings in 1989 were 6,244 mt for both species as opposed to landings of 5,591 mt in 1988. Also in 1989, there was no foreign fishery allocation for Pacific whiting. Joint venture requests exceeded the available supply, thus no TALFF was granted.

Widow rockfish landing rates varied somewhat through the season as a result of erratic market factors. At the beginning of the fishing year, trip limits were once again set at 30,000 pounds per week. Fishing was good coastwide, especially in January and February. The GMT projected in March that a 51 percent reduction in the rate of landings would be required to extend the fishery to the end of the year. On the advice of the GSG, the Council approved a reduction in the trawl trip limit to 10,000 pounds per week or 20,000 pounds per two weeks, effective April 26. On October 11, 1989, the trawl trip limit was further reduced to 3,000 pounds per week to avoid a fishery closure. Subsequently, the GMT projected that the quota would be reached on December 13, and on that date no further landings of widow rockfish were allowed. Final landings were 12,523 mt on 101 percent of the OY.

Management of the Sebastes complex was much the same as previous years. South of Coos Bay, trip limits were set at 40,000 pounds per trip. North of Coos Bay,

Table 15. ABCs for 1989 in mt for the California–Washington region by INPFC areas.

Species	Source[a/]	Vancouver[b/]	Columbia	Eureka	Monterey	Conception	Total	1988
Roundfish								
Lingcod	FMP	1,000	4,000	500	1,100	400	7,000	7,000
Pacific Cod	FMP	–	–	c/	c/	c/	3,200	3,100
Pacific Whiting[d/e/]	FMP	–	–	–	–	–	300,000	327,000
Sablefish[d/]	1988	–	–	–	–	–	9,000	10,800
Rockfish								
Pacific Ocean Perch	1987	0	0	c/	c/	c/	0	0
Shortbelly[d/]	FMP	–	–	–	–	–	10,000	10,000
Widow[d/]	1988	–	–	–	–	–	12,400	12,100
Other Rockfish								
Bocaccio	FMP	c/	c/	c/	4,100	2,000	6,100	6,100
Canary		800	2,100	600	c/	c/	3,500	3,500
Chilipepper[d/]	1986	–	–	–	–	–	3,600	3,600
Yellowtail	1988	1,100[f/]	2,900[g/]	300	c/	c/	4,300	4,000
Remaining Rockfish	1984	800	3,700	1,900	4,300	3,300	14,000	14,000
Flatfish								
Dover Sole	1984	2,400	11,500	8,000	5,000	1,000	27,900	27,900
English Sole[d/]	1986	–	–	–	–	–	1,900	1,900
Petrale Sole	1987	600	1,100	500	800	200	3,200	3,200
Other Flatfish	FMP	700	3,000	1,700	1,800	500	7,700	7,700
Other Fish[h/]								
Jack Mackerel[i/]	FMP	–	–	–	–	–	12,000	12,000
Others	1984	2,500	7,000	1,200	2,000	2,000	14,700	14,700

a/ Date refers to the date of the Council status of stocks document.

b/ U.S. portion.

c/ These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.

d/ Total all areas.

e/ Combined U.S. and Canadian waters. About 75 percent of the harvestable stock or 225,000 mt is expected to occur in U.S. waters in 1989.

f/ U.S. portion of the Vancouver area, based on 50 percent of the total area stock.

g/ Includes 100 mt designated designated for southern most portion of Columbia area and subject to different trip limit regulations.

h/ Includes sharks, skates, rays, ratfish, morids, grenadiers, jack mackerel, and arrowtooth flounder.

i/ All areas north of 39°N latitude.

trip limits were set at 25,000 pounds once per week of which no more than 7,500 pounds could be yellowtail rockfish. There were biweekly and semiweekly options available upon written notification. At the July 12-13 Council meeting, the GSG recommended the trip limit on yellowtail rockfish be reduced to 3,000 pounds or 20 percent of the Sebastes complex on board, whichever was greater, to keep the annual harvest near the ABC of 4,300 mt for the Vancouver and Columbia areas. This restriction became effective on July 26.

Management of Pacific ocean perch in 1989 presented the Council with a challenge. The ABCs were set at 0 but the OYs were set at 500 mt for the Vancouver area and 800 mt for the Columbia area to allow for incidental catch. In July, the GMT alerted the Council that the Columbia area OY would be met July 31 at the current landing rate. The Council recommended the trip limit be reduced to 2,000 pounds or 20 percent (by weight) of all legal fish on board, whichever was less, from 5,000 pounds or 20 percent (by weight) of all legal fish on board, whichever was less. Concurrently, the OY in the Columbia area was increased by 30 percent with the intent of preventing a fishery closure. The intent of the revised trip limit, which went into effect on July 26, was to accommodate incidental catches of Pacific ocean perch. The reduction in the trip limit was insufficient to keep landings within the OY of 1,040 mt in the Columbia area and the fishery closed on November 13. Landings for the year from the Vancouver and Columbia areas was 1,443 mt, 94 percent of the sum of the two OY.

Sablefish presented the Council with its greatest groundfish challenge in 1989. The stock assessment indicated that ABC should be 9,000 mt. Because the stock was still above MSY, the OY was set at 10,400 to 11,000 mt. The intent was to gradually fish the stock down to the level that produces MSY by managing for the low end of the OY, but if landings exceeded 11,000 mt, further landings would be prohibited for all gear types.

The initial allocations, excluding 22 mt for the Makah Indian Tribe, were 5,397 mt (52 percent) for trawl gear and 4,981 mt (48 percent) for nontrawl gear. A 600 mt reserve was established for uncertainties in landing projections, for incidental catches, and continuation of small nontrawl fisheries that operate later in the year. The trawl fishery began the fishing year with a trip limit of 1,000 pounds or 45 percent whichever was greater, of the deepwater complex. The deepwater complex was defined as sablefish, Dover sole, arrowtooth flounder, and thornyheads. The Council, at the April 4-7 meeting, was informed the sablefish landing rates were such that early fishery closure would occur: June 27 for nontrawl and September 21 for trawl. To minimize discards of sablefish in the trawl fishery and avoid large-scale disruption of the fishery, the Council recommended the trawl quota be increased by 1,000 mt (400 mt from nontrawl plus the 600 mt reserve) and altered the trawl trip limit. The new trip limit placed a once per week 30,000 pound limit on the deepwater complex of which no more than 1,000 pounds or 25 percent, whichever was greater, could be sablefish. There were also biweekly and twice weekly options available. The deepwater complex limit and trip frequency restriction were removed October 4, but the separate limit on sablefish remained in place. Directed fishing by nontrawl gear ended on July 17, when an incidental trip limit of 100 pounds per trip was implemented. On October 4 this limit was relaxed to 2,000 pounds or 20 percent of all groundfish on board, whichever was less. By year's end, trawl landings were 5,697 mt or 89 percent of the revised trawl allocation. The nontrawl fishery landed 4,417 mt or 96 percent of the nontrawl allocation.

1990 Fishery

The ABCs and OYs for the 1990 fishery were approved by the Council at the November 15-17, 1989, meeting in Portland, Oregon (Table 16). For those species requiring a numerical OY, landing limits were set at the estimated ABC with the exception of Pacific ocean perch and widow rockfish.

The initial and subsequent changes in management measures are shown in Table 7. Most management measures were similar to the previous two years. Trip limits were again used as the primary means of limiting landings of managed species. At present levels of fishing effort, trip limits offer the most viable method of meeting the Council objective of a year long groundfish fishery.

Landings in 1990 may be reduced in part to adverse weather conditions which prevailed for much of January and February. Lower landings are anticipated for Dover sole which set record landings in the Columbia area in 1989. Landings of thornyheads were nearly 7,000 mt through August and may exceed 10,000 mt by years end, a substantial increase over previous years.

Fleet size was similar to that of 1989 except that substantial effort from the shrimp fishery entered the groundfish fishery in August and September. This caused an increase in the deepwater complex fishery where effort was targeted on thornyheads. However, the landings of trawl caught sablefish also increased as well and in September, the GMT informed the Council that sablefish would become a prohibited species as early as November 8, 1990 if sablefish landings were not reduced by 50 percent during the last quarter. The Council responded by changing the definition of the deepwater complex (removing arrowtooth flounder) and placing a 15,000 pound trip limit on the deepwater complex while retaining the sablefish restriction. Removing arrowtooth flounder from the complex was justified by an analysis performed by Washington Department of Fisheries on Washington and Oregon trawl logbook data.

Nontrawl sablefish management also underwent several changes in 1990. In November 1989 the Council recommended the trawl/nontrawl allocation be revised from 58:42 to 62:38, and that the nontrawl season opening date be delayed to April 1. NMFS did not approve the Council's recommended management measures before the fishery opened on January 1. Therefore, the nontrawl trip limit in effect at the end of 1989 (the greater of 2,000 pounds or 20 percent of all fish on board) remained in effect until NMFS formally disapproved the Council's management recommendations. On January 31 the trip limit was rescinded, and nontrawl fishing was unrestricted. NMFS stated that the anticipated Indian tribal catch (300 mt) would be subtracted from OY, and reaffirmed that the remaining 8,600 mt would be allocated according to the 58:42 ratio established in 1989. On March 21, the nontrawl restriction on sablefish less than 22 inches (the greater of 1,500 pounds or 3 percent), which had been inadvertently dropped in the NMFS disapproval, was reinstated. The GMT projected that only 300 mt of the nontrawl quota would remain on June 24, and a 500 pound trip limit went into effect on that date. Further adjustments were made in July and again in September (Table 7). The September action which increased the trip limit to 2,000 pounds per trip was taken so that the nontrawl allocation could be fully utilized.

Table 16. ABCs for 1990 in mt for the California–Washington region by INPFC areas.

Species	Source[a/]	Vancouver[b/]	Columbia	Eureka	Monterey	Conception	Total	1989
Roundfish								
Lingcod	FMP	1,000	4,000	500	1,100	400	7,000	7,000
Pacific Cod	FMP	–	–	c/	c/	c/	3,200	3,100
Pacific Whiting[d/e/]	1989	–	–	–	–	–	245,000	300,000
Sablefish[d/]	1989	–	–	–	–	–	8,900	9,000
Rockfish								
Pacific Ocean Perch	1987	0	0	c/	c/	c/	0	0
Shortbelly[d/]	1989	–	–	–	–	–	13,000[f/]	10,000
Widow[d/]	1989	–	–	–	–	–	8,900[g/]	12,400
Other Rockfish								
Bocaccio	FMP	c/	c/	c/	4,100	2,000	6,100	6,100
Canary		800	2,100	600	c/	c/	3,500	3,500
Chilipepper[d/]	1986	–	–	–	–	–	3,600	3,600
Yellowtail	1988	1,100[h/]	2,900[i/]	300	c/	c/	4,300	4,300
Remaining Rockfish	1984	800	3,700	1,900	4,300	3,300	14,000	14,000
Flatfish								
Dover Sole	1984	2,400	11,500	8,000	5,000	1,000	27,900	27,900
English Sole[d/]	1986	–	–	–	–	–	1,900	1,900
Petrale Sole	1987	600	1,100	500	800	200	3,200	3,200
Other Flatfish	FMP	700	3,000	1,700	1,800	500	7,700	7,700
Other Fish[j/]								
Jack Mackerel[k/]	FMP	–	–	–	–	–	12,000	12,000
Others	1984	2,500	7,000	1,200	2,000	2,000	14,700	14,700

a/ Date refers to the date of the Council status of stocks document.
b/ U.S. portion.
c/ These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.
d/ Total all areas.
e/ Combined U.S. and Canadian waters. About 70 to 80 percent of the harvestable stock or 172,000 to 196,000 mt is expected to occur in U.S. waters in 1989.
f/ The FMP limits ABC increases to 30 percent per year; 13,000 mt is below the ABC of 13,900 to 43,000 mt recommended by the GMT.
g/ GMT recommended 7,900 mt; the Council set ABC at 8,900 mt and OY at 9,800 to 10,000 mt.
h/ U.S. portion of the Vancouver area, based on 50 percent of the total area stock.
i/ Includes 100 mt designated for southern most portion of Columbia area and subject to different trip limit regulations.
j/ Includes sharks, skates, rays, ratfish, morids, grenadiers, jack mackerel, and arrowtooth flounder.
k/ All areas north of 39°N latitude.

In November 1989, the GMT advised the Council that widow rockfish landings should be reduced substantially in 1990. The GMT recommended the 1990 ABC be set at 7,900 mt, down from the 12,400 mt ABC for 1989. The Council set ABC at 8,900 mt and OY at 9,800 mt to 10,000 mt, with the intention to manage for 9,800 mt. Landings of widow rockfish were projected to nearly reach 9,800 mt by the end of the year. Trip limits in 1990 were the most restrictive ever, 10,000 pounds per week or 25,000 pounds per 2 weeks. If the quota is not reached by the end of the year, it will be the first time that a single regulatory action has prevailed for the whole year for this species.

Management of the Sebastes complex south of Coos Bay Oregon in 1990 was unchanged from 1989; i.e., 40,000 pounds per trip without trip frequency restrictions. North of Coos Bay the trip limits were 25,000 per week of which no more than 7,500 pounds could be yellowtail rockfish. The GMT projected in July that additional restrictions for yellowtail rockfish would be necessary to stay within the harvest guideline. Subsequently, the Council recommended a reduction in the trip limit on yellowtail rockfish to 3,000 pounds per week or 20 percent of all Sebastes on board, whichever was greater. At the meeting in September, the Council was advised by the GMT that landings of yellowtail rockfish would exceed the harvest guideline. Because of a new stock assessment on yellowtail rockfish, the GMT advised the Council that an overage of 575 mt would not cause stress and no additional action was taken.

Management of Pacific ocean perch was not a problem in 1990. The trip limit implemented at the beginning of the year, 3,000 pounds per trip or 20 percent of all fish on board, whichever is less kept landing well within the quotas for both the Columbia and Vancouver areas.

Economic Status of the Washington, Oregon, and California Commercial Groundfish Fishery in 1989

Total shoreside landings in 1989 increased by 6.6 percent over 1988 to 97,700 mt. Joint venture landings of Pacific whiting again set a new record, increasing 47 percent to over 200,000 mt. As a result, the total commercial landed catch rose 31 percent over 1988 to a new high of 297,800 mt. The ex-vessel value of the total commercial landed catch was $89.1 million or 8.2 percent above the 1988 landed value. The ex-vessel value of shoreside landings decreased by 0.2 percent and joint venture value increased by 47 percent. A document providing a series of tables on the economic performance of the Washington, Oregon, and California groundfish fishery through 1989 is attached as Appendix M.

Foreign and Joint Venture Fishing Operations

Two types of fishing operations involving foreign vessels have been conducted off Washington, Oregon, and northern California since implementation of the MFCMA in 1977: the foreign trawl fishery (sometimes called the "directed fishery") in which fish are both caught and processed by foreign vessels, and the joint venture fishery, a domestic fishery in which U.S. trawl vessels deliver their catch to foreign processing vessels at sea. Foreign vessels are managed according to the groundfish FMP's regulations at 50 CFR 611.70, and the conditions and restrictions attached to individual foreign vessel permits issued by NMFS. The U.S. catcher vessels in the joint venture have been managed according to the regulations at 50 CFR 663, the same as U.S. vessels delivering

shoreside. A more detailed discussion of foreign and joint venture operations appears in Appendix E (available on request from the Council office).

Consistent with the intent of the MFCMA to encourage development of domestic fisheries, joint venture and shore-based landings of whiting generally have increased since 1978 (Table 17). Although shore-based deliveries of whiting have grown, they have comprised less than five percent of the total foreign and domestic harvest of whiting each year from 1978 to 1989, and probably 1990. In spite of the opportunities for joint venture and foreign fisheries, only 58 percent of the total whiting quota between 1978 and 1988 has been landed. However, since 1987, much higher proportions have been taken, reaching 94 percent in 1989. It appears that more than 90 percent of the OY will be taken in 1990 as well.

Foreign performance is perhaps more meaningful when compared with domestic landings of all groundfish species (Figure 4), not just whiting. The last year of foreign domination of groundfish landings was 1979. Since 1980, domestic landings (joint venture and shorebased) annually have contributed at least two thirds of the total groundfish landings, over 90 percent in 1982, 1983, 1984, and 1988. In 1985, due to the resurgence of the Polish directed fishery and diminished Soviet joint venture, about 70 percent of the total groundfish landings were made by domestic vessels. This percentage was maintained in 1986; although joint venture landings increased in 1986, foreign trawl landings also increased and shore-based landings declined, probably because U.S. fishermen turned to the more lucrative shrimp fishery that year. The proportion of domestic landings of groundfish increased to 80 percent in 1987 and 93 percent in 1988. In 1989 and 1990, with no foreign trawl fishery for whiting, the groundfish fishery off Washington, Oregon, and California was 100 percent domestic, as intended by the authors of the MFCMA.

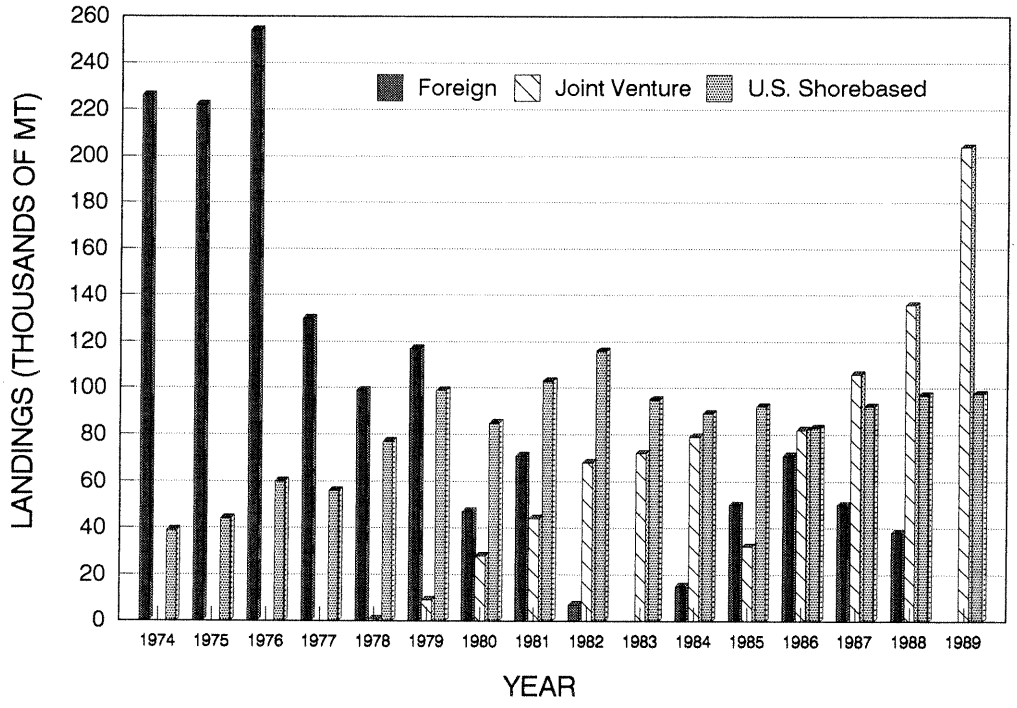

Figure 4. Pacific coast groundfish landings, 1974-1989.

Table 17. Landings and quotas for Pacific whiting.

Year	Foreign Fishery (mt)	Joint Venture (mt)	Shorebased (mt)	Total Landings (mt)[a/]	OY (mt)	Quota Landed (percent)
1978	96,827	856	689	98,372	130,000	76
1979	114,910	8,834	937	124,681	198,900	63
1980	44,023	27,537	793	72,353	175,000	41
1981	70,366	43,557	838	114,761	175,000	66
1982	7,089	67,465	1,024	75,578	175,500	43
1983	0	72,100	1,051	73,151	175,500	42
1984	14,772	78,889	2,721	96,382	175,500	55
1985	49,853	31,692	3,894	85,439	175,000	49
1986	69,861	81,639	3,463	154,963	295,800	52
1987	49,656	105,997	4,795	160,448	195,000	82
1988	18,041	135,781	6,876	160,698	232,000	69
1989	0	203,578	7,418	210,996	225,000	94
1990[b/]	0	171,000	Not Yet Available		196,000	--

[a/] Slight differences due to rounding.
[b/] Preliminary.

Shore-based landings of groundfish generally increased until 1983 when the full impact of regulations to limit landings of certain species began to be felt. Even though shore-based landings of groundfish have not returned to the peak levels of 1982, they have been higher than in the years before the MFCMA.

From its inception in 1978 until 1984, the joint venture for whiting grew steadily, and in 1984 accounted for almost half (47 percent) of the domestic landings of all groundfish species. However, in 1985, only 26 percent of the domestic groundfish landings were attributed to joint ventures. This decline occurred from reduced Soviet participation. (When the Soviets were "certified" by the Secretary of Commerce for excessive harvest of minke whales, their potential allocations were cut in half. The Soviets responded by not accepting any allocation for directed fishing in 1985 and reducing their joint venture contracts by half.) However, the trend of increasing proportions of joint venture landings in the domestic groundfish fishery resumed in 1986 and has continued since then. In 1986, joint venture landings virtually equaled shore-based landings of all groundfish species (including whiting) taken off Washington, Oregon, and California. In 1987, 1988, and 1989, joint venture landings contributed 54, 58, and 68 percent, respectively, of the domestic groundfish landings off Washington, Oregon, and California.

Considering all groundfish (foreign and domestic) landed off Washington, Oregon, and California, the joint venture accounted for 43 percent in 1983, 1984, and again in 1987. By 1988, the proportion increased to 50 percent, and peaked at 68 percent in 1989.

Some species that are fully utilized by domestic processors are caught unavoidably in the foreign and joint venture fisheries. These catches are not counted against quotas imposed on U.S. landings, and only small allowances are permitted in order to discourage their harvest. Only once have incidental species accounted for more than two percent of the annual catch in the foreign trawl fishery, in 1980 when six percent were taken. In the joint venture, less than five percent of the annual U.S. catch delivered to foreign processing vessels (including species that subsequently were discarded) have been incidental species, and generally less than a quarter of these were retained by the foreign vessels.

Salmon and Pacific halibut are prohibited species which means they must not be retained by any vessel involved in the directed foreign or joint venture fishery. Between 1977 and 1988, the average catch rate of salmon in the foreign fishery was 1 salmon per 12 mt of whiting (0.086 salmon per mt of whiting, Table 18). Between 1978 and 1989, the joint venture vessels averaged about 1 salmon per 8 mt of whiting received (0.121 salmon per mt of whiting). In 1989, the joint venture catch of salmon was about one-third lower than in the previous year, and the catch rate was about one-third (1 salmon per 22 mt of whiting) the 1978-1989 average (1 salmon per 8 mt of whiting). Preliminary data for 1990 indicate that both the catch and catch rate of salmon in the joint venture are similar to 1989 levels. Generally, over 90 percent of the salmon taken in these fisheries are chinook. In the joint venture in 1989, 98 percent of the salmon were chinook, averaging 56.6 cm (22.25 inches) in fork length and 2.67 kg (5.9 pounds) in weight. Only 1.6 percent were coho, averaging 54.0 cm (21.2 inches) in fork length and 2.06 kg (4.5 pounds) in weight. Less than 0.1 percent were chum salmon in the 1989 joint venture.

Table 18. Catch of salmon in joint venture and foreign trawl fisheries for Pacific whiting.

	Salmon (number)	Whiting (mt)	Number of Salmon Per Mt Whiting	Mt Whiting Per Salmon
Joint Venture				
1978	19	856	0.022	45
1979	1,623	8,834	0.184	5
1980	3,602	27,537	0.131	8
1981	6,422	43,557	0.147	7
1982	11,694	67,465	0.173	6
1983	5,143	72,100	0.071	14
1984	10,192	78,889	0.129	8
1985	1,575	31,692	0.050	20
1986	32,051	81,639	0.393	3
1987	8,636	105,997	0.081	12
1988	13,984	135,781	0.103	10
1989	9,199	203,578	0.045	22
Average	8,678	71,494	0.121	8
1990[a/]	9,367	167,173	0.056	18
Foreign Trawl				
1977	14,627	127,013	0.115	9
1978	5,905	96,827	0.061	16
1979	7,044	114,910	0.061	16
1980	4,831	44,023	0.110	9
1981	5,052	70,366	0.072	14
1982	104	7,089	0.015	68
1983		No Fishery in 1983		
1984	63	14,772	0.004	234
1985	713	49,853	0.014	70
1986	11,739	69,861	0.168	6
1987	4,649	49,656	0.094	11
1988	2,185	18,041	0.121	8
Average	5,174	60,219	0.086	12
1989		No Foreign Fishery		
1990		No Foreign Fishery		

[a/] Incomplete; preliminary data through September 15, 1990.

Between 1977 and 1989, small numbers of Pacific halibut have been taken in these fisheries, averaging about 1 halibut in 1,100 mt of whiting in the foreign fishery, and 1 halibut in 1,600 mt of whiting in the joint venture. The joint venture took 1 halibut in approximately 1,800 mt of whiting in 1989, close to the 11-year average. Preliminary data indicate the 1990 catch rate (about 1 halibut per 2,000 mt of whiting) is below average in the joint venture; the number of halibut caught has been quite small, only 77 fish through September 15, 1990.

GMT RECOMMENDED ESTIMATES OF ABC FOR 1991

The recommended levels of ABC for 1991 are listed in Table 19. In addition, comparisons of MSY, ABC, landings, stock condition, and abundance trends for Pacific coast groundfish stocks are summarized in Table 20. The ABCs of some species have not changed from the 1990 specifications.

Stock assessments for west coast groundfish are conducted by staff scientists of the California Department of Fish and Game, Oregon Department of Fish and Wildlife, Washington Department of Fisheries, Southwest Fisheries Science Center of the NMFS, and the Alaska Fisheries Science Center of NMFS. Preliminary stock assessments were presented to an ad hoc review group in August 1990. These assessments were used by the GMT to recommend preliminary levels of ABC which were adopted by the Council in September 1990. Final ABCs and resultant management measures will be adopted by the Council in November 1990. Following is a synopsis of ABC estimates for each principal species. Information from the abstracts of available stock assessments is reported here because the appendices containing the stock assessments are bound in separate volumes.

General Features

Stock Synthesis Model

Assessments of west coast groundfish stocks in 1990 have generally been conducted through use of the stock synthesis model[3/]. This tool is similar to other stock assessment tools (e.g., cohort analysis, catch-at-age analysis) in its handling of the interaction between a fishery and the exploited stock, but it provides much greater flexibility in the types of fishery and survey data that can be examined. The model is structured to simultaneously analyze catch biomass, age and length composition and effort from multiple fisheries, and abundance and age and length composition from multiple surveys. This flexibility has allowed quantitative examination of stocks and fisheries that could not be analyzed by other techniques. Although the nature of the available information rarely provide narrow constraints on the range of feasible model results, the model has provided a useful tool for organizing the available data and exploring the limits of our knowledge with regard to the history and current status of each stock.

$F_{35\%}$ Exploitation Rate

This year the GMT has adopted a new standard for setting the target level of exploitation. This standard, $F_{35\%}$, is the fishing mortality rate that would

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3/ Methot, Richard D. 1990. Synthesis Model: An Adaptable Framework for Analysis of Diverse Stock Assessment Data. INPFC Bulletin Number 50: 259-277.

Table 19. Preliminary GMT recommendations for ABCs for 1991 in mt for the Washington–California region by INPFC areas.

Species	Vancouver[a/]	Columbia	Eureka	Monterey	Conception	Total	1990
Roundfish							
Lingcod	1,000	4,000	500	1,100	400	7,000	7,000
Pacific Cod[b/]	–	–	c/	c/	c/	3,200	3,200
Pacific Whiting[b/]	–	–	–	–	–	228,000[d/]	196,000
Sablefish[b/]	–	–	–	–	–	8,900	9,000
Rockfish							
Pacific Ocean Perch	0	0	c/	c/	c/	0	0
Shortbelly[b/]	–	–	–	–	–	13,000	13,000
Widow[b/e/]	–	–	–	–	–	7,000	8,900
Other Rockfish							
Bocaccio	–	–	800[f/]	800[f/]	800[f/]	800	6,100
Canary	800	1,500	600	c/	c/	2,900	3,500
Chilipepper[b/]	–	–	–	–	–	3,600	3,600
Yellowtail	1,200	3,100[g/]	300	c/	c/	4,600	4,300
Thornyhead	c/	3,200	1,300	1,400	c/	5,900	–
Remaining Rockfish	800	3,700	1,900	4,300	3,300	14,000	14,000
Flatfish							
Dover Sole	2,400	6,100	8,000	5,000	1,000	22,500	27,900
English Sole[b/]	–	–	–	–	–	1,900	1,900
Petrale Sole	600	1,100	500	800	200	3,200	3,200
Other Flatfish	700	3,000	1,700	1,800	500	7,700	7,700
Other Fish[h/]							
Jack Mackerel[i/]	–	–	–	–	–	12,000	12,000
Others	2,500	7,000	1,200	2,000	2,000	14,700	14,700

[a/] U.S. portion.
[b/] Total all areas.
[c/] These species are not common nor important in the areas footnoted. Accordingly, for convenience, Pacific cod is included in the "Others" category for the areas footnoted and rockfish species are included in the "Remaining Rockfish" category for the area footnoted only.
[d/] Based on the Council's preliminary recommendation of 90 percent of the coastwide ABC of 253,000 mt.
[e/] The GMT recommended 7,900 mt ABC for 1990; Council set ABC at 8,900 and OY at 9,800 to 10,000 mt.
[f/] Includes Eureka area, but its contribution is small, and recreational catch.
[g/] Includes 100 mt designated for southern most portion of Columbia area and subject to different trip limit regulations.
[h/] Includes sharks, skates, rays, ratfish, morids, grenadiers, and jack mackerel.
[i/] All areas north of 39°N latitude.

Table 20. Comparisons of MSY, ABC, domestic shorebased landings, stock condition, and abundance trends for major Pacific coast groundfish stocks coastwide, 1989–1991.

Species	MSY	Assessment Status	Coastwide 1989 ABC	Coastwide 1989 Landings	Coastwide 1990 ABC	Coastwide 1990 Projected Landings[a]	Coastwide 1991 Preliminary ABC	Stock Condition	Abundance Trend
Flatfish									
Dover Sole	16,300	New	27,900	18,797	27,900	16,518	22,500	Above MSY	Declining
English Sole	4,500	Needed	1,900	2,395	1,900	1,787	1,900	Unknown	Unknown
Petrale Sole	3,200	Needed	3,200	2,135	3,200	1,720	3,200	Unknown	Unknown
Remaining Flatfish[b]	At Least ABC	Needed	7,700	6,513	7,700	7,511	7,700	Unknown	Declining
Rockfish									
Bocaccio	2,400	New	6,100	1,763[c]	6,100	474[d]	800	Below MSY	Declining
Chilipepper[d]	2,300	Needed	3,600	724	3,600	204	3,600	Unknown	Unknown
Canary Rockfish	3,500	New	3,500	2,230	3,500	1,593	2,900	Near MSY	Stable
Yellowtail Rockfish	4,500	New	4,300	4,217	4,300	4,145	4,600	Near MSY	Stable
Remaining Rockfish	Not Avail.	Needed	14,000	3,698	14,000	3,393	14,000	Unknown	Unknown
Sebastes Complex[e]	Not Appl.	Not Appl.	Not Appl.	12,631	Not Appl.	9,810	Not Appl.	Not Appl.	Not Appl.
Pacific Ocean Perch	2,500	Adequate	0	1,456	0	922	0	Below MSY	Stable
Shortbelly Rockfish	29,000	Adequate	10,000	2	13,000	0	13,000	Above MSY	Unknown
Widow Rockfish	8,300	New	12,400	12,722	8,900	7,924	7,000	Near MSY	Stable
Unspecified Rockfish	Not Appl.	Not Appl.	Not Appl.	9,140	Not Appl.	8,844	Not Appl.	Not Appl.	Not Appl.
Thornyheads	Not Avail.	New	Not Avail.	7,925	Not Avail.	9,733	5,900	Unknown	Declining
Other Species									
Jack Mackerel	12,000	Needed	12,000	0	12,000	0	52,500	Above MSY	Unknown
Lingcod	7,000	Needed	7,000	3,447	7,000	2,790	7,000	Unknown	Unknown
Pacific Cod	Not Avail.	Adequate	3,200	2,184	3,200	1,061	3,200	Unknown	Unknown
Pacific Whiting	251,000[f]	New	300,000[f]	7,418[g]	245,000[f]	5,618[g]	253,000[f]	Near MSY	Declining
Sablefish	8,700	New	9,000	10,255	8,900	8,560	8,900	Near MSY	Stable
Others[h]	At Least ABC	Not Appl.	14,700	694	14,700	98	14,700	Unknown	Unknown

[a] Projected landings for 1990 are the sum of January through August 1990, and September through December 1989.
[b] Remaining flatfish consists of all flatfish except Dover sole, English sole, and petrale sole.
[c] From 1990 bocaccio assessment document, not from PacFIN.
[d] Landing estimates do not include substantial landings of this species which are included under "Unspecified Rockfish".
[e] Sebastes complex consists of all rockfish except Pacific ocean perch, shorbelly rockfish, widow rockfish, and thornyheads.
[f] Total stock.
[g] Domestic shorebased only. Joint venture landings were 203,578 mt in 1989 and are an estimated 171,000 mt for 1990.
[h] Includes shark, skates, rays, morids, ratfish, and grenadiers.

reduce expected spawn production per female to 35 percent of its unfished level (Figure 5). This standard was reviewed in the analysis for the overfishing definition (FMP Amendment Number 5), and is supported by an independent analysis (Clark 1990).[4/] $F_{35\%}$ is intended as a proxy for F_{msy} (Figure 6), and it replaces other standards such as $F_{0.1}$. The problem with $F_{0.1}$ is that it examines only the marginal increase in yield per recruit as fishing mortality is increased and can cause large decreases in spawning biomass if fish recruit to the fishery before they become mature. This is especially true for trawl-caught sablefish. The problem with F_{msy} is that it is tightly linked to an assumed level of density-dependence in recruitment. The GMT does not have sufficient information to determine the level of density-dependence in recruitment for any stock. $F_{35\%}$ strikes a balance between obtaining a large fraction of the maximum sustainable yield if recruitment is highly insensitive to reductions in spawning biomass, and preventing a rapid depletion in stock abundance if recruitment is found to be extremely sensitive to reductions in spawning biomass.

The long-term expectations under an $F_{35\%}$ policy cannot be precisely defined. The $F_{35\%}$ policy recommends harvest of a fixed fraction for the stock each year. This harvest will reduce the expected, lifetime spawn production by each female entering the stock to 35 percent of the lifetime spawn production for females that are unfished, and will reduce the average total abundance of the female spawning stock to a level that is less than or equal to 35 percent of its virgin level. If this reduction in total stock causes no reduction in recruitment, then the long-term average female spawning stock level will be 35 percent of its unfished level and a large long-term average yield will be obtained. However, if the reduction in total female spawning stock causes some reduction in average recruitment, then future total female spawning stock levels will be less than 35 percent of the virgin level and future yields will be reduced also. In several cases we have calculated a level of MSY under the assumption that recruitment declines to 90 percent as spawning biomass is fished down to 50 percent of its virgin level. This is just one of several plausible levels of MSY (Figure 6), depending on the true level of density-dependence in recruitment, and is included for reference and continuity with past reports.

Discard Mortality

An additional general feature of stock assessments conducted in 1990 is that a factor for discard mortality is incorporated where it is reasonable to assume that market conditions or trip limit regulations cause discard. The GMT's recommendations on dealing with discard mortality were submitted to the Council in April 1990. Discard was considered to be negligible for some species of rockfish, and range up to about 20 percent for trawl-caught sablefish. Levels of ABC continue to be set for landed catch. For sablefish, Dover sole, and widow rockfish there is an assumed level of discard mortality that will occur in addition to this landed catch. This level of discard is accounted for in the assessment and projections of potential yield. These assumed levels of discard

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4/ Clark, William G. 1990. Groundfish Exploitation Rates Based on Life History Parameters. Submitted to Canadian Journal of Fisheries and Aquatic Sciences.

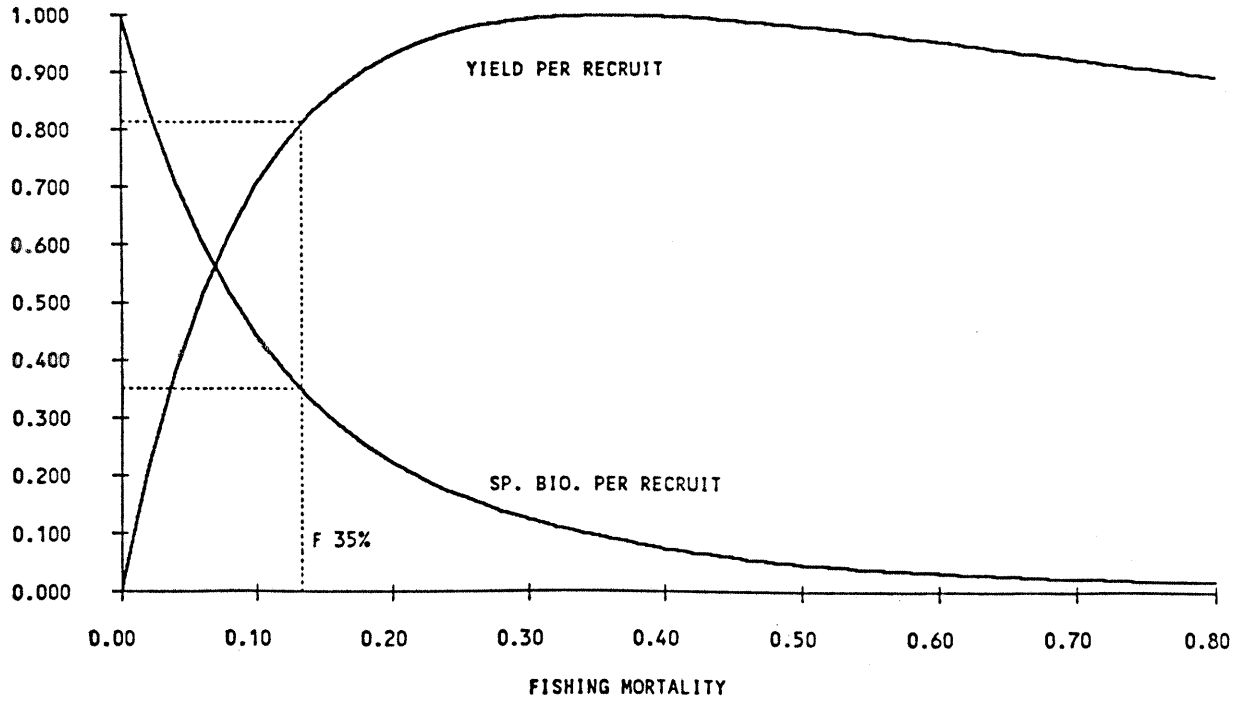

Figure 5. Expected relative yield per recruit and spawning biomass per recruit as a function of the rate of fishing mortality. Spawning biomass per recruit is equivalent to the expected lifetime egg production by a female entering the population. The level of fishing mortality indicated by $F_{35\%}$ will reduce spawning biomass per recruit to 35 percent of its unfished level.

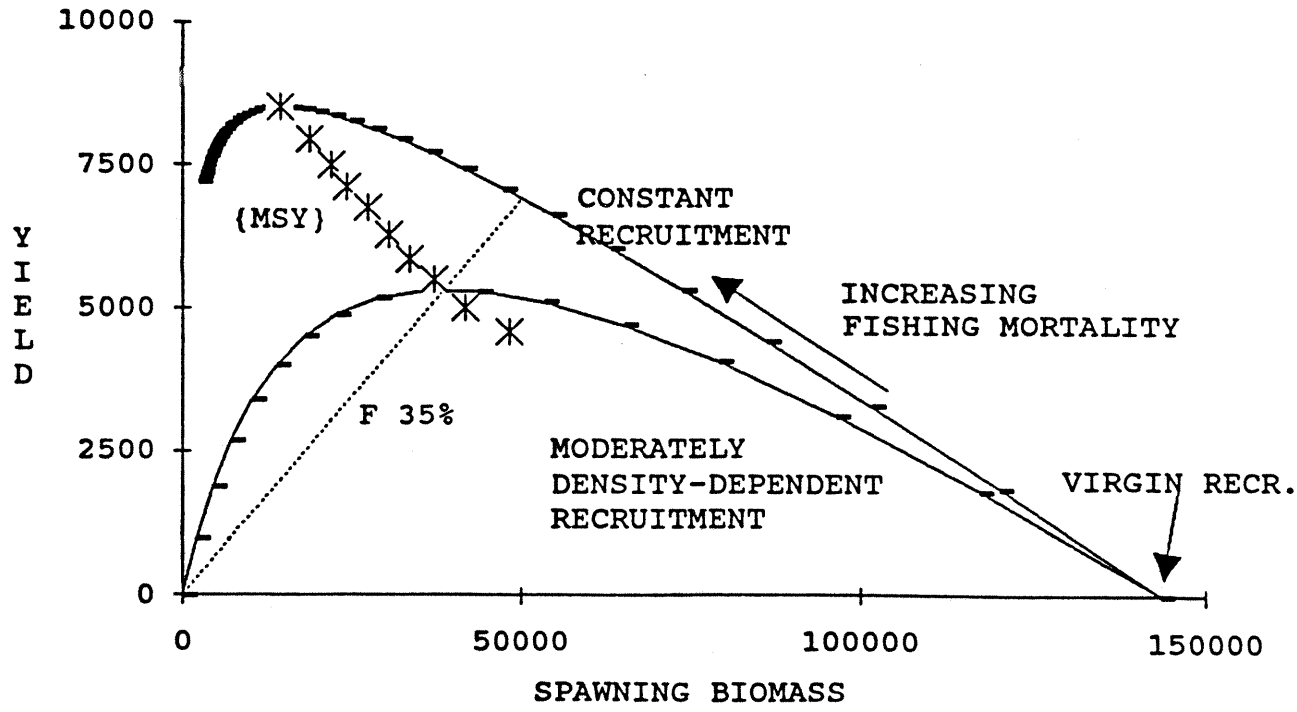

Figure 6. Relationship between equilibrium yield and female spawning biomass is displayed by the two curves, with tic marks indicating levels of fishing mortality at which these curves were evaluated. The upper curve describes a situation in which recruitment is independent of spawning biomass. The lower curve indicates a plausible, but arbitrary, level of density-dependence with a Beverton-Holt type of recruitment function. A set of possible MSY levels for a range of density-dependence is delineated by the stars. The relation between yield and spawning biomass upon application of the $F_{35\%}$ level of fishing mortality, which reduces each female's expected lifetime egg production to 35 percent of its unfished level, is indicated by the dotted line. The stock is expected to come to equilibrium where this dotted line intersects the true, but unknown, yield-spawning biomass curve. If the lower curve shown on the figure is the true level of density-dependence, then application of $F_{35\%}$ will produce MSY in this example.

are generally based on field observations[5/], but there is no monitoring to verify the true, current level of discard.

Pacific Whiting

The total harvest of Pacific whiting by the U.S. and Canada in 1990 is expected to be 269,500 mt, down from a high of 309,000 mt in 1989. The fishery continues to be supported by the strong 1980 and 1984 year classes. Assessment surveys in 1989 estimated the population biomass as 1.637 million mt, a decline of 24 percent from estimates made in 1986, but a lesser decline than projected in last year's assessment. In the 1990 assessment, the stock synthesis model is used to estimate age-structured population abundance, past levels of female spawning biomass, and recruitment for the 1959-1987 year classes. The assessment model was revised to include geographic structure and to estimate the parameters of a function defining the age-specific, annual migration of fish across the U.S.-Canada border. Recruitment estimates and fishery selectivity coefficients from the stock synthesis model are used with an age-structured simulation model to estimate sustainable yield under different harvesting strategies and levels of reduction in female spawning biomass. Constant, $F_{35\%}$ exploitation rates are not recommended for this species because of its extraordinary variability in recruitment and its young, but difficult to sample, age at maturity. Several harvesting strategies are explored: a constant F strategy; a variable F strategy, where fishing mortality for a particular year is proportional to the level of female spawning biomass; and a hybrid strategy that combines features of the other two policies. The hybrid strategy avoids the extreme variability in yield of the variable F strategy, yet increases protection of the stock at low levels of female spawning biomass. Long-term average yield depends on risk levels defined as the frequency with which female spawning biomass is expected to fall below a cautionary level of 457,000 mt. Estimates of average yield ranged from 168,000 to 227,000 mt for the constant F strategy, and from 187,000 to 235,000 mt for the hybrid strategy over a reasonable range of low biomass frequency. When a hybrid fishing strategy is applied to the projected numbers at age in 1991, the potential coastwide yield for 1991 is calculated to be 253,000 mt. The prospects in the immediate future for the Pacific whiting resource are for stable or declining yields depending on the timing of the next strong year class. The GMT recommended that 80 percent of the total ABC in 1990 be allocated to the U.S. fishing zone and 20 percent to the Canadian zone. The GMT defers recommendation on allocation in 1991 to a management group charged with this task.

Sablefish

The landings of sablefish in 1989 were 10,234 mt and the landed catch in 1990 is expected to be close to the ABC of 8,900 mt. The west coast sablefish stock was assessed in 1990 through application of the synthesis model to fishery size and age composition data from 1986-1989 and trawl and pot survey data. There were two significant changes in this year's assessment. First, the assessment was split into northern (U.S.-Vancouver and Columbia INPFC areas) and southern areas on the basis of known low rates of mixing of adult sablefish, and new evidence

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5/ Pikitch, Ellen K., Daniel L. Erickson and John R. Wallace. 1988. An Evaluation of the Effectiveness of Trip Limits as a Management Tool. Northwest and Alaska Fisheries Center Processed Report 88-27: 33.

of slower growth among fish captured off California. Second, greater reliance was placed on the trawl survey biomass estimates from southern Oregon because this area constitutes a significant fraction of the northern assessment area and a survey in 1989 replicated abundance levels observed in 1984 and 1988. The recommended assessment results that match this biomass level do not, however, provide a good match to the decline in the pot survey's estimate of sablefish abundance. The northern area's assessment indicates the biomass of age-3+ sablefish was about 80,400 mt at the beginning of 1990 and the biomass of mature females was 36,100 mt. This level of spawning biomass is intermediate between 38,800 mt (35 percent of virgin spawning biomass) and 31,800 mt (spawning biomass that produces MSY under previously assumed level of recruitment density-dependence), so this area's stock is judged to be approximately at its optimum level. Application of the $F_{35\%}$ exploitation policy to the expected 1991 biomass produces a recommended landed yield of 4,130 mt for the northern area, plus an expected trawl discard of 600 mt. The assessment in the southern area has greater uncertainty because of the lesser amount of survey data. The recommended assessment indicates that the biomass of age-3+ fish at the beginning of 1990 was 87,600 mt and the biomass of mature females was 45,200 mt. This level of spawning biomass is above 39,300 mt (35 percent of virgin spawning biomass) and 33,400 mt (spawning biomass that produces MSY under previously assumed level of recruitment density-dependence). Application of the $F_{35\%}$ exploitation policy to the expected 1991 biomass produces a recommended landed yield of 4,730 mt for the southern area, plus an expected trawl discard of 690 mt. A single, coastwide ABC of 8,860 mt is recommended for 1991.

Pacific Cod

The GMT recommends no change in the coastwide ABC for Pacific cod from the previous level of 3,200 mt which was set in 1989 at the highest catch of record. The catch reported by PacFIN for 1989 was 2,183 mt for all areas. No MSY is specified for this species because the Washington, Oregon and California area is the southern end of its range, and because environmental factors have a more significant influence on Pacific cod recruitment and stock abundance, in this area, than fishing.

Lingcod

No changes are recommended in the area-specific ABCs for lingcod. These are: Vancouver - 1,000 mt; Columbia - 4,000 mt; Eureka - 500 mt; Monterey - 1,100 mt; and Conception - 400 mt. The catch by area in 1989 was Vancouver - 807 mt; Columbia - 1,430 mt; Eureka - 377 mt; Monterey - 777 mt; and Conception - 21 mt.

Pacific Ocean Perch

A rebuilding program was established for Pacific ocean perch in 1981 following depletion of this stock during the 1960s and early 1970s. An assessment in 1987 indicated that the stock remained depleted. A review in 1990 of recent commercial fishery length data did not indicate any significantly strong year classes entering the fishery. The research surveys, which generally capture younger fish did indicate some evidence of incoming strong year classes, although none rivalled the magnitude of the 1970 cohort. This signal is encouraging, but significant rebuilding has not occurred, and the GMT recommends the ABC remain at zero in both the Vancouver and Columbia areas.

The GMT recognizes that incidental catches will occur and recommends that trip limits be set to allow a purely incidental fishery. High landings of 943 and 1,102 mt occurred in the Columbia area during 1988 and 1989, respectively. In 1990, the incidental catch rate was reduced to 3,000 pounds per trip and the landed catch decreased to about 400 mt, which is less than the pre-1989 level. With respect to other areas, Pacific ocean perch are neither common nor important and are included in the "Remaining Rockfish" category.

Shortbelly Rockfish

The age, growth and potential yield of shortbelly rockfish were re-examined in 1989 and no new work was conducted in 1990. Shortbelly rockfish remains an unexploited, virgin stock at present, thus is difficult to quantitatively assess. The extremes of the MSY estimates from two alternative yield calculations were 13,900 mt to 47,000 mt. The GMT recommends maintaining the ABC at 13,000 mt until further data can be collected.

Widow Rockfish

The stock synthesis model was used to estimate fishing mortality rates and population size for widow rockfish, using 1979-1990 landings estimates and 1980-1989 age composition data. For the three levels of fishing mortality (F) in 1989 considered most likely (0.25, 0.35, and 0.45), estimates of 1991 biomass ranged from 41,200 to 81,300 mt. The estimate of $F_{35\%}$ was 0.21 at a natural mortality rate of 0.15 and 0.255 for M = 0.20. The projected 1991 landing at $F_{35\%}$ ranged from 3,400 to 7,100 mt, depending on the assumed F for 1989. The recommended ABC of 7,000 mt is near the high end of this range, and is also consistent with last year's recommendation of 7,800 mt which was obtained by applying a higher level of fishing mortality (based on $F_{0.1}$) to a lower level of estimated biomass. As in previous years, the age composition data for 1989 indicate a continued fishing down of the older age groups and that the 1982 and 1983 year classes are relatively weak.

Bocaccio

Trawl landings of bocaccio were about 2,000 mt annually during the late 1970s, increased to about 4,700 mt by 1981 with the recruitment of the large 1977 year class, then fell to just over 1,000 mt since 1985. In 1989 the total landed catch of about 1,800 mt is composed of about two-third trawl catch, one-sixth set net, and one-sixth recreational catch. The previous assessment conducted in 1985 set the ABC at 6,100 mt. A new assessment was conducted in 1990 by applying the stock synthesis model to data from all three fishery components and NMFS trawl surveys. All data sources indicate a declining resource, and the model estimates that biomass has fallen from about 75,000 mt in 1978 to 7,000 to 14,000 mt in 1990. A significant fraction of the observed decline is due to poor recruitment since 1978. The spawning biomass in 1991 is probably less than 25 percent of the average, unfished level. The projected yield at $F_{35\%}$ in 1991 ranges from 800 to 1700 mt, and the preliminary ABC for 1991 was set equal to this range.

Canary Rockfish

The status of the canary rockfish stock in the Columbia area was assessed through application of the stock synthesis model to catch data from 1967-1989, age composition data from 1980-1988, trawl fishery effort data from 1980-1987, and

triennial trawl survey data from 1977-1989. The model was used to determine the most plausible level of virgin recruitment ranged from 1.25 to 1.75 million age-5 fish. At the extremes of this range, the female spawning biomass in 1989 was 16 to 33 percent of its virgin level, and fishing mortality for the age at maximum selectivity ranged from 0.143 to 0.370 in 1989. An interesting result is that male and female canary rockfish are estimated to have asymptotic availability to the trawl fishery, but the low observed proportion of old females is due to increased natural mortality for mature females.

The $F_{35\%}$ ranged from 0.135 to 0.190 and maximum long-term average yield at this level of fishing mortality would be 1,060 to 1,300 mt. Application of $F_{35\%}$ to the range of estimated 1991 biomass produces yields in the range 1,050 to 1,950 mt, and the GMT recommends the ABC for INPFC Columbia area be set equal to the midpoint which is 1,500 mt. Average catch from 1985-1989 was 1,320 mt in this area and the previous ABC of 2,100 mt has not been achieved since it was established in 1984. Catches in the INPFC Vancouver and Eureka areas have been close to or below current ABC levels of 800 and 600 mt, respectively. The GMT recommends no change in ABC for these areas.

Chilipepper Rockfish

The status of the chilipepper rockfish resource was last assessed in 1986. At that time, the coastwide ABC was set at 3,600 mt. The GMT does not recommend a change in the ABC for 1991, but does recognize that this species is an increasingly important component of the rockfish fishery in California, especially with the decline in bocaccio abundance. The GMT recommends a high priority for assessment of this species.

Yellowtail Rockfish

The status of the yellowtail rockfish stock was assessed in 1988 and the ABC for the U.S.-Vancouver and Columbia INPFC areas was set at 4,000 mt. This species is a prime target of the rockfish fishery in Washington and northern Oregon, and landed catch in 1989 and 1990 slightly exceeded the ABC. The GMT examined the magnitude of this excess harvest relative to the status of the stock and concluded that the excess harvest would not, in the short term, drive the stock below its optimum level.

A new assessment was conducted in 1990 using the stock synthesis model. This assessment takes advantage of two additional years of fishery age composition data, and splits the stock's range into three assessment areas that correspond more closely to known patterns of the species' distribution. As in previous assessments, the estimated current biomass was difficult to pinpoint because of the lack of quantitative auxiliary data. The assessment identified that natural mortality probably increases for older females; e.g., the same pattern that was identified for canary rockfish. In the Eureka/south Columbia area, the total population biomass is estimated at 13,100 to 21,600 mt and the female spawning biomass is greater than 50 percent of its virgin level. The recommended ABC in 1991 is 1,350 mt. This level of catch would exceed the known catch of record of 1,281 mt in 1983 and compares with 1,088 mt landed in 1989. In the north Columbia area, the 1991 total biomass is estimated to be 25,200 to 54,400 mt, and female spawning biomass is estimated to be between 28 and 64 percent of the unfished level. The recommended yield for 1991, 2,085 mt, is based on application of $F_{35\%}$ to the low end of this range because of recent declines in

observed recruitment. This level of ABC is similar to the 1989 landed catch of 2048 mt. Stock condition was also estimated for the south Vancouver area, which extends into Canadian waters to near the middle of Vancouver Island. Total biomass in 1991 is estimated to be in the range 20,600 to 39,700 mt and spawning biomass is estimated to be 23 to 48 percent of the virgin level. Application of $F_{35\%}$ to the low end of this range produces a recommended yield in 1991 of 2,040 mt. The recommended share for U.S. fisheries is 60 percent or 1,200 mt, which is slightly below the U.S. harvest of 1,400 mt in 1989. The GMT set the 1991 ABC for the U.S.-Vancouver and Columbia areas at 4,300 mt which is 300 mt greater than the previous level. The total female spawning biomass for the three assessment areas was 8,330 to 35,600 mt. These levels are 30 to 58 percent of estimated virgin levels and, at the low end, are essentially identical to the level that produces MSY under a level of density-dependence in which recruitment declines to 90 percent as female spawning biomass declines to 50 percent of its virgin level.

Thornyheads

The thornyhead (Sebastolobus spp.) market category supports an expanding fishery; coastwide landings during 1989 were almost 8,000 mt and landings during 1990 are expected to be in excess of 11,000 mt. In 1989, thornyheads accounted for 21 percent of total revenues from the deepwater complex (thornyheads, Dover sole, sablefish, and arrowtooth flounder). Shortspine thornyhead account for the majority of the landed catch, but the proportion of longspine thornyheads has increased in recent years. Age determinations, although unverified, indicate that thornyheads are among the most long-lived groundfish with maximum ages near 150 years. Accordingly, estimated natural mortality and growth rates are low, and the recommended level of fishing mortality ($F_{35\%}$) is in the range 0.03 to 0.06 per year. Some estimates of shortspine thornyhead density are available from trawl surveys in the Columbia and Conception INPFC areas and from underwater camera observations. Expansion of these density estimates to available habitat in the Monterey-Eureka-Columbia INPFC areas provides an estimate of biomass in each area. Application of $F_{35\%}$ to each of these biomass estimates indicates that recent harvests probably are too high, especially in the Eureka area. The GMT recommends a new 1991 ABC for shortspine and longspine thornyhead in the Monterey-Eureka-Columbia areas (where most of the harvest occurs) of 5,900 mt. This harvest level is similar to the landed catch in 1988 and substantially below the expected catch in 1990.

Remaining Rockfish

Remaining rockfish in the Vancouver and Columbia areas are defined as all rockfish except Pacific ocean perch, yellowtail, canary, widow, and shortbelly. In the Eureka, Monterey, and Conception areas, bocaccio and chilipepper rockfish are excluded from this category, but yellowtail and canary rockfishes are included. Because the GMT now recommends establishment of a separate ABC for thornyheads in the Monterey-Eureka-Columbia areas, thornyheads are removed from the remaining rockfish category in these three INPFC areas.

The GMT recommends the ABCs remain unchanged in 1991, that is, Vancouver - 800 mt; Columbia - 3,700 mt; Eureka - 1,900 mt; Monterey - 4,300 mt; and Conception - 3,300 mt. However, an examination of declines in mean length for several rockfish species in the Conception-Monterey-Eureka area suggests that fishery removals are having a noticeable impact on these stocks. The GMT does

not have sufficient information to recommend a specific harvest guideline for the remaining rockfish in this area, but does recommend that fishing mortality in this area be restrained.

Dover Sole

Size and age composition data from the INPFC Eureka and Columbia areas were analyzed by the stock synthesis model. The assessment for the Columbia area included data from trawl surveys conducted by NMFS on the continental slope off southern Oregon. Strong and weak year classes are not obvious in the age composition data, so this preliminary assessment was conducted under the assumption of constant recruitment. Sharp increases in the percentage of small Dover sole occurred beginning in 1983-1984, probably related to changes in market acceptance and in codend mesh sizes. The model accommodated these changes by introducing a new estimate of size-specific availability at that point in the time series. Two plausible levels of recruitment are identified for each area, and result in an approximately two-fold range in estimated current biomass.

In the Eureka area, recent landed catches have declined to about 4,000 mt and the stock seems to be in equilibrium, although lack of auxiliary data and movement of the fishery into deeper water hamper quantitative assessment. MSY, estimated under an assumed level of density-dependent recruitment, is in the range 4,200 to 5,300 mt. The current female spawning biomass is estimated to be well above the target level, and the range of $F_{35\%}$ yields for 1991 is 7,970 to 11,900 mt. The GMT recommends an ABC at the lower end of this range, especially pending a trawl survey planned for the Eureka area in late fall 1990. In the Columbia area, recent landed catches have increased to about 8,000 mt. MSY is estimated to be in the range 3,400 to 4,800 mt. Female spawning biomass in 1991 is estimated to be in the range 30,500 to 67,600 mt, which is 37 to 56 percent of virgin spawning biomass and above the target level of spawning biomass. Application of $F_{35\%}$ in 1991 would produce yields of 4,160 to 7,960 mt and the GMT recommends the midpoint of this range, 6,100 mt. If the lower biomass scenario is actually correct, then continued harvests of 8,000 mt will drive the Columbia area stock below its target level in about three years.

English Sole

No full analysis of the status of this species has been conducted since 1986. The GMT recommends no change in the coastwide ABC of 1,900 mt, but identifies this species as a good candidate for future stock assessment efforts because landed catch in 1989 was slightly above this level.

Petrale Sole

A stock assessment for the Vancouver and Columbia areas was conducted in 1987. The GMT recommends continuation of the ABCs recommended at that time: Vancouver - 600 mt; Columbia - 1,100 mt; Eureka - 500 mt; Monterey - 800 mt; and Conception - 200 mt. This total ABC of 3,200 mt is greater than the 1989 landed catch of 2,110 mt.

Other Flatfish

The GMT recommends no change in the ABCs for this group of species: Vancouver - 700 mt; Columbia - 3,000 mt; Eureka - 1,700 mt; Monterey - 1,800 mt; and

Conception - 500 mt. This coastwide ABC of 7,700 mt is greater than the 1989 catch of 6,500 mt (3,545 mt of arrowtooth flounder and 2,955 mt of other flatfish). The landed catch of arrowtooth flounder has increased in recent years and the GMT recommends that an assessment of this species be conducted in the near future.

Jack Mackerel

The GMT reviewed available information on productivity of jack mackerel at its October meeting. These data indicated that the current, nearly unfished spawning biomass is about 1.5 million short tons, the natural mortality rate is in the range of 0.1 to 0.2, a fishery located north of 39° is expected to harvest fish that are mostly older than age-16, and the long-term potential yield for this age range is 19,000 mt. The GMT recommends that the short-term yield for ages-16+ be set at 52,600 mt on the basis of a constant exploitation rate (equal to natural mortality) applied to estimates of current biomass. Biomass and short-term yield are expected to slowly decline under this level of exploitation. If this level of exploitation reduces long-term biomass to approximately 30 to 50 percent of the current biomass, then the long-term average yields for this age range would be near 19,000 mt. The GMT recommends close tracking of this fishery, especially with regard to catches outside of the EEZ and to the age composition of the harvested fish.

Other Groundfish

The GMT recommends no change in the coastwide ABC of 14,700 mt.

GMT RECOMMENDED HARVEST GUIDELINES AND QUOTAS FOR 1991

The GMT recommends quota management for Pacific whiting, shortbelly rockfish, and jack mackerel because of potential joint venture fisheries. The recommended level of these quotas is the ABC. Harvest guidelines are recommended for Pacific ocean perch, widow rockfish, yellowtail rockfish, sablefish, Dover sole, thornyheads, bocaccio and the Sebastes complex north of Coos Bay. The recommended level of each harvest guideline is equal to the ABC, except for Pacific ocean perch which has an ABC equal to zero.

In 1990, Pacific ocean perch was managed by a highly restrictive trip limit of 3,000 pounds per trip. The GMT recommends continuation of this trip limit, and establishment of a coastwide harvest guideline of 1,000 mt which is approximately 20 percent greater than the expected catch of 800 to 850 mt in 1990. This harvest guideline is not a target and it is established to accommodate expected increases in groundfish trawl effort in 1991. The GMT does not recommend establishment of separate harvest guidelines for each management area, but we will continue to track harvests of Pacific ocean perch within each management area.

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Washington, Oregon, and California Groundfish Fisheries

by

Charles S. Korson

Prepared for the

THIRTY-FIRST ANNUAL MEETING
of the
TECHNICAL SUBCOMMITTEE
of the
CANADA/UNITED STATES GROUNDFISH COMMITTEE

June 1990
Sitka, Alaska

Southwest Region
National Marine Fisheries Service
300 South Ferry Street
Terminal Island, California 90731

Summary of the Fishery in 1989

The following tables present statistics on annual landings, exvessel values, and fishing vessel fleet size for the commercial groundfish fisheries off Washington, Oregon, and California from 1981 through 1989. During the 1989 fishing year, shoreside landings increased by 6.6 percent over 1988 to 97,700 mt. Joint venture Pacific whiting landings again set a new record, increasing 47 percent to over 200,000 mt. As a result, the total commercial landed catch rose 31 percent over 1988 to a new high of 297,800 mt. The exvessel value of the total commercial landed catch was $89.1 million or 8.2 percent above the 1988 landed value. The exvessel value of shoreside and joint venture landings increased 7 percent and 47 percent, respectively.

Shoreside groundfish landings for individual species/species groups were generally higher in 1989, with lingcod, widow rockfish, and all flatfish species increasing in magnitude. Landings of sablefish and Pacific cod were lower in 1989.

Landings were higher for trawl and longline gear, but dropped slightly for pot gear. Despite the substantial increase in groundfish trawl landings, the number of trawl vessels making at least one landing of groundfish in 1989 fell by 7 vessels. This is the first year for the groundfish trawl fleet to contract since 1986. The groundfish pot fleet grew for the second consecutive year, while the size of the longline fleet appears to have reversed a three year declining trend. As in past years, the status of the groundfish setnet fleet cannot be determined due to insufficient data.

Table 1 - Quantity and exvessel value of groundfish landings in Washington, Oregon, and California, including joint venture deliveries in waters off these states, 1988-89.

	1988	1989	% Change
Shoreside (mt)	91,636	97,683	+6.6
Joint Venture (mt)[1]	133,365	200,045	+47.3
Total WOC Landings	227,419	297,728	+30.9
Shoreside Values $			
Current	67,646,000	67,544,000	-0.2
Real [1]	63,901,000	61,482,000	-3.8
Joint Venture Value			
Current	14,682,000	21,562,000	+46.9
Real	13,869,000	19,627,000	+41.5
Total WOC Groundfish Landed Value			
Current	82,328,000	89,106,000	+8.2
Real	77,771,000	81,109,000	+4.3

Source: Pacific Coast Fishery Information Network (PacFIN) Groundfish report series, preliminary data June 1990; 1988 preliminary data, May 1989. NMFS, Northwest Regional Office

1/ Includes Pacific whiting retained by foreign processors after landings by U.S. vessels. Does not include whiting that are landed, but eventually discarded, nor incidental species for which U.S. fishermen are not paid. Discarded whiting landings totaled 2,418 mt in 1988 and 3,532 mt in 1989.

2/ Real values are current values adjusted to eliminate the effects of inflation. This adjustment has been made by dividing current values by the current year GNP implicit price deflator, with a base year of 1986. The GNP deflators are 1.0586 in 1988 and 1.0986 in 1989.

Table 2 - Average annual exvessel prices paid for some commercially important groundfish species, 1980-1989.

	Sablefish		All Rockfish Combined		Widow Rockfish		Dover Sole		English Sole		Petrale Sole	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1980	.199	.265	.159	.212	-	-	.211	.281	.328	.437	.458	.611
1981	.215	.262	.169	.206	.135	.164	.223	.270	.297	.362	.512	.624
1982	.252	.289	.195	.224	.157	.180	.233	.267	.318	.365	.606	.696
1983	.237	.262	.223	.246	.192	.212	.224	.247	.322	.356	.682	.755
1984	.218	.232	.251	.267	.225	.240	.231	.246	.321	.343	.709	.755
1985	.334	.343	.281	.289	.250	.257	.240	.246	.333	.342	.736	.756
1986	.374	.374	.313	.313	.275	.275	.258	.258	.360	.360	.777	.777
1987	.472	.461	.350	.343	.322	.314	.305	.298	.402	.393	.816	.797
1988	.525	.496	.323	.305	.286	.270	.304	.287	.392	.370	.816	.771
1989	.476	.433	.319	.290	.258	.235	.275	.261	.365	.332	.816	.074

Source: PacFIN, Groundfish Report Series, preliminary data.
State Fishery Agencies.

NOTE: Real prices were adjusted for inflation using the GNP implicit price deflator, where 1986=1.00.
All prices are weighted averages.

Table 3 - Washington, Oregon, and California shoreside commercial groundfish landings (metric tons) and exvessel value (thousands of dollars), 1980-1989.

Year	California		Oregon		Washington		Total Coast	
	mt	$	mt	$	mt	$	mt	$
1980	36,862	16,551	28,515	11,425	22,514	9,119	87,891	37,095
1981	42,578	21,448	37,502	14,721	23,093	10,100	103,173	46,269
1982	52,608	27,795	41,023	20,445	25,368	11,405	118,999	59,645
1983	39,498	21,984	35,158	18,345	22,970	11,257	97,626	51,586
1984	40,570	22,914	28,209	15,234	21,080	10,474	89,859	48,622
1985	43,062	26,516	29,023	17,095	19,229	12,449	91,314	56,060
1986	41,246	28,522	24,931	16,813	16,081	10,905	82,298	56,240
1987	41,410	30,682	30,626	24,328	20,292	16,872	92,329	71,881
1988	39,420	28,213	31,845	23,748	20,371	15,686	91,635	67,646
1984-88 Average	41,142	27,369	28,927	19,444	19,441	13,277	89,487	60,090
1989	40,766	28,800	36,845	25,207	20,072	13,537	97,683	67,544

Source: State Fishery Agencies
PacFIN, Groundfish Report Series; preliminary data, 1981-1988.

Table 4 - Commercial landings (mt) of individual groundfish species by state, 1988-1989.

Species	California		Oregon		Washington	
	1988	1989	1988	1989	1988	1989
Lingcod	873	1135	999	1,175	756	1,136
Pacific Cod	5	-	1,022	780	2,305	1,403
Pacific Whiting	6,541	7,302	246	89	88	27
Sablefish	3,784	3,891	4,068	3,998	2,926	2,415
Pacific Ocean Perch	26	10	728	1,014	49	431
Widow Rockfish	1,847	1,578	5,445	6,964	3,555	4,176
Other Rockfish	14,345	15,327	8,898	10,431	5,686	3,933
Dover Sole	8,176	7,711	7,583	8,903	2,241	2,177
English Sole	1,062	1,040	577	693	454	662
Petrale Sole	785	827	894	863	452	444
Other Flatfish	1,709	1,699	1,369	1,919	1,553	2,887

Source: PacFIN, Groundfish Report Series, 1988 preliminary data, June 1990.
PacFIN, Groundfish Report Series, 1988 preliminary data, May 1989.

Table 5 - Landings and exvessel value of individual groundfish species landed in Washington, Oregon, and California, 1988-1989.[1]

Species	1988		1989		% Change	
	mt	$	mt	$	mt	$
Lingcod	2,629	2,122,100	3,446	2,665,000	+31.1	+25.6
Pacific Cod	3,332	1,945,700	2,183	1,246,000	-34.5	-36.0
Pacific Whiting	6,876	1,145,400	7,418	1,081,400	+7.9	-5.6
Sablefish	10,778	12,468,300	10,254	10,769,800	-0.05	-13.6
Pacific Ocean Perch	803	514,300	1,455	869,300	+81.2	+6.9
Widow Rockfish	10,847	6,827,500	12,717	7,227,700	+17.2	+5.9
Other Rockfish	28,928	21,550,800	29,691	22,744,500	+2.6	+5.5
Dover Sole	18,000	12,053,500	18,791	11,384,400	+4.4	-5.5
English Sole	2,093	1,809,800	2,395	1,928,300	+14.4	+6.5
Petrale Sole	2,131	3,835,200	2,134	3,836,500	+0.1	+0.03
Other Flatfish	4,631	2,968,000	6,505	3,314,300	+40.5	+11.7
TOTAL	91,048	67,240,600	96,989	67,067,200	+6.5	-0.2

Source: PacFIN, Groundfish Report Series, 1989 preliminary data, June 1990; 1988 preliminary data, May 1989.

1/ Includes domestic landings from U.S. coastal waters off WOC, but not Puget Sound; A small amount of landings of miscellaneous groundfish species are not included in the totals.

Table 6 - Washington, Oregon, and California landings and exvessel value of sablefish by gear, 1988-1989.[1]

	Total WOC 1988				Total WOC 1989			
	mt		$		mt		$	
Ground. trawl	5,262.4	(48.8)	4,169.5	(33.4)	5,647.2	(55.1)	4,551.4	(42.3)
Pot	2,018.7	(18.7)	2,651.7	(21.3)	1,924.4	(18.8)	2,285.4	(21.2)
Longline/Setline[2]	3,124.2	(29.0)	5,362.9	(43.0)	2,562.1	(25.0)	3,845.7	(35.7)
Net	60.2	(0.6)	41.0	(0.3)	55.4	(0.5)	35.5	(0.3)
Other	312.3	(2.9)	243.2	(1.9)	64.9	(0.6)	51.8	(0.5)
Total	10,777.8		12,468.3		10,254.0		10,769.8	

Source: PacFIN, Groundfish Report Series, preliminary data, May 1989.
PacFIN, Groundfish Report Series, preliminary data, June 1990.

1/ Figures in parentheses are the percentages each gear group contributed to the total landed catch and exvessel value.

2/ Includes California commercial pole-and-line gear.

Table 7 - West Coast groundfish shoreside landings (metric tons) by gear group, 1981-1989.

	Trawl	Trap/ Pot	Setline[1]/ Longline	Gill/Set[2] Net	Other/Misc
1981	90,797	3,956	3,997	1,632	2,791
1982	103,299	6,530	4,384	2,077	2,709
1983	81,668	5,423	2,191	2,243	6,101
1984	72,693	3,854	1,989	2,199	9,124
1985	75,352	3,703	4,603	3,918	3,737
1986	61,249	2,216	5,894	4,205	8,734
1987	74,719	2,076	6,952	3,903	4,740
1988	73,460	2,186	5,679	2,864	7,487
1989	83,782	1,992	5,753	2,302	3,869

Source: PacFIN, Groundfish Report Series, preliminary data, May 1989.
PacFIN, Groundfish Report Series, preliminary data, June 1990.

1/ Includes commercial pole catch for California landings, because large quantities of sablefish and rockfish are landed with this gear in PacFIN.

2/ Includes gill net, set net, and other net; but not dip, trammel, seine, or miscellaneous nets.

Table 8. Exvessel value (thousands of dollars) of West Coast groundfish landings by gear group, 1981-1989.

	Trawl	Trap/Pot	Set/Longline[1]	Gill/Set[2] Net	Other/Misc
1981	37,855	2,081	3,696	1,468	2,169
1982	46,987	4,863	4,551	1,814	1,430
1983	40,987	3,598	2,091	1,742	3,578
1984	36,885	2,338	2,083	1,955	5,361
1985	41,264	3,154	5,329	3,367	2,946
1986	36,916	2,171	6,811	3,715	6,627
1987	52,162	2,347	9,527	3,806	4,032
1988	48,010	2,797	8,573	2,709	3,928
1989	52,107	2,370	7,954	2,293	2,828

Source: PacFIN, Groundfish Report Series, preliminary data, May 1989.
PacFIN, Groundfish Report Series, preliminary data, June 1990.

1/ Includes commercial pole catch for California landings, because large quantities of sablefish and rockfish are landed with this gear as reported in PacFIN.

2/ Includes gill net, set net, and other net; but not dip, trammel, seine, or miscellaneous.

Table 9 - Number of shoreside vessels in Washington, Oregon, and California commercial groundfish fleets, 1981-1989.

Year	Otter Trawl	Pot/Trap[1]	Longline[1]
1981	408	66	191
1982	444	82	208
1983	436	59	185
1984	397	34	96[2]
1985	358	32	129[2]
1986	308	25	190[2]
1987	318	26	186[3]
1988	349	29	156[3]
1989	342	36	159[3]

Note: Data are preliminary, therefore, numbers are subject to change as updated information on fleets is received.

Source: State Fishery Agencies

1/ Vessels landing fish caught with this gear-type in two or more states are counted in each state for years 1982-83. These numbers therefore are an upper bound for the true number of vessels using this gear-type in these years. 1988 data updated with three additional vessels than reported originally.

2/ Represents number of longline vessels landing in Oregon and Washington, where double counting has been eliminated; California data unavailable for those years.

3/ Includes count for sablefish longline vessels landing in California and Oregon and all coastal longline vessels landing in Washington.

Table 10 - Washington, Oregon, and California groundfish shoreside trawl fleet characterisics, 1983-88.[1]

	1986	1987	1988	1989
Total Number Landing	308	318	349	342
Frequency by Size (length) Class				
< 30 feet	1	1	7	6
30-39	9	10	10	12
40-49	73	73	75	65
50-59	87	85	95	92
60-69	90	94	98	102
70-79	37	38	45	47
80-89	6	10	8	10
> 90	5	7	8	7
Missing	-	-	3	1
Vessel Characteristics:				
Average Length	58.2	58.2	58.4	59.0
Average Horsepower	310.8	318.9	317.8	330.8
Average Net Tonnage	47.6	49.7	48.8	42.3
Number Vessels Based in Each State				
California	126	121	130	127
Oregon	110	120	136	140
Washington	72	77	83	75
Vessels Landing in More Than One State	34	35	37	30

Source: State Fishery Agencies

1/ Preliminary data

Table 11 - West Coast commercial groundfish shoreside landings, exvessel values (thousands of dollars) and average vessel gross revenues for selected gear groups, 1981-89. (Numbers of vessels using gear types other than the three listed below are unknown).

Year	Groundfish Otter Trawl[1]			Pot/Trap			Longline		
	mt	$	Average $ per vessel	mt	$	Average $ per vessel	mt	$	Average $ per vessel
1981	90.800	37,900	92.9	3,956	2,080	31.5	3,997	3,700	11.3
1982	103,300	47,000	105.8	6,530	4,860	59.3	4,384	4,600	13.2
1983	81,700	40,600	93.1	5,423	3,600	61.0	2,191	2,100	7.2
1984	72,700	36,900	92.9	3,854	2,340	68.8	1,989	2,100	N/A
1985	75,400	41,300	115.4	3,703	3,154	98.6	4,603	5,300	N/A
1986	61,200	36,900	119.8	2,216	2,171	86.8	5,894	6,800	N/A
1987	74,700	52,200	164.1	2,076	2,347	90.3	6,952	9,500	51.1
1988	73,500	48,000	137.5	2,186	2,797	96.4	5,679	8,600	55.1
1989	83,800	52,100	152.3	1,992	2,370	65.8	5,753	8,000	50.3

Source: PacFIN, Groundfish Report Series, preliminary data.

1/ Includes bottom, roller, and midwater trawls.

Table 12 - Landings and participation in Pacific Whiting joint-venture fisheries off of Washington, Oregon, and California, 1979-89.

Year	Landings (mt)	Estimated Dollar Value ($)	Number of Trawl Vessel	Average Revenue Per Vessel ($)
1979	9,054	1,162,000	11	105,600
1980	26,793	3,275,000	15	218,300
1981	43,758	6,345,000	21	302,100
1982	68,420	10,367,000	17	609,800
1983	72,140	10,217,000	19	537,700
1984	79,047	11,841,000	21	563,800
1985	31,567	3,751,000	17	220,700
1986	81,855	8,760,000	25	350,400
1987	106,095	11,663,000	30	388,800
1988[1]	135,365	14,682,000	40	367,100
1989[1]	200,045	21,562,000	65	331,700

Source: PacFIN, Groundfish Report Series
NMFS, Northwest Regional Office

1/ Beginning in 1988, data sources permitted separation of total landings from whiting that was retained by foreign processors, and for which U.S. fishermen were paid. Therefore, figures reflect retained landings, excluding whiting that are eventually discarded. Discarded whiting totaled 2,418 mt in 1988 and 3,532 mt in 1989.

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