DRAFT FOR SECRETARIAL REVIEW

ENVIRONMENTAL ASSESSMENT FOR AMENDMENT 38 TO THE FISHERY MANAGEMENT PLAN FOR THE GROUNDFISH FISHERY OF THE GULF OF ALASKA

TO AMEND THE GULF OF ALASKA PACIFIC OCEAN PERCH REBUILDING PLAN

Prepared by

Staff
National Marine Fisheries Service
Alaska Region

June 1996

Executive Summary

Decline of the Pacific ocean perch (POP) stock since the early period of the foreign fishery prompted the North Pacific Fishery Management Council (Council) to recommend a rebuilding plan for POP. The POP Rebuilding Plan was contained in Amendment 32 to the Fishery Management Plan for Groundfish of the Gulf of Alaska, which was approved by the Secretary of Commerce in 1993. The POP Rebuilding Plan provides a specific rebuilding strategy for POP stocks, based on available biological and economic information. An algorithm, or formula, was selected to annually determine the POP total allowable catch (TAC). However, the amendment did not provide for any flexibility in setting TAC below this amount. In December 1994 the Council requested an analysis of alternatives for modifying the FMP to allow this flexibility.

Three alternatives are considered:

Alternative 1: Status quo. Maintain the current procedure for specifying the annual TAC amounts for POP as detailed in the FMP. The current means of calculating the TAC was part of the policy alternative adopted by the Council under Amendment 32, the Rebuilding Plan.

Alternative 2: [The Preferred Alternative]. Amend the FMP to allow the Council to recommend a POP TAC *at or below* the amount dictated by the Rebuilding Plan. Any downward adjustment in the TAC from the Rebuilding Plan amount would be based on biological or resource conservation concerns about the Pacific ocean perch resource or associated with the Pacific ocean perch fishery that are not accounted for in the Rebuilding Plan or the annual Stock Assessment and Fishery Evaluation reports or to maintain the TAC within the bounds of the ABC, in cases where the calculated TAC results in an amount that is higher than the ABC. The current formula for specifying the TAC would be the upper-bound limit and the POP TAC could be annually specified at or below this level in one or more of the GOA regulatory areas or districts.

Alternative 3: Re-evaluate the Rebuilding Plan to reconsider the Council's intended harvest strategy. The Council would direct staff to complete an analysis of alternatives to the Rebuilding Plan should this alternative be chosen.

The primary difference between alternative 2 and 3 is that Alternative 2 would not change the general direction established by the Rebuilding Plan except to allow the Council flexibility in recommending annual Gulf of Alaska (GOA) POP TACs if the Council identified specific biological or conservation issues that were not adequately addressed by the Rebuilding Plan TAC level. However, if the Council believes that the general direction of the Rebuilding Plan, which will allow for increasing POP TAC levels as the POP biomass increases, does not reflect how they wish to pursue POP rebuilding in the future, Alternative 3 would provide for a re-evaluation of the Rebuilding Plan to reconsider alternative harvest strategies. If socioeconomic concerns exist with respect to the management of the POP fishery, particularly in the Eastern GOA, Alternative 3 would allow for a separate FMP amendment to address these issues separately from the conservation issues addressed under the POP Rebuilding Plan.

The economic impact of a particular annual POP TAC, under Alternative 2, will depend on the difference between the TAC as determined by the Rebuilding Plan formula, and the amount recommended by the Council. POP is harvested by trawl vessels; therefore, any reduction in TAC from the Rebuilding Plan amount will result in a loss in revenue to trawl catcher/processors currently participating in the POP fishery, that may or may not be made up in the future. Unless these losses are offset by other benefits identified by the Council and NMFS, the reduction in TAC would result in a net loss.

The economic value of a directed fishery for POP derives from the value of all species harvested - including species like sablefish and some rockfishes which are themselves on "bycatch-only" status and may be harvested only in directed fisheries for other species. Harvests during the 1995 directed trawl fisheries for POP (Table 4) illustrate the importance of these other bycatch species. The estimated wholesale processed product value of the 1995 directed trawl fisheries for POP was about $6.7 million. POP contributed about $3 million to the value, other rockfish approximately $1.9 million, and sablefish bycatch about $1.6 million.[1] As discussed in Section 3.0, the wholesale value of the catch overstates the potential economic loss because it is not adjusted for operating costs.

1.0 INTRODUCTION

The groundfish fisheries in the Exclusive Economic Zone (EEZ) (3 to 200 miles offshore) in the Gulf of Alaska are managed under the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA FMP). The GOA FMP was developed by the North Pacific Fishery Management Council (Council) under the Magnuson Fishery Conservation and Management Act (Magnuson Act). It was approved by the Secretary of Commerce and became effective in 1978.

Actions taken to amend Fishery Management Plans or implement other regulations governing the groundfish fisheries must meet the requirements of Federal laws and regulations. In addition to the Magnuson Act, the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA).

NEPA, E.O. 12866 and the RFA require a description of the purpose and need for the proposed action as well as a description of alternative actions which may address the problem. This information is included in Section 1. Section 2 contains information on the biological and environmental impacts of the alternatives as required by NEPA. Impacts on endangered species and marine mammals are also addressed in this section.
This Environmental Assessment (EA) addresses alternatives to amend the Pacific Ocean perch (POP) Rebuilding Plan in the GOA FMP.

---

[1]The wholesale processed product value overestimates the net economic value of the POP directed fishery because adjustments have not been made for costs of harvesting and processing.

1.1 Purpose of and Need for the Action

Decline of the POP stock since the early period of the foreign fishery (early 1960's) prompted the Council to request an analysis of alternative rebuilding strategies for POP. This analysis was presented as Amendment 32 to the GOA FMP in 1993 (November 8, 1993). The Council adopted a particular rebuilding strategy, based on available biological and economic information. This rebuilding plan contains a formula, specified in the FMP, for determining the TAC. The amendment does not provide for any flexibility in recommending a TAC at a level other than that which is dictated by the formula.

The Council is concerned that the TAC level in a given year, as specified in the FMP, may be inconsistent with the Council's intent for rebuilding the POP resource. Under the current Rebuilding Plan the potential also exists for the calculated TAC to be greater than the ABC; were this to occur it would be inconsistent with the current management practice for other groundfish stocks. At its December 1994 meeting, therefore, the Council requested that NMFS prepare an analysis for providing the flexibility to lower the TAC below the level specified in the FMP, which is similar to the latitude that the Council has to lower TAC for other species. The intent is to allow the Council to set a TAC amount that could accomodate unaccounted for biological or resource conservation concerns about the POP resource or associated with the POP fishery and/or to keep the POP TAC within the bounds of the ABC.

This document presents alternatives for modifying the Rebuilding Plan.

1.2 Rockfish Management

Amendment 32 to the GOA FMP established a plan to rebuild stocks of the rockfish Pacific Ocean perch (Sebastes alutus) in the GOA. POP is a highly valued groundfish. It was heavily exploited by a foreign trawl fleet from the early 1960's until the mid-1980's. Thereafter, a domestic at-sea processing fleet harvested POP at a substantially lower rate. Catches of POP peaked in 1965 when an estimated 350,000 mt were harvested by the foreign fleet; catches declined sharply in the late 1960's. From 1961-77, annual POP landings averaged over 40,000 mt; after 1977, landings averaged 6,000 mt. In the domestic fishery, POP was managed as part of a larger slope rockfish assemblage of about 20 species until 1991, when POP was established as a separate target species category to prevent possible overfishing.

As a result of increased concern about the declined status of POP stocks, biomass assessment methodology has been improved, POP has been managed as a single species and domestic harvest levels have been reduced. The 1994 TAC of 2,550 mt, derived from the rebuilding plan calculations, was available only as incidental catch in other groundfish fisheries, except for a short-term directed fishery in the Eastern GOA. In 1995 the TAC for POP as determined by the Rebuilding Plan was 5,630 mt, enough to support a directed fishery.

The original analysis for Amendment 32 examined various exploitation strategies for POP, including a bycatch-only harvest policy. The analysis is presented in the EA/RIR to Amendment 32 (November 8, 1993). After examining biological and socioeconomic information, the Council adopted a rebuilding plan for POP that set the harvest as outlined under Alternative 1.

Under the Rebuilding Plan an acceptable biological catch (ABC) is set for this species for the GOA and this ABC is apportioned among regulatory areas based on the biomass distribution. The TAC is determined using the formula and is then apportioned to each regulatory area according to the percentage biomass distribution used for the ABC apportionment. However, some Council members continue to express conservation concerns related to the rebuilding of the POP resource and about the lack of flexibility to lower the TAC to accomodate those concerns.

Available scientific information indicates that harvest of POP at the rates prescribed under the current rebuilding plan is not jeopardizing the rebuilding of POP. The TAC amount recommended for 1995, and for 1996, is consistent with the rebuilding plan as chosen by the Council.

Although the current rebuilding plan was chosen by the Council to achieve optimum yield and proper conservation and management of POP in the Gulf of Alaska there may be circumstances under which optimum yield would not be achieved with the current rebuilding plan.

1.3 Historical Catch

Tables 1 through 3 present recent catch information for POP. Additional historical catch information was presented in the EA/RIR/FRFA for the Rebuilding Plan. Table 1 summarizes POP catch by gear type from 1992 through 1995. Tables 2 and 3 summarize the 1994 and 1995 POP catch by target fishery and gear. Target fishery designations on the NMFS in-season database group all rockfish directed fisheries together rather than distinguishing among directed fisheries for the individual rockfish species groups (see Table 4 in Section 3 for further detail on the 1995 POP directed fishery).

Table 1. Blend Estimates of Pacific ocean perch by gear type in the Gulf of Alaska, (retained and discarded), in metric tons, 1992-1995.

	TRAWL		HOOK & LINE		POT		TOTAL - all gear types		
	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	TOTAL
1992	4,720	1,812	6	0.40	0	0.09	4,726	1,812	6,538
1993	426	1,632	3	0.03	0	0	429	1,632	2,061
1994	769	1,083	2	0	0	0	771	1,083	1,854
1995	4,637	1,147	0.24	1	0.06	0.20	4,637	1,147	5,786

Source: Blend estimates of catch as of 11/2/95.

Table 2. 1994 Blend estimates of Pacific ocean perch catch in the Gulf of Alaska by target fishery (metric tons).

		WGOA			CGOA			EGOA			TOTAL - GOA		
Gear	Target	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total
Trawl	Rockfish	34	45	79	54	261	315	554	187	741	642	493	1,135
	Atka mackerel	0	74	74	0	1	1	0	0	0	0	75	75
	Pollock	<1	<1	<1	0	3	3	3	0	3	3	3	6
	Pacific cod	<1	11	11	10	6	16	0	0	0	10	17	27
	Deepwater flat	0	0	0	32	306	338	1	22	23	33	328	361
	Shallow water flat	0	0	0	2	11	13	0	0	0	2	11	13
	Rex sole	0	0	0	41	151	192	0	0	0	41	151	192
	Flathead sole	1	0	1	35	0	35	0	0	0	36	0	36
	Unknown	0	0	0	2	5	7	0	0	0	2	5	7
	Total - Trawl	35	130	165	175	744	920	557	209	767	769	1,083	1,852
Hook and line		<1	0	<1	1	0	1	1	0	1	2	0	2
Pot		0	0	0	0	0	0	<1	0	<1	<1	0	<1
	Total all targets	35	130	165	176	744	921	558	209	768	771	1,083	1,854

Source: Blend estimates of catch as of 8/29/95.

Table 3. 1995 Blend estimates of Pacific ocean perch catch in the Gulf of Alaska by target fishery (metric tons)

		WGOA			CGOA			EGOA			TOTAL		
Gear	Target	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total
Trawl	Rockfish	1,331	71	1,402	1,601	447	2,048	1,605	109	1,714	4,537	627	5,164
	Atka mackerel	0	0	0	0	59	59	0	0	0	0	59	59
	Bottom pollock	2	2	4	14	<1	14	0	0	0	16	2	18
	Pacific cod	6	4	10	22	25	47	0	0	0	28	29	57
	Deepwater flat	0	0	0	30	59	89	0	14	14	30	73	103
	Shallow water flat	<1	5	5	0	28	28	0	0	0	0	33	33
	Rex sole	0	0	0	10	310	320	0	0	0	10	310	320
	Flathead sole	0	1	1	<1	4	4	0	0	0	0	5	5
	Unknown	<1	0	<1	16	10	26	0	1	0	16	10	26
	Total - Trawl	1,339	83	1,422	1,693	942	2,636	1,605	124	1,728	4,637	1,147	5,786
Hook and Line		0	<1	<1	<1	1	1	<1	0	0	<1	1	1
Pot		0	0	0	<1	<1	<1	<1	0	<1	<1	<1	<1
	Total all targets	1,339	83	1,422	1,693	943	2,637	1,605	124	1,728	4,637	1,149	5,787

Source: Blend estimates of catches as of 11/2/95.

1.4 Alternatives Considered

Alternative 1: Status quo. Maintain the current procedure for specifying the annual TAC amounts for POP as detailed in the FMP. The current means of calculating the TAC was part of the policy alternative adopted by the Council under Amendment 32, the Rebuilding Plan.

Amendment 32 to the FMP established the procedure for deriving the annual GOA TACs for POP. POP stocks are considered to be rebuilt when the total biomass of mature females is equal to or greater than Bmsy. Annual TACs, under the current FMP, are established as follows:

(a) Determine the current biomass, Bmsy, and the optimal fishing mortality rate;

(b) Determine the fishing mortality rate half way between the optimal fishing mortality rate and the fishing mortality rate estimated to be sufficient to supply unavoidable bycatch of POP based on 1992 bycatch rates;

(c) When the current biomass of mature females is less than Bmsy, adjust the resultant fishing mortality rate in (b) by the ratio of current biomass to Bmsy so that when Bmsy is attained, the fishing mortality rate will be the optimal fishing mortality rate;

(d) The GOA TAC of POP is the amount of fish resulting from the adjusted fishing mortality rate in (c); and

(e) The TAC is apportioned among regulatory area in proportion to POP biomass distribution.

Alternative 2: [The Preferred Alternative]. Amend the FMP to allow the Council to recommend a POP TAC *at or below* the amount dictated by the Rebuilding Plan. Any downward adjustment in the TAC from the Rebuilding Plan amount would be based on biological or resource conservation concerns about the Pacific ocean perch resource or associated with the Pacific ocean perch fishery that are not accounted for in the Rebuilding Plan or the annual Stock Assessment and Fishery Evaluation reports, or to maintain the TAC within the bounds of the ABC, in cases where the calculated TAC results in an amount that is higher than the ABC. The current formula for specifying the TAC would be the upper-bound limit and the POP TAC could be annually specified at or below this level in one or more of the GOA regulatory areas or districts.

As with other species, NMFS would consider the Council's TAC recommendations during the annual specification process. If the Council chooses to recommend a POP TAC lower than the Rebuilding Plan amount, the administrative record must include the additional biological concerns that lead to this recommendation which were not addressed by the Rebuilding Plan TAC amount. In addition to the Council's recommendation, NMFS also will consider scientific

information presented by the Plan Team, the Council's Scientific and Statistical Committee, as well as other sources of biological information.

The Council may wish to have the flexibility to adjust the TAC downwards because the possibility exists under the current FMP for the ABC to be set lower than the TAC. The ABC for POP is currently calculated using F_{opt} but another F level could be chosen to calculate the ABC, resulting in an ABC lower than the TAC.

Alternative 2 **[The Preferred Alternative]** does not, in itself, dictate a lower TAC amount. The proposed FMP amendment would only give the Council the authority to recommend a lower POP TAC in the annual specifications process, as can be done with other species' TACs, to address biological or conservation concerns that are not adequately addressed under the Rebuilding Plan. If socioeconomic concerns exist with respect to the management of the POP fishery, particularly in the Eastern GOA, the Council could consider a separate amendment to address these issues separately from the conservation issues addressed under the POP Rebuilding Plan.

Alternative 3: Re-evaluate the current Rebuilding Plan to reconsider the Council's intended harvest strategy.

If the Council believes that the existing POP Rebuilding Plan does not adequately address its biological concerns, or is not meeting other POP rebuilding goals, the Council could consider re-evaluation of the existing rebuilding plan beyond the amendments proposed in Alternative 2.

2.0 NEPA REQUIREMENTS: ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

An environmental assessment (EA) is required by the National Environmental Policy Act of 1969 (NEPA) to determine whether the action considered will result in significant impact on the human environment. The environmental analysis in the EA provides the basis for this determination and must analyze the intensity or severity of the impact of an action and the significance of an action with respect to society as a whole, the affected region and interests, and the locality. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An environmental impact study (EIS) must be prepared for major Federal actions significantly affecting the human environment.

An EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives, and a list of document preparers. The purpose and alternatives were discussed in Sections 1.1 and 1.2, and the list of

preparers is in Section 5. This section contains the discussion of the environmental impacts of the alternatives including impacts on threatened and endangered species and marine mammals.

2.1 Environmental Impacts of the Alternatives

The environmental impacts generally associated with fishery management actions are effects resulting from 1) harvest of fish stocks which may result in changes in food availability to predators, changes in the population structure of target fish stocks, and changes in community structure; 2) changes in the physical and biological structure of the benthic environment as a result of fishing practices, e.g., effects of gear use and fish processing discards; and 3) entanglement/entrapment of non-target organisms in active or inactive fishing gear. A summary of the effects of the 1995 and 1996 groundfish total allowable catch amounts on the biological environment and associated impacts on marine mammals, seabirds, and other threatened or endangered species are discussed in the final environmental assessments for the 1995 and 1996 groundfish total allowable catch specifications (NMFS 1995a, 1996). Alternative 2 **[The Preferred Alternative]** would provide the flexibility to lower the TAC below the level specified in the current FMP text to address resource conservation concerns or to accomodate TAC within the bounds of the ABC.

If the TAC were specified lower than the amounts calculated in the FMP for a given year in a manner that reduced overall trawl activity the impacts of trawling on the benthic structure could be lessened. However, the destructive impact to the benthic environment that might be contributed by trawling specifically for POP, whose TAC is relatively low, would probably be minimal.

Some concerns were expressed that the nature of the trawl participants may change, potentially indirectly altering the observer coverage for the POP fishery, if the TAC were lowered to a level that would create a bycatch only fishing situation. However, under either the FMP calculated TAC or another TAC that would represent a directed fishing situation or a bycatch only amount, the level of catch monitoring, by observers, should remain similar. During the directed fishery for POP that was executed in 1995 all vessels had 100 percent observer coverage except for one vessel that had 30 percent observer coverage. Under the situation of a bycatch only fishery (ie. the 1994 fishing situation) all vessels that caught POP had 100 percent observer coverage except for 4 vessels with 30 percent observer coverage.

To determine any impacts of Alternative 3, specific rebuilding strategies, which are beyond the scope of this document, would need to be identified.

In an analysis presented to the Council in April 1995 NMFS examined the situation of a TAC set at 2,550 mt (ie. the 1994 TAC amount that supported a bycatch only fishery) and determined that that level would provide little additional benefit in terms of the timing or rate of POP rebuilding (NMFS 1995b, Appendix 1) compared to a TAC that followed the Rebuilding Plan formula.

2.2 Impacts on Endangered, Threatened or Candidate Species Under the ESA

Species that are listed as threatened or endangered, or are candidates or proposed for listing under the Endangered Species Act (ESA), may be present in the BSAI and GOA. Additionally, non-listed species, particularly seabirds, also occur in those areas and may be impacted by fishing operations. A list of species and a detailed discussion regarding life history and potential impacts of the 1996 groundfish fisheries of the BSAI and GOA on marine species can be found in an EA for the 1996 TAC specifications for the GOA and BSAI (NMFS 1996). Insofar as this proposed amendment would help prevent groundfish harvests in excess of TACs and PSC mortality in excess of designated limits, fishing activities under any of the alternatives would not be expected to cause any adverse effects additional to those noted in the EA.

2.2.1 Salmon

Listed species of salmon, including the Snake River sockeye salmon (O. nerka), fall chinook and spring/summer chinook salmon (both Oncorhynchus tschawytscha) may be present in the BSAI or GOA. These areas are believed to be outside the range of another listed species, the Sacramento River winter-run chinook salmon. A Biological Opinion conducted on effects of the BSAI and GOA groundfish fisheries concluded that these fisheries are not likely to jeopardize the continued existence of endangered or threatened Snake River salmon species (NMFS 1994c). None of the alternatives considered are expected to adversely affect any listed salmon in a manner not already considered in previous consultations.

2.2.2 Seabirds

Listed or candidate species of seabirds include the endangered short-tailed albatross (Diomedea albatrus), the threatened spectacled eider (Somateria fischeri), and the candidate (category 1) Steller's eider (Polysticta stelleri), or (category 2) marbled murrelet (Brachyramphus marmoratus), red-legged kittiwake (Rissa brevirostris) or Kittlitz's murrelet (Brachyramphus brevirostris). A formal consultation conducted by the U.S. Fish and Wildlife Service (USFWS) on the potential impacts of groundfish fisheries and subsequent informal consultation on impacts of 1994 groundfish fisheries on these species concluded that groundfish fisheries adversely affect, but do not jeopardize, the existence of the short-tailed albatross (USFWS 1989, 1994) if the incidental take allowance of up to two short-tailed albatrosses per year was not exceeded. The informal consultation also concluded that groundfish fisheries were not likely to adversely affect the spectacled eider, Steller's eider, or marbled murrelet. The USFWS did not comment on remaining candidate species at that time. None of the alternatives considered are expected to adversely affect any listed or candidate seabirds in a manner not already considered in previous consultations.

2.2.3 Marine Mammals

As with salmon and seabirds listed under the ESA, fishing activities under this proposed action are not likely to impact the threatened Steller sea lion (Eumetopias jubatus), in a manner, or to an

extent, not previously considered in informal section 7 consultations for 1994 groundfish fisheries (NMFS, 1994d,e).

Other listed marine mammals include the endangered fin whale (Balaenoptera physalus), sei whale (Balaenoptera borealis), humpback whale (Megaptera novaeangliae), sperm whale (Physeter catodon), northern right whale (Balaena glacialis), blue whale (Balaenoptera musculus) and Steller sea lion (Eumetopias jubatus). None of these species are anticipated to be adversely affected by this proposed amendment.

2.3 Impacts on Marine Mammals not listed under the ESA

Marine mammals not listed under the ESA that may be present in the BSAI or GOA include cetaceans, [minke whale (Balaenoptera acutorostrata), killer whale (Orcinus orca), Dall's porpoise (Phocoenoides dalli), harbor porpoise (Phocoena phocoena), Pacific white-sided dolphin (Lagenorhynchus obliquidens), and the beaked whales (e.g., Berardius bairdii and Mesoplodon spp.)] as well as pinnipeds [northern fur seals (Callorhinus ursinus), and Pacific harbor seals (Phoca vitulina)] and the sea otter (Enhydra lutris). As previously mentioned, a list of species and detailed discussion regarding life history and potential impacts of the 1995 and 1996 groundfish fisheries of the BSAI and GOA on those species can be found in an EA conducted on the 1995 and 1996 Total Allowable Catch Specifications for the GOA and BSAI (NMFS 1995a, 1996). None of the alternatives considered are expected to adversely affect any listed or candidate marine mammals in a manner not already considered in previous consultations.

2.4 Coastal Zone Management Act

Each of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

2.5 Conclusions or Findings of No Significant Impact

None of the alternatives are likely to significantly affect the quality of the human environment; preparation of an environmental impact statement for selection of any of the alternatives as the proposed action would not be required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

3.0 ECONOMIC IMPACTS OF THE ALTERNATIVES

Under Alternative 1 (status quo), the Council would determine the GOA POP TAC based on the procedures outlined in the Rebuilding Plan. Under Alternatives 2 and 3, the TAC-setting procedures in the Rebuilding Plan would be amended. Alternative 2 **[The Preferred Alternative]** would provide the Council the authority to recommend TACs below the amount

determined by the Rebuilding Plan formula, provided sufficient biological or conservation justification could be made for the adjustment.

Alternative 2 provides for a downward adjustment in the POP TAC that could range from zero to the full amount of the POP TAC specified by the Rebuilding Plan. At some point in this range, the TAC would not be sufficient to support a directed fishery for POP. In this case, NMFS would place POP on "bycatch-only" status - meaning that POP could be harvested only as bycatch in other directed fisheries. The exact level of POP TAC that would result in a "bycatch-only" status for POP depends on how much POP would be expected to be harvested in other groundfish fisheries, an amount which will vary depending on the TAC for other species and on fishing effort. For purposes of the economic analysis, NMFS is examining the two different fishing scenarios of a directed POP fishery and a bycatch only fishery for POP, which could be represented by different TAC levels within the two fishing scenarios.

The 1994 POP TAC of 2,550 mt was not sufficient to support a directed fishery. However, in 1995 the Rebuilding Plan specified a TAC of 5,630 mt. As a result, directed fisheries occurred in the Western Gulf from July 3 to July 20, in the Central Gulf from July 3 to July 6, and in the Eastern Gulf from July 3 to July 9 and from October 13 to 16. Nineteen trawl catcher/processors participated in these fisheries (7 in WGOA, 11 in CGOA, and 12 in EGOA). All of these catcher/processors except one was 100 percent observed. The 1996 POP TAC of 6,959 mt likely will support directed fisheries for POP as well.

The economic value of a directed fishery for POP derives from the value of all species harvested - including species like sablefish and some rockfishes which are themselves on "bycatch-only" status and may be harvested only in directed fisheries for other species. Harvests during the 1995 directed trawl fisheries for POP (Table 4) illustrate the imporance of these other bycatch species. The estimated wholesale processed product value of the 1995 directed trawl fisheries for POP was about $6.7 million. POP contributed about $3 million to the value, other rockfish approximately $1.9 million, and sablefish bycatch about $1.6 million.[2]

Unless the economic losses associated with a downward adjustment in POP TAC are offset by other benefits identified by the Council and NMFS, the reduction in TAC would result in net economic losses. In an analysis presented to the Council in April 1995, NMFS examined the alternative of a TAC set at 2,550 mt (which was the 1994 TAC amount that resulted in "bycatch-only" status for POP) and determined that this TAC would provide little additional benefit in terms of the timing or rate of POP rebuilding compared to a TAC that followed the Rebuilding Plan formula (NMFS 1995b, Appendix 1). If this were the case, the value of the catch foregone by a reduction in the POP TAC would not be made up by increased catch at an earlier date in the

[2]The wholesale processed product value overestimates the net economic value of the POP directed fishery because adjustments have not been made for costs of harvesting and processing.

future. As the difference between the TAC allowed under the Rebuilding Plan and an adjusted TAC increases in future years, economic losses would increase.

Even if faster POP rebuilding occurs as a result of lower TACs, economic losses may still occur in the form of trade-offs between catch now and catch in the future. In general, a higher economic value is placed on catch in the near term because current participants are able to realize and reinvest economic returns sooner and because current participants are not assured that they will be the people benefiting from future increased catches of POP. For those fishermen who currently do not target on POP, but would in the future, an allocation of catch between the present and the future represents an economic benefit.

The economic impacts of Alternative 3 would depend on additional alternatives identified in re-evaluation of the Rebuilding Plan.

3.1 Administrative and Enforcement Costs

None of the alternatives considered would significantly affect administrative or enforcement costs associated with management of the GOA groundfish fisheries.

Table 4. Estimated catch (mt), utilization (mt), and value ($) of the 1995 directed trawl fisheries for Pacific Ocean perch in the Gulf of Alaska.

Species	WGOA		CGOA		EGOA		Gulf of Alaska Total			
	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	Total	Value ($) 1/
POP	1,331	71	1,290	52	1,487	89	4,108	212	4,321	3,079,874
DSR	1	1	3	4	3	9	7	14	20	12,575
Northern Rock.	44	4	147	17	23	7	214	29	243	113,408
Pelagic Shelf	38	1	131	9	217	11	386	20	406	280,781
Slope Rockfish	1	18	23	105	78	128	103	251	354	81,426
SRRE	90	3	136	48	154	165	380	215	596	633,382
Thornyhead	42	11	31	18	50	20	123	49	172	710,100
Total Rockfish	1,547	109	1,762	253	2,012	428	5,321	791	6,112	4,911,546
Sablefish	60	2	149	53	148	55	357	110	467	1,602,493
Pacific Cod	4	32	14	37	5	4	22	73	95	17,670
Atka Mackerel	109	16	0	0	1	1	110	16	126	69,518
DW Flat	9	2	19	13	2	8	30	22	52	27,993
Flathead Sole	0	1	2	0	1	0	3	2	5	2,445
Rex Sole	3	5	28	6	3	3	33	14	48	55,086
SW Flat	0	0	0	4	2	0	3	4	7	2,967
Pollock	0	62	1	9	0	21	1	92	93	0
Arrowtooth	61	73	107	146	49	197	218	415	633	49,891
Other	0	11	2	9	0	25	2	45	47	0
All Groundfish	1,793	312	2,084	530	2,223	742	6,101	1,584	7,685	6,739,610

1/ Estimated wholesale processed product value based on multiplying retained catch weight by a product recovery rate (primarily H&G Eastern cut) and an estimated wholesale price based on the 1994 processor's annual reports.

Source: Blend estimates of catch, Weekly Production Reports, and Commercial Operator's Annual Report, as of 11/5/95.

4.0 REFERENCES

National Marine Fisheries Service (NMFS). 1996. Final Environmental Assessment for 1996 Groundfish Total Allowable Catch Specifications. NMFS, PO Box 21668, Juneau, AK 99802-1668.

National Marine Fisheries Service (NMFS). 1995a. Final Environmental Assessment for 1995 Groundfish Total Allowable Catch Specifications. NMFS, PO Box 21668, Juneau, AK 99802-1668.

National Marine Fisheries Service (NMFS). 1995b. "Interim Report on the Status of the Pacific Ocean Perch Rebuilding Plan in the Gulf of Alaska". Prepared by J. Heifetz, J. Ianelli, and J. Fujioka. Juneau, Ak. April 6, 1995.

National Marine Fisheries Service (NMFS). 1994c. Biological Opinion on the Effects of the North Pacific Groundfish Fisheries on Salmon. January 19, 1994. 28p.

National Marine Fisheries Service (NMFS). 1994d. Section 7 Consultation for 1994 Total Allowable Catch Specifications for the Bering Sea and Aleutian Islands Groundfish Fishery. January 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

National Marine Fisheries Service (NMFS). 1994e. Section 7 Consultation for 1994 Total Allowable Catch Specifications for the Gulf of Alaska Groundfish Fishery. January 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

United States Fish and Wildlife Service (USFWS). 1989. Formal Consultation with the U.S. Fish and Wildlife Service Pursuant to Section 7 of the Endangered Species Act. Biological Opinion. July 3, 1989. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

United States Fish and Wildlife Service (USFWS). 1994. Informal Consultation with the U.S. Fish and Wildlife Service Pursuant to Section 7 of the Endangered Species Act. February 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

5.0 LIST OF PREPARERS

Kaja Brix
Sally Bibb
National Marine Fisheries Service
Juneau, Alaska

APPENDIX 1.

Interim Report on the Status of the Pacific Ocean Perch Rebuilding Plan in the Gulf of Alaska[1]

Jonathan Heifetz[a], James N. Ianelli[b], and Jeffrey T. Fujioka[a]

[a]National Marine Fisheries Service, Alaska Fisheries Science Center, Auke Bay Laboratory, 11305 Glacier Highway, Juneau, AK 99801
[b]National Marine Fisheries Service, Alaska Fisheries Science Center, Resource Ecology and Fisheries Management, 7600 Sandpoint Way N.E., Seattle, WA 98115

Introduction

The purpose of the document is to address points brought up by Alaska Department of Fish and Game (ADF&G) about the stock assessment and rebuilding plan for Pacific ocean perch (POP) in the Gulf of Alaska (GOA). These concerns were first expressed by ADF&G at the December 1994 North Pacific Fishery Management Council Meeting (Appendix A) and then discussed at a meeting on March 3, 1995 at the Auke Bay Laboratory attended by staff of ADF&G, NMFS Alaska Fisheries Science Center, and NMFS Regional Office (Appendix B). Two primary concerns were discussed. First, whether there is a biological crisis which warrants an emergency rule to lower the TAC from the level set by the rebuilding plan in the FMP. ADF&G was concerned about relying too heavily on the 1993 survey results and the effects of taking young fish in the Central and Western areas and a directed fishery targeting older and larger fish. We address these concerns by reviewing the stock assessment and rebuilding plan and examining the short-term effects of alternative TAC levels on spawning biomass and age composition. Spawning biomass per recruit analysis is also provided to examine long-term implications of different selectivity patterns under present fishing rates. The second concern focused on the appropriateness of the rebuilding plan, current stock assessment, and measures of reproductive potential. Here, we discuss how this concern may be addressed in future assessments.

Review of current stock assessment

Current stock levels

The current stock assessment for POP in the GOA is based on the stock synthesis model (Heifetz and Ianelli 1992). The data sets used in this analysis included total catch biomass for years 1961-

[1] Report submitted to the North Pacific Fishery Management Council April 6, 1995.

1994, size compositions from the fishery for 1963-78 and 90-92, fishery CPUE for 1964-79, survey age compositions based on surface reading of otoliths (biased ages) for 1963-67, 78, and 79, survey size compositions for 1978-93, survey "break and burn" (unbiased ages) age compositions for 1980-82, 84, 87, 90 and 93, and survey biomass estimates for 1984, 87, 90 and 93. Ageing error, transformations from biased to unbiased ages, and standard errors of survey estimates of abundance were included in the model.

Initial exploratory runs of the model indicated that estimates of survey biomass were inconsistent with survey age and size compositions and fishery CPUE. In addition, regardless of the emphasis on survey biomass, the model did not fit the survey biomass levels very well. Even with extremely high emphasis on survey biomass, the trend in biomass suggested by the surveys could not be adequately modeled. The fluctuations in survey biomass estimates coupled with incompatibility with other data sources indicates that the sharp decline in biomass suggested by the 1987 and 1990 surveys was unlikely.

As in previous assessments, a model that had low emphasis on survey biomass was chosen as the best model to determine current stock condition. The fit to survey biomass for this model is shown in Figure 1. For three of the four years of the survey the model prediction of survey biomass is considerably less than the actual survey estimates, whereas fits to survey age composition are reasonably good (Fig. 1). As can be concluded from the 1994 SAFE report, the assessment presumes that the survey has in general poorly estimated POP abundance but the age compositions from the survey are reasonably accurate. Thus, the assessment does not rely heavily on biomass estimates from the 1993 survey or any other survey. A summary of the estimated age structure of the current population based on the model and other parameters is in Table 1. A prominent feature of this assessment is the dominance of the 1986 year-class especially in the Central and Western areas which was first documented in the 1990 survey and verified in the 1993 survey.

The estimate of female spawning biomass at the beginning of 1995 based on the current assessment is about 116,000 mt. In last years assessment, the estimate of female spawning biomass at the beginning of 1994 was about 75,000 mt. It is important to understand that we do not believe the female spawning biomass has increased from 75,000 mt to 116,000 from 1994 to 1995. This point is clarified in Figure 2 which shows the trend in female spawning biomass based on last years assessment and the current assessment. Based on the current assessment female spawning biomass has increased 13% from 1994 to 1995 (103,000 to 116,000 mt).

ABC, OFL, and TAC

The optimal fishing rate (Fopt) for POP has been estimated to be the $F_{44\%}$ rate (Ianelli and Heifetz 1995). If the rebuilding target female spawning biomass of 150,000 mt is used as an estimate of Bmsy, then to calculate ABC the fishing rate is reduced by the ratio of current female spawning biomass to target female spawning biomass (0.776). This computation resulted in an ABC of 8,230 mt that was recommended by the SAFE authors and the SSC. The $F_{44\%}$ rate is considered

an estimate of Fmsy, therefore the overfishing level (OFL) is set equal to ABC. To provide a reasonable buffer between OFL and ABC, the Plan Team (PT) guidelines require reducing the fishing rate by the ratio of $F_{35\%}$ to $F_{30\%}$ which resulted in an ABC of 6,530 mt. The PT ABC was adopted by the Council.

The TAC for POP is determined by the rebuilding plan. Under this plan the rate halfway between the optimum rate and the rate estimated to provide unavoidable bycatch of POP in 1992 is used to determine TAC. The $F_{55\%}$ rate was determined to be consistent with the rebuilding plan. This rate is adjusted downward by the ratio of current female spawning biomass to target female spawning biomass to give a fishing rate of 0.041 and a TAC of 5,630 mt.

Rebuilding analysis overview

Decline of the stock of POP in the GOA since the early period of the foreign fishery has raised concerns that harvest restrictions on the domestic fishery during the 1990's may have been insufficient to rebuild the POP stock. Consequently, the Council requested that an analysis be performed to: a) identify optimal fishing rates for rockfish species such as Pacific ocean perch, b) identify the biomass level that would produce an optimum yield, and c) evaluate alternative fishing policies designed to improve the condition of the POP resource. This analysis was carried out and presented as Plan Amendment 32 and reported in Ianelli et al. (1993) and Ianelli and Heifetz (1995).

The approach to address objectives (a) and (b) was to modify Clark's (1991) analysis in order to incorporate recruitment variability and to consider plausible stock-recruitment relationships in light of the available POP data. Objective © was addressed through Monte Carlo simulations under alternative hypotheses regarding stock productivity. This portion of the analysis was similar to other analyses found in the literature (e.g., Overholtz et al. 1986, Quinn et al. 1990, and Rosenberg and Brault 1991). In addition, Bayesian methods were used to develop probability estimates for the alternative hypotheses regarding stock productivity (Thompson 1992).

Recruitment variability was shown to play an important role in determining the effects of different harvest policies. Based on estimates of optimal biomass and fishing mortality rates, four alternative harvest policies were developed and evaluated using a stochastic simulation model. These policies ranged from harvests based on rates under the status quo policy to increasingly restrictive measures. Policy outcomes were measured in terms of yield in weight and dollar-value, female spawner biomass, and risks. We presented the results in the form of Bayesian decision tables. The main conclusion drawn from the simulations were that the ability to predict future stock levels with a high degree of certainty was poor.

Updated rebuilding analysis

Because of continuing concerns on the current status of the POP stocks in the GOA, the rebuilding analysis was updated based on this year's stock assessment. The main difference between the data used was the inclusion of recent estimates of age composition derived from the 1993 survey. The results from this analysis is presented below and in the section on the "need for emergency rule to reduce TAC."

Preliminary analyses using alternative reproductive potential measures

To date, the estimate of female spawning biomass has been used as an index of reproductive potential. Total fecundity or consideration of some other age specific index of reproductive value of the population may be more appropriate (Leaman 1991). However, there appears to be considerable uncertainty about the fecundity and age relationship for POP (Fig. 3). A preliminary analysis on the sensitivity of the current stock assessment to these uncertainties has been conducted in the context of the stock assessment and the rebuilding analysis. In place of mature female spawning biomass, an estimated age-specific fecundity index (Fig. 3) was used in stock synthesis and then re-analyzed for stock-recruitment relationships. The effect of using a measure of fecundity instead of spawner biomass results in a greater estimated reduction in reproductive potential relative to historical levels. In terms of stock productivity, this means that the stock would be more resilient to reduction in reproductive potential than originally estimated because the estimated recruitment levels remain the same but arise from relatively fewer units of reproductive output. This is illustrated in the estimated likelihood profile for the critical shape parameter from the stock-recruitment relationship (Fig. 4). While a large portion of the differences in the updated analysis is due to the addition of recruitment estimates up to 1992, some of this effect is due to the use of an alternative index of reproductive output. The updated results may likely indicate a slightly higher optimum fishing mortality rate than was previously estimated. Currently, new maturity data are planned for collection and we envision incorporating a more thorough analysis of effective age-specific reproductive output for the next stock assessment cycle.

Need for emergency rule to reduce TAC

Short-term projections and spawning biomass per recruit

Deterministic projections of the model to the year 2000 starting with the current estimated age composition were performed to address ADF&G's concern that removal of certain age components of POP may adversely impact reproductive potential. Three alternative harvest scenarios were examined: 1) a constant TAC of 2,550 mt (i.e., the 1994 TAC) and the currently estimated selectivity pattern of the fishery; 2) a variable TAC based on the rebuilding plan and the currently estimated selectivity pattern of the fishery; and 3) a variable TAC based on the rebuilding plan and an asymptotic selectivity pattern. The TAC for scenarios 2 and 3 was

4 (TAC would go up w/ biomass est.

now assume a dome-shaped selectivity

identical. Scenario 3 was chosen to examine the possible effects of a fishery that shifts to targeting older individuals.

The projections indicate that there will be negligible gains in short-term levels of spawning biomass under scenario 1 (Fig. 5). By the year 2000, scenario 1 results in a 10% higher level of spawning biomass than either 2 or 3. In addition, there are minor differences among the scenarios in overall age compositions and the proportion of "old" fish (ie. > age 14) in the population (Fig. 6). From 1994 to 2000, the proportion of "old" fish increases from 7.6% to 23.5% for scenario 1, to 21.5% for scenario 2, and to 21.0% for scenario 3. Cumulative yields of 15,300 mt for scenario 1 and 52,400 mt for scenarios 2 and 3 would have been realized under these hypothetical scenarios (Fig. 5).

That there is very little difference in age composition and spawning biomass among the three scenarios also could have been concluded by consideration of a spawner biomass per recruit plot. Figure 7 shows equilibrium spawning biomass per recruit isopleths for all combinations of F from 0 to 0.25 and age at 50% selection from 4 to 14. The F rates in question range between 0.02 - 0.04. At such low fishing rates, regardless of the selectivity pattern of the fishery, there is negligible difference in spawning biomass.

These illustrations support the conclusion reached at the March 3, 1995 meeting (Appendix B) that there is not a biological justification for an emergency rule to lower the TAC for the 1995 fishery.

Geographic comparisons

Another useful way to put the situation for the GOA POP in perspective is to compare abundance and harvest patterns of this species from nearby areas. Here we contrast the habitat area, harvest levels, and survey catch rates between the GOA and the Aleutian Islands region. In the depth strata where POP are abundant, the survey CPUE's are on the order of three times greater in the Aleutian Islands than the GOA (Table 2). However, the surface area of the two strata between 100-300 meters is more than 5 times greater in the GOA than in the Aleutians. While the difference in average depth-stratified survey CPUE in these areas is cause for concern, the level of harvests suggested by the rebuilding plan are relatively low. The recent harvests in the Aleutians have, until this year, proceeded at the $F_{35\%}$ rate without any apparent detrimental effects (eg. Ianelli and Ito 1994). Along the Canadian British Columbia coast, an area considerably smaller than the GOA, TAC's of POP in recent years have been on the order of 3,000 to 4,000 mt. On balance, there should be continuing concerns regarding the status of POP rebuilding in the GOA. However, the current situation and the plan for rebuilding does not seem to justify alarm if the goal is to manage a *fishery*.

Future considerations

According to the POP rebuilding plan in the FMP, "rebuilding is determined to have occurred when the current total biomass of mature females is equal to, or greater than, Bmsy." The document further states that "when Bmsy is obtained, the fishing mortality rate will be the optimal fishing mortality" rate.

Incorporation of new data to estimate Bmsy and an optimal fishing rate appears to be consistent with the rebuilding plan. Under this plan there will be a substantial increase in TAC the first time the population is projected to be at or above the target level of female spawning biomass (Fig. 8). After the target is attained, the population will likely fluctuate around the target level. There probably will be disagreement on whether the population has actually reached the rebuilt level and whether other criteria may be more appropriate. Thus, in addition to the target level of female spawning biomass, alternative measures of rebuilding success may need to be identified. Such alternative measures will need an amendment to be included in the POP rebuilding plan in the FMP.

Age composition as a measure of stock condition

Referencing papers by Leaman (1991, 1993), ADF&G has suggested that age structure characteristics, in addition to female spawning biomass, should be considered as a measure of rebuilding success or stock condition. Leaman (1991) states that consideration of reproductive value should be incorporated into management strategies. Reproductive value is incorporated into ABC recommendations for POP and other species by basing fishing rates on the reduction of spawning biomass per recruit, such as $F_{35\%}$, $F_{44\%}$, or the target biomass criteria used to adjust the fishing rate.

Spawning biomass may only be an approximation to actual reproductive potential, and fecundity may be more appropriate. While we could not find substantiation of Leaman's (1991) statement that "fecundity of older fish is greater than for younger fish of the same somatic weight", we have made a preliminary incorporation of length-fecundity data to provide a more precise measure of reproductive potential (reported in the section "Rebuilding analysis overview")

Trippel and Morgan (1994) point out that "If gamete quality and related fertilization and hatching success change with reproductive experience, then the stock component of a stock-recruitment relationship should also be adjusted for gamete quality in relation to the relative abundance of different mature age groups in the population". The POP stock-recruitment relationship can be re-estimated incorporating a hypothetical function reflecting age-specific probability of reproductive experience into the measure of reproductive potential. New estimates of Fopt, target reproductive potential, current reproductive potential, and ABC would result.

"Benchmarks" such as the proportion of stock above a given age (or size), or number of strong age classes were suggested by ADF&G as examples of possible measures of stock condition or reproductive potential. While Leaman and Stanley (1993) illustrate the change in proportion of POP greater than 40 cm. as a stock experiences exploitation, it is not clear that they recommend

such a value as a measure of stock condition. Instead, they point out how it is influenced by the occurrence of varying year class strengths. Leaman (1991) illustrates that age composition is unstable due to high variation in cohort strength by pointing out that the mean age of a lightly exploited stock decreased by 15 years within a span of 6 years, due to recruitment variability. Quast (1972) warned of dangers of interpreting catch curves in POP, noting that a fairly flat catch curve in later phases of exploitation could be mistaken for evidence of a low exploitation rate, whereas it could have been caused by reduced recruitment, perhaps caused by the reduction of reproductive potential. Likewise, Leaman's (1991) observations seem to show that the age composition of a heavily exploited stock cannot be distinguished from a lightly exploited stock that has recent strong recruitment.

Criteria for rebuilding success

Recent FAO draft guidelines for fishery management contain criteria for defining stages of stock rebuilding (FAO 1994) . The guidelines postulate that "following precautionary principles, a policy of stock rebuilding cannot be considered successful, and normal fishing level[2] should not be resumed, until the first year class generated subsequent to this policy", has itself generated one respectably large year-class, further, that this second year class has reached commercially exploited sizes". While the derivation of this criterion is unclear, it does assure the opportunity of reproductive success. Determination of whether this criterion has been met would be objective, and combined with the attainment of Bmsy or other reproductive potential target, may assure that normal fishing can be safely resumed.

References

Alverson, D.L., and S.J. Westrheim, 1961. A review of the taxonomy and biology on the Pacific ocean perch and its fishery. Rap. P.-V. Reun. Cons. Perm. Int. Explor. Mer 150:12-27.

Chikuni, S. 1975. Biological study on the population of Pacific ocean perch in the North Pacific. Far Seas Fish. Res. Lab., Shimizu, Japan. Bull 12: 1-119.

Food and Agricultural Organization (FAO). 1994. Guidelines for responsible management of fisheries (first draft). FI:CCRF/94/Inf.5.

Gunderson, D.R. 1976. Population biology of Pacific ocean perch (Sebastes alutus) stocks in the Washington-Queen Charlotte Sound Region, and their response to fishing. PhD. Dissertation. Univ. of Washington, Seattle, WA 98195. 140 p.

Heifetz J. and J. N. Ianelli. 1992. Stock assessment of Pacific ocean perch in the Gulf of Alaska based on the stock synthesis model. In Stock assessment and fishery evaluation report for the 1993 Gulf of Alaska groundfish fishery, Appendix IV. North Pacific Fishery Management Council, P. O. Box 103136, Anchorage, AK 99510.

---

[2] "normal fishing levels" in the FAO (1994) document were harvests corresponding to the F0.1 fishing rate which is considerably higher than the rates proposed for POP in the Gulf of Alaska.

Ianelli J., J. Hastie, and J. Heifetz. 1993. Environmental assessment/regulatory impact review/initial regulatory flexibility analysis of alternative harvest policies for rebuilding Pacific ocean perch in the Gulf of Alaska. North Pacific Fishery Management Council, P. O. Box 103136, Anchorage, AK 99510.

Ianelli, J.N. and J. Heifetz. 1995. Decision analysis of alternative harvest policies for the Gulf of Alaska Pacific ocean perch fishery. Fish. Res. (in press).

Ianelli, J. N., and D. H. Ito. 1993. Stock assessment of Pacific ocean perch (*Sebastes alutus*) using an explicit age structured model. *In* Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea/Aleutian Islands region as projected for 1994 (November 1993), 20 pp.

Leaman, B.M. 1991. Reproductive styles and life history variables relative to exploitation and management of *Sebastes* stocks. Environ. Biol. Fish. 30: 253-271.

Leaman, B.M. 1993. Reference points for fisheries management: the western Canadian experience. p. 15-30. *In* S.J. Smith, J.J. Hunt and D. Rivard [ed.] Risk evaluation and biological reference points for fisheries management. Can. Spec. Publ. Fish. Aquat. Sci. 120.

Leaman, B.M. and R.D. Stanley. 1993. Experimental management programs for two rockfish stocks off British Columbia, Canada. p. 403-418. *In* S.J. Smith, J.J. Hunt and D. Rivard [ed.] Risk evaluation and biological reference points for fisheries management. Can. Spec. Publ. Fish. Aquat. Sci. 120.

Overholtz, W.J., M.P. Sissenwine, and S.J. Clark. 1986. Recruitment variability and its implication for managing and rebuilding the Georges Bank Haddock (*Melanogrammus aeglefinus*) stock. Can. J. Fish. Aquat. Sci. 43:748-753.

Quast, J.C. 1972. Reduction in stocks of the Pacific ocean perch, an important demersal fish off Alaska. Trans. Amer. Fish. Soc. 101:64-74.

Quinn, T.J. II, R. Fagen, and J. Zheng. 1990. Threshold management policies for exploited populations. Can. J. Fish. Res. Board Can. 34:1130-1142.

Rosenberg, A.A. and S. Brault. 1991. Stock rebuilding strategies over different time scales. North Atl. Fish. Org. Sci. Coun. Studies. 16:171-181.

Thompson, G.G. 1992. A bayesian approach to management advice when stock-recruitment parameters are uncertain. Fish. Bull. 90:561-573.

Trippel, E.A., and Morgan, M.J. 1994. Age-specific paternal influences on reproductive success of Atlantic Cod (*Gadus morhua* L.) of the Grand Banks, Newfoundland. - ICES mar. Sci. Symp., 198:414-422.

Table 1. Estimated numbers (thousands) of Pacific ocean perch at age in 1995 and schedule of age specific maturity, fishery selectivity, and mean weight based on the stock synthesis model.

Age	Numbers in 1995	Percent mature	Percent Selected	Weight (grams)
2	42,026	0	1	53
3	39,969	0	2	116
4	38,008	5	3	194
5	48,452	12	5	279
6	24,580	27	8	363
7	49,123	50	13	442
8	49,919	73	20	515
9	92,694	88	31	579
10	22,207	95	45	635
11	51,054	98	61	683
12	32,986	99	77	724
13	18,827	100	89	759
14	6,782	100	97	788
15	29,996	100	100	812
16	2,921	100	100	832
17	2,842	100	97	848
18	3,722	100	94	861
19	12,032	100	89	872
20	1,133	100	84	881
21	702	100	79	889
22	514	100	75	895
23	987	100	70	900
24	1,031	100	65	904
25+	14,974	100	61	907

Table 2. Area, CPUE, and biomass estimates by 100 meter depth strata for the 1993 GOA survey and the 1994 Aleutian Islands survey.

	Sum of area (km2)		Average of CPUE (kg/km2)		Sum of Biomass (mt)	
Depth (m)	Gulf of Alaska	Aleutians	Gulf of Alaska	Aleutians	Gulf of Alaska	Aleutians
0-100	89,315	14,704	62	24	6,920	354
101-200	119,983	18,978	2,831	8,802	303,331	167,046
201-300	32,501	10,111	6,637	23,385	125,011	236,451
301-500	12,968	12,746	2,096	119	20,761	1,515
Total	254,767	56,539	-	-	456,023	405,366

Source: NMFS RACE Division staff, 7600 Sand Point Way NE, Seattle, WA 98115.

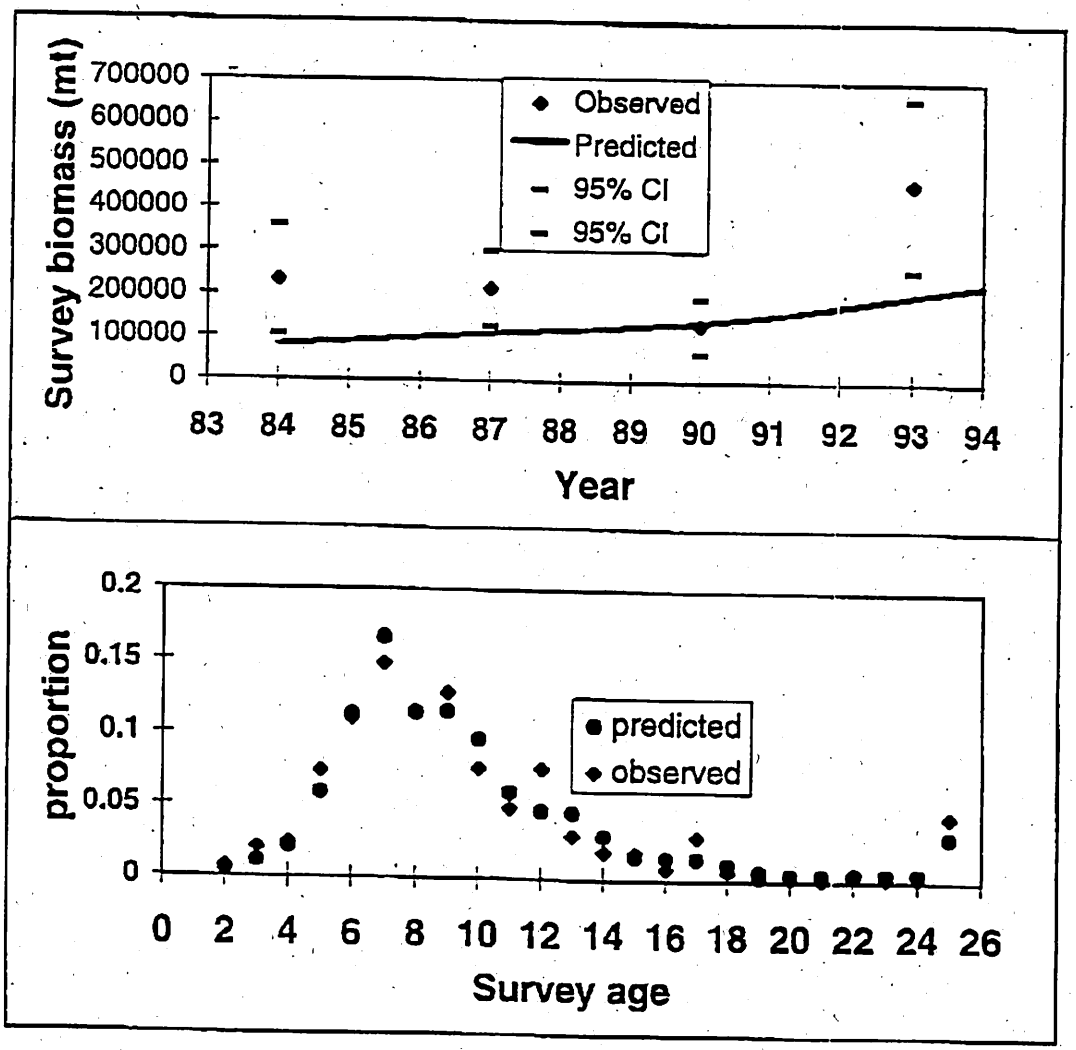

Figure 1. Fit to observed survey biomass of Pacific ocean perch in the Gulf of Alaska based on the stock synthesis model (upper panel). Fit to observed 1993 survey age composition of Pacific ocean perch in the Gulf of Alaska based on the stock synthesis model (lower panel).

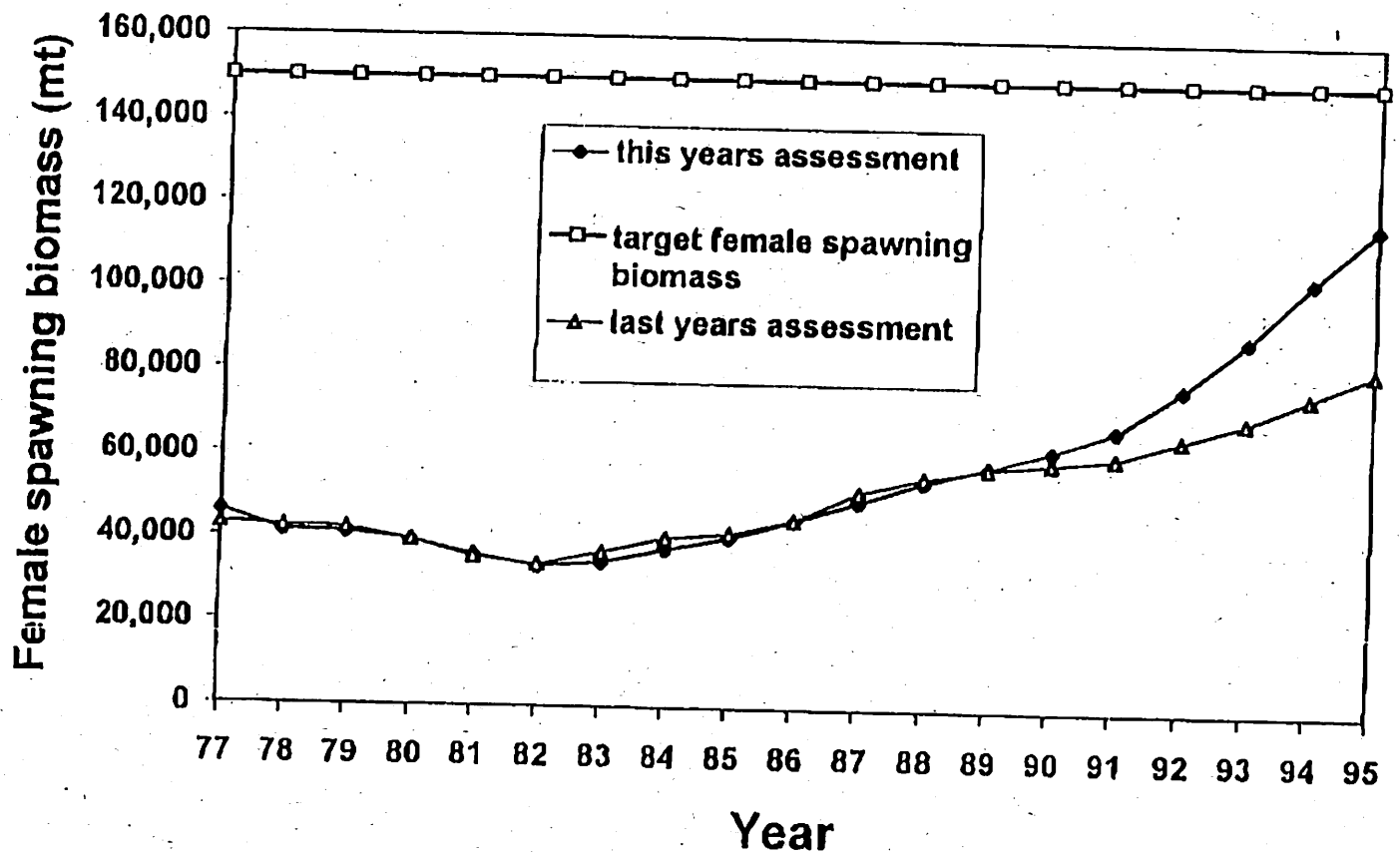

Figure 2. Recent trend in female spawning biomass relative to the rebuilding target of 150,000 mt based on last years assessment and the current assessment.

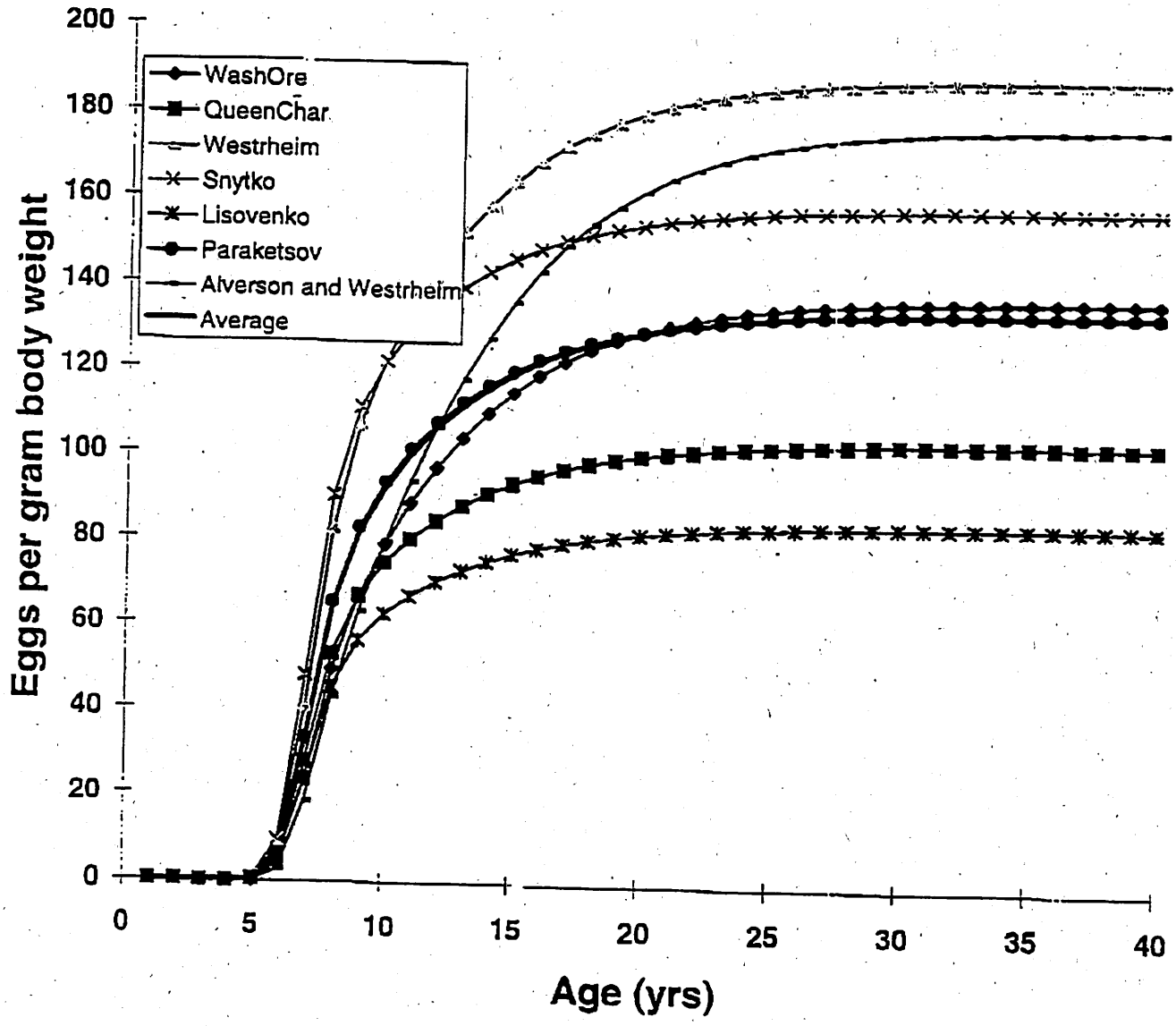

Figure 3. Estimated relationship between fecundity per gram of body weight and age for POP (computed from length-fecundity relationships in Alverson and Westrheim (1961), Chikuni (1975), and Gunderson (1976)).

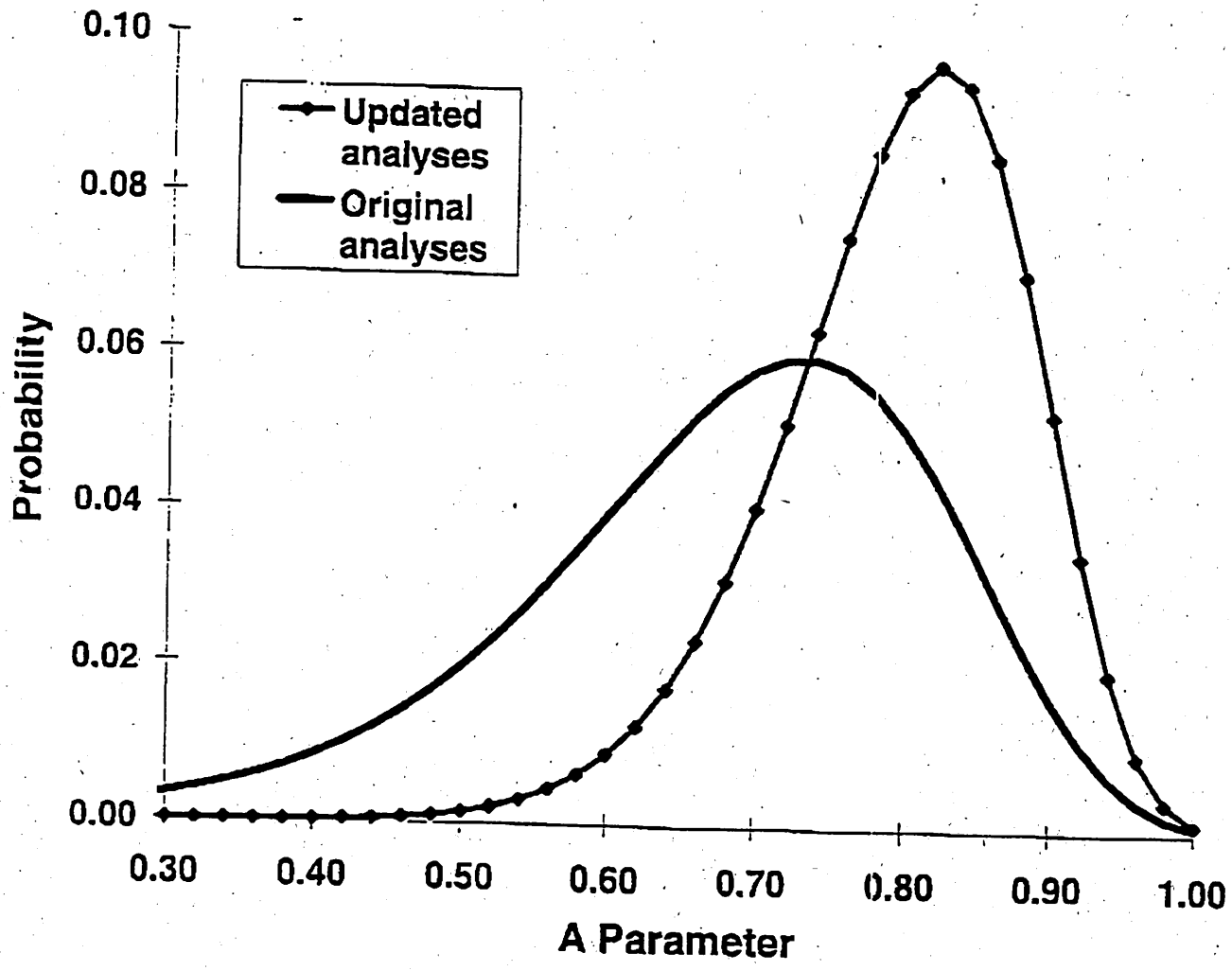

Figure 4. Probability profile of critical stock-recruitment parameter under the original rebuilding plan analyses versus the updated analyses with a longer time series of data. The updated analysis is based on additional stock recruitment data, and stock is measured as fecundity instead of spawning biomass.

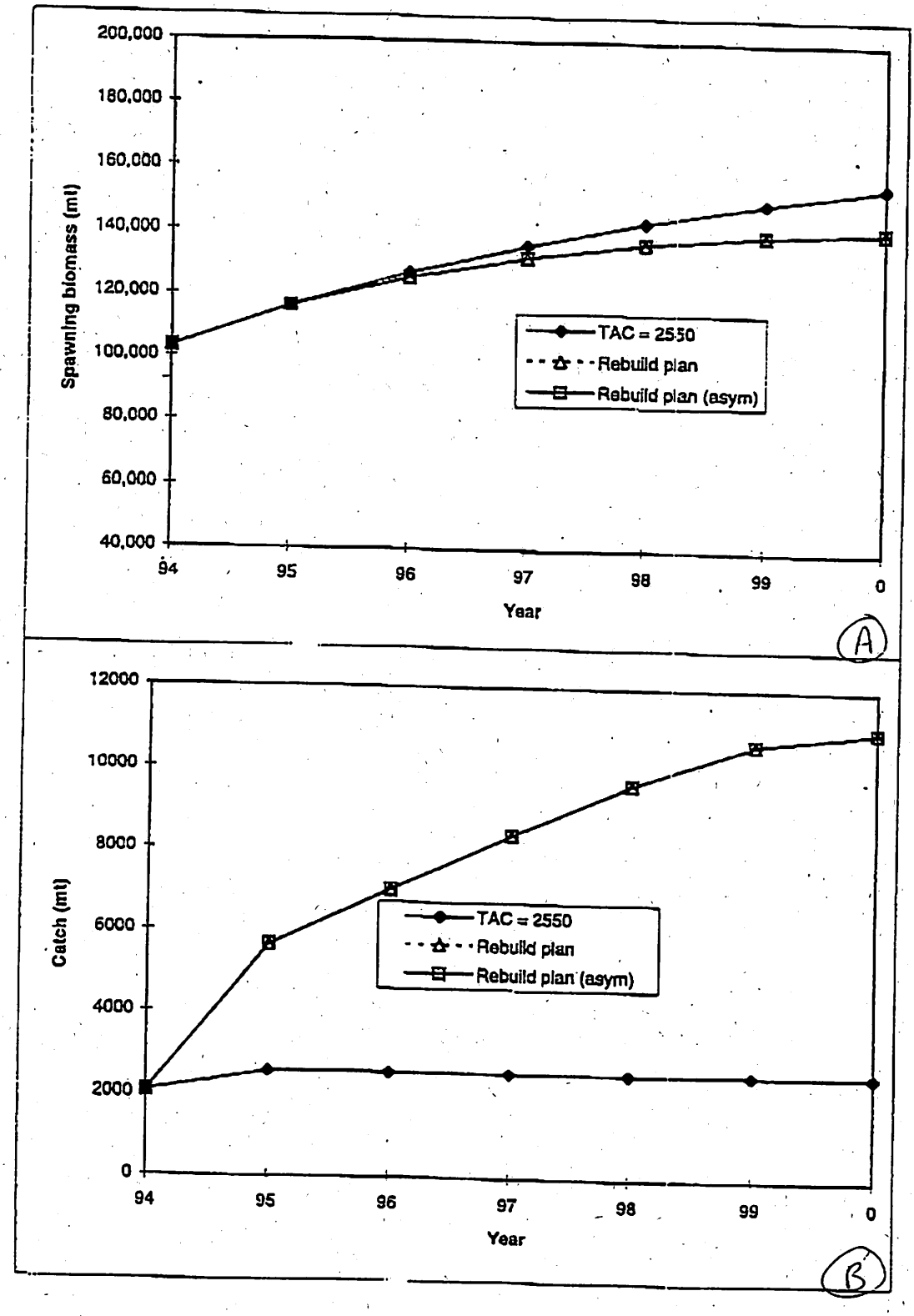

Figure 5. Projected trend in spawning biomass and catch for three harvest scenarios.

gain catch (B) at loss of 10% in spawning biomass (A) if you keep TAC consistent w/ biomass estimates

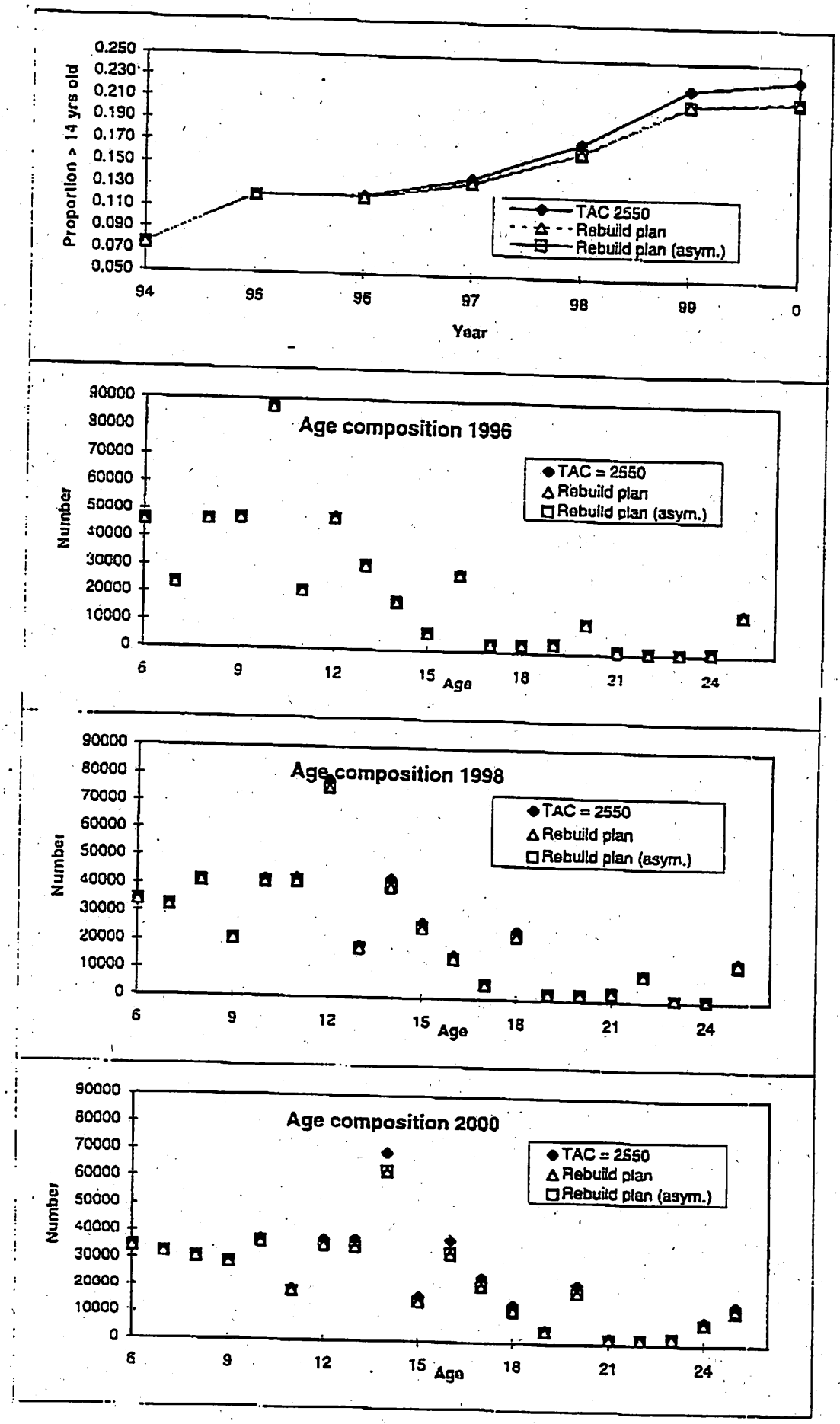

Figure 6. Projected trend in age composition of Pacific ocean perch for three harvest scenarios.

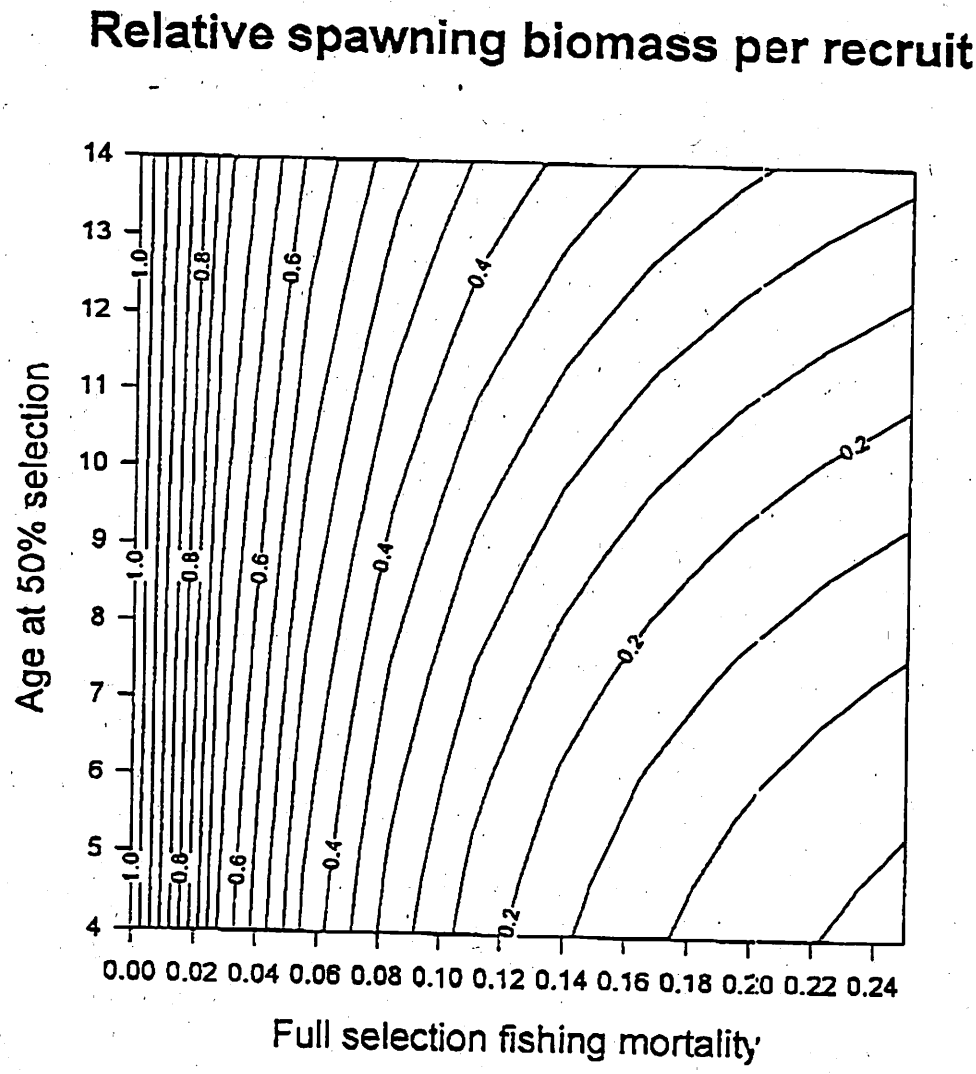

Figure 7. Spawning biomass per recruit isopleths for Pacific ocean perch in the Gulf of Alaska.

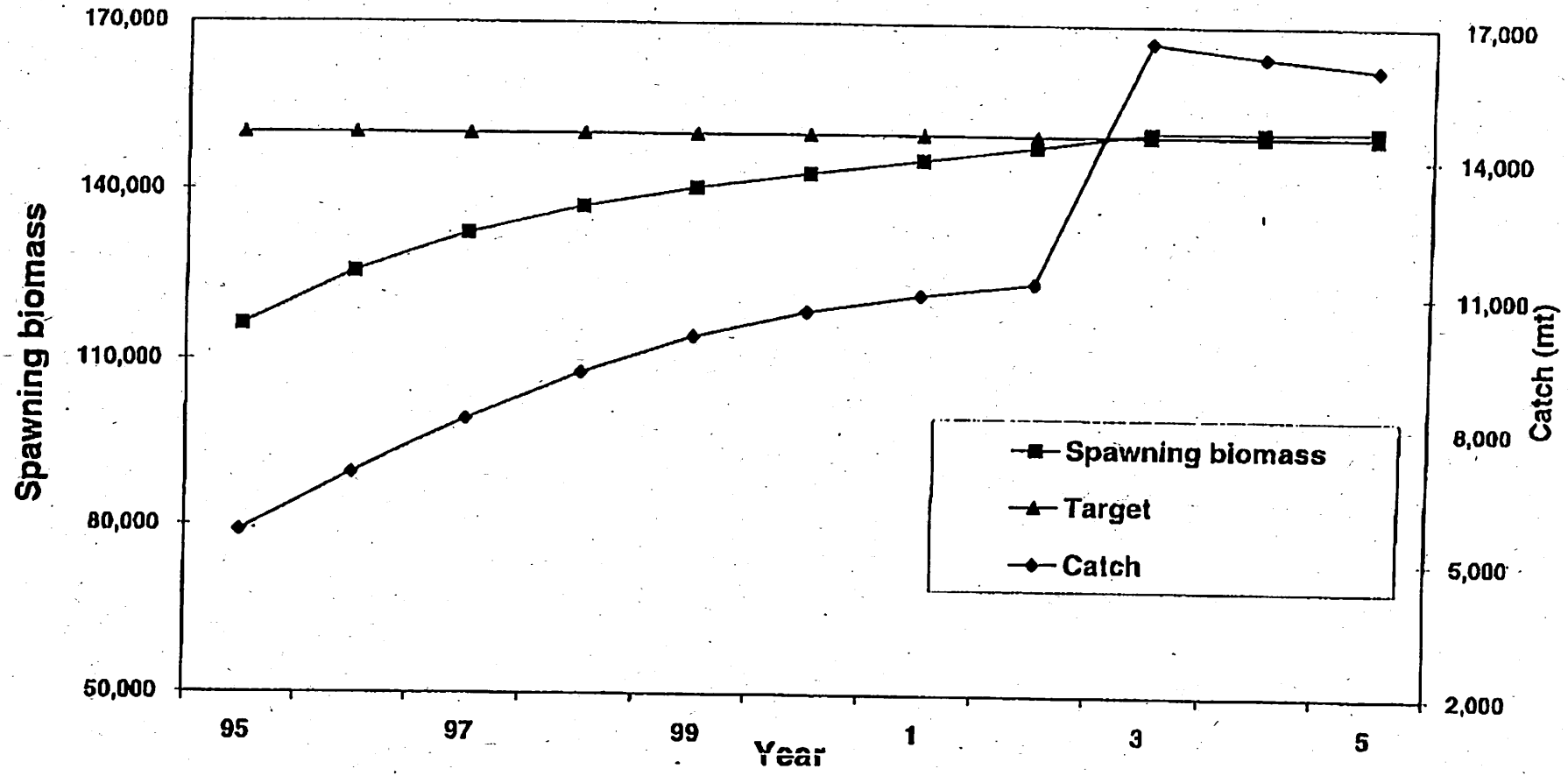

Figure 8. Hypothetical example of TAC levels that would result under the rebuilding plan.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

November 20, 1995

Originial of doc sent by E-Mail

Clarence G. Pauztke, Executive Director
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Alaska 99501

Dear Clarence:

The North Pacific Fishery Management Council is scheduled to take final action on an amendment to the FMP for Groundfish of the Gulf of Alaska that would amend the Pacific Ocean Perch rebuilding plan. Enclosed is a draft Environment Assessment/Regulatory Impact Review/Initial Regulatory Flexibililty Analysis for this action. Please provide it to the interested public and to the Council's advisory bodies as appropriate.

Sincerely,

Steven Pennoyer,
Director, Alaska Region

filename: POP-1.EA

DRAFT FOR COUNCIL REVIEW

Environmental Assessment/Regulatory Impact Review/ Initial Regulatory Flexibility Analysis of Alternatives to Amend the Gulf of Alaska Pacific Ocean Perch Rebuilding Plan

Prepared by

National Marine Fisheries Service

November 1995

Executive Summary

Decline of the Pacific ocean perch (POP) stock since the early period of the foreign fishery prompted the North Pacific Fishery Management Council (Council) to recommend a rebuilding plan for POP. The POP Rebuilding Plan was contained in Amendment 32 to the Fishery Management Plan for Groundfish of the Gulf of Alaska, which was approved by the Secretary of Commerce. The POP Rebuilding Plan provides a specific rebuilding strategy for POP stocks, based on available biological and economic information. An algorithm, or procedure, was selected to annually determine the POP total allowable catch (TAC). However, the amendment did not provide for any flexibility in setting TAC below this amount. In December 1994 the Council requested an analysis of alternatives for modifying the FMP to allow this flexibility.

Three alternatives are considered:

Alternative 1: Status quo. Maintain the current procedure for specifying the annual TAC amounts for POP as detailed in the FMP. The current means of calculating the TAC was part of the policy alternative adopted by the Council under Amendment 32, the Rebuilding Plan.

Alternative 2: Amend the FMP to allow the Council to specify a POP TAC *at or below* the amount dictated by the Rebuilding Plan. The current algorithm for specifying the TAC would be the upper-bound limit and the POP TAC could be annually specified at or below this level.

Alternative 3: Re-evaluate the Rebuilding Plan to address conservation or biological concerns that may not be being met by the current plan. The Council would direct staff to complete an analysis of alternatives to the Rebuilding Plan should this alternative be chosen.

The Council requested analysis of Alternative 2 and NMFS added Alternative 3. The primary difference between the two is that Alternative 2 would not change the general direction established by the Rebuilding Plan except to allow the Council flexibility in setting annual Gulf of Alaska (GOA) POP TACs if the Council identified specific biological or conservation issues that were not adequately addressed by the Rebuilding Plan TAC level. However, if the Council believes that the general direction of the Rebuilding Plan, which will allow for increasing POP TAC levels as the POP biomass increases, does not reflect how they wish to pursue POP rebuilding in the future, NMFS recommends re-evaluation of the Rebuilding Plan to address these concerns. NMFS further recommends that if socioeconomic concerns exist with respect to the management of the POP fishery, particularly in the Eastern GOA, that it consider a separate FMP amendment to address these issues separate from the conservation issues addressed under the POP Rebuilding Plan.

The economic impact of a particular annual POP TAC will depend on the difference between the upper-limit of the TAC as determined by the Rebuilding Plan algorithm, and the amount recommended by the Council. Any reduction in TAC from the Rebuilding Plan amount will result in a loss in revenue to trawl catcher/processors currently participating in the POP directed fishery, that may or may not be made up in the future. Unless these losses are offset by other benefits identified by the Council and NMFS, the reduction in TAC would result in a net loss.

The 1995 directed trawl fishery for POP can be used to illustrate the potential economic losses to current participants in the first year from a bycatch-only TAC. Nineteen trawl catcher/processors

participated in the directed POP fishery. All of these catcher/processors except one was 100 percent observed. The estimated wholesale processed product value of the 1995 directed fishery was about $6.7 million. POP contributed about $3 million to the value, other rockfish approximately $1.9 million, and sablefish bycatch about $1.6 million. The majority of this catch would likely not have been harvested if POP had been placed on bycatch only status in 1995.

1.0 INTRODUCTION

The groundfish fisheries in the Exclusive Economic Zone (EEZ) (3 to 200 miles offshore) in the Gulf of Alaska are managed under the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA FMP). The GOA FMP was developed by the North Pacific Fishery Management Council (Council) under the Magnuson Fishery Conservation and Management Act (Magnuson Act). It was approved by the Secretary of Commerce and became effective in 1978.

Actions taken to amend Fishery Management Plans or implement other regulations governing the groundfish fisheries must meet the requirements of Federal laws and regulations. In addition to the Magnuson Act, the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA).

NEPA, E.O. 12866 and the RFA require a description of the purpose and need for the proposed action as well as a description of alternative actions which may address the problem. This information is included in Section 1. Section 2 contains information on the biological and environmental impacts of the alternatives as required by NEPA. Impacts on endangered species and marine mammals are also addressed in this section. Section 3 contains a Regulatory Impact Review (RIR) which addresses the requirements of both E.O. 12866 and the RFA that economic impacts of the alternatives be considered.

This Environmental Assessment/Regulatory Impact Review (EA/RIR) addresses alternatives to amend the Pacific Ocean perch (POP) Rebuilding Plan in the GOA FMP.

1.1 Purpose of and Need for the Action

Decline of the POP stock since the early period of the foreign fishery (early 1960s) prompted the Council to request an analysis of alternative rebuilding strategies for POP. This analysis was presented as Amendment 32 to the GOA FMP in 1993. The Council adopted a particular rebuilding strategy, based on available biological and economic information. This rebuilding plan contains an algorithm, specified in the FMP, for determining the TAC. The amendment does not provide for any flexibility in setting the TAC at a level other than that which is dictated by the algorithm.

Concern exists that the TAC level in a given year, as specified in the FMP, could be high enough to allow a directed fishery. At its December 1994 meeting, therefore, the Council requested that NMFS prepare an analysis for providing the flexibility to lower the TAC below the level specified in the FMP. The intent is to allow the Council to set a TAC amount that would supply bycatch-only needs of POP in other fisheries.

This document presents alternatives for modifying the Rebuilding Plan.

1.2 Rockfish Management

Amendment 32 to the GOA FMP established a plan to rebuild stocks of the rockfish Pacific Ocean perch (Sebastes alutus) in the GOA. POP is a highly valued groundfish. It was heavily exploited by a foreign trawl fleet from the early 1960's until the mid-1980's. Thereafter, a domestic at-sea processing fleet harvested POP at a substantially lower rate. Catches of POP peaked in 1965 when an estimated 350,000 mt were harvested by the foreign fleet; catches declined sharply in the late 1960's. From 1961-77, annual POP landings averaged over 40,000 mt; after 1977, landings averaged 6,000 mt. In the domestic fishery, POP was managed as part of a larger slope rockfish assemblage of about 20 species until 1991, when POP was established as a separate target species category to prevent possible overfishing.

As a result of increased concern about the declined status of POP stocks, biomass assessment methodology has been improved, POP has been managed as a single species and domestic harvest levels have been reduced. The 1994 TAC of 2,550 mt, derived from the rebuilding plan calculations, was available only as incidental catch in other groundfish fisheries, except for a short-term directed fishery in the Eastern GOA. In 1995 the TAC for POP as determined by the Rebuilding Plan was 5,630 mt, enough to support a directed fishery.

The original analysis for Amendment 32 examined various exploitation strategies for POP, including a bycatch-only harvest policy. The analysis is presented in the EA/RIR to Amendment 32. After examining biological and socioeconomic information, the Council adopted a rebuilding plan for POP that set the harvest as outlined under Alternative 1.

Under the Rebuilding Plan an acceptable biological catch (ABC) is set for this species for the GOA and this ABC is apportioned among regulatory areas based on the biomass distribution. The TAC is determined using the algorithm and is then apportioned to each regulatory area according to the percentage biomass distribution used for the ABC apportionment. In a given year the TAC could be enough to support a directed fishery and remain consistent with the POP Rebuilding Plan, as was the case in 1995. However, some Council members continue to express conservation concerns about the impact of a directed fishery as POP rebuilds.

As outlined in the FMP, the current rebuilding plan was chosen by the Council to achieve optimum yield and proper conservation and management of POP in the Gulf of Alaska (GOA FMP). The rebuilding plan as adopted for Amendment 32 was designed to ensure timely rebuilding of depressed stocks of POP.

Available scientific information indicates that harvest of POP at the rates prescribed under the current rebuilding plan is not jeopardizing the rebuilding of POP. The TAC amount recommended for 1995, and for 1996, is consistent with the rebuilding plan as chosen by the Council and represents a conservative exploitation strategy.

1.3 Historical Catch

Tables 1 through 3 present recent catch information for POP. Additional historical catch information was presented in the EA/RIR/FRFA for the Rebuilding Plan. Table 1 summarizes POP catch by gear type from 1992 through 1995. Tables 2 and 3 summarize the 1994 and 1995 POP catch by target fishery and gear. Target fishery designations on the NMFS in-season database group all rockfish directed fisheries together rather than distinguishing among directed fisheries for the individual rockfish species groups (see Table 4 in Section 3 for further detail on the 1995 POP directed fishery).

Table 1. Blend Estimates of Pacific ocean perch by gear type in the Gulf of Alaska, (retained and discarded), in metric tons, 1992-1995.

	TRAWL		HOOK & LINE		POT		TOTAL - all gear types		
	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	TOTAL
1992	4,720	1,812	6	0.40	0	0.09	4,726	1,812	6,538
1993	426	1,632	3	0.03	0	0	429	1,632	2,061
1994	769	1,083	2	0	0	0	771	1,083	1,854
1995	4,637	1,147	0.24	1	0.06	0.20	4,637	1,147	5,786

Source: Blend estimates of catch as of 11/2/95.

Table 2. 1994 Blend estimates of Pacific ocean perch catch in the Gulf of Alaska by target fishery (metric tons).

		WGOA			CGOA			EGOA			TOTAL - GOA		
Gear	Target	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total
Trawl	Rockfish	34	45	79	54	261	315	554	187	741	642	493	1,135
	Atka mackerel	0	74	74	0	1	1	0	0	0	0	75	75
	Pollock	<1	<1	<1	0	3	3	3	0	3	3	3	6
	Pacific cod	<1	11	11	10	6	16	0	0	0	10	17	27
	Deepwater flat	0	0	0	32	306	338	1	22	23	33	328	361
	Shallow water flat	0	0	0	2	11	13	0	0	0	2	11	13
	Rex sole	0	0	0	41	151	192	0	0	0	41	151	192
	Flathead sole	1	0	1	35	0	35	0	0	0	36	0	36
	Unknown	0	0	0	2	5	7	0	0	0	2	5	7
	Total - Trawl	35	130	165	175	744	920	557	209	767	769	1,083	1,852
Hook and line		<1	0	<1	1	0	1	1	0	1	2	0	2
Pot		0	0	0	0	0	0	<1	0	<1	<1	0	<1
	Total all targets	35	130	165	176	744	921	558	209	768	771	1,083	1,854

Source: Blend estimates of catch as of 8/29/95.

Table 3. 1995 Blend estimates of Pacific ocean perch catch in the Gulf of Alaska by target fishery (metric tons)

		WGOA			CGOA			EGOA			TOTAL		
Gear	Target	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total
Trawl	Rockfish	1,331	71	1,402	1,601	447	2,048	1,605	109	1,714	4,537	627	5,164
	Atka mackerel	0	0	0	0	59	59	0	0	0	0	59	59
	Bottom pollock	2	2	4	14	<1	14	0	0	0	16	2	18
	Pacific cod	6	4	10	22	25	47	0	0	0	28	29	57
	Deepwater flat	0	0	0	30	59	89	0	14	14	30	73	103
	Shallow water flat	<1	5	5	0	28	28	0	0	0	0	33	33
	Rex sole	0	0	0	10	310	320	0	0	0	10	310	320
	Flathead sole	0	1	1	<1	4	4	0	0	0	0	5	5
	Unknown	<1	0	<1	16	10	26	0	1	0	16	10	26
	Total - Trawl	1,339	83	1,422	1,693	942	2,636	1,605	124	1,728	4,637	1,147	5,786
Hook and Line		0	<1	<1	<1	1	1	<1	0	0	<1	1	1
Pot		0	0	0	<1	<1	<1	<1	0	<1	<1	<1	<1
	Total all targets	1,339	83	1,422	1,693	943	2,637	1,605	124	1,728	4,637	1,149	5,787

Source: Blend estimates of catches as of 11/2/95.

1.4 Alternatives Considered

Alternative 1: Status quo. Maintain the current procedure for specifying the annual TAC amounts for POP as detailed in the FMP. The current means of calculating the TAC was part of the policy alternative adopted by the Council under Amendment 32, the Rebuilding Plan.

Amendment 32 to the FMP established the procedure for deriving the annual GOA TACs for POP. POP stocks are considered to be rebuilt when the total biomass of mature females is equal to or greater than Bmsy. Annual TACs, under the current FMP, are established as follows:

(a) Determine the current biomass, Bmsy, and the optimal fishing mortality rate;

(b) Determine the fishing mortality rate half way between the optimal fishing mortality rate and the fishing mortality rate estimated to be sufficient to supply unavoidable bycatch of POP based on 1992 bycatch rates;

(c) When the current biomass of mature females is less than Bmsy, adjust the resultant fishing mortality rate in (b) by the ratio of current biomass to Bmsy so that when Bmsy is attained, the fishing mortality rate will be the optimal fishing mortality rate;

(d) The GOA TAC of POP is the amount of fish resulting from the adjusted fishing mortality rate in (c); and

(e) The TAC is apportioned among regulatory area in proportion to POP biomass distribution.

Alternative 2: Amend the FMP to allow the Council to specify a POP TAC *at or below* the amount dictated by the Rebuilding Plan in one or more of the GOA regulatory areas or districts.

The current Rebuilding Plan algorithm would determine the upper-bound for the POP TAC, but the Council would be authorized to recommend a TAC below this level in a GOA regulatory area or district. As with other species, NMFS would consider the Council's TAC recommendations during the annual specification process. If the Council chooses to recommend a POP TAC lower than the Rebuilding Plan amount, the administrative record must include the additional biological concerns that lead to this recommendation which were not addressed by the Rebuilding Plan TAC amount. In addition to the Council's recommendation, NMFS also will consider scientific information presented by the Plan Team, the Council's Scientific and Statistical Committee, as well as other sources of biological information.

The Council may wish to have the flexibility to adjust the TAC downwards because the possibility exists under the current FMP for the ABC to be set lower than the TAC. The ABC for POP is currently calculated using F_{opt} but another F level could be chosen to calculate the ABC, resulting in an ABC lower than the TAC.

Alternative 2 does not, in itself, authorize a "bycatch-only" fishery for POP. The proposed FMP amendment would only give the Council the alternative of recommending a lower POP TAC in the annual specifications process to address biological or conservation concerns that are not adequately addressed under the Rebuilding Plan. If socioeconomic concerns exist with respect to the management of the POP fishery, particularly in the Eastern GOA, the Council could consider a separate FMP amendment to address these issues separate from the conservation issues addressed under the POP Rebuilding Plan.

Alternative 3: Re-evaluate the current Rebuilding Plan.

If the Council believes that the existing POP Rebuilding Plan does not adequately address its biological concerns, or is not meeting other POP rebuilding goals, the Council may wish to consider re-evaluation of the existing rebuilding plan beyond the amendments proposed in Alternative 2.

Should this alternative be chosen, the Council would need to provide direction to staff on alternative rebuilding strategies for analysis purposes.

2.0 NEPA REQUIREMENTS: ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

An environmental assessment (EA) is required by the National Environmental Policy Act of 1969 (NEPA) to determine whether the action considered will result in significant impact on the human environment. The environmental analysis in the EA provides the basis for this determination and must analyze the intensity or severity of the impact of an action and the significance of an action with respect to society as a whole, the affected region and interests, and the locality. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An environmental impact study (EIS) must be prepared for major Federal actions significantly affecting the human environment.

An EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives, and a list of document preparers. The purpose and alternatives were discussed in Sections 1.1 and 1.2, and

the list of preparers is in Section 6. This section contains the discussion of the environmental impacts of the alternatives including impacts on threatened and endangered species and marine mammals.

2.1 Environmental Impacts of the Alternatives

The environmental impacts generally associated with fishery management actions are effects resulting from 1) harvest of fish stocks which may result in changes in food availability to predators, changes in the population structure of target fish stocks, and changes in community structure; 2) changes in the physical and biological structure of the benthic environment as a result of fishing practices, e.g., effects of gear use and fish processing discards; and 3) entanglement/entrapment of non-target organisms in active or inactive fishing gear. A summary of the effects of the 1995 groundfish total allowable catch amounts on the biological environment and associated impacts on marine mammals, seabirds, and other threatened or endangered species are discussed in the final environmental assessment for the 1995 groundfish total allowable catch specifications. Alternative 2 would provide the flexibility to lower the TAC below the level specified in the current FMP text, to a bycatch-only level or the TAC could be at a level to supply a directed fishery.

If the TAC were lowered to bycatch-only amounts for a given year this could lessen the impacts of trawling on the benthic structure through a decreased effort for POP. However, the destructive impact to the benthic environment that might be contributed by trawling specifically for POP, whose TAC is relatively low, would probably be minimal.

Under either a bycatch-only amount or an amount that would be enough for a directed fishery the level of catch monitoring, by observers, should remain similar. During the directed fishery for POP that was executed in 1995 all vessels had 100 percent observer coverage except for one vessel that had 30 percent observer coverage. Under a situation of a bycatch fishery (eg. during most of 1994) all vessels that bycaught POP had 100 percent observer coverage except for 4 vessels with 30 percent observer coverage.

To determine any impacts of Alternative 3, specific rebuilding strategies, which are beyond the scope of this document, would need to be identified.

2.2 Impacts on Endangered, Threatened or Candidate Species Under the ESA

Species that are listed as threatened or endangered, or are candidates or proposed for listing under the Endangered Species Act (ESA), may be present in the BSAI and GOA. Additionally, non-listed species, particularly seabirds, also occur in those areas and may be impacted by fishing operations. A list of species and a detailed discussion regarding life history and potential impacts of the 1995 groundfish fisheries of the BSAI and GOA on marine species can be found in an EA for the 1995 TAC specifications for the GOA and BSAI (NMFS 1995a). Insofar as this proposed regulatory amendment would help prevent groundfish harvests in excess of TACs and PSC mortality in excess of designated limits,

fishing activities under any of the alternatives would not be expected to cause any adverse effects additional to those noted in the EA.

2.2.1 Salmon

Listed species of salmon, including the Snake River sockeye salmon (O. nerka), fall chinook and spring/summer chinook salmon (both Oncorhynchus tschawytscha) may be present in the BSAI or GOA. These areas are believed to be outside the range of another listed species, the Sacramento River winter-run chinook salmon. A Biological Opinion conducted on effects of the BSAI and GOA groundfish fisheries concluded that these fisheries are not likely to jeopardize the continued existence of endangered or threatened Snake River salmon species (NMFS 1994b). None of the alternatives considered are expected to adversely affect any listed salmon in a manner not already considered in previous consultations.

2.2.2 Seabirds

Listed or candidate species of seabirds include the endangered short-tailed albatross (Diomedea albatrus), the threatened spectacled eider (Somateria fischeri), and the candidate (category 1) Steller's eider (Polysticta stelleri), or (category 2) marbled murrelet (Brachyramphus marmoratus), red-legged kittiwake (Rissa brevirostris) or Kittlitz's murrelet (Brachyramphus brevirostris). A formal consultation conducted by the U.S. Fish and Wildlife Service (USFWS) on the potential impacts of groundfish fisheries and subsequent informal consultation on impacts of 1994 groundfish fisheries on these species concluded that groundfish fisheries adversely affect, but do not jeopardize, the existence of the short-tailed albatross (USFWS 1989, 1994) if the incidental take allowance of up to two short-tailed albatrosses per year was not exceeded. The informal consultation also concluded that groundfish fisheries were not likely to adversely affect the spectacled eider, Steller's eider, or marbled murrelet. The USFWS did not comment on remaining candidate species at that time. None of the alternatives considered are expected to adversely affect any listed or candidate seabirds in a manner not already considered in previous consultations.

2.2.3 Marine Mammals

As with salmon and seabirds listed under the ESA, fishing activities under this proposed action are not likely to impact the threatened Steller sea lion (Eumetopias jubatus), in a manner, or to an extent, not previously considered in informal section 7 consultations for 1994 groundfish fisheries (NMFS, 1994c,d).

Other listed marine mammals include the endangered fin whale (Balaenoptera physalus), sei whale (Balaenoptera borealis), humpback whale (Megaptera novaeangliae), sperm whale (Physeter catodon), northern right whale (Balaena glacialis), blue whale (Balaenoptera musculus) and Steller sea lion (Eumetopias jubatus). None of these species are anticipated to be adversely affected by this proposed amendment.

2.3 Impacts on Marine Mammals not listed under the ESA

Marine mammals not listed under the ESA that may be present in the BSAI or GOA include cetaceans, [minke whale (Balaenoptera acutorostrata), killer whale (Orcinus orca), Dall's porpoise (Phocoenoides dalli), harbor porpoise (Phocoena phocoena), Pacific white-sided dolphin (Lagenorhynchus obliquidens), and the beaked whales (e.g., Berardius bairdii and Mesoplodon spp.)] as well as pinnipeds [northern fur seals (Callorhinus ursinus), and Pacific harbor seals (Phoca vitulina)] and the sea otter (Enhydra lutris). As previously mentioned, a list of species and detailed discussion regarding life history and potential impacts of the 1995 groundfish fisheries of the BSAI and GOA on those species can be found in an EA conducted on the 1995 Total Allowable Catch Specifications for the GOA and BSAI (NMFS 1995a). None of the alternatives considered are expected to adversely affect any listed or candidate marine mammals in a manner not already considered in previous consultations.

2.4 Coastal Zone Management Act

Each of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

2.5 Conclusions or Findings of No Significant Impact

None of the alternatives are likely to significantly affect the quality of the human environment; preparation of an environmental impact statement for selection of any of the alternatives as the proposed action would not be required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

3.0 REGULATORY IMPACT REVIEW: ECONOMIC AND SOCIOECONOMIC IMPACTS OF THE ALTERNATIVES

This section provides information about the economic and socioeconomic impacts of the alternatives including identification of the individuals or groups that may be affected by the action, the nature of these impacts, quantification of the economic impacts if possible, and discussion of the trade offs between qualitative and quantitative benefits and costs.

The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement from the order:

> In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable

> measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environment, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

This section also addresses the requirements of both E.O. 12866 and the Regulatory Flexibility Act to provide adequate information to determine whether an action is "significant" under E.O. 12866 or will result in "significant" impacts on small entities under the RFA. E.O. 12866 defines a "significant regulatory action" as likely to result in (1) an annual effect on the economy of $100 million or more; (2) an adverse effect in a material way on the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; or (3) a novel legal or policy issue. Requirements of the RFA are addressed in Section 4.

Under Alternative 1 (status quo), the Council would determine the GOA POP TAC based on the procedures outlined in the Rebuilding Plan. Under Alternatives 2 and 3, the TAC-setting procedures in the Rebuilding Plan would be amended..

Alternative 2 would provide the Council the authority to recommend TACs below the amount determined by the Rebuilding Plan algorithm, provided sufficient justification could be made for the adjustment. The economic impact of a particular annual POP TAC would depend on the difference between the upper-limit of the TAC as determined by the Rebuilding Plan algorithm, and the amount recommended by the Council. Any reduction in TAC from the Rebuilding Plan amount would result in a loss in revenue to trawl catcher/processors currently participating in the POP directed fishery, that may or may not be made up in the future. Unless these losses are offset by other benefits identified by the Council and NMFS, the reduction in TAC would result in a net loss.

Conclusions about the long-term potential economic losses from closure of the directed POP fishery are based largely on the assumptions and results of the biological modeling and the extent to which a downward adjustment is made from the rebuilding TAC. In an analysis presented to the Council in April 1995, NMFS projected that a "bycatch-only" TAC would provide little additional benefit in terms of the timing or rate of POP rebuilding (NMFS, 1995b). If this is the case, the value of the catch foregone as a result of the bycatch-only fishery would not be made up by increased catch at an earlier date in the future. As the difference between the TAC allowed under the rebuilding plan and the bycatch-only fishing level increases in future years, the direct economic losses associated with a bycatch-only fishery would increase.

Even if faster POP rebuilding occurs as a result of lower TACs, economic losses may still occur in the form of trade-offs between catch now and catch in the future. In general, a

higher economic value is placed on catch in the near term because current participants are able to realize and reinvest economic returns sooner and because current participants are not assured that they will be the people benefiting from future increased catches of POP. For those fishermen who currently do not target on POP, but would in the future, an allocation of catch between the present and the future represents an economic benefit.

The 1995 directed trawl fisheries for POP can be used to illustrate the potential economic losses to current participants in the first year from a bycatch-only TAC.

Directed fisheries for POP were allowed in all areas of the GOA in 1995. The fisheries were open in the Western Gulf from July 3 to July 20, in the Central Gulf from July 3 to July 6, and in the Eastern Gulf from July 3 to July 9 and from October 13 to 16. Nineteen trawl catcher/processors participated in these directed POP fisheries (7 in WGOA, 11 in CGOA, and 12 in EGOA). All of these catcher/processors except one was 100 percent observed.

Table 1 summarizes the estimated catch and value for the 1995 directed trawl fisheries for POP by area and species. The estimated wholesale processed product value of the 1995 directed trawl fisheries for POP was about $6.7 million. POP contributed about $3 million to the value, other rockfish approximately $1.9 million, and sablefish bycatch about $1.6 million. The majority of this catch would likely not have been made if POP had been placed on bycatch only status in 1995.

The economic impacts of Alternative 3 would depend on additional alternatives identified in re-evaluation of the Rebuilding Plan.

3.1 Administrative and Enforcement Costs

None of the alternatives considered would significantly affect administrative or enforcement costs associated with management of the GOA groundfish fisheries.

Table 4. Estimated catch (mt), utilization (mt), and value ($) of the 1995 directed trawl fisheries for Pacific Ocean perch in the Gulf of Alaska.

Species	WGOA		CGOA		EGOA		Gulf of Alaska Total			
	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	Total	Value ($) 1/
POP	1,331	71	1,290	52	1,487	89	4,108	212	4,321	3,079,874
DSR	1	1	3	4	3	9	7	14	20	12,575
Northern Rock.	44	4	147	17	23	7	214	29	243	113,408
Pelagic Shelf	38	1	131	9	217	11	386	20	406	280,781
Slope Rockfish	1	18	23	105	78	128	103	251	354	81,426
SRRE	90	3	136	48	154	165	380	215	596	633,382
Thornyhead	42	11	31	18	50	20	123	49	172	710,100
Total Rockfish	1,547	109	1,762	253	2,012	428	5,321	791	6,112	4,911,546
Sablefish	60	2	149	53	148	55	357	110	467	1,602,493
Pacific Cod	4	32	14	37	5	4	22	73	95	17,670
Atka Mackerel	109	16	0	0	1	1	110	16	126	69,518
DW Flat	9	2	19	13	2	8	30	22	52	27,993
Flathead Sole	0	1	2	0	1	0	3	2	5	2,445
Rex Sole	3	5	28	6	3	3	33	14	48	55,086
SW Flat	0	0	0	4	2	0	3	4	7	2,967
Pollock	0	62	1	9	0	21	1	92	93	0
Arrowtooth	61	73	107	146	49	197	218	415	633	49,891
Other	0	11	2	9	0	25	2	45	47	0
All Groundfish	1,793	312	2,084	530	2,223	742	6,101	1,584	7,685	6,739,610

1/ Estimated wholesale processed product value based on multiplying retained catch weight by a product recovery rate (primarily H&G Eastern cut) and an estimated wholesale price based on the 1994 processor's annual reports.

Source: Blend estimates of catch, Weekly Production Reports, and Commercial Operator's Annual Report, as of 11/5/95.

4.0 INITIAL REGULATORY FLEXIBILITY ANALYSIS

The objective of the Regulatory Flexibility Act is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. If an action will have a significant impact on a substantial number of small entities an Initial Regulatory Flexibility Analysis (IRFA) must be prepared to identify the need for the action, alternatives, potential costs and benefits of the action, the distribution of these impacts, and a determination of net benefits.

NMFS has defined all fish-harvesting or hatchery businesses that are independently owned and operated, not dominant in their field of operation, with annual receipts not in excess of $2,000,000 as small businesses. In addition, seafood processors with 500 employees or fewer, wholesale industry members with 100 employees or fewer, not-for-profit enterprises, and government jurisdictions with a population of 50,000 or less are considered small entities. A "substantial number" of small entities would generally be 20% of the total universe of small entities affected by the regulation. A regulation would have a "significant impact" on these small entities if it reduced annual gross revenues by more than 5 percent, increased total costs of production by more than 5 percent, or resulted in compliance costs for small entities that are at least 10 percent higher than compliance costs as a percent of sales for large entities.

If an action is determined to affect a substantial number of small entities, the analysis must include:

> (1) a description and estimate of the number of small entities and total number of entities in a particular affected sector, and total number of small entities affected; and
>
> (2) analysis of economic impact on small entities, including direct and indirect compliance costs, burden of completing paperwork or recordkeeping requirements, effect on the competitive position of small entities, effect on the small entity's cash flow and liquidity, and ability of small entities to remain in the market.

4.1 Economic Impact on Small Entities

These alternatives affect specification of the POP TAC in the Gulf of Alaska. Participants in the directed trawl fishery for POP generally are trawl catcher/processor vessels which are not considered small entities for purposes of the RFA. Therefore, this action is not anticipated to affect any small entities.

5.0 REFERENCES

National Marine Fisheries Service (NMFS). 1995a. Final Environmental Assessment for 1995 Groundfish Total Allowable Catch Specifications. NMFS, PO Box 21668, Juneau, AK 99802-1668.

National Marine Fisheries Service (NMFS). 1995b. "Interim Report on the Status of the Pacific Ocean Perch Rebuilding Plan in the Gulf of Alaska". Prepared by J. Heifetz, J. Ianelli, and J. Fujioka. Juneau, Ak. April 6, 1995.

National Marine Fisheries Service (NMFS). 1994b. Biological Opinion on the Effects of the North Pacific Groundfish Fisheries on Salmon. January 19, 1994. 28p.

National Marine Fisheries Service (NMFS). 1994c. Section 7 Consultation for 1994 Total Allowable Catch Specifications for the Bering Sea and Aleutian Islands Groundfish Fishery. January 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

National Marine Fisheries Service (NMFS). 1994c. Section 7 Consultation for 1994 Total Allowable Catch Specifications for the Gulf of Alaska Groundfish Fishery. January 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

United States Fish and Wildlife Service (USFWS). 1989. Formal Consultation with the U.S. Fish and Wildlife Service Pursuant to Section 7 of the Endangered Species Act. Biological Opinion. July 3, 1989. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

United States Fish and Wildlife Service (USFWS). 1994. Informal Consultation with the U.S. Fish and Wildlife Service Pursuant to Section 7 of the Endangered Species Act. February 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

6.0 LIST OF PREPARERS

Kaja Brix
Sally Bibb
National Marine Fisheries Service
Juneau, Alaska

kbrix 9/18/95
g:\fmgroup\pop.ea
rev sbibb 11/9/95

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

November 20, 1995

Sent out in Council mailing on 11/22/95

Clarence G. Pauztke, Executive Director
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Alaska 99501

Dear Clarence:

The North Pacific Fishery Management Council is scheduled to take final action on an amendment to the FMP for Groundfish of the Gulf of Alaska that would amend the Pacific Ocean Perch rebuilding plan. Enclosed is a draft Environment Assessment/Regulatory Impact Review/Initial Regulatory Flexibililty Analysis for this action. Please provide it to the interested public and to the Council's advisory bodies as appropriate.

Sincerely,

Steven Pennoyer,
Director, Alaska Region

DRAFT FOR COUNCIL REVIEW

Environmental Assessment/Regulatory Impact Review/ Initial Regulatory Flexibility Analysis of Alternatives to Amend the Gulf of Alaska Pacific Ocean Perch Rebuilding Plan

Prepared by

National Marine Fisheries Service

November 1995

Executive Summary

Decline of the Pacific ocean perch (POP) stock since the early period of the foreign fishery prompted the North Pacific Fishery Management Council (Council) to recommend a rebuilding plan for POP. The POP Rebuilding Plan was contained in Amendment 32 to the Fishery Management Plan for Groundfish of the Gulf of Alaska, which was approved by the Secretary of Commerce. The POP Rebuilding Plan provides a specific rebuilding strategy for POP stocks, based on available biological and economic information. An algorithm, or procedure, was selected to annually determine the POP total allowable catch (TAC). However, the amendment did not provide for any flexibility in setting TAC below this amount. In December 1994 the Council requested an analysis of alternatives for modifying the FMP to allow this flexibility.

Three alternatives are considered:

Alternative 1: Status quo. Maintain the current procedure for specifying the annual TAC amounts for POP as detailed in the FMP. The current means of calculating the TAC was part of the policy alternative adopted by the Council under Amendment 32, the Rebuilding Plan.

Alternative 2: Amend the FMP to allow the Council to specify a POP TAC *at or below* the amount dictated by the Rebuilding Plan. The current algorithm for specifying the TAC would be the upper-bound limit and the POP TAC could be annually specified at or below this level.

Alternative 3: Re-evaluate the Rebuilding Plan to address conservation or biological concerns that may not be being met by the current plan. The Council would direct staff to complete an analysis of alternatives to the Rebuilding Plan should this alternative be chosen.

The Council requested analysis of Alternative 2 and NMFS added Alternative 3. The primary difference between the two is that Alternative 2 would not change the general direction established by the Rebuilding Plan except to allow the Council flexibility in setting annual Gulf of Alaska (GOA) POP TACs if the Council identified specific biological or conservation issues that were not adequately addressed by the Rebuilding Plan TAC level. However, if the Council believes that the general direction of the Rebuilding Plan, which will allow for increasing POP TAC levels as the POP biomass increases, does not reflect how they wish to pursue POP rebuilding in the future, NMFS recommends re-evaluation of the Rebuilding Plan to address these concerns. NMFS further recommends that if socioeconomic concerns exist with respect to the management of the POP fishery, particularly in the Eastern GOA, that it consider a separate FMP amendment to address these issues separate from the conservation issues addressed under the POP Rebuilding Plan.

The economic impact of a particular annual POP TAC will depend on the difference between the upper-limit of the TAC as determined by the Rebuilding Plan algorithm, and the amount recommended by the Council. Any reduction in TAC from the Rebuilding Plan amount will result in a loss in revenue to trawl catcher/processors currently participating in the POP directed fishery, that may or may not be made up in the future. Unless these losses are offset by other benefits identified by the Council and NMFS, the reduction in TAC would result in a net loss.

The 1995 directed trawl fishery for POP can be used to illustrate the potential economic losses to current participants in the first year from a bycatch-only TAC. Nineteen trawl catcher/processors participated in the directed POP fishery. All of these catcher/processors except one was 100 percent observed. The estimated wholesale processed product value of the 1995 directed fishery was about $6.7 million. POP contributed

about $3 million to the value, other rockfish approximately $1.9 million, and sablefish bycatch about $1.6 million. The majority of this catch would likely not have been harvested if POP had been placed on bycatch only status in 1995.

1.0 INTRODUCTION

The groundfish fisheries in the Exclusive Economic Zone (EEZ) (3 to 200 miles offshore) in the Gulf of Alaska are managed under the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA FMP). The GOA FMP was developed by the North Pacific Fishery Management Council (Council) under the Magnuson Fishery Conservation and Management Act (Magnuson Act). It was approved by the Secretary of Commerce and became effective in 1978.

Actions taken to amend Fishery Management Plans or implement other regulations governing the groundfish fisheries must meet the requirements of Federal laws and regulations. In addition to the Magnuson Act, the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA).

NEPA, E.O. 12866 and the RFA require a description of the purpose and need for the proposed action as well as a description of alternative actions which may address the problem. This information is included in Section 1. Section 2 contains information on the biological and environmental impacts of the alternatives as required by NEPA. Impacts on endangered species and marine mammals are also addressed in this section. Section 3 contains a Regulatory Impact Review (RIR) which addresses the requirements of both E.O. 12866 and the RFA that economic impacts of the alternatives be considered.

This Environmental Assessment/Regulatory Impact Review (EA/RIR) addresses alternatives to amend the Pacific Ocean perch (POP) Rebuilding Plan in the GOA FMP.

1.1 Purpose of and Need for the Action

Decline of the POP stock since the early period of the foreign fishery (early 1960s) prompted the Council to request an analysis of alternative rebuilding strategies for POP. This analysis was presented as Amendment 32 to the GOA FMP in 1993. The Council adopted a particular rebuilding strategy, based on available biological and economic information. This rebuilding plan contains an algorithm, specified in the FMP, for determining the TAC. The amendment does not provide for any flexibility in setting the TAC at a level other than that which is dictated by the algorithm.

Concern exists that the TAC level in a given year, as specified in the FMP, could be high enough to allow a directed fishery. At its December 1994 meeting, therefore, the Council requested that NMFS prepare an analysis for providing the flexibility to lower the TAC below the level specified in the FMP. The intent is to allow the Council to set a TAC amount that would supply bycatch-only needs of POP in other fisheries.

This document presents alternatives for modifying the Rebuilding Plan.

1.2 Rockfish Management

Amendment 32 to the GOA FMP established a plan to rebuild stocks of the rockfish Pacific Ocean perch (Sebastes alutus) in the GOA. POP is a highly valued groundfish. It was heavily exploited by a foreign trawl fleet from the early 1960's until the mid-1980's. Thereafter, a domestic at-sea processing fleet harvested POP at a substantially lower rate. Catches of POP peaked in 1965 when an estimated 350,000 mt were harvested by the foreign fleet; catches declined sharply in the late 1960's. From 1961-77, annual POP landings averaged over 40,000 mt; after 1977, landings averaged 6,000 mt. In the domestic fishery, POP was managed as part of a larger slope rockfish assemblage of about 20 species until 1991, when POP was established as a separate target species category to prevent possible overfishing.

As a result of increased concern about the declined status of POP stocks, biomass assessment methodology has been improved, POP has been managed as a single species and domestic harvest levels have been reduced. The 1994 TAC of 2,550 mt, derived from the rebuilding plan calculations, was available only as incidental catch in other groundfish fisheries, except for a short-term directed fishery in the Eastern GOA. In 1995 the TAC for POP as determined by the Rebuilding Plan was 5,630 mt, enough to support a directed fishery.

The original analysis for Amendment 32 examined various exploitation strategies for POP, including a bycatch-only harvest policy. The analysis is presented in the EA/RIR to Amendment 32. After examining biological and socioeconomic information, the Council adopted a rebuilding plan for POP that set the harvest as outlined under Alternative 1.

Under the Rebuilding Plan an acceptable biological catch (ABC) is set for this species for the GOA and this ABC is apportioned among regulatory areas based on the biomass distribution. The TAC is determined using the algorithm and is then apportioned to each regulatory area according to the percentage biomass distribution used for the ABC apportionment. In a given year the TAC could be enough to support a directed fishery and remain consistent with the POP Rebuilding Plan, as was the case in 1995. However, some Council members continue to express conservation concerns about the impact of a directed fishery as POP rebuilds.

As outlined in the FMP, the current rebuilding plan was chosen by the Council to achieve optimum yield and proper conservation and management of POP in the Gulf of Alaska (GOA FMP). The rebuilding plan as adopted for Amendment 32 was designed to ensure timely rebuilding of depressed stocks of POP.

Available scientific information indicates that harvest of POP at the rates prescribed under the current rebuilding plan is not jeopardizing the rebuilding of POP. The TAC amount recommended for 1995, and for 1996, is consistent with the rebuilding plan as chosen by the Council and represents a conservative exploitation strategy.

1.3 Historical Catch

Tables 1 through 3 present recent catch information for POP. Additional historical catch information was presented in the EA/RIR/FRFA for the Rebuilding Plan. Table 1 summarizes POP catch by gear type from 1992 through 1995. Tables 2 and 3 summarize the 1994 and 1995 POP catch by target fishery and gear. Target fishery designations on the NMFS in-season database group all rockfish directed fisheries together rather than distinguishing among directed fisheries for the individual rockfish species groups (see Table 4 in Section 3 for further detail on the 1995 POP directed fishery).

Table 1. Blend Estimates of Pacific ocean perch by gear type in the Gulf of Alaska, (retained and discarded), in metric tons, 1992-1995.

	TRAWL		HOOK & LINE		POT		TOTAL - all gear types		
	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	TOTAL
1992	4,720	1,812	6	0.40	0	0.09	4,726	1,812	6,538
1993	426	1,632	3	0.03	0	0	429	1,632	2,061
1994	769	1,083	2	0	0	0	771	1,083	1,854
1995	4,637	1,147	0.24	1	0.06	0.20	4,637	1,147	5,786

Source: Blend estimates of catch as of 11/2/95.

Table 2. 1994 Blend estimates of Pacific ocean perch catch in the Gulf of Alaska by target fishery (metric tons).

		WGOA			CGOA			EGOA			TOTAL - GOA		
Gear	Target	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total
Trawl	Rockfish	34	45	79	54	261	315	554	187	741	642	493	1,135
	Atka mackerel	0	74	74	0	1	1	0	0	0	0	75	75
	Pollock	<1	<1	<1	0	3	3	3	0	3	3	3	6
	Pacific cod	<1	11	11	10	6	16	0	0	0	10	17	27
	Deepwater flat	0	0	0	32	306	338	1	22	23	33	328	361
	Shallow water flat	0	0	0	2	11	13	0	0	0	2	11	13
	Rex sole	0	0	0	41	151	192	0	0	0	41	151	192
	Flathead sole	1	0	1	35	0	35	0	0	0	36	0	36
	Unknown	0	0	0	2	5	7	0	0	0	2	5	7
	Total - Trawl	35	130	165	175	744	920	557	209	767	769	1,083	1,852
Hook and line		<1	0	<1	1	0	1	1	0	1	2	0	2
Pot		0	0	0	0	0	0	<1	0	<1	<1	0	<1
	Total all targets	35	130	165	176	744	921	558	209	768	771	1,083	1,854

Source: Blend estimates of catch as of 8/29/95.

Table 3. 1995 Blend estimates of Pacific ocean perch catch in the Gulf of Alaska by target fishery (metric tons)

		WGOA			CGOA			EGOA			TOTAL		
Gear	Target	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total	Retained	Discard	Total
Trawl	Rockfish	1,331	71	1,402	1,601	447	2,048	1,605	109	1,714	4,537	627	5,164
	Atka mackerel	0	0	0	0	59	59	0	0	0	0	59	59
	Bottom pollock	2	2	4	14	<1	14	0	0	0	16	2	18
	Pacific cod	6	4	10	22	25	47	0	0	0	28	29	57
	Deepwater flat	0	0	0	30	59	89	0	14	14	30	73	103
	Shallow water flat	<1	5	5	0	28	28	0	0	0	0	33	33
	Rex sole	0	0	0	10	310	320	0	0	0	10	310	320
	Flathead sole	0	1	1	<1	4	4	0	0	0	0	5	5
	Unknown	<1	0	<1	16	10	26	0	1	0	16	10	26
	Total - Trawl	1,339	83	1,422	1,693	942	2,636	1,605	124	1,728	4,637	1,147	5,786
Hook and Line		0	<1	<1	<1	1	1	<1	0	0	<1	1	1
Pot		0	0	0	<1	<1	<1	<1	0	<1	<1	<1	<1
	Total all targets	1,339	83	1,422	1,693	943	2,637	1,605	124	1,728	4,637	1,149	5,787

Source: Blend estimates of catches as of 11/2/95.

1.4 Alternatives Considered

Alternative 1: Status quo. Maintain the current procedure for specifying the annual TAC amounts for POP as detailed in the FMP. The current means of calculating the TAC was part of the policy alternative adopted by the Council under Amendment 32, the Rebuilding Plan.

Amendment 32 to the FMP established the procedure for deriving the annual GOA TACs for POP. POP stocks are considered to be rebuilt when the total biomass of mature females is equal to or greater than Bmsy. Annual TACs, under the current FMP, are established as follows:

(a) Determine the current biomass, Bmsy, and the optimal fishing mortality rate;

(b) Determine the fishing mortality rate half way between the optimal fishing mortality rate and the fishing mortality rate estimated to be sufficient to supply unavoidable bycatch of POP based on 1992 bycatch rates;

(c) When the current biomass of mature females is less than Bmsy, adjust the resultant fishing mortality rate in (b) by the ratio of current biomass to Bmsy so that when Bmsy is attained, the fishing mortality rate will be the optimal fishing mortality rate;

(d) The GOA TAC of POP is the amount of fish resulting from the adjusted fishing mortality rate in (c); and

(e) The TAC is apportioned among regulatory area in proportion to POP biomass distribution.

Alternative 2: Amend the FMP to allow the Council to specify a POP TAC *at or below* the amount dictated by the Rebuilding Plan in one or more of the GOA regulatory areas or districts.

The current Rebuilding Plan algorithm would determine the upper-bound for the POP TAC, but the Council would be authorized to recommend a TAC below this level in a GOA regulatory area or district. As with other species, NMFS would consider the Council's TAC recommendations during the annual specification process. If the Council chooses to recommend a POP TAC lower than the Rebuilding Plan amount, the administrative record must include the additional biological concerns that lead to this recommendation which were not addressed by the Rebuilding Plan TAC amount. In addition to the Council's recommendation, NMFS also will consider scientific information presented by the Plan Team, the Council's Scientific and Statistical Committee, as well as other sources of biological information.

The Council may wish to have the flexibility to adjust the TAC downwards because the possibility exists under the current FMP for the ABC to be set lower than the TAC. The ABC for POP is currently calculated using F_{opt} but another F level could be chosen to calculate the ABC, resulting in an ABC lower than the TAC.

Alternative 2 does not, in itself, authorize a "bycatch-only" fishery for POP. The proposed FMP amendment would only give the Council the alternative of recommending a lower POP TAC in the annual specifications process to address biological or conservation concerns that are not adequately addressed under the Rebuilding Plan. If socioeconomic concerns exist with respect to the management of the POP fishery, particularly in the Eastern GOA, the Council could consider a separate FMP amendment to address these issues separate from the conservation issues addressed under the POP Rebuilding Plan.

Alternative 3: Re-evaluate the current Rebuilding Plan.

If the Council believes that the existing POP Rebuilding Plan does not adequately address its biological concerns, or is not meeting other POP rebuilding goals, the Council may wish to consider re-evaluation of the existing rebuilding plan beyond the amendments proposed in Alternative 2.

Should this alternative be chosen, the Council would need to provide direction to staff on alternative rebuilding strategies for analysis purposes.

2.0 NEPA REQUIREMENTS: ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

An environmental assessment (EA) is required by the National Environmental Policy Act of 1969 (NEPA) to determine whether the action considered will result in significant impact on the human environment. The environmental analysis in the EA provides the basis for this determination and must analyze the intensity or severity of the impact of an action and the significance of an action with respect to society as a whole, the affected region and interests, and the locality. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An environmental impact study (EIS) must be prepared for major Federal actions significantly affecting the human environment.

An EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives, and a list of document preparers. The purpose and alternatives were discussed in Sections 1.1 and 1.2, and the list of

preparers is in Section 6. This section contains the discussion of the environmental impacts of the alternatives including impacts on threatened and endangered species and marine mammals.

2.1 Environmental Impacts of the Alternatives

The environmental impacts generally associated with fishery management actions are effects resulting from 1) harvest of fish stocks which may result in changes in food availability to predators, changes in the population structure of target fish stocks, and changes in community structure; 2) changes in the physical and biological structure of the benthic environment as a result of fishing practices, e.g., effects of gear use and fish processing discards; and 3) entanglement/entrapment of non-target organisms in active or inactive fishing gear. A summary of the effects of the 1995 groundfish total allowable catch amounts on the biological environment and associated impacts on marine mammals, seabirds, and other threatened or endangered species are discussed in the final environmental assessment for the 1995 groundfish total allowable catch specifications. Alternative 2 would provide the flexibility to lower the TAC below the level specified in the current FMP text, to a bycatch-only level or the TAC could be at a level to supply a directed fishery.

If the TAC were lowered to bycatch-only amounts for a given year this could lessen the impacts of trawling on the benthic structure through a decreased effort for POP. However, the destructive impact to the benthic environment that might be contributed by trawling specifically for POP, whose TAC is relatively low, would probably be minimal.

Under either a bycatch-only amount or an amount that would be enough for a directed fishery the level of catch monitoring, by observers, should remain similar. During the directed fishery for POP that was executed in 1995 all vessels had 100 percent observer coverage except for one vessel that had 30 percent observer coverage. Under a situation of a bycatch fishery (eg. during most of 1994) all vessels that bycaught POP had 100 percent observer coverage except for 4 vessels with 30 percent observer coverage.

To determine any impacts of Alternative 3, specific rebuilding strategies, which are beyond the scope of this document, would need to be identified.

2.2 Impacts on Endangered, Threatened or Candidate Species Under the ESA

Species that are listed as threatened or endangered, or are candidates or proposed for listing under the Endangered Species Act (ESA), may be present in the BSAI and GOA. Additionally, non-listed species, particularly seabirds, also occur in those areas and may be impacted by fishing operations. A list of species and a detailed discussion regarding life history and potential impacts of the 1995 groundfish fisheries of the BSAI and GOA on marine species can be found in an EA for the 1995 TAC specifications for the GOA and BSAI (NMFS 1995a). Insofar as this proposed regulatory amendment would help prevent groundfish harvests in excess of TACs and PSC

mortality in excess of designated limits, fishing activities under any of the alternatives would not be expected to cause any adverse effects additional to those noted in the EA.

2.2.1 Salmon

Listed species of salmon, including the Snake River sockeye salmon (O. nerka), fall chinook and spring/summer chinook salmon (both Oncorhynchus tschawytscha) may be present in the BSAI or GOA. These areas are believed to be outside the range of another listed species, the Sacramento River winter-run chinook salmon. A Biological Opinion conducted on effects of the BSAI and GOA groundfish fisheries concluded that these fisheries are not likely to jeopardize the continued existence of endangered or threatened Snake River salmon species (NMFS 1994b). None of the alternatives considered are expected to adversely affect any listed salmon in a manner not already considered in previous consultations.

2.2.2 Seabirds

Listed or candidate species of seabirds include the endangered short-tailed albatross (Diomedea albatrus), the threatened spectacled eider (Somateria fischeri), and the candidate (category 1) Steller's eider (Polysticta stelleri), or (category 2) marbled murrelet (Brachyramphus marmoratus), red-legged kittiwake (Rissa brevirostris) or Kittlitz's murrelet (Brachyramphus brevirostris). A formal consultation conducted by the U.S. Fish and Wildlife Service (USFWS) on the potential impacts of groundfish fisheries and subsequent informal consultation on impacts of 1994 groundfish fisheries on these species concluded that groundfish fisheries adversely affect, but do not jeopardize, the existence of the short-tailed albatross (USFWS 1989, 1994) if the incidental take allowance of up to two short-tailed albatrosses per year was not exceeded. The informal consultation also concluded that groundfish fisheries were not likely to adversely affect the spectacled eider, Steller's eider, or marbled murrelet. The USFWS did not comment on remaining candidate species at that time. None of the alternatives considered are expected to adversely affect any listed or candidate seabirds in a manner not already considered in previous consultations.

2.2.3 Marine Mammals

As with salmon and seabirds listed under the ESA, fishing activities under this proposed action are not likely to impact the threatened Steller sea lion (Eumetopias jubatus), in a manner, or to an extent, not previously considered in informal section 7 consultations for 1994 groundfish fisheries (NMFS, 1994c,d).

Other listed marine mammals include the endangered fin whale (Balaenoptera physalus), sei whale (Balaenoptera borealis), humpback whale (Megaptera novaeangliae), sperm whale (Physeter catodon), northern right whale (Balaena glacialis), blue whale (Balaenoptera musculus) and Steller sea lion (Eumetopias jubatus). None of these species are anticipated to be adversely affected by this proposed amendment.

2.3 Impacts on Marine Mammals not listed under the ESA

Marine mammals not listed under the ESA that may be present in the BSAI or GOA include cetaceans, [minke whale (Balaenoptera acutorostrata), killer whale (Orcinus orca), Dall's porpoise (Phocoenoides dalli), harbor porpoise (Phocoena phocoena), Pacific white-sided dolphin (Lagenorhynchus obliquidens), and the beaked whales (e.g., Berardius bairdii and Mesoplodon spp.)] as well as pinnipeds [northern fur seals (Callorhinus ursinus), and Pacific harbor seals (Phoca vitulina)] and the sea otter (Enhydra lutris). As previously mentioned, a list of species and detailed discussion regarding life history and potential impacts of the 1995 groundfish fisheries of the BSAI and GOA on those species can be found in an EA conducted on the 1995 Total Allowable Catch Specifications for the GOA and BSAI (NMFS 1995a). None of the alternatives considered are expected to adversely affect any listed or candidate marine mammals in a manner not already considered in previous consultations.

2.4 Coastal Zone Management Act

Each of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

2.5 Conclusions or Findings of No Significant Impact

None of the alternatives are likely to significantly affect the quality of the human environment; preparation of an environmental impact statement for selection of any of the alternatives as the proposed action would not be required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

3.0 REGULATORY IMPACT REVIEW: ECONOMIC AND SOCIOECONOMIC IMPACTS OF THE ALTERNATIVES

This section provides information about the economic and socioeconomic impacts of the alternatives including identification of the individuals or groups that may be affected by the action, the nature of these impacts, quantification of the economic impacts if possible, and discussion of the trade offs between qualitative and quantitative benefits and costs.

The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement from the order:

> In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable

> measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environment, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

This section also addresses the requirements of both E.O. 12866 and the Regulatory Flexibility Act to provide adequate information to determine whether an action is "significant" under E.O. 12866 or will result in "significant" impacts on small entities under the RFA. E.O. 12866 defines a "significant regulatory action" as likely to result in (1) an annual effect on the economy of $100 million or more; (2) an adverse effect in a material way on the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; or (3) a novel legal or policy issue. Requirements of the RFA are addressed in Section 4.

Under Alternative 1 (status quo), the Council would determine the GOA POP TAC based on the procedures outlined in the Rebuilding Plan. Under Alternatives 2 and 3, the TAC-setting procedures in the Rebuilding Plan would be amended..

Alternative 2 would provide the Council the authority to recommend TACs below the amount determined by the Rebuilding Plan algorithm, provided sufficient justification could be made for the adjustment. The economic impact of a particular annual POP TAC would depend on the difference between the upper-limit of the TAC as determined by the Rebuilding Plan algorithm, and the amount recommended by the Council. Any reduction in TAC from the Rebuilding Plan amount would result in a loss in revenue to trawl catcher/processors currently participating in the POP directed fishery, that may or may not be made up in the future. Unless these losses are offset by other benefits identified by the Council and NMFS, the reduction in TAC would result in a net loss.

Conclusions about the long-term potential economic losses from closure of the directed POP fishery are based largely on the assumptions and results of the biological modeling and the extent to which a downward adjustment is made from the rebuilding TAC. In an analysis presented to the Council in April 1995, NMFS projected that a "bycatch-only" TAC would provide little additional benefit in terms of the timing or rate of POP rebuilding (NMFS, 1995b). If this is the case, the value of the catch foregone as a result of the bycatch-only fishery would not be made up by increased catch at an earlier date in the future. As the difference between the TAC allowed under the rebuilding plan and the bycatch-only fishing level increases in future years, the direct economic losses associated with a bycatch-only fishery would increase.

Even if faster POP rebuilding occurs as a result of lower TACs, economic losses may still occur in the form of trade-offs between catch now and catch in the future. In general, a higher economic

value is placed on catch in the near term because current participants are able to realize and reinvest economic returns sooner and because current participants are not assured that they will be the people benefiting from future increased catches of POP. For those fishermen who currently do not target on POP, but would in the future, an allocation of catch between the present and the future represents an economic benefit.

The 1995 directed trawl fisheries for POP can be used to illustrate the potential economic losses to current participants in the first year from a bycatch-only TAC.

Directed fisheries for POP were allowed in all areas of the GOA in 1995. The fisheries were open in the Western Gulf from July 3 to July 20, in the Central Gulf from July 3 to July 6, and in the Eastern Gulf from July 3 to July 9 and from October 13 to 16. Nineteen trawl catcher/processors participated in these directed POP fisheries (7 in WGOA, 11 in CGOA, and 12 in EGOA). All of these catcher/processors except one was 100 percent observed.

Table 1 summarizes the estimated catch and value for the 1995 directed trawl fisheries for POP by area and species. The estimated wholesale processed product value of the 1995 directed trawl fisheries for POP was about $6.7 million. POP contributed about $3 million to the value, other rockfish approximately $1.9 million, and sablefish bycatch about $1.6 million. The majority of this catch would likely not have been made if POP had been placed on bycatch only status in 1995.

The economic impacts of Alternative 3 would depend on additional alternatives identified in re-evaluation of the Rebuilding Plan.

3.1 Administrative and Enforcement Costs

None of the alternatives considered would significantly affect administrative or enforcement costs associated with management of the GOA groundfish fisheries.

Table 4. Estimated catch (mt), utilization (mt), and value ($) of the 1995 directed trawl fisheries for Pacific Ocean perch in the Gulf of Alaska.

Species	WGOA		CGOA		EGOA		Gulf of Alaska Total			
	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	Total	Value ($) 1/
POP	1,331	71	1,290	52	1,487	89	4,108	212	4,321	3,079,874
DSR	1	1	3	4	3	9	7	14	20	12,575
Northern Rock.	44	4	147	17	23	7	214	29	243	113,408
Pelagic Shelf	38	1	131	9	217	11	386	20	406	280,781
Slope Rockfish	1	18	23	105	78	128	103	251	354	81,426
SRRE	90	3	136	48	154	165	380	215	596	633,382
Thornyhead	42	11	31	18	50	20	123	49	172	710,100
Total Rockfish	1,547	109	1,762	253	2,012	428	5,321	791	6,112	4,911,546
Sablefish	60	2	149	53	148	55	357	110	467	1,602,493
Pacific Cod	4	32	14	37	5	4	22	73	95	17,670
Atka Mackerel	109	16	0	0	1	1	110	16	126	69,518
DW Flat	9	2	19	13	2	8	30	22	52	27,993
Flathead Sole	0	1	2	0	1	0	3	2	5	2,445
Rex Sole	3	5	28	6	3	3	33	14	48	55,086
SW Flat	0	0	0	4	2	0	3	4	7	2,967
Pollock	0	62	1	9	0	21	1	92	93	0
Arrowtooth	61	73	107	146	49	197	218	415	633	49,891
Other	0	11	2	9	0	25	2	45	47	0
All Groundfish	1,793	312	2,084	530	2,223	742	6,101	1,584	7,685	6,739,610

1/ Estimated wholesale processed product value based on multiplying retained catch weight by a product recovery rate (primarily H&G Eastern cut) and an estimated wholesale price based on the 1994 processor's annual reports.

Source: Blend estimates of catch, Weekly Production Reports, and Commercial Operator's Annual Report, as of 11/5/95.

4.0 INITIAL REGULATORY FLEXIBILITY ANALYSIS

The objective of the Regulatory Flexibility Act is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. If an action will have a significant impact on a substantial number of small entities an Initial Regulatory Flexibility Analysis (IRFA) must be prepared to identify the need for the action, alternatives, potential costs and benefits of the action, the distribution of these impacts, and a determination of net benefits.

NMFS has defined all fish-harvesting or hatchery businesses that are independently owned and operated, not dominant in their field of operation, with annual receipts not in excess of $2,000,000 as small businesses. In addition, seafood processors with 500 employees or fewer, wholesale industry members with 100 employees or fewer, not-for-profit enterprises, and government jurisdictions with a population of 50,000 or less are considered small entities. A "substantial number" of small entities would generally be 20% of the total universe of small entities affected by the regulation. A regulation would have a "significant impact" on these small entities if it reduced annual gross revenues by more than 5 percent, increased total costs of production by more than 5 percent, or resulted in compliance costs for small entities that are at least 10 percent higher than compliance costs as a percent of sales for large entities.

If an action is determined to affect a substantial number of small entities, the analysis must include:

(1) a description and estimate of the number of small entities and total number of entities in a particular affected sector, and total number of small entities affected; and

(2) analysis of economic impact on small entities, including direct and indirect compliance costs, burden of completing paperwork or recordkeeping requirements, effect on the competitive position of small entities, effect on the small entity's cash flow and liquidity, and ability of small entities to remain in the market.

4.1 Economic Impact on Small Entities

These alternatives affect specification of the POP TAC in the Gulf of Alaska. Participants in the directed trawl fishery for POP generally are trawl catcher/processor vessels which are not considered small entities for purposes of the RFA. Therefore, this action is not anticipated to affect any small entities.

5.0 REFERENCES

National Marine Fisheries Service (NMFS). 1995a. Final Environmental Assessment for 1995 Groundfish Total Allowable Catch Specifications. NMFS, PO Box 21668, Juneau, AK 99802-1668.

National Marine Fisheries Service (NMFS). 1995b. "Interim Report on the Status of the Pacific Ocean Perch Rebuilding Plan in the Gulf of Alaska". Prepared by J. Heifetz, J. Ianelli, and J. Fujioka. Juneau, Ak. April 6, 1995.

National Marine Fisheries Service (NMFS). 1994b. Biological Opinion on the Effects of the North Pacific Groundfish Fisheries on Salmon. January 19, 1994. 28p.

National Marine Fisheries Service (NMFS). 1994c. Section 7 Consultation for 1994 Total Allowable Catch Specifications for the Bering Sea and Aleutian Islands Groundfish Fishery. January 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

National Marine Fisheries Service (NMFS). 1994c. Section 7 Consultation for 1994 Total Allowable Catch Specifications for the Gulf of Alaska Groundfish Fishery. January 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

United States Fish and Wildlife Service (USFWS). 1989. Formal Consultation with the U.S. Fish and Wildlife Service Pursuant to Section 7 of the Endangered Species Act. Biological Opinion. July 3, 1989. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

United States Fish and Wildlife Service (USFWS). 1994. Informal Consultation with the U.S. Fish and Wildlife Service Pursuant to Section 7 of the Endangered Species Act. February 14, 1994. National Marine Fisheries Service, PO Box 21668, Juneau, AK 99802-1668.

6.0 LIST OF PREPARERS

Kaja Brix
Sally Bibb
National Marine Fisheries Service
Juneau, Alaska