

Economic Impacts of Reducing Bering Sea and Aleutian Islands Prohibited Species Catch Limits for Halibut

Presentation to

North American Association of Fishery Economists

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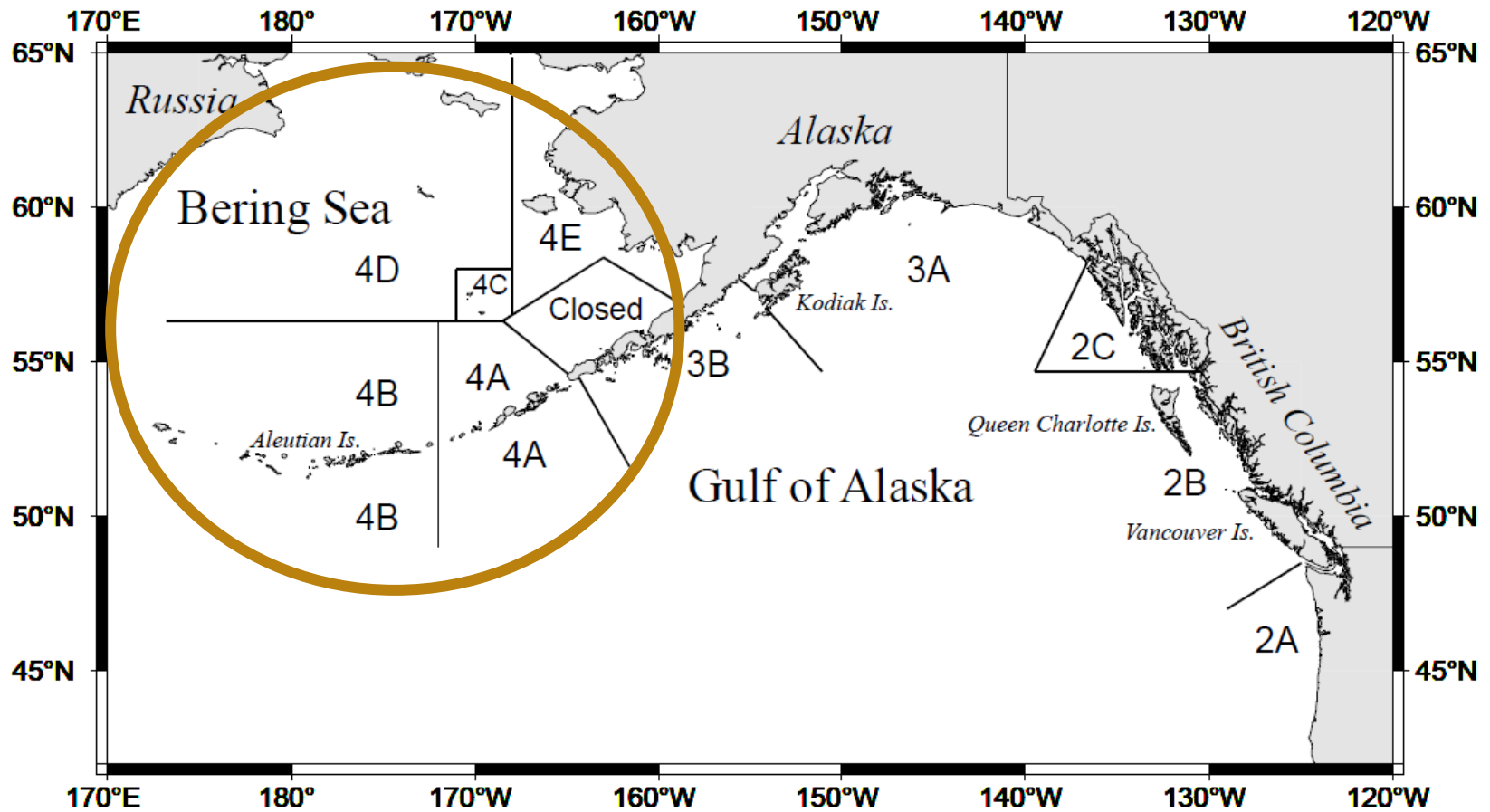
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Pacific Halibut Management

- **Stock assessments and determination of area by area yield are the responsibility of the International Pacific Halibut Commission (IPHC)**
- **Allocations of harvest to user groups are determined regionally by US Fishery Councils and Department of Fisheries and Oceans Canada**
- **In Alaska, allocation issues are determined by the North Pacific Fishery Management Council, which provided all of the funding for this study**

IPHC Management Areas



Pacific Halibut in Alaska

- There are four Primary User Groups
- Commercial Halibut Fishery—an IFQ longline fishery since 1995
- Three “non-market” user groups
 - Subsistence and Personal Use
 - Recreational Users—independent anglers & charter operations
 - Groundfish Fishery-takes halibut as incidental catch, but retention is **prohibited**, and **catch** of this **species** is strictly limited
 - ◆ PSC-based closures to groundfish fisheries are imposed if **PSC Limits** are reached (with a few exceptions).
- In the BSAI (Area 4) subsistence and recreational harvests are relatively minor (37 mt from 2005–13)

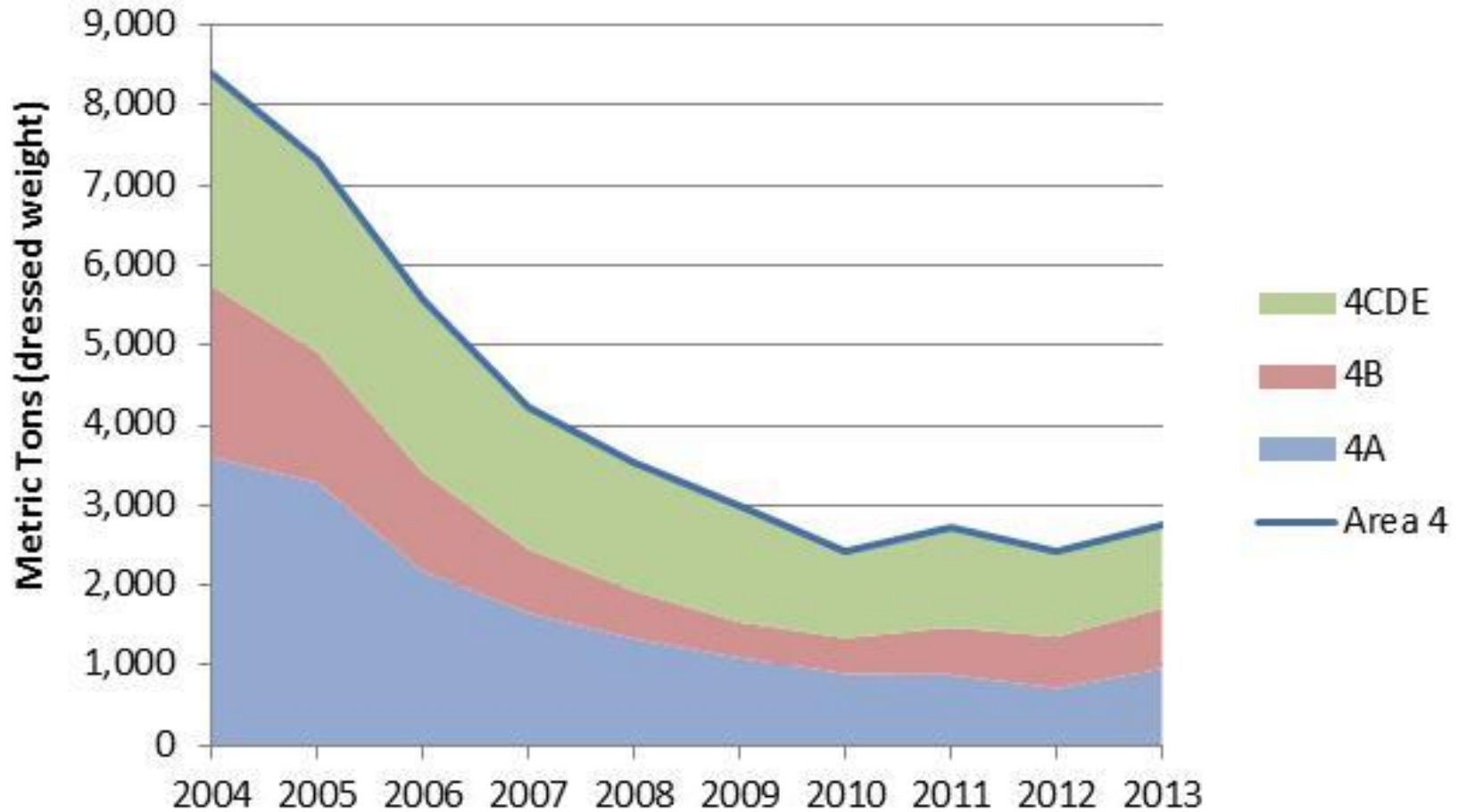
The Proposed Action

- **Increase the amount of halibut available for harvest by commercial halibut fishery**
- **By re-allocating halibut from the groundfish fishery in which it is a prohibited species taken incidentally**

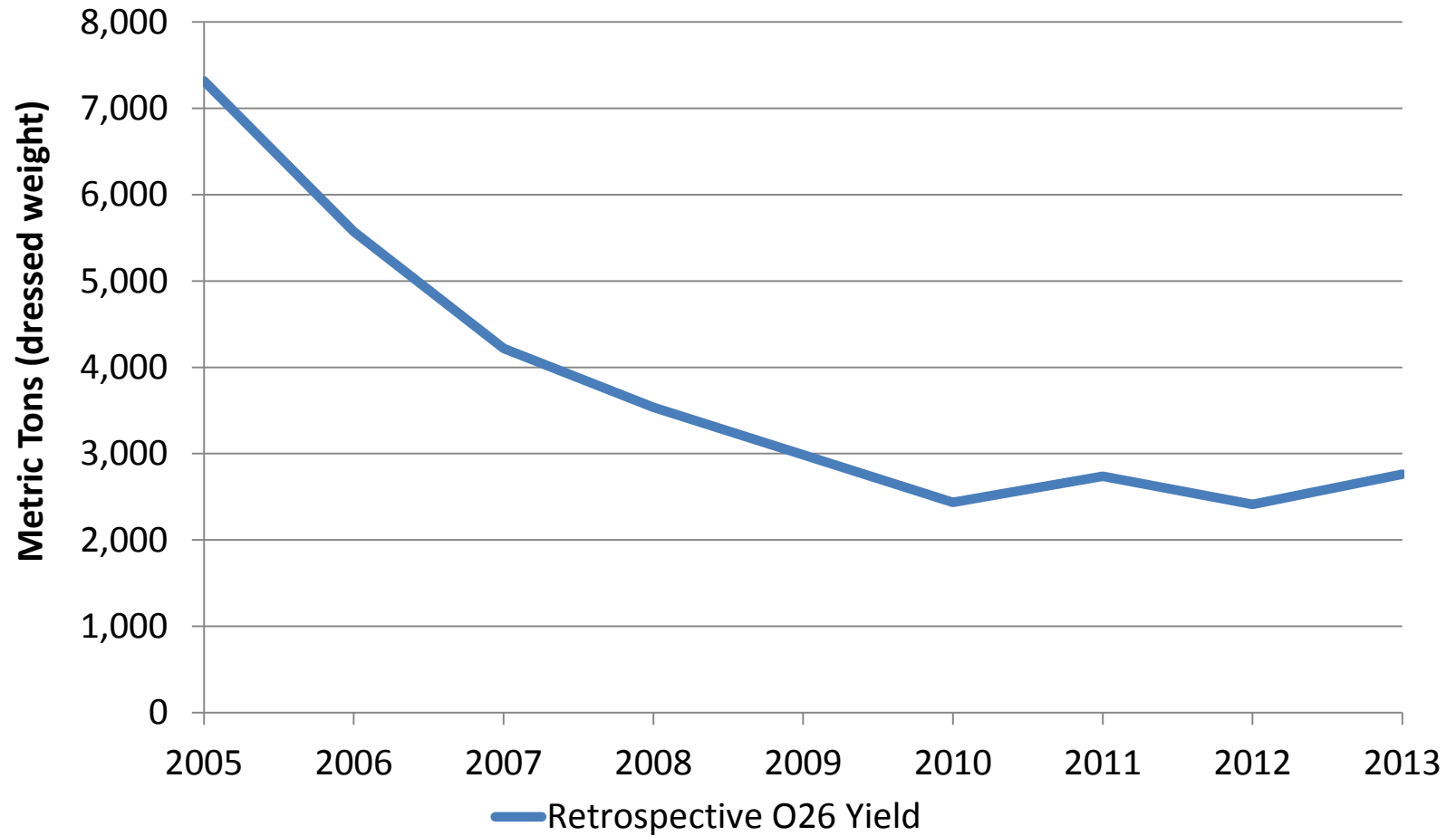
IPHC Biomass and Exploitable Yields

- **IPHC stock scientists determined in 2011 that their assessment models had a “retrospective” bias**
- **Exploitable Yields have been adjusted downward both looking backward and looking forward**
- **The downward trends have been very significant**

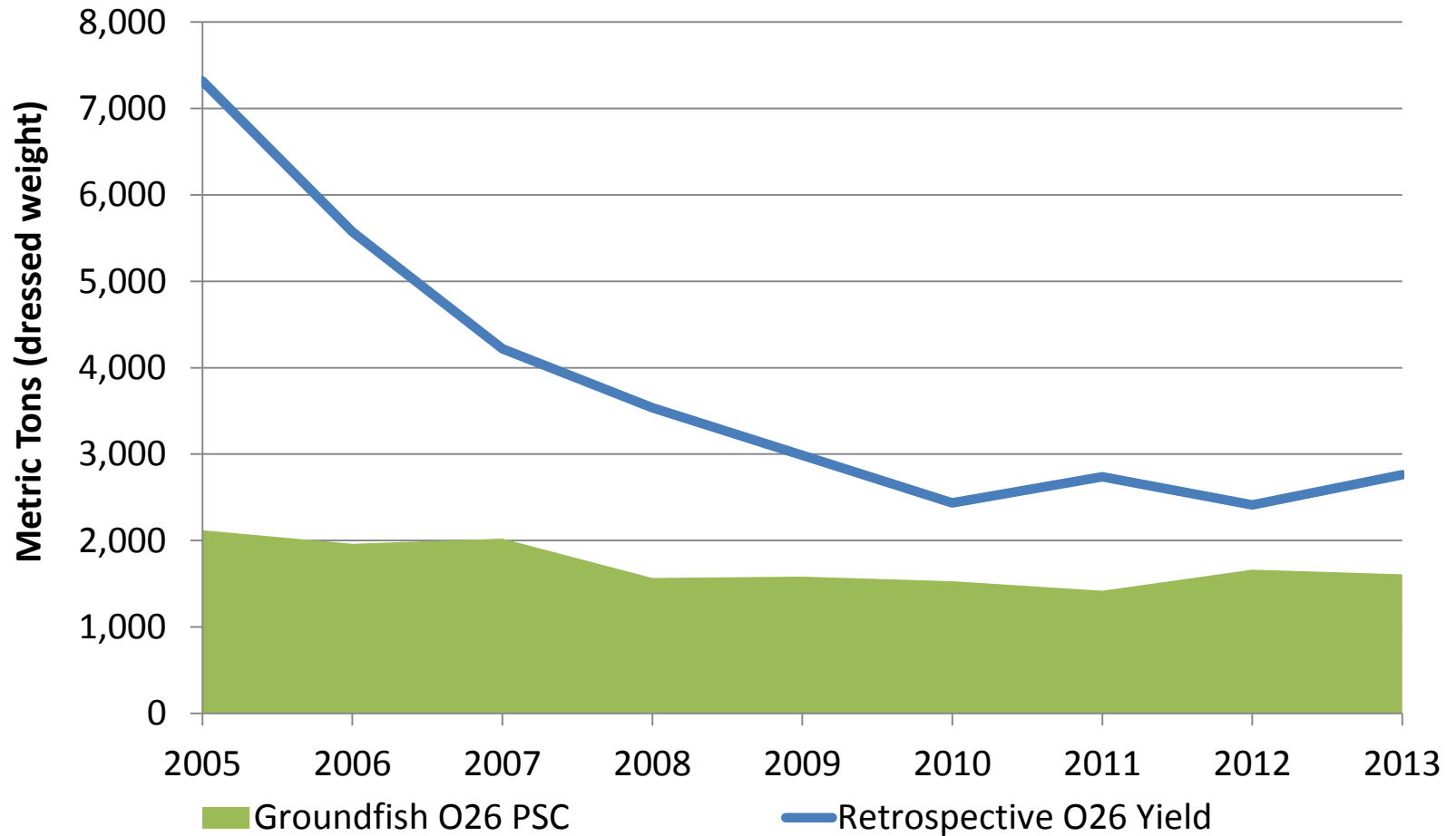
Current Estimate of Historical O26 Yield



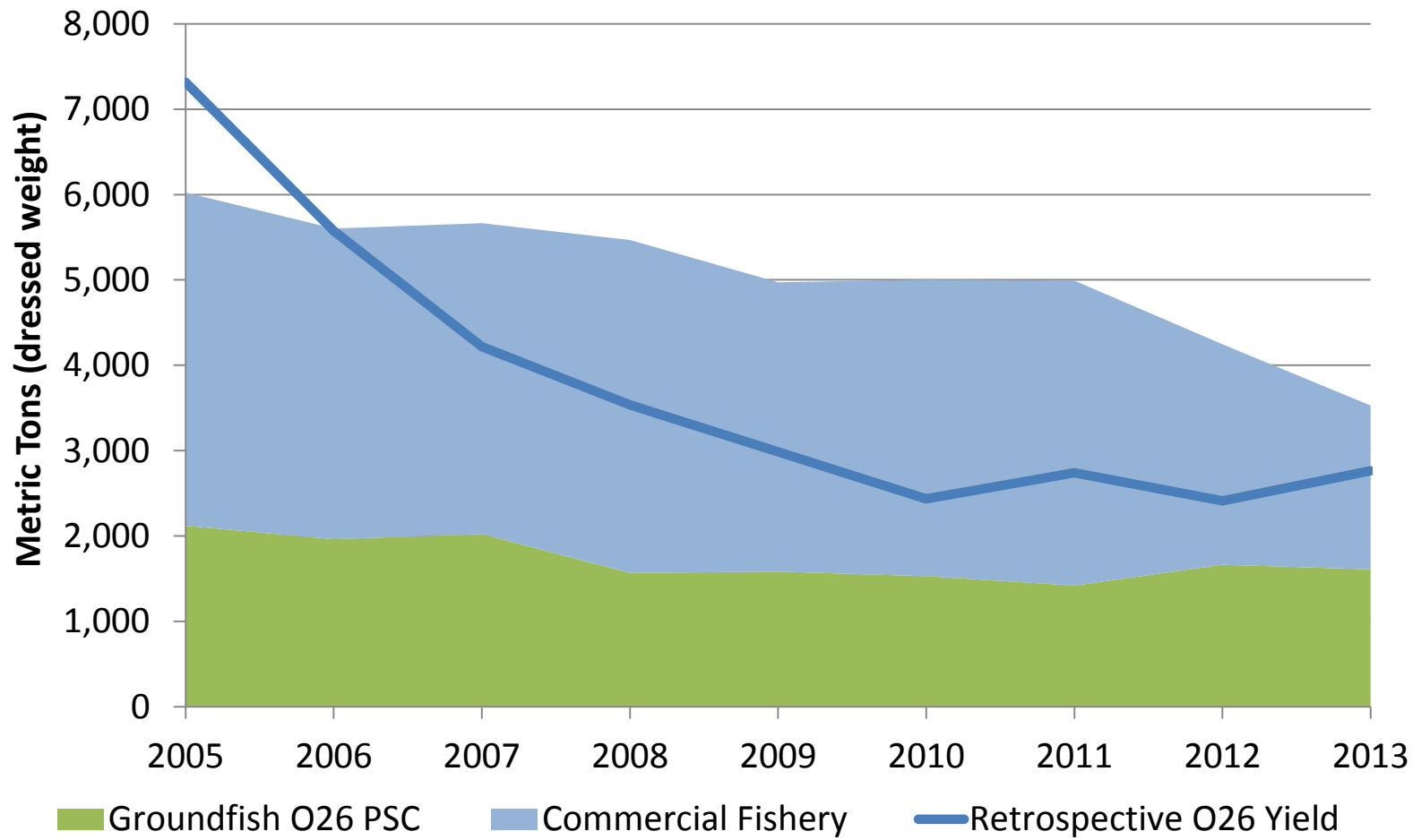
Area 4 O26 Yield



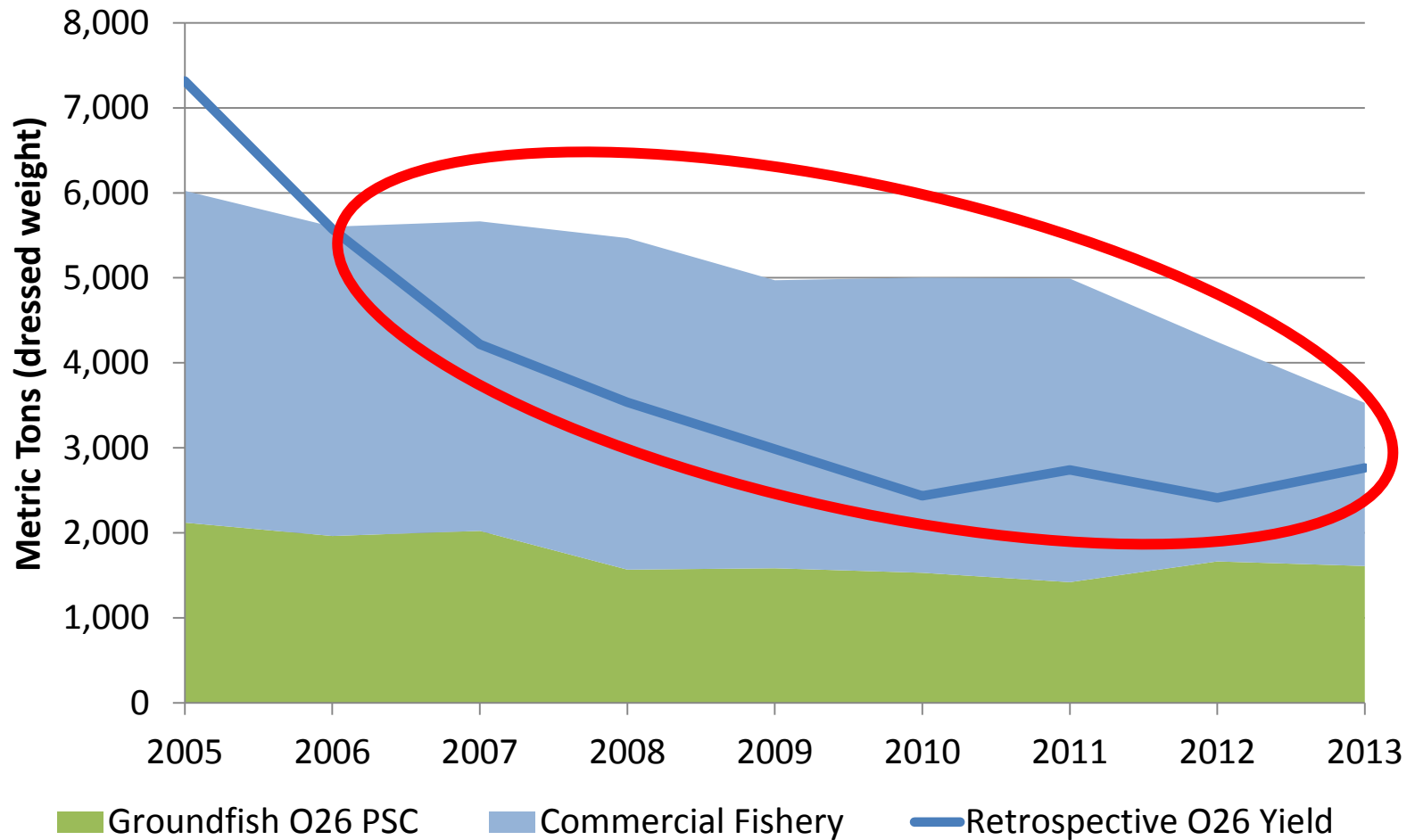
Area 4 O26 Yield, Groundfish PSC



Area 4 O26 Yield, Groundfish PSC & Commercial Harvest

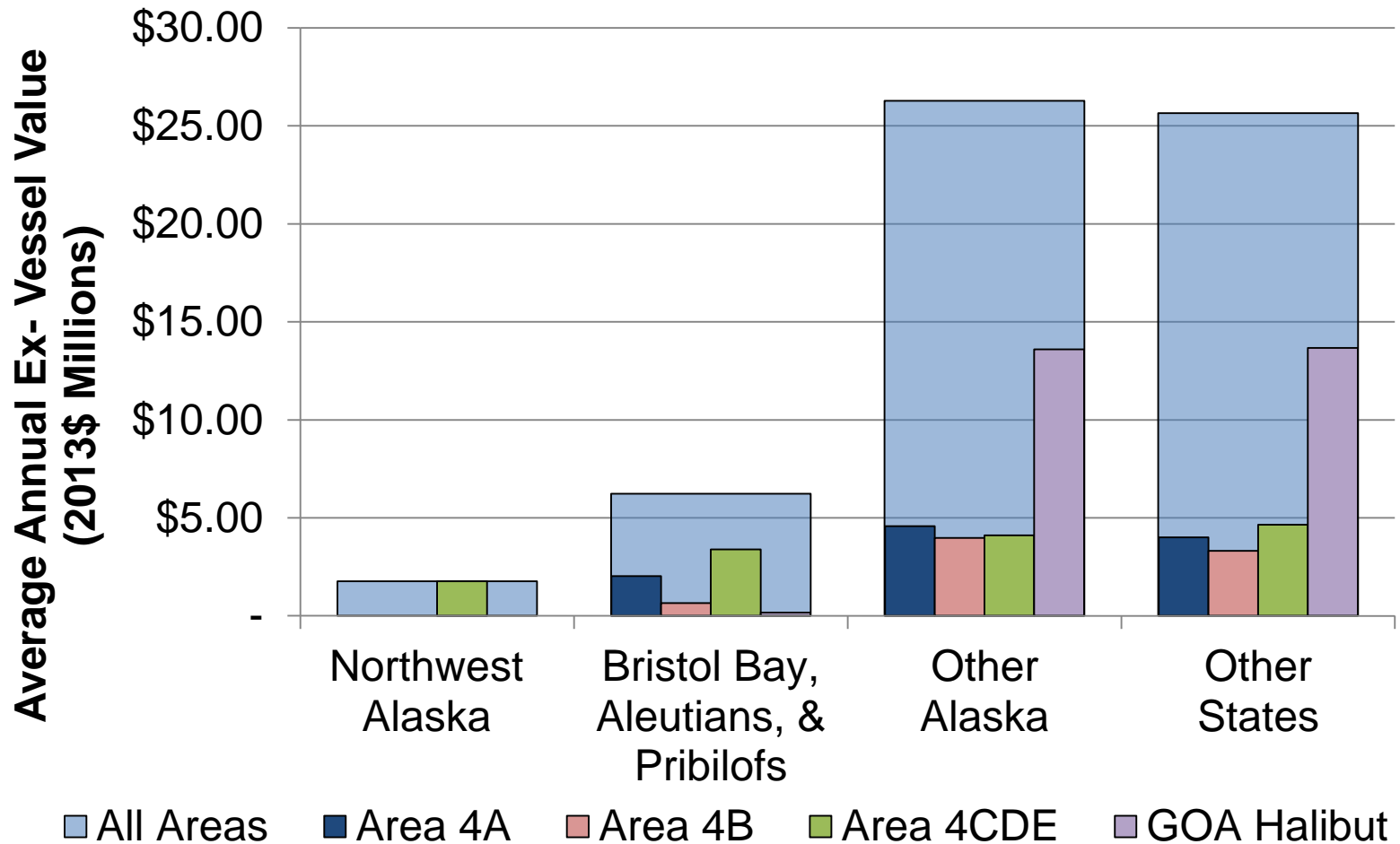


Area 4 O26 Yield, Groundfish PSC & Commercial Harvest



The area within the circle represents commercial halibut harvests that would not have occurred, if the stock model was free of retrospective bias.

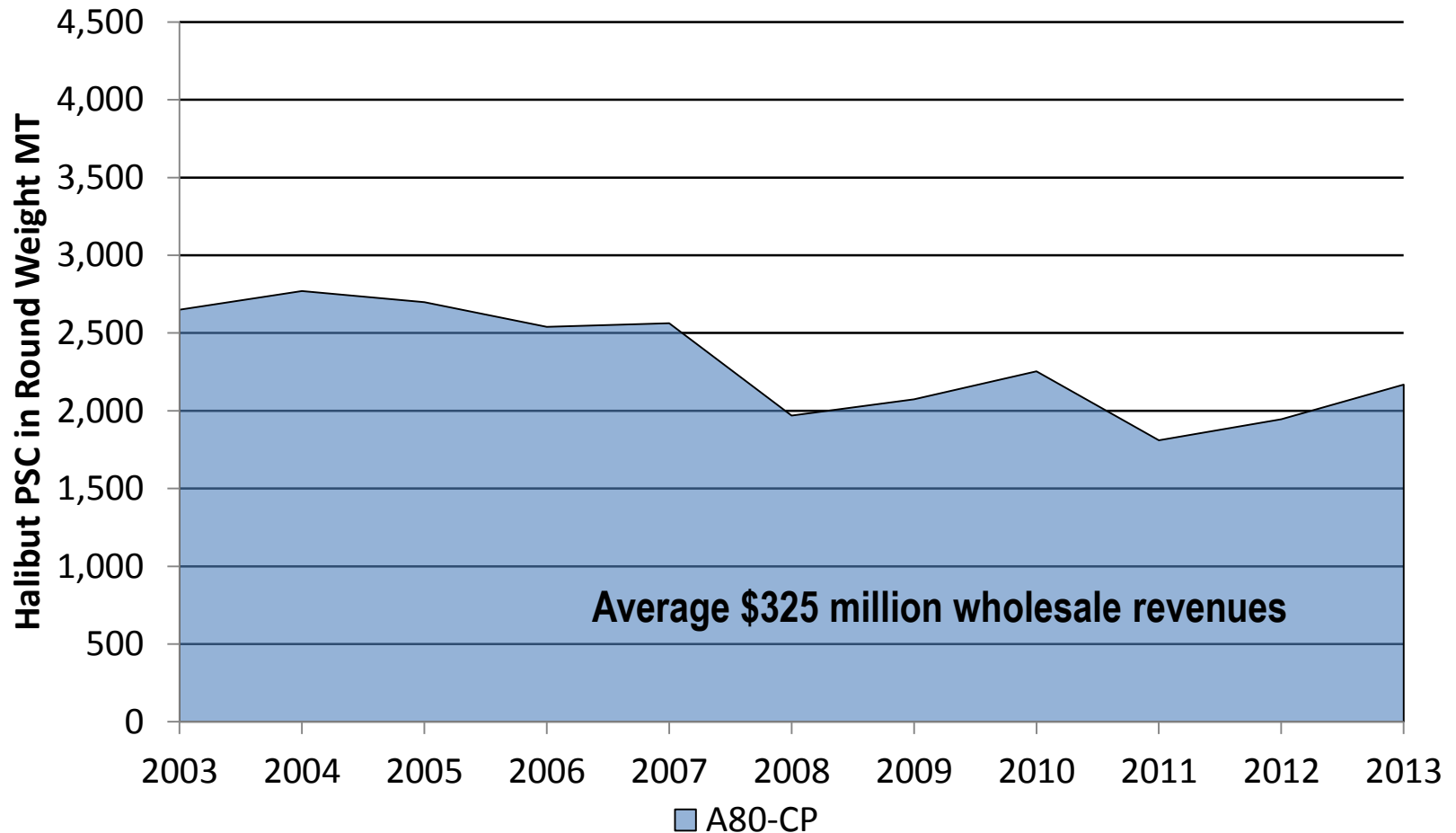
Commercial Halibut Fishery from 2008–2013



Area 4 halibut harvests are dominated by non-local Alaskans & residents of Other States

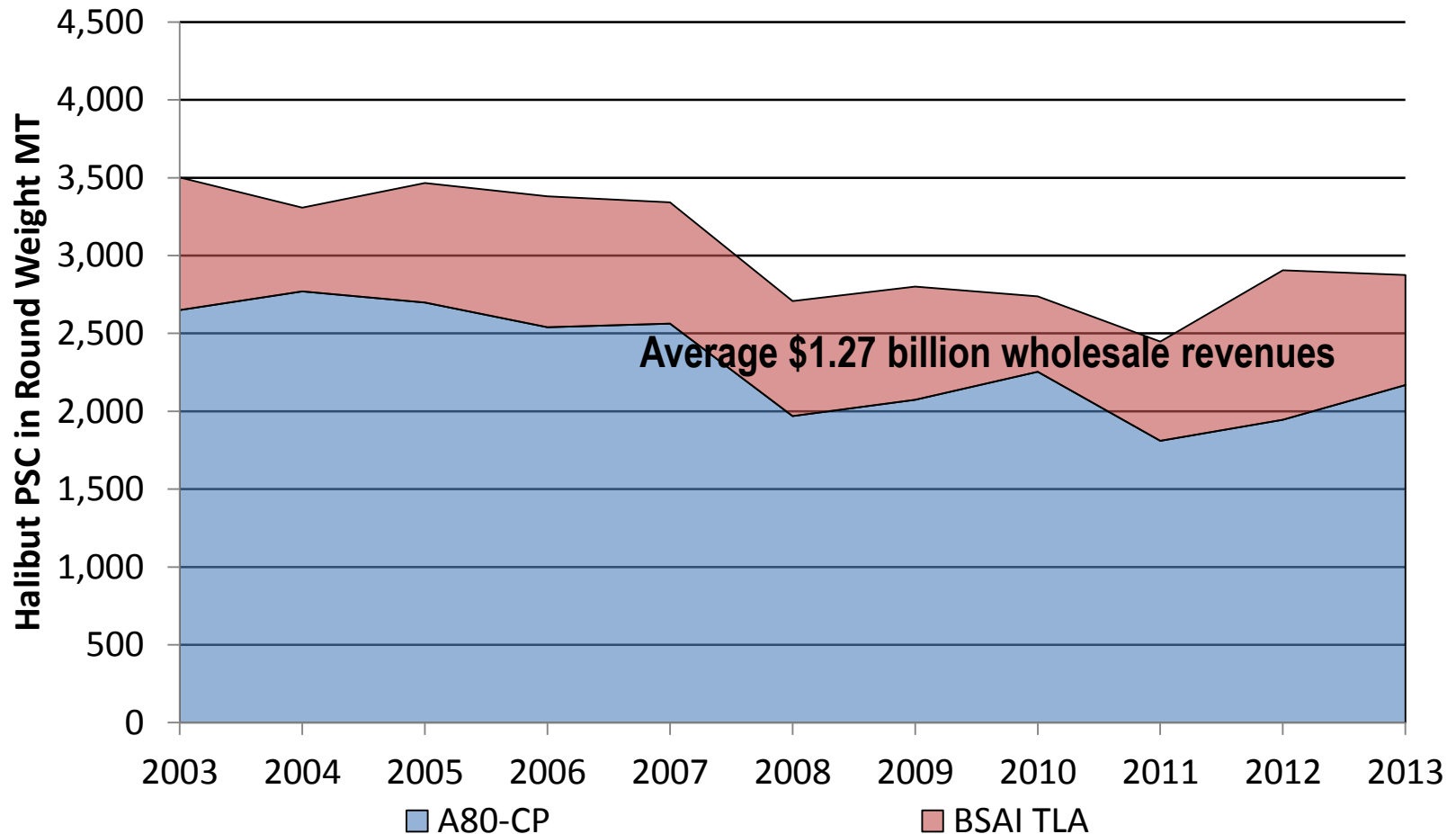


BSAI Halibut PSC by Groundfish Sector & Year



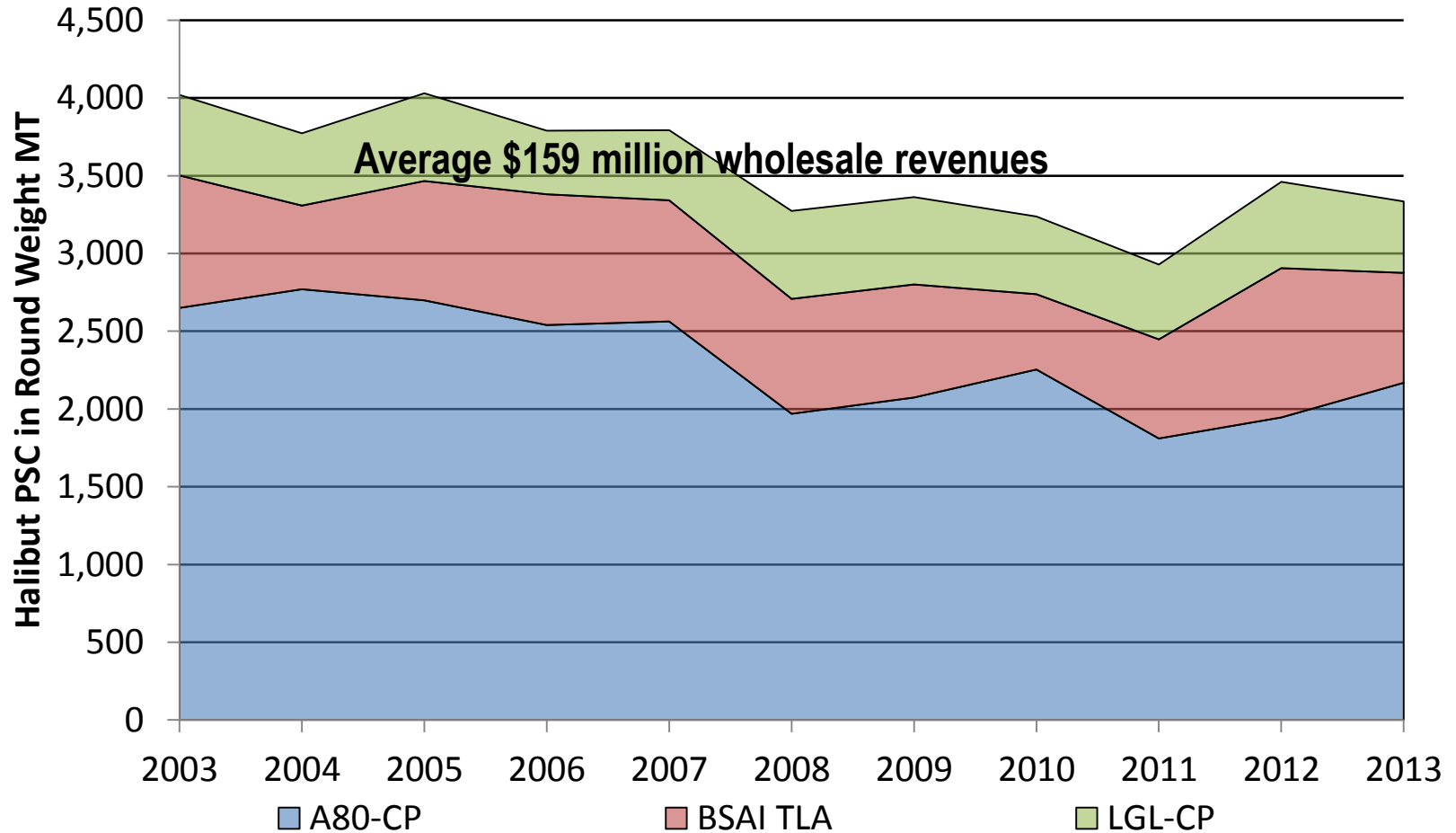
Amendment 80 Trawl Catcher Processors (A80-CPs)

BSAI Halibut PSC by Groundfish Sector & Year



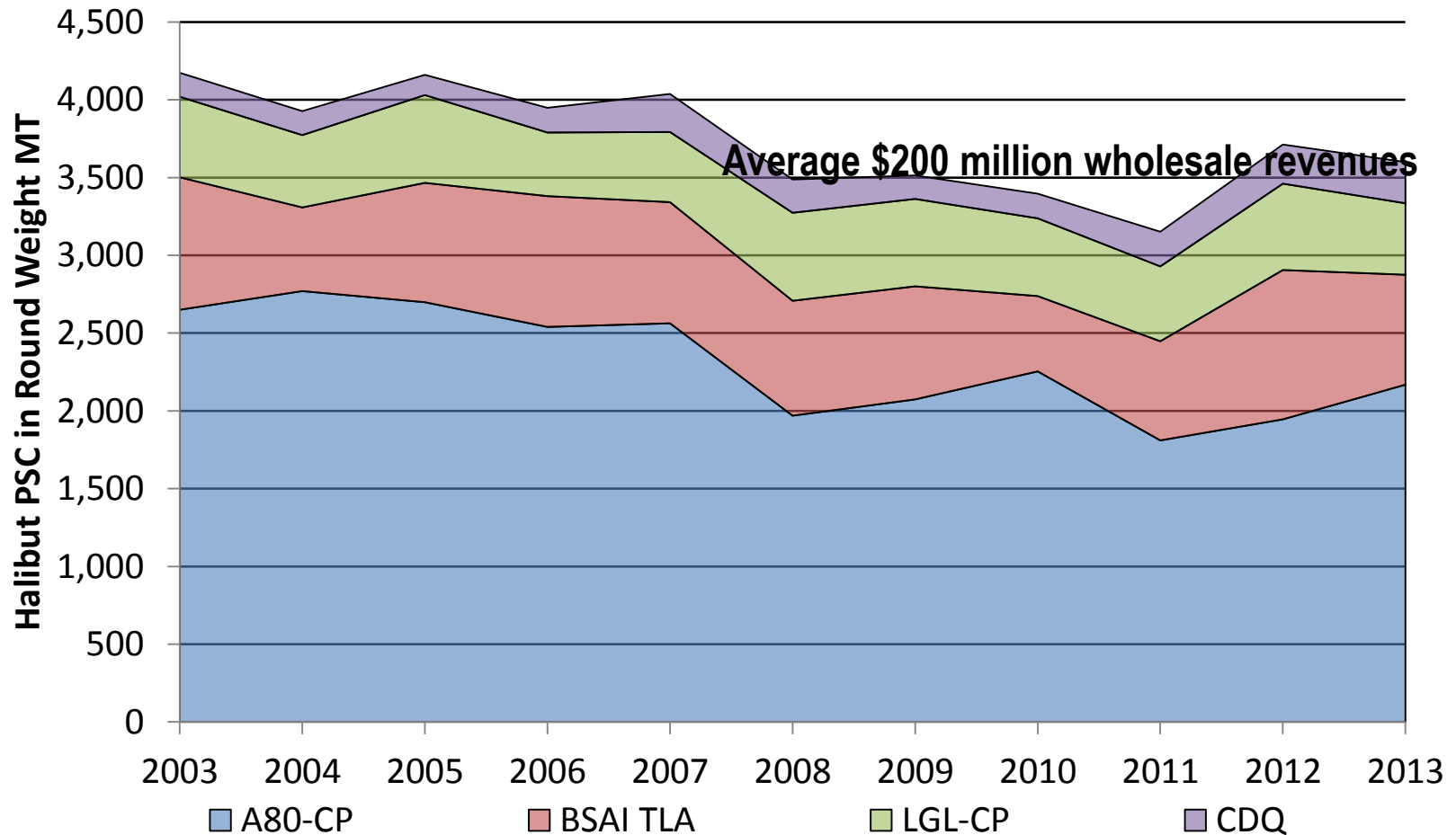
BSAI Trawl Limited Access: AFA Trawl CPs, AFA-CVs, Non-AFA CVs

BSAI Halibut PSC by Groundfish Sector & Year



Longline Catcher Processors (LGL-CPs)

BSAI Halibut PSC by Groundfish Sector & Year



Community Development Quota Harvester (AFA-CPs, A80-CPs, L-CPs)

The Problem

- **The determination of the retrospective bias in 2011 leads to reductions in commercial halibut harvest in 2012, 2013, and into the future**
- **Also leads to calls for reductions in PSC and PSC limits in the groundfish fisheries**

Setting the Commercial Halibut Fishery ACLs

- **Fishery Yield = Total Yield – Predicted Non-market Removals**
- **Predicted Non-Market Removals = Last year's Non-mkt Removals**
- **Total Yield = Estimated Yield from IPHC stock assessments
+ last year's non-market prediction errors
+ underages or overages in the commercial halibut fishery**
- **All of the yield estimates and estimates of removals are specified in terms of fish that have (or will in the current year) recruited into the fishery—these fish are over 26 inches in length or O26 halibut**

But wait! There's more!

- **What about the U26 fish?**
- **If there is a PSC reduction then there are savings of both O26 and U26 halibut**
- **O26 savings go directly into yield increases in Area 4 (over a 2 year lag)**
- **U26 fish that are saved (about 40% of total PSC) add to the coastwide yield in years 5 – 20 on a pound for pound basis**

NEI's job was relatively straight-forward

- Predict the economic impacts of reductions in currently non-binding PSC Limits ...
- on the groundfish fisheries and on the commercial halibut fishery...
- using the IPHC's dynamic yield setting process, and
- making sure to account for increased yield from U26 savings that accrue from 5 to 20 years out into the future and which are distributed coastwide,
- and remembering that halibut PSC is highly variable over time and by sector, and appears to have very little correlation to estimated halibut yields.

Proposed Reductions in PSC Limits

- **A80-CPs: current limit is 2,325 mt**

- Proposed cuts from 10% (2,093 mt) to 50% cut (1,162.5 mt)

- **BSAI TLA: current limit is 875 mt**

- Proposed cuts from 10% (787.5 mt) to 50% cut (437.5 mt)

- **LGL-CP: current limit is 760 mt for Pacific cod fishery**

- Proposed cuts from 10% (684 mt) to 50% cut (360 mt)

- **CDQ Groundfish: current limit is 393 mt**

- Proposed cuts from 10% (358 mt) to 50% cut (mt)

The Iterated Multi-year Simulation Model

- IMS Model projects Area 4 halibut yields over a 10-year future period with the following key assumptions:
- The estimated total halibut yield from the IPHC for 2014 remains in place through 2023; all yield increases result from PSC cuts
- Groundfish PSC limit reductions are imposed starting in 2014 and remain in place through 2023.
- Groundfish harvests, revenues, amounts of PSC, and PSC rates are taken directly from the basis years (2008–2013)
- Halibut participants and revenues per ton are also taken from the basis years

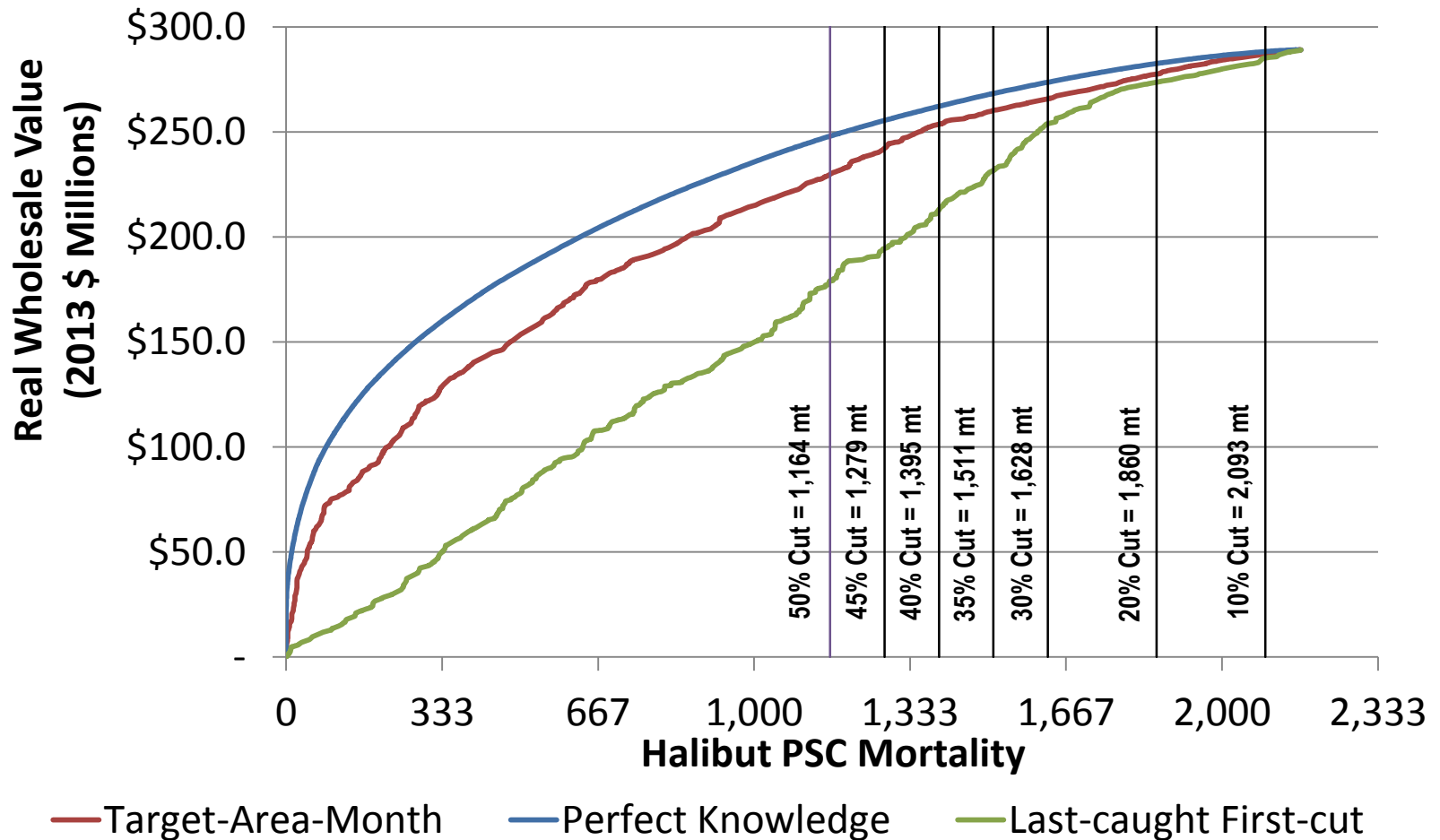
The Iterated Multi-year Simulation Model

- **Basis years are drawn randomly (with replacement) to populate each of the future years**
- **One iteration is a complete draw of the 10-year future period**
- **Each full IMS model run consists of 10,000 iterations**
- **Commercial halibut fishery yields increase because of reduced O26 PSC in groundfish fisheries beginning in 2015.**
- **Increased Yields due to U26 savings augment yields beginning 5 years after initial PSC reductions (2019) and are distributed coastwide in proportion to biomass**

Mechanisms to Reduce PSC in Groundfish

- Each groundfish sector's PSC is systematically cut based on its level of rationalization.
- Is the fishery rationalized?
- If yes then the fleet has the potential to organize and can mitigate revenue impacts of harvest reductions
- If no, then the fleet is confined to a race-for-fish and a last-caught first-cut reduction methodology
- A80-CPs, LGL-CPs, CDQ groundfish fisheries, and BSAI Trawl Pollock fisheries all rationalized
- Two smaller components of BSAI Trawl Limited Access fishery are not rationalized

PSC Reductions in the A80-CP Sector, 2013



Scenario A and Scenario B

- **We developed two Scenarios for each sector that form “book-ends” of the impacts**
 - Create a plausible range within which impacts are likely to fall.

IMS Model Runs

- **PSC Limit reduction model runs are independent across sectors consisting of 10,000 iterations for each Scenario**
 - PSC Limit reductions are varied for only one sector, while other sectors are held constant
 - The NPFMC can adopt any combination of the percentage reduction options for any of the sectors
 - One set of “all sector” IMS Model runs was of provided at each percentage level to give decision makers a context for the “cumulative” effects

Discounted Average Annual Wholesale Revenues (\$ million) to the Commercial Halibut Fishery with PSC Reductions to All Sectors

Year	Status Quo	Reduce all limits by 20%	Reduce all limits by 35%	Reduce all limits by 50%
	Scenario A - B	Scenario A - B	Scenario A - B	Scenario A - B
2014	\$45.8 to \$45.7	+\$0.0 to \$0.0	+\$0.0 to \$0.0	+\$0.0 to \$0.0
2015	\$38.9 to \$39.0	+\$5.6 to \$6.5	+\$15.6 to \$17.6	+\$28.9 to \$31.7
2016	\$39.8 to \$39.9	+\$2.7 to \$3.1	+\$8.0 to \$9.0	+\$15.0 to \$16.3
2017	\$37.6 to \$37.7	+\$2.6 to \$3.0	+\$7.4 to \$8.3	+\$13.7 to \$15.1
2018	\$35.6 to \$35.6	+\$2.5 to \$2.8	+\$7.0 to \$7.9	+\$13.0 to \$14.3
2019	\$33.7 to \$33.7	+\$2.3 to \$2.8	+\$6.7 to \$7.5	+\$12.4 to \$13.6
2020	\$31.8 to \$32.0	+\$2.3 to \$2.7	+\$6.5 to \$7.4	+\$12.0 to \$13.1
2021	\$30.3 to \$30.4	+\$2.2 to \$2.6	+\$6.3 to \$7.1	+\$11.6 to \$12.9
2022	\$28.9 to \$28.9	+\$2.2 to \$2.6	+\$6.2 to \$7.0	+\$11.6 to \$12.5
2023	\$27.3 to \$27.4	+\$2.1 to \$2.4	+\$6.0 to \$6.8	+\$11.1 to \$12.3
Average	\$35.0 to \$35.0	+\$2.2 to \$2.8	+\$6.0 to \$7.9	+\$9.9 to \$14.2

Estimated Foregone Revenue of Groundfish Fisheries (All Sectors Combined) of PSC Reduction Options (\$2013 Millions)

Year	DPV of Wholesale Revenue Under the Status Quo	Reduce all limits by 20%	Reduce all limits by 35%	Reduce all limits by 50%
	Scen. A - B	Forgone Discounted Present Value of Wholesale Revenue Under the Alternatives		
	Scen. A - B	Scen. A - B	Scen. A - B	Scen. A - B
2014	\$1,959.4 - \$1,958.3	\$7.3 - \$22.5	\$32.4 - \$71.3	\$86.3 - \$155.0
2015	\$1,861.4 - \$1,860.4	\$6.9 - \$21.4	\$30.8 - \$67.7	\$82.0 - \$147.3
2016	\$1,768.3 - \$1,767.3	\$6.6 - \$20.3	\$29.3 - \$64.4	\$77.9 - \$139.9
2017	\$1,679.9 - \$1,679.0	\$6.2 - \$19.3	\$27.8 - \$61.1	\$74.0 - \$132.9
2018	\$1,595.9 - \$1,595.0	\$5.9 - \$18.3	\$26.4 - \$58.1	\$70.3 - \$126.3
2019	\$1,516.1 - \$1,515.3	\$5.6 - \$17.4	\$25.1 - \$55.2	\$66.8 - \$120.0
2020	\$1,440.3 - \$1,439.5	\$5.4 - \$16.6	\$23.8 - \$52.4	\$63.4 - \$114.0
2021	\$1,368.3 - \$1,367.5	\$5.1 - \$15.7	\$22.6 - \$49.8	\$60.3 - \$108.3
2022	\$1,299.9 - \$1,299.2	\$4.8 - \$14.9	\$21.5 - \$47.3	\$57.2 - \$102.8
2023	\$1,234.9 - \$1,234.2	\$4.6 - \$14.2	\$20.4 - \$44.9	\$54.4 - \$97.7
Average	\$1,572.4 - \$1,571.6	\$5.8 - \$18.1	\$26.0 - \$57.2	\$69.2 - \$124.4

Onward to Community and Social Impacts

■ More information is available online at ...

http://legistar2.granicus.com/npfmc/meetings/2015/6/925_A_North_Pacific_Council_15-06-01_Meeting_Agenda.pdf

- the documents are linked off the Council's C-2 agenda item

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