

MEMORANDUM

TO: Council and AP Members  
FROM: Chris Oliver *Chris*  
Executive Director  
DATE: March 26, 2003  
SUBJECT: Alaska Groundfish Programmatic SEIS

ESTIMATED TIME  
2 HOURS

ACTION REQUIRED

- (1) Receive Progress Report and Update on Schedule
- (2) Receive report on the multi-species model used for analysis and review its assumptions (SSC only)

BACKGROUND

In June 2002, the Council adopted a suite of four policy alternatives and accompanying frameworks for analysis in the revised draft Programmatic SEIS for the BSAI and GOA Groundfish Fisheries (PSEIS) (Item C-5(a)). In the process of developing the analysis, and with the concurrence of the PSEIS Steering Committee/Chairman's Workgroup, minor adjustments were made to the framework. An annotated version of the spreadsheet is attached as Item C-5(b), detailing where modifications were made from the Council's June 2002 version. A narrative summary of the alternatives and their example FMPs is attached as Item C-5(c).

Some of the alternative policies call for re-opening or further restricting the fishing area in the BSAI and GOA. Although the PSEIS decision will be at a policy level, illustrative maps have been created for various example FMP bookends, to inform the analysis of a more or less restrictive spatial policy. These maps in poster form will be displayed during the PSEIS agenda item. Statistics on the example FMP bookend spatial restrictions are included in Item C-5(d).

In addition, the Council will receive a report on the Court's recent decision to reduce the work schedule for completing the PSEIS by 8 months. A new revised schedule will be presented showing NOAA Fisheries issuing a revised Draft PSEIS in September of 2003, with a final document being released during the summer of 2004. A Record of Decision on the PSEIS will be issued no later than September 1, 2004. To achieve this aggressive schedule, the Council will have to select a preliminary preferred alternative at its June 2003 meeting. Region staff will review the necessary steps to accomplish this task so that the Council's decision can be included in the revised Draft PSEIS. Following the June meeting, the document will be prepared for public review. The detailed revised schedule is attached as Item C-5(e).

Other effects of the Court-mandated deadline include shortening the public review period to the required minimum 45-days, requiring all electronic comments to be submitted using an agency web-based portal system, and perhaps scheduling a special meeting for the Council to review and select its final preferred alternative next spring.

Attached as Item C-5(f) is a copy of the powerpoint slides for Dr. James Ianelli's report to the SSC on the multi-species model used in the PSEIS analysis.

## REVISED SCHEDULE

- June 2003 overview of the revised draft PSEIS presented to Council; Council will determine its preliminary preferred alternative, to be included in the revised draft PSEIS
- Sep-Oct 2003 public review of revised draft PSEIS
- Oct-Dec 2003 synthesis and review of public comments
- December 2003 comment summary presented to Council
- Spring 2004 Council finalizes its preferred alternative
- Summer 2004 Final PSEIS released for public review
- September 2004 Record of decision

## ALTERNATIVE 1(a)

### Current BSAI Policy Statement (same as original 1979 FMP)

#### Section 3.2 of Bering Sea/Aleutian Islands FMP      Goals for Management Plan

The North Pacific Fishery Management Council has determined that all its fishery management plans should, in order to meet the requirements of its constituency, the resources and FCMA, achieve the following goals:

1. Promote conservation while providing for the optimum yield from the Region's groundfish resource in terms of: providing the greatest overall benefit to the nation with particular reference to food production and recreational opportunities; avoiding irreversible or long-term adverse effects on the fishery resources and the marine environment; and insuring availability of a multiplicity of options with respect to the future uses of these resources.
2. Promote, where possible, efficient use of the fishery resources but not solely for economic purposes.
3. Promote fair and equitable allocation of identified available resources in a manner such that no particular group acquires an excessive share of the privileges.
4. Base the plan on the best scientific information available.

In accomplishing these broad objectives a number of secondary objectives have been considered:

1. Conservation and management measures have taken into account the unpredictable characteristics of future resource availability and socioeconomic factors influencing the viability of the industry.
2. Where possible, individual stocks of fish are managed as a unit throughout their range, but such management is in due consideration of other impacted resources.
3. In such instances when stocks have declined to a level below that capable of producing MSY, management measures promote the rebuilding the stocks. In considering the rate of rebuilding, factors other than biological considerations have been taken into account.
4. Management measures, while promoting efficiency where practicable, are designed to avoid disruption of existing social and economic structures where fisheries appear to be operating in reasonable conformance with the Act and have evolved over a period of years as reflected in community characteristics, processing capability, fleet size and distribution. These systems and the resources upon which they are based are not static, but change in the existing regulatory regime should be the result of considered action based on data and public input.
5. Management measures should contain a margin of safety in recommending allowable biological catches when the quality of information concerning the resource and ecosystem is questionable. Management plans should provide for accessing biological and socioeconomic data in such instances where the information base is inadequate to effectively establish the biological parameters of the resource or to reasonably establish optimum yield. This plan has identified information and research required for further plan development.
6. Fishing strategy has been designed in such a manner as to have minimal impact on other fisheries and the environment.

## Current GOA Policy Statement (adopted through Amendment 14 in 1985)

### Section 2.1 of GOA FMP Goals and Objectives for Management of Gulf Groundfish Fisheries

The North Pacific Fishery Management Council (NPFMC or the Council) is committed to develop long-range plans for managing the Gulf of Alaska groundfish fisheries that will promote a stable planning environment for the seafood industry and will maintain the health of the resource and the environment for the seafood industry and will maintain the health of the resource and the environment. In developing allocations and harvesting systems, the Council will give overriding considerations to maximizing economic benefits to the United States. Such management will:

1. Conform to the National Standards and to the NPFMC Comprehensive Fishery Management Goals.
2. Be designed to assure that to the extent possible:
  1. Commercial, recreational, and subsistence benefits may be obtained on a continuing basis.
  2. Minimize the chances of irreversible or long-term adverse effects on fishery resources and the marine environment.
  3. A multiplicity of options will be available with respect to future use of the resources.
  4. Regulations will be long-term and stable with changes kept to a minimum.

Principal Management Goal. Groundfish resources of the Gulf of Alaska will be managed to maximize positive economic benefits to the United States, consistent with resource stewardship responsibilities for the continuing welfare of the Gulf of Alaska living marine resources. Economics benefits include, but are not limited to, profits, benefits to consumers, income and employment.

To accomplish this goal, a number of objectives will be considered:

- Objective 1: The Council will establish annual harvest guidelines, within biological constraints, for each groundfish fishery and mix of species taken in that fishery.
- Objective 2: In its management process, including the setting of annual harvest guidelines, the Council will account for all fishery-related removals by all gear types for each groundfish species, sport fishery and subsistence catches, as well as by directed fisheries.
- Objective 3: The Council will manage fisheries to minimize waste by:
1. Developing approaches to treating bycatches other than as a prohibited species. Any system adopted must address the problems of covert targeting and enforcement.
  2. Developing management measures that encourage the use of gear and fishing techniques that minimize discards.
- Objective 4: The Council will manage groundfish resources of the Gulf of Alaska to stimulate development of fully domestic fishery operations.
- Objective 5: The Council will develop measures to control effort in a fishery, including systems to convert the common property resource to private property, but only when requested to do so by industry.
- Objective 6: Rebuilding stocks to commercial or historic levels will be undertaken only if the benefits to the United States can be predicted after evaluating the associated costs and benefits and the impacts on related fisheries.
- Objective 7: Population thresholds will be established for economically viable species complexes under Council management on the basis of the best scientific information, and acceptable biological catches (ABCs) will be established as defined in this document. If population estimates drop below these thresholds, ABC will be set to reflect necessary rebuilding as determined in Objective 6.

## ALTERNATIVE 1(b)

### Management Approach

Continue to work toward the goals of maintaining sustainable fisheries, protecting threatened and endangered species, and to protect, conserve, and restore living marine resource habitat through existing institutions and processes. Continue to manage the groundfish fisheries through the current risk averse conservation and management program that is based on a conservative harvest strategy. Under this management strategy, fishery impacts to the environment are mitigated as scientific evidence indicates that the fishery is adversely impacting the ecosystem. Management decisions will utilize the best scientific information available; the management process will be adaptive to new information and reactive to new environmental issues; incorporate and apply ecosystem-based management principles; consider the impact of fishing on predator-prey, habitat, and other important ecological relationships; maintain the statutorily mandated programs to reduce excess capacity and the race-for-fish; draw upon federal, state, and academic capabilities in carrying out research, administration, management, and enforcement; and consider the effects of fishing and encourage the development of practical measures that minimize bycatch and adverse effects of essential fishing habitat. This strategy is based on the assumption that fishing does produce some adverse impact on the environment and that as these impacts become known, mitigation measures are developed and FMP amendments are implemented. Issues will be addressed as they ripen and are identified through Council staff tasking and research priorities. The Council will continue to use the National Standards and other applicable law as its guide in practicing adaptive management and responsible decision making and to consistently amend FMPs accordingly. To meet the goal of this overall program, the Council and NMFS will seek to achieve the following management objectives:

#### ***Prevent Overfishing:***

1. Adopt conservative harvest levels for single species fisheries and specify Optimum Yield (OY). [M, MSA-NS1; NAS SF]
2. Continue to use existing OY cap for BSAI and GOA groundfish fisheries.
3. Provide for adaptive management by continuing to specify OY as a range. [M, MSA to set OY; D to set as range]

#### ***Preserve Food Web:***

4. Incorporate ecosystem considerations into fishery management decisions. [NAS SF]
5. Continue to protect the integrity of the food web through limits on harvest of forage species.
6. Develop a conceptual model of the food web. [EPAP]

#### ***Reduce and Avoid Bycatch:***

7. Continue current incidental catch and bycatch management program.
8. Continue to manage incidental catch and bycatch through seasonal distribution of TAC and geographical gear restrictions.
9. Continue to account for bycatch mortality in monitoring annual TACs.
10. Control the bycatch of prohibited species through PSC limits.
11. Continue program to require full utilization of target species.
12. Continue to respond to evidence of population declines by closing areas and implementing gear and seasonal restrictions in affected areas.

#### ***Avoid Impacts to Seabirds and Marine Mammals:***

13. Continue to cooperate with USFWS to protect ESA-listed and other seabird species. [M, ESA - listed species; D, other species]
14. Maintain current protection measures in order to avoid jeopardy to ESA-listed Steller sea lions. [M, ESA]

***Reduce and Avoid Impacts to Habitat:***

15. Respond to new scientific information regarding areas of critical habitat by closing those regions to all fishing (i.e., no-take marine reserves such as Sitka Pinnacles).
16. Evaluate the impacts of trawl gear on habitat through the stepwise implementation of a comprehensive research plan, to determine appropriate habitat protection measures.
17. Continue to evaluate candidate areas for marine protected areas. [EO 13158]

***Allocation Issues:***

18. Continue to reduce excess fishing capacity, overcapitalization and the adverse effects of the race for fish. [M, SFA to continue AFA Pollock cooperative program; D, other programs; NAS SF]
19. Provide economic and community stability by maintaining current allocation percentages to harvesting and processing sectors.

***Increase Alaska Native Consultation:***

20. Continue to incorporate traditional knowledge in fishery management.
21. Continue current levels of Alaska Native participation and consultation in fishery management. [EO 13084 ]

***Data Quality, Monitoring and Enforcement:***

22. Continue the existing reporting requirements and Observer Program to provide catch estimates and biological information.
23. Continue on-going effort to improve community and regional economic impact assessments.
24. Increase the quality of monitoring data through improved technological means.

## ALTERNATIVE 2

### Management Approach

Amend the current FMPs to establish a more aggressive harvest strategy while still preventing overfishing of target groundfish stocks. The goal would be to maximize biological and economic yield from the resource. Such a management approach will be based on the best scientific information available, take into account individual stock and ecosystem variability; involve and be responsive to the needs and interests of affected states and citizens; continue to work with state and federal agencies to protect threatened and endangered species; maintain the statutorily mandated programs to reduce excess capacity and the race-for-fish; draw upon federal, state, and academic capabilities in carrying out research, administration, management, and enforcement; and consider the effects of fishing and encourage the development of practical measures that minimize bycatch and adverse effects of essential fishing habitat. This strategy is based on the assumption that fishing does not have an adverse impact on the environment except in specific cases as noted. To meet the goal of this overall program, the Council and NMFS will seek to achieve the following management objectives:

#### ***Prevent Overfishing:***

1. Prevent overfishing by setting an Optimum Yield (OY) cap at the sum of OFL or the sum of the ABCs for each species.
2. Provide for adaptive management by continuing to specify OY as a range. [M - MSA to set OY; D - to set as range]

#### ***Preserve Food Web:***

(none)

#### ***Reduce and Avoid Bycatch:***

3. Monitor the bycatch of prohibited species and adjust or eliminate PSC limits.
4. Manage incidental catch and bycatch through closure areas for selected gear types.

#### ***Avoid Impacts to Seabirds and Marine Mammals:***

6. Maintain current protection measures to protect ESA-listed seabird species. [M, ESA]
7. Maintain current protection measures to avoid jeopardy to ESA-listed Steller sea lions. [M, ESA]

#### ***Reduce and Avoid Impacts to Habitat:***

8. Evaluate the impacts of trawl gear on habitat through the implementation of the existing research plan, identify EFH, and determine appropriate habitat protection measures.
9. Continue to evaluate candidate areas for marine protected areas. [EO 13158]

#### ***Allocation Issues:***

10. Maintain AFA and CDQ program as authorized by MSA. [M, SFA to continue AFA Pollock cooperative program; D other programs; NAS SF]

#### ***Increase Alaska Native Consultation:***

11. Continue to incorporate traditional knowledge in fishery management.
12. Continue current levels of Alaska Native participation and consultation in fishery management.

#### ***Data Quality, Monitoring and Enforcement:***

13. Continue the existing reporting requirements to provide catch estimates and biological information.
14. Continue on-going effort to improve community and regional economic impact assessments.
15. Consider repealing the Observer Program.

## ALTERNATIVE 3

### Management Approach

Accelerate precautionary management measures through community or rights-based management, ecosystem-based management principles, and where appropriate and practicable, increased habitat protection and additional bycatch constraints. This policy objective seeks to provide sound conservation of the living marine resources; provide socially and economically viable fisheries and fishing communities, minimize human caused threats to protected species; maintain a healthy marine resource habitat; and incorporate ecosystem-based considerations into management decisions. This policy recognizes the need to balance many competing uses of marine resources and different social and economic goals for fishery management. This policy will utilize and improve upon existing processes to involve a broad range of the public in decisionmaking. Further, these objectives seek to maintain the balanced goals of the National Standards and other provisions of the MSA as well as the requirements of other applicable law, all as based on the best scientific information available. This policy takes into account the National Academy of Science's Sustainable Fisheries Policy Recommendations. Under this approach, additional conservation and management measures will be taken as necessary to respond to social, economic or conservation needs, or if scientific evidence indicates that the fishery is negatively impacting the environment.

#### ***Prevent Overfishing:***

1. Adopt conservative harvest levels for multi-species and single species fisheries.
2. Provide for adaptive management. Continue to specify OY as a range or a formula. [M - MSA to set OY; D - to set as range]
3. Initiate a scientific review of the adequacy of  $F_{40}$  and implement improvements accordingly. [D, MSA]
4. Continue to collect scientific information and improve upon MSSTs including obtaining biological information necessary to move Tier 4 species into Tiers 1-3 in order to obtain MSSTs.

#### ***Preserve Food Web:***

5. Incorporate ecosystem-based considerations into fishery management decisions. [NAS SF]
6. Develop indices of ecosystem health as targets for management. [EPAP]
7. Improve the procedure to adjust ABCs as necessary to account for uncertainty and ecosystem factors such as predator-prey relationships and regime shifts.
8. Initiate a research program to identify the habitat needs of different species that represent the significant food web. [EPAP]

#### ***Reduce and Avoid Bycatch:***

9. Continue and improve current incidental catch and bycatch management program.
10. Developing incentive programs for incidental catch and bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, VBAs, or other bycatch incentive systems.
11. Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits as information becomes available.
12. Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce discards.

#### ***Avoid Impacts to Seabirds and Marine Mammals:***

13. Continue to cooperate with USFWS to protect ESA-listed and other seabird species. [M, ESA - listed species; D, other species]
14. Initiate joint research program with USFWS to evaluate current population estimates for all seabird species that interact with the groundfish fisheries.
15. Maintain or adjust current protection measures as appropriate to avoid jeopardy to ESA-listed Steller sea lions. [M, ESA]
16. Encourage programs to review status of other marine mammal stocks and fishing interactions (right whales, sea otters, etc.) and develop fishery management measures as appropriate.



***Reduce and Avoid Impacts to Habitat:***

17. Develop goals, objectives and criteria to evaluate the efficacy of marine protected areas and no-take marine reserves as tools to maintain abundance, diversity, and productivity of marine organisms. Consider implementation of MPAs if and where appropriate, giving due consideration to areas already closed to various types of fishing operations. [NRC MPA; EO 13158]
18. Develop a research program to identify regional baseline habitat information and mapping.
19. Evaluate the impacts of all gear on habitat through the implementation of a comprehensive research plan, to determine habitat protection measures as necessary and appropriate.
20. Identify and designate EFH and HAPC.

***Allocation Issues:***

21. Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.
22. Maintain LLP program and further decrease excess fishing capacity and other adverse effects of the race for fish by eliminating latent licences and extending programs such as community or rights-based management to some or all groundfish fisheries. [NAS SF]
23. Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of property rights based on performance.
24. To support fishery management, extend cost recovery program to all rationalized groundfish fisheries.

***Increase Alaska Native Consultation:***

25. Continue to incorporate traditional knowledge in fishery management.
26. Consider ways to enhance collection of traditional knowledge from communities, and incorporate such knowledge in fishery management where appropriate.
27. Increase Alaska Native participation and consultation in fishery management.

***Data Quality, Monitoring and Enforcement:***

28. Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.
29. Improve groundfish Observer Program, and consider ways to address the disproportionate costs associated with the current funding mechanism.
30. Improve community and regional economic impact assessments through increased data reporting requirements.
31. Increase the quality of monitoring data through improved technological means.
32. Establish a coordinated, long-term ecosystem monitoring program to collect baseline information and compile existing information from a variety of ongoing research initiatives.
33. Adopt the recommended research plan included in this document.
34. Cooperate with research institutions such as the North Pacific Research Board in identifying research priorities to address pressing fishery issues.

## ALTERNATIVE 4

### Management Approach

Adopt an extremely precautionary approach to managing fisheries under scientific uncertainty in which the burden of proof is shifted to the user of the resource to demonstrate that the intended use will not have a detrimental effect on the environment. Modify restrictive conservation and management measures as additional, reliable scientific information becomes available. Establish a fishery conservation and management program to maintain ecological relationships among exploited, dependent and related species as well as ecosystem processes that sustain them. Management decisions assume that science cannot eliminate uncertainty and that action must be taken in the face of large uncertainties, guided by policy priorities and the strict interpretation of the precautionary principle. Management decisions will involve and be responsive to the public but decrease emphasis on industry and community concerns; incorporate and apply strict ecosystem principles; address the impact of fishing on predator-prey, habitat and other important ecological relationships in the marine environment; implement measures that avoid or minimize bycatch; include the use of explicit allocative or cooperative programs to reduce excess capacity and allocate fish to particular gear types and fisheries; identify and incorporate non-consumptive-use values; and draw upon federal, state, academic and other capabilities in carrying out research, administration, management, and enforcement. This strategy is based on the assumption that fishing does produce adverse impacts on the environment but due to lack of information and uncertainty, we know little about these impacts. This strategy would result in a number of significant changes to the FMPs that would significantly curtail the groundfish fisheries until more information is known about the frequency and intensity of fishery impacts upon the environment. Expanded research and monitoring programs will fill critical data gaps. Once more is known about fishery effects on the ecosystem, scientific information will be used to modify and relax the precautionary measures initially adopted. To meet the goals of this overall program, the Council and NMFS will seek to achieve the following management objectives:

#### ***Prevent Overfishing:***

1. Prevent overfishing by transitioning from single-species to ecosystem-oriented management of fishing activities.
2. Close an additional 20-50% of known spawning areas of target species across the range of the stock to protect the productivity and genetic diversity.

#### ***Preserve Food Web:***

3. Develop and implement a Fishery Ecosystem Plan through the modification or amendment of current FMPs. [EPAP, NRC]
4. Conserve native species and biological diversity at all relevant scales of genetic, species, and community interactions.
5. Reduce the ABC to account for uncertainty and ecological considerations for all exploited stocks, including genetic, life history, food web and habitat considerations.
6. Set fishing levels in a highly precautionary manner to preserve ecological relationships between exploited, dependent, and related species.

#### ***Reduce and Avoid Bycatch:***

7. Include bycatch mortality in TAC accounting and improve the accuracy of mortality assessments for target, non-target, and PSC bycatch, including unobserved mortality.
8. Reduce bycatch, incidental catch, and PSC limits (e.g., by 10%/year for five years).
9. Phase out fisheries with >25% incidental catch and bycatch rates.
10. Establish PSC limits for salmon, crab and herring in the Gulf of Alaska.
11. Set stringent bycatch limits for vulnerable non-target species based on best available information.

***Avoid Impacts to Seabirds and Marine Mammals:***

12. Set protection measures immediately for all seabird species and cooperate with USFWS to develop fishing methods that reduce incidental takes to levels approaching zero for all threatened or endangered species and for USFWS's list of species of management concern.
13. Initiate joint research program with USFWS to evaluate current population estimates for all seabird species that interact with the groundfish fisheries and modify protection measures based on research findings.
14. Increase existing protection measures for ESA-listed Steller sea lions by further restricting gear in critical habitat and setting more conservative harvest levels for prey base species.

***Reduce and Avoid Impacts to Habitat:***

15. Zone and delimit fishing gear use in the action area and establish no-take marine reserves (both pelagic and nearshore) encompassing 20-50% of management areas to conserve EFH, provide refuges from fishing, serve as experimental controls to test the effects of fisheries, protect genetic and biological diversity, and foster regeneration of depleted stocks in fished areas.
16. To protect habitat and reduce bycatch, prohibit trawling in fisheries that can be prosecuted with more selective gear types and establish trawl closure areas.
17. Manage fisheries in an explicitly adaptive manner to facilitate learning (including large no-take marine reserves that provide experimental controls).
18. Protect marine habitats, including EFH, HAPC, ESA-designated critical habitats and other identified habitat types.
19. Commit to funding a comprehensive research plan in order to provide baseline habitat atlas.

***Allocation Issues:***

20. Reduce excess fishing capacity and employ equitable allocative or cooperative programs to end the race for fish, reduce waste, increase safety, and promote long-term stability and benefits to fishing communities.
21. Consider non-consumptive use values.

***Increase Alaska Native Consultation:***

22. Utilize traditional knowledge in fishery management, including monitoring and data-gathering capabilities, through co-management and cooperative research programs.
23. Increase participation of and consultation with Alaska Native subsistence users and explicitly address the direct, indirect and cumulative fishery impacts on traditional subsistence uses and cultural values of living marine resources.

***Data Quality, Monitoring and Enforcement:***

24. Increase the precision of observer data through increased observer coverage and enhanced sampling protocols, and address the shortcomings of the current funding mechanism by implementing either a federally funded or equitable fee-based system for a revamped Observer Program Research Plan.
25. Improve enforcement and in-season management through improved technological means.
26. Establish a coordinated, long-term monitoring program to collect baseline information and better utilize existing research information to improve implementation of the Fishery Ecosystem Plan.
27. Adopt the recommended research plan included in this document.

**KEY:**

ABC	Acceptable Biological Catch
AFA	American Fisheries Act
BSAI	Bering Sea and Aleutian Islands
D	Discretionary (if no indication, action is discretionary)
EFH	Essential Fish Habitat
EO	Executive Order
EPAP	Ecosystem Principles Advisory Panel Recommendations on Ecosystem-Based Management
ESA	Endangered Species Act
FCMA	Fishery Conservation and Management Act (now called the Magnuson Stevens Act)
FMP	Fishery Management Plan
GOA	Gulf of Alaska
HAPC	Habitat Areas of Particular Concern
IR/IU	Improved Retention/Improved Utilization
M	Mandatory
MSA	Magnuson Stevens Fishery Conservation and Management Act
MSA NS#	MSA National Standard #
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
NAS SF	National Academy of Sciences Policy Recommendations for Sustainable Fisheries
NMFS	National Marine Fisheries Service
NMFS BYC	NMFS National Bycatch Plan
NPFMC	North Pacific Fishery Management Council
NRC	National Research Council
NRC MPA	National Research Council Marine Protected Areas Report
OFL	Overfishing Level
OY	Optimum Yield
PSC	Prohibited Species Catch
SFA	Sustainable Fisheries Act
TAC	Total Allowable Catch
USFWS	U.S. Fish and Wildlife Service

COMPARISON OF FMP FRAMEWORK FOR SECOND DRAFT ALTERNATIVES

AS APPROVED 2002

	Alt 1	Alt 2	Alt 3	Alt 4
	1	2.1 ↔ 2.2	3.1 ↔ 3.2	4.1 ↔ 4.2
<b>TAC-setting Process</b>	<ul style="list-style-type: none"> <li>- Set ABC &lt; OFL</li> <li>- Sum of TAC has to be within OY range</li> <li>- OY specified as range for BSAI: 1.4 - 2.0 mil MT and OY specified as range for GOA: 116,000 - 800,000 MT; BSAI OY cap: if the sum of TAC &gt; 2 mil mt then TAC will be adjusted down</li> <li>- B<sub>20</sub> rule for prey species (pollock, P.cod, Atka mackerel)</li> <li>- ABC tier system (Amendment 56)</li> <li>- No directed fishery for forage fish (forage fish ban; Amendment 38/39)</li> <li>- Specify MSSTs for Tier 1-3 stocks</li> <li>- Set group TAC for "other species"</li> <li>- Precautionary adjustments exist, but vary with uncertainty only in Tier 1</li> <li>- Develop ecosystem indicators for future use in TAC-setting</li> <li>- Target species closures when harvest limit reached</li> </ul>	<ul style="list-style-type: none"> <li>- Set ABC = OFL</li> <li>- Sum of TAC has to be within OY range</li> <li>- OY specified as range; OY cap = sum of OFL</li> <li>- No changes from Alt 1</li> <li>- OFL management (Amendment 56 OFL definitions with inflection points removed in tiers 1-3)</li> <li>- No forage fish ban</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- OFL management only</li> <li>- No ecosystem indicators</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- Set ABC &lt; OFL</li> <li>- Set TAC =&lt; ABC for all targets and "other spp." category</li> <li>- OY specified as range for BSAI: 1.4 - 2.0 mil MT and OY specified as range for GOA: 116,000 - 800,000 MT; BSAI OY cap: if the sum of TAC &gt; 2 mil mt then TAC will be adjusted down (No changes from Alt 1)</li> <li>- B<sub>20</sub> rule for prey species (pollock, P.cod, Atka mackerel) (No changes from Alt 1)</li> <li>- Review F<sub>20</sub> and adapt ABC tier system where F<sub>20</sub> is maximum permissible for stocks without estimate of MSY</li> <li>- No directed fishery for forage fish (forage fish ban, Amendment 38/39; No changes from Alt 1)</li> <li>- Identify minimum required elements, resources, cost and a realistic time frame necessary to establish MSSTs for additional stocks and prioritize a list of candidate stocks</li> <li>- Break sharks and skates out of "other species" group for TAC setting (Amendment 63/63)</li> <li>- Develop criteria for breaking out a species from a species complex</li> <li>- Conduct F<sub>20</sub> review and adopt appropriate measures</li> <li>- Develop criteria for using key ecosystem indicators in TAC-setting</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No OY range in plan; OY = TAC which is =&lt; ABC TAC is fishery specific</li> <li>- Revise harvest control rule by incorporating a constant buffer</li> <li>- When possible, biological reference points based on species specific production patterns and ecosystem considerations</li> <li>- Same as 3.1</li> <li>- Initiate analysis of MSSTs for priority stocks based on the timeframe determined by additional availability of required resources</li> <li>- Break sharks and skates and additional groups out of "other species" group for TAC setting</li> <li>- Develop criteria to bring a non-specified species into a managed category</li> <li>- Develop, implement and update as necessary, procedures to account for uncertainty in estimating ABC</li> <li>- Adopt, update as necessary, and use ecosystem indicators in TAC-setting</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- In the face of uncertainty, set TAC = 0 for all species unless fisheries are proven to have no adverse effect on the environment</li> <li>- No changes from Alt 1</li> <li>- Harvest limit = 0</li> </ul>
<b>Spatial/ Temporal Mgmt of TAC</b>	<ul style="list-style-type: none"> <li>- Species TAC distributed spatially for all BSAI and GOA species except "other spp."</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- Distribute TAC spatially for all GOA species except "other spp.", and for BS pollock by mgmt region</li> </ul>
<b>MPAs and EFH</b>	<ul style="list-style-type: none"> <li>- EO13158 description and evaluation of potential MPA areas</li> <li>- Maintain current closed/restricted areas such as: Walrus Island closures, RKC savings area, Bogoslof area, Pribilof Island closure, Nearshore Bristol Bay closures, Kodiak Type I-III areas, eastern GOA trawl closures</li> <li>- Sitka Pinnacles marine reserve</li> <li>- Identify and designate EFH and HAPC</li> </ul>	<ul style="list-style-type: none"> <li>- No MPAs</li> <li>- Repeal current closed/restricted areas such as: Walrus Island closures, RKC savings area, Bogoslof area, Pribilof Island closure, Nearshore Bristol Bay closures, Kodiak Type I-III areas, eastern GOA trawl closures</li> <li>- Repeal Sitka Pinnacles marine reserve</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- Develop MPA efficacy methodology including program goals, objectives and criteria for establishing MPAs and no take marine reserves</li> <li>- MPA's may include no take areas</li> <li>- Review existing closures such as Sitka Pinnacles to see if these areas qualify for MPAs under established criteria</li> <li>- Could include restrictions of specific gear types or fisheries</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- Identify and designate EFH and HAPC (No changes from Alt 1)</li> <li>- [PLACEHOLDER CONTINGENT ON EFH COMMITTEE]</li> </ul>	<ul style="list-style-type: none"> <li>- Establish 20-50% of the management area as no take MPAs covering the full range of marine habitats</li> <li>- Example areas in BSAI include: Submarine canyons: Unimak Pass, old Crab Pot sanctuary (into area 512), near Pribilof Islands, Al (SSL CH), SW of St. George, Misty Moon, RKC savings area</li> <li>- Example areas in GOA include: Davidson Bank, Shumagin Islands, and region around Kodiak Island (previous crab closure areas), Gulf Shelf breaks, Sitka Pinnacles</li> <li>- Establish AI Special Management Area to protect coralline bottom habitats</li> <li>- Establish 20-50% of the spawning areas as spawning area reserves for exploited species that are fished intensively at spawning time (may be same areas as for MPAs identified above)</li> </ul>

COMPARISON OF FMP FRAMEWORKS FOR SECOND DRAFT ALTERNATIVES

AS APPROVED JUNE 2002

	Alt 1	Alt 2		Alt 3		Alt 4	
	1	2.1	2.2	3.1	3.2	4.1	4.2
<b>SSL Measures</b>	<ul style="list-style-type: none"> <li>- 2002 SSL closures: no fishing in Seguam Pass, 3nm no transit zones around rookeries; trawl and fixed gear closures in nearshore and critical habitat areas</li> <li>- Aleutian Islands (AI) Closures until 2003</li> <li>- B<sub>30</sub> rule for prey species (pollock, P.cod, Atka mackerel)</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- 2002 SSL closures: no fishing in Seguam Pass; 3nm no transit zones around rookeries; trawl and fixed gear closures in nearshore and critical habitat areas (No changes from Alt 1)</li> <li>- AI Closures (same as Alt 1)</li> <li>- B<sub>30</sub> rule for prey species (pollock, P.cod, Atka mackerel) (No changes from Alt 1)</li> </ul>	<ul style="list-style-type: none"> <li>- Continue 2002 SSL closures except establish frameworked buffer zones that are based on distance from shore using edding telemetry data; as new data becomes available, buffer zones would be modified accordingly; for purpose of analysis, a 15 mile buffer zone will be used</li> <li>- Extend AI Closures</li> <li>- Revise harvest control rule by incorporating a constant buffer</li> </ul>	<ul style="list-style-type: none"> <li>- Comprehensive trawl exclusion zones to protect all designated SSL critical habitat</li> <li>- Set F<sub>35</sub> for prey species (pollock, P.cod, Atka mackerel)</li> </ul>	<ul style="list-style-type: none"> <li>- 100% closure areas</li> <li>- TAC = 0 for all species</li> </ul>
<b>Bycatch and Incidental Catch Restrictions</b>	<ul style="list-style-type: none"> <li>- PSC limits for herring, crab, halibut and salmon in BSAI, and for halibut in GOA</li> <li>- IR/IU for pollock, P.cod</li> <li>- Current bycatch and incidental catch restrictions</li> <li>- VIP (vessel incentive program)</li> <li>- Demersal Shelf Rockfish (DSR) full-retention</li> <li>- Crab trawl closures</li> <li>- Cook Inlet prohibition for bottom trawl</li> <li>- Inseason bycatch management measures:                             <ul style="list-style-type: none"> <li>(a) establishment of fishing seasons for bycatch mgmt</li> <li>(b) herring closures for areas (not fishery)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Eliminate PSC limits</li> <li>- Repeal IR/IU</li> <li>- No bycatch restrictions</li> </ul>	<ul style="list-style-type: none"> <li>- PSC limits as for Alt 1. Where sufficient stock status information is available, adjustable PSC limits established based on a percentage of the annual stock status</li> <li>- No changes from Alt 1</li> <li>- Same as 2.1</li> </ul>	<ul style="list-style-type: none"> <li>- BSAI: Reduce PSC limits for herring, crab, halibut and salmon to the extent practicable (0-10%)</li> <li>- GOA: Establish PSC limits on salmon NTE a 25,000 fish cap for Chinook and a 20,500 fish cap for 'other salmon'; establish PSC limits on crab and herring based on biomass or other fishery data;</li> <li>- Reduce GOA halibut PSC limit 0-10%</li> <li>- For those PSC species where annual population estimates exist, the Team will explore a mortality rate-based approach to setting limits</li> <li>- No changes from Alt 1</li> <li>- Review effectiveness of Coop-managed PSC reduction</li> <li>- Repeal VIP program</li> <li>- Control bycatch by closing hotspot areas when bycatch limits are attained</li> </ul>	<ul style="list-style-type: none"> <li>- BSAI: Reduce PSC limits for herring, crab, halibut and salmon to the extent practicable (10-30%)</li> <li>- GOA: Establish PSC limits on salmon NTE a 25,000 fish cap for Chinook and a 20,500 fish cap for 'other salmon'; establish PSC limits on crab and herring based on biomass or other fishery data; reduce all by 0-10%</li> <li>- Reduce GOA halibut PSC limit 10-30%</li> <li>- For those PSC species where annual population estimates exist, the Team will explore a mortality rate-based approach to setting limits</li> <li>- Incentive program for incidental catch and bycatch reduction, e.g.:                             <ul style="list-style-type: none"> <li>(a) Individual Bycatch Quota</li> <li>(b) Harvest Priority (10% of TAC reserved to reward clean fishing)</li> <li>(c) bycatch reduction standards established</li> <li>(d) Coop managed Harvest Priority (0-10% TAC or PSC reserved to reward clean fishing)</li> <li>(e) HMAP</li> </ul> </li> <li>- Develop appropriate closure areas in GOA to address bycatch for halibut and/or crab</li> <li>- Repeal MRBs and establish a system of caps and quotas</li> </ul>	<ul style="list-style-type: none"> <li>- BSAI: Reduce PSC limits for herring, crab, salmon, halibut by 30-50%</li> <li>- GOA: Establish PSC limits on salmon NTE a 25,000 fish cap for Chinook and a 20,500 fish cap for 'other salmon'; establish PSC limits on crab and herring based on biomass or other fishery data; reduce all by 30-50%</li> <li>- For those PSC species where annual population estimates exist, the Team will explore a mortality rate-based approach to setting limits</li> <li>- Extend IR/IU to all target species</li> <li>- Reduce bycatch:                             <ul style="list-style-type: none"> <li>BSAI: reduce all by 30-50%</li> <li>GOA: reduce all by 30-50%</li> </ul> </li> <li>- Bycatch limits for non-target stocks as information becomes available</li> <li>- Establish gear closure areas and marine reserves to reduce and avoid bycatch</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- PSC limit = 0</li> <li>- No incidental catch</li> <li>- No bycatch</li> <li>- 100% closure areas</li> <li>- No inseason mgmt measures (no fishing)</li> </ul>
<b>Seabird Measures</b>	<ul style="list-style-type: none"> <li>- Take of more than 4 short-tailed albatross within 2 years triggers consultation</li> <li>- Seabird avoidance measures</li> </ul>	<ul style="list-style-type: none"> <li>- Take of more than 4 short-tailed albatross within 2 years triggers consultation (No changes from Alt 1)</li> <li>- No seabird avoidance measures</li> </ul>	<ul style="list-style-type: none"> <li>- Same as 2.1</li> <li>- Same as 2.1</li> </ul>	<ul style="list-style-type: none"> <li>- Take of more than 4 short-tailed albatross within 2 years triggers consultation (No changes from Alt 1)</li> <li>- Cooperate with USFWS to develop scientifically-based fishing methods that reduce incidental take for all threatened or endangered species and other albatrosses</li> </ul>	<ul style="list-style-type: none"> <li>- Same as 3.1</li> <li>- Cooperate with USFWS to develop scientifically-based fishing methods that reduce incidental take for all seabird species</li> </ul>	<ul style="list-style-type: none"> <li>- Set protection measures for all seabird species</li> <li>- Cooperate with USFWS to develop scientifically-based fishing methods that reduce incidental take to levels approaching zero for all threatened or endangered species and for USFWS's list of species of management concern</li> </ul>	<ul style="list-style-type: none"> <li>- 100% protection of seabirds from fishing</li> <li>- Zero incidental take; No fishery</li> </ul>

COMPARISON OF FMP FRAMEWORK FOR SECOND DRAFT ALTERNATIVES

AS APPROVED

2002

	Alt 1	Alt 2		Alt 3		Alt 4	
	1	2.1	2.2	3.1	3.2	4.1	4.2
<b>Gear Restrictions and Allocations</b>	<ul style="list-style-type: none"> <li>- Retain existing no-trawl zones and fixed gear restrictions; Bottom trawl ban in BSAI for pollock</li> <li>- No pot fishing in GOA for sablefish</li> <li>- Retain existing gear restrictions and allocations</li> <li>- Sablefish and P.cod allocated by gear in BSAI; sablefish allocated by gear in GOA</li> </ul>	<ul style="list-style-type: none"> <li>- Eliminate all trawl closure areas and trawl and fixed gear restrictions</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- BSAI prohibition on bottom trawl for pollock</li> <li>- No changes from Alt 1 [PLACEHOLDER; CONTINGENT ON EFH COMMITTEE]</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- BSAI and GOA prohibition on bottom trawl for pollock</li> <li>- Restrict fishing to areas where fishing has previously been concentrated [PLACEHOLDER; CONTINGENT ON EFH COMMITTEE]</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- Prohibit trawling in all fisheries that can be prosecuted with other gear types (e.g., fisheries with &gt; 25% bycatch)</li> <li>- Restrict bottom trawling for flatfish to specific areas; No trawling in areas identified (previous) as MPAs</li> <li>- SEE GEAR RESTRICTIONS ABOVE</li> <li>- Close fisheries with bycatch</li> </ul>	<ul style="list-style-type: none"> <li>- Prohibit all fishing</li> <li>- Prohibit all fishing</li> <li>- Close fisheries with bycatch</li> </ul>
<b>Overcapacity</b>	<ul style="list-style-type: none"> <li>- LLP and moratorium</li> <li>- AFA Coops</li> <li>- CDQ Program</li> <li>- Sablefish IFQ</li> <li>- Community quota shares for sablefish</li> </ul>	<ul style="list-style-type: none"> <li>- Eliminate LLP and moratorium</li> <li>- AFA Coops (No changes from Alt 1)</li> <li>- Repeal CDQ except for pollock and crab</li> <li>- Eliminate Sablefish IFQ</li> <li>- No quota share for sablefish</li> <li>- No further work on rationalization</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> <li>- Same as 2.1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- LLP and moratorium (No changes from Alt 1)</li> <li>- Rights-based mgmt, fishery by fishery basis as needed</li> <li>- (a) IFQs</li> <li>- (b) Coops</li> <li>- (i) community-based</li> <li>- (ii) sector-based</li> <li>- (c) CDQs</li> <li>- (d) Other community-based programs (e.g. halibut community share program as applied to other species)</li> </ul>	<ul style="list-style-type: none"> <li>- Same as 3.1</li> <li>- Rationalize all fisheries</li> <li>- Ensure CDQ program maximizes benefits in rural communities</li> </ul>	<ul style="list-style-type: none"> <li>- Effort-based regulations</li> <li>- I.e., trip, gear size limits, vessel size and hp limits, limits on tender vessels, seasonal exclusive area registration</li> <li>- No fishing including subsistence in the EEZ</li> </ul>	<ul style="list-style-type: none"> <li>- Zero fishing effort; No fishery</li> <li>- No fishing including subsistence in the EEZ</li> </ul>
<b>Alaska Native Issues</b>	<ul style="list-style-type: none"> <li>- Incorporation of traditional knowledge through existing literature</li> <li>- AFSC anthropologist position</li> <li>- AP and Council representation</li> <li>- Allow for subsistence uses consistent with Federal Law</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- Develop and implement procedures to incorporate traditional knowledge into fisheries management</li> <li>- Increase consultation with Alaska Native and encourage increased participation</li> </ul>	<ul style="list-style-type: none"> <li>- Incorporate additional traditional knowledge from research</li> <li>- Increase consultation with and representation of Alaska Natives in fishery management</li> </ul>	<ul style="list-style-type: none"> <li>- Initiate cooperative research programs for data gathering and monitoring in order to enhance use of traditional knowledge in fishery management</li> <li>- Increase consultation with and encourage participation of subsistence users (native and non-native)</li> <li>- Provide for traditional Native subsistence uses of fish and wildlife within protected areas</li> </ul>	<ul style="list-style-type: none"> <li>- No fishing including subsistence in the EEZ</li> </ul>
<b>Observer Program</b>	<ul style="list-style-type: none"> <li>- Fixed 0/30/100% coverage</li> <li>- 100% for AFA &amp; CDQ catcher boats &gt; 60 ft. and 200% for AFA &amp; CDQ catcher processors and motherships</li> <li>- Industry pays for employment related costs</li> <li>- OWNI rule</li> <li>- ATLAS rule</li> <li>- 2003 Regulation package</li> </ul>	<ul style="list-style-type: none"> <li>- Repeal all observer programs except AFA and CDQ</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- Observer coverage same as Alt 1 or modified based on data and compliance needs, and should be scientifically-based</li> <li>- Address conflict of interest</li> <li>- Improve sampling stations</li> <li>- Improve species identification for non-target</li> <li>- Develop uncertainty estimates for target species data</li> </ul>	<ul style="list-style-type: none"> <li>- Extend to 100% &gt; 60' CDQ &amp; AFA to stay the same as Alt 1</li> <li>- Same as 3.1</li> <li>- Same as 3.1</li> <li>- Same as 3.1</li> <li>- Expand uncertainty estimates to all possible stocks</li> </ul>	<ul style="list-style-type: none"> <li>- Expand level of observer coverage</li> <li>- Address conflict of interest</li> <li>- Expand uncertainty estimates to all possible stocks (same as Alt 3.2)</li> </ul>	<ul style="list-style-type: none"> <li>- Same as 4.1</li> <li>- Same as 4.1</li> <li>- Same as 4.1</li> </ul>
<b>Data and Reporting Requirements</b>	<ul style="list-style-type: none"> <li>- Current reporting requirements</li> <li>- AFA requires all C-P and Motherships to weigh all pollock catch on NMFS-approved scales</li> <li>- All CDQ Groundfish catch to be weighed on NMFS-approved scales</li> <li>- Mandatory VMS for Alka mackerel fleet, pollock and P. cod (following June Council action)</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> <li>- No at-sea weighing of catch required except under AFA C-Ps</li> <li>- No VMS</li> </ul>	<ul style="list-style-type: none"> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> <li>- No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>- Collect and verify economic data through independent third party (accounting firm/other)</li> <li>- No changes from Alt 1</li> <li>- Modify VMS to incorporate new technology and system providers</li> </ul>	<ul style="list-style-type: none"> <li>- Mandatory economic data reporting by vessels and processors, i.e. earnings, expenditure and employment data</li> <li>- No changes from Alt 1</li> <li>- Same as 3.1</li> </ul>	<ul style="list-style-type: none"> <li>- Requirement of motion-compensated scales to weigh all catches at sea or at shore-based processing plants</li> <li>- Mandatory VMS for all groundfish vessels</li> </ul>	<ul style="list-style-type: none"> <li>- No fishing</li> <li>- No fishing</li> <li>- No fishing</li> </ul>





COMPARISON OF FMP FRAMEWORKS FOR 2ND DRAFT ALTERNATIVES

REVIEWED BY STEERING COMMITTEE JAN 2003

Alt 1	Alt 2	Alt 3	Alt 4
<p><b>BSL Measures</b></p> <ul style="list-style-type: none"> <li>2002 SSL closures: no fishing in Segum Pass; 3m no trawl zones around rookeries; trawl and fixed gear closures in nearshore and critical habitat areas</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>Continue 2002 SSL closures except establish trawled-outlet zones that are based on salmon abundance</li> <li>See map; buffer zones around rookeries and fishing liberty</li> <li>TRAM: modified according to analysis; a 15 m buffer zone around rookeries and fishing liberty</li> <li>TRAM: modified according to analysis; a 15 m buffer zone around rookeries and fishing liberty</li> </ul>
<p><b>Bycatch and Incidental Catch Restrictions</b></p> <ul style="list-style-type: none"> <li>PSC limits for herring, crab, halibut and salmon in BSAI</li> <li>Where sufficient stock status information is available, adjustable PSC limits as for Alt 1</li> <li>PSC limits for herring, crab, halibut and salmon in BSAI, where sufficient stock status information is available, adjustable PSC limits established based on a percentage of the annual stock status</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate PSC limits</li> </ul>	<ul style="list-style-type: none"> <li>Repeat ITIU</li> </ul>	<ul style="list-style-type: none"> <li>Extend ITIU to all target species</li> <li>No incidental catch</li> </ul>
<p><b>Bycatch and Incidental Catch Restrictions</b></p> <ul style="list-style-type: none"> <li>Eliminate PSC limits for herring, crab, halibut and salmon in BSAI</li> <li>Where sufficient stock status information is available, adjustable PSC limits as for Alt 1</li> <li>PSC limits for herring, crab, halibut and salmon in BSAI, where sufficient stock status information is available, adjustable PSC limits established based on a percentage of the annual stock status</li> </ul>	<ul style="list-style-type: none"> <li>Repeat ITIU</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>Extend ITIU to all target species</li> <li>No incidental catch</li> </ul>
<p><b>Current Bycatch and Incidental Catch Restrictions</b></p> <ul style="list-style-type: none"> <li>VIP (vessel incentive program)</li> <li>Demersal Shell Rookery (SSR) full-retention</li> </ul>	<ul style="list-style-type: none"> <li>No bycatch restrictions</li> </ul>	<ul style="list-style-type: none"> <li>Repeat VIP program</li> <li>PSC reduction</li> </ul>	<ul style="list-style-type: none"> <li>Reduce bycatch</li> <li>GOA: reduce all by 30-60%</li> <li>Bycatch limits for non-target stocks as information becomes available</li> </ul>
<p><b>Crab Trawl Closures</b></p> <ul style="list-style-type: none"> <li>Eliminate all closure areas (except SSL measures) and no Cook Inlet trawl ban</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate all closure areas (except SSL measures) and no Cook Inlet trawl ban</li> </ul>
<p><b>In-season Bycatch Management Measures:</b></p> <ul style="list-style-type: none"> <li>(a) establishment of fishing seasons for bycatch mgmt</li> <li>(b) herring closures for areas (not fishery)</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate all in-season bycatch measures</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> </ul>
<p><b>Seabird Measures</b></p> <ul style="list-style-type: none"> <li>Seabird evidence measures, including those approved in 2001</li> <li>Take of more than a short-tailed albatross within 2 years</li> <li>Take of more than 4 short-tailed albatrosses within 2 years</li> <li>Seabird evidence measures, including those approved in 2001</li> </ul>	<ul style="list-style-type: none"> <li>Take of more than 4 short-tailed albatrosses within 2 years triggers consultation (No changes from Alt 1)</li> <li>Take of more than 4 short-tailed albatrosses within 2 years triggers consultation (No changes from Alt 1)</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>Set protection measures for all seabird species</li> <li>100% protection of seabirds from fishing</li> </ul>

COMPARISON OF FMP FRAMEWORKS FOR 2ND DRAFT ALTERNATIVES

	Alt 1	Alt 2	Alt 3	Alt 4
<b>Gear Restrictions and Allocations</b>	<ul style="list-style-type: none"> <li>Retain existing no-trawl zones and fixed gear restrictions; Bottom trawl ban in BSAI for pollock</li> <li>No pot fishing in GOA for sablefish</li> <li>Retain existing gear restrictions and allocations</li> <li>Subsistence and P-cood allocated by gear in BSAI; sablefish allocated by gear in GOA</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate all trawl closure areas and trawl and fixed gear restrictions (except SSL measures)</li> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>BSA and GOA prohibition on bottom trawl for pollock</li> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit trawling in all fisheries that can be prosecuted, except for types (e.g., sablefish bottom trawling for flounder to specific areas; No trawling in areas identified previously) as MPAs</li> <li>SEE GEAR RESTRICTIONS ABOVE</li> <li>Close fisheries with bycatch</li> <li>Zero fishing effort; No fishery</li> </ul>
<b>Overcapacity</b>	<ul style="list-style-type: none"> <li>LLP and moratorium</li> <li>AFA Coops</li> <li>CDO Program</li> <li>Sablefish IFQ</li> <li>Community quota shares for sablefish</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate LLP and moratorium</li> <li>AFA Coops (No changes from Alt 1)</li> <li>Repeat CDO except for pollock and crab</li> <li>Eliminate Sablefish IFQ</li> <li>No quota share for sablefish</li> </ul>	<ul style="list-style-type: none"> <li>LLP and moratorium, AFA, CDO, Sablefish IFQ (No changes from Alt 1)</li> <li>Repeat CDO except for pollock and crab</li> <li>(A) IFQs</li> <li>(B) Coops</li> </ul>	<ul style="list-style-type: none"> <li>AFA and CDO</li> <li>LLP and moratorium</li> <li>Sablefish IFQ</li> <li>Effort-based regulations</li> <li>Effort-based regulations that existing programs would be repealed under Alt 4, effort-based regulations would apply to other groundfish fisheries</li> <li>I.e., trip, gear, seasonal, effort-based regulations</li> <li>Effort-based regulations would apply to other groundfish fisheries</li> </ul>
<b>Alaska Native Issues</b>	<ul style="list-style-type: none"> <li>Incorporation of traditional knowledge through existing structure</li> <li>AFSC anthropologist position</li> <li>AP and Council representation</li> <li>Allow for subsistence uses consistent with Federal Law</li> </ul>	<ul style="list-style-type: none"> <li>No further work on rationalization</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>Repealing all fisheries (all GOA, BSAI and GOA) and replacing with effort-based management program maximizes opportunities</li> <li>AFSC: For purposes of discussion, research defined as field research on specific aspects of importance</li> <li>AFSC: For purposes of discussion, would not explore various methods such as increased personal contact with IMFC/Council (telephone or in-person), creation or expansion of an official IMFC/Council representative on the AFSC</li> <li>AFSC: For purposes of discussion, would explore various methods such as increased personal contact with IMFC/Council (telephone or in-person), creation or expansion of an official IMFC/Council representative on the AFSC</li> </ul>	<ul style="list-style-type: none"> <li>No fishing including subsistence in the EEZ</li> <li>Same as 4.1</li> </ul>
<b>Observer Program</b>	<ul style="list-style-type: none"> <li>Fixed 0/30/100% coverage</li> <li>100% for AFA &amp; CDO catcher boats &gt; 60 ft, and 200% for AFA &amp; CDO catcher processors and maintainers</li> <li>Industry pays for employment related costs</li> <li>OMRM rule</li> <li>ATLAS rule</li> <li>2003 Regulation package</li> </ul>	<ul style="list-style-type: none"> <li>Repeal all observer programs except AFA and CDO</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>AFSC: For purposes of discussion, would explore various methods such as increased personal contact with IMFC/Council (telephone or in-person), creation or expansion of an official IMFC/Council representative on the AFSC</li> <li>AFSC: For purposes of discussion, would explore various methods such as increased personal contact with IMFC/Council (telephone or in-person), creation or expansion of an official IMFC/Council representative on the AFSC</li> <li>AFSC: For purposes of discussion, would explore various methods such as increased personal contact with IMFC/Council (telephone or in-person), creation or expansion of an official IMFC/Council representative on the AFSC</li> </ul>	<ul style="list-style-type: none"> <li>100% coverage on vessels (vessels &lt;60' = 30% coverage)</li> <li>100% hauls are observed</li> <li>Federal contract funding (annual appropriation)</li> <li>Research Plan (e.g., fee-based)</li> <li>TAC set aside</li> <li>Expand uncertainty estimates to all possible stocks</li> </ul>
<b>Data and Reporting Requirements</b>	<ul style="list-style-type: none"> <li>Current reporting requirements</li> <li>AFA requires all C-P and fisheries to weigh all pollock catch on NMFS-approved scales</li> <li>AFSC CDO Groundfish catch to be weighed on NMFS-approved scales</li> <li>Mandatory VMS for Alutia mackerel fleet, pollock and P. cod</li> </ul>	<ul style="list-style-type: none"> <li>No changes from Alt 1</li> <li>No in-area weighing of catch required except under AFA C-Ps</li> <li>No VMS</li> <li>No changes from Alt 1</li> </ul>	<ul style="list-style-type: none"> <li>Mandatory VMS for Alutia mackerel fleet, pollock and P. cod (for species), also implications</li> <li>Mandatory VMS for Alutia mackerel fleet, pollock and P. cod (for species), also implications</li> <li>Mandatory VMS for all groundfish vessels</li> <li>Same as 3.1</li> </ul>	<ul style="list-style-type: none"> <li>Expand uncertainty estimates to all possible stocks</li> <li>Requirement of motion-compensated scales to weigh all catches at sea or at shore-based processing plants</li> <li>Mandatory VMS for all groundfish vessels</li> <li>No fishing</li> </ul>

## DESCRIPTION OF THE EXAMPLE FMP BOOKENDS

*NOTE: The FMP map figures referred to are posters that will be available for viewing at the April Council meeting.*

Four policy alternatives are under consideration in this document. In order to provide sufficient detail to the analysis of the policies, each alternative is accompanied by, and associated with, a Fishery Management Plan (FMP) framework consisting of a set of example FMPs. A description of the framework concept, followed by a summary of each alternative policy and their associated FMPs, is provided below.

### Concept of the Analytical Framework

Each alternative is comprised of three elements: a management approach statement that describes the goals of, and rationale and assumptions behind, the alternative; a set of management objectives that complement and further refine the goals set forth in the management approach; and, except for Alternative 1(status quo), a pair of example FMP "bookends" that illustrate and frame the range of implementing management measures for that alternative. The management approach statement and objectives serve to define the direction the Council wishes to follow in the management of the fisheries. The example FMP bookends serve two purposes: first, they provide an additional level of analytical detail that will facilitate the comparison of the physical, biological and socio-economic effects of the alternatives and the status quo; and second, they provide the public with an illustration of the types of management measures the Council envisions it will use to achieve the goals of the alternative. Ultimately, the Council's preferred alternative will include a policy statement accompanied by a set of management objectives and a set of example FMP bookends that will illustrate a range of implementable management actions. This FMP framework structure will communicate to the public the Council's intent as to how it plans to pursue its policy objectives in the future. By providing, as part of its preferred alternative, a range of potential management measures (as illustrated by the example FMP bookends), the Council retains its management flexibility under the Magnuson-Stevens Act to adaptively manage the fishery through FMP amendments.

### Alternative 1      **Continue Under the Current Risk Averse Management Policy**

Under this alternative, the Council would continue to manage the groundfish fisheries based upon the present risk-averse policy. Alternative 1(a) represents the policy language currently stated in the FMPs, dating from 1979 and 1985 for the BSAI and GOA FMPs, respectively. These policies, based on the best scientific information available, avoid irreversible or long-term adverse effects on fishery resources and the marine environment, while at the same time providing for optimum yield.

Alternative 1(b) is a substitute for the written policy language in the current FMPs and would include objectives that specifically address the variety of concerns that are balanced by the Council in current management considerations. Alternative 1(b) encapsulates a risk-averse conservation and management program that is based on a conservative harvest strategy. This policy assumes that fishing does result in some adverse impacts to the environment and that, as these impacts become known, mitigation measures will be developed and appropriate FMP amendments will be implemented.

## FMP 1 (Current BSAI and GOA Groundfish FMPs)

The Alternative 1(a) and 1(b) policies are both represented by FMP 1, which is the current fisheries management program for the BSAI and the GOA and incorporates management measures approved by the Council through the June 2002 meeting.

In the current FMPs, the total allowable catch (TAC) is determined annually based on a conservative harvest strategy that calculates the overfishing level (OFL) and the acceptable biological catch (ABC) for each managed stock or stock complex. The current FMPs specify the OFL and maximum ABC (maxABC) by means of a six-tier system wherein the amount and quality of information available for a given stock or stock complex determine the formula that is used to define  $F_{OFL}$  and  $max F_{ABC}$  (Tiers 1-5) or OFL and maxABC directly (Tier 6). Most stocks are currently managed under Tier 3, where  $max F_{ABC}$  equals  $F_{40\%}$  if biomass is above  $F_{40\%}$ . Precautionary adjustments are made, including decreasing  $F_{OFL}$  and  $F_{ABC}$  linearly with biomass whenever biomass falls below a tier-specific reference level, but only Tier 1 stocks include an uncertainty variation in maxABC. The status of each stock in Tiers 1-3 is also examined annually with respect to the minimum stock size threshold (MSST), as defined in the National Standard Guidelines.

Optimum yield (OY) is specified in the current FMPs as a range that is aggregated across all stocks and does not vary with biomass. The current FMPs require the sum of the individual groundfish TACs to fall within the OY range. In the BSAI, the high end of the range, 2 million mt, acts as a cap on the TACs, as the aggregated ABCs regularly exceed this limit. In practice, although it is not required in the current FMPs, TACs are never set higher than the corresponding ABCs. Taking into account the ecosystem considerations of the food web, the FMPs also prohibit directed fishing for forage species.

Through amendments over the last twenty years, the current FMPs have built up a network of spatial and temporal closed areas, intended to protect resources of concern, as well as to minimize gear conflicts. In the BSAI, various areas around the Pribilof Islands and in Bristol Bay are closed year-round to trawling in order to protect red and blue king crab habitat, and a chum salmon area is closed seasonally. Also in the BSAI, waters within 12nm of Walrus Islands are closed to groundfish fishing to minimize disturbance of walrus haulouts. In the BSAI and the GOA, Steller sea lion protection measures permanently close to all fishing the area within 3nm of rookeries, as a no-transit zone. Additionally, they impose trawl prohibitions within 10-20nm of all rookeries and haulouts, and prohibit fishing in Seguam Pass. In the GOA, trawling is prohibited in SE Alaska west of 140° West. Also, a 2.5 sq nm area designated as the Sitka Pinnacles Marine Reserve in the GOA is closed to groundfish fishing to protect habitat for rockfish and lingcod (see Figure FMP 1 map).

The current BSAI FMP prohibits directed fishing for pollock with non-pelagic trawl gear. There is no similar restriction on pollock trawling in the current GOA FMP. Directed fishing for sablefish with longline pot gear is prohibited in the GOA. Non-pelagic trawling is prohibited in the Bristol Bay Red King Crab Savings Area in the BSAI and in the Cook Inlet in the GOA. Additionally, various areas around Kodiak Island are closed to non-pelagic trawling either year-round or seasonally to protect crab stocks (see Figure FMP 1 map). (Further details on the FMP 1 map illustration are provided in a separate subsection below.)

Groundfish fisheries in the BSAI and GOA are required to discard any incidental catch of halibut, salmon, crab, herring, or Steelhead trout, known collectively as prohibited species. The FMPs currently set prohibited species

catch (PSC) limits on many of these species, with penalties ranging from closure of a particular zone or of the whole management area to a directed fishery or fisheries for a specified season or for the remainder of the year. In the BSAI FMP, stairstep limits for trawl bycatch within specified zones are set for red king crab and *C. bairdi* crab. The catch limit varies based on stock abundance. The BSAI FMP also specifies an absolute trawl catch limit for chinook salmon and "other salmon" within specified zones. Once the apportioned PSC limit for a trawl fishery is reached within a zone, the fishery is prohibited from fishing within that zone. The BSAI FMP specifies a trawl catch limit for herring in the BSAI at 1% of annual biomass. Catch limits on *C. opilio* crab and halibut bycatch in the BSAI are established in regulation. The *C. opilio* catch limit applies to a specified zone and is based on an adjusted percentage of biomass that must fall within a certain range. The halibut catch limit is a BSAI-wide mt limit and is based on halibut mortality. In the GOA FMP, catch limits on halibut bycatch are authorized and set by the Council as part of the annual procedure for setting groundfish harvest levels. There are no other prohibited species catch limits set in the GOA.

Other bycatch reduction measures are required under FMP 1. The Increased Retention/Increased Utilization (IR/IU) program requires full retention, by vessels fishing for groundfish, of all pollock and Pacific cod fit for human consumption, as well as full utilization of the two species by inshore processors. A minimum utilization standard of 15% is set for all at-sea processors. The Council is also adopting a policy to require full retention of Demersal Shelf Rockfish by hook-and-line and jig vessels in the Southeast Outside District of the GOA. A Vessel Incentive Program (VIP) encourages bycatch reduction by setting bycatch reduction standards biannually. If a vessel fails to meet these standards, it can be penalized. Inseason bycatch management measures establish fishing seasons for bycatch management and give the NOAA Fisheries/Alaska Regional Administrator the authority to close areas with high bycatch.

The Reasonable and Prudent Alternative (RPA) measures adopted from the most recent US Fish and Wildlife Service (USFWS) biological opinion on the short-tailed albatross stipulate the use of certain seabird avoidance measures and require that the take of more than 4 short-tailed albatross within 2 years trigger consultation with the USFWS and the potential closure of fisheries. To further reduce the possibility of the take of albatross impacting the fisheries, the Council in 2001 required all longline vessels to adopt more stringent seabird avoidance methods.

A Licence Limitation Program for groundfish vessels over 32' LOA (with certain jig gear exceptions) and a moratorium on entry into the groundfish fisheries is in place for the BSAI and the GOA. An IFQ program is in place for sablefish in the BSAI and GOA, which includes provisions for community purchase of quota share. In the BSAI, the directed fishery for pollock is organized into cooperatives as authorized under the American Fisheries Act (AFA). A multispecies community development quota (CDQ) program apportions 7.5-10% of all BSAI groundfish quota to 65 eligible western Alaska communities.

FMP 1 monitors the groundfish fishing effort through Federal and State reporting requirements and through the use of the North Pacific Groundfish Observer Program. All vessels between 60' and 125' LOA are required by regulation to have an observer on board 30% of the time; for vessels over 125' LOA this increases to 100%. For AFA and CDQ catcher boats greater than 60' LOA, one observer must be on board at all times, and for catcher processors and motherships, two observers must be on board at all times. The program also has observers at inshore processing plants. An additional monitoring tool is the reporting requirements for BSAI and GOA vessels that submit daily or weekly logbooks including information on the composition of catch and the locations of the

hauls. The Alaska Department of Fish and Game (ADF&G) also collects data from fish tickets at the point that catch is sold. Mandatory vessel monitoring systems (VMS) for all directed Atka mackerel, pollock, and Pacific cod fishing verify vessel location.

## **Alternative 2      Adopt a More Aggressive Harvest Management Policy**

This policy would maximize biological and economic yield from the resource while still preventing overfishing of the groundfish stocks. Such a management approach would, among other things, be based on the best scientific information available, take into account individual stock and ecosystem variability, and continue to work with other agencies in protecting threatened and endangered species. A more aggressive harvest strategy would be implemented based upon the concept that the present policy is overly conservative and that higher harvests can be taken without overfishing the target groundfish stocks. This policy assumes that fishing at the recommended levels would have no adverse impact on the environment, except in specific cases that are known and mitigated.

### **Example FMP 2.1**

Example FMP bookend 2.1 illustrates a more aggressive harvest strategy than Alternative 1 by removing many of the constraints from the fisheries. As the policy is based on an assumption that the impacts of fishing on the environment are generally known and mitigated, the precautions currently built into the existing TAC-setting process will be alleviated. The buffer between the ABC level and the OFL is removed, and the maximum OY for the groundfish stocks in the BSAI is released from its 2 million mt cap and allowed to float as the sum of the OFLs for the BSAI groundfish stocks. Additionally, FMP 2.1 removes the precautionary element of the current FMPs that decreases  $F_{ABC}$  linearly with biomass when the biomass falls below a specific reference level.

FMP bookend 2.1 also removes physical constraints from the fisheries by repealing the various closure areas currently in place. The fishery would be returned to an open-access scenario, where time and area closures, gear restrictions, and prohibited species catch restrictions are repealed. The potential impact of the groundfish fisheries on Steller sea lions, however, means that the current mitigating suite of protection measures that constrain fishing around rookeries and haulouts and protect Steller sea lion prey species (pollock, Pacific cod and Atka mackerel) when at low biomass levels would remain in place (see Figure FMP 2.1 map). This is required by the Endangered Species Act (ESA) to avoid determinations of jeopardy and adverse modification. The same applies to the impact of groundfish fishing on short-tailed albatross, with the consequent take limits remaining in effect.

The federally-mandated effort limitation program for the directed BSAI pollock fishery, enacted under the AFA, would remain in place, with its accompanying CDQ allocation, but all other effort limitation programs (such as the sablefish IFQ program and the multispecies CDQ program) would be repealed. Reporting requirements would remain in place, in order to keep track of the impact of the fisheries, but the observer program, except as federally mandated by the AFA, would be repealed, as would VMS requirements.

### **Example FMP 2.2**

A more moderate illustration of Alternative 2, example FMP bookend 2.2, also represents a more aggressive harvest strategy than Alternative 1. In this case, the mechanisms for setting ABC and TAC remain the same as in the current FMPs (see FMP 1 for further detail), but the existing regulatory capped maximum OY of 2

million mt in the BSAI would be removed in favor of a maximum OY equaling the sum of individual groundfish ABCs in the BSAI. Additionally, bycatch reduction incentives and bycatch restrictions would be repealed, other than those related to PSC limits or IR/TU. Under the assumption that fishing does not have an impact on the environment other than what is generally known and mitigated, the Council's more stringent seabird avoidance measures enacted in 2001 would be repealed, leaving only the mitigation measures recommended by USFWS to avoid jeopardy or adverse modification for short-tailed albatross. Closure areas in FMP 2.2 mirror those in FMP 1 (see Figure FMP 2.2 map).

### **Alternative 3      Adopt a More Precautionary Management Policy**

This policy would seek to accelerate the existing precautionary management measures through community or rights-based management, ecosystem-based management principles and, where appropriate and practicable, increased habitat protection and additional bycatch constraints. Under this approach, additional conservation and management measures would be taken as necessary to respond to social, economic or conservation needs, or if scientific evidence indicated that the fishery was negatively impacting the environment. This policy recognizes the need to balance many competing uses of marine resources and different social and economic goals for fishery management.

#### **Example FMP 3.1**

Example FMP bookend 3.1 illustrates a management approach that accelerates precautionary management measures by increasing conservation-oriented constraints on the fisheries where necessary, formalizing precautionary practices in the FMPs, and initiating scientific review of existing practices as a necessary precursor to the decision of how best to incorporate adequate precautions.

Example FMP bookend 3.1 implements changes to the TAC-setting process following a comprehensive review. Precautionary practices such as setting TAC less than or equal to the ABC, and specifying MSSTs for Tiers 1-3 in accordance with National Standard Guidelines, would be formalized in the FMP. Sharks and skates would be removed from the Other Species management category and given their own TACs, and criteria to do the same for other target stocks would be developed. Efforts to develop ecosystem indicators to be used in TAC-setting, as per ecosystem management principles, would be accelerated.

In order to balance the needs of social and economic stability with habitat protection and resource conservation, the Council would conduct a review of the existing system of closure areas in the BSAI and the GOA (for closure areas under FMP 3.1, see Figure FMP 3.1 map), and evaluate them against a MPA methodology to be developed as part of this alternative. The Council would also seek to initiate joint consultation and research with USFWS to develop fishing methods that reduce incidental take of threatened and endangered species. To mitigate any adverse impacts of fisheries management decisions on fishing communities, and to comply with other national directives, the Council would implement formal procedures to encourage increased participation of Alaska Natives in fishery management.

Example FMP bookend 3.1 recognizes that the anticipated community or rights-based management programs may address bycatch reduction objectives (a review of bycatch rates under existing such programs is initiated), but in the meantime a moderate reduction of PSC limits will be initiated as an intermediary step. Additionally,

PSC limits for crab, herring and salmon would be authorized in the GOA, in addition to the halibut PSC limits authorized under the current GOA FMP. Effective monitoring and timely reaction to change in the environment and the fisheries would be enhanced through improvements in the observer program and third party verification of economic data.

### Example FMP 3.2

Example FMP bookend 3.2 implements the acceleration of existing precautionary measures on a more rapid timeline than example FMP bookend 3.1. Rather than reviewing existing practices prior to incorporating increased precaution, this bookend implements changes to many aspects of the FMPs concurrently with the initiation of scientific research efforts necessary to bring management measures in line with a precautionary policy.

Example FMP bookend 3.2 significantly accelerates precautionary management by incorporating an uncertainty correction into the estimation of ABC for all species. Additionally, OY would be specified separately for each stock or stock complex rather than for the groundfish complex as a whole (i.e., OY would be set as a formula rather than as a range, eliminating the BSAI 2 million mt OY cap), and would be set equal to the respective stock or stock complex's TAC. The current precautionary practice of setting TAC less than or equal to ABC would be formalized in the FMP. FMP bookend 3.2 would also incorporate stock-specific biological reference points in the tier system where scientifically justifiable. This could result in Tier 3 rockfish stocks, for example, being capped at  $F_{60\%}$  rather than  $F_{40\%}$ . In implementing this bookend, criteria would be developed for specifying MSSTs for Tiers 4-6, along with a list of priority candidate stocks; and the development of criteria for moving stocks from the Other Species and Nonspecified Species management categories would minimally result in sharks and skates being given their own TACs.

Example FMP bookend 3.2 also reexamines the existing closure system in the BSAI and the GOA. The bookend sets a guideline of 0-20 percent of the Exclusive Economic Zone (EEZ; 3 to 200 nm) to be closed as a MPA, of which no more than 5 percent should be completely closed to commercial fishing (designated No-Take Marine Reserve). The remainder of the closed area is designated as no-bottom-contact MPA. The objective of these measures is to provide greater protection to a full range of marine habitats within the 1000 m bathymetric line (see Figure FMP 3.2 map). The guideline aims to provide greater protection for a wide range of species, from Steller sea lions to slope rockfish to prohibited species, while at the same time respecting traditional fishing grounds and maintaining open area access for coastal communities. Additionally, the bookend would extend the existing bottom-trawl ban on pollock to the GOA.

Additional conservation benefits would be realized in FMP bookend 3.2 through the comprehensive rationalization of all fisheries (except those already part of a cooperative or IFQ program.) In adopting rationalization programs such as cooperative-style programs with built-in community protections, the Council would also be addressing habitat and bycatch concerns by reducing concentrated effort in the fisheries. To increase precaution regarding bycatch, PSC limits would be significantly reduced by the Council (and set for all prohibited species in the GOA), but would not be expected to act as a proportionate restraint on the fisheries due to the incentives for bycatch reduction under cooperatives, or other bycatch incentive programs implemented as necessary under this bookend.

In accordance with ecosystem principles, the Council would seek to initiate joint consultation and research with USFWS to develop fishing methods that reduce incidental take of all seabird species. The Council would also



implement formal procedures to increase consultation with and representation of Alaska Natives in fishery management.

Effective monitoring and timely reaction to change in the environment and the fisheries would be enhanced through increase of coverage and improvements to the observer program, as well as an increase in the use of VMS and the range of economic data collected from industry.

## **Alternative 4      Adopt a Highly Precautionary Management Policy**

This policy represents an extremely precautionary approach to managing fisheries under scientific uncertainty. It shifts the burden of proof to the users of the resource and the Council/NOAA Fisheries to demonstrate that the intended use would not have a detrimental effect on the environment. It would involve a strict interpretation of the precautionary principle. Management discussions would involve and be responsive to the public, but would decrease emphasis on industry and community concerns in favor of ecosystem processes and principles. This policy assumes that fishing does produce adverse impacts on the environment, but due to a lack of information and uncertainty, we know little about these impacts. The initial restrictive and precautionary conservation and management measures would be modified or relaxed when additional, reliable scientific information becomes available.

### **Example FMP 4.1**

Example FMP bookend 4.1 illustrates a fishery management plan where current levels of fishing are reduced and other precautionary restrictions are implemented until scientific research shows that the fisheries have no adverse effect on the sustainability of the resource and its environment.

Accordingly, example FMP bookend 4.1 would substantially reduce the potential of adverse environmental impacts of the fisheries. A modified TAC-setting process would create a more substantial buffer between ABC and the overfishing level (OFL) by setting the fishing mortality rate at  $F_{75\%}$  for all Steller sea lion prey species (pollock, Pacific cod and Atka mackerel) and for rockfish (as long-lived, slow-growing species). Also, the  $max F_{ABC}$  for each stock or stock complex in Tiers 1-5 would be adjusted downward based on the lower bound of a confidence interval surrounding the survey biomass estimate. Optimum yield would be specified separately for each stock or stock complex rather than for the groundfish complex as a whole (i.e., OY would be set as a formula rather than as a range, eliminating the BSAI 2 million mt OY cap), and would be set equal to the respective stock or stock complex TAC. The current precautionary practice of setting TAC less than or equal to ABC would be formalized in the FMP. For species managed as members of a stock complex, rather than setting TAC as the aggregate of the individual members' ABCs, the  $maxABC$  value for each component stock would be determined and the TAC set equal to the lowest value. Where sufficient biological information is available, such as with Eastern Bering Sea pollock, TAC would be distributed on a smaller spatial scale. MSSTs would be determined for all tiers.

To further mitigate the possibility of the fisheries having a detrimental biological and ecosystem impact, 20-50% of the EEZ would be designated as No-Take Marine Reserve (i.e., no commercial fishing) covering the full range of marine habitats within the 1000m bathymetric line (see Figure FMP 4.1 map). As part of this area in the Aleutian Islands, a Special Management Area would be established to protect coral and other live bottom

habitats. The closed area would include spawning reserve areas for intensively fished species. Under the FMP 4.1 example, comprehensive trawl exclusion zones would be set to protect all Steller sea lion critical habitat, and trawling itself would be restricted to only those fisheries that cannot be prosecuted with other gear types (i.e., the flatfish fisheries.)

In an effort to reduce waste and the risk of adverse impact to the environment, existing PSC limits would be halved under this bookend, as would bycatch and discard rates. Increased retention and utilization (IR/IU) would be extended to all target species. Stringent PSC limits would be set for salmon, crab and herring in the GOA, and as information becomes available, bycatch limits would be set for non-target species also. Protection measures would be set for all seabird species.

Because this policy alternative necessitates greater research and data-gathering efforts, example FMP bookend 4.1 would expand observer coverage to 100 percent for all vessels over 60' LOA and require 30 percent observer coverage on vessels presently exempted from observer coverage (i.e., vessels under 60' LOA). VMS would be made mandatory for all groundfish vessels, as would motion-compensated scales for weighing all catches at sea or at shore-based processors. Cooperative research and data-gathering programs would be initiated as well to expand the use of traditional knowledge in fisheries management.

#### **Example FMP 4.2**

Example FMP bookend 4.2 expands the precautionary principles of Alternative 4 by suspending all fishing until the fisheries can be shown to have no adverse effect on the resource and its environment. The TAC for all species would be set at zero. All areas of the EEZ would be closed to all fishing (e.g. commercial, recreational, and subsistence) (see Figure FMP 4.2 map); bycatch and incidental catch, as well as the take of seabirds and marine mammals, would then necessarily be reduced to zero.

Scientific research and data-gathering efforts would continue. When a fishery can be shown to pose no significant threat of adverse biological and environmental impacts, or if adverse effects can be successfully mitigated through use of fishery-specific regulations, the measures illustrated by this FMP bookend would be relaxed to allow fishing to resume.

Under this FMP illustration, it is assumed that each groundfish fishery currently conducted in federal waters in the BSAI and GOA would be individually reviewed by the Council and NOAA Fisheries. Upon completion of this review (which may take up to 2 years), the agency would certify those fisheries that have no significant adverse impacts on the environment and authorize fishing under a specific set of regulations. If a fishery is found by this review to produce significantly adverse environmental effects, and mitigation measures can not be designed to mitigate those effects, that fishery would not be certified and would remain closed until more scientific information is known.

## PSEIS Map Statistics

Fishable Area is defined as that part of the EEZ that is continental shelf and slope to 1000m.

41.5% of the BSAI EEZ is fishable area

29.7% of the GOA EEZ is fishable area

The maps for the bookends FMP 1, FMP 2.2 and FMP 3.1 are identical.

<b>% of EEZ (3-200nm) closed to:</b>	<b>FMP 1</b>	<b>FMP 2.1</b>	<b>FMP 2.2</b>	<b>FMP 3.1</b>	<b>FMP 3.2</b>	<b>FMP 4.1</b>	<b>FMP 4.2</b>
All commercial fishing	0.1%	0.1%	0.1%	0.1%	3.1%	10.6%	100.0%
Selected gear-types or directed fisheries	10.6%	4.1%	10.6%	10.6%	14.7%	8.4%	NA
<b>TOTAL % of EEZ closed to some form of commercial fishing</b>	<b>10.7%</b>	<b>4.2%</b>	<b>10.7%</b>	<b>10.7%</b>	<b>17.8%</b>	<b>19.0%</b>	<b>100.0%</b>

<b>% of fishable area (1000m) closed to:</b>	<b>FMP 1</b>	<b>FMP 2.1</b>	<b>FMP 2.2</b>	<b>FMP 3.1</b>	<b>FMP 3.2</b>	<b>FMP 4.1</b>	<b>FMP 4.2</b>
All commercial fishing	0.3%	0.3%	0.3%	0.3%	8.2%	28.5%	100.0%
Selected gear-types or directed fisheries	28.5%	14.3%	28.5%	28.5%	39.6%	22.6%	NA
<b>TOTAL % of fishable area closed to some form of commercial fishing</b>	<b>28.8%</b>	<b>14.6%</b>	<b>28.8%</b>	<b>28.8%</b>	<b>47.8%</b>	<b>51.1%</b>	<b>100.0%</b>



## **A multi-species technical interaction projection model**

James Ianelli

Alaska Fisheries  
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## **Outline**

- **Background**
- **Fisheries**
- **Stock assessment information**
- **Alternative specifications**
  - \* **Model constraints**
  - \* **Results**
  - \* **Critical assumptions**
- **A short LP Primer**

## **Why?**

- **More "realistic" analyses of fishing alternatives requested**
  - \* **Single-species contrasts inappropriate**

## **Why? (cont'd)**

- **Single species "what ifs" unrealistic due to**
  - \* **Managed bycatch constraints**
  - \* **Total allowable catches within each region**  
(OY specified to fall within a range of total catch)
  - \* **Market considerations and other factors**
- **Provide a general approach to modeling multispecies fisheries management**

### N. Pacific groundfish conservation strategies:

- **Multispecies management**
  - \* Individual TAC's should not be exceeded
  - \* Basis is to use "lowest common denominator" species
  - \* Fishery "openings" allowed based on anticipated bycatch rates
  - \* Fishery "closures" occur based on real-time observer catch estimates and fish-ticket data

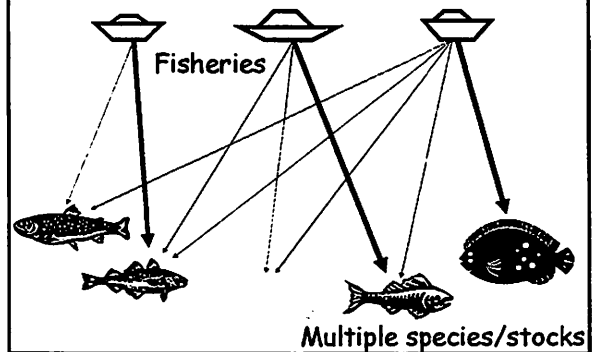
### Evaluating management alternatives

- **Combines**
  - \* Stock assessment results
    - Identical to existing basis for quota recommendations
    - Dynamics included and monitored for main species
  - \* Species composition of catch
    - from observer and fish-ticket data
  - \* Realistic management constraints
    - E.g., PSC limits, 2 million ton OY cap, ABC's

### Fisheries characteristics

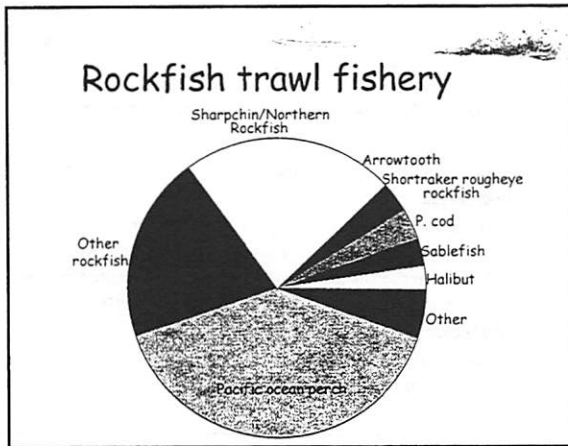
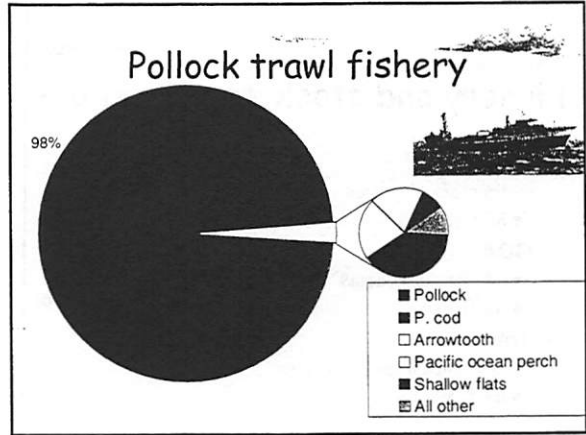
Species composition issue

### Multispecies-multifisheries management



### What defines a fishery?

- **Simply**
  - \* Gear type
  - \* Area fishing
  - \* "Target" as defined by the NMFS blend system
- **Limitations**
  - \* Some small scale fisheries pooled with others
  - \* New fisheries not allowed
    - e.g., a directed GOA Atka mackerel fishery



### Schematic catch matrix

(Based on observer data)

Species/Stock	A	B	C	D
BS/AI Pelagic trawl pollock	$C_{i,j}$	...		$C_{i,n}$
BS/AI bottom trawl yellowfin sole	⋮	⋮		
BS/AI Longline Pacific cod				
BS/AI Pot (trap) Pacific cod				
BS/AI Longline Sablefish	$C_{m,j}$			$C_{m,n}$

## Fishery and stock specifications

- **BSAI:**
  - \* 56 stocks/species
  - \* 35 fisheries
- **GOA**
  - \* 54 Stocks/species
  - \* 32 fisheries
- **Total**
  - \* 110 stocks/species groups
  - \* 67 fisheries

## Species list (BSAI)

EBS pollock	other species	scopen/whip
AI pollock	halibut mortality	sponge
Pacific cod	band crab	anemone
yellowfin sole	red king crab	tunicate
greenland turbot	chinook	benthiv
arrowtooth	other salmon	echinodem
rock sole	herring	otherfish
flathead sole	other tanner crab	birds
alaska plaice	other king crab	smelts
other flatfish	sculpin	shark
sablefish	gunnel	salmonshk
pacific ocean perch	stichelidae	dogfish
EBS other rockfish	sandfish	sleepershk
AI other rockfish	granadier	skates
northern rockfish	crabs	lanternfish
shortraker/rougheye	starfish	sandance
atka mackerel	jellyfish	octopus
Squid	invertund	squid

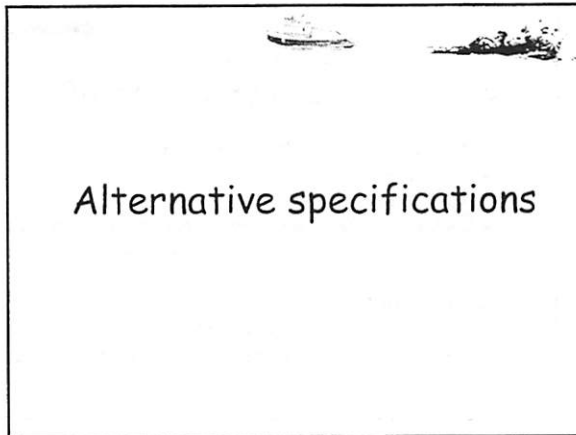
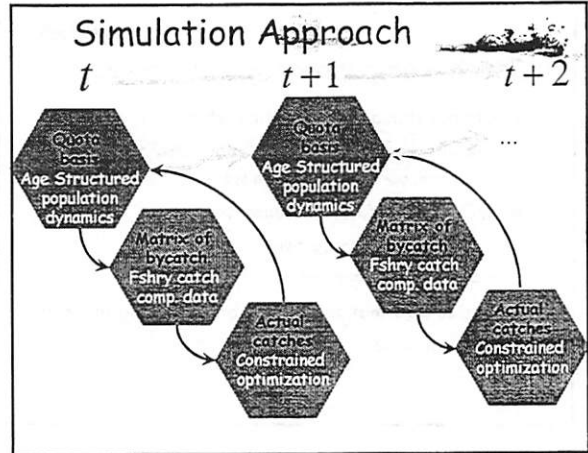
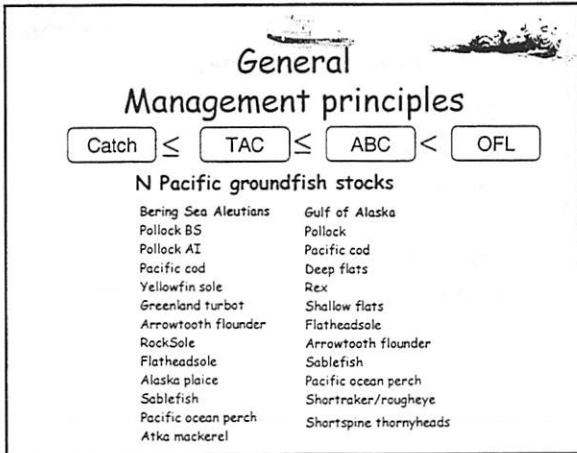
## Stock assessment

### Information

## Stock dynamics

- \* Begin-year N-at-age in 2002 for all age-structured stocks
- \* Selectivity, M, mean wt, maturity at age and recruitment time series included
  - These are used to estimate F40% F35% B40 etc.
  - These set ABCs for each stock depending on Alternative specs
  - Recruitment variability follows inverse-Gaussian distribution with same mean and variances as observed for each stock
- \* All stocks treated the same
  - Dynamic allocation of variables
  - Sex specific
  - Multiple fisheries





### Alternative specification summary

FMP	Catch-comp. Data	Constraint specification	ABC / Biology
1		Baseline assumptions	Amendment 56
2.1	Pre-IFQ catch-composition rates (sablefish)	OY set to sum of ABC's No PSC limits Effort potential high	$F_{ABC}$ set to $F_{OFL}$ ( $F_{35\%}$ ) No reduction in $F$ as
2.2	Same as Alt 1	OY set to sum of ABC's	Same as Alt 1
3.1	Same as Alt 1	Halibut PSC reduced by 10%	Same as Alt 1
3.2	Increase retention Reduce discards $C = R + D * 0.8$	OY set to sum of ABC's Halibut PSC limit reduced by 30%	$F_{OFL}$ for rockfish Risk averse adjustment
4.1	Same as Alt 1	OY set to sum of ABC's Fisheries > 33% bycatch eliminated	Survey uncertainty adj. $F_{ABC} = F_{35\%}$ for SSL prey & rockfish
4.2	No bycatch	No constraints	No fishing

### Catch-composition Data Issues

- \* Data get thin as area and time strata are defined
  - Results can become driven by "noise" rather than real patterns, particularly for rare species
- \* Difficult to reflect this uncertainty
  - Only 5 years of data available
  - Statistical approach not well developed
- \* Species information often at broader geographic and temporal scale

### Constraint types

- \* OY Range
- \* ABC's and PSC's for appropriate stocks
- \* Gear allocations
  - i.e., splitting ABC into gears where appropriate
- \* Area apportionments
- \* Relative increase or decrease for each fishery
- \* Market constraints

### Bounds on fishery reduction & growth

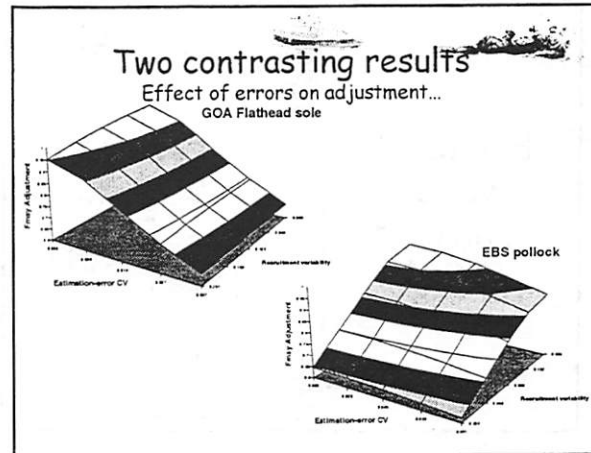
- Judgments made on allowable magnitude of increase and decreases for each fishery
  - \* Generally capped at 10% to 300%
  - \* Some fishery bounds had a lower range
- Ex-vessel value of retained catch affects objective function
  - \* should be revenue, i.e., include costs
- Meeting of experts may provide more objective limits
  - \* However, sensitivity to global expansion of the bounds increased flexibility and resulted in only slightly more catch

### Alternative 3.2 Risk averse adjustment to ABC

- Uses main sources of uncertainty
  - \* Process error
    - recruitment variability
  - \* Measurement/estimation error in current stock size
    - Based on estimated covariance matrix of numbers-at-age in first projection year
- Assumptions
  - \*  $F_{35\%}$ ,  $B_{35\%}$  is a good proxy for  $F_{msy}$  &  $B_{msy}$
  - \* Stock-recruitment relationship inferred from these estimates

### Risk-averse adjustments

Datafile_name	Geometric	Harmonic Mean	Adjustment factor (applied to $F_{20\%}$ as a proxy for $F_{\infty}$ )
BSAI ATKA	0.455	0.269	0.592
BSAI POP	0.054	0.052	0.961
BS ATF	0.300	0.279	0.930
BS FHS	0.350	0.279	0.798
BSAI PCOD	0.321	0.241	0.751
BS ROCKSOLE	0.177	0.145	0.821
BS Pollock	0.532	0.331	0.622
BS YFS	0.125	0.114	0.916
GOA ATF	0.211	0.193	0.913
GOA FHS	0.372	0.242	0.651
GOA NRF	0.061	0.054	0.885
GOA POP	0.057	0.037	0.648
Sablefish	0.141	0.069	0.491
BSAI Greenland turbot	0.484	0.313	0.646
GOA PCOD	0.401	0.287	0.718*
GOA SST			0.831**
GOA Pollock			0.671***



### Alternative 3.2

#### Reduce bycatch, improve retention

Currently for each species within a fishery:

$$C = \text{Catch} = \text{Retained} + \text{Discarded}$$

Under Alt 3.2:

$$C = \text{Retained} + \text{Discarded} \times 0.8$$

Improve (increase) retention rates (reduce discarded species) by 80%:

$$\text{New retention rate} = 1.0 - 0.8 (1 - \text{Obs\_Retention\_Rate})$$

### Retention rate (BSAI example)

Fishery	PLCK	ARPK	PCOD	YSOL	GTRB	ARTH	RSOL	PNOL	ANPL	OFT	SAB	POP	AIORCK
B_BTR_PNOL	0.43	0.95	0.60	0.85	0.19	0.32	0.87	0.10	0.27	0.84	0.71		
B_BTR_GTRB	0.44	0.94	0.53	0.93	0.44	0.34	0.97	0.48	0.99	0.97	0.96		
B_BTR_OPLT	0.51	0.98	0.65	0.88	0.18	0.41	0.81	0.55	0.84	0.66	0.58		
B_BTR_PCOD	0.36	0.99	0.25	0.39	0.17	0.24	0.44	0.02	0.21	0.64	0.16		
B_BTR_RSOL	0.50	0.97	0.72	0.80	0.30	0.59	0.64	0.10	0.08	0.56	0.73		
B_BTR_SABL	0.72	0.94	0.86	0.73	0.48	0.38	0.78	0.18	0.05	0.93	0.35		
B_BTR_YSOL	0.62	0.93	0.83	0.97	0.84	0.29	0.66	0.60	0.01	0.32	0.17		
B_JIAL_GTRB	0.72	0.98	0.04	0.76	0.08	0.02	0.06	0.60	0.01	0.32	0.17		
B_JIAL_PCOD	0.82	0.15	0.30	0.01	0.15					0.98			
B_JIAL_SABL	0.72	0.94	0.86	0.73	0.48	0.38	0.78	0.18	0.05	0.93	0.35		
B_JIAL_YSOL	0.62	0.93	0.83	0.97	0.84	0.29	0.66	0.60	0.01	0.32	0.17		
B_POT_PCOD	0.59	1.00	0.03	0.20	0.04	0.04	0.61		0.14	0.84	0.81	0.59	
B_PTR_PCK	1.00	0.96	0.35	0.43	0.44	0.36	0.45			0.18	0.14	0.45	0.10
C_BTR_ATKA		0.89	0.99		0.77	0.58	0.23	0.19		0.31	1.00	0.21	0.06
C_BTR_PCOD		0.76	1.00		0.23	0.07	0.23	0.19		0.59	0.99	0.97	0.60
C_BTR_POP		0.69	0.99		1.00	0.43	0.65	0.04			0.88	0.64	0.62
C_HAL_GTRB		0.62	0.96		0.45	0.05					0.85	1.00	0.04
C_HAL_PCOD		0.62	0.96		0.45	0.05					0.99	1.00	0.06
C_HAL_SABL		0.64	0.75		0.66	0.18	0.04				1.00	0.48	0.96
C_POT_PCOD		1.00			0.04	0.03							0.96
C_PTR_PCK		1.00	0.99		0.80	1.00							0.21
E_BTR_ATKA		0.84	0.99	0.03	0.91	0.43	0.34	0.56		0.67	0.94	0.58	0.21
E_BTR_PCOD		0.15	0.99		0.08	0.05	0.11	0.03		0.05	0.36	0.12	0.04

AGENDA ITEM C-5(f)  
April 2003

Ex-vessel value estimates (GOA)

SPECIES	BTR	HAL	POT
ANPL	\$264		
ATKA	\$255		\$291
ARTH	\$68	\$292	\$68
DEEP	\$264	\$264	
DRCK		\$2,431	
FSOL	\$283	\$286	
NRCK	\$111	\$111	\$111
ORCK	\$197	\$896	\$1,000
OTDR	\$601	\$818	\$207
PCOD	\$264	\$726	\$823
PRCK	\$152	\$238	\$916
PLCK	\$279	\$172	\$207
REXS	\$952	\$877	
SABL	\$3,620	\$4,937	\$4,937
SHAL	\$298	\$473	\$443
JSAT	\$136	\$184	
SQUD	\$89		
SRAE	\$779	\$621	\$539
THDS	\$1,207	\$1,818	\$1,818
POP	\$110	\$639	

Results

Example output

Catch

Pollock

	Alt 1	Alt 2.1	Alt 2.2	Alt 3.1	Alt 3.2	Alt 4.1	Alt 4.2
2002	1485.0	1485.0	1485.0	1485.0	1485.0	1485.0	1485.0
2003	1477.8	2869.3	2312.7	1486.6	1636.7	362.1	0.0
2004	1465.3	2104.3	1866.9	1479.4	1636.2	388.1	0.0
2005	1482.6	1713.9	1439.8	1496.7	1497.1	403.7	0.0
2006	1323.1	1549.7	1336.4	1464.8	1311.9	419.0	0.0
2007	1273.2	1577.2	1408.4	1364.7	1302.6	439.3	0.0
Avg	1404.4	1962.9	1672.8	1458.4	1476.9	402.4	0.0

Spawning Biomass

BSAI Pollock

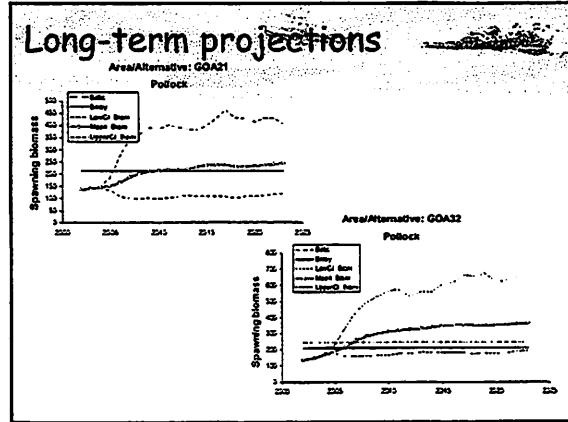
	Equilibrium	2,754.5	2,410.2	2,754.5	2,754.5	2,754.5	5,164.7	6,888.3
2002	3,690.6	3,690.6	3,690.6	3,690.6	3,690.6	3,690.6	3,690.6	3,690.6
2003	3,454.9	3,236.6	3,329.3	3,453.6	3,432.1	3,602.8	3,646.8	3,646.8
2004	3,196.2	2,519.2	2,787.9	3,190.5	3,104.9	3,809.8	4,011.1	4,011.1
2005	2,930.5	2,128.1	2,467.9	2,919.3	2,799.1	3,937.5	4,295.8	4,295.8
2006	2,632.4	2,053.6	2,458.4	2,798.1	2,719.9	4,125.7	4,593.3	4,593.3
2007	2,966.4	2,215.0	2,631.1	2,883.5	2,871.7	4,433.3	5,014.8	5,014.8
Avg	3,076.1	2,432.5	2,734.5	3,049.0	2,965.5	3,961.8	4,311.4	4,311.4

AGENDA ITEM C-5(f)  
April 2003

### Implied SPR values

BSAI Pollock

	Equilibrium	40%	36%	40%	40%	40%	75%	100%
2002	53%	53%	53%	53%	53%	53%	53%	53%
2003	51%	35%	40%	51%	49%	81%	100%	100%
2004	49%	35%	40%	49%	46%	81%	100%	100%
2005	47%	35%	43%	46%	45%	81%	100%	100%
2006	46%	35%	43%	45%	47%	81%	100%	100%
2007	48%	35%	43%	46%	47%	81%	100%	100%
Avg	49%	35%	42%	47%	47%	81%	100%	100%



### Ex-vessel value (BSAI example)

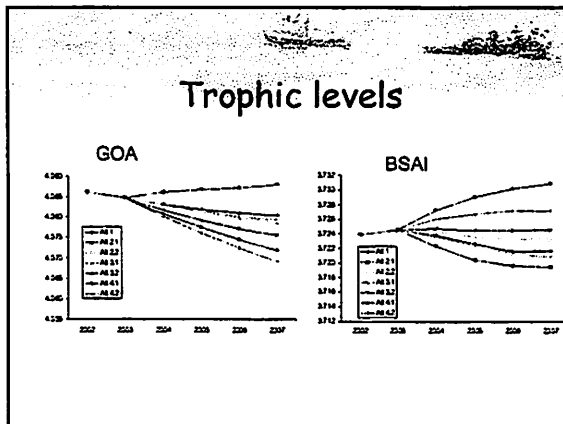
Year: 2007

Stock	Alt 1	Alt 2.1	Alt 2.2	Alt 3.1	Alt 3.2	Alt 4.1
PLCK	\$294,375	\$368,969	\$326,956	\$316,369	\$303,404	\$101,524
PCOD	\$109,560	\$149,057	\$116,059	\$109,083	\$106,669	\$45,707
YSOL	\$15,999	\$18,570	\$15,646	\$15,052	\$16,633	\$15,226
RSOL	\$11,270	\$10,846	\$12,393	\$9,018	\$10,951	\$9,781
SABL	\$6,266	\$27,990	\$9,011	\$6,262	\$1,505	\$7,141
ATKA	\$21,005	\$23,623	\$21,398	\$20,991	\$19,253	\$5,433
GTRB	\$1,901	\$3,121	\$1,745	\$1,906	\$1,001	\$1,474
PSOL	\$3,330	\$6,470	\$6,299	\$2,578	\$2,649	\$2,306
AKPLCK	\$0,257	\$11,964	\$0,252	\$0,248	\$0,224	\$1,011
AKPLC	\$0,370	\$0,491	\$0,406	\$0,341	\$0,678	\$0,337
ARTH	\$0,548	\$0,619	\$0,649	\$0,508	\$0,668	\$0,230
BSAIPOP	\$1,948	\$2,930	\$2,286	\$1,785	\$1,357	\$0,109
BSAISRJR	\$0,378	\$0,530	\$0,406	\$0,354	\$0,234	\$0,037
OFLT	\$0,094	\$0,135	\$0,136	\$0,089	\$0,136	\$0,037
BSORCK	\$0,010	\$0,013	\$0,014	\$0,010	\$0,005	\$0,020
BSAIRthm	\$0,059	\$0,097	\$0,074	\$0,058	\$0,159	\$0,017
AJORCK	\$0,021	\$0,100	\$0,029	\$0,021	\$0,008	\$0,009
BSAIOHSP	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
<b>Grand Total</b>	<b>\$467,580</b>	<b>\$625,524</b>	<b>\$513,797</b>	<b>\$484,673</b>	<b>\$465,603</b>	<b>\$190,400</b>

### Groundfish biomass

BSAI thousands of tons

Groundfish Biomass	Alt 1	Alt 2.1	Alt 2.2	Alt 3.1	Alt 3.2	Alt 4.1	Alt 4.2
2002	20,691	20,891	20,691	20,691	20,891	20,691	20,691
2003	19,637	19,637	19,637	19,637	19,637	19,637	19,637
2004	19,054	17,471	18,150	19,054	18,914	20,405	20,985
2005	18,976	16,789	17,742	18,977	18,706	21,431	22,570
2006	19,037	16,804	17,974	19,038	18,798	22,341	23,949
2007	19,227	16,996	18,278	19,123	19,063	23,088	25,104
<b>Avg</b>	<b>19,186</b>	<b>17,541</b>	<b>18,356</b>	<b>19,166</b>	<b>19,024</b>	<b>21,330</b>	<b>22,451</b>



### Recap of some weaknesses

- \* Constant, non-varying catch-composition matrix
- \* Linkage between single-species stock assessment "gear" and bycatch matrix "gear" is absent
- \* Fisheries mgt mimicked to be "optimal"
- \* Bycatch data derived from 5-year average in which none of the alternatives were specified
- \* Constraints on the degree fisheries allowed to grow or shrink somewhat subjective—could be improved through interaction with managers and fishery experts

### Recap of strengths

- \* Integrated evaluation of multi-species technical interactions
- \* Realistic catch trajectories
  - Improvement over single-species
- \* A general model
  - Any species can specified as constraining (FMP or Prohibited)
  - New uncertainty components can be easily added
- \* Model assumptions more visible
- \* Excellent learning tool
  - Highlights data gaps

### Conclusion

- Model output is only one tool, not "THE" tool
  - \* Common sense should dictate the extent of using model results

### A short LP Primer

- As applied in two-species fishery with an overriding constraint

### Two species

Let

$$X \geq 0$$

$$Y \geq 0$$

If Y and X represent catch of two different species then this represents a wide open unregulated fishery scenario

### Add some single-species limits...

$$0 \leq Y \leq ABC_y$$

$$0 \leq X \leq ABC_x$$

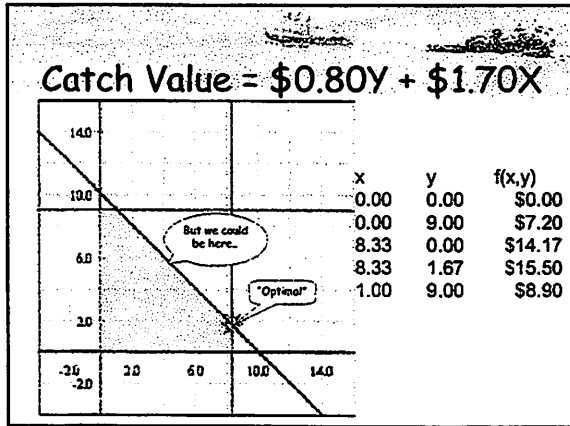
### Add an OY constraint (10 tons)

$$0 \leq Y \leq ABC_y$$

$$0 \leq X \leq ABC_x$$

$$X + Y \leq OY$$

**AGENDA ITEM C-5(f)**  
**April 2003**





**PSEIS Map Statistics**

Fishable Area is defined as that part of the EEZ that is continental shelf and slope to 1000m.

41.5% of the BSAI EEZ is fishable area

29.7% of the GOA EEZ is fishable area

The maps for the bookends FMP 1, FMP 2.2 and FMP 3.1 are identical.

<b>% of EEZ (3-200nm) closed to:</b>	<b>FMP 1</b>	<b>FMP 2.1</b>	<b>FMP 2.2</b>	<b>FMP 3.1</b>	<b>FMP 3.2</b>	<b>FMP 4.1</b>	<b>FMP 4.2</b>
All commercial fishing	0.1%	0.1%	0.1%	0.1%	3.1%	10.6%	100.0%
Selected gear-types or directed fisheries	10.6%	4.1%	10.6%	10.6%	14.7%	8.4%	NA
<b>TOTAL % of EEZ closed to some form of commercial fishing</b>	<b>10.7%</b>	<b>4.2%</b>	<b>10.7%</b>	<b>10.7%</b>	<b>17.8%</b>	<b>19.0%</b>	<b>100.0%</b>

<b>% of fishable area (1000m) closed to:</b>	<b>FMP 1</b>	<b>FMP 2.1</b>	<b>FMP 2.2</b>	<b>FMP 3.1</b>	<b>FMP 3.2</b>	<b>FMP 4.1</b>	<b>FMP 4.2</b>
All commercial fishing	0.3%	0.3%	0.3%	0.3%	8.2%	28.5%	100.0%
Selected gear-types or directed fisheries	27.8%	14.6%	27.8%	27.8%	39.6%	22.6%	NA
<b>TOTAL % of fishable area closed to some form of commercial fishing</b>	<b>28.1%</b>	<b>14.9%</b>	<b>28.1%</b>	<b>28.1%</b>	<b>47.8%</b>	<b>51.1%</b>	<b>100.0%</b>

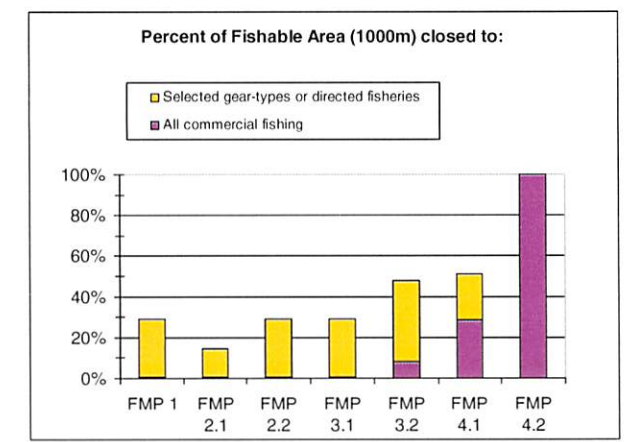
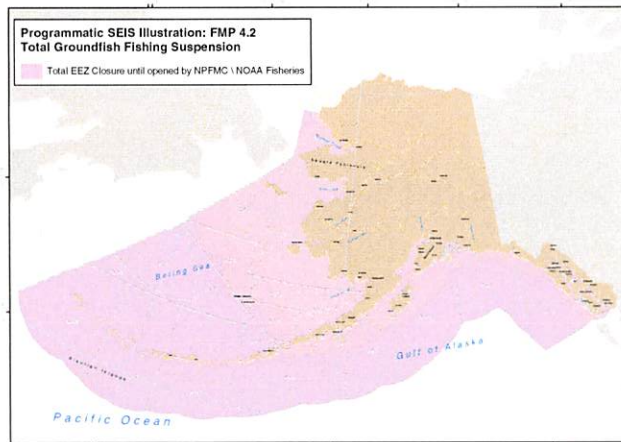
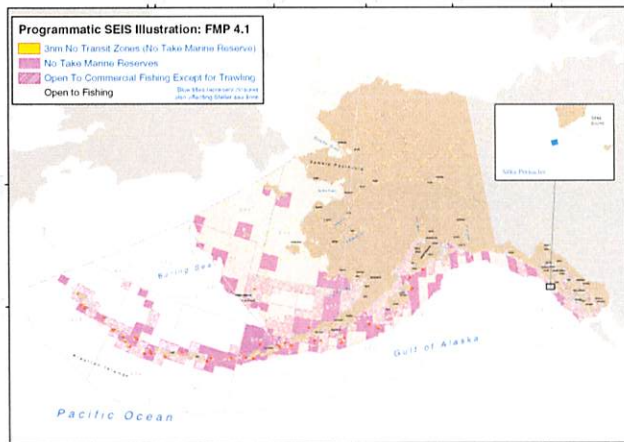
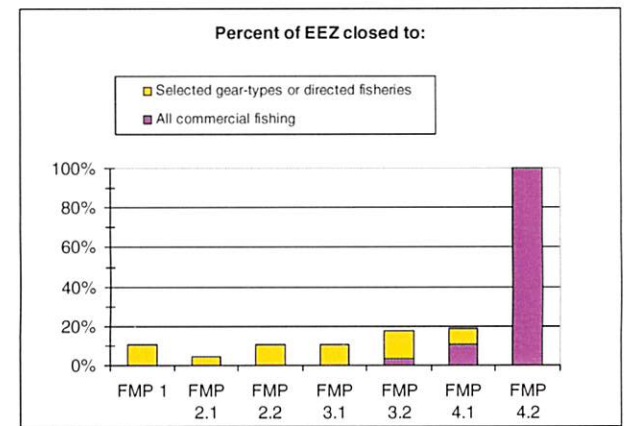
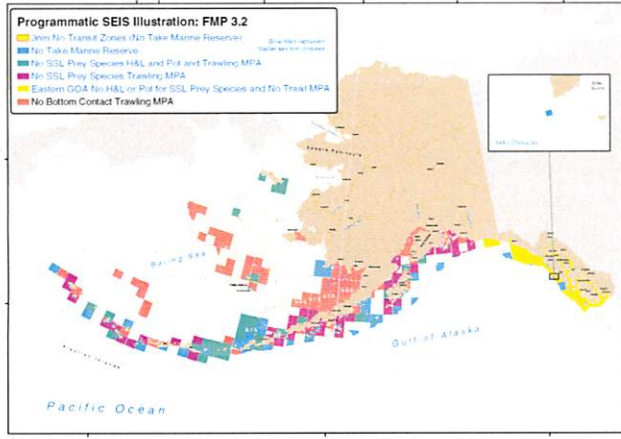
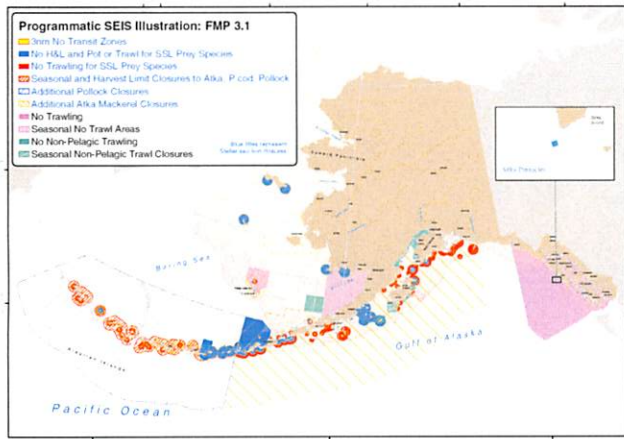
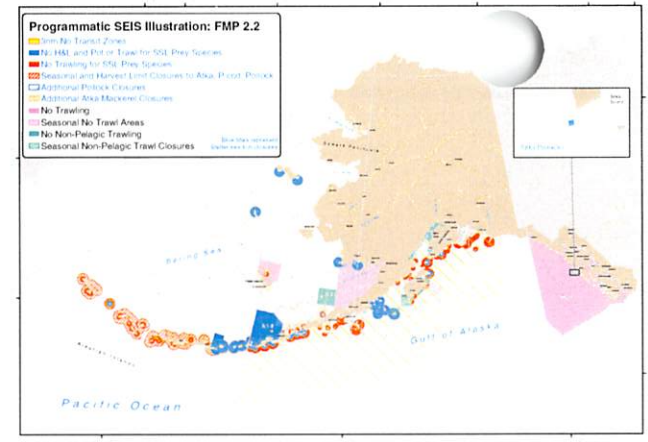
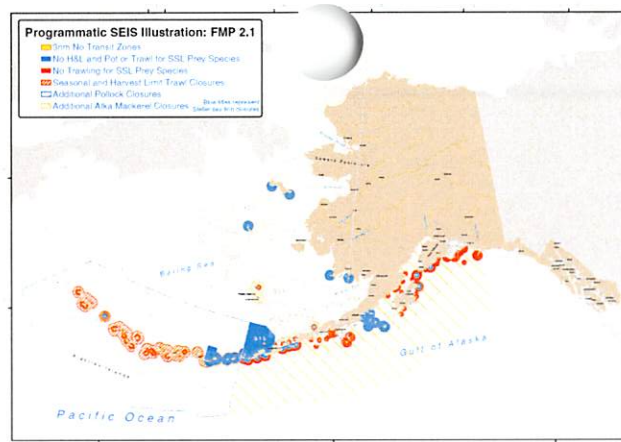
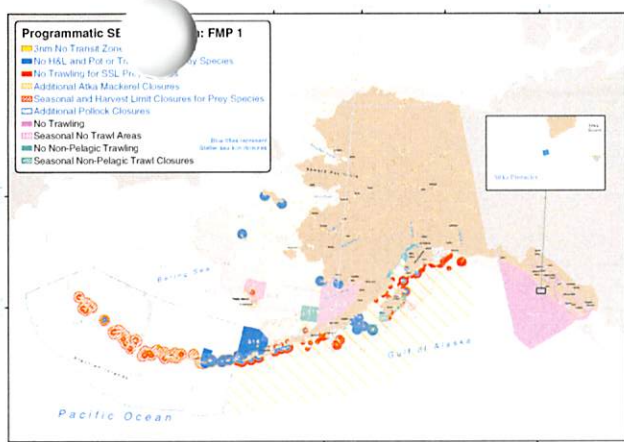
**AGENDA ITEM C-5(d) SUPPLEMENTAL**

**TRAWL GEAR CLOSURES:**

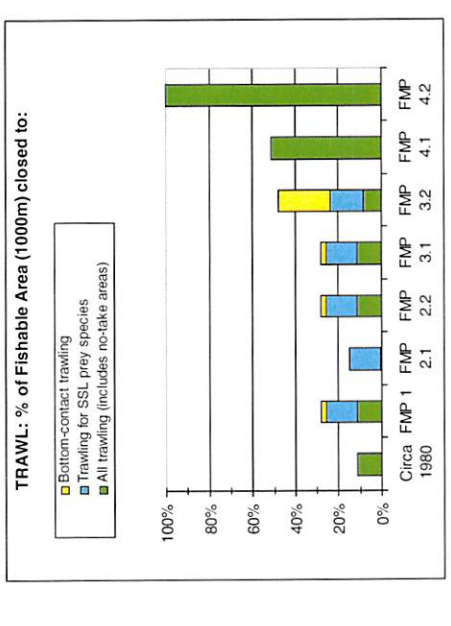
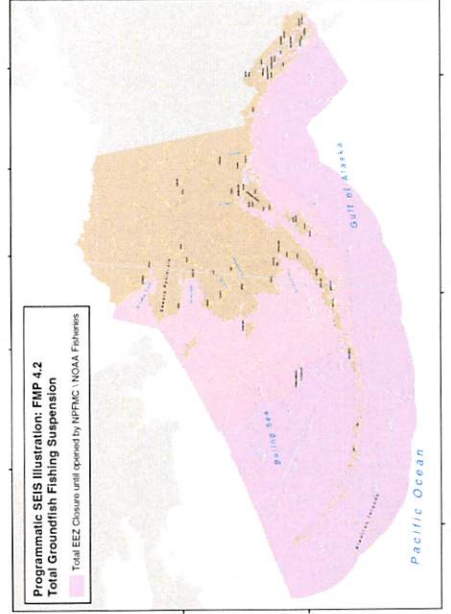
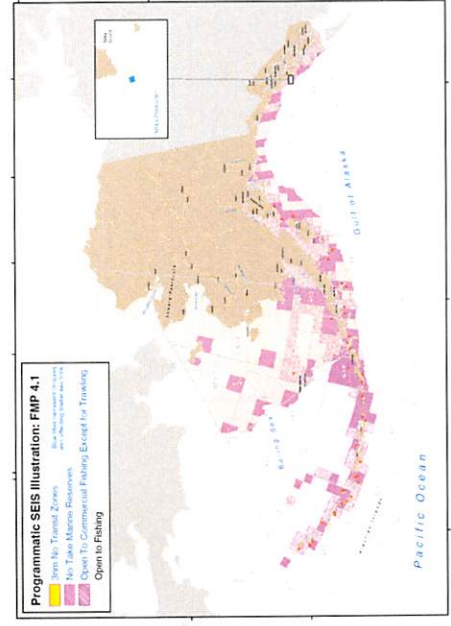
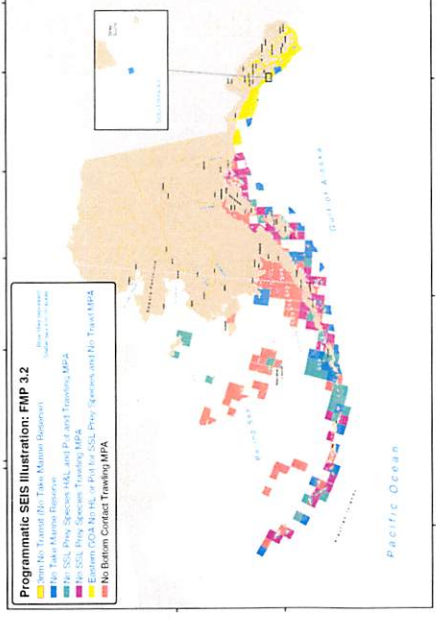
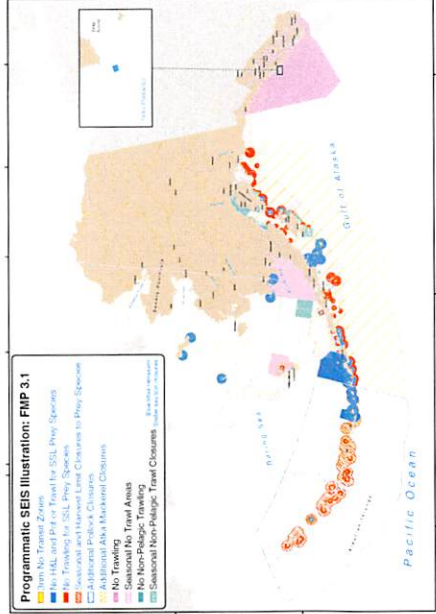
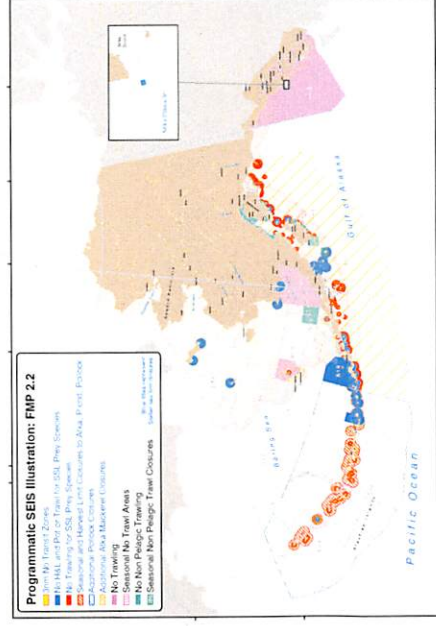
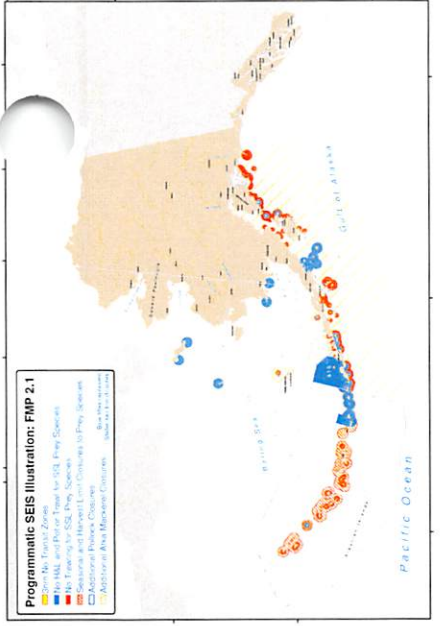
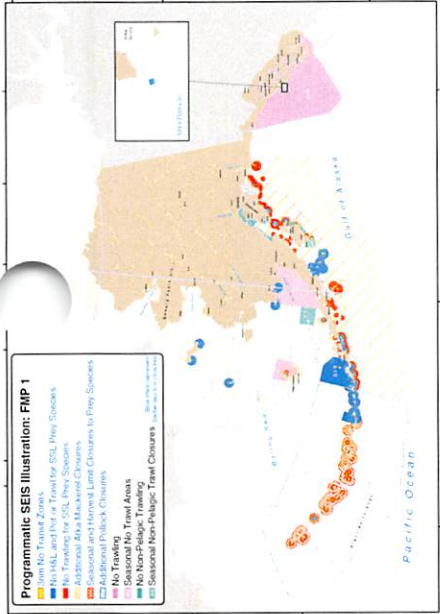
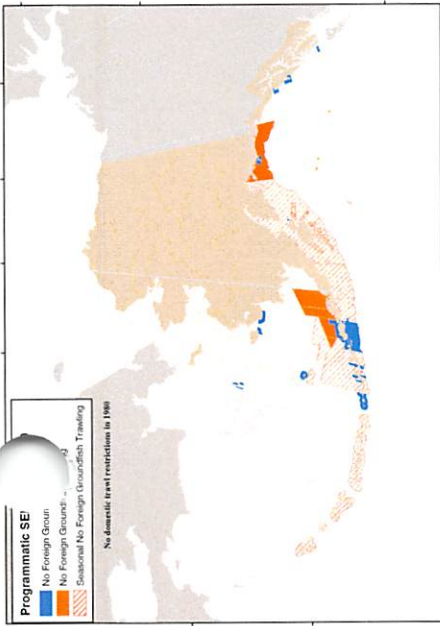
<b>% of fishable area (1000m) closed to:</b>	<b>Circa 1980 (FOREIGN ONLY)</b>	<b>FMP 1</b>	<b>FMP 2.1</b>	<b>FMP 2.2</b>	<b>FMP 3.1</b>	<b>FMP 3.2</b>	<b>FMP 4.1</b>	<b>FMP 4.2</b>
All trawling (includes no-take areas)	11.5%	11.1%	0.3%	11.1%	11.1%	8.2%	51.1%	100.0%
Trawling for SSL prey species	NA	14.3%	14.6%	14.3%	14.3%	15.5%	NA	NA
Bottom-contact trawling	NA	2.7%	NA	2.7%	2.7%	24.2%	NA	NA
<b>TOTAL % of fishable area closed year-round to one of the above forms of trawling</b>	<b>11.5%</b>	<b>28.1%</b>	<b>14.9%</b>	<b>28.1%</b>	<b>28.1%</b>	<b>47.9%</b>	<b>51.1%</b>	<b>100.0%</b>

**FIXED GEAR CLOSURES:**

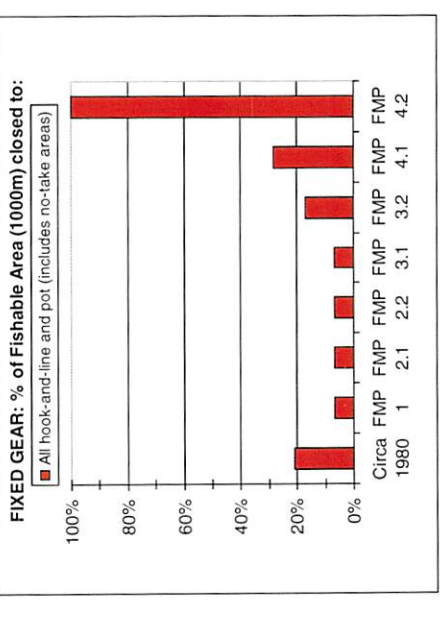
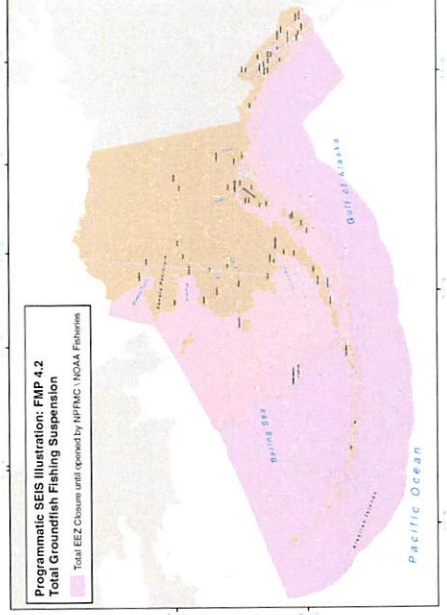
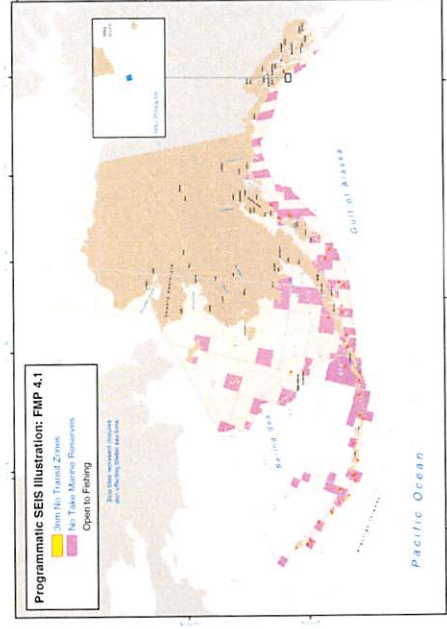
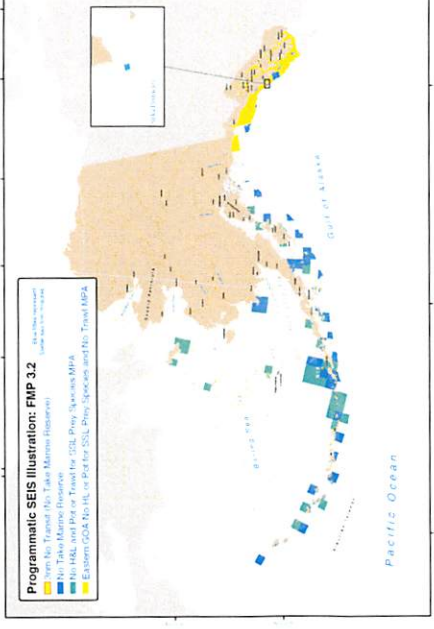
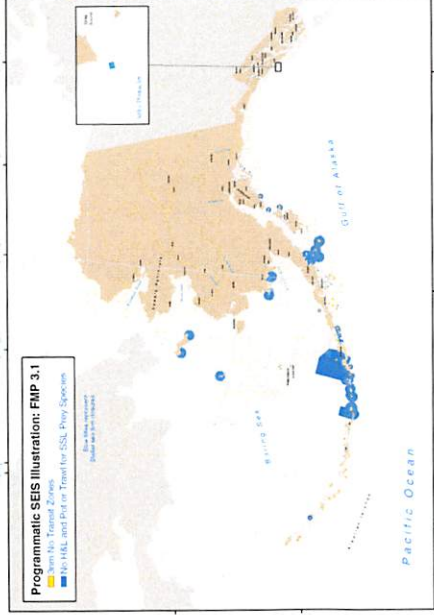
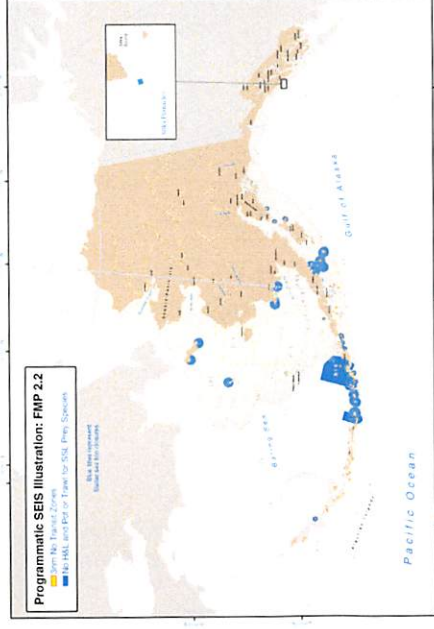
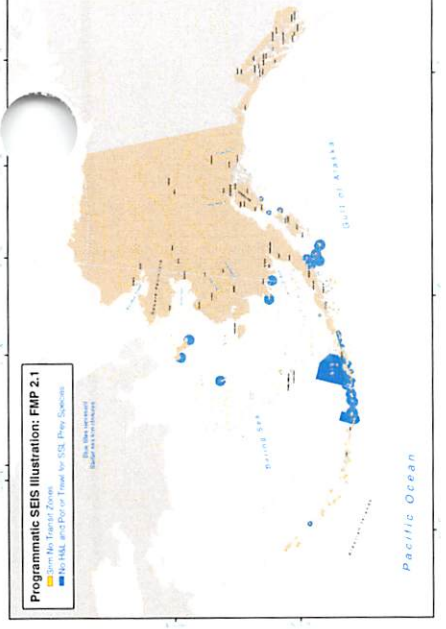
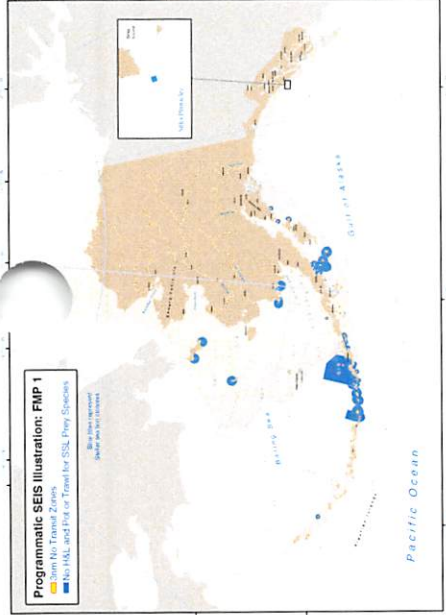
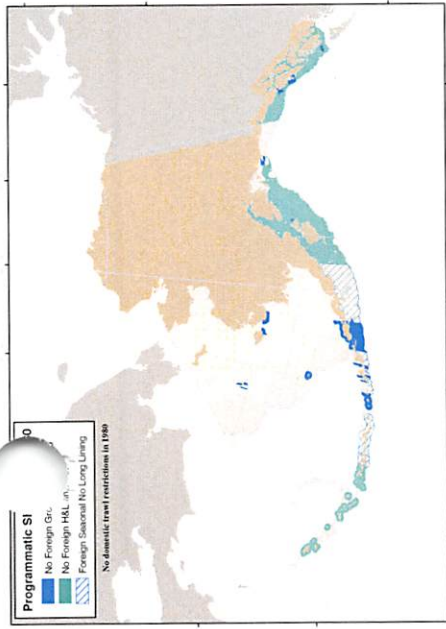
<b>% of fishable area (1000m) closed to:</b>	<b>Circa 1980 (FOREIGN ONLY)</b>	<b>FMP 1</b>	<b>FMP 2.1</b>	<b>FMP 2.2</b>	<b>FMP 3.1</b>	<b>FMP 3.2</b>	<b>FMP 4.1</b>	<b>FMP 4.2</b>
All hook-and-line and pot (includes no-take areas)	21.0%	6.5%	6.5%	6.5%	6.5%	16.8%	28.5%	100.0%



# Programmatic FMP Bookends



Closure Areas for Groundfish: Trawl Gear Only



Closure Areas for Groundfish: Fixed Gear (H&L and Pot)

# PUBLIC TESTIMONY SIGN-UP SHEET FOR AGENDA ITEM C-5 PSEIS

PLEASE SIGN ON THE NEXT BLANK LINE.  
LINES LEFT BLANK WILL BE DELETED.

	<i>NAME</i>	<i>AFFILIATION</i>
1.	<i>Donna Parker</i>	<i>High Seas Corp</i>
2.		
3.		
4.		
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C-3 22T

ACDE

Jul. 1. 1909

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