BSAI Halibut Mortality 2003 - 2012

Presentation to
North Pacific Fishery Management Council

Marcus L. Hartley
February 2014
Chapter 1 contains an introduction & defines terms.

Trawl Sectors
- BSAI Trawl Limited Access (BSAI TLA)
  - AFA-CPs, AFA-CVs, AFA-MCVs
  - TRW CVs TRW-MCVs
- A80-CPs

Non-Trawl Sectors
- LGL-CPs, LGL-CVs, LGL-MCVs
- Pot –CPs, Pot-CVs, Pot-MCVs
Variables Used

- **Halibut Mortality** = MT of Halibut Mortality calculated using mortality rates specific to gear and targets.
- **Halibut Bycatch Rate** = Halibut Mortality MT / Groundfish MT in target fishery.
- **Normalized Wholesale Value**; uses the average value per ton of groundfish in the sector and target over all years.
  - Normalizing the value reduces impacts of inflation, exchange rates, and recessions on wholesale values.
Document Outline

- Chapter 2—Halibut Related Closures from 2000–2013
  - Numbers of closures are greatly reduced since Amendment 80
- Chapter 3—Summary of Historical Bycatch
  - Provides PSC summaries by major apportionment groups.
- Chapter 4—Bycatch Mortality by Target Fishery
  - Target Fisheries with Multiple Sectors
    - Pollock
    - Pacific Cod
    - Yellowfin Sole
  - Amendment 80 Fisheries
- Chapter 5—Potential Options for Reducing Bycatch
# Directed Fishing Closures Resulting from Halibut PSC in the BSAI, 2000-2013

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<th>Sub-Area</th>
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<td><strong>3</strong> 8 11 7 6 12 18 15 5 6 3 0 0 0**</td>
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Hook & Line Gear Closures Resulting from Halibut PSC in the BSAI, 2000-2013

- There have been three Hook & Line (HAL) closures due to halibut PSC, all in the PCOD Fishery in 2001.
- Since 2001 there have not been any HAL closures related to halibut PSC.

<table>
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<tr>
<th>Gear Sector</th>
<th>Species Code</th>
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<td>CVs &gt;= 60 ft</td>
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Trawl Closures in Flatfish Fisheries Resulting from Halibut PSC in BSAI, 2000-2013

- From 2000 – 2007 there were 66 seasonal or PSC limit closure in the Trawl fisheries for flatfish species.
- After A80, “Trawl” fisheries were no longer regular as a whole.

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Flatfish Trawl Total: 3 5 9 5 6 10 14 14
Trawl Closures in Pacific Cod Fisheries Resulting from Halibut PSC in BSAI, 2000-2013

- There were eleven closures in the Pacific cod trawl fisheries between 2002 and 2007

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Number of Halibut Related Directed Fishing Closures
## A80 Limited Access Closures Related to Halibut PSC

- From 2008 – 2010 there were 14 closures in the A80 Limited Entry fisheries related to halibut PSC.
- In 2011 a second cooperative formed. There have been no halibut related closures issued by NMFS for A80 cooperatives.

### Table: Number of Halibut Related Directed Fishing Closures

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## Directed Fishing Closures Resulting from Halibut PSC in BSAI, 2000-2013

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Apportionment of Halibut in 2014 from NMFS Specification Table 8A

- Non-Trawl Apportionments

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<th>Non-trawl CDQ PSQ (^1)</th>
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- Trawl CDQ and non-CDQ Apportionments

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<td>3,675 mt</td>
<td>326 mt</td>
<td>3,349 mt</td>
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- A80 CPs & Trawl Limited Access Apportionments

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<td>875 mt</td>
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Note: CDQ Prohibited Species Quota (PSQ) from trawl and non-Trawl are combined into a single non-gear specific limit.
Apportionment of BSAI Halibut PSC to Trawl, Non-Trawl and CDQs

BSAI Halibut PSC Limits
(4,575 mt)
Apportionment of BSAI Halibut PSC to Trawl, Non-Trawl and CDQs

- BSAI Halibut PSC Limits (4,575 mt)
  - Non-Trawl PSC 900 mt
  - Trawl PSC 3,675 mt
Apportionment of BSAI Halibut PSC to Trawl, Non-Trawl and CDQs

BSAI Halibut PSC Limits (4,575 mt)

Non-Trawl PSC 900 mt
- Non-trawl PSC 833 mt
- Non-trawl CDQ PSQ 67 mt

Trawl PSC 3,675 mt
- Trawl CDQ PSQ Reserve 326 mt
- Remaining Trawl PSC 3,349 mt
Apportionment of BSAI Halibut PSC to Trawl, Non-Trawl and CDQs

BSAI Halibut PSC Limits (4,575 mt)

- Non-Trawl PSC 900 mt
  - Non-trawl PSC 833 mt
  - Non-trawl CDQ PSQ 67 mt

- Trawl PSC 3,675 mt
  - Trawl CDQ PSQ Reserve 326 mt
  - Remaining Trawl PSC 3,349 mt

CDQ PSQ (Unspecified)
Apportionment of BSAI Halibut PSC to Trawl, Non-Trawl and CDQs

BSAI Halibut PSC Limits (4,575 mt)

- Non-Trawl PSC 900 mt
  - Non-trawl PSC 833 mt
  - Non-trawl CDQ PSQ 67 mt

- Trawl PSC 3,675 mt
  - Trawl CDQ PSQ Reserve 326 mt
  - Remaining Trawl PSC 3,349 mt

CDQ PSQ (Unspecified)
Apportionments of Non-Trawl Halibut PSC
Apportionments of Non-Trawl Halibut PSC

Non-trawl PSC 833 mt
Apportionments of Non-Trawl Halibut PSC

- Non-trawl PSC 833 mt
  - Other Targets 58 mt
  - Pacific Cod 775 mt
Apportionments of Non-Trawl Halibut PSC

Non-trawl PSC 833 mt

- Other Targets 58 mt
- Pacific Cod 775 mt

- Non-trawl CPs 760 mt
- Non-trawl CVs 15 mt
Apportionments of Non-Trawl Halibut PSC

Non-trawl PSC 833 mt

Other Targets 58 mt

Pacific Cod 775 mt

Non-trawl CPs 760 mt

- Jan 1 to Jun 10: 60% (455 mt)
- Jun 10 to Aug 15: 25% (190 mt)
- Aug 15 to Dec 31: 15% (115 mt)

Non-trawl CVs 15 mt

- Jan 1 to Jun 10: 66% (10 mt)
- Jun 10 to Aug 15: 20% (3 mt)
- Aug 15 to Dec 31: 14% (2 mt)
Apportionment of Trawl Halibut PSC
Apportionment of Trawl Halibut PSC

Remaining Trawl PSC
3,349 mt
Apportionment of Trawl Halibut PSC

Remaining Trawl PSC 3,349 mt

- A-80 2,325 mt
- BSAI TLA 875 mt
- Unallocated Reductions 150 mt
Apportionment of Trawl Halibut PSC

Remaining Trawl PSC 3,349 mt

- A-80 2,325 mt
- BSAI TLA 875 mt
- Unallocated Reductions 150 mt

- Yellowfin Sole (167 mt)
- Rockfish (5 mt)
- Pacific Cod (453 mt)
- Pollock/Atka Mackerel/Other (250 mt)
Halibut Mortality by Major Apportionment Group
Halibut Mortality by Major Apportionment Group

Figure 2 in the Discussion Paper

Halibut Mortality (mt)

- All Gear Total
- Trawl Total
- Non-Trawl Total
- A80-CPs
- TRW Limited Access
- Trawl CDQ
- LGL CPs & CVs
- POT CPs & CVs
- Non-Trawl CDQ
Halibut Mortality by Major Apportionment Group

Halibut Mortality (mt)


Non-Trawl Total
Halibut Mortality by Major Apportionment Group
Non-Trawl Halibut Mortality

- Halibut Mortality (mt)
- Non-Trawl Total
- LGL CPs & CVs
- POT CPs & CVs
- Non-Trawl CDQ

Graph showing the trend of non-trawl halibut mortality from 2003 to 2012.
Non-Trawl Halibut Mortality

Halibut Mortality (mt)

Non-Trawl Total
LGL CPs & CVs


Non-Trawl Halibut Mortality
Non-Trawl Halibut Mortality
Non-Trawl Halibut Mortality

![Graph showing Non-Trawl Halibut Mortality from 2003 to 2012. The graph includes lines for Non-Trawl Total, LGL CPs & CVs, POT CPs & CVs, and Non-Trawl CDQ.](image-url)
Pot gear halibut mortality is shown in Figure 2 and these graphics, but actually does not count against the non-trawl PSC limit.
Non-Trawl Halibut Mortality

Pot gear halibut mortality is shown in Figure 2 and these graphics, but actually does not count against the non-trawl PSC limit.

Similarly halibut PSC in Sablefish IFQ fisheries is included in the figure for LGL CP & CVs but does not count against the non-trawl PSC limit.
Halibut Mortality by Major Apportionment Group

Figure 2 in the Discussion Paper

Halibut Mortality (mt)

- All Gear Total
- A80-CPs
- TRW Limited Access
- LGL CPs & CVs
- Non-Trawl Total
- Trawl Total
- POT CPs & CVs
- Non-Trawl CDQ
- Trawl CDQ

Years: 2003 to 2012

- BSAI TLA is Apportioned 875 mt of halibut PSC
- 453 mt to Pacific cod, 167 mt to yellowfin sole, 5 mt to rockfish
- 250 mt to Pollock and Atka Mackerel, but limit is non-binding; NMFS could impose a closure in the use of non-pelagic gear
- 2012 PSC in PCOD, Yellowfin sole and Pollock all increased.
- In 2012 the BSAI TLA Sector halibut PSC exceeded their 875 limit and experienced a year-over-year increase of 52 percent.

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<tr>
<td>Pollock/Atka Mackerel</td>
<td>74</td>
<td>82</td>
<td>101</td>
<td>109</td>
<td>265</td>
<td>276</td>
<td>396</td>
<td>198</td>
<td>292</td>
<td>370</td>
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<tr>
<td>Pacific Cod</td>
<td>801</td>
<td>452</td>
<td>650</td>
<td>616</td>
<td>449</td>
<td>292</td>
<td>183</td>
<td>258</td>
<td>241</td>
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<tr>
<td>Yellowfin Sole</td>
<td>2</td>
<td>4</td>
<td>16</td>
<td>93</td>
<td>58</td>
<td>157</td>
<td>99</td>
<td>27</td>
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<td>All Other Flatfish &amp; Rockfish</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>23</td>
<td>8</td>
<td>14</td>
<td>49</td>
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<tr>
<td>All Targets</td>
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<td>NA</td>
<td>NA</td>
<td>841</td>
<td>781</td>
<td>738</td>
<td>727</td>
<td>485</td>
<td>637</td>
<td>967</td>
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Note: NA indicates that the data has not available for disclosure to protect data confidentiality.
Source: Developed by Northern Economics based on CAS data from AKFIN.
Table 8. Halibut PSC Mortality in the Non-CDQ A80 Fisheries, 2003 - 2012

- Halibut PSC of A80 CPs has trended downward from peak in 2004
- Since 2011 all PSC has been allocated to cooperatives
- Within co-ops vessels determine how maximize benefits from PSC
- Since 2011 PSC in the Rock sole fishery has fallen by 56%
- Since 2011 PSC in Arrowtooth fisheries has more than doubled
- In 2012 the A80 fleet had a 7% year-over-year increase in PSC.

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<td>Rock sole, flathead sole, OFLT</td>
<td>1,178</td>
<td>1,025</td>
<td>1,072</td>
<td>1,122</td>
<td>1,277</td>
<td>867</td>
<td>742</td>
<td>1,050</td>
<td>528</td>
<td>464</td>
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<tr>
<td>Arrowtooth/Kamchatka/Turbots</td>
<td>61</td>
<td>93</td>
<td>202</td>
<td>123</td>
<td>17</td>
<td>127</td>
<td>229</td>
<td>181</td>
<td>259</td>
<td>504</td>
</tr>
<tr>
<td>Yellowfin Sole</td>
<td>701</td>
<td>391</td>
<td>552</td>
<td>345</td>
<td>446</td>
<td>802</td>
<td>894</td>
<td>814</td>
<td>758</td>
<td>711</td>
</tr>
<tr>
<td>Pacific Cod</td>
<td>577</td>
<td>1,160</td>
<td>782</td>
<td>833</td>
<td>612</td>
<td>42</td>
<td>75</td>
<td>35</td>
<td>17</td>
<td>37</td>
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<tr>
<td>Pollock/Atka Mackerel/Other</td>
<td>83</td>
<td>50</td>
<td>77</td>
<td>88</td>
<td>195</td>
<td>97</td>
<td>105</td>
<td>119</td>
<td>157</td>
<td>162</td>
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<tr>
<td>Rockfish &amp; Sablefish</td>
<td>48</td>
<td>51</td>
<td>13</td>
<td>29</td>
<td>17</td>
<td>33</td>
<td>30</td>
<td>55</td>
<td>92</td>
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<td>All Targets</td>
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<td>2,770</td>
<td>2,698</td>
<td>2,540</td>
<td>2,563</td>
<td>1,969</td>
<td>2,073</td>
<td>2,254</td>
<td>1,810</td>
<td>1,945</td>
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Source: Developed by Northern Economics based on CAS data from AKFIN.
Table 9. Halibut PSC Mortality by the Longline CPs and CVs, 2003 - 2012

- Almost all of the non-trawl halibut PSC is taken by the LGL CPs
  - In 2012 the LGL-CP had a 15% year-over-year increase of PSC in PCOD
- There is very little LGL-CV activity in the Pacific Cod fishery
- Analysis of halibut PSC in sablefish IFQ fisheries is not included
  - Halibut PSC in Sablefish IFQ is not constrained by PSC Limits.
  - Low levels of observer coverage limit the accuracy of estimates prior to 2013
  - Beginning in 2013 increased observer coverage will improve estimates

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<tbody>
<tr>
<td>Halibut PSC Mortality (mt) in the BSAI by Hook &amp; Line CVs and CPs</td>
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<tr>
<td>Pacific Cod (LGL-CPs)</td>
<td>495</td>
<td>440</td>
<td>541</td>
<td>392</td>
<td>468</td>
<td>625</td>
<td>648</td>
<td>542</td>
<td>476</td>
<td>549</td>
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<tr>
<td>Pacific Cod (LGL-CVs)</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Other non-IFQ Longline Target Fisheries</td>
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<td>22</td>
<td>12</td>
<td>17</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>11</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>All Targets</td>
<td>520</td>
<td>467</td>
<td>559</td>
<td>412</td>
<td>481</td>
<td>640</td>
<td>658</td>
<td>555</td>
<td>482</td>
<td>556</td>
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</table>

Note: NA indicates that the data has not available for disclosure to protect data confidentiality.
Source: Developed by Northern Economics based on CAS data from AKFIN.
Figure 4. Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in Pollock Target Fisheries, 2003 - 2012

Note: Includes only harvests and values of sectors included in Table 12. Axes values are scaled so that the changes in the different variables are relative.
Figure 4. Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in Pollock Target Fisheries, 2003 - 2012

Note: Includes only harvests and values of sectors included in Table 12. Axes values are scaled so that the changes in the different variables are relative.
Figure 5. Annual Halibut Mortality and Groundfish Wholesale Value per MT of Halibut in AFA Pollock Target Fisheries, 2003-2012

Note: Wholesale values per ton of groundfish harvested in the pollock fishery have been normalized to reduce the effects of due to inflation, exchange rates and other changes in market prices.
Figure 6. Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in Pacific Cod Target Fisheries of Included Sectors, 2003 - 2012

Note: Includes only harvests and values of sectors included in Table 14—i.e. AFA-CPs are not included. Axes values are scaled so that the changes in the different variables are relative.
Figure 8. Annual Halibut Mortality and Groundfish Wholesale Value per MT Halibut in Pacific Cod Trawl Fisheries, 2003-2012
Figure 10. Annual Halibut Mortality and Groundfish Wholesale Value per MT Halibut in Pacific Cod Longline Fisheries, 2003-2012
Figure 12. Annual Halibut Mortality and Groundfish Wholesale Value per MT Halibut in Pacific Cod Pot Fisheries, 2003-2012
Figure 14. Groundfish Harvest, Halibut Bycatch & Normalized Wholesale Value of Groundfish in Yellowfin Sole Target Fisheries of Included Sectors
Figure 15. Halibut Bycatch Rates in Yellowfin Sole Targeted Fisheries by Sector, 2003-2012
Figure 16. Annual Halibut Mortality and Groundfish Wholesale Value per MT Halibut in Yellowfin Sole Target Fisheries
Halibut Bycatch of Amendment 80 CPs

- Amendment 80 implemented in 2008
- Exclusive allocations of yellowfin sole, rock sole, Atka mackerel, flathead sole, and Pacific cod.
  - Pacific cod apportionment to all trawl CPs was reduced under Amendment 85.
- Since Amendment 80, the sector has increased total groundfish harvest while reducing halibut bycatch
Figure Groundfish Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in All A80-CP Target Fisheries, 2003 - 2012
Increasing groundfish harvest with a decline in halibut bycatch.
Halibut Bycatch Rates and Groundfish Value per MT of Halibut Mortality for A80-CPs across All Target Fisheries, 2003–2012
Groundfish Harvest, Halibut Bycatch and Normalized Wholesale Value of
Groundfish in A80-CP Target Fisheries for Atka Mackerel, 2003 - 2012

[Graph showing Groundfish Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in A80-CP Target Fisheries for Atka Mackerel, 2003 - 2012.]
Groundfish Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in A80-CP Target Fisheries for Yellowfin Sole, 2003 - 2012

Graph showing groundfish, halibut mortality, and normalized wholesale value for the years 2003 to 2012.
Groundfish Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in A80-CP Target Fisheries for Pacific Cod, 2003 - 2012

Groundfish Wholesale Value ($ millions)

- Groundfish (100,000 mt)
- Halibut Mortality (mt 1,000s)
- Normalized Wholesale Value

Graph showing trends in groundfish, halibut mortality, and normalized wholesale value from 2003 to 2012.
Groundfish Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in A80-CP Target Fisheries for Arrowtooth, 2003 - 2012
Groundfish Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in A80-CP Target Fisheries for Arrowtooth, 2003 - 2012
Groundfish Harvest, Halibut Bycatch and Normalized Wholesale Value of Groundfish in A80-CP Target Fisheries for Pollock, 2003 - 2012
GIS Maps of Halibut Bycatch by Fishery


- Maps for …
  - Pacific cod LGL-CPs
  - Trawl CPs & MS (BSAI TLA + A80) in Pacific cod targets
  - Trawl CPs & MS (BSAI TLA + A80) in yellowfin sole targets
  - Trawl CPs & MS (BSAI TLA + A80) in rock sole targets
Halibut PSC Rates from 2003–2007 in the Pacific Cod Fishery of Longline Catcher Processors

Source: Developed on request by Steve Lewis; GIS Coordinator/Analyst, NOAA Fisheries, Alaska Region, on January 10, 2014.
Halibut PSC Rates from 2008–2012 in the Pacific Cod Fishery of Longline Catcher Processors

Source: Developed on request by Steve Lewis; GIS Coordinator/Analyst, NOAA Fisheries, Alaska Region, on January 10, 2014.
Halibut PSC Rates from 2003–2007 in the Pacific Cod Fishery of Trawl Catcher Processors and Motherships

Source: Developed on request by Steve Lewis; GIS Coordinator/Analyst, NOAA Fisheries, Alaska Region, on January 10, 2014.
Halibut PSC Rates from 2008–2012 in the Pacific Cod Fishery of Trawl Catcher Processors and Motherships

Source: Developed on request by Steve Lewis; GIS Coordinator/Analyst, NOAA Fisheries, Alaska Region, on January 10, 2014.
Halibut PSC Rates from 2003–2007 in the Yellowfin Sole Fishery of Trawl Catcher Processors and Motherships

Source: Developed on request by Steve Lewis; GIS Coordinator/Analyst, NOAA Fisheries, Alaska Region, on January 10, 2014.
Halibut PSC Rates from 2008–2012 in the Yellowfin Sole Fishery of Trawl Catcher Processors & Motherships

Source: Developed on request by Steve Lewis; GIS Coordinator/Analyst, NOAA Fisheries, Alaska Region, on January 10, 2014.
Halibut PSC Rates from 2003–2007 in the Rock Sole Fishery of Trawl Catcher Processors and Motherships

Source: Developed on request by Steve Lewis; GIS Coordinator/Analyst, NOAA Fisheries, Alaska Region, on January 10, 2014.
Halibut PSC Rates from 2008–2012 in the Rock Sole Fishery of Trawl Catcher Processors & Motherships

Source: Developed on request by Steve Lewis; GIS Coordinator/Analyst, NOAA Fisheries, Alaska Region, on January 10, 2014.
Series of Figures Showing Bycatch by Month

Example: Two figures for A80-CP yellowfin sole bycatch

First of each pair shows Groundfish + Bycatch Rate

- Left-hand axis for the bars showing Groundfish MT
- Right-hand axis for the line showing bycatch rate
Series of Figures Showing Bycatch by Month

- Second figure of each pair shows + Bycatch Rate
  - Left-hand axis for the bars showing halibut MT
  - Right-hand axis for the line showing bycatch rate
Potential Options to Reduce BSAI Halibut PSC

Excerpted from IPHC’s *Report of the Halibut Bycatch Work Group*
- Presented to stakeholders at the 2013 IPHC Annual Meeting

Six Primary Options that could/would apply to both BSAI and GOA

Several additional options specific to Alaska Fisheries
- Options for reducing bycatch in fixed gear fisheries
- Options for reducing bycatch in BSAI Trawl fisheries
- Options for reducing bycatch in GOA Trawl fisheries
Primary Options

- Establish updated Canada and U.S. bycatch reduction targets
- Authorize currently prohibited gears to retain & sell halibut
- Define minimum standards for catch monitoring and reporting and implement 100% monitoring
- Establish individual vessel accountability for halibut bycatch
- Establish additional time and area closures
- Define areas with high bycatch as “areas of special concern”
  - reduce their catch limits in areas of special concern; and
  - adjust catch limits upwards in areas that have minimized bycatch
Additional Options for Alaska Fixed Gear Fisheries

- Eliminate the minimum size limit for halibut
- Require mandatory retention of all halibut
- Set the season opening date for halibut (and sablefish) at January 1
- Authorize pot gear in the GOA to catch sablefish IFQ & authorize retention of halibut IFQ bycatch in pots.
- Stop exempting the sablefish longline fishery from the halibut fixed gear PSC limits

Estimated halibut mortality savings: 1,760 mt
- The current halibut PSC cap for GOA fixed gear fisheries is 300 mt, so about 1,460 mt would be saved.
- The savings in the BSAI are not estimated, but would be smaller.
Options for BSAI Trawl Fisheries

- **Issue individual halibut bycatch quota (halibut IBQ)**
  - IBQ would be based on their target groundfish quotas
  - Require retention of all halibut caught against the IBQ
  - Authorize the sale of IBQ halibut to markets

- **Estimated halibut mortality savings: 480 mt**
  - Assume a 15% reduction in PSC limit when issued as IBQ
  - Additionally, any unused IBQ at the end of the year would result in additional halibut mortality savings
Options for GOA Trawl Fisheries

- Rationalize the trawl fishery
- Then implement halibut IBQs
BSAI Halibut Mortality 2003 – 2012

Questions or Comments

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907.274.5600