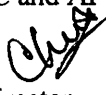


MEMORANDUM

TO: Council, SSC and AP Members
FROM: Chris Oliver 
Executive Director
DATE: November 27, 2007
SUBJECT: Groundfish Management

ESTIMATED TIME 8 HOURS (All D-1 items)
--

ACTION REQUIRED

(c) Review tasking plans for managing Other Species complex and discussion paper on analytical approach.

BACKGROUND

In April 2005, the Council initiated an analysis to split the other species complex into separate groups. In 2007, the Council added an alternative to amend the Gulf of Alaska (GOA) Groundfish Fishery Management Plan (FMP) to allow the Council to recommend an overfishing level and allowable biological catch for the GOA other species assemblage. Council staff is recommending that the Council bifurcate the combined analysis into two separate actions. A draft action plan for the GOA FMP amendment is presented under Item D-1(c)(1). Pending Council concurrence with staff recommendations to bifurcate, this first action is scheduled for initial review in February 2008 and final action in April 2008. Implementation is planned for the start of the 2009 GOA groundfish fisheries.

The second proposed action would amend the GOA and Bering Sea/Aleutian Islands Groundfish FMPs to allow the Council to set separate specifications for sharks, skates, squids, sculpins, and octopuses, and possibly grenadiers. A draft action plan is presented under Item D-1(c)(2). A discussion paper regarding the second analysis is attached as Item D-1(c)(3). Scott Miller (NMFS) will discuss his preliminary findings (Item D-1(c)(4)).

This agenda item was addressed by the AP (see below) and SSC (Item D-1(c)(5)) in October 2007, but the Council deferred discussion of this item until December due to time constraints. The Non-Target Species Committee reviewed the action plans and discussion paper at its November 2007 meeting (Item D-1(c)(6)).

"The AP requests the Council to bifurcate the other species breakout initiative into two separate proposed actions. The first proposed action would amend the GOA groundfish FMP to allow the Council to recommend and overfishing level and allowable biological catch for the GOA and other species assemblage.

Motion passed 13/0

Further, the AP recommends the Council task staff to proceed with the staff-proposed methodology and the "next steps" as recommended by the SSC. Motion passed 13/0."

**ACTION PLAN TO SET OVERFISHING AND ALLOWABLE BIOLOGICAL CATCH SPECIFICATIONS
FOR THE OTHER SPECIES ASSEMBLAGE IN THE GULF OF ALASKA GROUND FISH FMP
June 25, 2007**

PROPOSED ACTION In April 2005, the Council initiated an amendment to the GOA Groundfish FMP that would set an OFL and ABC for the GOA other species assemblage¹.

PROBLEM STATEMENT/OBJECTIVE The GOA Groundfish FMP requires that an annual Total Allowable Catch (TAC) be set for the other species assemblage. That TAC is set less than or equal to the sum of the four groups that comprise the assemblage (sharks, squids, sculpins, and octopuses)². However, the FMP does not authorize the specification of an overfishing level (OFL) or allowable biological catch (ABC) for the assemblage. The proposed action is intended to comply with National Standard 1 of the Magnuson-Stevens Act, MSA Section 303(a)³ for specifying annual catch limits in the FMP, and Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) Section 104(b)(1)(B) requirements that Annual Catch Limits⁴ be implemented by 2011, and other applicable laws.

ANALYSIS An EA for a GOA Groundfish FMP amendment is required.

PROPOSED RANGE OF ALTERNATIVES

Alternative 1. No Action

Alternative 2. Set aggregate OFL and ABC for the GOA other species assemblage.

STAFF RESOURCES

NPFMC Diana Evans and/or Diana Stram (EA)
NOAA AKR Scott Miller (EA), Andy Smoker (regional coordinator)
NOAA AFSC Olav Ormseth (REFM liaison), Jennifer Ferdinand (Observer Program liaison), Rebecca Reuter, M.Elizabeth O'Connell, Todd TenBrink, Dave Clausen, Cindy Tribuzio
NOAA GCAK John Lepore (legal review)
HQ No national policy implications

TIMELINE TO IMPLEMENTATION

August 2006 interagency staff meeting to draft the action plan for this analysis
October 2006 Council, AP, and SSC reviews action plan and analytical outline
November 2006- AFSC prepares stock assessments for the groups
- Plan Teams recommend 2007-2008 group OFLs and ABCs for analysis
December 2006 SSC recommends 2007-2008 groups OFLs and ABCs for analysis
March 2007 - SF In-Season Management staff prepares discussion paper on:
1) temporal/spatial fishery interactions between groups and directed groundfish fisheries; and
2) effects of proposed group specifications on groups and directed fisheries
- Non-Target Species Committee, Council, AP, and SSC reviews paper
June 2007 interagency staff meeting to revise the action plan for this analysis
September 2007 GOA Plan Team reviews revised action plan
October 2007 Council reviews revised action plan and SSC reviews preliminary analysis
February 2008 Initial Review

¹ A second action to separate the BSAI and GOA other species assemblages into the component groups is proposed to be addressed in a separate FMP amendment.

² Skates were separated from the assemblage in 2004 under GOA Plan Amendment 63.

³ As amended under MSRA Section 103(c)(3)

⁴ The definition of which is under development by NOAA Headquarters Staff

June 2008 Final Action

Summer 2008 Secretarial approval of FMP amendment (no rulemaking)

November 2008 Plan Teams recommend GOA other species assemblage OFLs and ABCs for 2009/2010

December 2008 Council recommends GOA other species assemblage OFLs, ABCs, and TACs for 2009/2010

Feb/Mar 2009 Publication of GOA groundfish specifications

APPLICABLE LAWS NEPA, MSA

MAJOR ISSUES

- Protect other species assemblage from overfishing as an intermediate step in a long range plan to revise policy for management of non-target groundfish species
- No economic, enforcement, or legal issues identified
- Addresses MSRA requirements to prevent overfishing and set annual catch limits for all stocks
- Implementation will require biennial preparation of AFSC stock assessment chapters for the groups

**ACTION PLAN TO SET SEPARATE SPECIFICATIONS FOR SQUID, SHARK, SKATE, SCULPIN,
OCTOPUS, AND GRENADIERS IN THE BERING SEA/ALEUTIAN ISLANDS AND GULF OF ALASKA
GROUND FISH FMPs
June 2007**

PROPOSED ACTION In April 2005, the Council initiated a joint BSAI/GOA Groundfish FMP amendment to eliminate the "other species" category and set specifications for squid, shark, skate, sculpin, and octopus (and possibly grenadier), based on recommendations from its Groundfish Plan Teams, Scientific and Statistical Committee, and Non-Target Species Committee.

PROBLEM STATEMENT/OBJECTIVE The two groundfish FMPs require that specifications be set for the "other species" assemblage category (BSAI squid and GOA skate specifications already are set separately). Management of the assemblages, however, may not offer sufficient protection from overfishing of the component groups because its overfishing level (OFL), allowable biological catch (ABC), and total allowable catch (TAC) is set equal to the sum of the estimates for the groups in the BSAI. The GOA FMP does not authorize the specification of an OFL and ABC for the assemblage; only a TAC is set at less than or equal to the sum of four groups. Therefore, any one (or more) groups (or species within a group¹) are vulnerable to overfishing because they are managed under specifications that are set above the level deemed appropriate for that individual group.

ANALYSIS An EA for a joint BSAI/GOA Groundfish GMP amendment is required.

RANGE OF ALTERNATIVES

- Alternative 1. No Action
- Alternative 2. Eliminate "other species" assemblage and manage squids, skates, sculpins, sharks, and octopi as separate assemblages.
- Alternative 3. Manage only BSAI skates and BSAI and GOA sculpins as separate assemblages.
- Alternative 4. Manage only BSAI skates as separate assemblage
- Alternative 5. Add grenadiers to BSAI and GOA TAC specification process:
 - Option 1. separate assemblage
 - Option 2. in other species assemblage

STAFF RESOURCES

- NPFMC Jane DiCosimo (project leader), Diana Stram and Diana Evans (EA)
- NOAA AKR Scott Miller (economic analysis in EA), Andy Smoker (regional coordinator), Steve Lewis (GIS); Sally Bibb (CDQ liaison)
- NOAA AFSC Olav Ormseth (REFM liaison), Jennifer Ferdinand (Observer Program liaison), Rebecca Reuter, M. Elizabeth O'Connell, Todd TenBrink, Dave Clausen, Cindy Tribuzio
- NOAA GCAK John Lepore (legal review)
- HQ No national policy implications

TIMELINE TO IMPLEMENTATION

- August 2006 interagency staff meeting to draft the action plan for this analysis
- October 2006 Council, AP, and SSC reviews action plan and analytical outline
- November 2006- AFSC prepares stock assessments for the groups
 - Plan Teams recommend 2007-2008 group OFLs and ABCs for analysis
- December 2006 SSC recommends 2007-2008 groups OFLs and ABCs for analysis

¹ Specifications for species will be set as information is deemed sufficient to break them out of a group, per GOA Plan Amendment 63.

March 2007 - SF In-Season Management staff prepares discussion paper on:
 1) temporal/spatial fishery interactions between groups and directed groundfish fisheries; and
 2) effects of proposed group specifications on groups and directed fisheries
 - Non-Target Species Committee, Council, AP, and SSC reviews paper
 June 2007 interagency staff meeting to revise the action plan for this analysis
 September 2007 Groundfish Plan Teams review AKR staff discussion paper on fishery interactions
 October 2007 Council reviews revised action plan and discussion paper
 Feb/Apr 2008 Preliminary Review of draft analysis
 Spring 2008 Non-Target Species Committee reviews draft analysis
 June 2008 Initial Review of EA/IRFA
 Sept 2008 Plan Teams review draft analysis
 October 2008 Final Action on EA/IRFA
 ??? 2009 Approval by the Secretary; Implementation of FMP amendments
 November 2009 Plan Teams recommend group OFLs and ABCs for 2010/2011
 December 2009 Council (and AP and SSC) recommends group OFLs, ABCs, and TACs for 2010/2011
 March 2010 Implementation of group specifications, with other groundfish specifications

APPLICABLE LAWS NEPA, MSA

MAJOR ISSUES

- Protect non-target species from overfishing as intermediate step in long range plan to revise policy
- Most non-target species are managed under Tier 5 or 6 (data poor), yet these specifications are managed equal to those set at Tier 1 or 3 (less uncertainty)
- Difficulty in managing small TACs, with CDQ and area suballocations
- Complex temporal/spatial patterns of how fleets shift effort between directed fisheries
- Historical patterns of how fleets respond to high levels of incidental catches
 - Can not predict future patterns – case by case basis
- How SF –In Season Management responds when catches approach TAC, ABC, and OFL
- Geographic hotspots where high levels of incidental catches occur (e.g. BS octopus in Areas 517/519)
- Adding grenadier TAC would further constrain other BSAI groundfish TACs under OY cap
- Determining if specifications should be set for other non-specified species would unduly burden this analysis and compromise the proposed timeline (defer to “next step”)
- Would increase workload on recordkeeping and reporting systems (would be mitigated by electronic reporting), In-Season Management, Groundfish Plan Teams, and SSC
- Already increased workload on AFSC RACE, REFM, and Observer Programs
- No enforcement or legal issues identified

**Evaluating Potential Fishery Effects
of
Changes to Other Species Management**

A Discussion Paper

Scott A. Miller
Economist
NOAA Fisheries, Alaska Region, Analytical Team
September 2007

With Contributions by

Andy Smoker, NOAA Fisheries Alaska Region In-season Management
Jane DiCosimo, North Pacific Fisheries Management Council Staff.

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Introduction

The Council has been discussing management of some species groups in the other species groundfish complexes since a proposal was submitted to the Council by the Alaska Department of Fish and Game in 1998. The proposal was to set sharks and skates as bycatch in directed commercial fisheries. Over years of development, the proposed management action was expanded from sharks and skates to all other species, and then to all non-target groundfish species under the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands (BSAI) Groundfish Fishery Management Plans (FMP). In December 2004 the Council requested that staff develop a discussion paper of a proposal from the Groundfish Plan Teams and Science and Statistical Committee. Those bodies, along with the ad hoc group and Non-Target Species Committee have collectively developed three separate management actions that were combined into one proposed analysis.

The first action was split off and implemented in 2006. This action amended the GOA Groundfish FMP to set the total allowable catch (TAC) for the GOA other species complex less than or equal to 5 percent of the sum of all Groundfish TACs. It allows the Council to reduce the TAC to a level that allows NMFS to set the complex on bycatch status at the beginning of the year.

The second proposed action would set an overfishing level (OFL) and allowable biological catch (ABC) for the GOA "other species" category to match the BSAI Groundfish FMP. The third proposed action would set specifications for some or all of the component groups contained in the assemblage, with an option to add specifications for grenadier. In April 2005 the Council initiated an analysis for the latter two actions. Council staff developed a discussion paper of the proposed actions as a first step in the development of the combined analysis in October 2005¹. National Marine Fisheries Service (NMFS) Regional Office staff previewed the effect of five possible management alternatives in a March 2007 paper.² The author applied proxy OFLs and ABCs that were developed by the NMFS Alaska Fishery Science Center and reviewed by the Plan Teams and SSC in 2006 to identify the relationships between certain other species groups and directed commercial fisheries.

Staff is once again recommending that the two proposed actions be split into separate analyses so as to fast track the GOA Plan Amendment. Revised action plans for the two analyses are scheduled for review by the Council in October 2007. The following constitutes a preliminary analytical approach that will be the basis of the analysis of the third action to revise management of the other species complex. Once approved by the SSC, staff will develop the initial review draft of the analysis over the winter of 2007.

Focus of this Discussion Paper

The topic of independent management of the individual species that comprise the "other species" group and of grenadiers has received considerable analytical attention over the past several years. This effort has resulted in extensive analysis of the topic by Andy Smoker, head of NOAA Fisheries Alaska Region Inseason Management, which was presented to the Council earlier this year. That treatment provided information on the tier system and an overview of how the "other species" group is presently managed.

This paper depends heavily on the previous analysis, but attempts to focus the discussion to answer the following questions:

1. Is the species in question, if managed independently, likely to be of management concern such that management measures would be necessary to prevent overfishing?
2. Which fisheries (gear/target species) are primarily responsible, and thus most likely to be affected by management measures, for the incidental catch of the species in question?

¹ http://www.fakr.noaa.gov/npfmc/current_issues/non_target/OSpeciesDiscPaperOct05.pdf

² http://www.fakr.noaa.gov/npfmc/current_issues/non_target/SmokerOtherSpecies307.pdf

3. What are the implications of spatial and temporal aspects of the incidental catch?
4. In light of the answers to the above questions, what methodology would be appropriate to analyze the likely effects on fishery revenue of potentially needed management measures?

To answer these questions, this paper will discuss pertinent aspects of each individual species under consideration in the alternative set. This information will then be summarized in tabular form. Each alternative will then be discussed. Finally, the methodology that would need to be employed to more formally evaluate these alternatives will be discussed.

The Alternative Set

The alternative set presently under consideration is as follows:

- Alternative 1. No Action
- Alternative 2. Eliminate “other species” assemblage and manage squids, skates, sculpins, sharks, and octopi as separate assemblages.
- Alternative 3. Manage only BSAI skates and BSAI and GOA sculpins as separate assemblages.
- Alternative 4. Manage only BSAI skates as a separate assemblage.
- Alternative 5. Add grenadiers to BSAI and GOA TAC specification process:
 - Option 1. separate assemblage
 - Option 2. in other species assemblage

This alternative set differs in order and content from that presented in the previous discussion paper. Alternatives 3 and 4 have been reversed in order. Previously, an alternative (alternative 2) was included in the alternative set that would have set aggregate “other species” OFL and ABC for the GOA. That alternative is being treated in a separate analytical process and is no longer a part of this alternative set. In addition, the alternatives have been reordered by renaming, as alternative 2, what was previously alternative 5, and by naming the Grenadier option alternative 5 with its suboptions as shown above.

Key Characteristics of Incidental Catch of Other Species

This section identifies, based on Andy Smoker’s previous discussion paper, the key characteristics of incidental catch of the various species in the other species group and of grenadiers. The treatment begins with the species in the BSAI and then covers those in the GOA. Note, the descriptive graphics, and excerpts of the text, used here are “borrowed” from the previous discussion paper but have been reorganized and re-numbered.

BSAI Skates

Figure 1 shows that cumulative BSAI Skate catch by year (2004-06), relative to the Skate ABC and OFL, has been below ABC by more than 10,000 mt each of the past three years. BSAI Skate catch tends to accelerate in the January to March timeframe, tapers off in the early summer months, and then increases in late summer through October.

Figure 2 shows that the hook-and-line Pacific cod fishery dominate BSAI Skate catch.

Figure 3 shows that skate catch is broadly distribution in the BSAI. Thus, it may not be possible to identify a discrete area for closure. In the event of an overfishing concern, broad area closures could be required.

If the ABC and directed fishery for Pacific cod with hook-and-line gear increases, the incidental catch needs for skate would likely increase as well. Given that incidental catch is substantially less than than ABC, a directed fishery for skate could be considered.

Figure 1: Cumulative BSAI Skate Catch by Year (2004-6) Relative to Skate ABC and OFL

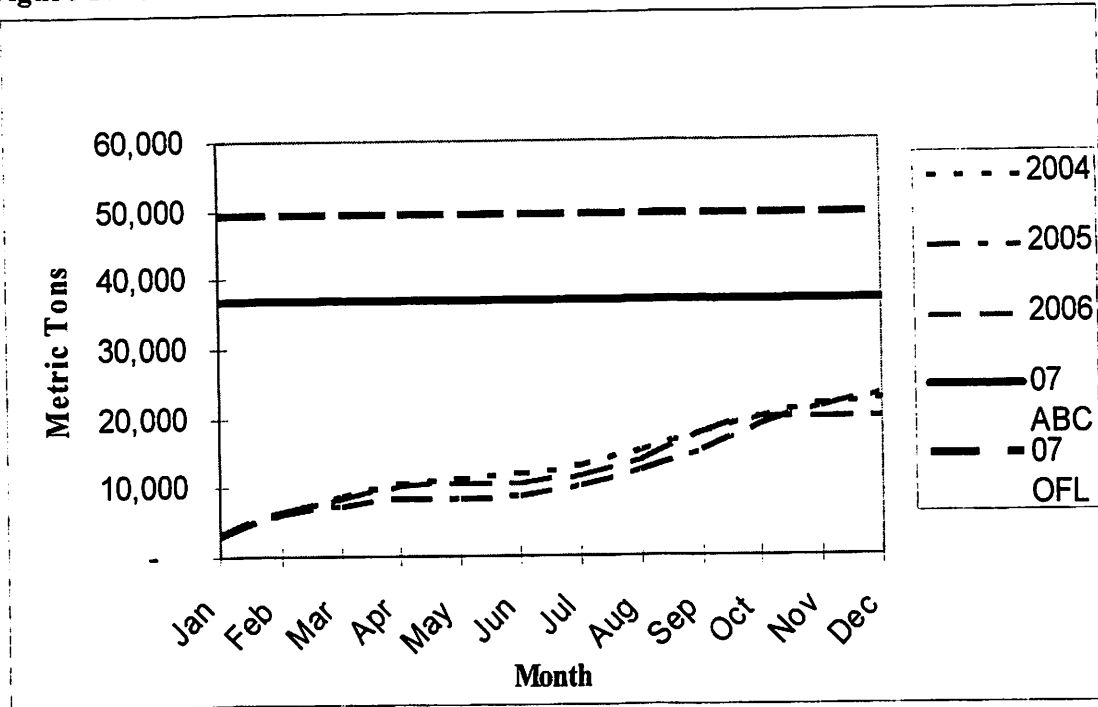


Figure 2: BSAI Skate Average Catch by Gear and Target

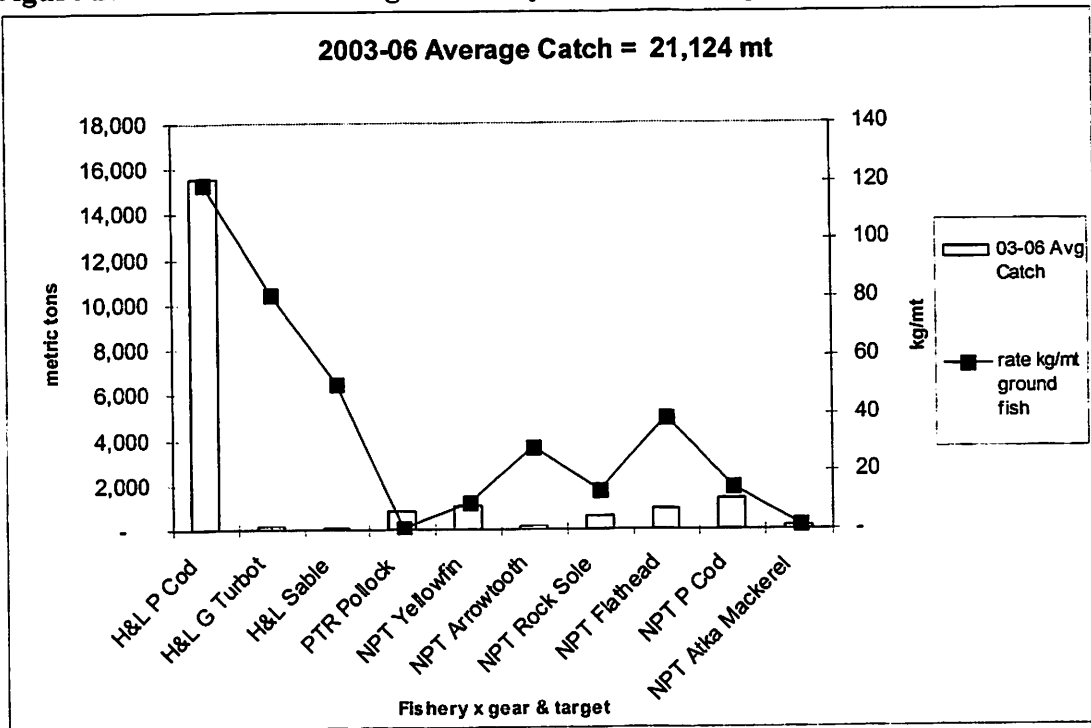
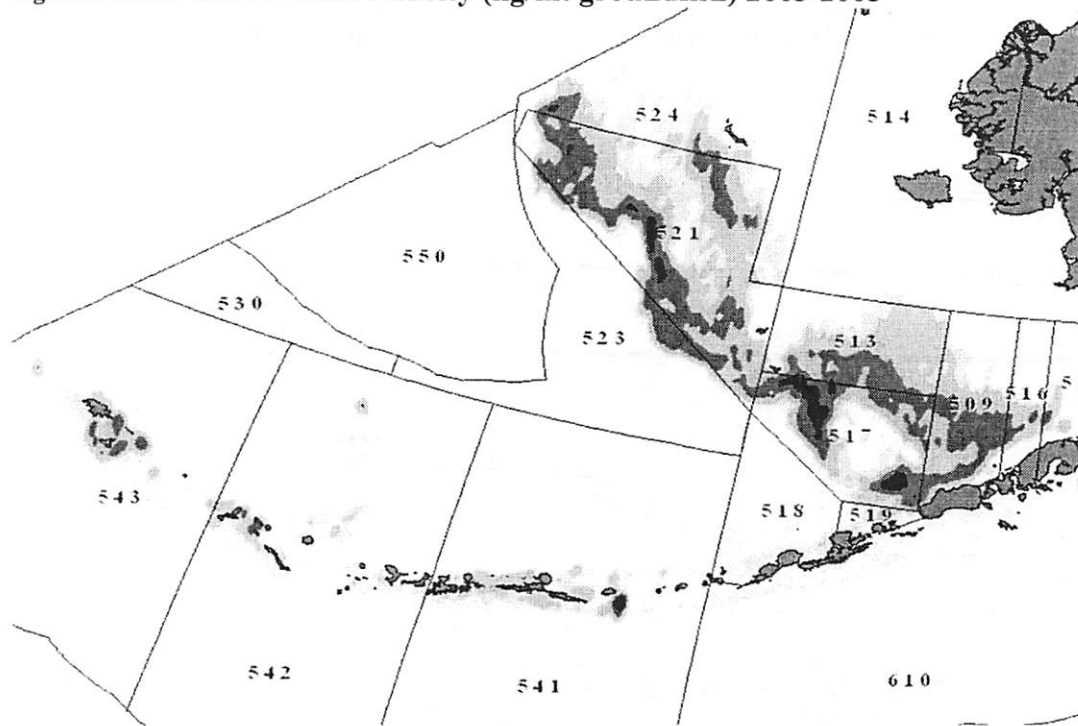


Figure 3 BSAI Skate Catch Density (kg/mt groundfish) 2003-2005



BSAI Sharks

Figure 4 shows that the cumulative annual catch of BSAI sharks approached the ABC (617mt) in 2005, exceeded the ABC in 2004, and exceeded the OFL (463mt) in 2006. BSAI shark catch in 2004 and 2005 was constant during the year; however, the 2006 catch increased sharply in August and exceeded the OFL by September.

Figure 4: Cumulative BSAI Sharks Catch by Year (2004-6) Relative to ABC and OFL

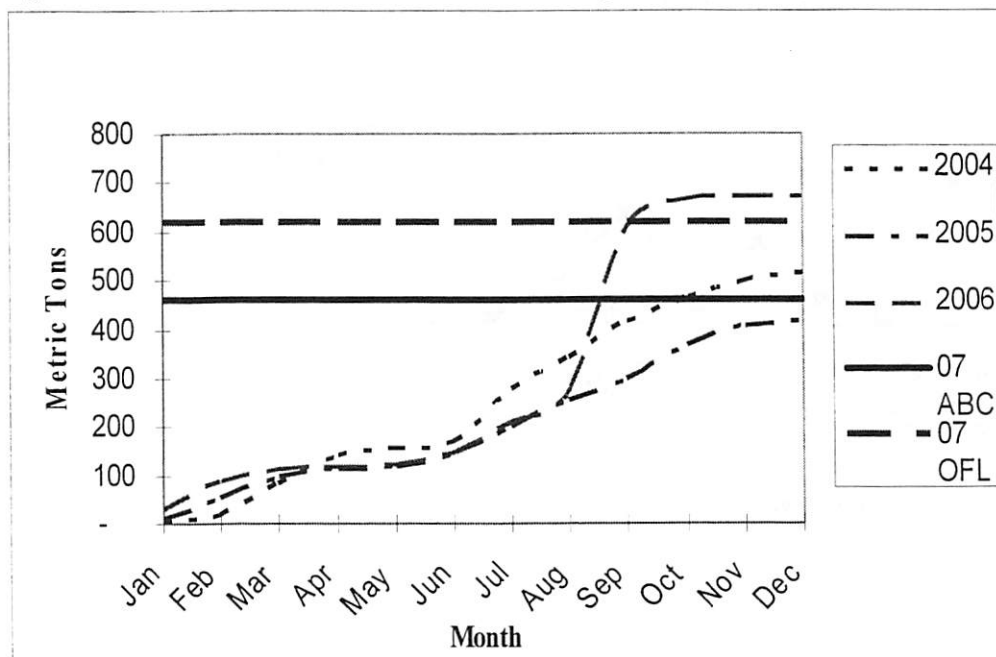


Figure 5 shows that the bulk of the shark incidental catch occurs in the mid-water pelagic trawl pollock and hook-and-line Pacific cod target fisheries. The hook-and-line Greenland turbot and sablefish fisheries catch sharks at high rates, but the tonnage of sharks caught in these fisheries is low.

The cumulative incidental catch of BSAI sharks regularly approaches one or both of the management benchmarks. Thus, a directed fishery is not possible without limiting incidental catch in other fisheries. Further, actions in the future to prevent overfishing and reduce the incidental catch of sharks would be likely if this species is managed on an individual basis.

Figure 5: BSAI Sharks Average Catch by Gear and Target

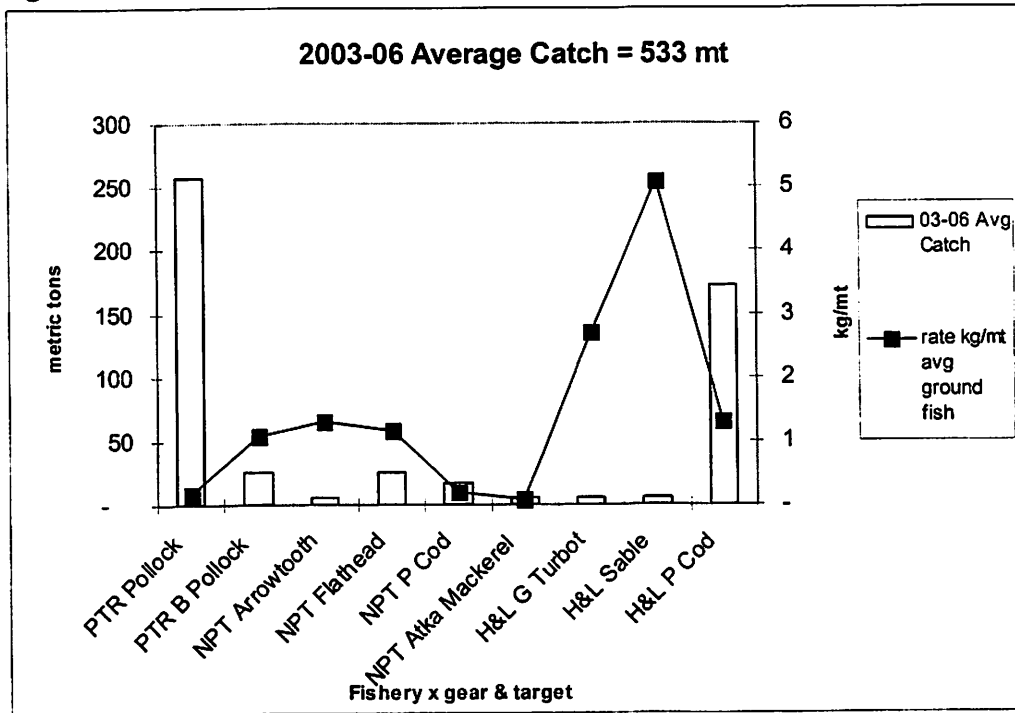
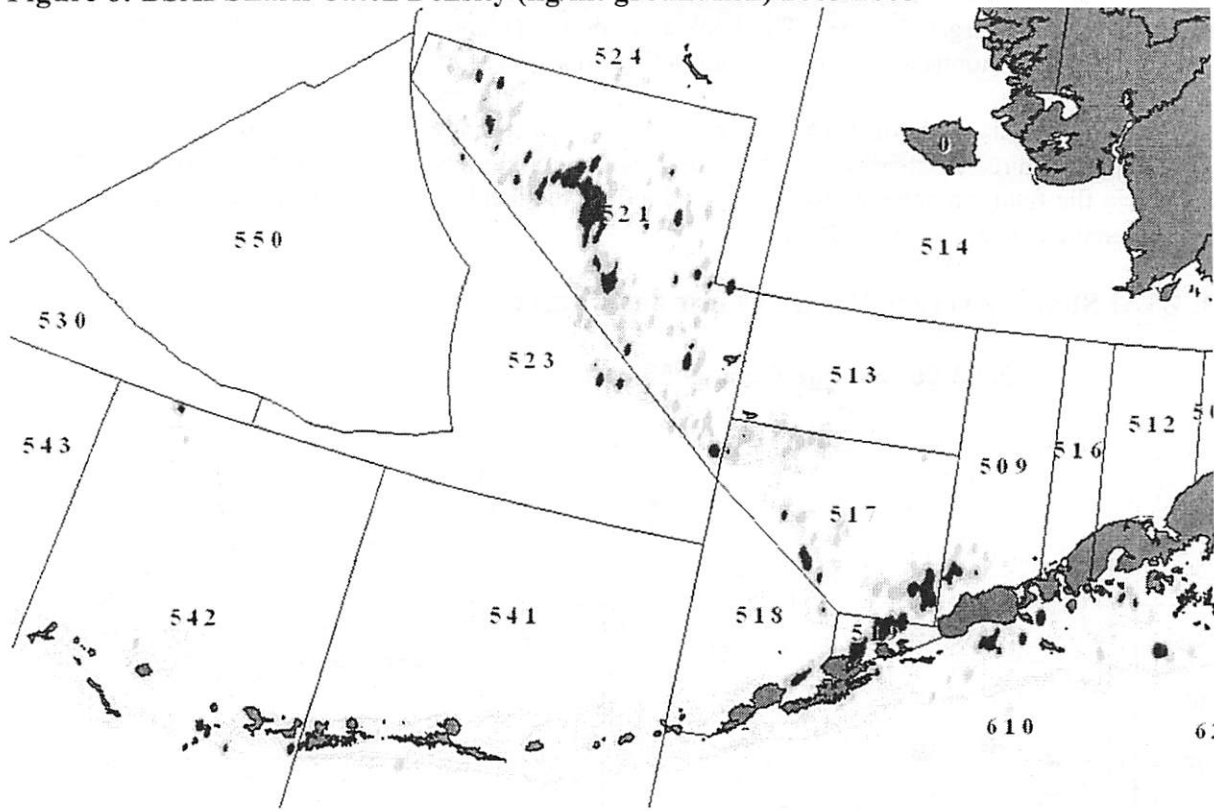


Figure 6: BSAI Shark Catch Density (kg/mt groundfish) 2003-2005



BSAI Sculpins

Figure 7 shows that cumulative BSAI sculpin catches, during 2003-2006 have averaged around 5,000 mt and are well below the 41,200 OFL and 30,900 mt ABC. Incidental catch would have to increase significantly for management concerns to develop that would impact the BSAI groundfish fishery. Thus, management of this species on an individual basis is not likely to require restrictions on fishing activity at present levels of harvest. Figure 7 also shows that the catch rate remains constant during the fishing year.

Given the difference of nearly 25,000 mt between present levels of incidental catch and the ABC, this species group could support a directed fishery. Management decisions would have to focus on the species of sculpin that would be targeted; perhaps developing a stock assessment for that particular species. Consideration would also need to be given to incidental catch of other groundfish in a sculpin target, and implications of prohibited species bycatch among other considerations.

Figure 7: Cumulative BSAI Sculpins Catch by Year (2004-6) Relative to ABC and OFL

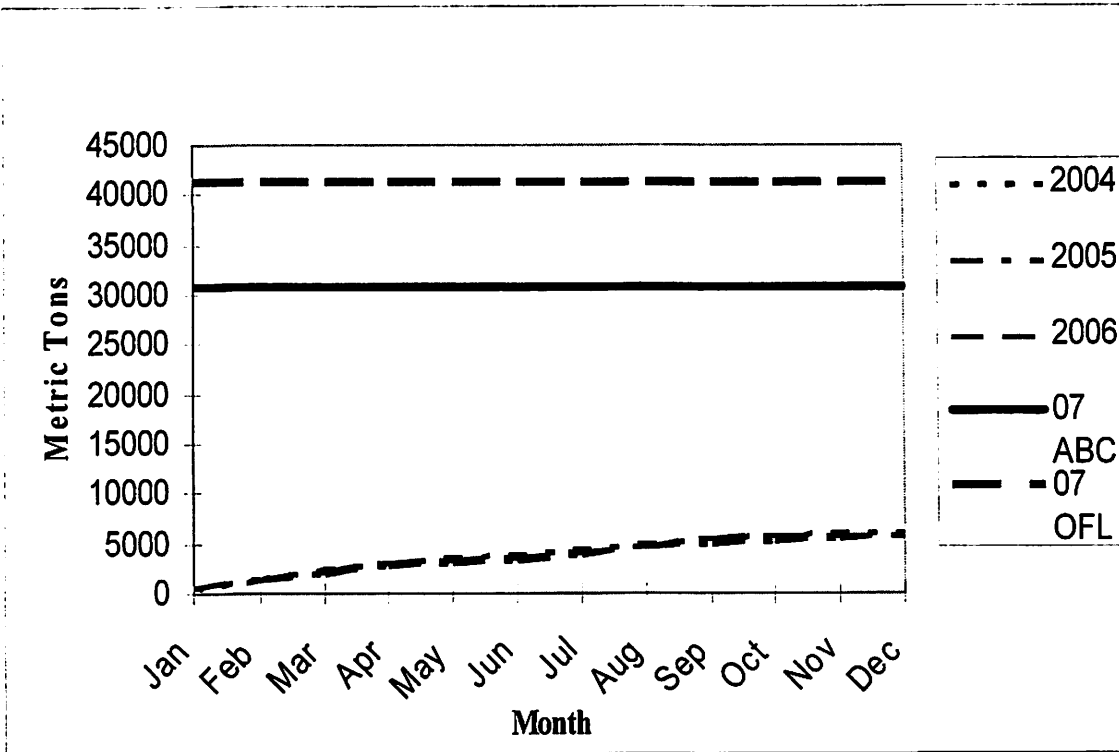


Figure 8 shows that this species group is primarily caught in gear and target combinations including non-pelagic trawl yellowfin sole, non-pelagic trawl Pacific cod, and hook-and-line Pacific cod. Several other fisheries also catch sculpins incidentally.

Figure 8: BSAI Sculpins Average Catch by Gear and Target

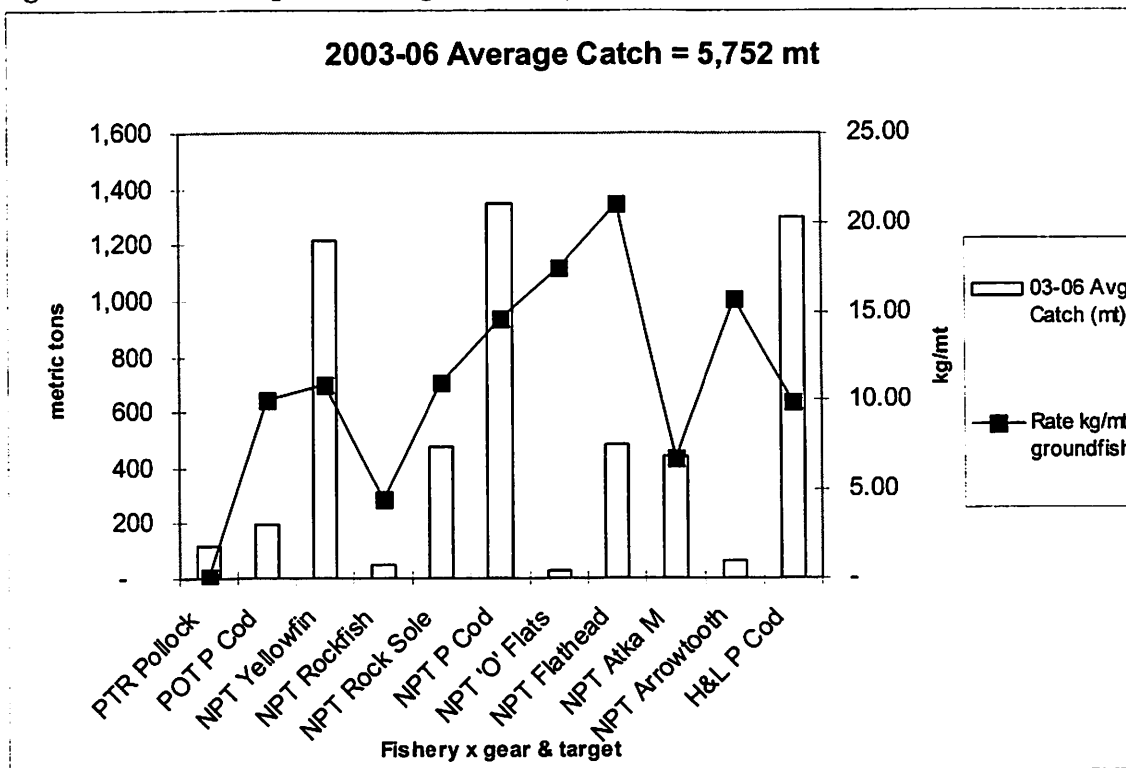
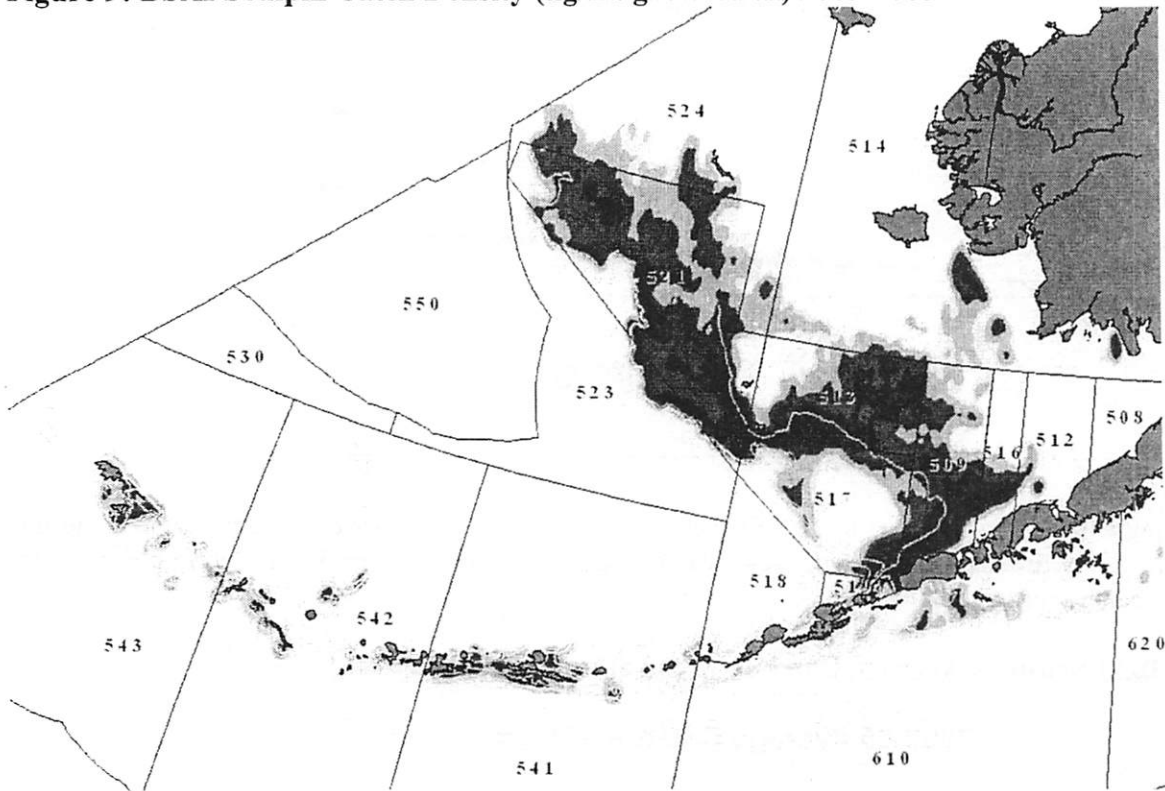


Figure 9 shows that the incidental catch of sculpins is distributed quite broadly throughout the BSAI. Were incidental catch to increase to amounts requiring restrictions to prevent overfishing, or were a directly fishery undertaken, broad areas of the BSAI would have to be considered for incidental catch closure in several trawl fisheries, as well as the hook-and-line Pacific cod fishery. Given that current catch rates are constant throughout the year, and well below management benchmark levels, it is not possible to identify when in the year such restrictions might become necessary.

Figure 9: BSAI Sculpin Catch Density (kg/mt groundfish) 2003-2005



BSAI Octopi

The BSAI octopus OFL and ABC are 688 mt and 516 mt, respectively. Figure 10 shows that the cumulative catch of BSAI octopi exceeded the 516mt ABC in 2004 but was considerably less than that level, about 300 mt per year, in 2005 and 2006. BSAI octopus incidental catch tends to accelerate in late winter and into spring before tapering off during the summer and then increasing sharply in late summer and fall.

Figure 10: Cumulative BSAI Octopi Catch by Year (2004-6) Relative to ABC and OFL

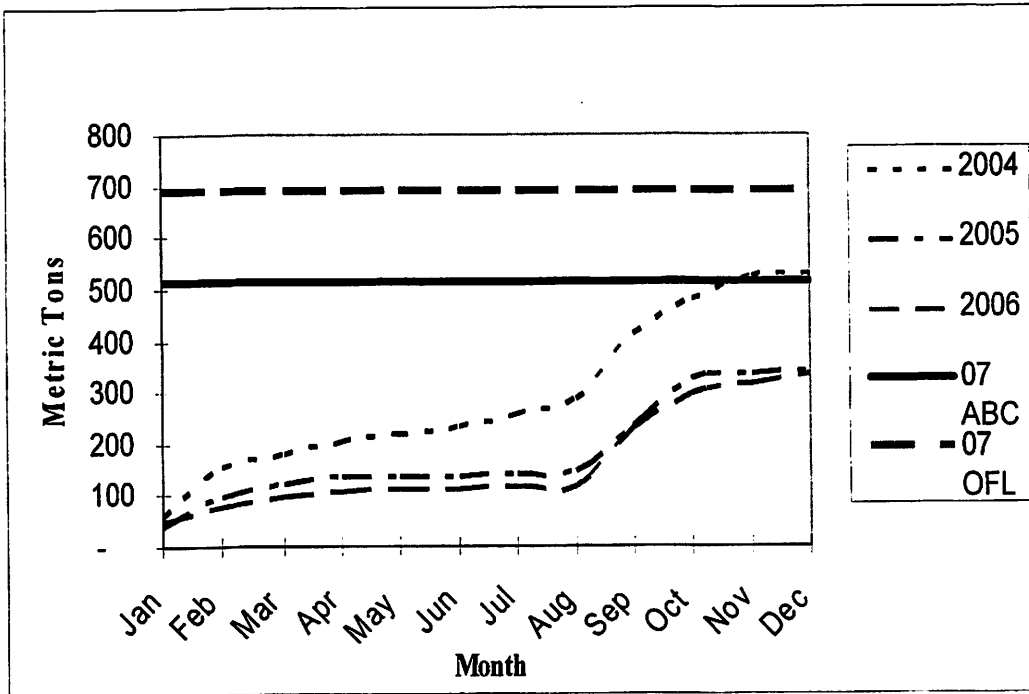
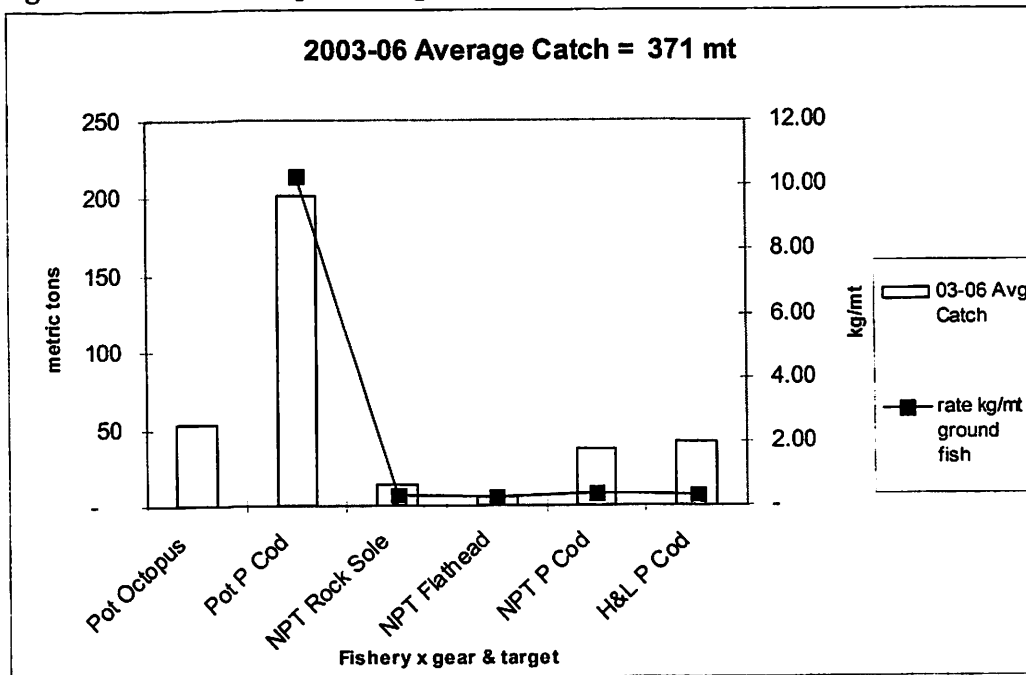


Figure 11: BSAI Octopi Average Catch by Gear and Target

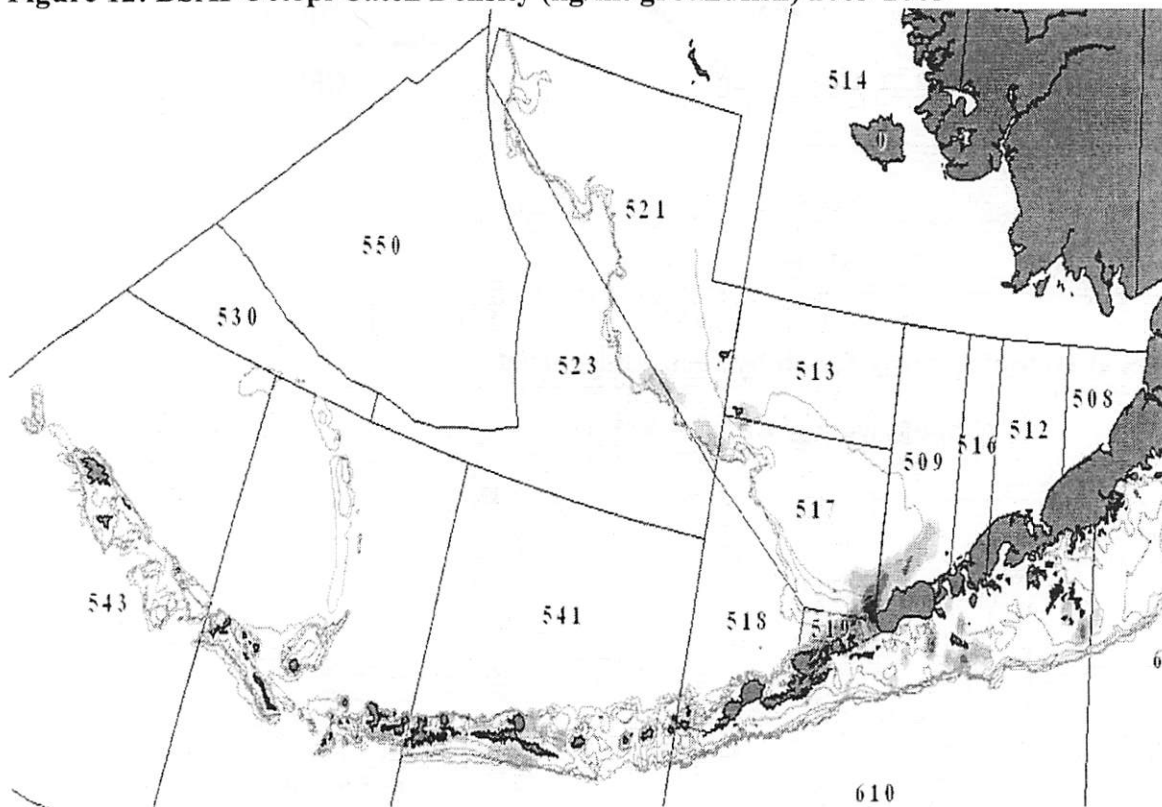


Octopi are predominately caught in pot gear Pacific cod fisheries (Figure 11). If incidental catch rates relative to Pacific cod tend to be consistent over years, octopus catch should fluctuate with the ABC for Pacific cod. If octopus biomass experiences rapid growth and expansion they can become more abundant relative to Pacific cod. Their catch rates are expected to increase as well. Occasionally enough octopi are caught and delivered with pot gear that it is identified as a target. Its target status is an artifact of the catch accounting system even though the directed fishery remains closed.

A market exists for octopus which promotes its retention. If the species group could be assessed at tier 5 or higher, a larger ABC and definition of a TAC could sustain a directed fishery. However, The lack of appropriate information, including a lack of accurate biomass estimates, means that octopi will likely remain in tier 6 and closed to directed fishing.

Over time catch is expected to meet the ABC and approach the OFL. If the OFL is approached fisheries shown in Figure 12 (Pacific cod fisheries with pot gear followed by hook-and-line and non-pelagic trawl gear) would be candidates for closure to prevent overfishing. The patchy distribution of octopus catch (Figure 13) may lead to discrete area closures if an overfishing closure were required. Such closures, if needed, would likely occur in October and could extend for the remainder of the fishing year.

Figure 12: BSAI Octopi Catch Density (kg/mt groundfish) 2003-2005



BSAI Grenadiers

The BSAI grenadier tier 5 OFL and ABC are 108,888 mt and 81,666 mt, respectively. Figure 13 shows that the cumulative catch of grenadier has been well below the ABC in recent years. Grenadier incidental catch tends to accelerate in spring and continues at a constant rate through the end of the year.

Incidental catch of grenadier occurs predominately in hook-and-line fisheries for Greenland turbot and sablefish (Figure 14). The incidental catch rates of over 800 kg/mt in the Greenland turbot target and over 1,000 kg/mt in the sablefish target indicate that grenadier average about half the catch in those fisheries.

Figure 15 shows the broad distribution of grenadier catch along bathymetric lines. Incidental catch of BSAI grenadiers would have to more than double in order to approach the ABC. If this were to happen, restrictions to prevent overfishing would likely cover broad areas of the BSAI. Such closures would likely affect the hook-and-line Greenland turbot and sablefish fisheries. Given that current catch rates are constant from May throughout the end of the year, and well below management benchmark levels, it is not possible to identify when in the year such restrictions might become necessary, for how long they might last, or how large an area might be affected.

Figure 13: Cumulative BSAI Grenadier Catch by Year (2004-06) Relative to ABC and OFL

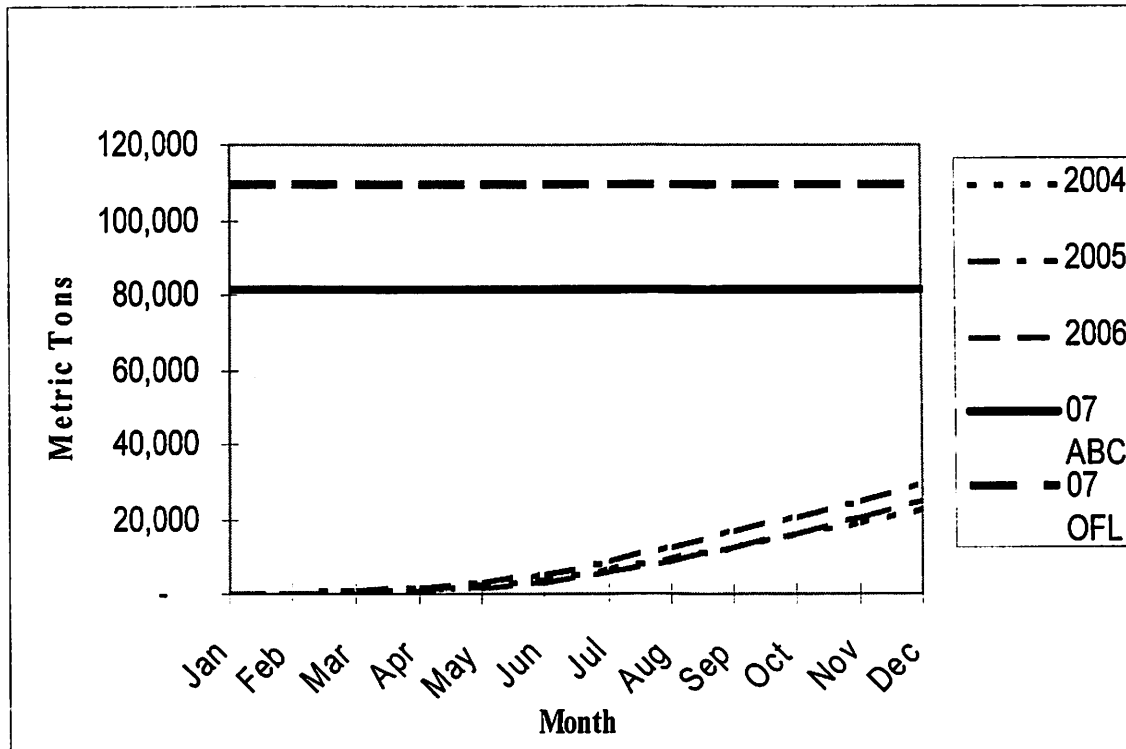


Figure 14: BSAI Grenadier Average Catch by Gear and Target

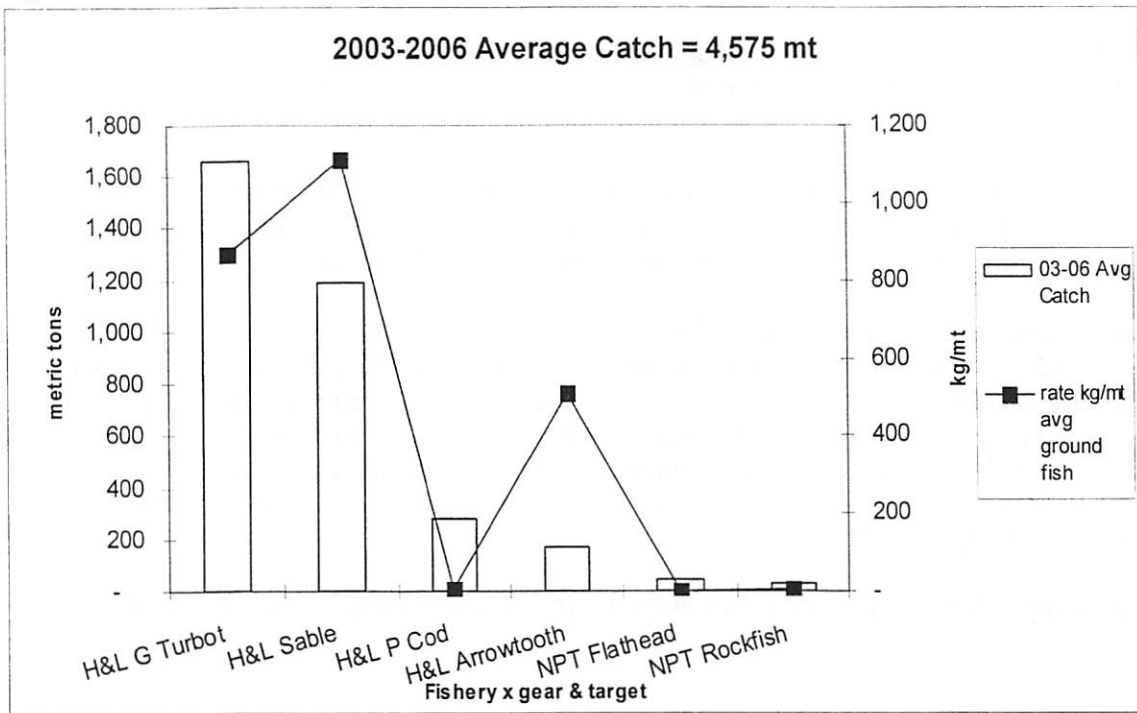
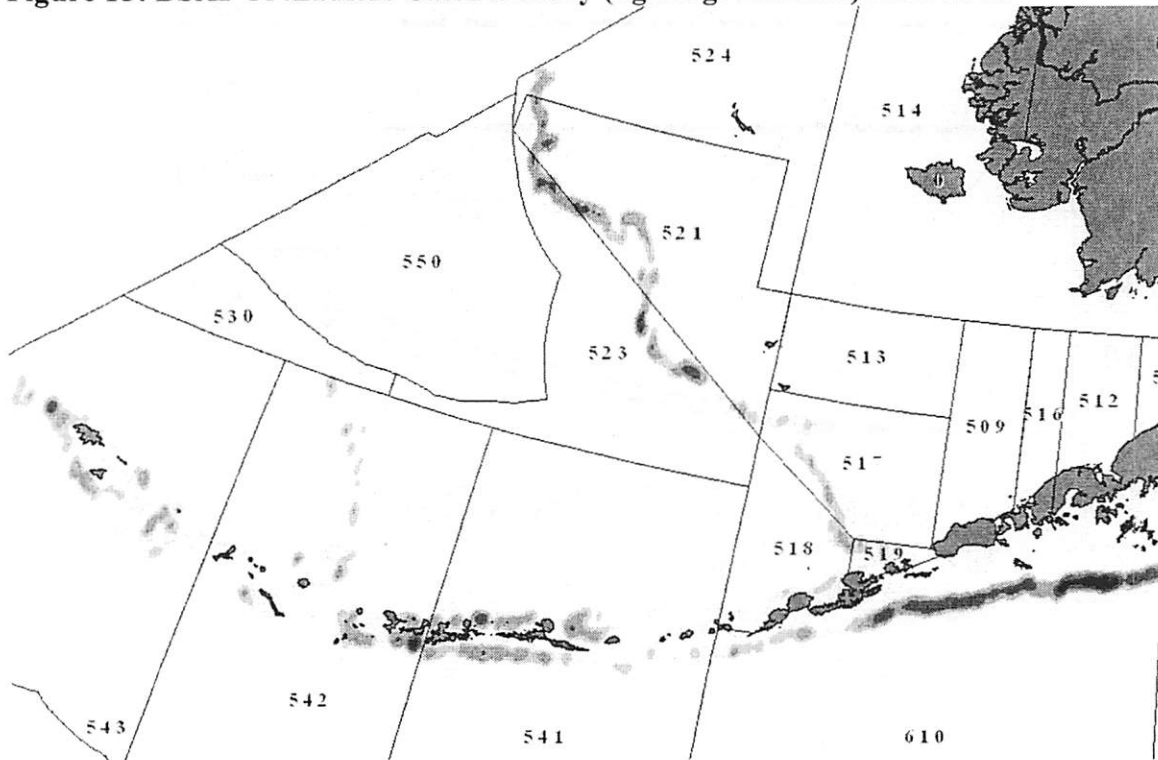


Figure 15: BSAI Grenadiers Catch Density (kg/mt groundfish) 2003-2005



GOA Squid

Figure 16 shows that cumulative GOA incidental squid catch has, prior to 2006, been below both the tier 6 OFL and ABC of 2,030 mt and 1,526 mt, respectively. However, GOA incidental squid catch has been steadily increasing over the last several years and attained the ABC in 2006.

Figure 16 also shows that the timing of the squid catch is somewhat unique within the GOA other species group. Squid catch accelerates during the pollock A season and remains flat for the remainder of the year.

Figure 16: Cumulative GOA Squid Catch by Year (2004-6) Relative to ABC and OFL

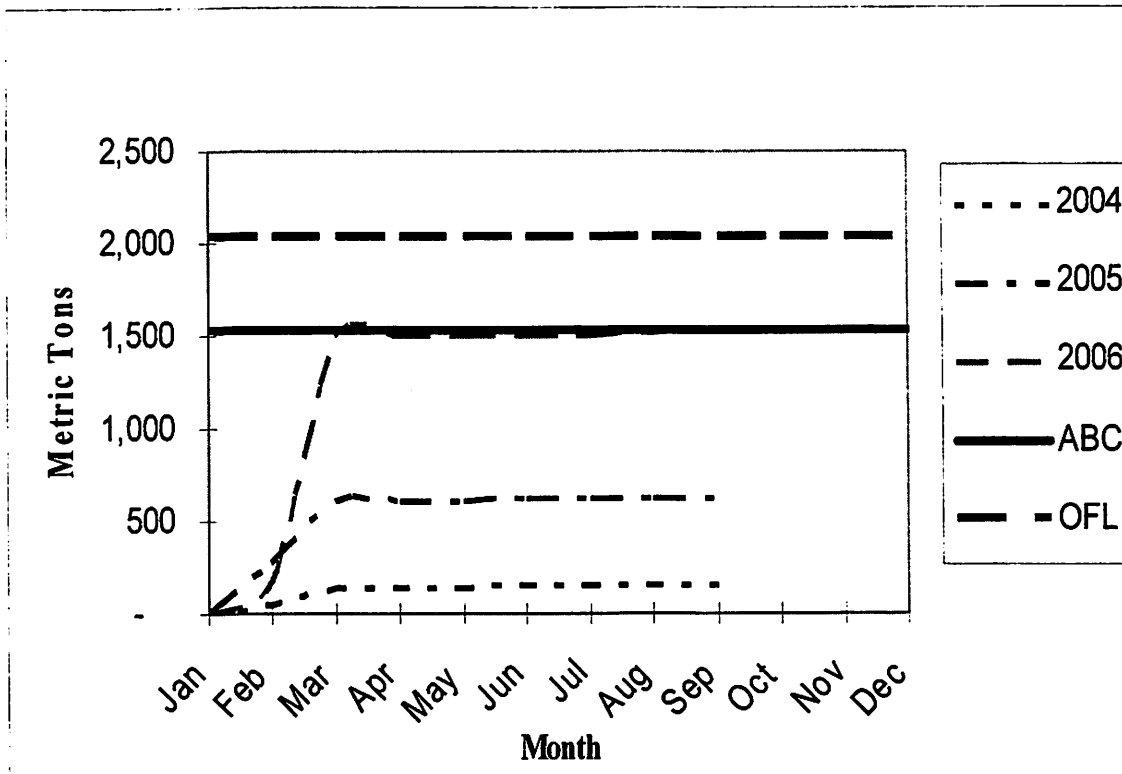


Figure 17 shows the GOA incidental squid catch occurs nearly entirely in the pollock fishery. And Figure 18 shows that the geographic distribution of GOA incidental squid catch is very discrete. Nearly the entire catch of squid occurs in a relatively small portion of Shelikof Strait (Area 620) during February and March. Thus, any actions undertaken by Inseason Management to prevent overfishing of GOA squid would likely be taken early in the year, would likely be of limited duration, and would focus on a discrete area of Shelikof Strait.

With use of information from vessel operators, reported catch, VMS, and observer data, a squid hot spot can probably be identified by Inseason Management. That area could be closed by NMFS, or closure could possibly be avoided through voluntary avoidance by vessel operators. If vessel operators can cooperatively reduce incidental catch they can preserve more flexibility to their fishing operations than if NMFS closes the pollock fishery. This would be an important consideration as the area described is very popular for high-value roe-bearing pollock. Thus, closure of the area could affect the value of the GOA pollock fishery.

Figure 17 GOA Squid Average Catch by Gear and Target

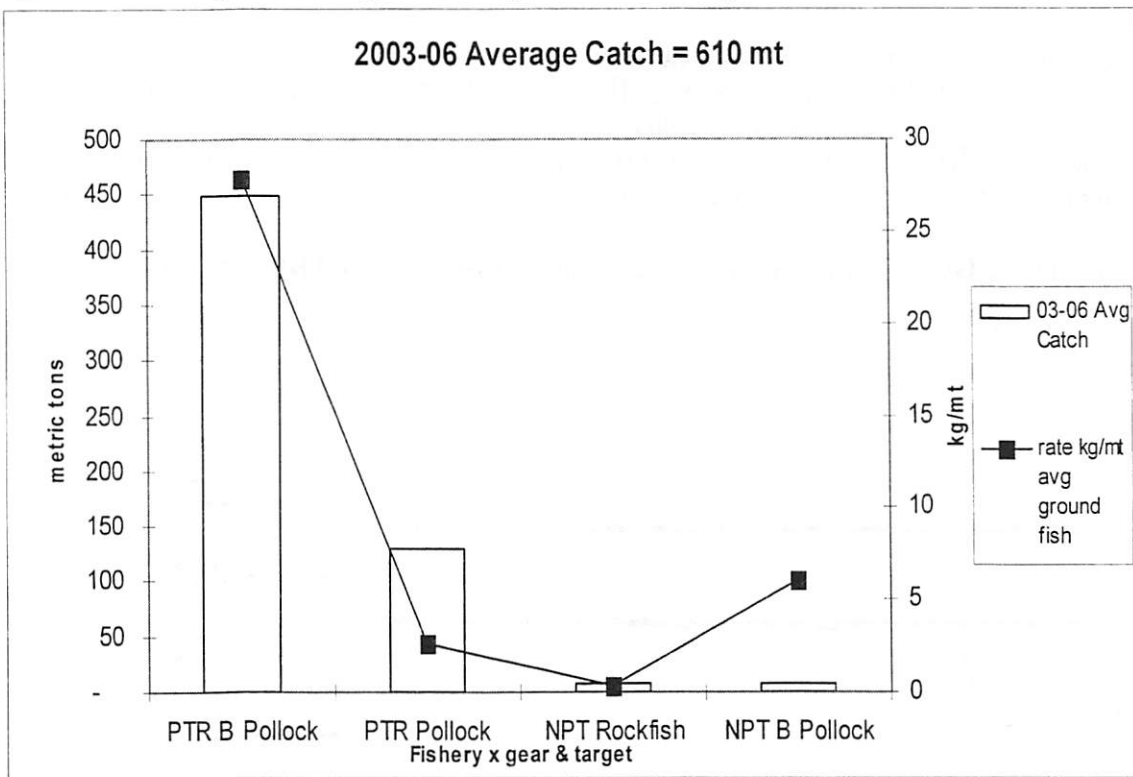
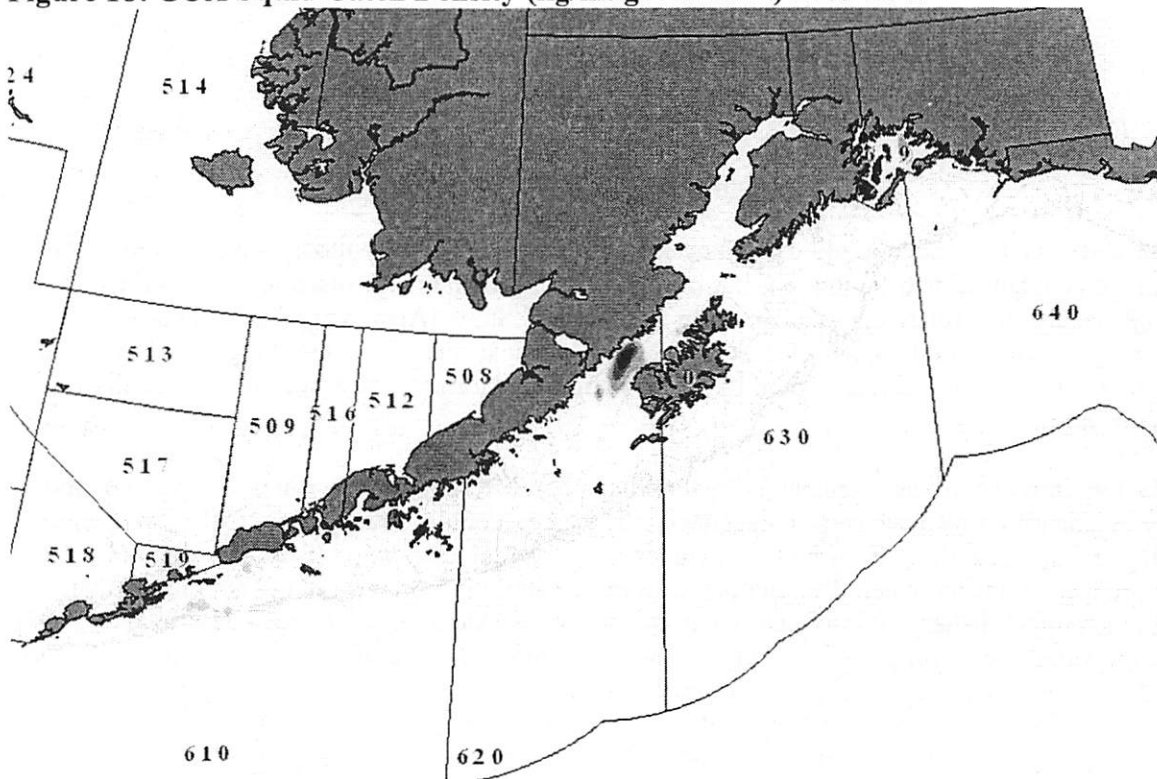


Figure 18: GOA Squid Catch Density (kg/mt groundfish) 2003-2006



GOA Sculpins

Incidental sculpin catch in the GOA, between 2004 and 2006, has consistently averaged about 15 percent of the 5,770 mt ABC (Figure 19).

Figure 20 shows that average incidental catch of GOA sculpins by species and gear combinations is concentrated in the Pot gear Pacific Cod fishery, non-pelagic trawl shallow water flatfish fishery, and the hook-and-line gear Pacific cod fishery. Several other non-pelagic trawl fisheries take the remainder. The variety of fisheries that share in the incidental catch of sculpins reflects the broad geographical distribution of the species group and the importance of incidental catch of this species in those fisheries.

Figure 21 shows that sculpins have an irregular distribution in the GOA compared to other species and generally reflect the preferred areas for many of the gear and target combinations identified in Figure 20. Because of the high sculpin management benchmarks relative to catch, restrictions on fishing are not a current concern.

Figure 19: Cumulative GOA Sculpins Catch by Year (2004-6) Relative to ABC and OFL

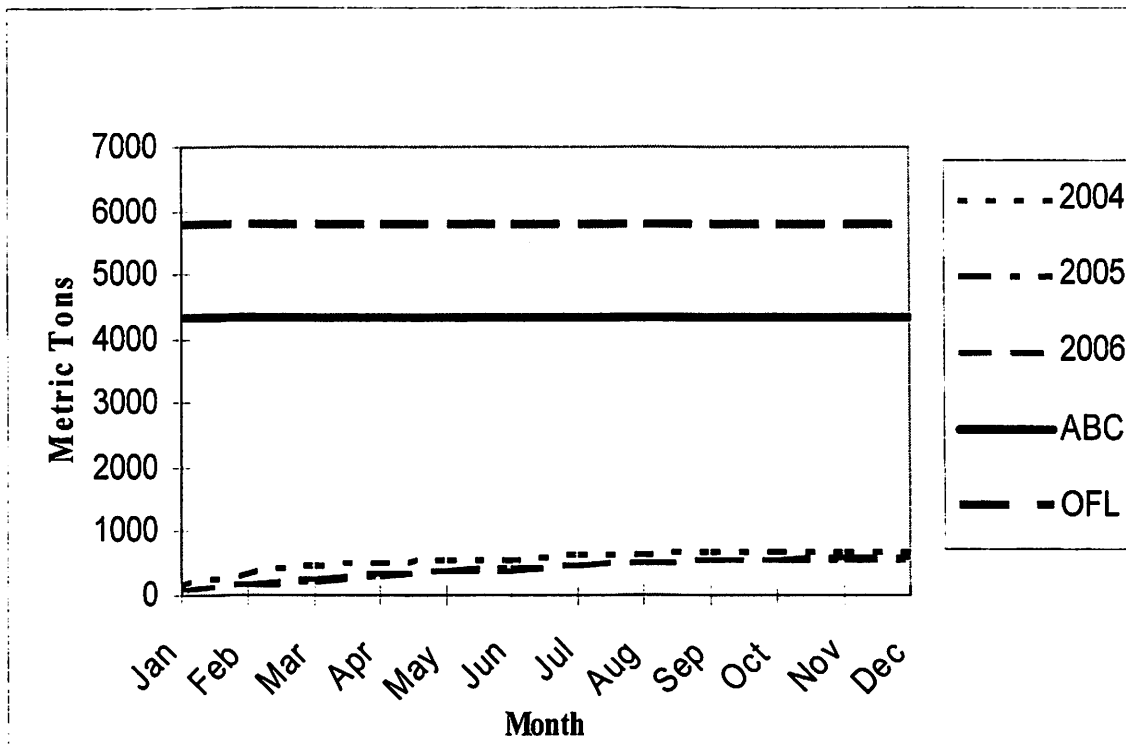


Figure 20: GOA Sculpins Average Catch by Gear and Target

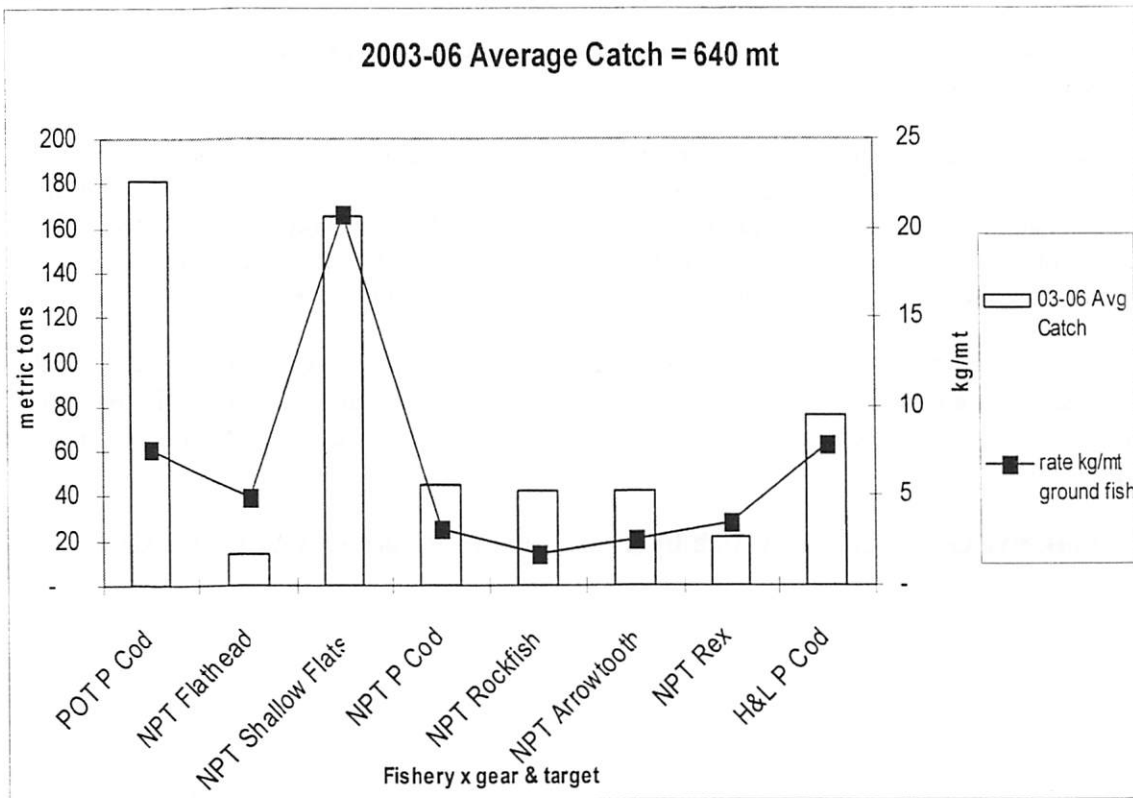
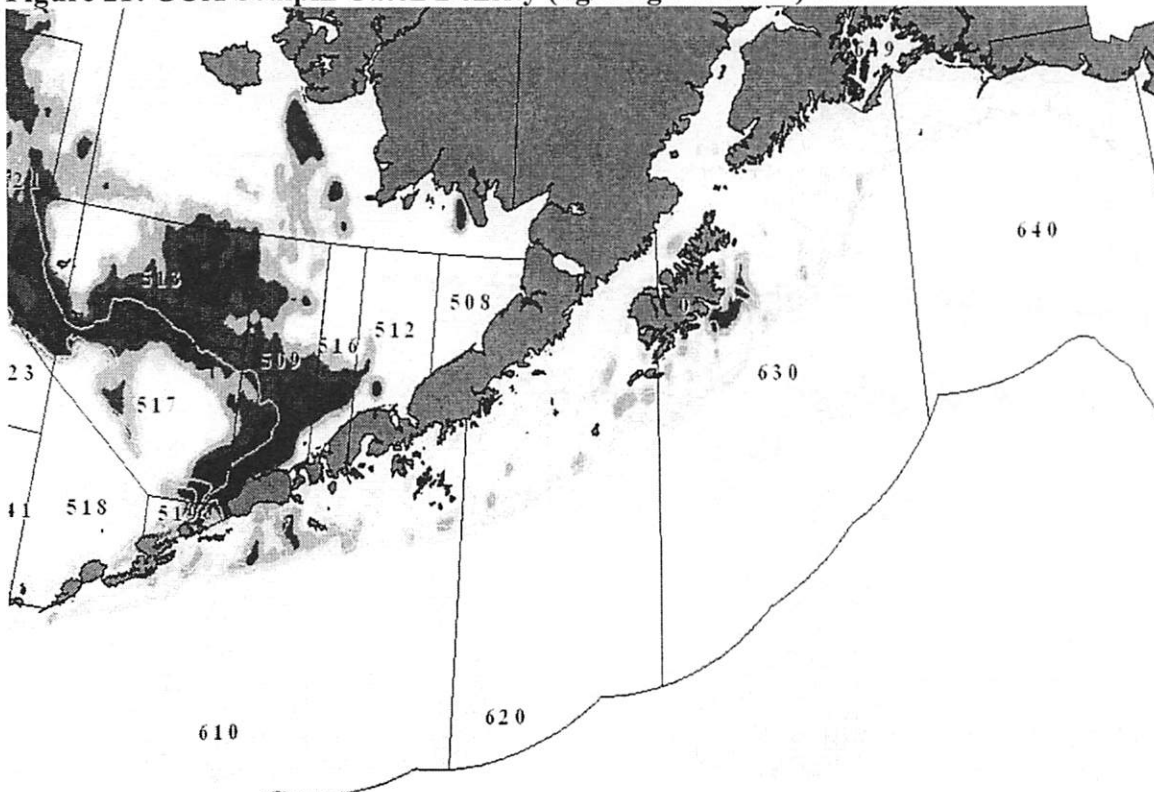


Figure 21: GOA Sculpin Catch Density (kg/mt groundfish) 2003-2005



GOA Sharks

Cumulative incidental shark catch in the GOA has increased over the last three years. Figure 22 shows that, while GOA shark catch is still below the tier 6 OFL of 2,390 mt and the ABC of 1,792, the ABC will be reached and the OFL may be approached if the increasing trend continues. Cumulative GOA shark catch accelerates between January and April, tapers off in the summer months, and then increases in the fall such that triggering of management benchmarks would be most likely late in the year.

Figure 22: Cumulative GOA Sharks Catch by Year (2004-6) Relative to ABC and OFL

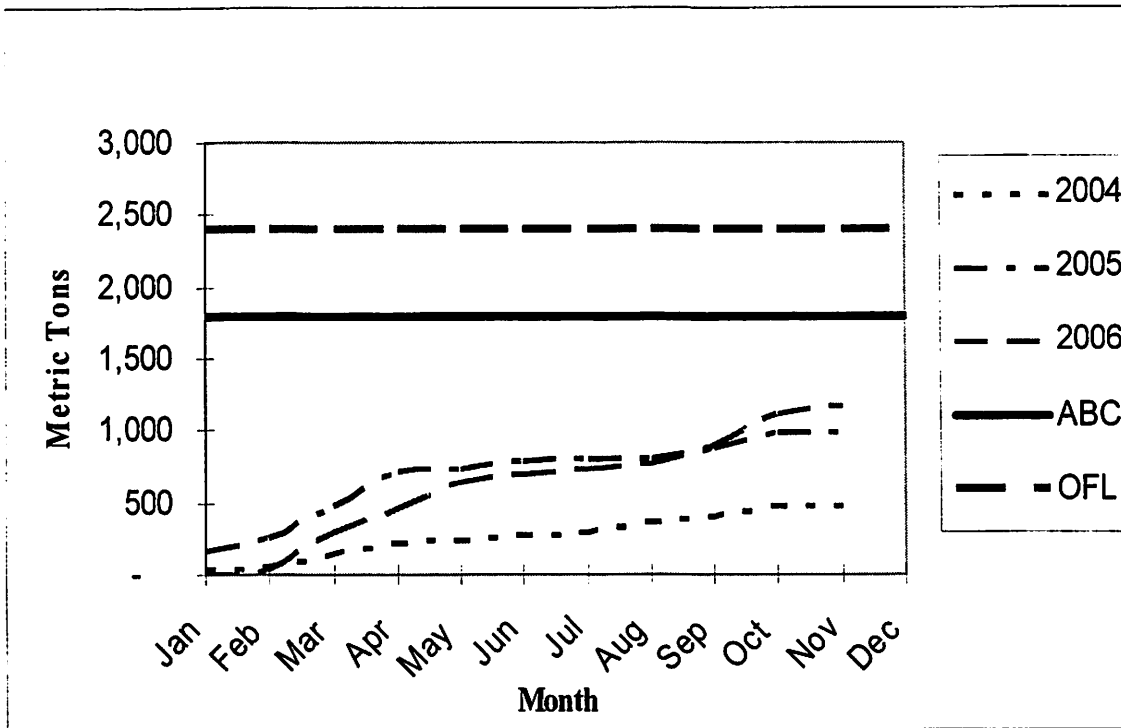


Figure 23 shows that multiple gear and target combinations take sharks in the GOA; hook-and-line Sablefish accounting for the single largest catch of GOA sharks. Pollock trawl fisheries, the hook-and-line Pacific cod fishery, and multiple non-pelagic trawl flatfish target fisheries also harvest GOA sharks incidentally.

Figure 24 shows that Shark catch in the GOA is distributed broadly enough that distinct hot spot closures, in the event of overfishing, are unlikely. The distribution of catch among fisheries (Figure 23) combined with the geographically broad distribution of that catch implies that if a closure to prevent overfishing were warranted, the hook-and-line sablefish, trawl pollock, and multiple flatfish fisheries would be vulnerable to restrictions ranging from NMFS reporting area closures to complete closures of the fisheries throughout the GOA. Temporal context of the catch (Figure 22) suggest that such restrictions would most likely occur in late summer or early fall, however, such speculation is highly dependent on whether cumulative catch in the January-April timeframe were to increase enough to reach management benchmarks.

Figure 23 GOA Shark Average Catch by Gear and Target

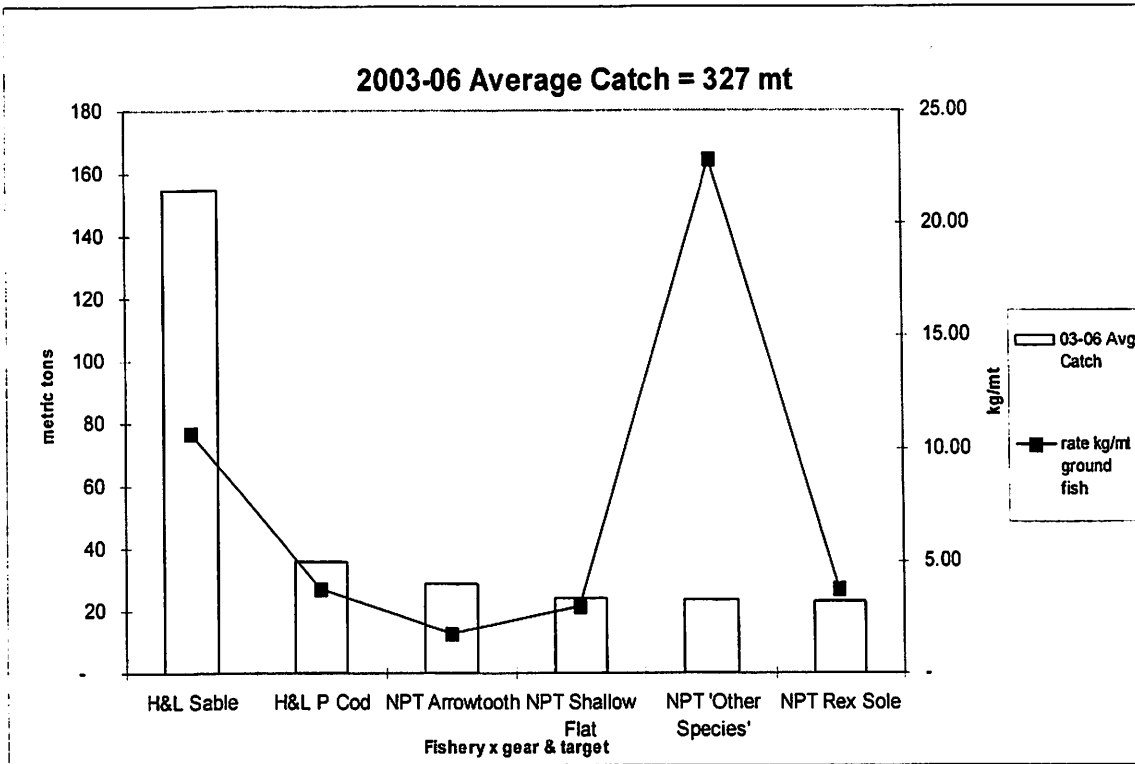
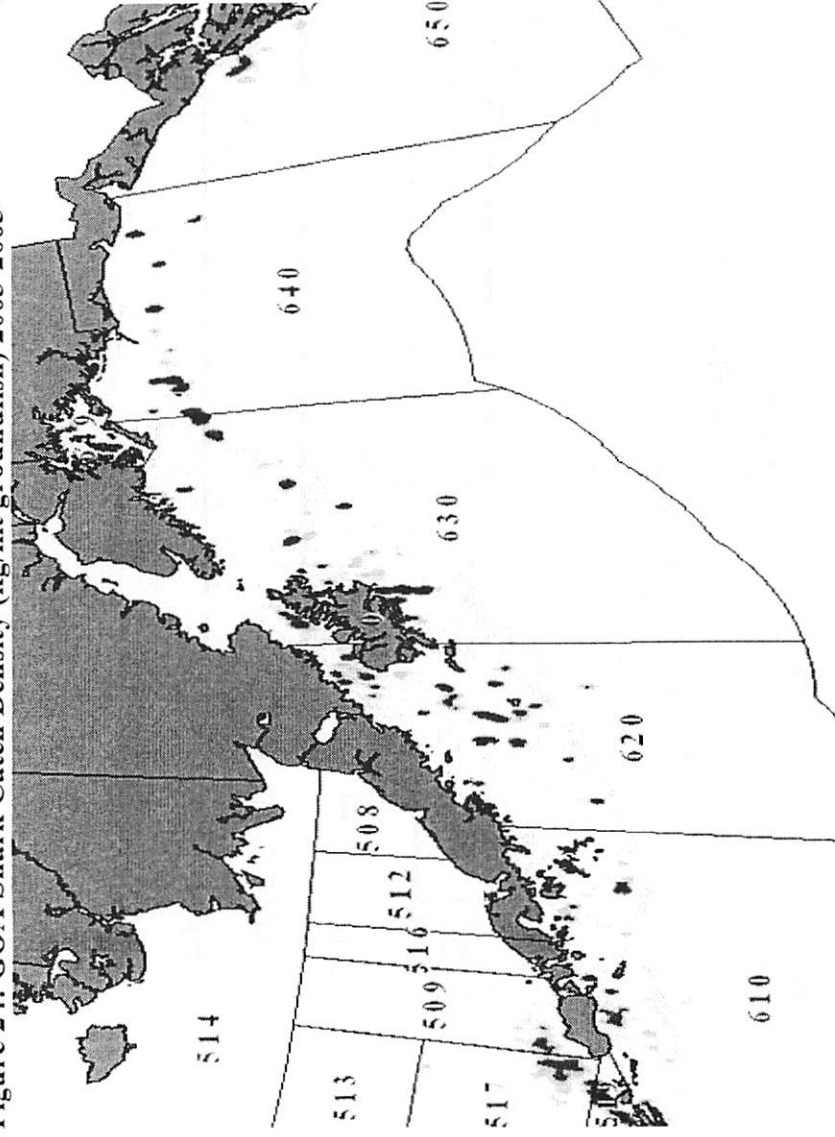


Figure 24: GOA Shark Catch Density (kg/mt groundfish) 2003-2005



GOA Octopi

In 2004 cumulative GOA octopus catch approached the 290 mt ABC in November, but was well below the ABC, and the 290 mt OFL, in 2005 and 2006 (Figure 25). The proximity of the 2004 catch to the ABC shows that catch can approach the ABC late in the year.

Figure 26 shows that incidental GOA octopus catch occurs primarily in the Pacific cod pot gear fishery. A moderate amount is also assigned to an octopus target, but is also taken during the Pacific cod pot fishery. Geographic distribution of incidental catch of GOA octopi (Figure 27) is limited to several relatively discrete areas in the GOA. If GOA octopi are managed independently from the other species group, and given the nature of tier 6 stock assessments, incidental catch of GOA octopi can occasionally be expected to attain the ABC or OFL. Thus, management actions to prevent overfishing would likely consist of VMS and observer data derived 'hot spot' closures occurring late in the fishing year in the Pacific cod pot fishery

Figure 25 Cumulative GOA Octopi Catch by Year (2004-2006) Relative to OFL and ABC

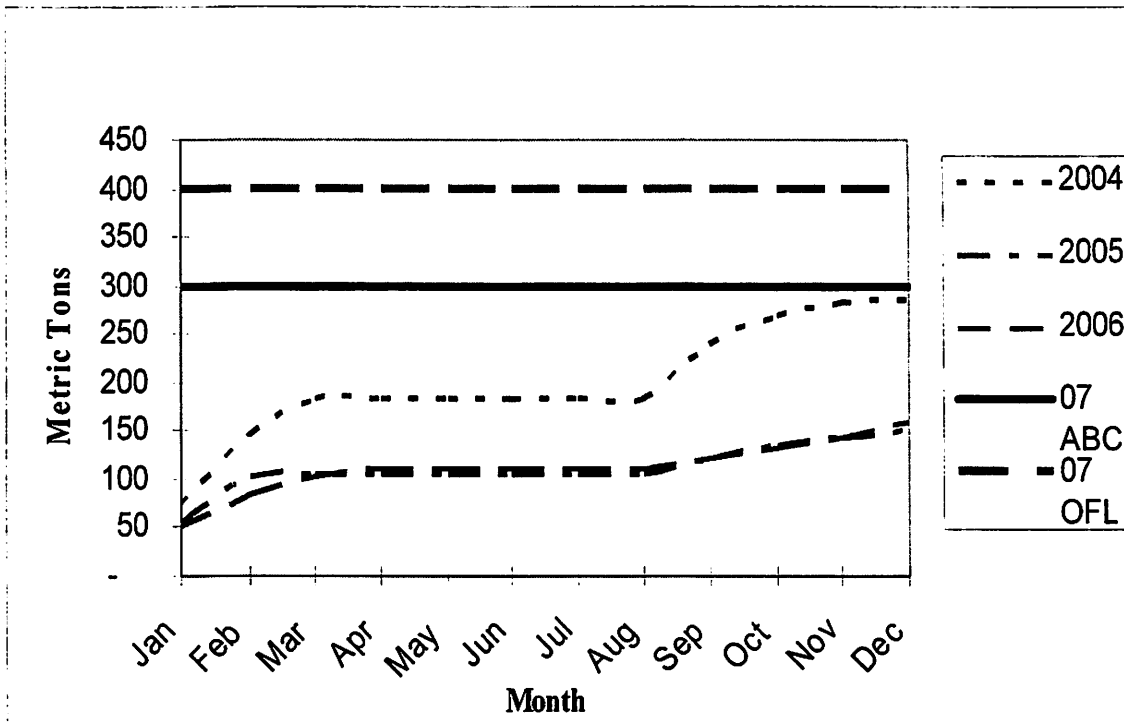


Figure 26: GOA Octopi Average Catch by Gear and Target

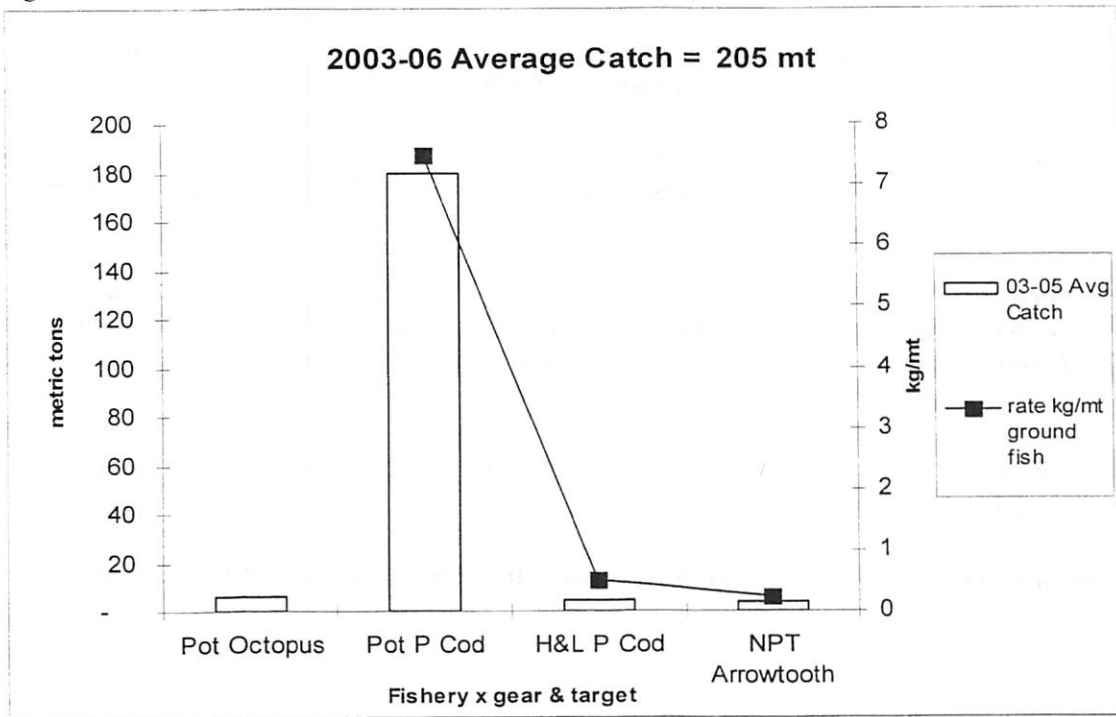
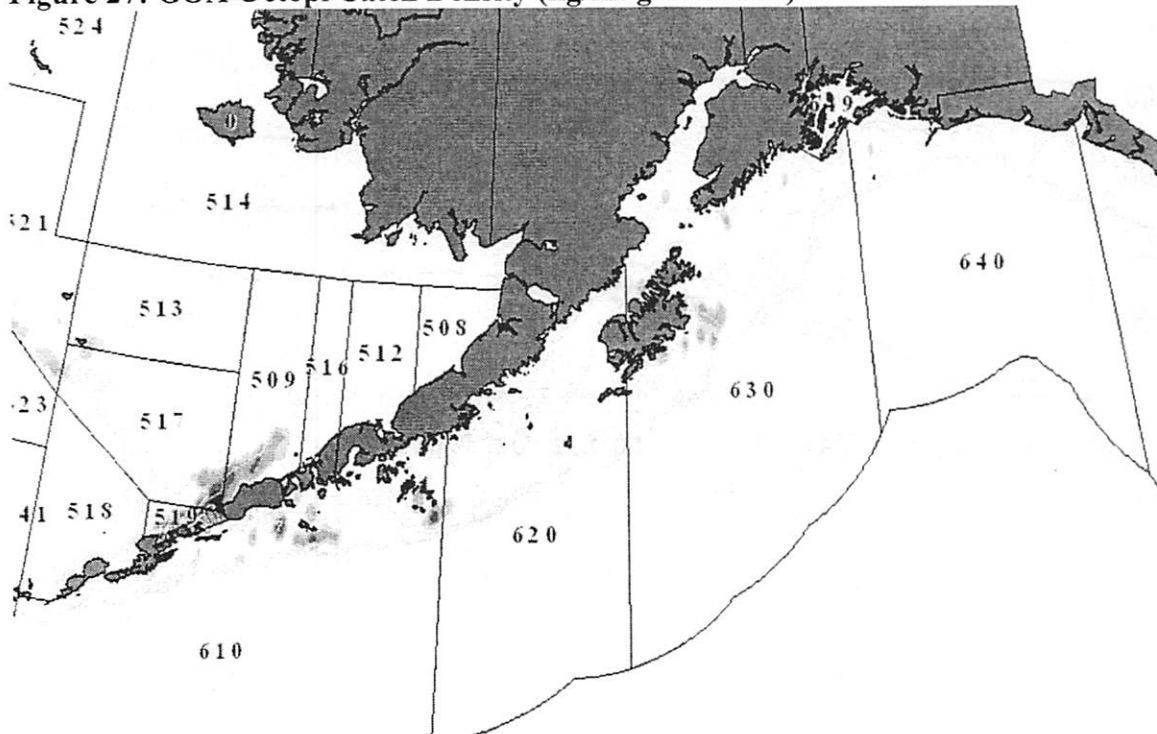


Figure 27: GOA Octopi Catch Density (kg/mt groundfish) 2003-2005



GOA Grenadiers

The GOA grenadier tier 5 OFL and ABC are 27,852 mt and 20,889 mt, respectively. Figure 28 shows that cumulative grenadier catch increases in February and March, as the IFQ fisheries for halibut and sablefish begin, and tends to remain fairly constant into October. Cumulative annual incidental catch of GOA grenadiers has consistently been about half of the ABC from 2004-2006. Thus, grenadiers, if managed independently, are not likely to require restrictions or closures in the fisheries that harvest them incidentally.

Grenadier are most often caught in the GOA hook-and-line sablefish target fisheries, followed distantly by non-pelagic trawl gear in the rockfish, deep-water flatfish, and flathead sole targets (Figure 29). The rate of more than 500 kg/mt groundfish in the hook-and-line sablefish target indicates that, on average, about a quarter of the catch in that fishery is grenadier.

Figure 30 shows grenadier catch tracking the distribution of most of the sablefish fishery, which is broadly distributed along bathymetric lines.

Figure 28: Cumulative GOA Grenadier Catch by Year (2004-06) Relative to ABC and OFL

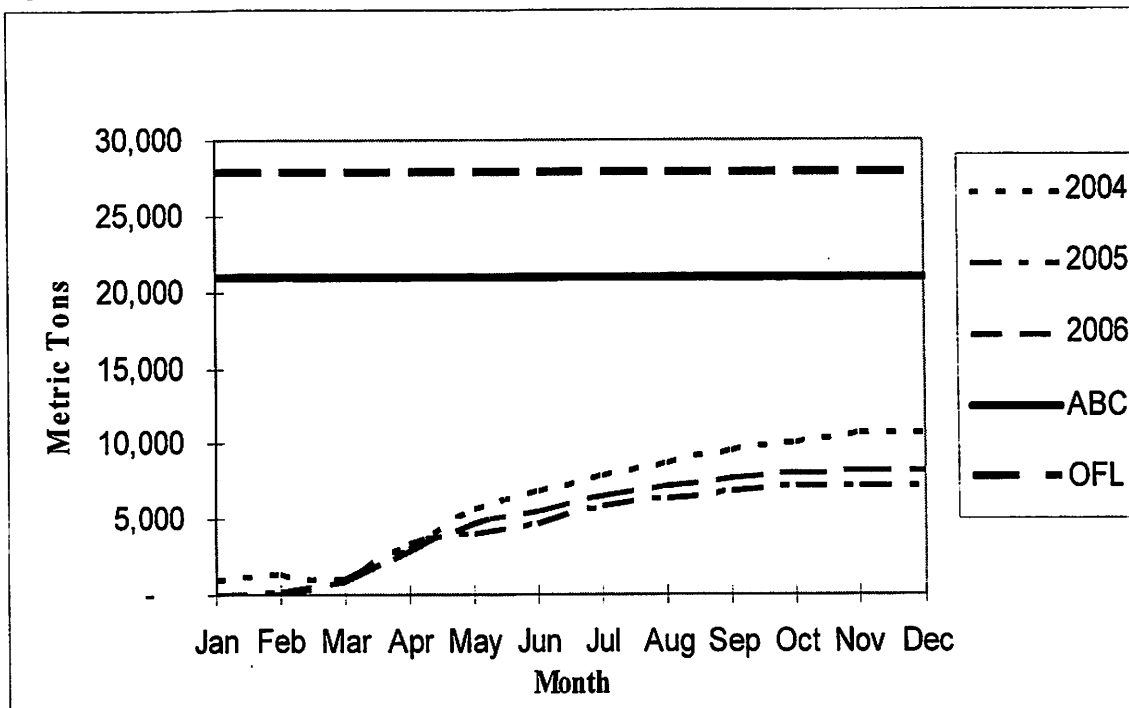


Figure 29: GOA Grenadier Average Catch by Gear and Target

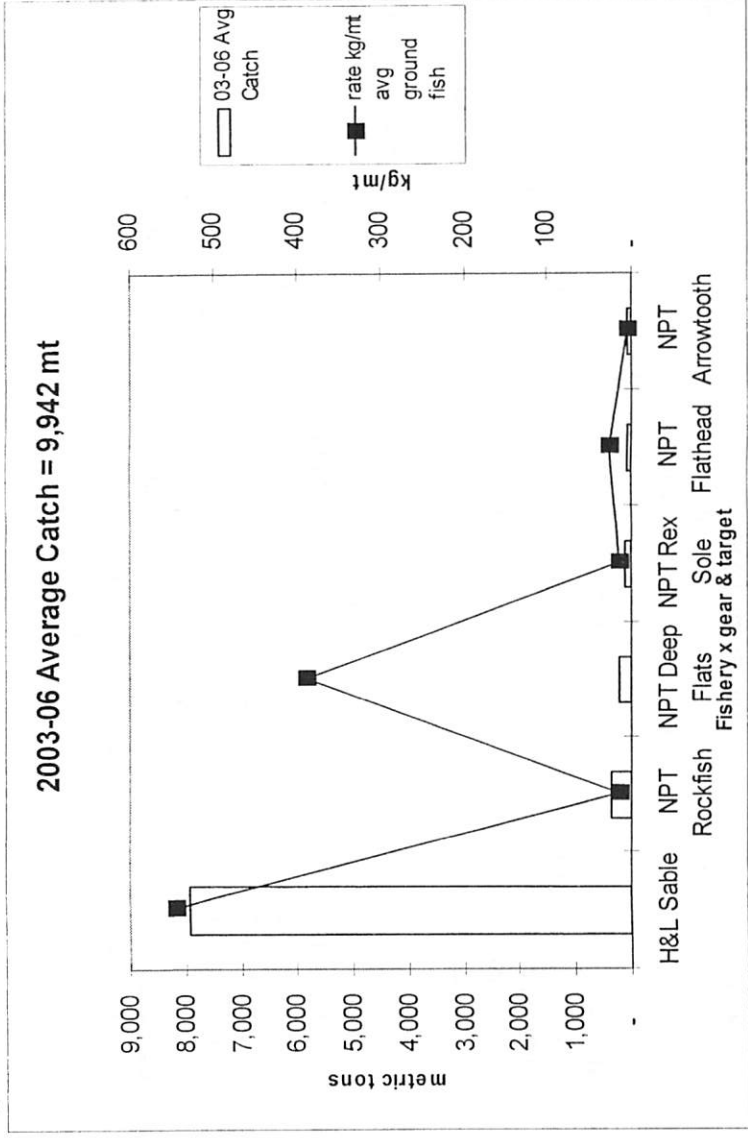
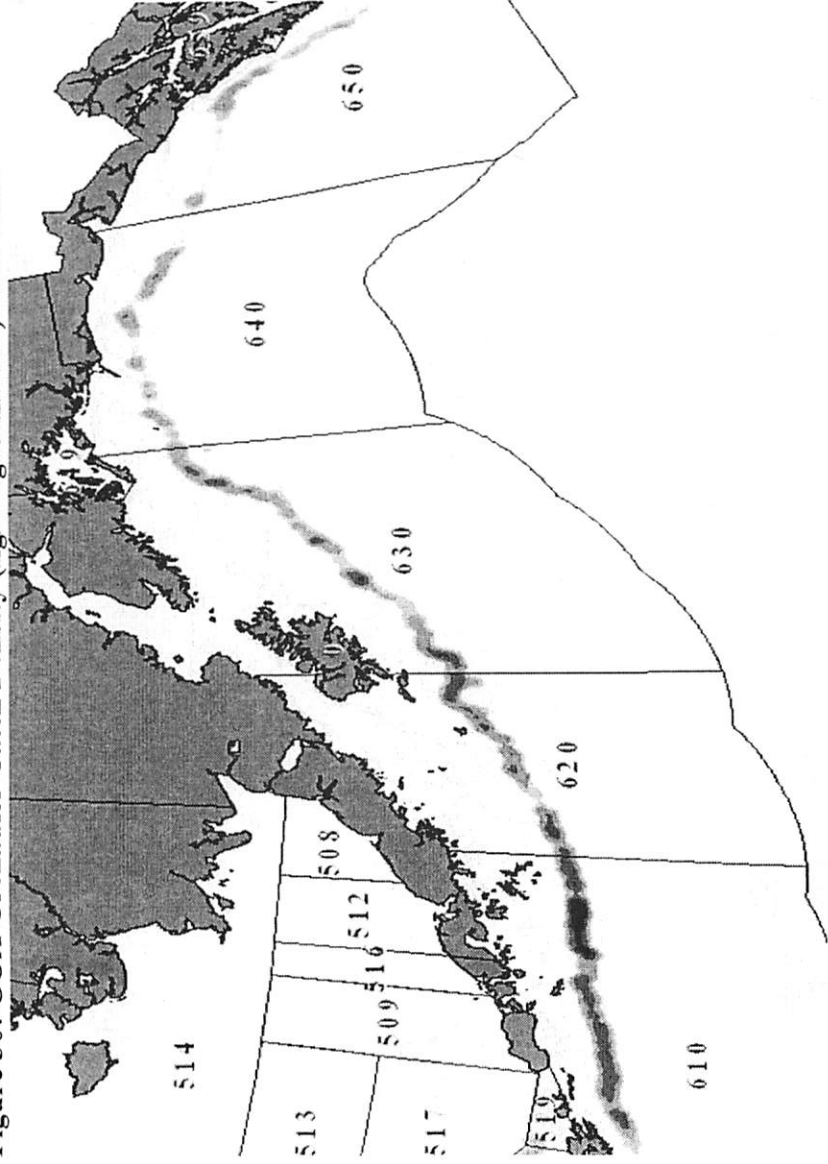


Figure 30: GOA Grenadier Catch Density (kg/mt groundfish) 2003-2005



Summary of Key Characteristics

The review, presented above, of cumulative incidental catch, distribution of catch by fishery, and geographic distribution of catch identifies several potential management actions that might be needed to prevent overfishing of some species. In recent years, however, most of the species in question have been incidentally caught at levels well below presently established management benchmarks. Thus, in most cases, management actions to prevent overfishing of the species, if managed independently of the other species group, are not likely to be needed. There are, however, several cases where management actions are perceived as being needed if the species is managed independently. There are also several species that could be candidates for a directed fishery. In addition, information on the distribution of incidental catch by target fishery has identified several fisheries most likely to be affected by management measures, should they become necessary.

Table 1, below, summarizes this information in order to provide a clearer picture of which species and fisheries are most likely to be directly affected by the proposed alternatives. The table indicates whether the species is of present management concern. If so, the species is presently reaching management benchmarks or could possibly reach them if recent catch trends continue. Also shown is whether the species could support a directed fishery or not. The gear/species combinations responsible for most of the catch of the species in question are also identified. These fisheries would likely be restricted in some way if management measures to prevent overfishing of the species are, or become, necessary. The spatial context of the distribution of the incidental catch of the species, as discussed above, is also provided. The spatial context largely determines the type and extent of potential management measures that would be employed if incidental catch of the independently managed species were to approach management benchmarks. Finally, the table identifies the time of year when management measures are most likely to be employed to prevent overfishing.

Table 1: Potential Effects Summary by Region and Species

BSAI Species	Management Concern	Directed Fishery Possible	Gear/Target Potentially Affected	Spatial Context	Potential Management Measures	Potential Closure Timing
Skates (Tier 5)	No	Yes	Pacific cod H&L	Broad	Broad Closures	n/a
Sharks (Tier 6)	Yes	No	Pollock Pelagic Trawl, Pacific cod H&L	Broad	Broad Closures	Aug.-Sept.
Sculpins (Tier 5)	No	Yes	Yellowfin sole NPT, Pacific cod NPT, Pacific cod H&L	Broad	Broad Closures	n/a
Octopi (Tier 6)	Possibly	Possibly	Pacific cod pot, Pacific cod H&L, Pacific cod NPT	Patchy / Discrete	Voluntary / Discrete Closures	October
Grenadiers (Tier 5)	No	Possibly	G.Turbot H&L, Sablefish H&L	Broad / Bathymetry	Broad Closures	n/a
GOA Species	Management Concern	Directed Fishery Possible	Gear/Target Potentially Affected	Spatial Context	Potential Management Measures	Potential Closure Timing
Squid (Tier 6)	Possibly	No	Pollock Pelagic Trawl	Very Discrete	Voluntary / Hot Spot	March
Sculpins (Tier 5)	No	No	Multiple Pot, NPT, H&L fisheries	Irregular	Broad Closures	n/a
Sharks (Tier 6)	Possibly	No	Sablefish H&L, Pollock Trawl, Pacific cod H&L, multiple NPT flatfish	Broad	Broad Closures	October
Octopi (Tier 6)	Possibly	No	Pacific cod Pot	Discrete	Voluntary/ Hot Spots	October
Grenadiers (Tier 5)	No	No	Sablefish H&L, NPT Deep Flats	Broad / Bathymetry	Broad Closures	n/a

Notes: H&L= hook-and-line, NPT= non-pelagic trawl,

Preliminary Assessment of Potential Affected Fisheries.

Alternative 2:

Alternative 2 would eliminate the “other species” assemblage and manage squids, skates, sculpins sharks, and octopi as separate assemblages. It is important to note that squid is presently managed individually in the BSAI, but not in the GOA. In addition, skates are presently managed individually in the GOA but not in the BSAI. Thus, this alternative would manage skates, sculpins, sharks, and octopi as separate assemblages in the BSAI, while individually managing squids, sculpins, sharks, and octopi as separate assemblages in the GOA.

Of the species addressed by this alternative, only BSAI sharks would likely require management measures to prevent overfishing if managed individually (see Table 1). BSAI sharks are managed under tier 6 and are not presently a candidate for a directed fishery.

BSAI sharks are incidentally caught across a broad geographic distribution primarily in the pelagic pollock trawl and hook-and-line Pacific cod fisheries. Closures of those fisheries in broad areas in the BSAI would be the most likely management measures employed to prevent overfishing of BSAI sharks. Such closures would likely need to occur in the August to September timeframe. Timing of closures would depend heavily on the rate of shark catch related to the level of effort being employed in these two fisheries.

In addition to BSAI sharks, BSAI Octopi are a possible species of management concern if individually managed. This is so because incidental catch of BSAI octopi exceeded ABC late in the 2004 fishing year. Thus, it is possible that BSAI octopus catch could exceed management benchmarks in the future. This is, of course, a function of octopi being managed under tier 6, with management benchmarks based on historic catch.

The patchy distribution of BSAI octopus catch, which occurs primarily in the Pacific cod pot fishery, implies that potential management measures could be limited to discrete areas closures beginning in October. It may be possible to identify hot spots earlier in the season. Voluntary avoidance of hot spots by vessels in the Pacific cod pot fishery, and possibly the Pacific cod hook-and-line and non-pelagic trawl fisheries may reduce or eliminate the need for area closures.

In the GOA, none of the species that would be managed individually under Alternative 2 are of immediate management concern. However, squid, sharks and octopi are all tier 6 species in the GOA. Thus, by the very nature of the setting of benchmarks based on historic catch, these species could approach or exceed management benchmarks in the future. Thus, they are all identified (Table 1) as possibly being of management concern.

GOA squid are somewhat unique among these species in that they are caught in a very discrete area of Shelikof Strait and only during the early part of the year by the pollock trawl fishery. Thus, it is possible that a hot spot can be identified and voluntary avoidance be used to mitigate the potential for overfishing of GOA squid. However, if a closure of the hot spot becomes necessary, potentially in March, it would likely affect GOA pollock catch during the highly valued roe season.

GOA octopi are caught in discrete areas in the Pacific cod pot fishery and, while only possibly being of management concern, could be managed with voluntary avoidance of hot spots. If closures of these hot spots become necessary, such closures would be most likely in the Pacific cod pot fishery possibly in October.

As a tier 6 species, GOA sharks are also possibly a species of management concern. However, recent incidental GOA shark catch has been below the management benchmarks. If GOA shark catch approaches the benchmarks, management measures to prevent overfishing could affect several fisheries across a broad geographic area. Sablefish hook-and-line, pollock trawl, Pacific cod hook-and-line, and multiple flatfish non-pelagic trawl fisheries harvest GOA sharks incidentally. The distribution of that harvest occurs broadly across the GOA, but in somewhat localized areas of high density. It is possible that some of these localized areas could be identified as areas to be voluntarily avoided. However, it is also possible that broad closures in a multitude of fisheries might be needed. The timing of such closures would be a function of the timing of the increased catch, which is not known.

Alternative 3:

Alternative 3 would separate management of BSAI skates, BSAI sculpins, and GOA sculpins from the other species assemblage. These changes are best discussed regionally, as they affect the remaining species in the other species group.

BSAI skates and BSAI sculpins are both managed under tier 5. As shown in Table 1, neither has been identified as being of management concern if managed individually. In fact, Both species could support a directed fishery, and both are broadly distributed. BSAI skates are taken dominantly in the Pacific cod hook-and-line fishery, while BSAI sculpins are taken in several fisheries including the Yellowfin sole and Pacific cod non-pelagic trawl fisheries and in the Pacific cod hook-and-line fishery (see Table 1)

While BSAI skates and BSAI sculpins are not of management concern, the species that would remain in the other species group, sharks and octopi, are both potentially of management concern. As has been discussed under Alternative 2 above, closures in the pelagic pollock trawl and hook-and-line Pacific cod fisheries in broad areas in the BSAI would be the most likely management measures employed to prevent overfishing of BSAI sharks. Such closures would likely need to occur in the August to September timeframe.

The patchy distribution of BSAI octopus catch, which occurs primarily in the Pacific cod pot fishery, implies that potential management measures could be limited to voluntary avoidance and/or discrete areas closures beginning in October.

Separation of BSAI skates and sculpins from the BSAI other species group would likely mean management measures to prevent overfishing of the other species group (now sharks and octopi) would be similar to the management measures potentially needed to prevent overfishing of each of these species individually. This is because these species are incidentally caught in different fisheries with different geographic catch characteristics. Thus, management measures would need to focus on the individual species in the other species group to be effective. As a result, there does not appear to be a difference in potential effect on fisheries between Alternatives 2 and 3 in the BSAI.

Separation of GOA sculpins from the other species group appears to result in a similar outcome as separating BSAI skates and sculpins. As is the case in the BSAI, sculpins are not of management concern in the GOA and the remaining species in the other species group, squid, sharks, and octopi, are all managed under tier 6 and are all potentially of management concern if managed individually. Further, the spatial contexts of incidental catch of the three remaining species in the other species group differ from one another. Squid has a very discrete and temporally limited hot spot, octopi also have potential for hot spot management in several hot spots, while incidental catch of sharks is broadly distributed. The fisheries that catch these three species are also somewhat different (see Table 1). Thus, as is likely the case in the

BSAI, management measures employed to prevent overfishing of the GOA other species group under this alternative (squid, sharks, and octopi) would likely be similar to that used to manage each of these species individually under Alternative 2. Therefore, there does not appear to be a difference in potential effect on fisheries between Alternatives 2 and 3 in the GOA.

Alternative 4:

Alternative 4 would manage only BSAI skates as a separate assemblage. BSAI skates, if managed individually, would not be of management concern and could possibly support a directed fishery by vessels participating in the Pacific cod hook-and-line fishery. Thus, at the present level of harvest, no management measures to prevent overfishing of BSAI skates would be needed under this alternative.

Under this alternative, the BSAI other species group would consist of sharks, sculpins, and octopi. Given that a relatively high proportion of other species TAC comes from sculpins, and that available sculpin incidental catch is not heavily utilized, the remaining other species group would not likely be of management concern under this alternative. In essence, the large proportion of unused other species TAC coming from sculpins would mask the potential management concerns identified for sharks and octopi.

Alternative 5:

Alternative 5 would add grenadiers, a tier 5 species, to both the BSAI and GOA TAC specifications processes via two options. Option 1 would add grenadiers as separate assemblages and Option 2 would add them into the other species assemblage.

As summarized in Table 1, grenadiers, if managed independently of the other species group are not of present management concern in either the BSAI or GOA. BSAI incidental catch of grenadiers has averaged, in recent years, less than 5,000 mt out of an 80,000 mt ABC. In the GOA, the average catch of just under 10,000 mt is less than half of the ABC. They are caught in fisheries that are associated with their broad geographic distribution along bathymetric lines. Specifically, grenadiers are caught primarily in the BSAI Greenland turbot and sablefish hook-and-line fisheries and in the GOA sablefish hook-and-line and non-pelagic trawl deepwater flatfish fisheries. Management of grenadiers as separate assemblages in both the BSAI and GOA is not likely to have direct effect (i.e. imposition of management measures to prevent overfishing) on the fisheries that incidentally catch them.

Option 2 would add grenadiers to the other species groups. The addition of grenadiers to the other species groups would add a species with a relatively large, and lightly used, ABC under tier 5 management to these groups. It seems that this would have a similar effect as having the other tier 5 species (BSAI skates and sculpins in the BSAI and GOA) within the other species groups. That is, it would tend to mask catch of tier 6 species in excess of their individual ABCs and OFLs. Thus, adding grenadiers to the other species assemblage would not result in additional management measures affecting groundfish fisheries.

Proposed Methodology for Evaluation of Potential Effects

This discussion paper has helped to identify several species that could be of management concern under the various alternatives and has identified the spatial and temporal nature of management measures that may be taken to prevent overfishing of those species. In addition, the target fisheries most likely to be

directly affected by any needed management measures have been identified. This information is summarized in Table 1 and the discussion of the alternatives above.

The next step in the process of determining the potential effects of management actions on target fisheries is to create a fisheries activity model. This will require detail mapping of weekly fishing activity in potentially affected target fisheries. This will be done using Vessel Monitoring System (VMS) data, fisheries observer data, weekly production reports, and fish ticket data. The goal of this process is to create a database, with geographical information system (GIS) interconnectivity, that determines catch composition, catch rates (of all species, including prohibited species), and effort level at a 5 kilometer grid level of spatial resolution. This product would allow spatial (5 km blocks) and temporal (weekly) evaluation of fishing activity in potentially affected fisheries both within areas that could be considered for closure as well as in adjacent areas that would likely remain open. This product has been referred to in the past as the Catch-in-Areas database, and associated GIS output. This effort will be an advance of the previous product to update it with new and better data (e.g. VMS).

Concurrent with developing of the fishery activity model, identification of the geographic polygons of potential closure areas will be undertaken. This will be done with the assistance of Inseason Management staff. This process will review cumulative incidental catch and catch rate data to determine the spatial and temporal extent of closures that Inseason management staff might take to prevent overfishing of species potentially of management concern. This process may provide a range of closures from broad to fine so that potential effects can be determined across a range of potential actions.

The final step in the evaluation process is the assessment of Revenue at Risk. Revenue at Risk is simply the revenue that could be expected to be earned in the area being considered for closure. It is based on the recent past levels of fishing activity in the areas in question. The revenue expected to occur in that areas is "placed at risk" by the closure. This is not to say that the revenue at risk is not earned. It is assumed that, to the extent practicable, the industry will mitigate the revenue at risk by moving fishing effort to adjacent areas that remain open. Thus, the analysis will also have to consider catch rates and effort levels in adjacent areas to determine whether revenue at risk can be mitigated. The analysis will also need to consider whether the mitigation would tend to increase operational costs (i.e. via lower catch rates and/or higher levels of required effort), affect prohibited species catch, or create operational burdens (e.g. fishing in areas of bad weather).

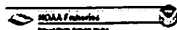
The revenue at risk analysis must convert catch in areas into revenue in areas. This will be done by applying species group pricing data developed annually for the TAC specifications gross revenue model. This data is developed by the Alaska Fisheries Science Center as part of the annual Economic SAFE report preparation process. In this case, however, there will be a need to collect some additional market data on several species that could be candidates for a directed fishery and/or have marketability as incidental catch. This is because pricing data for the individual species in the other species group is not collected.

Equipped with the output of the catch-in-areas database and fishery activity model, the range of closure areas, and the revenue at risk analysis, a formal regulatory impact review (RIR) will be developed to accompany an Environmental Assessment and in Initial Regulatory Impact Assessment of potentially affected small entities. The RIR would inform the Council process by providing a detailed description of how potentially affected fisheries operate under the status quo, as well as assessing potential effects on fishing activity, revenue, and operational costs that each of the alternatives may have.

Evaluating Potential Fishery Effects of Changes to Other Species Management

Analysis Conducted
by
Scott Miller
Economist
NOAA Fisheries, Alaska Region, Analytical Team

With Contributions by
Andy Smoker, NOAA Fisheries Alaska Region Inseason Management
Jane DiCosimo, North Pacific Fisheries Management Council Staff.



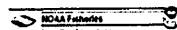
Focus of Discussion Paper

- Is the catch of the species in question, if managed independently, likely to approach management benchmarks such that management measures would be necessary to prevent overfishing?
- Which fisheries (gear/target species) are primarily responsible, and thus most likely to be affected by management measures, for the incidental catch of the species in question?
- What are the implications of spatial and temporal aspects of the incidental catch?
- In light of the answers to the above questions, what methodology would be appropriate to analyze the likely effects on fishery revenue of potentially needed management measures?

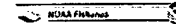
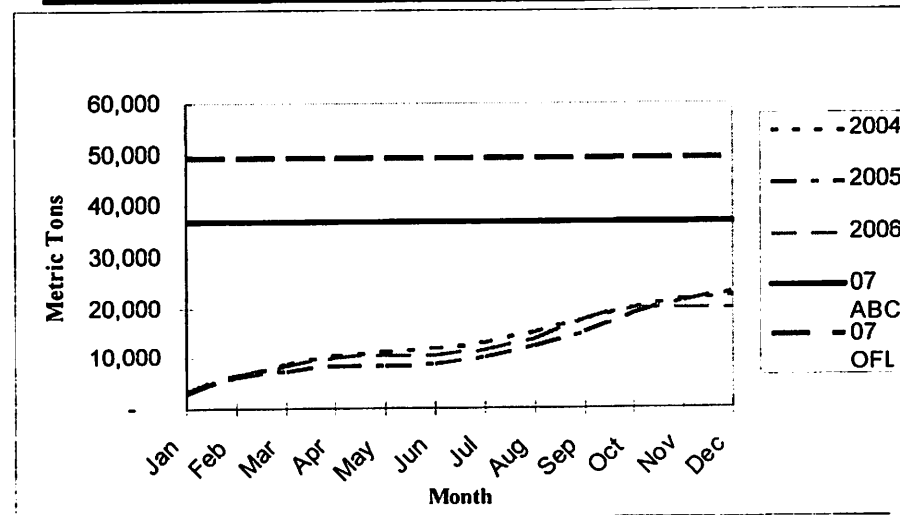


The Alternative Set

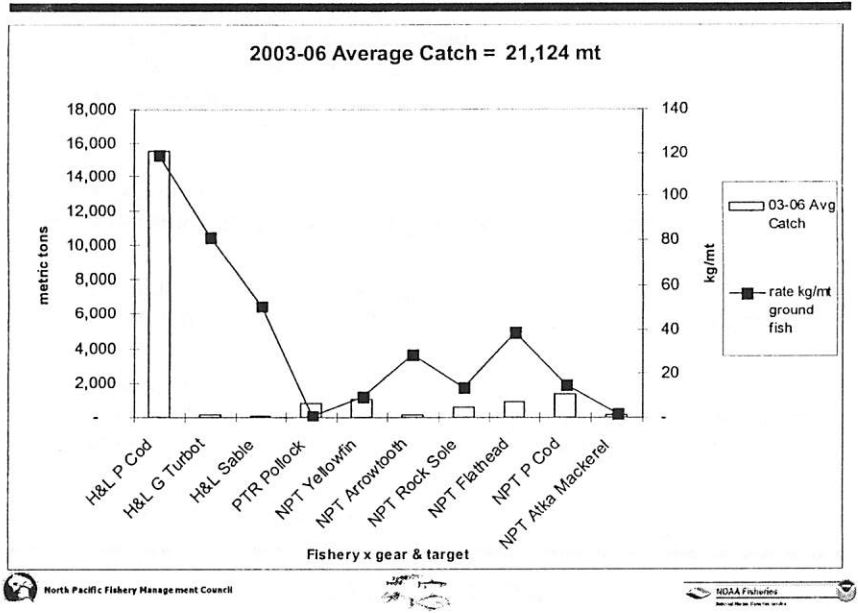
- Alternative 1: No Action
- Alternative 2: Eliminate "other species" assemblage and manage squids, skates, sculpins, sharks, and octopi as separate assemblages.
- Alternative 3: Manage only BSAI skates and BSAI and GOA sculpins as separate assemblages.
- Alternative 4: Manage only BSAI skates as a separate assemblage.
- Alternative 5: Add grenadiers to BSAI and GOA TAC specification process.
 - Option 1. separate assemblage
 - Option 2. in other species assemblage



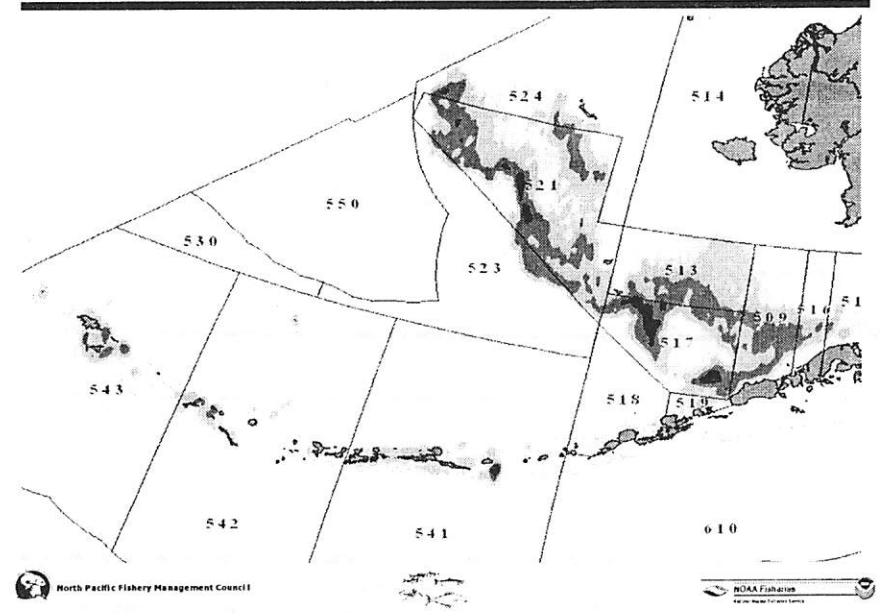
Cumulative BSAI Skate Catch by Year (2004-6) Relative to Skate ABC and OFL



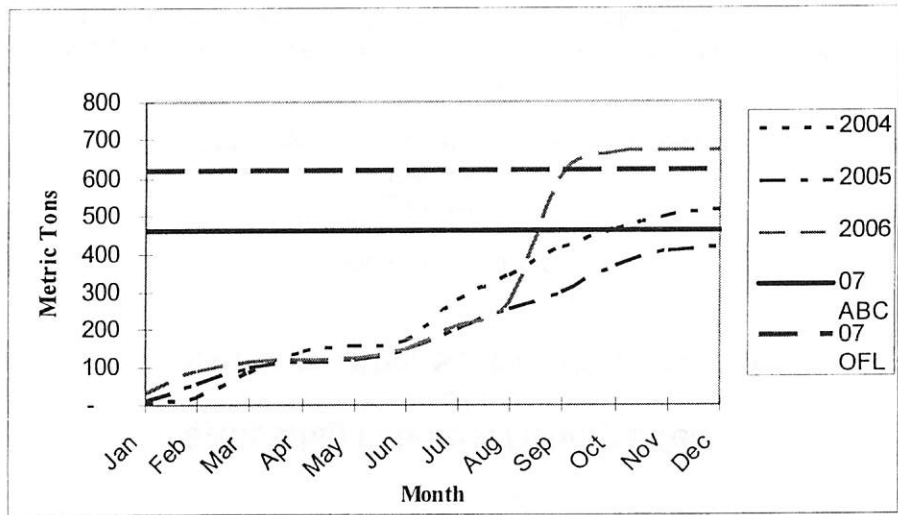
BSAI Skate Average Catch by Gear and Target



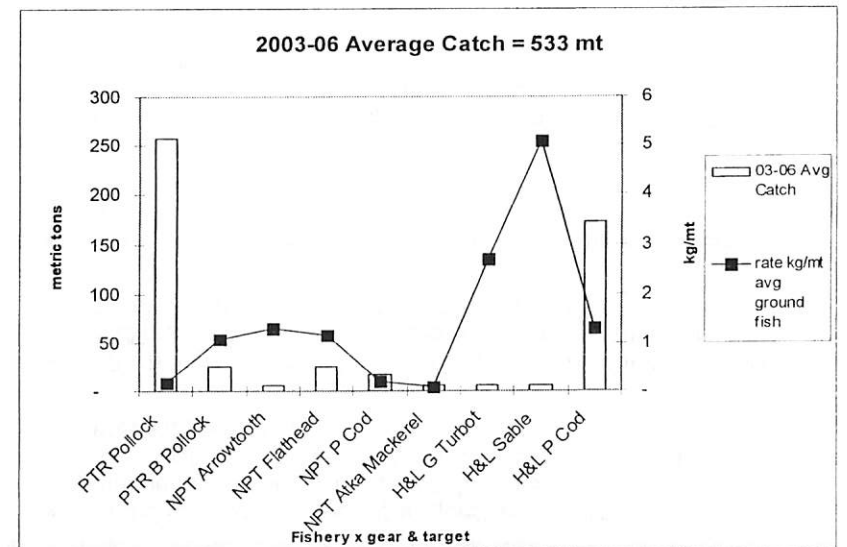
BSAI Skate Catch Density (kg/mt groundfish) 2003-2005



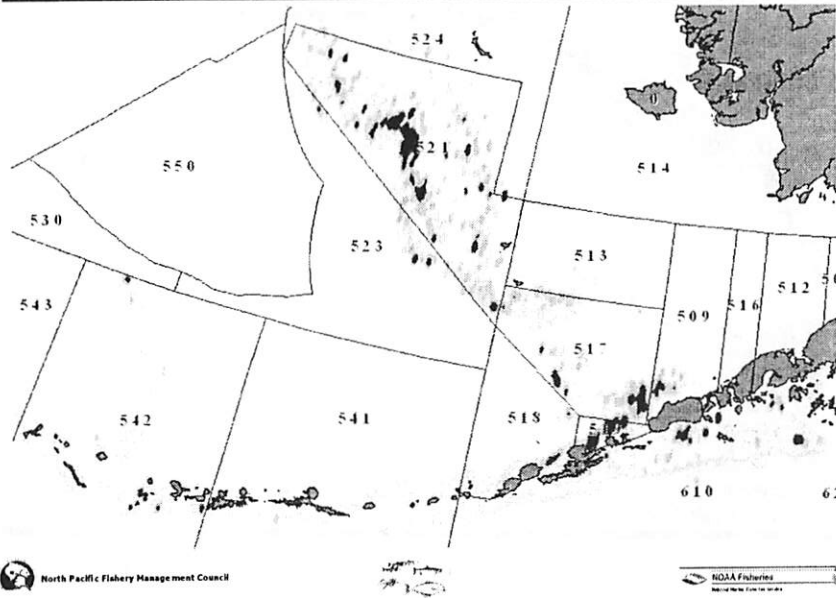
Cumulative BSAI Sharks Catch by Year (2004-6) Relative to ABC and OFL



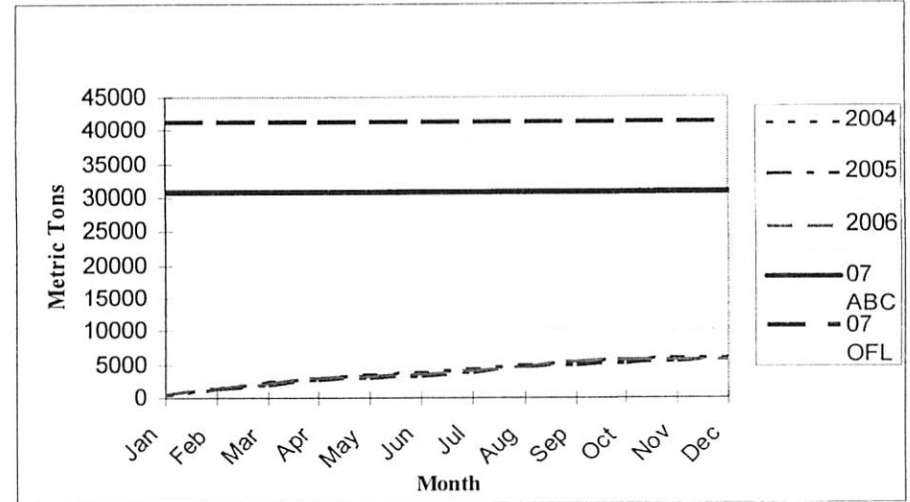
BSAI Sharks Average Catch by Gear and Target



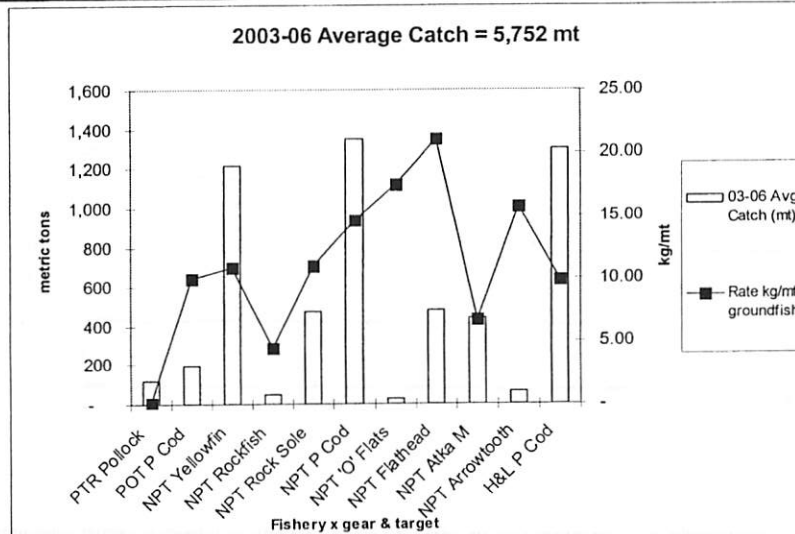
BSAI Shark Catch Density (kg/mt groundfish) 2003-2005



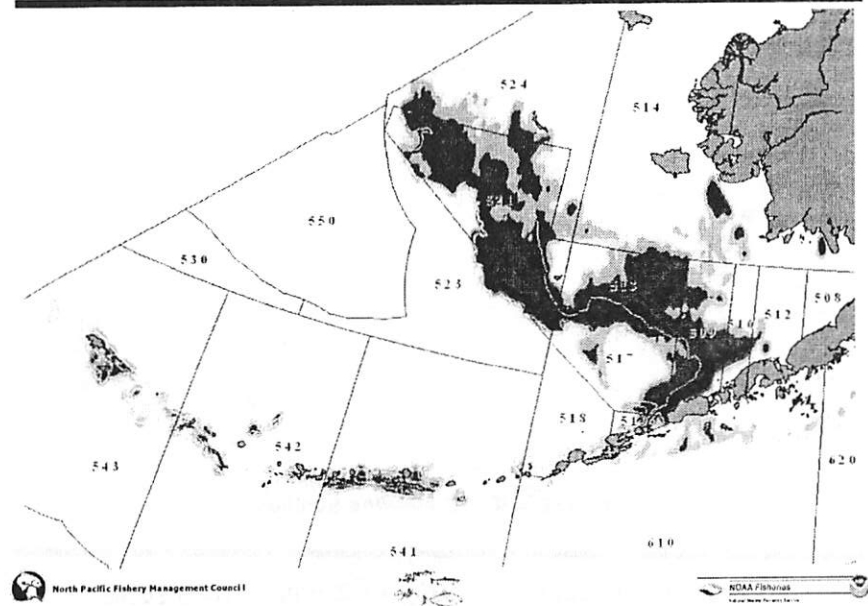
Cumulative BSAI Sculpins Catch by Year (2004-6) Relative and OFL



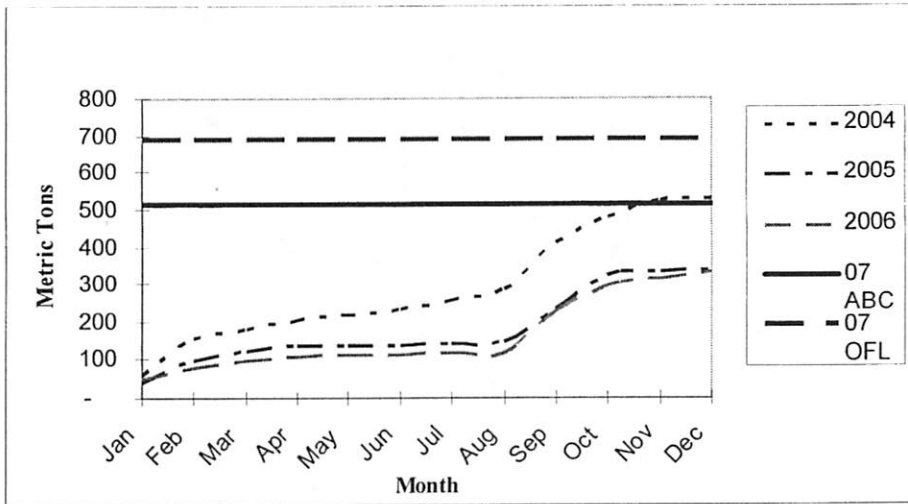
BSAI Sculpins Average Catch by Gear and Target



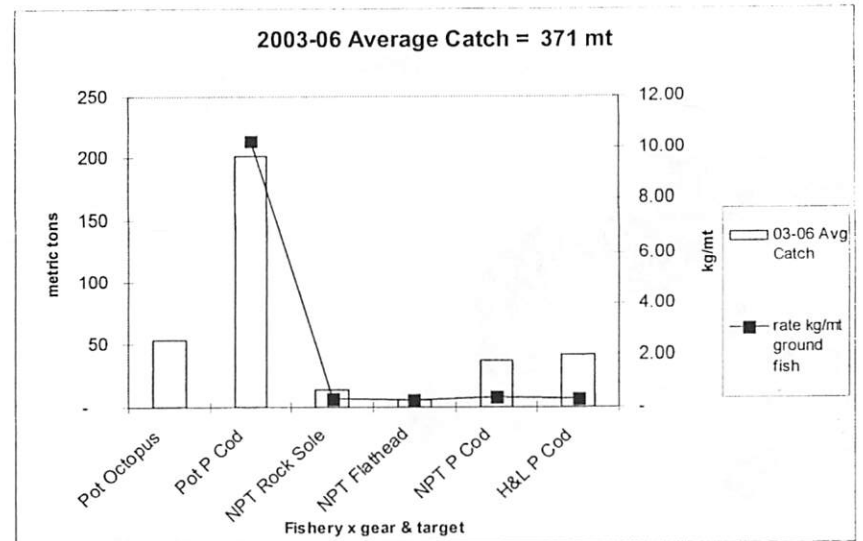
BSAI Sculpin Catch Density (kg/mt groundfish) 2003-2005



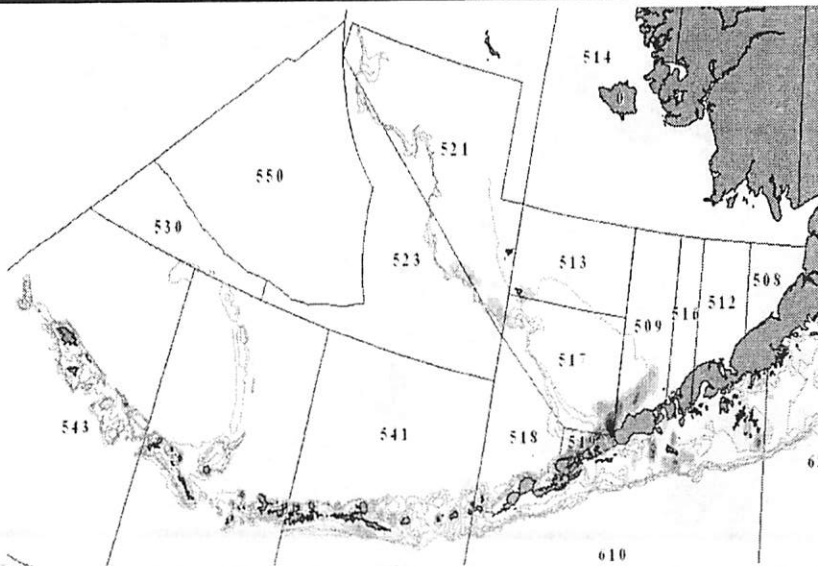
Cumulative BSAI Octopi Catch by Year (2004-6) Relative to ABC and OFL



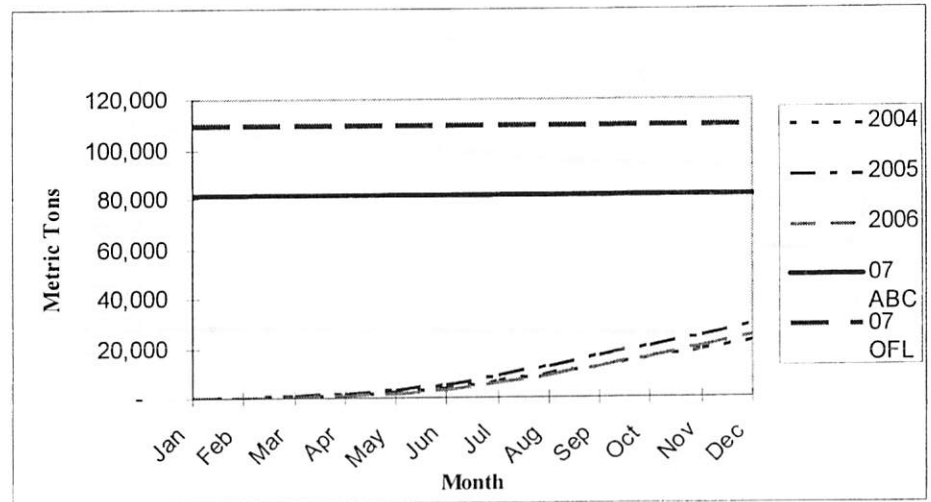
BSAI Octopi Average Catch by Gear and Target



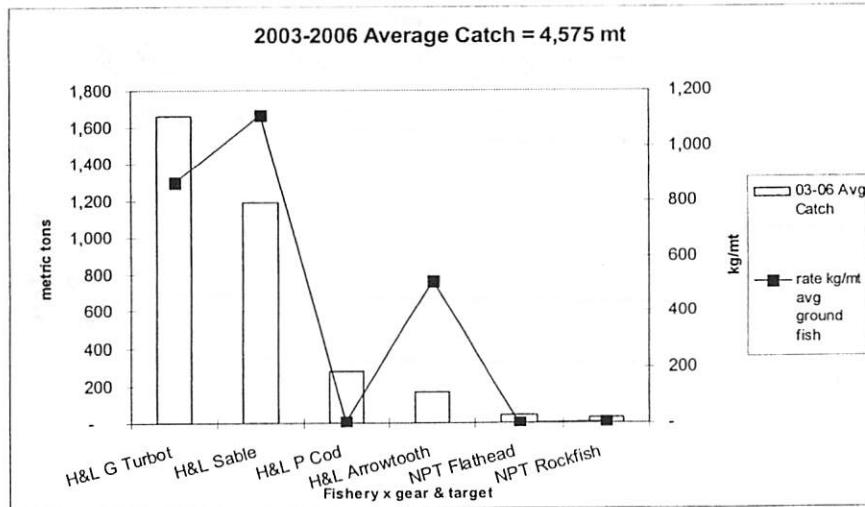
BSAI Octopi Catch Density (kg/mt groundfish) 2003-2005



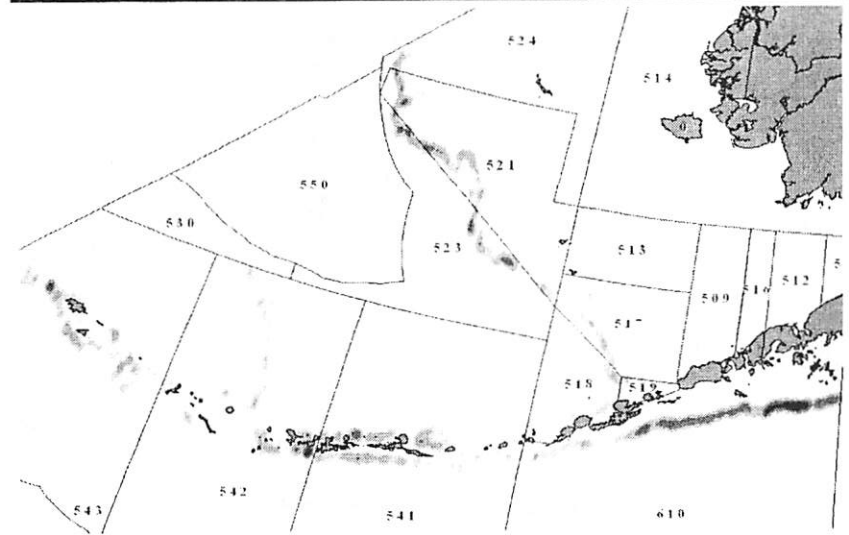
Cumulative BSAI Grenadier Catch by Year (2004-06) Relative to ABC and OFL



BSAI Grenadier Average Catch by Gear and Target



BSAI Grenadiers Catch Density (kg/mt groundfish) 2003-2005

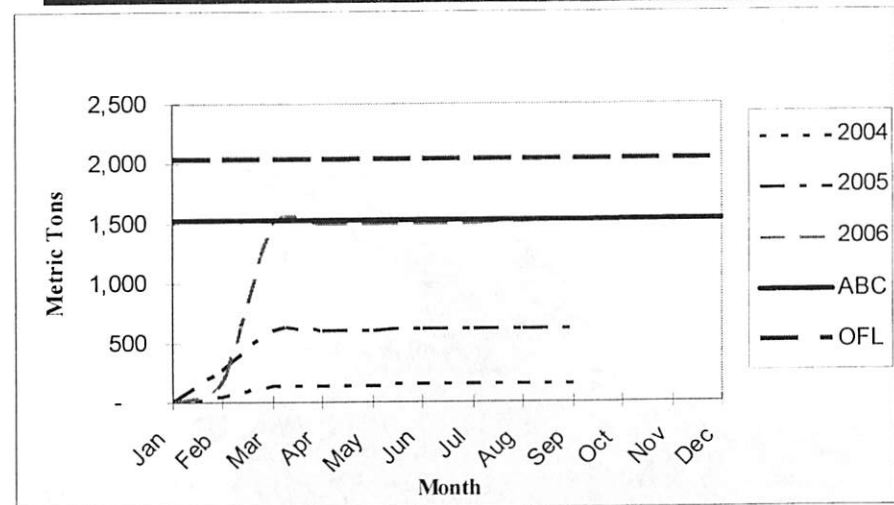


BSAI Summary Table

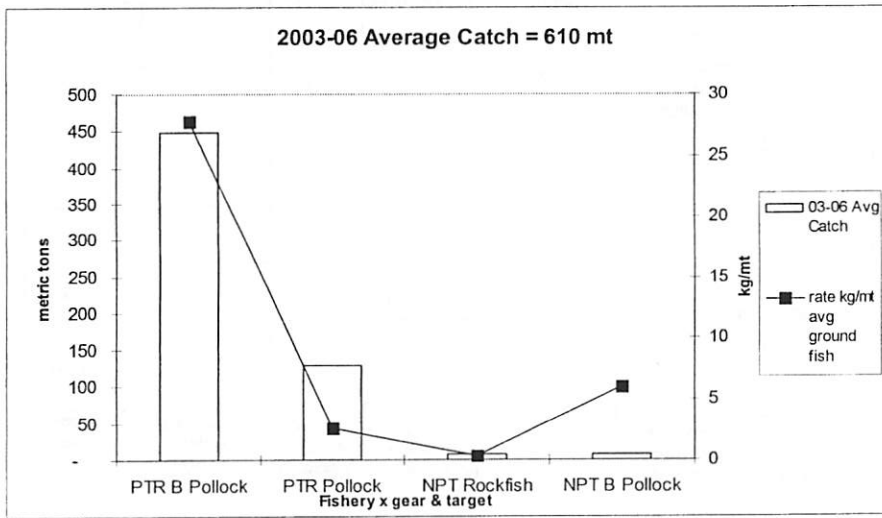
BSAI Species	Likely to Approach Benchmarks	Directed Fishery Possible	Gear/Target Potentially Affected	Spatial Context	Potential Management Measures	Potential Closure Timing
Skates (Tier 5)	No	Yes	Pacific cod H&L	Broad	Broad Closures	n/a
Sharks (Tier 6)	Yes	No	Pollock Pelagic Trawl, Pacific cod H&L	Broad	Broad Closures	Aug.-Sept.
Sculpins (Tier 5)	No	Yes	Yellowfin sole NPT, Pacific cod NPT, Pacific cod H&L	Broad	Broad Closures	n/a
Octopi (Tier 6)	Possibly	Possibly	Pacific cod pot, Pacific cod H&L, Pacific cod NPT	Patchy / Discrete	Voluntary / Discrete Closures	October
Grenadiers (Tier 5)	No	Possibly	G. Turbot H&L, Sablefish H&L	Broad / Bathymetry	Broad Closures	n/a



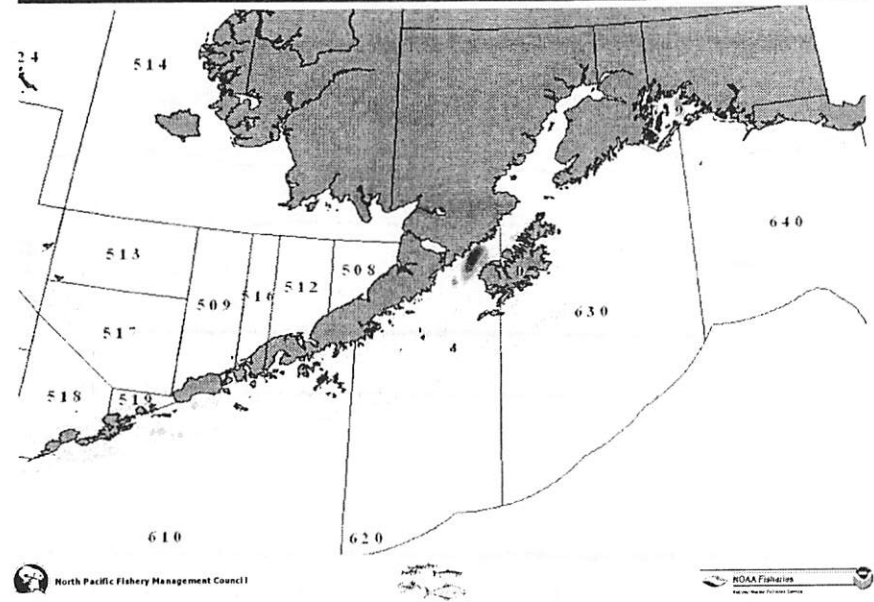
Cumulative GOA Squid Catch by Year (2004-6) Relative to ABC and OFL



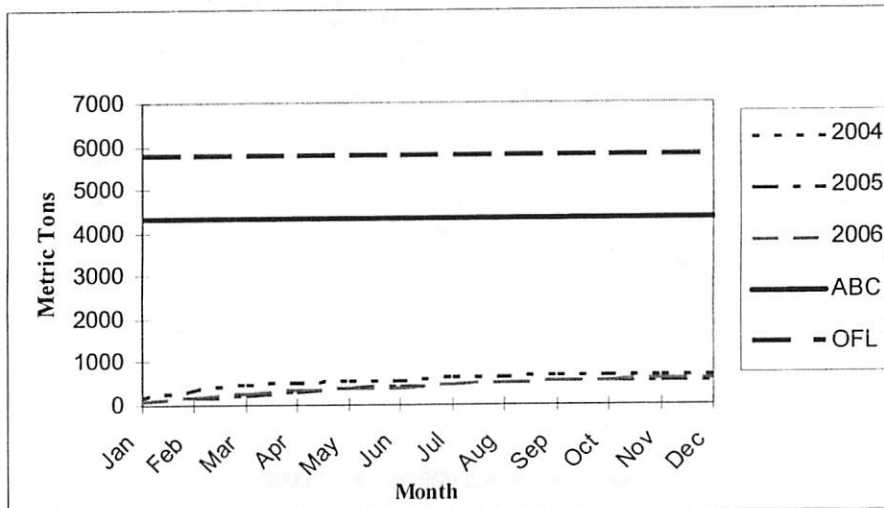
GOA Squid Average Catch by Gear and Target



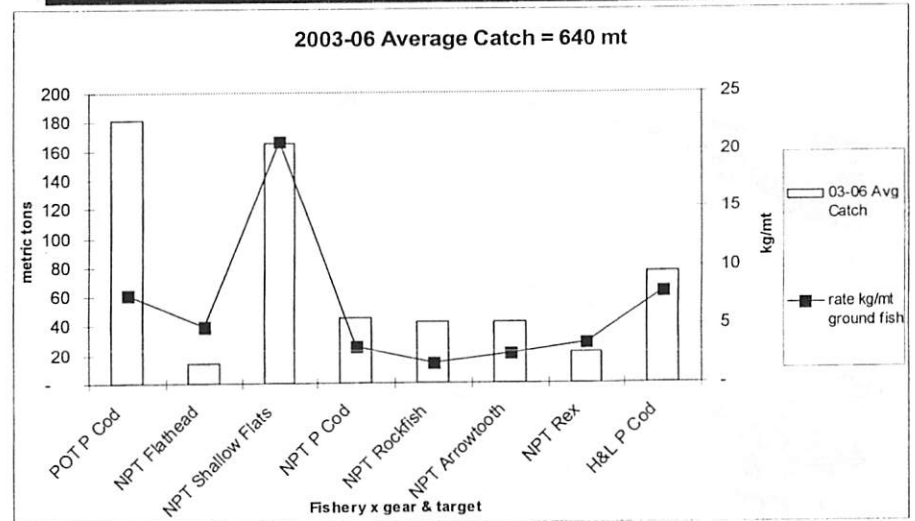
GOA Squid Catch Density (kg/mt groundfish) 2003-2006



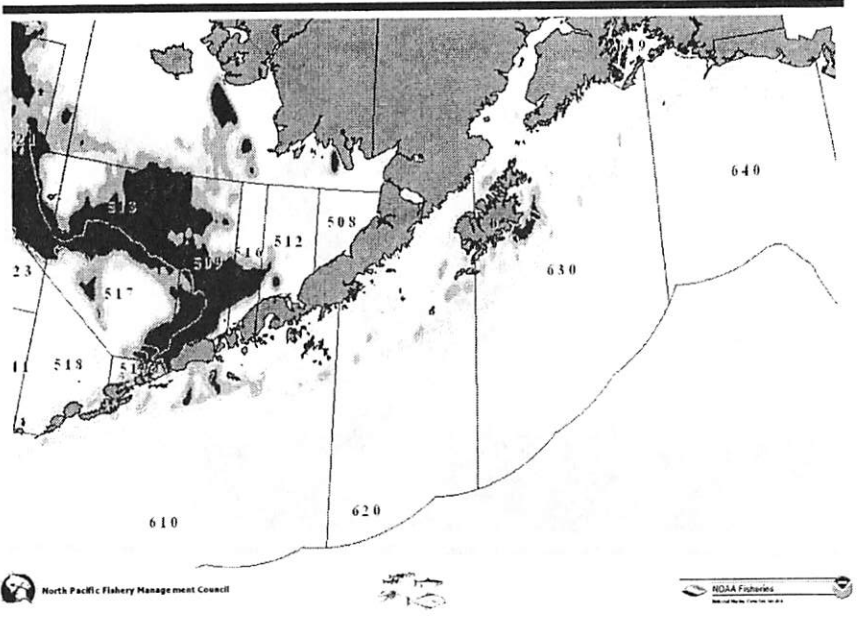
Cumulative GOA Sculpins Catch by Year (2004-6) Relative to ABC and OFL



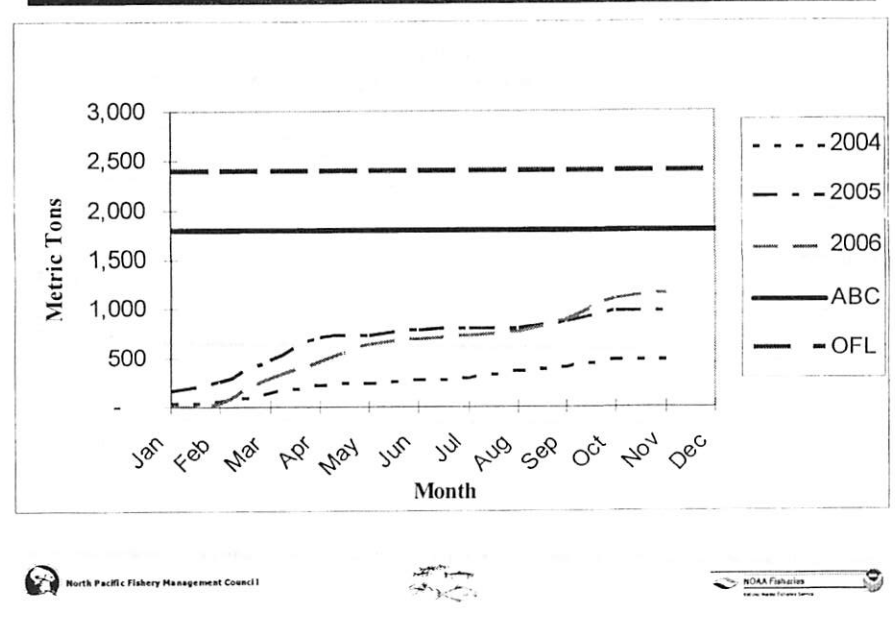
GOA Sculpins Average Catch by Gear and Target



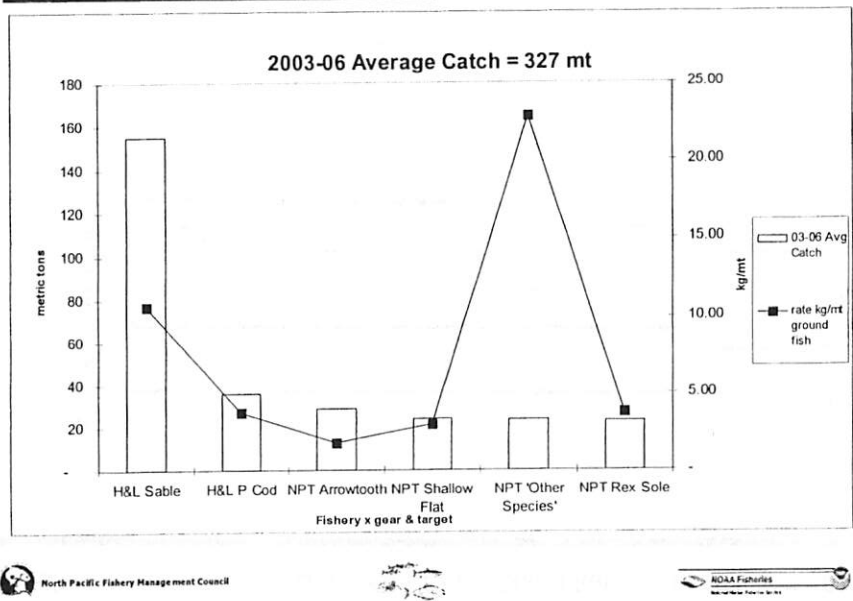
GOA Sculpin Catch Density (kg/mt groundfish) 2003-2005



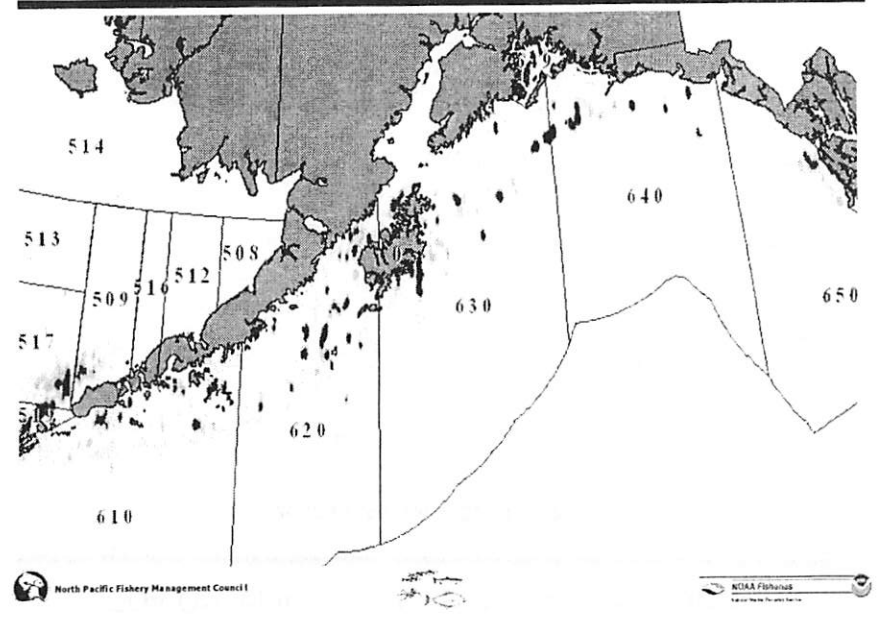
Cumulative GOA Sharks Catch by Year (2004-6) Relative to ABC and OFL



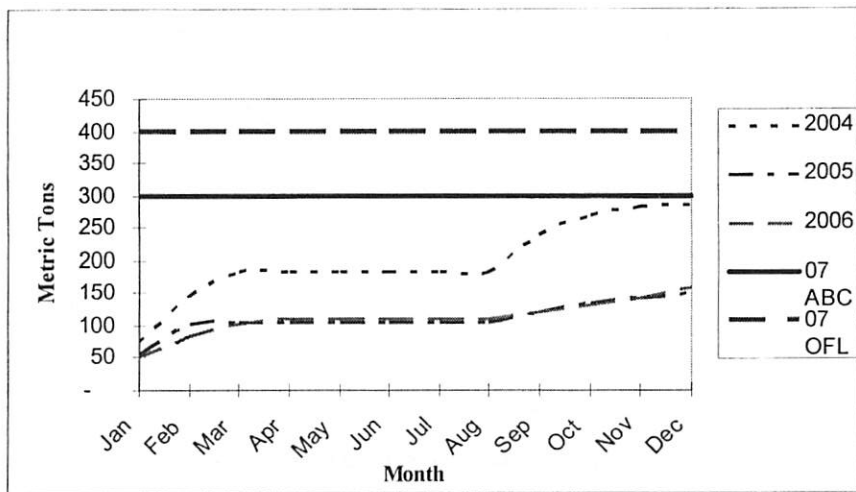
GOA Shark Average Catch by Gear and Target



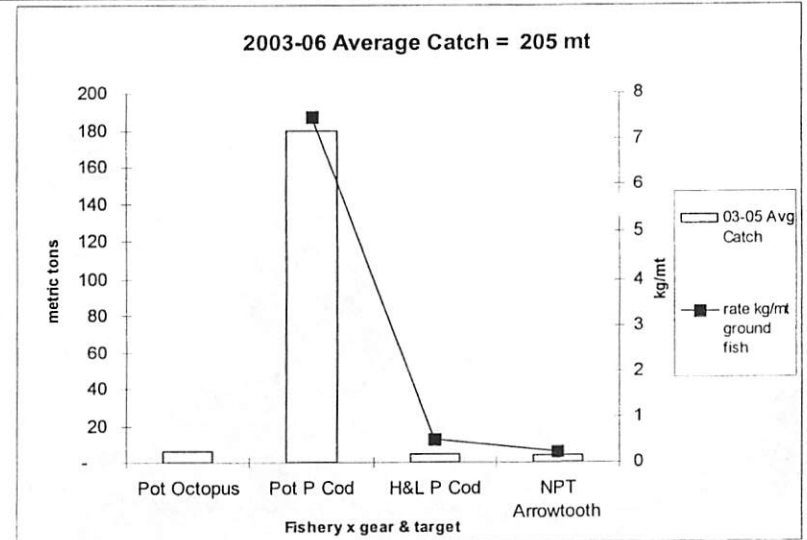
GOA Shark Catch Density (kg/mt groundfish) 2003-2005



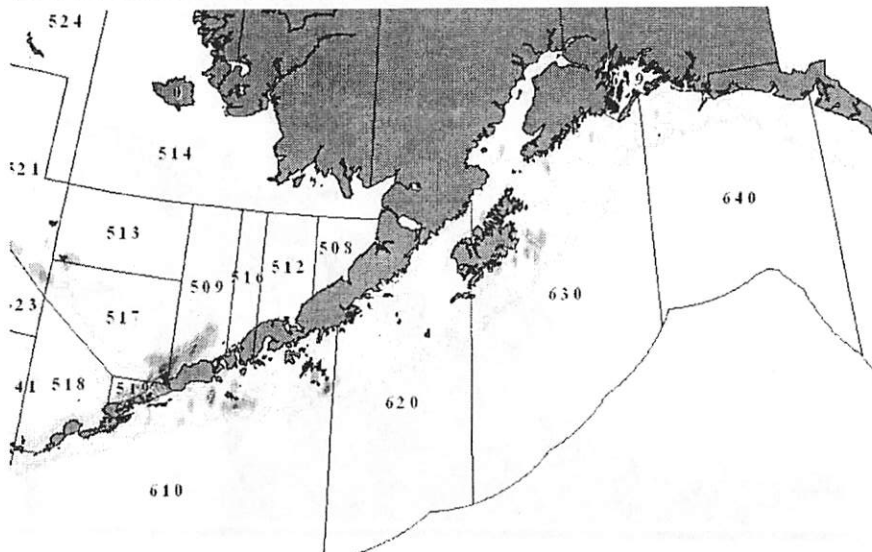
Cumulative GOA Octopi Catch by Year (2004-2006) Relative to OFL and ABC



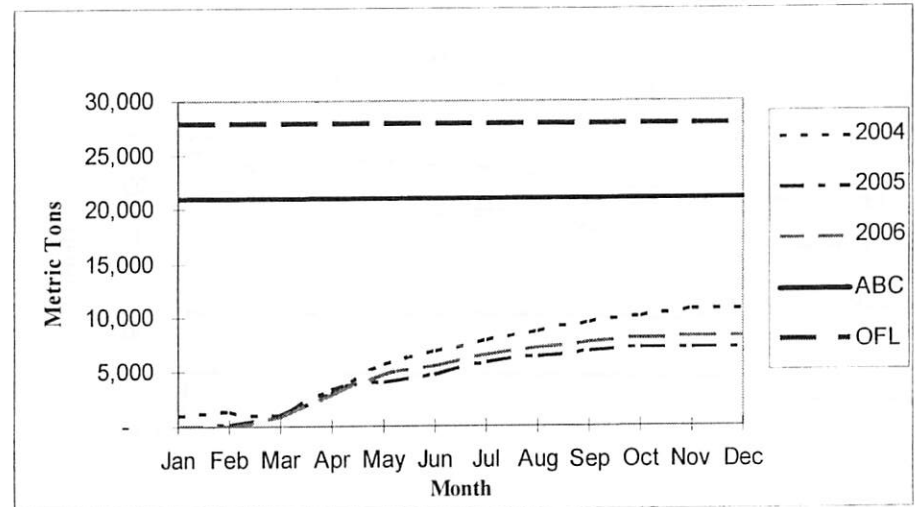
GOA Octopi Average Catch by Gear and Target



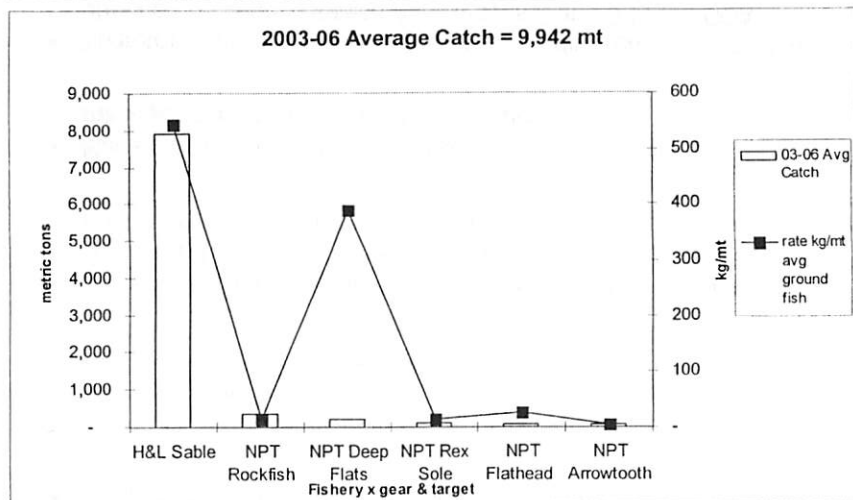
GOA Octopi Catch Density (kg/ mt groundfish) 2003-2005



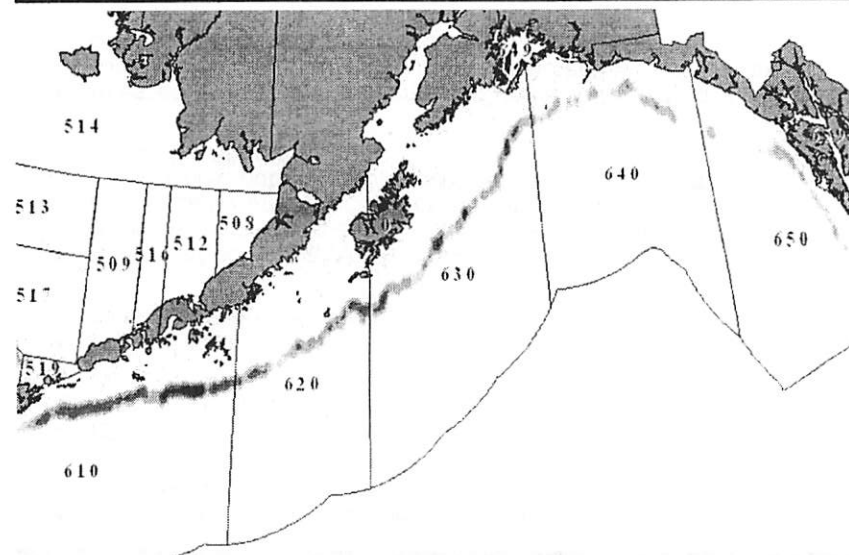
Cumulative GOA Grenadier Catch by Year (2004-06) Relative to ABC and OFL



GOA Grenadier Average Catch by Gear and Target



GOA Grenadier Catch Density (kg/mt groundfish) 2003-2006



GOA Summary Table

GOA Species	Management Concern	Directed Fishery Possible	Gear/Target Potentially Affected	Spatial Context	Potential Management Measures	Potential Closure Timing
Squid (Tier 6)	Possibly	No	Pollock Pelagic Trawl	Very Discrete	Voluntary / Hot Spot	March
Sculpins (Tier 5)	No	No	Multiple Pot, NPT, H&L fisheries	Irregular	Broad Closures	n/a
Sharks (Tier 6)	Possibly	No	Sablefish H&L, Pollock Trawl, Pacific cod H&L, multiple NPT flatfish	Broad	Broad Closures	October
Octopi (Tier 6)	Possibly	No	Pacific cod Pot	Discrete	Voluntary / Hot Spots	October
Grenadiers (Tier 5)	No	No	Sablefish H&L, NPT Deep Flats	Broad / Bathymetry	Broad Closures	n/a



Overview of Alternative 2: BSAI

- Alternative 2 would eliminate the "other species" assemblage and manage BSAI skates, sculpins, sharks, and octopi as separate assemblages.
- BSAI sharks would likely require management measures, primarily in the pelagic pollock trawl and hook-and-line Pacific cod fisheries in the August-September time frame.
- BSAI Octopi catch may approach management benchmarks if individually managed.
- Potential Octopi management measures could be limited to discrete areas closures beginning in October. Voluntary avoidance could also be used.



Overview of Alternative 2: GOA

- Alternative 2 would eliminate the "other species" assemblage and manage GOA squids, sculpins, sharks, and octopi as separate assemblages. None of these species are of immediate management concern
- GOA squid and octopi could approach or exceed management benchmarks in the future. Both are caught in discrete areas and could be managed with hot spots.
- If GOA shark catch approaches benchmarks, management measures to prevent overfishing could affect several fisheries across a broad geographic area.
- Sablefish hook-and-line, pollock trawl, Pacific cod hook-and-line, and multiple flatfish non-pelagic trawl fisheries harvest GOA sharks.
- It is possible that some localized areas of highest catch could be identified as areas to be voluntarily avoided. However, it is also possible that broad closures in a multitude of fisheries might be needed. The timing of such closures would be a function of the timing of the increased catch, which is not known.



Overview of Alternative 3: BSAI

- Alternative 3 would separate management of BSAI skates, and sculpins, from the other species assemblage.
- Neither BSAI skates nor BSAI sculpins are of management concern and could support directed fisheries.
- Management measures to prevent overfishing of the other species group (now sharks and octopi) would be similar to the management measures potentially needed to prevent overfishing of each of these species individually.
- These species are incidentally caught in different fisheries with different geographic catch characteristics.
- There does not appear to be a difference in potential effect on fisheries between Alternatives 2 and 3 in the BSAI.



Alternative 3 Overview: GOA

- GOA sculpins catch does not approach benchmarks.
- The remaining species in the other species group, squid, sharks, and octopi, are all managed under tier 6. Thus, catch of these species may approach benchmarks.
- The spatial contexts of incidental catch of the three remaining species in the other species group differ from one another, as do the fisheries that incidentally catch these species.
- Management measures would likely be similar to those used to manage each of these species individually.
- Therefore, there does not appear to be a difference in potential effect on fisheries between Alternatives 2 and 3 in the GOA.



Alternative 4 Overview

- Alternative 4 would manage only BSAI skates as a separate assemblage.
- BSAI skates catch would not approach management benchmarks and could possibly support a directed fishery.
- Under this alternative, the BSAI other species group would consist of sharks, sculpins, and octopi.
- Given that a relatively high proportion of other species TAC comes from sculpins, and that available sculpin incidental catch is not heavily utilized, catch of the remaining other species group would not likely approach management benchmarks under this alternative.
- In essence, the large proportion of unused other species TAC coming from sculpins would mask the potential for shark and octopi catch to approach benchmarks.



Alternative 5 Overview

- Alternative 5 would add grenadiers, a tier 5 species, to both the BSAI and GOA TAC specifications processes
- Grenadiers are not of present management concern in either the BSAI or GOA.
- Management of grenadiers as separate assemblages in both the BSAI and GOA (Option 1) is not likely to have direct effect (i.e. imposition of management measures to prevent overfishing) on the fisheries that incidentally catch them.
- Option 2 would add grenadiers to the other species groups. The addition of grenadiers to the other species groups would add a species with a relatively large, and lightly used, ABC under tier 5 management to these groups.
- This would tend to mask catch of tier 6 species in excess of their individual ABCs and OFLs.



Proposed Impact Analysis Methodology

- Identification of the target fisheries most likely to be directly affected by any needed management measures.
- Create a fisheries activity model for those fisheries
 - Spatial and temporal database and mapping of fishing activity using VMS data, observer data, weekly production reports, and fish tickets.
 - Catch composition, catch rates (of all species, including prohibited species), and effort level at a 5 kilometer grid level of spatial resolution
 - Catch-in-Areas database, and associated GIS output. This effort will be an advance of the previous product to update it with new and better data (e.g. VMS).



Methodology Continued

- Identification of the geographic polygons of potential closure areas.
 - Working with Inseason Management staff, this process will review cumulative incidental catch and catch rate data to determine the spatial and temporal extent of closures that Inseason management staff might take to prevent overfishing.
- This process may provide a range of hypothetical closures, from broad to fine scale, so that potential effects can be determined across a range of potential actions.



Methodology Continued

- Revenue At Risk Assessment.
 - Determines revenue that could be expected to be earned, based on recent fishing activity, in the area being considered for closure.
 - Catch-in-areas is converted to revenue using AFSC pricing data.
- Mitigation of Revenue at Risk
 - Industry will mitigate the revenue at risk by moving fishing effort to adjacent areas that remain open
 - The analysis will have to consider catch rates and effort levels in adjacent areas to determine whether revenue at risk can be mitigated.
- Operational Implications
 - How would mitigating activity affect operational costs (i.e. via lower catch rates and/or higher levels of required effort),
 - What might the affect be on prohibited species catch,
 - Or would mitigating activity tend to create operational burdens (e.g. fishing in areas of bad weather).



Comments from the AP, SSC, and Non-Target Species Committee.

- Need to develop quantitative analysis of when benchmarks might be hit.
- Breakout retained versus discarded catch of other species.
- Breakout subspecies proportions of catch. Specifically sharks (e.g. dogfish vs. sleeper)
- Provide longer time series of catch, and compare to biomass of target species (specific to sharks).
- Breakout Catcher Vessels separately from Catcher Processors and Mothership Processors
- Analyze Pacific Cod sector split and overall Amendment 80 and 85 effect on other species incidental catch.
- Discuss how adding BSAI grenadiers would affect BSAI TAC cap.
- Need spatial overlay of harvest of target species by gear type with other species by gear type.

Comments Continued

- Use of term "management concern" is arbitrary. Use "overfishing concern" or "approaches management benchmarks" instead.
- Clarify whether directed fisheries are actually possible. Specifically for BSAI sharks.
- Discuss market constraints on potential target fisheries.
- Estimate amount of octopi catch retained and used for bait versus retained and sold.
- Discuss process for SSC to re-evaluate management benchmarks based on more recent data.
- Discuss mortality rates of discarded catch: What is the survival rate (e.g. octopi) when discarded? Could survival allow full discard once benchmarks hit but no fishery closure?
- Experimental grenadier processing has been tried and should be discussed in relation to possibility for a directed fishery.

Comments Continued

- The analysis assumes that management measures would be needed but voluntary avoidance of discrete areas could be used (e.g. Freezer Longliners do this now for Halibut avoidance via the co-op system)
- Various types of management that could be used aren't discussed thoroughly. Need to evaluate voluntary avoidance via co-ops, rolling hotspots, gear modification, and fishing strategies (e.g. day vs. night).
- Co-ops exist in two thirds of affected fisheries and that should be looked at as a management method.
- Co-ops exist and are well managed in the BSAI but not so much at this point in the GOA
- Need to give fleet tools to prevent a "race for bycatch" that could shut a fishery down. (e.g. first halibut PSC cap)

Comments Continued

- Halibut fishery catch of other species is a big issue that should be addressed.
- Shark bycatch occurs in Halibut fishery and has "gone through the roof" recently but is all discarded so it doesn't show up in catch accounting.
- Broad closures might be needed to prevent overfishing of other species, specifically sharks, because of Halibut fishery.
- This shows why observer coverage is needed in the Hook and line fisheries, specifically the Halibut fishery.

Comments Continued

- Historic catch accounting doesn't collect data on discarded other species catch in all fisheries (e.g. unobserved hook and line) and this will make analysis highly uncertain.
- What is proposed is nothing more than a retrospective analysis and is not going to be indicative of where the fleet might be in the future.
- The spatial analysis needs to be more focused on the specific alternatives and how they affect the fleet.
- Analysis might be better if split out by BSAI vs. GOA.
- Concern has been expressed over using VMS data, which is highly confidential.

Conclusion

- The Non-Target Committee plans to meet again to discuss this topic.
- Based on comments received, additional work is needed to address the questions raised.
- Options:
 - Develop a preliminary review draft EA/RIR/IRFA.
 - Re-draft the discussion paper to address comments and concerns and to refine potential actions under alternatives.
 - Stand down pending other developments.

October 2007 SSC minutes excerpt on Other species discussion paper

“Scott Miller (NMFS AKR) gave an overview of a discussion paper on the implications of a proposed amendment to set overfishing and allowable biological catch specifications for the other species assemblages in the BSAI and GOA. At the current time, 5 alternatives are under consideration. The discussion paper provided plots of monthly cumulative catch by fishery and sector, and the spatial distribution of other species catch. The analysts expect that the action will trigger a regulatory amendment and will require an EA/RIR/IRFA. The analysts plan to develop a fishery activity model for target fisheries. The effort would include an analysis of temporal and spatial distributions of fisheries on a 5 km grid. This would allow the ability to assess what types of management measures (quotas, time and area closures, or gear restrictions) that would be most effective at maintaining catch at a biologically acceptable level and to evaluate revenue at risk, mitigation of revenue at risk, and operational implications.

Jane DiCosimo (NPFMC) provided background information on the larger effort to manage non-target species. At the current time, rule making on the feasibility of distinguishing between target and non-target management is uncertain. The NPFMC is recommending moving forward with the other species breakout as an interim step. **The NPFMC anticipates that future rule making would propose species specific management measures for every non-target species.** Council staff also noted that grenadiers are currently considered to be of “no management concern” and, therefore, asked the SSC to comment on whether Alternative 5 should be included in the amendment package.

There was no public testimony on this agenda item.

The SSC agrees with the NPFMC plan to proceed with an interim measure to break the other species complex into its component species complexes. This effort, and its associated analysis, should provide useful insight into the potential implications of proposed species specific management of non-target management. **The SSC does not recommend dropping Alternative 5 on adding grenadier to the specification process from the amendment package.** In the GOA, where incidental catch is approximately 40% of a potential ABC, it is premature to drop this species group from the analysis. Furthermore, inclusion of grenadier in the analysis would provide useful insight into the implications of management of a non-target species group.

The SSC agrees that the proposed work plan for development of the EA/RIR/IRFA is reasonable. **However, additional detail would be required for the SSC to provide more specific comments and suggestions.** Analysts should include an analysis of prospective markets for these species, and the anticipated rate of developing markets. The analysis should also include an analysis of the impacts of the proposed species breakout on existing target fisheries and markets.

The SSC recommends that future discussion papers differentiate between bycatch (i.e., incidental groundfish catch that is discarded), versus incidental catch (i.e., which is, by definition, retained). The SSC notes that the label “management concern” is a value judgment. This label appears to be linked to whether recent observed catches of a group approached the group ABC or OFL. The SSC recommends that this criterion be more clearly defined. The SSC notes that, for example, 41 species of sculpins were identified in the Eastern Bering Sea (EBS) and 22 species in the Aleutian Islands (AI) region. Thus, the analysis will need to point out that the assessment of concern applies only at the group level, and that species level impacts might still be incurred in this management system.”

**Non-target Species Committee Meeting
DRAFT Summary
November 12, 2007**

Committee members Dave Benson (chair), Lori Swanson, Julie Bonney, Dave Wood, Janet Smoker, Michelle Ridgway attended the meeting in Seattle on November 12, 2007 from 2-5 pm. Karl Haflinger and Jon Warrenchuk participated by phone. Simon Kineen, Paul Spencer, and Ken Goldman were absent. Jane DiCosimo provided staff support. Scott Miller, Andy Smoker, Tom Pearson, Anne Hollowed, and Olav Ormseth attended for NMFS. Paul MacGregor and John Gauvin also attended.

Jane DiCosimo reviewed the purpose of meeting, which was to comment on Council staff recommendations to split a proposed analysis of two actions (1) (a) set OFLs and ABCs for Gulf of Alaska other species assemblage and (b) set separate specifications for sharks, skates, squids, sculpins, and octopuses (and possibly grenadiers) into two separate analyses and timelines and (2) review a NMFS staff discussion paper on the second proposed action. While the AP and SSC reviewed the discussion paper in October 2007, the Council rescheduled its review for December 2007 due to lack of time to take the report. This timing allowed the committee an opportunity to review the paper also. She also provided an update on the possible timeline for publication of a proposed rule by NMFS Headquarters on annual catch limits (ACLs) and accountability measures (AMs), which are required under the reauthorized Magnuson-Stevens Act. The public comment period may overlap the Council's February Council meeting, but could be later. She recalled that resolution of a management approach for all non-target species management was tabled until proposed revised guidelines for the overfishing definition (which has been captured under the ACL initiative) were published. In the mean time, the Council has initiated the current interim measures to address the other species assemblage. If the Council concurs with staff recommendations, the analysis for the GOA FMP amendment to set an ABC and OFL for GOA other species assemblage would be scheduled for final action in April 2008, with implementation planned for 2009. **The committee concurred with the separating the two actions and scheduling final action on the GOA FMP amendment for April 2008.**

The second action plan is the subject of Scott Miller's discussion paper, which he presented next. Committee members had numerous suggestions on possible actions that industry could initiate in place of Federal closures, which was the only proposed action suggested in the presentation. These include:

- Breakout catcher vessels separately from catcher processors and motherships
- Analyze Pacific cod sector split and overall effects of Amendments 80 and 85 on other species incidental catch.
- Discuss how adding BSAI grenadiers would affect BSAI TAC 2 M t cap.
- Need spatial overlay of harvest of target species by gear type with other species by gear type. The analysis assumes that management measures would be needed but voluntary avoidance of discrete areas could be used (e.g., as freezer longliners have done for halibut avoidance)
- Various types of management that could be used aren't discussed thoroughly. Need to evaluate voluntary avoidance via co-ops, rolling hotspots, gear modification, and fishing strategies (e.g., day vs. night).
- Co-ops exist in two thirds of affected fisheries and that should be looked at as a management method.
- Co-ops exist and are well managed in the BSAI but not so much at this point in the GOA
- Need to give fleet tools to prevent a "race for bycatch" that could shut a fishery down (e.g., first halibut PSC cap)

The committee also discussed different ways to prioritize actions contained within the other species initiative. The committee noted that the Council began consideration of setting sharks and skates as bycatch in 1998, and to date only GOA skates have been provided additional protection. One member suggested that separate analyses could be undertaken for (1) the BSAI and the GOA, (2) sharks and skates, (3) BSAI skates, (4) delete sculpins from action because it has high biomass and no directed fishery, (5) delete grenadiers from action because adding grenadiers as a specification category is counter to the long term goals of not managing species for which there is

no intent to harvest under a TAC and economic implications to other valuable groundfish species under the BSAI 2 M t cap. The committee discussed negative aspects of (1) an analysis of the current suite of alternatives becoming unmanageable and (2) cherry picking individual groups for action.

The committee questioned whether the proposed action to manage at the group level would allow for species to be separated from their respective groups and managed individually. Staff responded that managing at the species level regularly occurs as part of the current specification process as recommended by the Plan team or SSC, and does not require a FMP amendment.

The committee discussed that a general benefit of managing at the group level is that there would then be a disincentive to catch certain species. Therefore, past catch history might not be that reflective of what would happen in the future. Avoidance of their catch might be easier than expected, particularly under rationalized fisheries. Individual vessel accounting may be the key to success. Because of the different natures of the BSAI and GOA fisheries (the BSAI has a small, well observed fleet compared to the GOA), success of proposed GOA group level management may not be as good as in the BSAI. The committee noted a serious flaw in the catch accounting system, in that groundfish caught as incidental catch in the halibut IFQ fishery does not count against OFL, ABC, or TAC. Anne Hollowed suggested that management approaches for non-target species or groups could be based on an evaluation of catch relative to abundance (alternatively, F relative to Z).

The committee agreed to meet again in February 2008 to possibly rearrange or delete some of the current alternatives. The Council can revise the alternatives at any step in its deliberations on this proposed action. By February 2008, the ACL proposed rule may have been published and the Council will review the staff report in December 2007. Staff suggested that they will continue developing the background information for the analysis.