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# Evaluating Potential Fishery Effects of Changes to Other Species Management

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North Pacific Fishery Management Council



# Focus of Discussion Paper

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- 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?



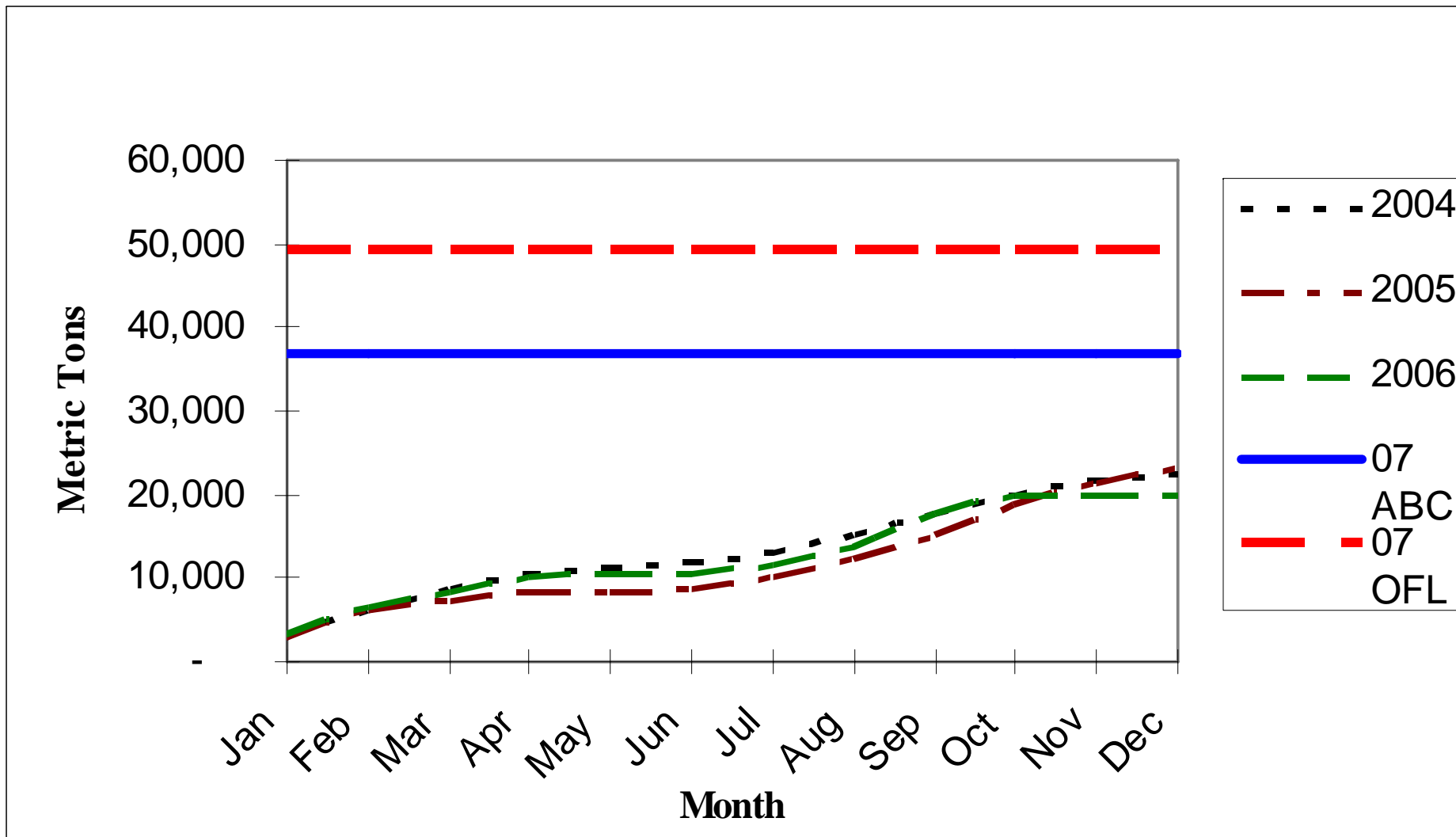
# The Alternative Set

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- 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

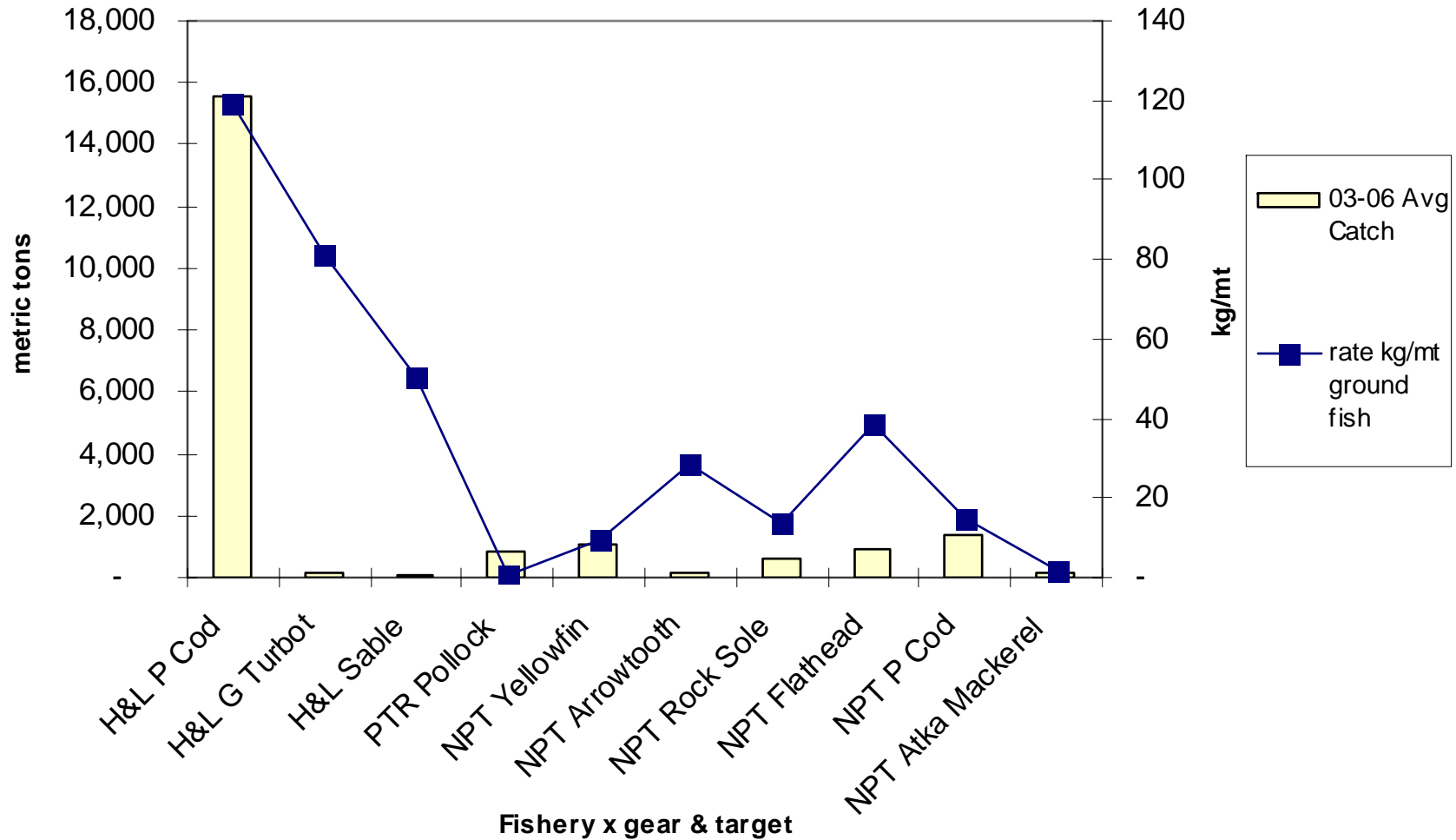


# Cumulative BSAI Skate Catch by Year (2004-6) Relative to Skate ABC and OFL

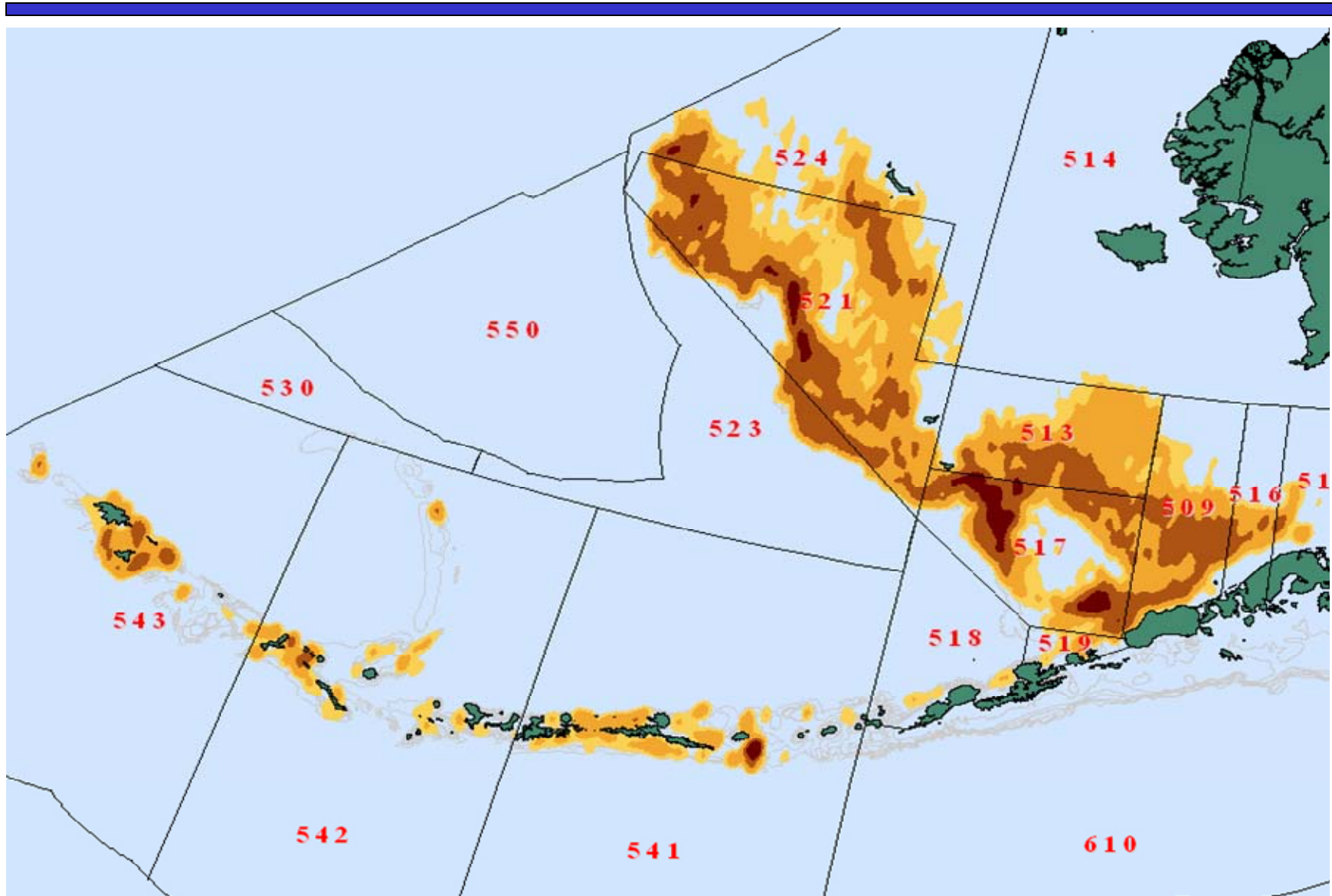


# BSAI Skate Average Catch by Gear and Target

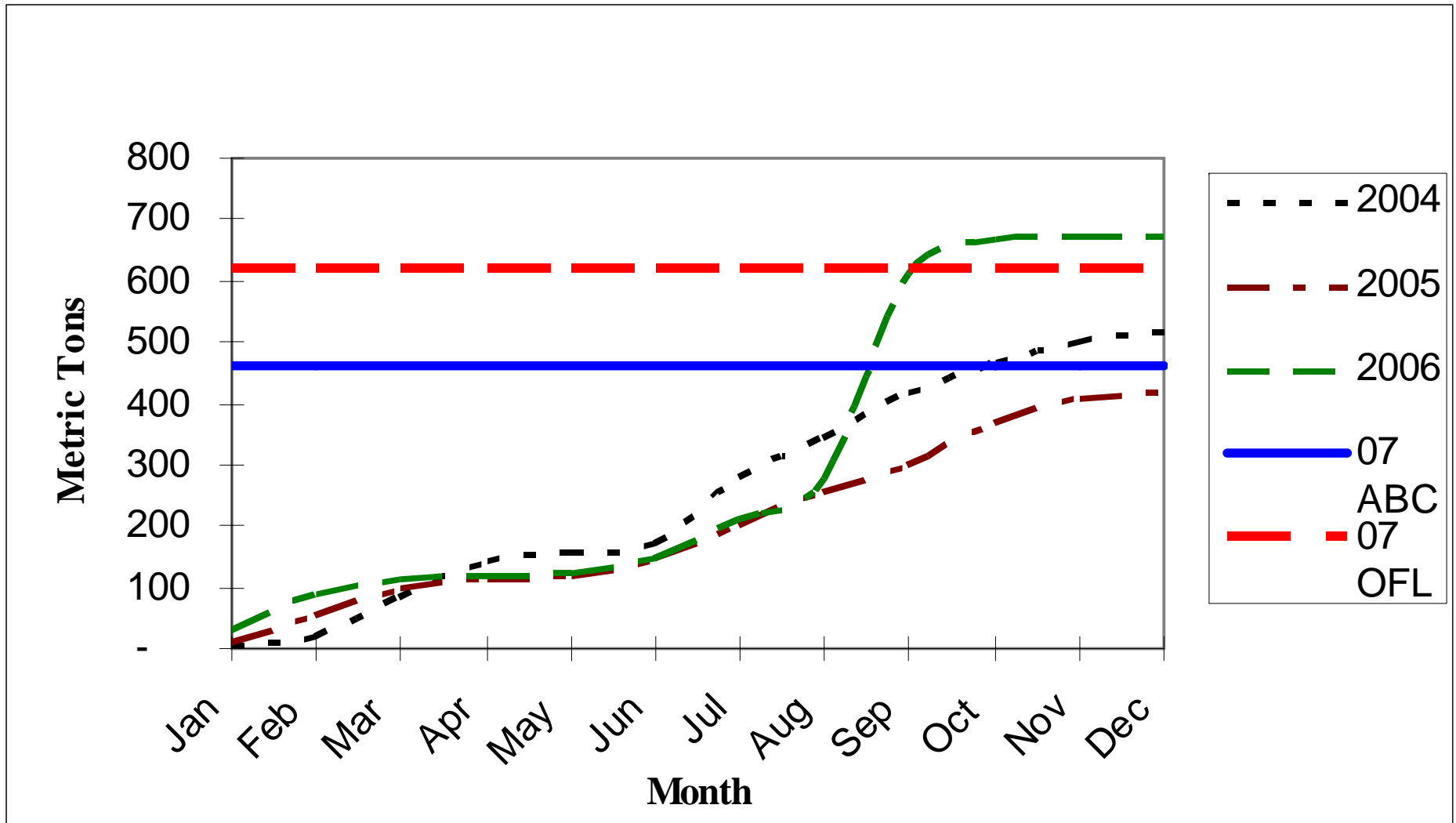
2003-06 Average Catch = 21,124 mt



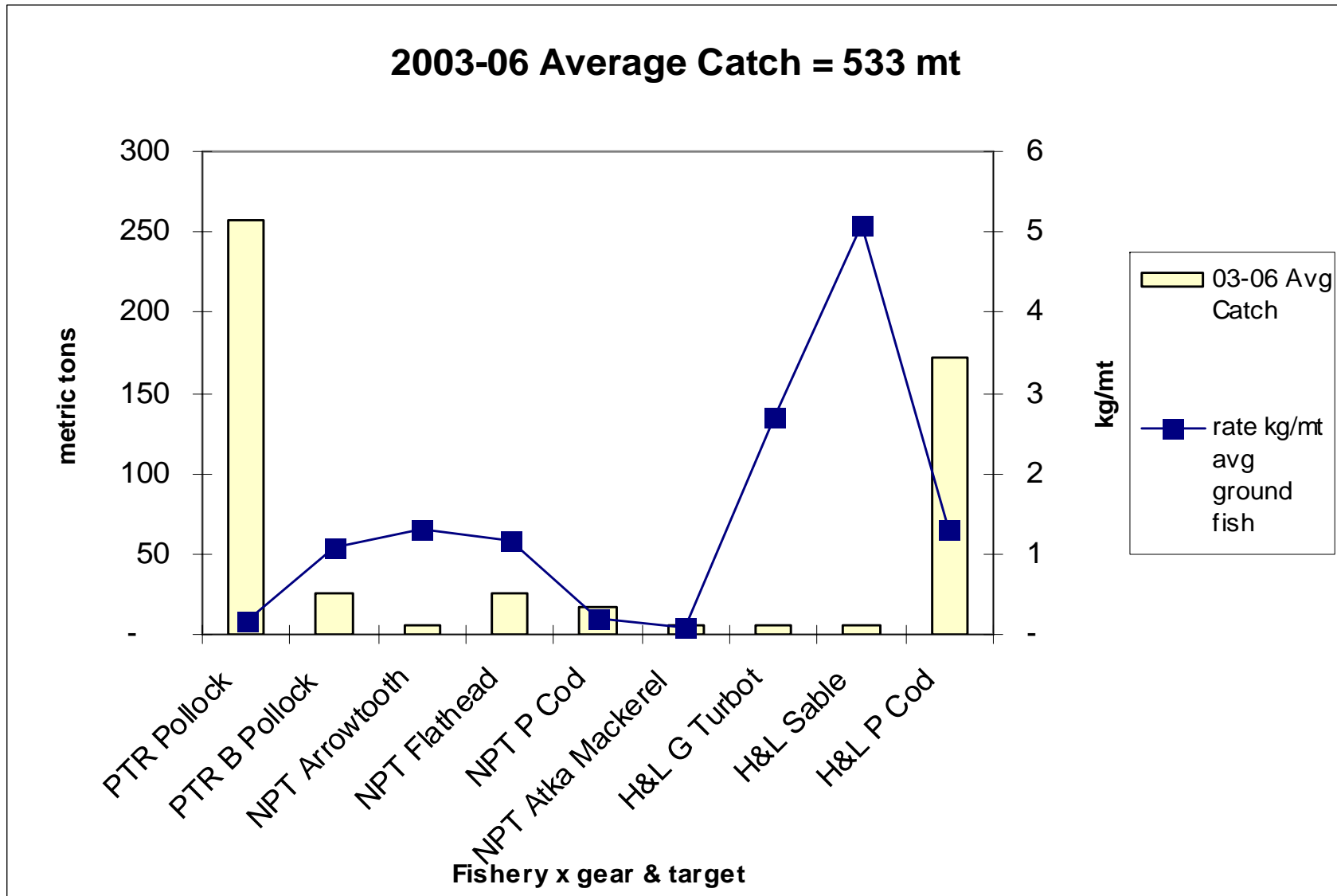
# BSAI Skate Catch Density (kg/mt groundfish) 2003-2005



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

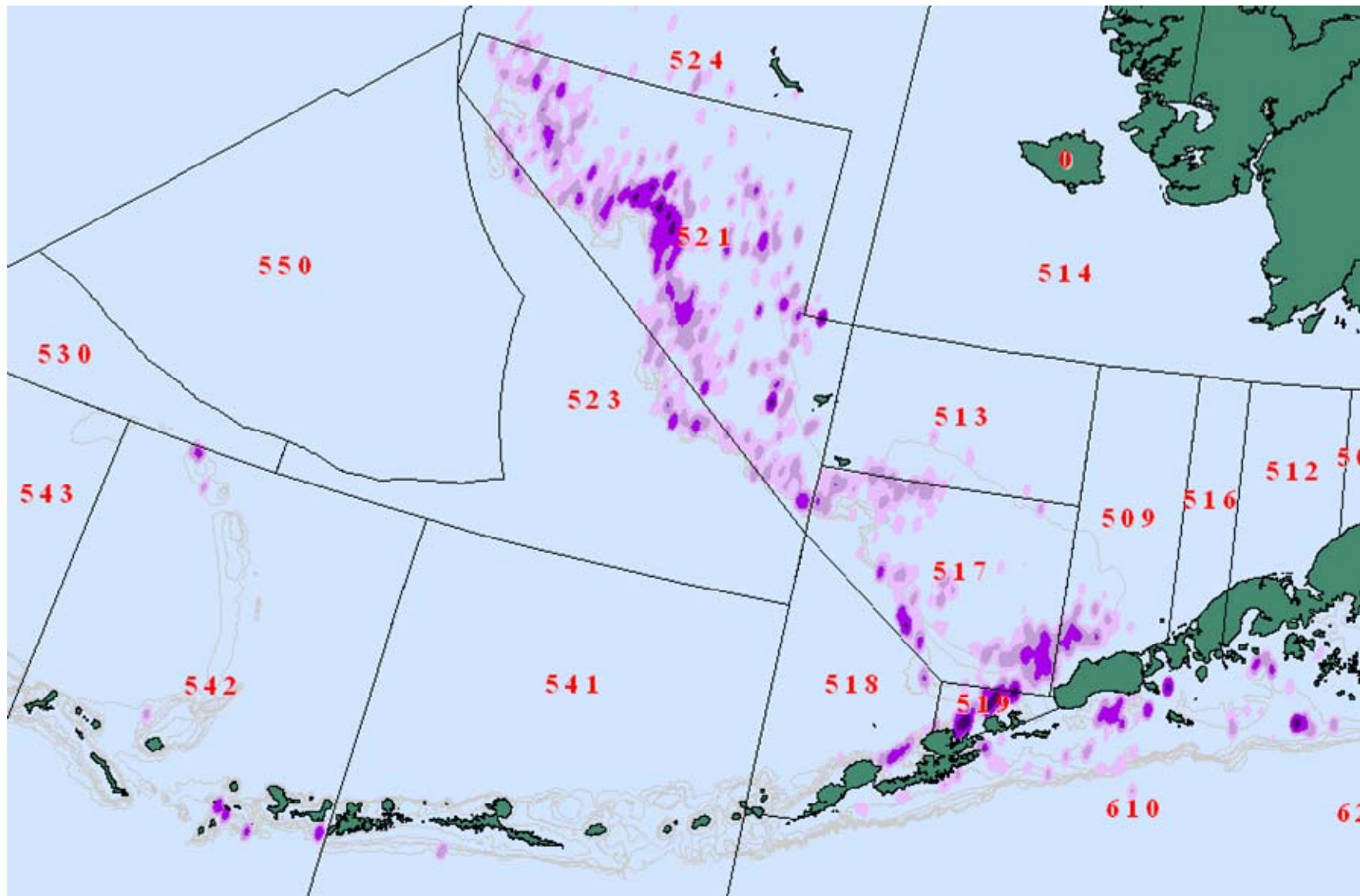


# BSAI Sharks Average Catch by Gear and Target

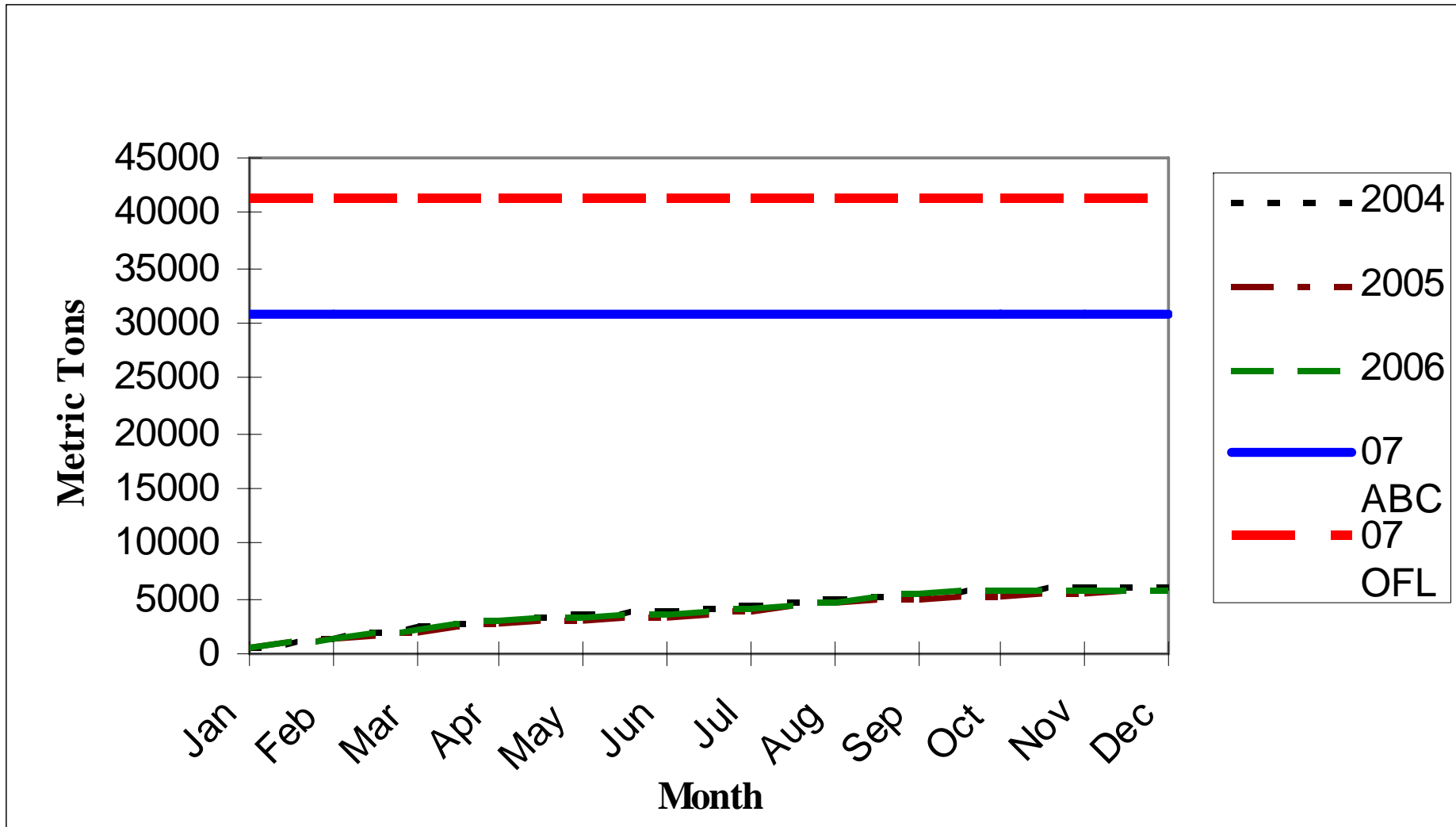




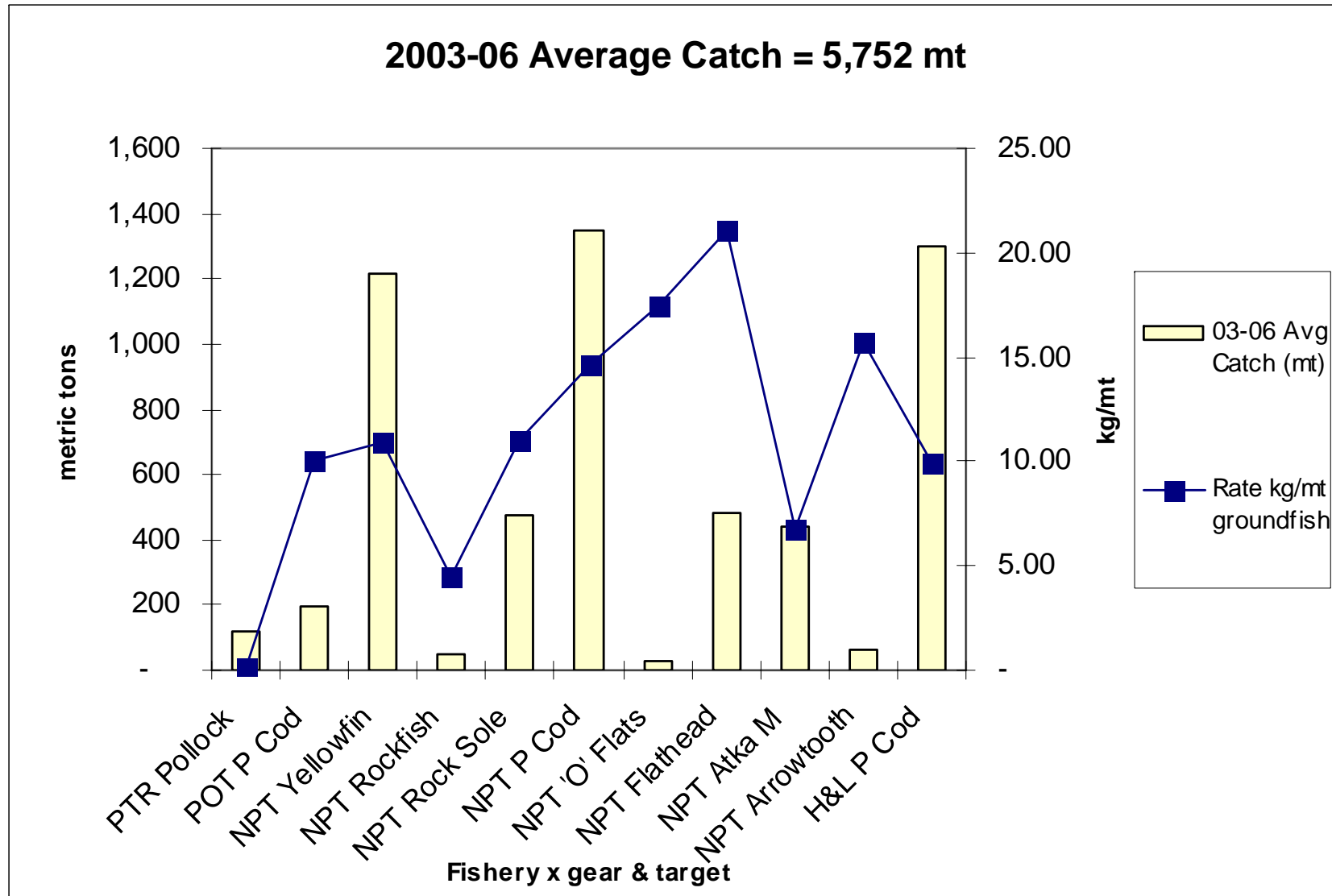
# BSAI Shark Catch Density (kg/mt groundfish) 2003-2005



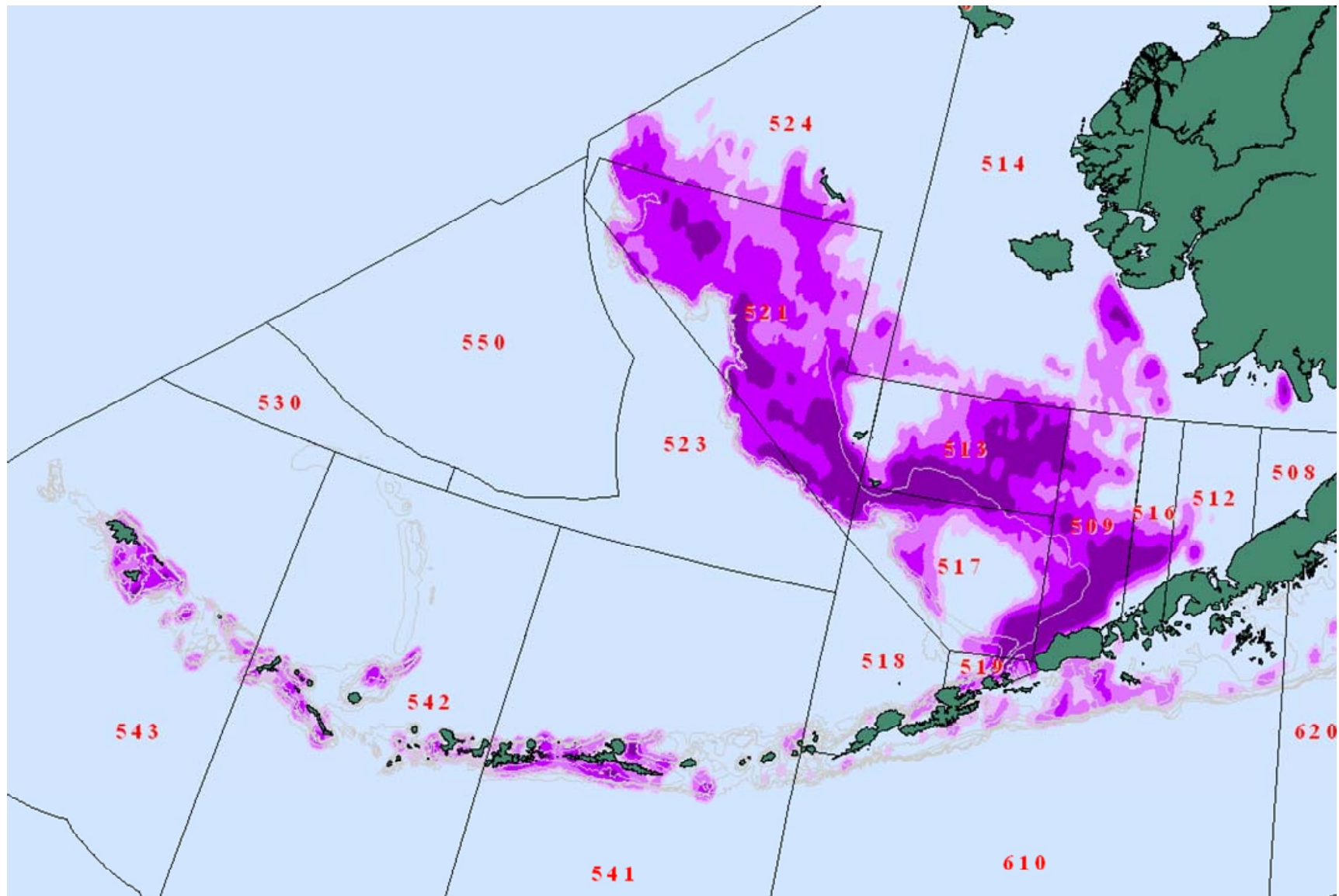
# Cumulative BSAI Sculpins Catch by Year (2004-6) Relative to ABC and OFL



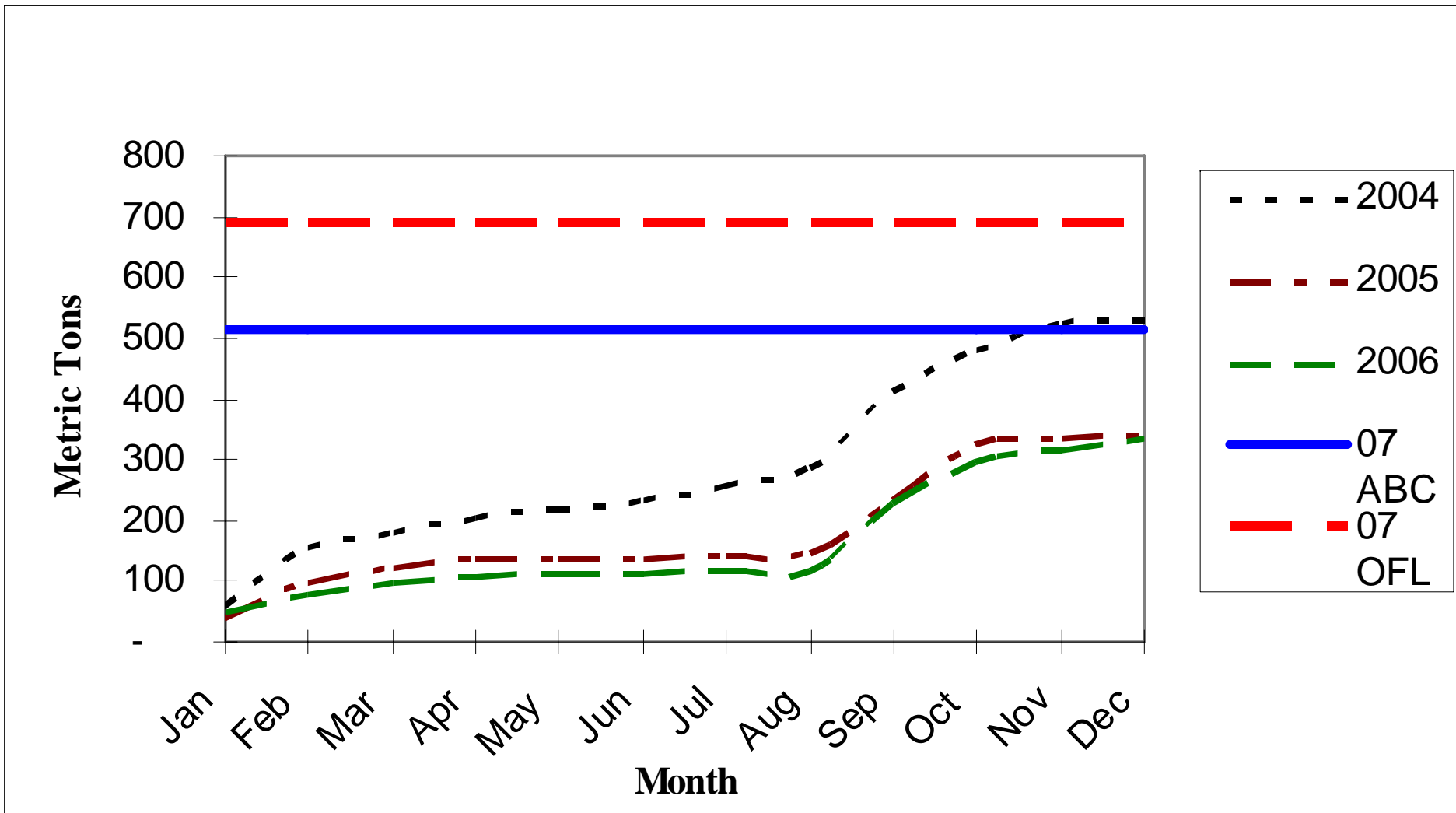
# BSAI Sculpins Average Catch by Gear and Target



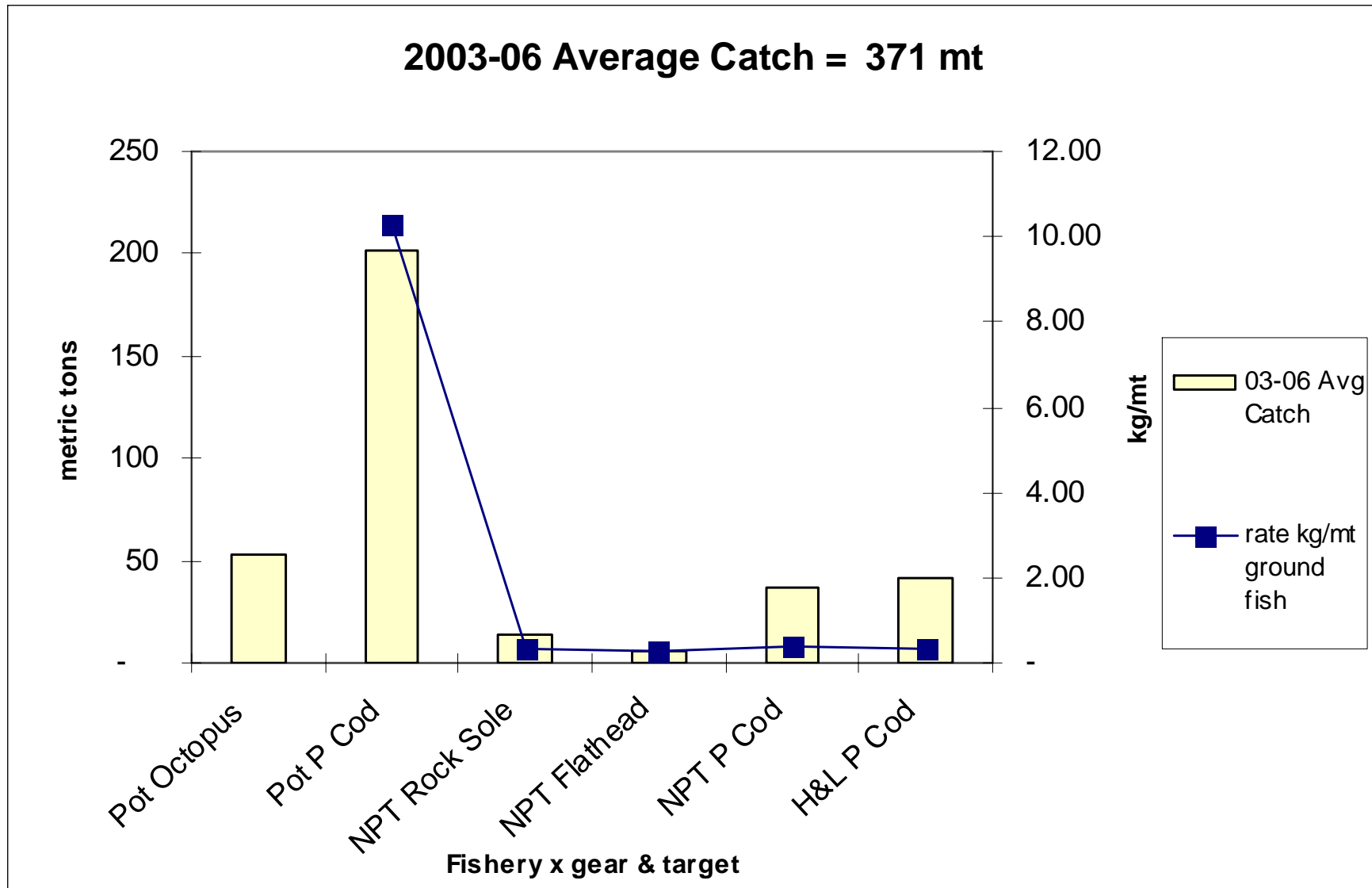
# BSAI Sculpin Catch Density (kg/mt groundfish) 2003-2005



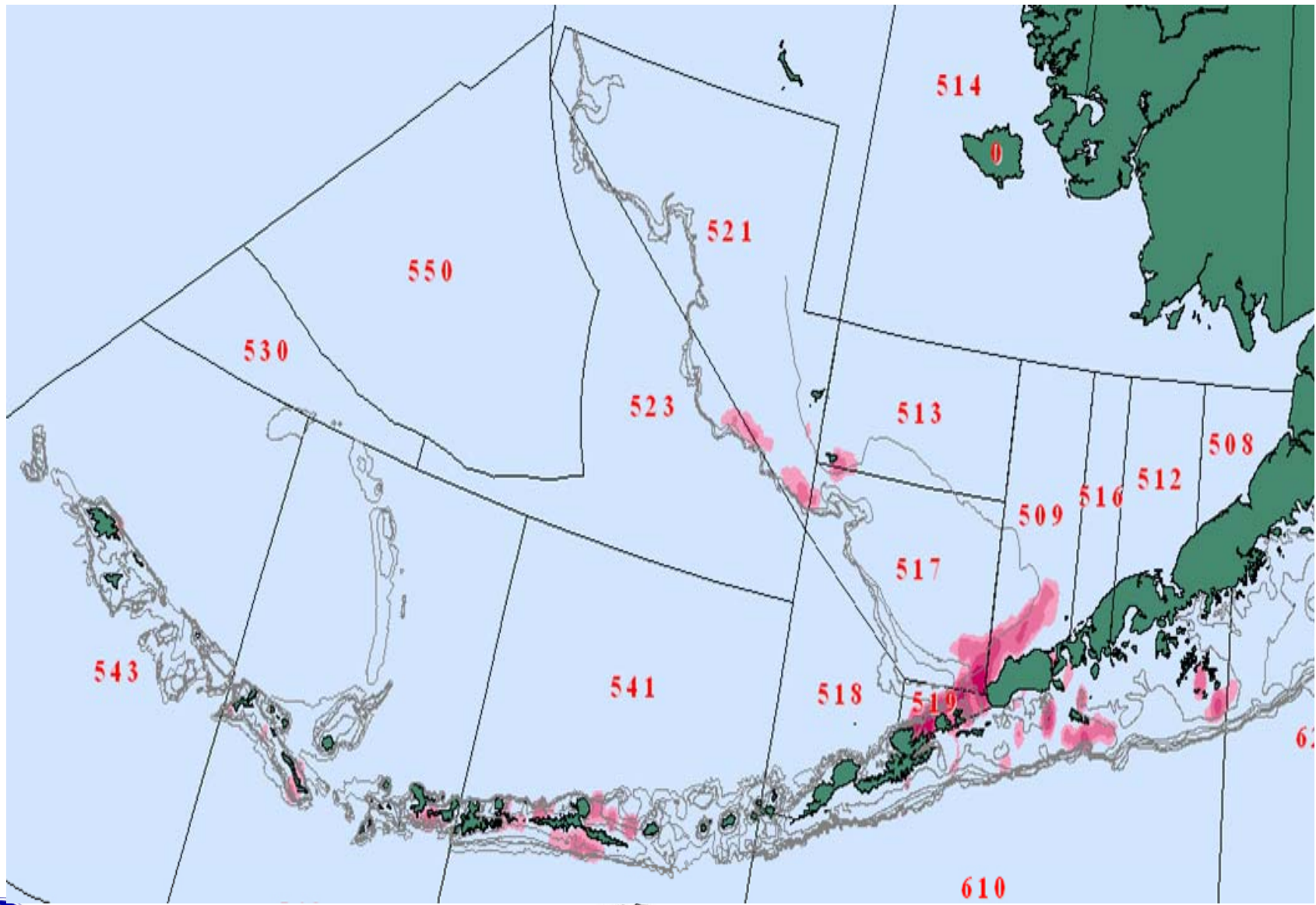
# Cumulative BSAI Octopi Catch by Year (2004-6) Relative to ABC and OFL



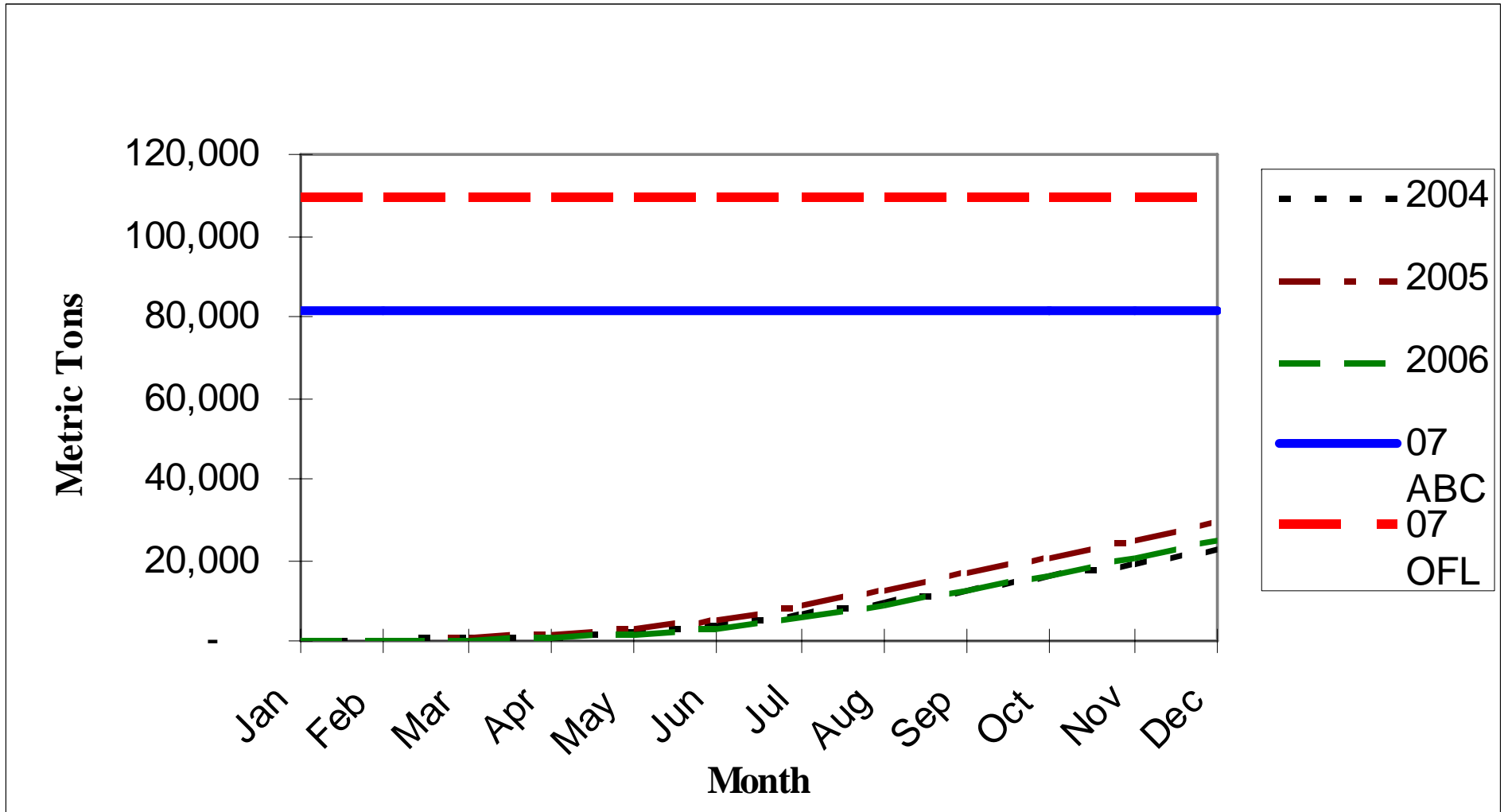
# BSAI Octopi Average Catch by Gear and Target



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

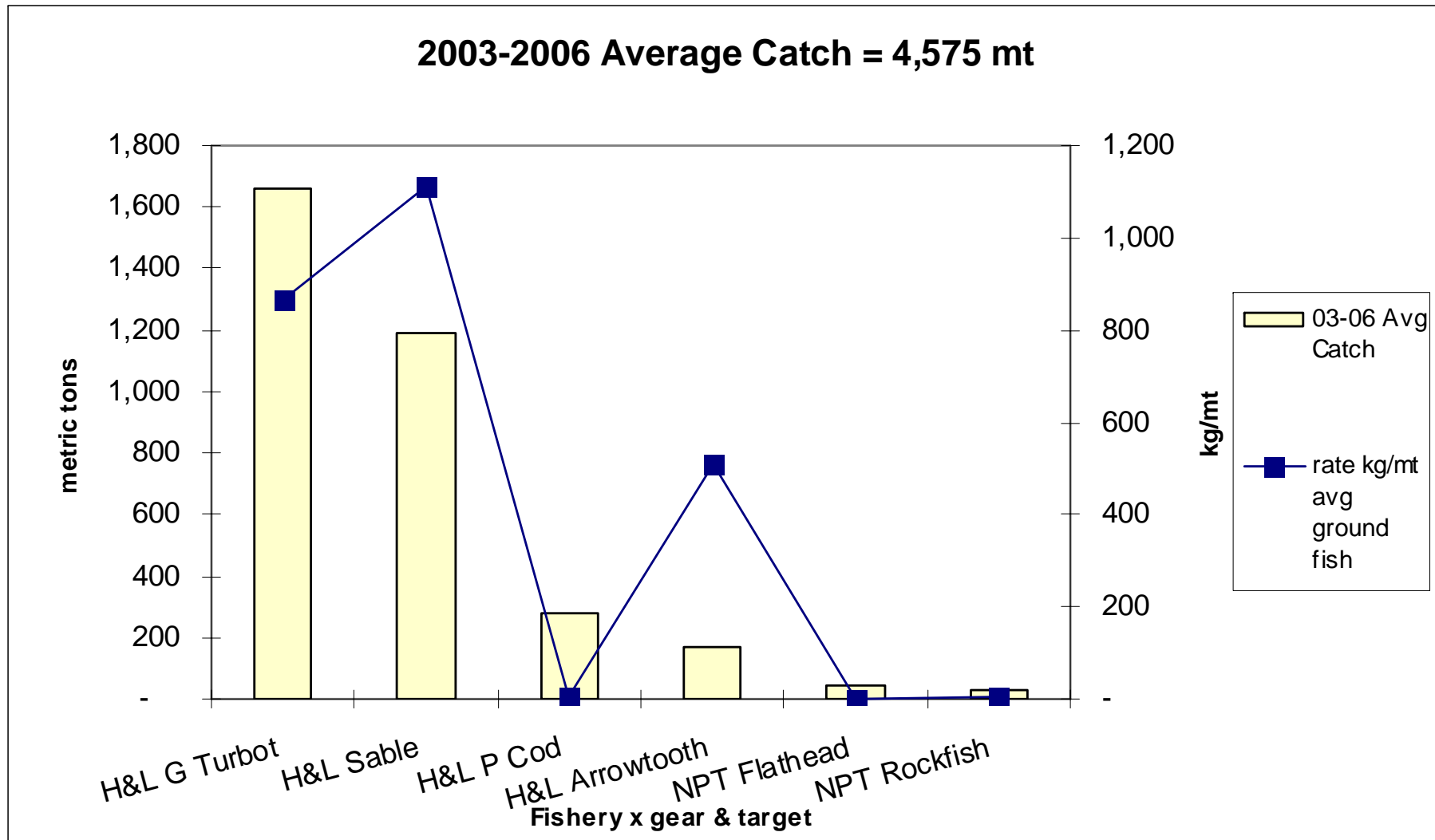


# Cumulative BSAI Grenadier Catch by Year (2004-06) Relative to ABC and OFL

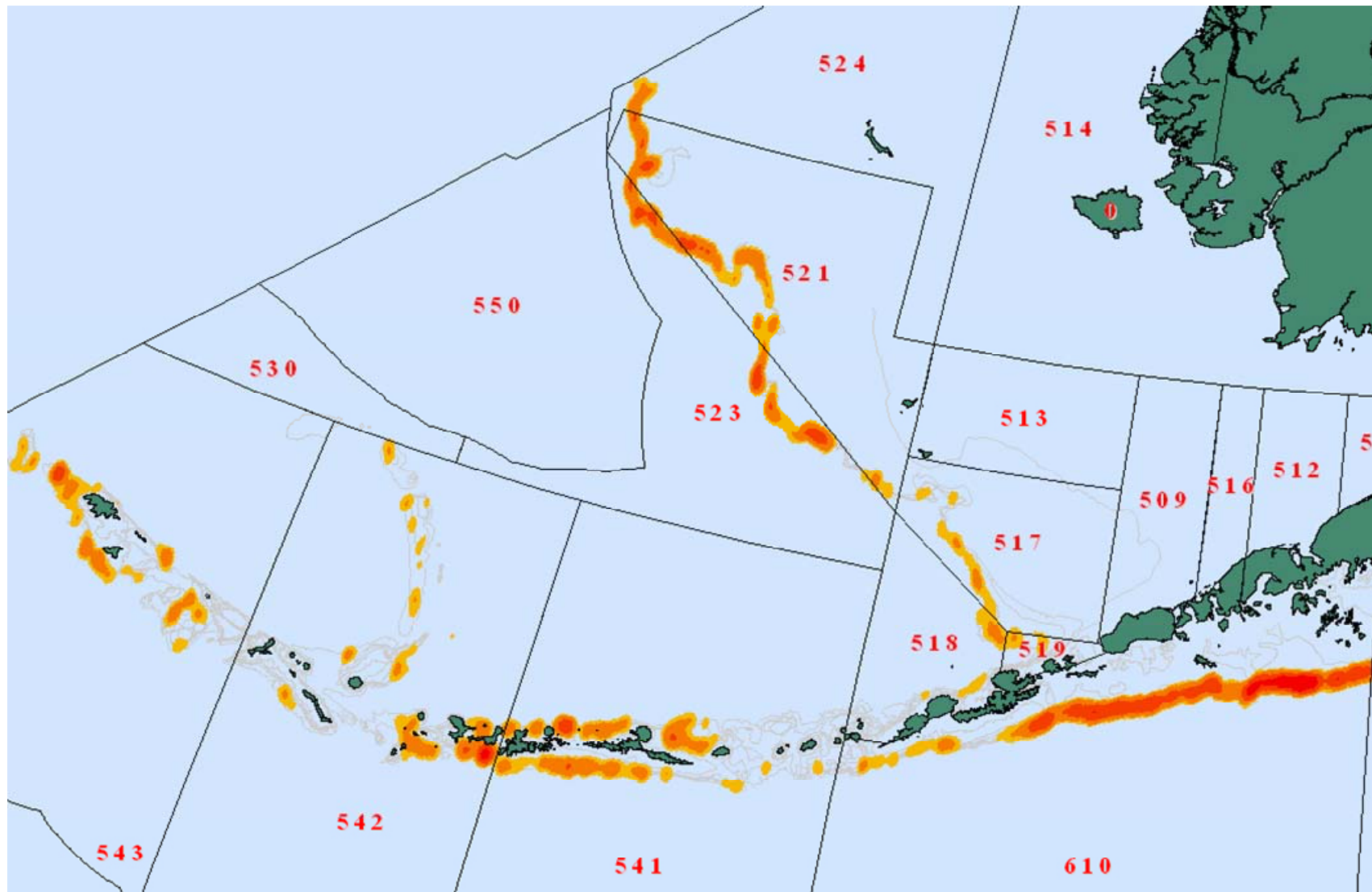




# BSAI Grenadier Average Catch by Gear and Target



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

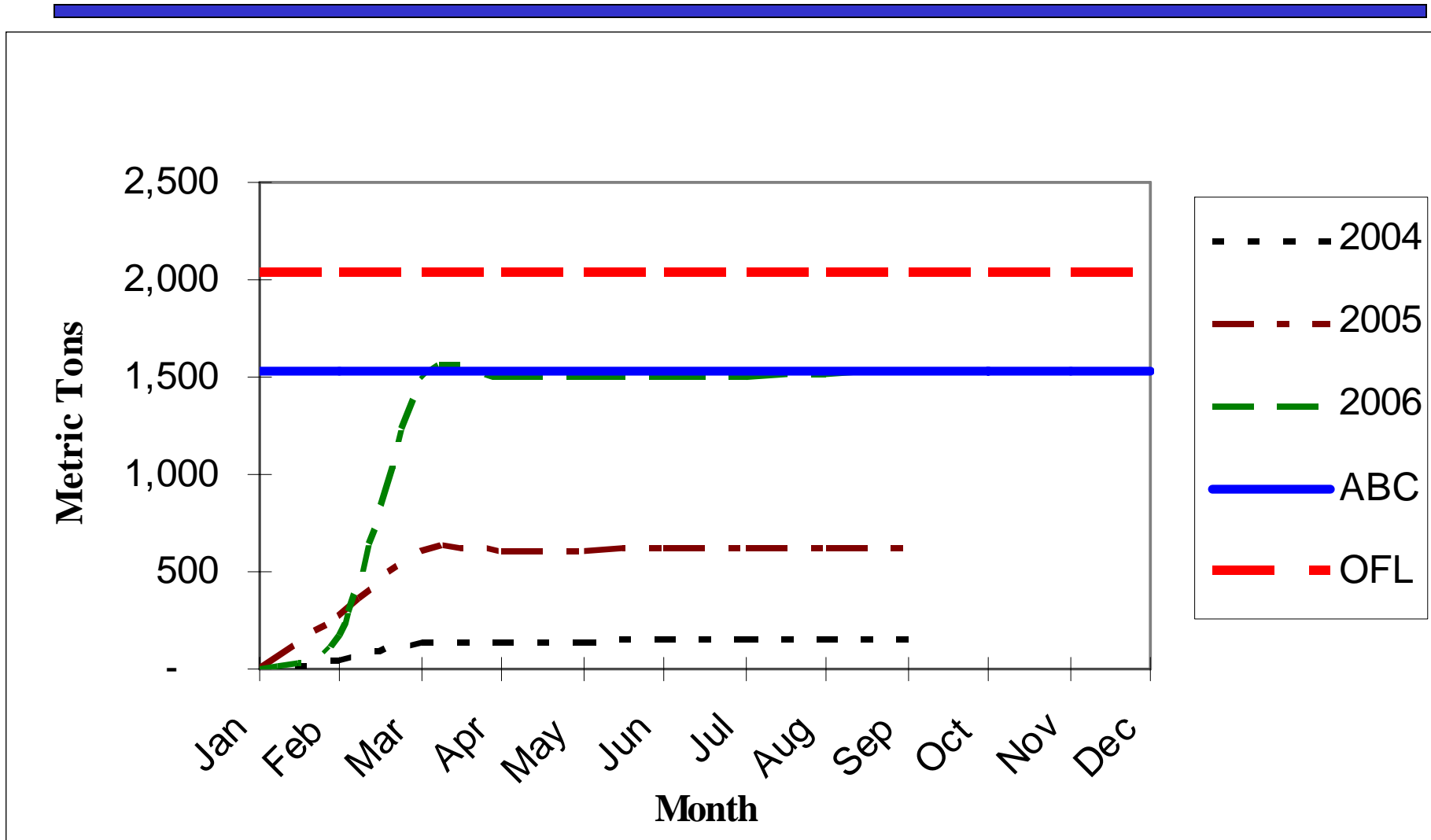


# BSAI Summary Table

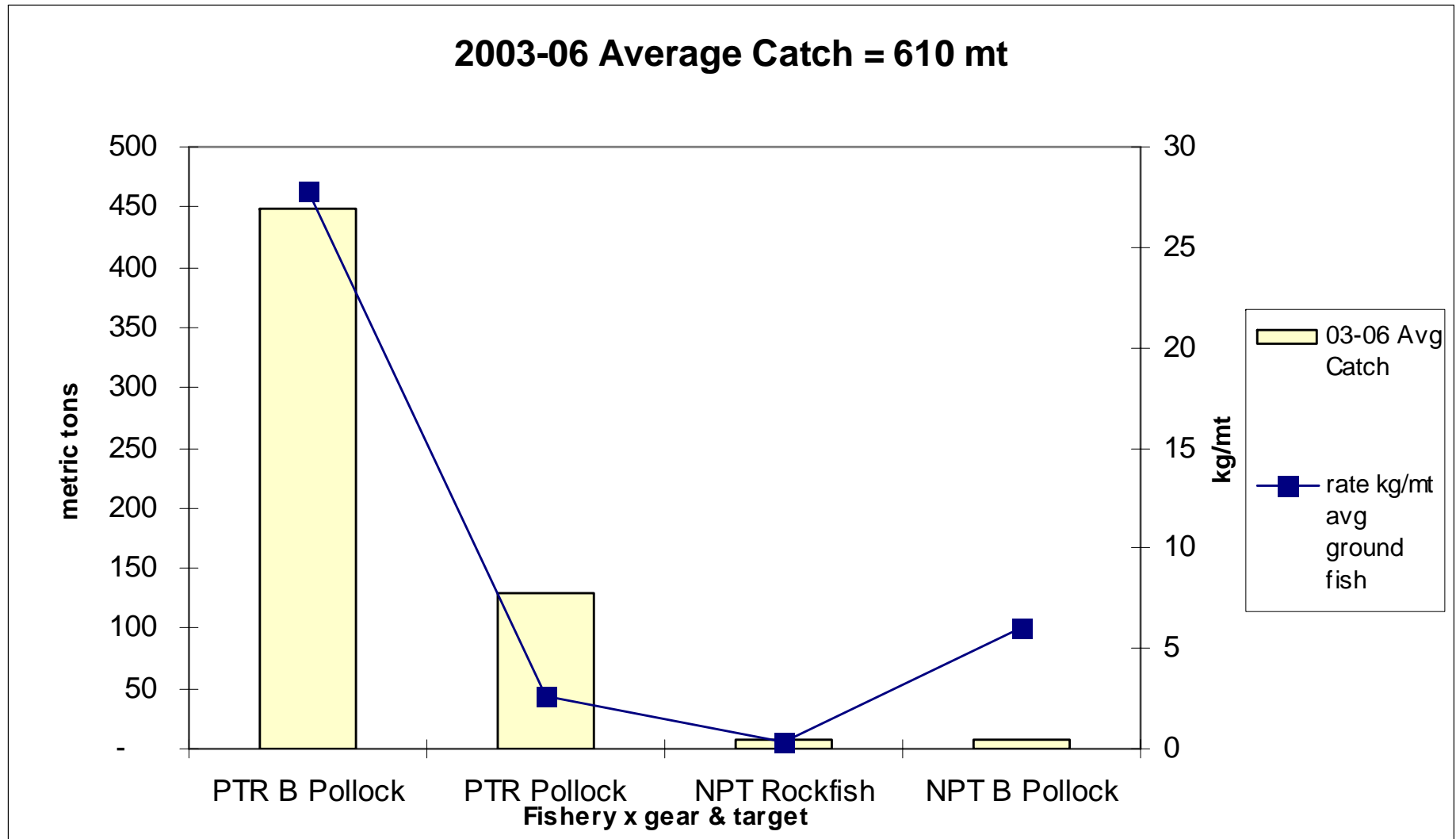
BSAI Species	Likely to Approach Benchmarks	Directed Fishery Possible	Gear/Target Potentially Affected	Spatial Context	Potential Management Measures	Potential Closure Timing
<b>Skates</b> (Tier 5)	No	Yes	Pacific cod H&L	Broad	Broad Closures	n/a
<b>Sharks</b> (Tier 6)	Yes	No	Pollock Pelagic Trawl, Pacific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



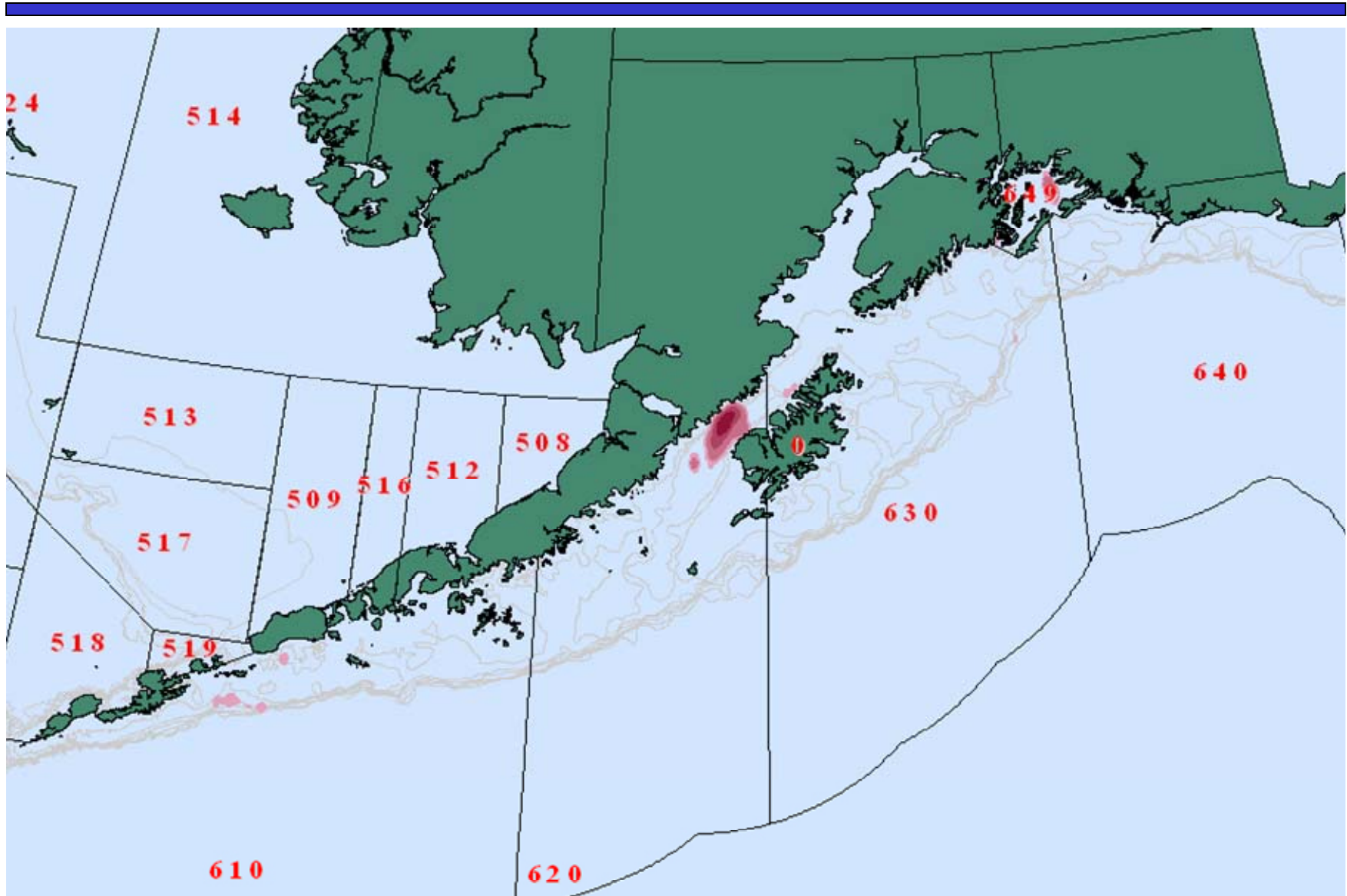
# Cumulative GOA Squid Catch by Year (2004-6) Relative to ABC and OFL



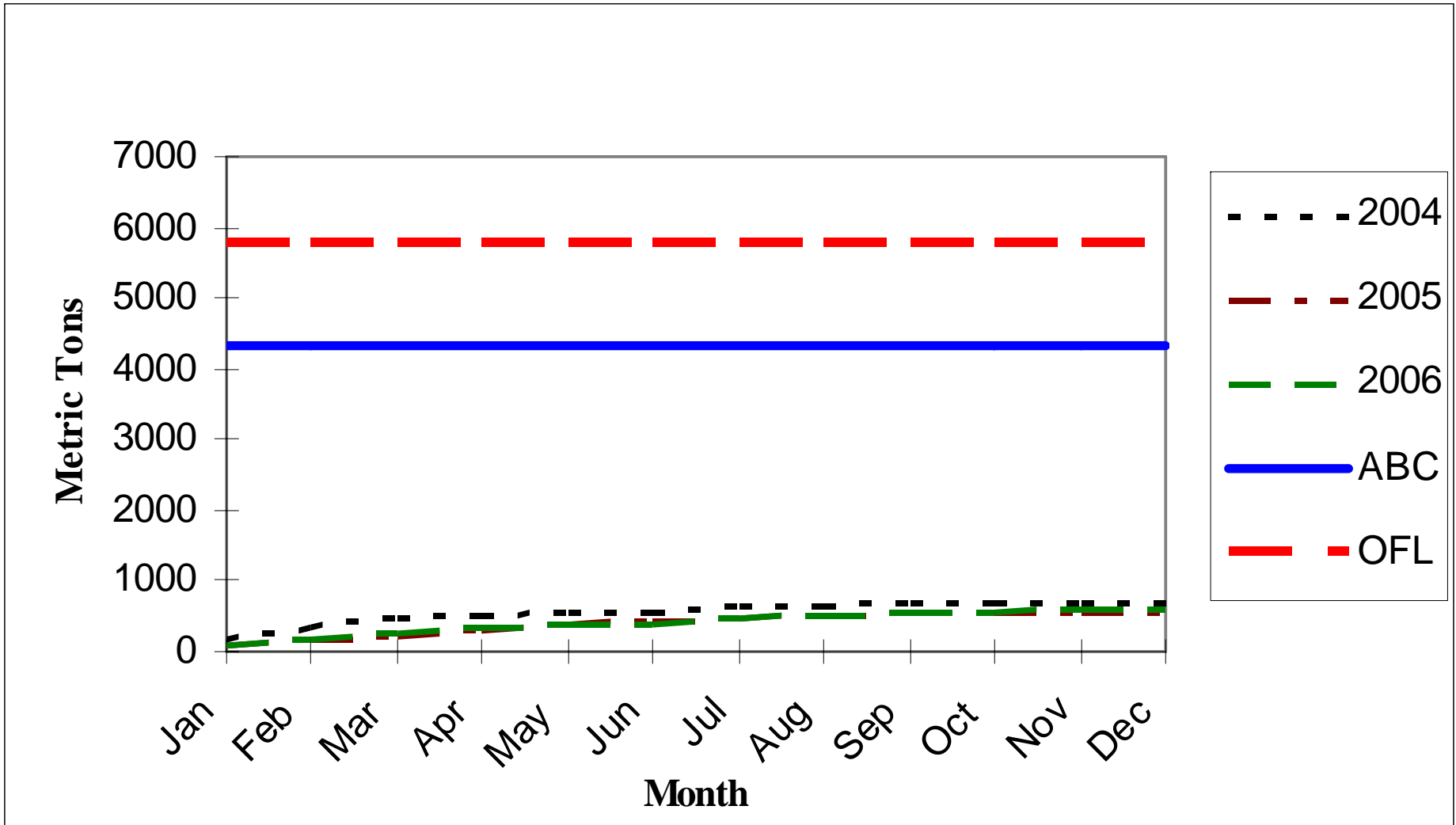
# GOA Squid Average Catch by Gear and Target



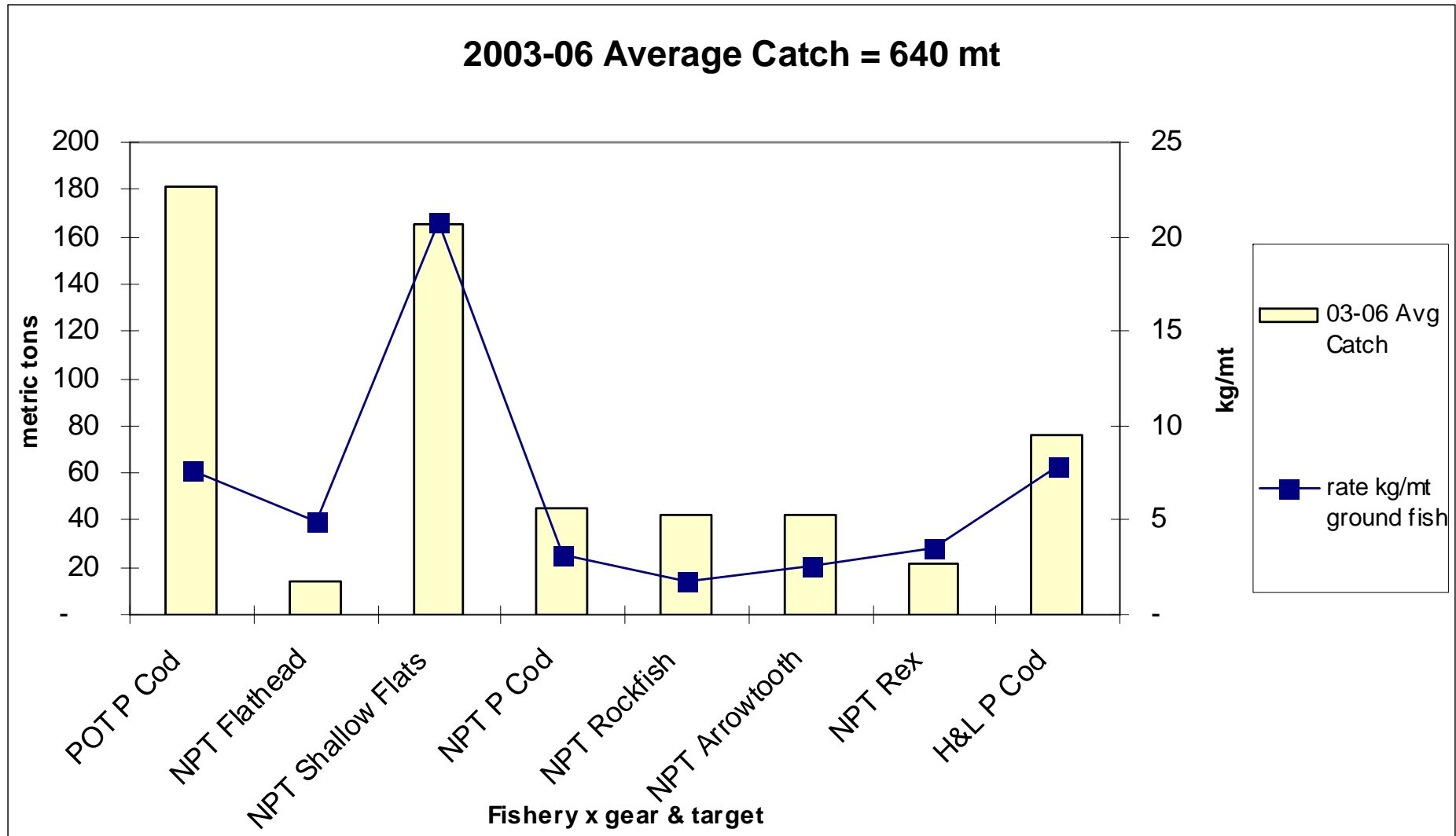
# GOA Squid Catch Density (kg/mt groundfish) 2003-2006



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

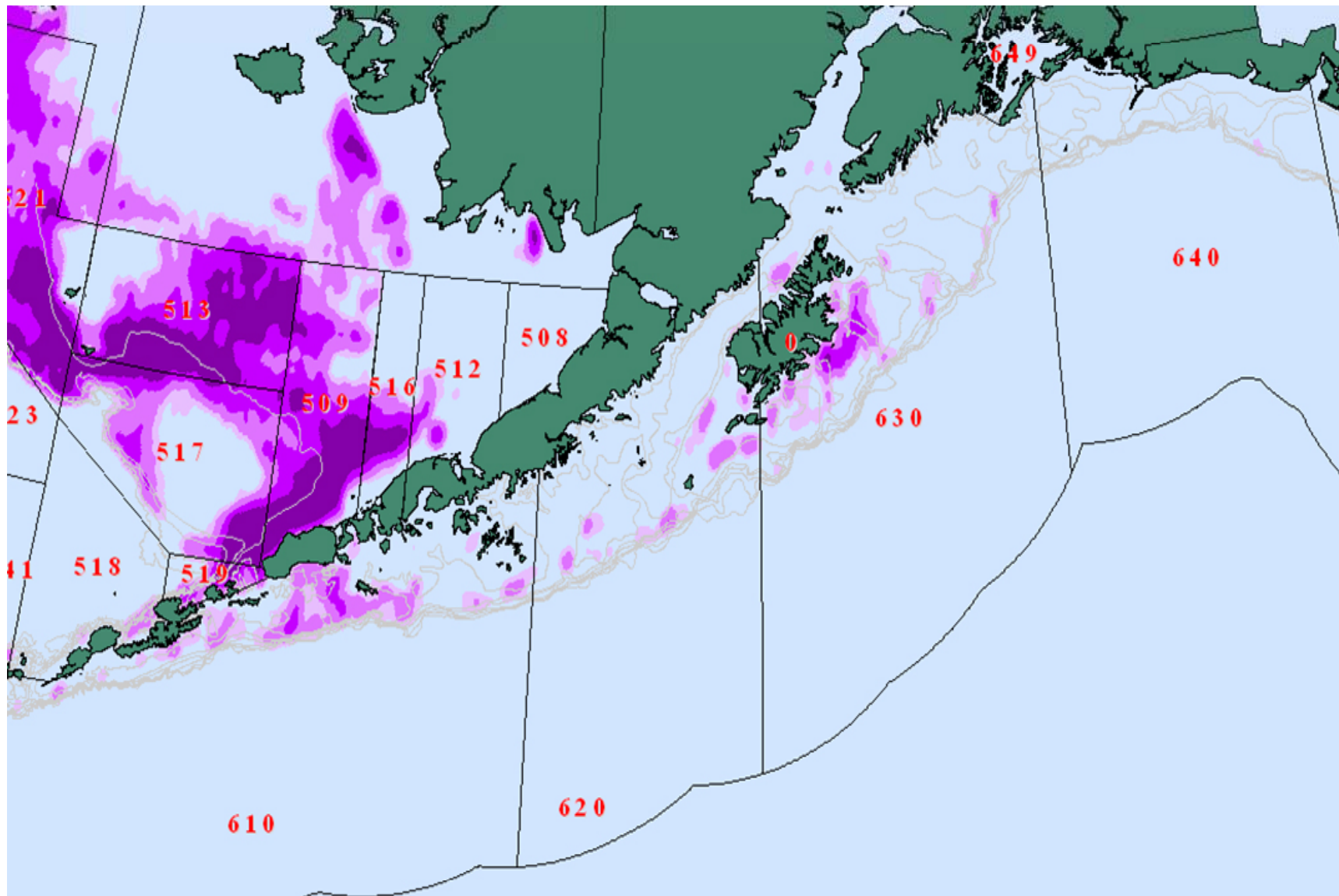


# GOA Sculpins Average Catch by Gear and Target

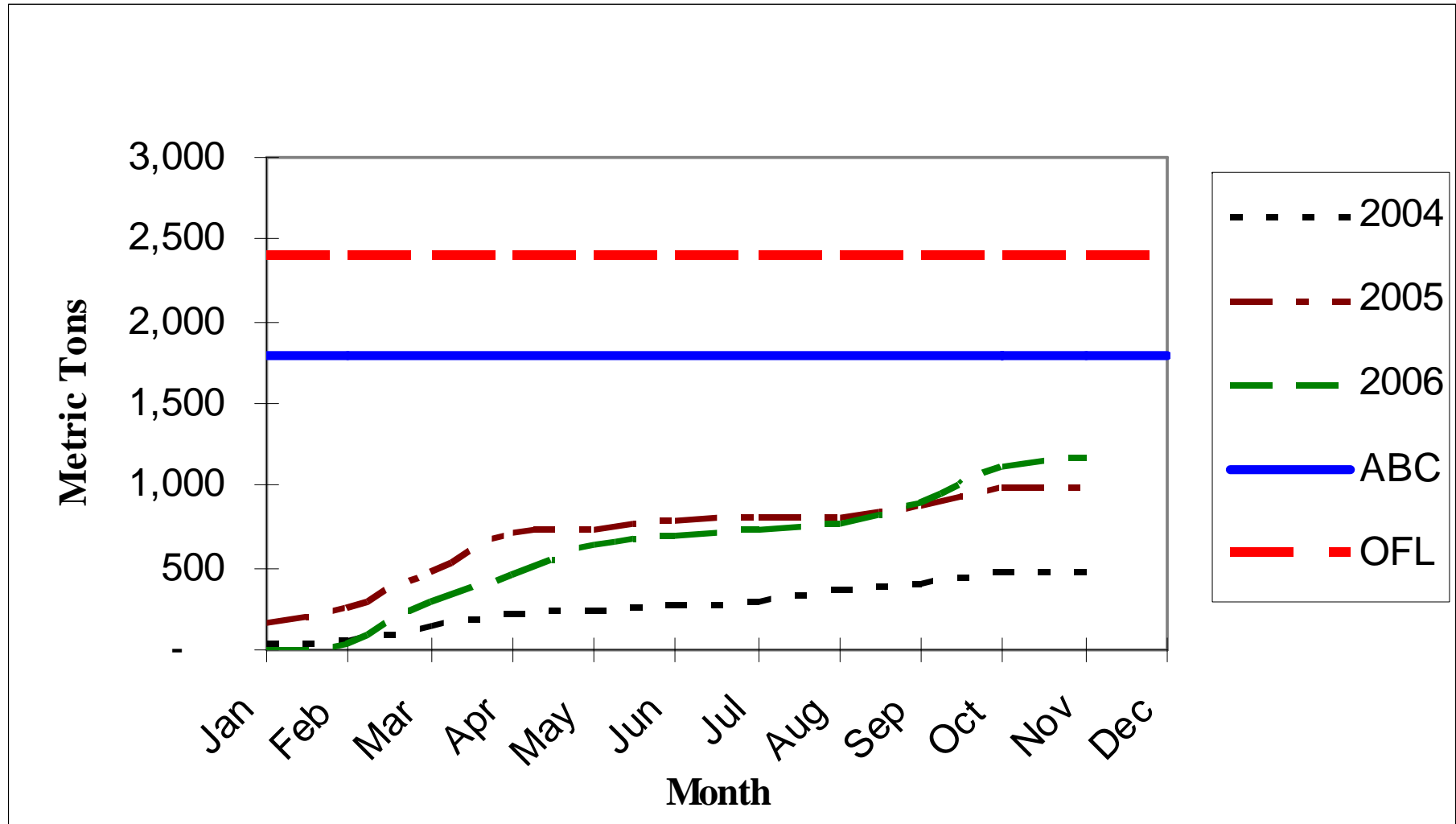




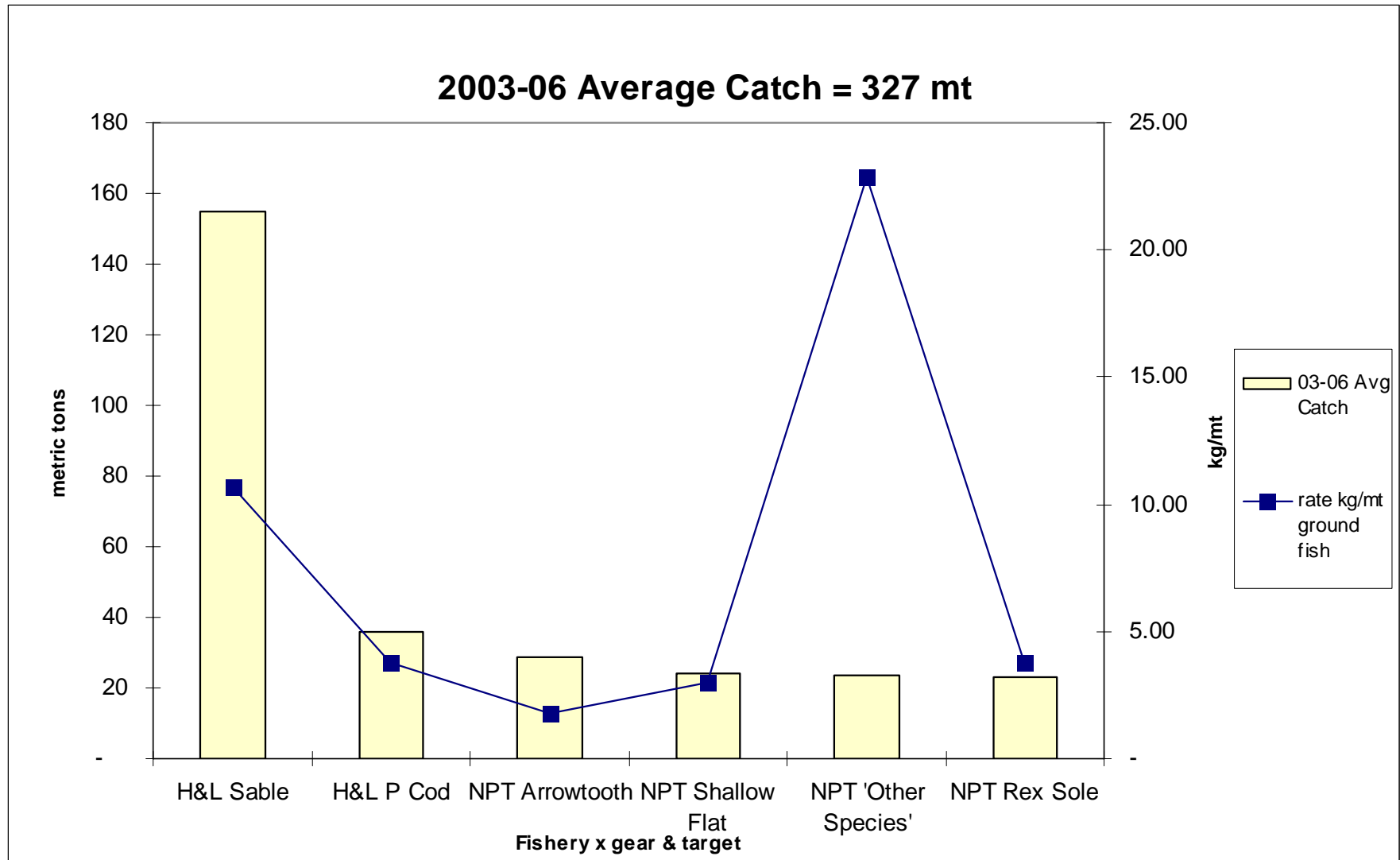
# GOA Sculpin Catch Density (kg/mt groundfish) 2003-2005



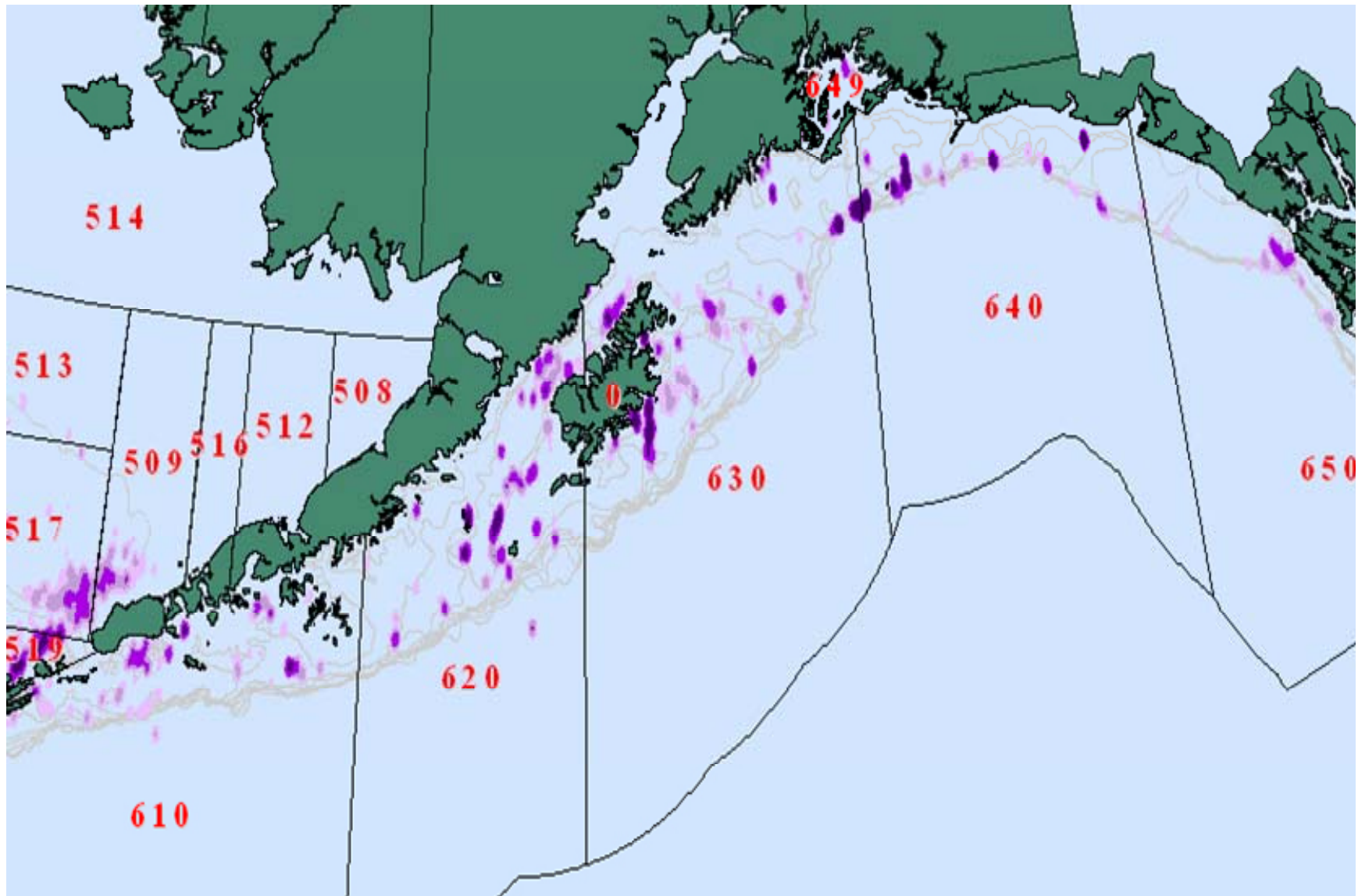
# Cumulative GOA Sharks Catch by Year (2004-6) Relative to ABC and OFL



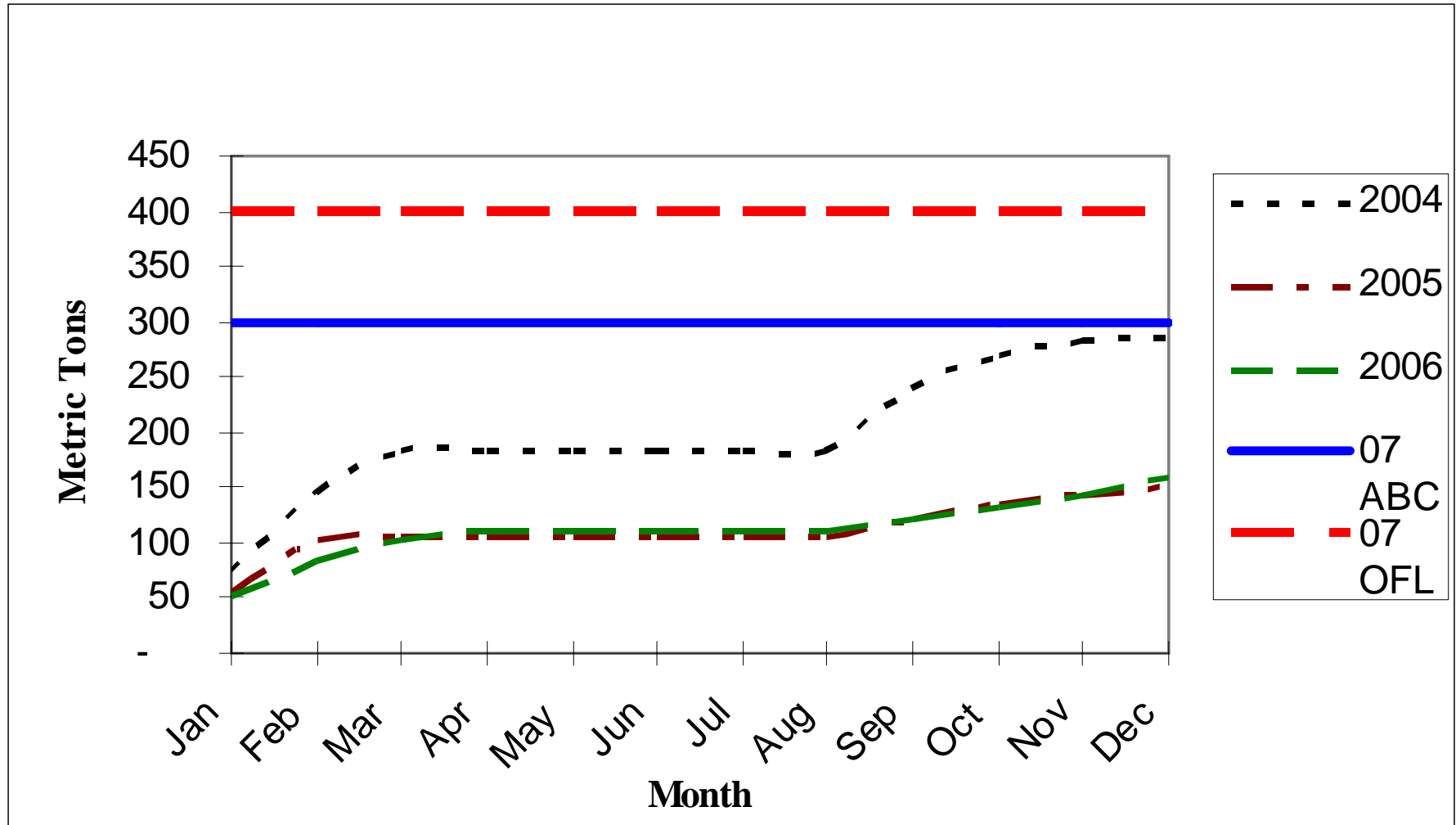
# GOA Shark Average Catch by Gear and Target



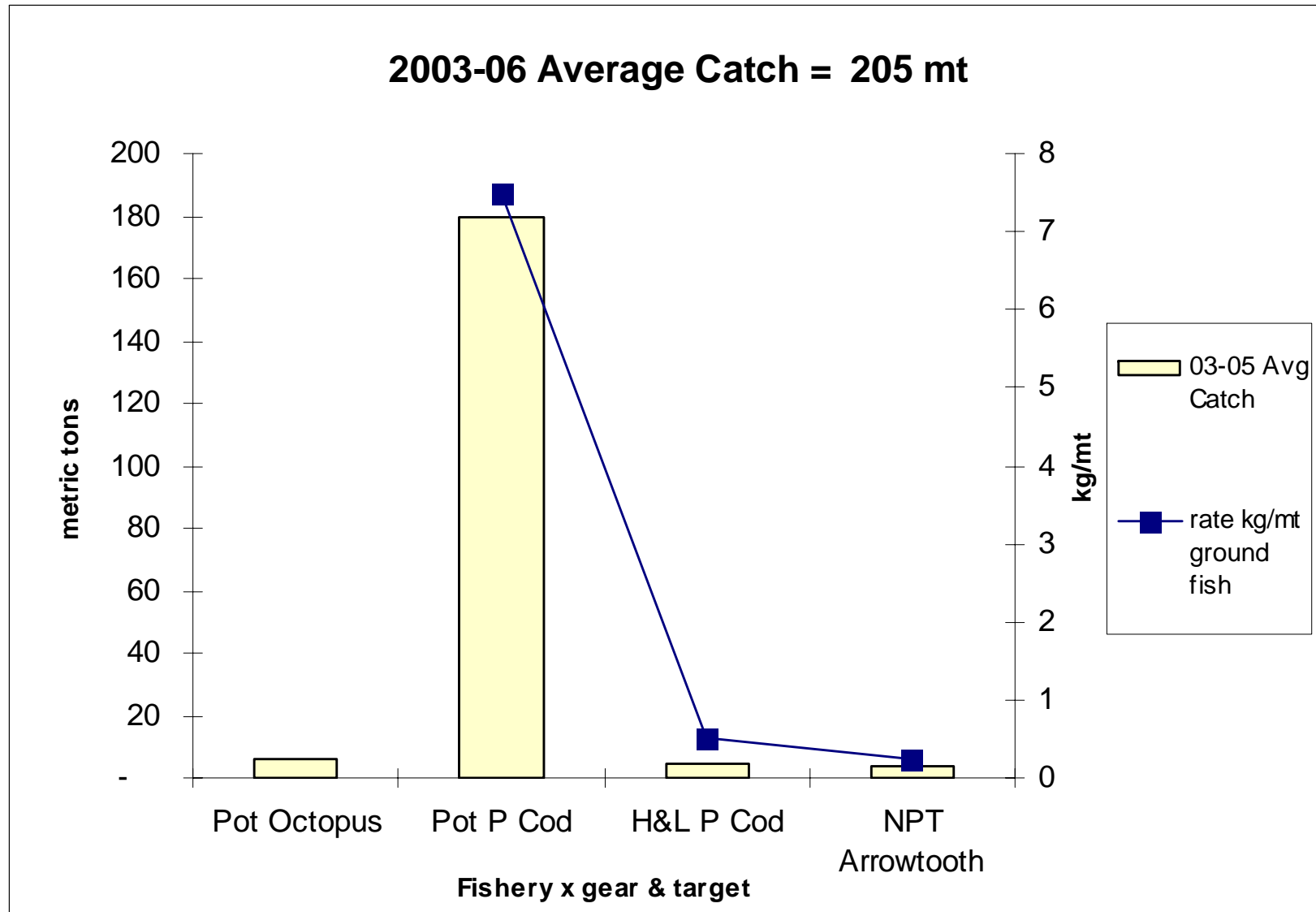
# GOA Shark Catch Density (kg/mt groundfish) 2003-2005



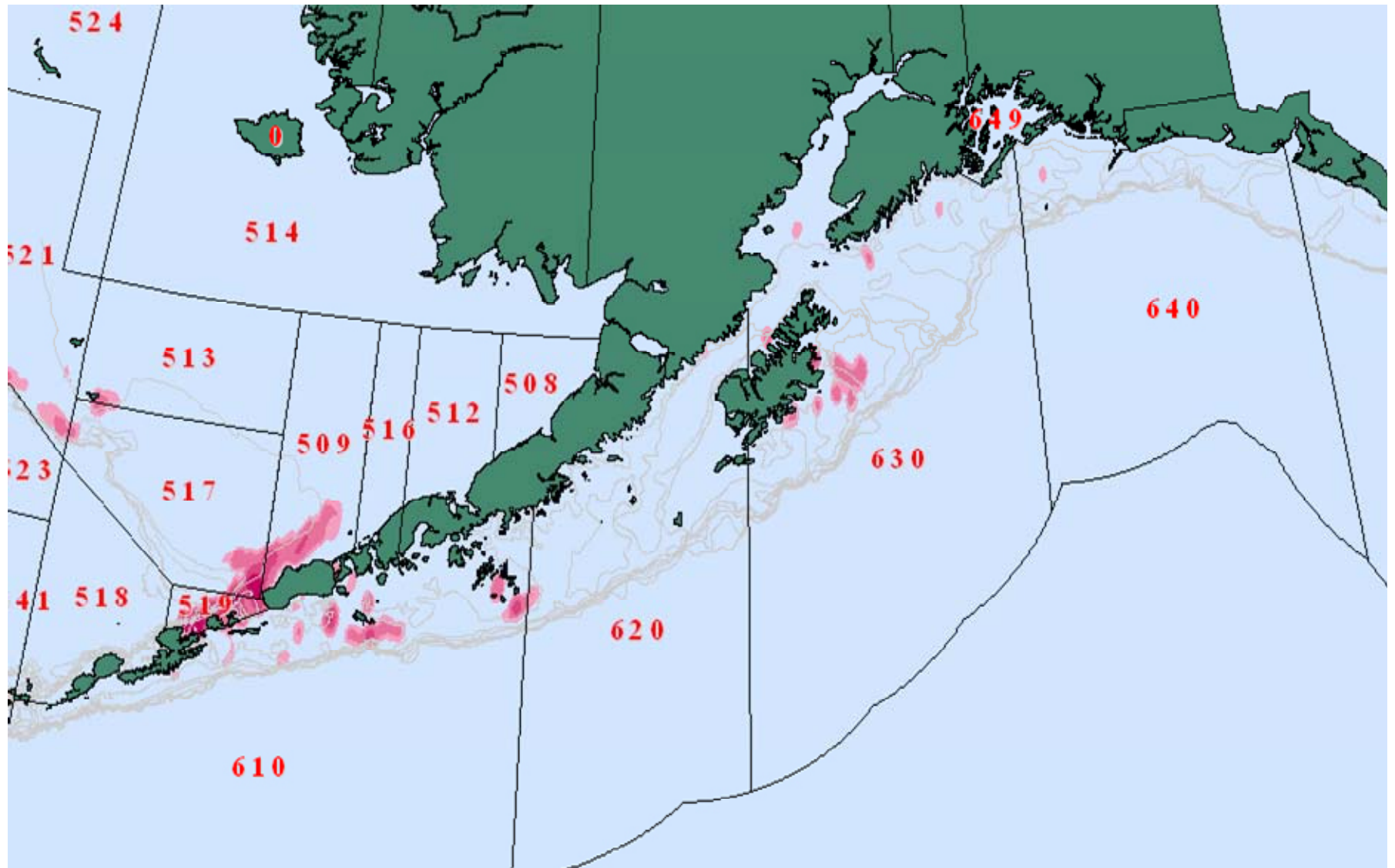
# Cumulative GOA Octopi Catch by Year (2004-2006) Relative to OFL and ABC



# GOA Octopi Average Catch by Gear and Target



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



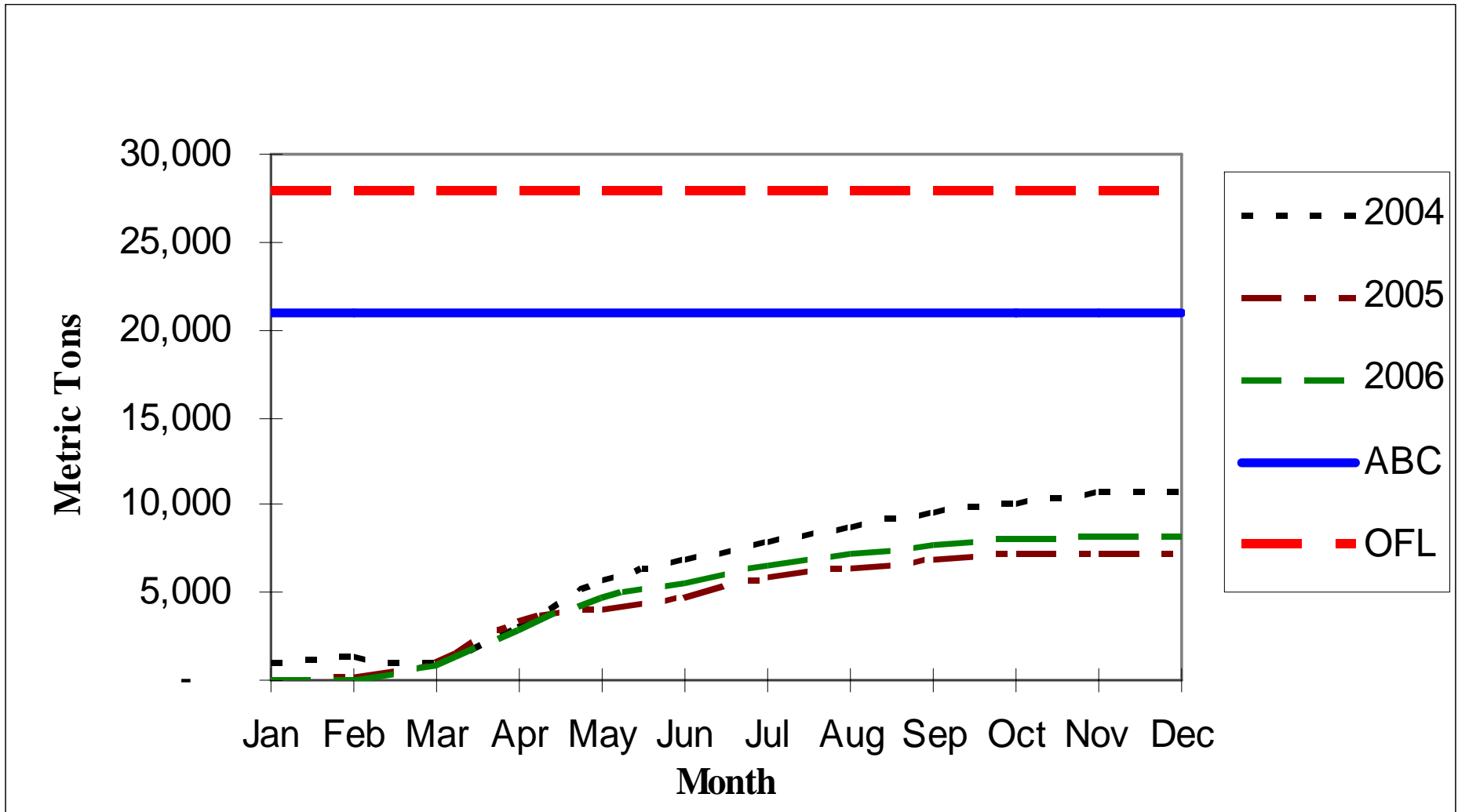
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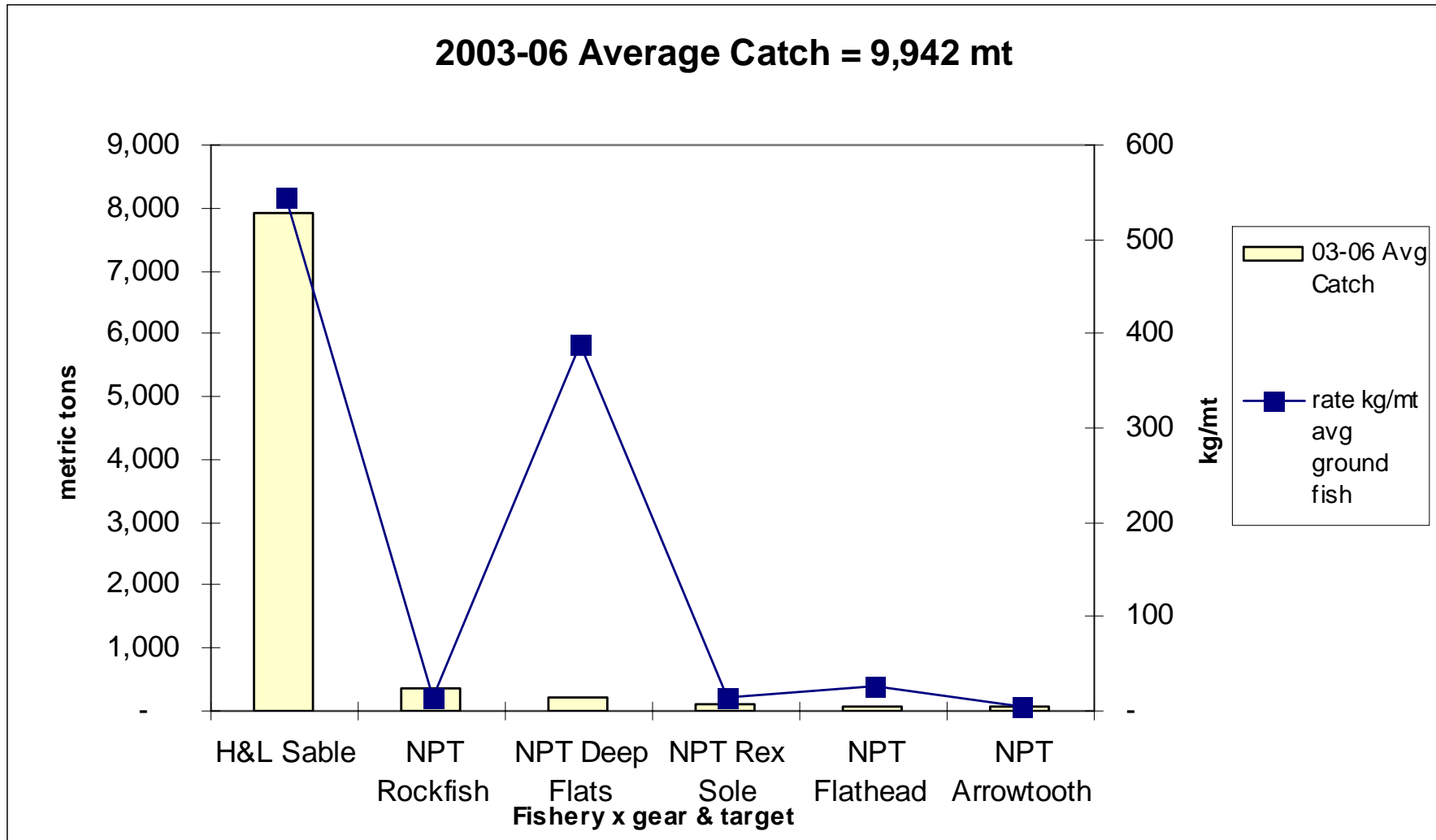


# Cumulative GOA Grenadier Catch by Year (2004-06) Relative to ABC and OFL

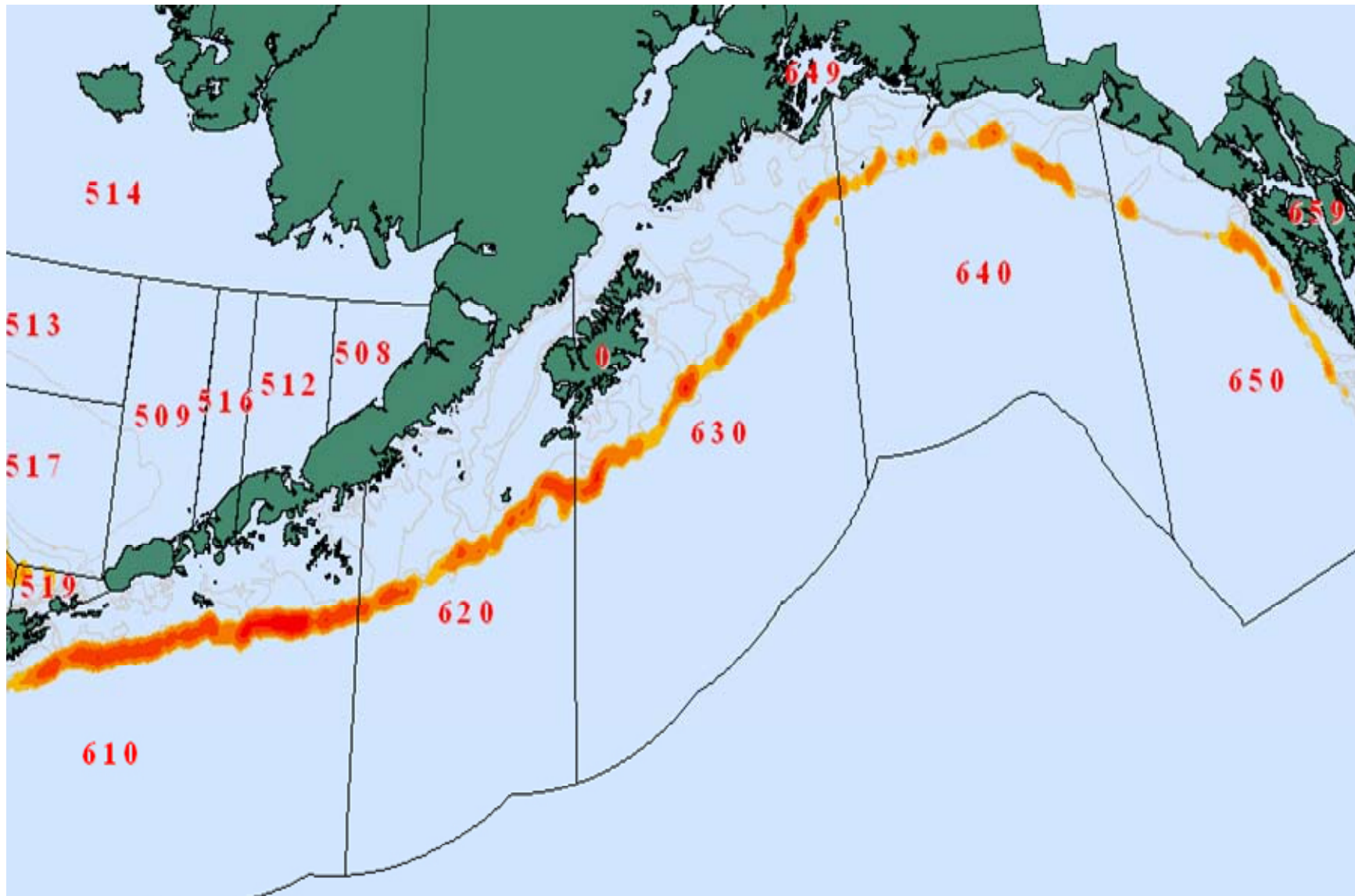




# GOA Grenadier Average Catch by Gear and Target



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



# GOA Summary Table

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



## Overview of Alternative 2: BSAI

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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.

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- 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

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- 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

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- The analysis assumes that management measures would be needed but voluntary avoidance of discrete areas could be used
- 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

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- 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

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- 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

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- 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.

