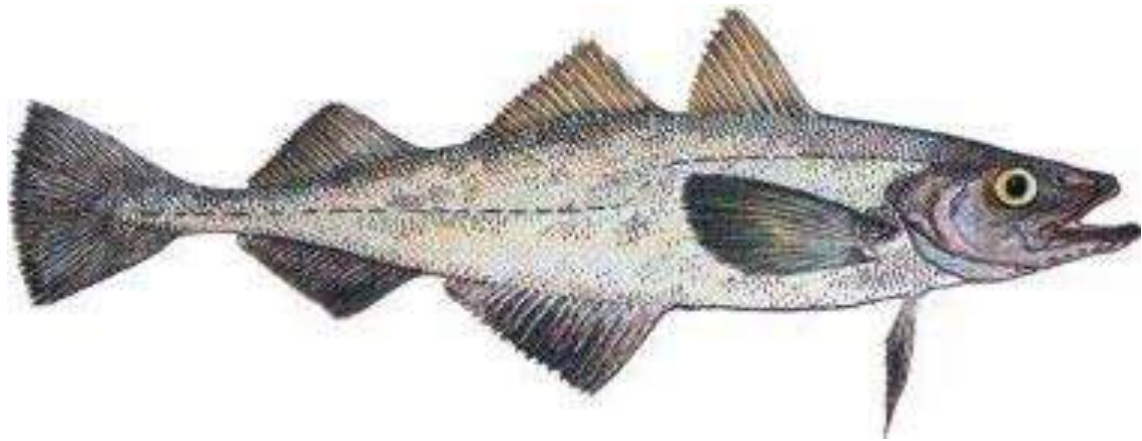Information for Discussions

at the

Scientific and Technical Committee


submitted by the

United States Party to the

14th Annual Conference of the Parties to the Convention on the Conservation

and Management of Pollock Resources in the Central Bering Sea

31 August – 1 September, 2009

Stevenson, Washington, USA

# Table of Contents

Table 1.  All-nation historical catch of pollock from the Bering Sea, in metric tons, 1977-2009

| Year | Olyotorskiy-Karagin (W of 170W) | Navarin Region (E of 170W) | Donut Hole | Bogoslof | Aleutian Region | Eastern Bering Sea | Total Bering Sea |
|---|---|---|---|---|---|---|---|
| 1977 | 265,000 | | | | 7,625 | 978,370 | 1,250,995 |
| 1978 | 417,000 | | | | 6,282 | 979,431 | 1,402,713 |
| 1979 | 546,000 | | | | 9,504 | 935,714 | 1,491,218 |
| 1980 | 825,000 | | | | 58,156 | 958,280 | 1,841,436 |
| 1981 | 1,133,000 | | | | 55,516 | 973,502 | 2,162,018 |
| 1982 | 976,000 | | | | 57,978 | 955,964 | 1,989,942 |
| 1983 | 1,006,000 | | | | 59,026 | 981,450 | 2,046,476 |
| 1984 | 252,000 | 503,000 | 181,200 | | 81,834 | 1,092,055 | 2,110,089 |
| 1985 | 134,000 | 488,000 | 363,400 | | 58,730 | 1,139,676 | 2,183,806 |
| 1986 | 297,000 | 570,000 | 1,039,800 | | 46,641 | 1,141,993 | 3,095,434 |
| 1987 | 349,000 | 463,000 | 1,326,300 | 377,436 | 28,720 | 859,416 | 3,403,872 |
| 1988 | 475,000 | 852,000 | 1,395,900 | 87,813 | 30,000 | 1,228,721 | 4,069,434 |
| 1989 | 345,000 | 684,000 | 1,447,600 | 36,073 | 15,531 | 1,229,600 | 3,757,804 |
| 1990 | 582,000 | 232,000 | 917,400 | 151,672 | 79,025 | 1,455,193 | 3,417,290 |
| 1991 | 326,000 | 178,000 | 293,400 | 264,760 | 78,649 | 1,217,301 | 2,358,110 |
| 1992 | 282,000 | 315,000 | 10,000 | 160 | 48,745 | 1,164,440 | 1,820,345 |
| 1993 | 288,000 | 389,000 | 1,957 | 885 | 54,074 | 1,198,790 | 1,932,706 |
| 1994 | 204,000 | 288,900 | NA | 556 | 53,224 | 1,197,224 | 1,743,904 |
| 1995 | 79,000 | 427,300 | Trace | 264 | 60,184 | 1,169,614 | 1,736,362 |
| 1996 | 34,000 | 753,000 | Trace | 389 | 26,597 | 1,102,579 | 1,916,565 |
| 1997 | 30,000 | 735,000 | Trace | 163 | 24,721 | 1,036,789 | 1,826,673 |
| 1998 | 25,000 | 719,000 | Trace | 8 | 22,053 | 1,058,288 | 1,824,349 |
| 1999 | 46,000 | 639,000 | Trace | 1 | 965 | 889,561 | 1,575,527 |
| 2000 | 15,000 | 507,000 | Trace | 29 | 1,174 | 1,019,067 | 1,542,270 |
| 2001 | 25,000 | 526,000 | 0 | 61 | 788 | 1,247,305 | 1,799,154 |
| 2002 | 8,000 | 370,000 | 0 | 22 | 1,134 | 1,331,416 | 1,710,572 |
| 2003 | 14,600 | 411,200 | 0 | 24 | 1,653 | 1,491,356 | 1,918,833 |
| 2004 | 6,200 | 424,500 | 0 | 0 | 1,150 | 1,493,394 | 1,925,244 |
| 2005 | 4,400 | 446,800 | 0 | 0 | 1,622 | 1,483,398 | 1,936,220 |
| 2006 | 3,900 | 462,500 | 0 | 0 | 1,736 | 1,486,414 | 1,954,550 |
| 2007 | 62,600 | 587,900 | 0 | 0 | 2,519 | 1,354,091 | 2,007,110 |
| 2008 | 50,632 | 504,487 | 0 | 9 | 1,277 | 990,314 | 1,546,719 |
| 2009* | | 52,011* | 0 | 46 | 1,299 | 622,956 | |

**Sources of Data**

Reported by the Parties to the Convention

*  US data through 1 August 2009:  Russian Federation data through 30 June2009

Table 2.  Estimated Biomass (mt) of Pollock in the Aleutian Basin region of the
 Convention Area based on assumption that the Bogoslof Survey biomass
represents sixty percent of the Aleutian Basin biomass.

| Year | Bogoslof Biomass from Surveys, mt | Basin Biomass (Extrapolated Biomass) | Catch mt | Exploitation Rate (%) |
|------|-----------------------------------|--------------------------------------|----------|-----------------------|
| 1984 |           |           | 181,200   | ? |
| 1985 |           |           | 363,400   | ? |
| 1986 |           |           | 1,039,800 | ? |
| 1987 |           |           | 1,326,300 | ? |
| 1988 | 2,396,000 | 3,993,333 | 1,395,900 | 35 |
| 1989 | 2,084,000 | 3,473,333 | 1,447,600 | 42 |
| 1990 |           |           | 917,400   | ? |
| 1991 | 1,283,000 | 2,138,333 | 293,400   | 14 |
| 1992 | 888,000   | 1,480,000 | 10,000    | 1 |
| 1993 | 631,000   | 1,051,667 | 1,957     | 0 |
| 1994 | 490,000   | 816,667   | 0         | 0 |
| 1995 | 1,020,000 | 1,700,000 | 0         | 0 |
| 1996 | 582,000   | 970,000   | 0         | 0 |
| 1997 | 342,000   | 570,000   | 0         | 0 |
| 1998 | 432,000   | 720,000   | 0         | 0 |
| 1999 | 393,000   | 655,000   | 0         | 0 |
| 2000 | 270,000   | 450,000   | 0         | 0 |
| 2001 | 208,000   | 346,667   | 0         | 0 |
| 2002 | 227,000   | 378,333   | 0         | 0 |
| 2003 | 198,000   | 330,000   | 0         | 0 |
| 2004 | No survey |           | 0         | 0 |
| 2005 | 253,000   | 421,667   | 0         | 0 |
| 2006 | 240,000   | 400,000   | 0         | 0 |
| 2007 | 292,000   | 486,667   | 0         | 0 |
| 2008 | No survey |           | 9         | Near 0 |
| 2009 | 110,000   | 183,333   | 46        | Near 0 |

Table 3. Summary of Trial Fisheries on Pollock in the Central Bering Sea Donut Hole Area

| Year | Dates | Nation | No. Vessels | Vessel Name | Vessel Days | No. hauls | Data Source (Annual Conference Report) | Pollock Catch (KG) | Catch Number |
|------|-------|--------|-------------|-------------|-------------|-----------|----------------------------------------|--------------------|--------------|
| 2008 | | | | No vessel participated | | | | | |
| | | | | | | | | | |
| 2007 | | Korea | 2 | ??? | 20 | 40 | S&T, Appendix 3, 13th | | 2 |
| | | | | | | | | | |
| 2006 | Jul 31-Aug 5 | Korea | 1 | Oriental Angel (Keuk Dong Co) | | | 12th | 0.0 | 0 |
| 2006 | Jul 31-Aug 8 | Korea | 1 | Nambuk Ho (Nambuk Fish Co) | | | 12th | 0.0 | 0 |
| 2006 | Jul 31-Aug 8 | Korea | 1 | Joosung Ho (Hansung Enterprise Co) | | | 12th | 0.7 | 1 |
| | | | | | | | | | |
| 2003 | Mar 12-26 | Korea | 2 | Man Jeck No. 21, O Yang Ho - 2 | 27 | | 9th | 2.6 | 2 |
| 2003 | Oct - Nov | Korea | 1 | O-Ryong 503 | 15 | | 9th | 0.0 | 2 |
| 2003 | Nov 15-27 | Russia | 1 | Pioner Nikolayeva | 13 | | 9th | 1.6 | 1 |
| | | | | | | | | | |
| 2001 | Nov 11-14 | China | 2 | Ming Zhu, Kai Feng | 8 | | 7th | 0.0 | 0 |
| 2001 | Jun 7 - Jul 14 | China | 1 | Kai Tuo | 38 | | 6th | *~24.0* | 16 |
| | | | | | | | | | |
| 2000 | Jan 12 - Feb 3 | Korea | 1 | Oriental Discoverer | 23 | | 5th | 0.0 | 0 |
| 2000 | May 11-20 | Korea | 1 | Oriental Angel | 10 | | 5th | 0.0 | 0 |
| 2000 | May 20 - Jun 28 | China | 1 | Kai Chuang | 40 | | 5th | *~64.5* | 43 |
| | | | | | | | | | |
| 1999 | Aug 17-30 | Poland | 1 | Homar | 14 | 10 | 5th | 2.3 | 2 |
| 1999 | Apr 29 - May 3 | Poland | 1 | Acamar | 5 | 5 | 4th | 2.9 | 2 |
| | | | | | | | | | |
| 1998 | Sep 3-8 | Poland | 1 | Acamar | 6 | 5 | 4th | 3.3 | 2 |
| | | | | | | | | | |
| 1997 | Oct 12-15 | Poland | 1 | Acamar | 4 | 3 | STC, Sep. 1998 | 0.0 | 0 |
| 1997 | Aug 16-19 | Russia | 1 | ? | 4 | | 2nd | 0.0 | 0 |
| 1997 | Jun & Aug | China | 2 | ? | 8 | | 2nd | *< 900.0* | *< 600* |
| | | | | | | | | | |
| 1996 | ? | China | 1 | ? | ? | | 2nd | ? | ? |
| 1996 | Sep 1-11 | Poland | 1 | Acamar | 11 | 11 | 2nd | 244.2 | 184 |
| | | | | | | | | | |
| 1995 | Oct 18 - Nov 12 | Poland | 1 | Acamar | 25 | 16 | 1st | 40.3 | 31 |
| 1995 | Oct 13 - Nov 10 | Poland | 1 | Homar | 29 | 6 | | 15.6 | 12 |
| | | | | | | | | | |
| 1993 | Jul 2 - Sep 4 | Poland | 1 | Adm. Arciszewski | 63 | 69 | Bull. SFI. 2(138) 1996 | 627,500 | 570,454 |
| 1993 | Jun 6-14 | Japan | 1 | ? | 9 | | unpub ms | ? | ? |
| 1993 | Jul 13-22 | Japan | 1 | ? | 10 | | unpub ms | ? | ? |
| 1993 | Nov 12-17 | Japan | 1 | ? | 6 | | unpub ms | ? | ? |
| 1993 | Dec 8-17 | Japan | 1 | ? | 6 | | unpub ms | ? | ? |

? indicates unknown
Italics indicate non-reported estimated numbers

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Table 4.   United States Pollock Catches in metric tons, 1993-2009

| Year | E. Bering Sea | Aleutians | Bogoslof | Gulf of Alaska |
|---|---|---|---|---|
| 1993 | 1,198,790 | 54,074 | 885 | 108,066 |
| 1994 | 1,197,224 | 53,224 | 556 | 110,890 |
| 1995 | 1,169,614 | 60,184 | 264 | 73,248 |
| 1996 | 1,102,579 | 26,597 | 389 | 37,106 |
| 1997 | 1,036,789 | 24,721 | 163 | 89,893 |
| 1998 | 1,058,288 | 22,053 | 8 | 123,805 |
| 1999 | 889,561 | 965 | 1 | 93,422 |
| 2000 | 1,019,067 | 1,174 | 29 | 23,643 |
| 2001 | 1,247,305 | 788 | 61 | 70,485 |
| 2002 | 1,331,416 | 1,134 | 22 | 50,712 |
| 2003 | 1,491,356 | 1,653 | 24 | 48,573 |
| 2004 | 1,493,394 | 1,150 | 50 | 60,929 |
| 2005 | 1,483,398 | 1,622 | 0 | 80,040 |
| 2006 | 1,486,414 | 1,736 | 0 | 68,950 |
| 2007 | 1,354,091 | 2,519 | 0 | 60,928 |
| 2008 | 990,314 | 1,277 | 9 | 50,697 |
| Through 1 Aug 2009 | 622,956 | 1,299 | 46 | 23,802 |
|  |  |  |  |  |
| Catch Quota for 2008 | 815,000 | 19,000 |  | 40,405 |
| Remaining Quota | 192,044 | 17,701 |  | 16,603 |

Note:  (Data from http://www.fakr.noaa.gov/sustainablefisheries/catchstats.htm)

| Year = 2008 | OFL | ABC | TAC | TAC/ABC |
|---|---|---|---|---|
| Eastern Bering Sea | 28,200 | 1,000,000 | 1,000,000 | 1.00 |
| Aleutians Region | 19,000 | 29,400 | 19,000 | 0.65 |
| Bogoslof | 58,400 | 7,970 | 10 | 0.00 |
| Gulf of Alaska | 72,110 | 51,940 | 51,940 | 1.00 |

| Year = 2009 | OFL | ABC | TAC | TAC/ABC |
|---|---|---|---|---|
| Eastern Bering Sea | 977,000 | 815,000 | 815,000 | 1.00 |
| Aleutians Region | 32,600 | 26,900 | 19,000 | 0.71 |
| Bogoslof | 58,400 | 7,970 | 50 | 0.01 |
| Gulf of Alaska | 58,590 | 41,620 | 41,620 | 1.00 |

**Update on the Status of Pollock Resources of the Eastern Bering Sea, Aleutians, and Bogoslof Regions (through 2008)**

**(Extracted from SAFE Report, NPFMC, Anchorage)**

The standard time period for updating the status of pollock resources for meeting the schedule of the North Pacific Fishery Management Council is in November of each year when the Groundfish Plan Teams of the Council meet.  The last update was conducted in November 2008 when the status of Pollock resources was assessed for application for management of the 2009 fishery. The detailed assessments of the stocks off Alaska can be found at:

http://www.afsc.noaa.gov/REFM/stocks/assessments.htm

The summary of the Pollock assessments is shown below:

| Status and catch specifications (t) of walleye pollock in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2009 and 2010 are those recommended by the Plan Team. Catch data are current through November 8, 2008. | | | | | | |
|---|---|---|---|---|---|---|
| **Area** | **Year** | **Age 3+ Biomass** | **OFL** | **ABC** | **TAC** | **Catch** |
| Eastern | 2007 | 6,360,000 | 1,640,000 | 1,394,000 | 1,394,000 | 1,354,091 |
| Bering | 2008 | 4,360,000 | 1,440,000 | 1,000,000 | 1,000,000 | 989,895 |
| Sea | 2009 | 6,240,000 | 977,000 | 815,000 | n/a | n/a |
| | 2010 | n/a | 1,430,000 | 1,230,000 | n/a | n/a |
| | | | | | | |
| Aleutian | 2007 | 229,000 | 54,500 | 44,500 | 19,000 | 2,488 |
| Islands | 2008 | 197,000 | 34,000 | 28,200 | 19,000 | 1,282 |
| | 2009 | 266,000 | 32,600 | 15,300 | n/a | n/a |
| | 2010 | n/a | 36,800 | 15,300 | n/a | n/a |
| | | | | | | |
| Bogoslof | 2007 | 240,000 | 48,000 | 5,220 | 10 | 0 |
| | 2008 | 292,000 | 58,400 | 7,970 | 10 | 9 |
| | 2009 | 292,000 | 58,400 | 7,970 | n/a | n/a |
| | 2010 | n/a | 58,400 | 7,970 | n/a | n/a |

## Eastern Bering Sea
*Changes from previous assessment*
New data in this year's assessment include the following:
- Updated total catch for 2007 and a preliminary estimate of the 2008 catch.
- Biomass estimates from the 2008 bottom trawl survey and the 2008 echo-integration trawl (EIT) survey. The estimate from the bottom trawl survey was 3.03 million t, down 30% from the 2007 estimate, and the third lowest point in the 1982-2008 time series. The estimate from the EIT survey was 0.942 million t, down 47% from last year's survey, and the lowest in the 1979-2008 time series.
- Age composition data from the 2008 bottom trawl survey, updated age composition data from the 2007 EIT survey, and preliminary age composition data from the 2008 EIT survey (based on the

age-length key from this year's bottom trawl survey). The 2008 survey age compositions tend to confirm the strength of the large 2006 year class first observed in the 2007 surveys.
- Age and size composition data and weight-at-age data from the 2007 fishery.

***There were no substantive changes to the stock assessment model this year.***

*Spawning biomass and stock status trends*
Consistent with the estimates produced in last year's assessment, age 3+ biomass of EBS walleye pollock has declined steadily since 2003 due to poor recruitment from the 2001-2005 year classes, with the age 3+ biomass for 2008 estimated to be the lowest in the time series since 1980. This string of five consecutive poor year classes is unprecedented in the known history of the stock. Spawning biomass is estimated to be 34% below $B_{MSY}$ in 2008. The 2006 year class is reliably estimated to be well above average, however, so spawning biomass is projected to increase in the near future (25% below $B_{MSY}$ in 2009 and near $B_{MSY}$ in 2010, if the stock is fished at the maximum permissible ABC).

*Tier determination/Plan Team discussion and resulting ABCs and OFLs*
The SSC has determined that reliable estimates of $B_{MSY}$ and the probability density function for $F_{MSY}$ exist for EBS walleye pollock. Therefore, it qualifies for management under Tier 1. The Plan Team concurs with the assessment authors' conclusion that the Tier 1 reference points continue to be reliably estimated. The updated estimate of $B_{MSY}$ from the present assessment is 1.919 million t, compared to 1.88 million t from last year's assessment. Projected spawning biomass for 2009 is 1.443 million t, placing EBS walleye pollock in sub-tier "b" of Tier 1. As in recent assessments, the maximum permissible ABC harvest rate was based on the ratio between MSY and the equilibrium biomass corresponding to MSY. The harmonic mean of this ratio from the present assessment is 0.332, very close to last year's value of 0.341.
The harvest ratio of 0.332 is scaled according to the Tier 1b formula and then multiplied by the geometric mean of the projected fishable biomass for 2009 (3.321 million t) to obtain the maximum permissible ABC for 2009, which is 815,000 t. This ABC is 78% higher than the 2009 yield of 458,000 t that would correspond to a Tier 3b strategy based on a $B_{40\%}$ value of 2.43 million t.
The Plan Team supports the authors' recommendation to set 2009 ABC at the maximum permissible level of 815,000 t. The Team considered recommending a lower value, but concluded that the maximum permissible level is sufficiently conservative for the following reasons:
- A 2009 ABC of 815,000 t will keep the spawning exploitation rate within the range experienced during the 1979-2005 period, and below the comparatively high values experienced in 2006-2008.
- The Tier 1 harvest control rules already have a built-in precautionary adjustment for stocks that fall below $B_{MSY}$.
- Uncertainty is already factored into the Tier 1 harvest control rules.
- A 2009 ABC of 815,000 t constitutes a large (18%) reduction from the 2008 ABC of 1 million t and would result in greater short-term catch stability than a lower ABC.
- The strength of the 2006 year class, estimated for the first time in last year's assessment, has been confirmed after a second year of survey observations, and the confidence interval has tightened considerably in the present assessment. A strong 2006 year class following weak 2001-2005 year classes would also be consistent with the hypothesis that the 2006 year class was affected positively by both decreased temperature and increased copepod abundance.
- Under a 2009 ABC of 815,000 t, the stock is expected to return to near $B_{MSY}$ by 2010 if the stock is fished at the maximum permissible level.

The Team also concurs with the authors' recommendation to set the preliminary ABC for 2010 at the maximum permissible level, which is 1.23 million t. However, the Team emphasizes that its recommendation next year for the final 2010 ABC will depend on the estimates of recent year class strengths contained in next year's stock assessment. For example, if the 2006 year class is only average (which appears unlikely based on the data presently available), this year's assessment indicates that the

maximum permissible ABC for 2010 would be reduced to about 900,000 t. Next year's estimates of other incoming year classes will also factor into the recommendation for the final 2010 ABC.

The OFL harvest ratio under Tier 1a is 0.398, the arithmetic mean of the ratio between MSY and the equilibrium fishable biomass corresponding to MSY. The product of this ratio, rescaled according to the Tier 1b formula, and the geometric mean of the projected fishable biomass for 2009 gives the OFL for 2009, which is 977,000 t. The current projection for OFL in 2010 given a 2009 catch of 815,000 t is 1.43 million t. The walleye pollock stock in the EBS is not overfished and is not approaching an overfished condition.

*Ecosystem considerations*

Both copepods and euphausiids are present in the diet of pollock in all years. While estimates of copepod abundance are available, similar information on euphausiids is presently lacking. However, ongoing research should provide more information on euphausiid abundance in the next couple of years. The weakness of the 2001-2005 year classes suggests that it has been harder than average for pollock to survive through their first year. Recent abundance of apex predators has been within the range of historic variability, though pelagic foragers (including pollock) have declined recently, perhaps due to reduced prey (e.g., copepod) abundance during the early part of this decade. Pribilof fur seal pup weights in 2008 were lower on those rookeries where females forage on the shelf than for off-shelf foragers. This may have been due to insufficient local availability of forage for nursing females, requiring them to make longer than normal foraging trips.

*Response to SSC comments*

The probability of the spawning biomass being below $B_{20\%}$ in 2008 is approximately 15%. In 2009, the probability decreases to less than 10%, given a 2009 catch of 815,000 t.

**Aleutian Islands**

*Changes from previous assessment*

The AI pollock assessment underwent an extensive peer review during the summer of this year, conducted by the Council of Independent Experts (CIE). In response to this review, many changes were made in the assessment model.

The only new data in the model consists of fishery catches in the area from 170-174°W, as recommended by the CIE reviewers.

Changes to the model, all recommended by the CIE reviewers, consisted of the following:

- A bootstrap method was used to compute annual catch at age, average weight at age, and input sample sizes for catch at age.
- A constant sample size of 100 was assumed for survey age compositions, except for the 1991 survey, which was given a lower sample size due to non-representative age structure sampling.
- The maturity schedule from the GOA pollock stock was used instead of the maturity schedule from the BS stock.
- Survey selectivity was forced to be constant across the entire time series, and fishery selectivity was forced to be constant within each of three time blocks (pre-1992, 1992-2005, and post-2005).
- Values of stock-recruitment parameters were assumed rather than estimated.
- The age range for which average catchability is forced to equal 1.0 was changed from 8-10 years to 5-12 years, and the range of years used to estimate average recruitment was changed from 1990-2007 to 1978-2006.
- To make projections, the selectivity curve estimated in the AI assessment model was used instead of the selectivity curve estimated in the EBS assessment model.

*Spawning biomass and stock status trends*

Relative to last year's assessment, the numerous revisions to this year's model resulted in a major change

in the estimated trajectory of the stock relative to biomass reference points. In last year's assessment, the stock was estimated to have been well above $B_{40\%}$ for the entire time series. In contrast, this year's assessment estimates that spawning biomass reached a minimum level of about $B_{21\%}$ in 1999, increased steadily through 2006 to a level around $B_{30\%}$, then remained fairly close to that level through the present. The increase in spawning biomass since 1999 has resulted more from a dramatic decrease in harvest than from good recruitment, as there have been no above-average year classes spawned since 1983. However, it should be noted that the average recruitment for this stock is almost twice the median level. The 2000 year class was the first to exceed the median level since the 1989 year class. Spawning biomass for 2009 is projected to be 85,500 t.

*Tier determination/Plan Team discussion and resulting ABCs and OFLs*
The SSC has determined that this stock qualifies for management under Tier 3. The Plan Team concurs, believing that the changes made this year in response to the CIE review have made a good model even better. The revised model estimates $B_{40\%}$ at a value of 113,000 t, placing the AI pollock stock in sub-tier "b" of Tier 3. Under Tier 3b, with $F_{40\%}=0.29$, the maximum permissible ABC for 2009 is 26,900 t. However, the Plan Team notes that this value is more than 10 times the maximum catch taken in the last decade. Given that the stock is well below $B_{35\%}$, that all cohorts presently in the population are estimated to be below average, and that the assessment model is in a state of transition, the Plan Team feels that it would be appropriate to set the 2009 ABC at some level lower than the maximum permissible. As an alternative to the maximum permissible ABC under Tier 3b, the assessment authors have provided the value corresponding to the maximum permissible ABC under Tier 5, which is 15,300 t (based on the model's estimated value of 0.22 for the natural mortality rate). The Plan Team recommends setting the 2009 and preliminary 2010 ABCs at this value. This recommendation should not be interpreted as a statement that the stock fails to qualify for Tier 3, but rather as a statement that a phased transition from recent actual catches to the higher catch levels associated with Tier 3 is advisable.
Following the Tier 3b formula with $F_{35\%}=0.36$, OFL for 2009 is 32,600 t. The projected OFL for 2010, given a 2009 catch of 2,000 t, is 36,800 t. The walleye pollock stock in the Aleutian Islands is not overfished and is not approaching an overfished condition.

*Response to SSC comments*
There is less than a 1% chance that the AI pollock stock will be below $B_{20\%}$ in 2009.

**Bogoslof**
*Changes from previous assessment*
This assessment has been placed on a biennial schedule, and Chapter 1b is basically a summary of last year's assessment. No survey took place this year.
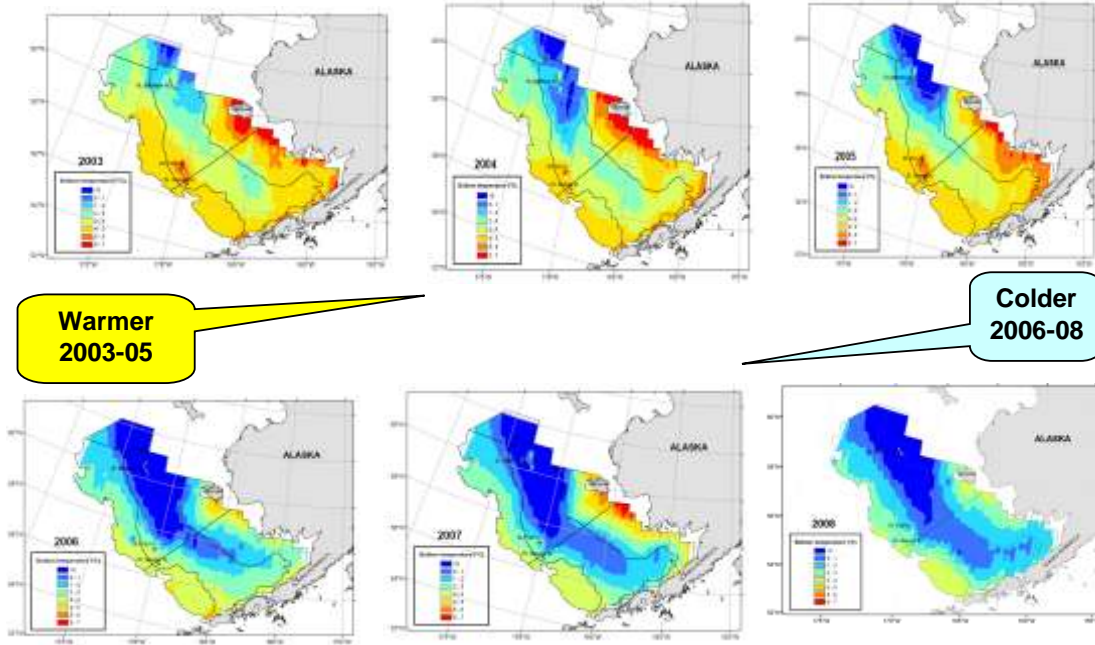*Spawning biomass and stock status trends*
Survey biomass estimates since 2000 have all been lower than estimates prior to 2000, ranging from a low of 198,000 t in 2003 to a high of 301,000 t in 2000. The 2007 estimate was the highest since the 2000 estimate.

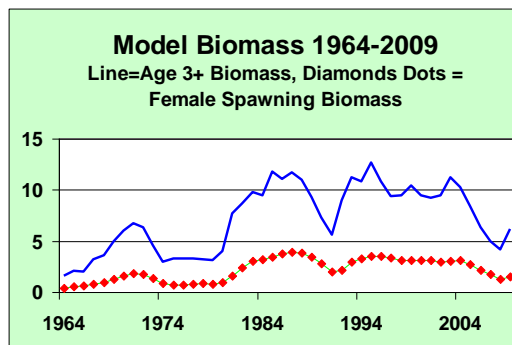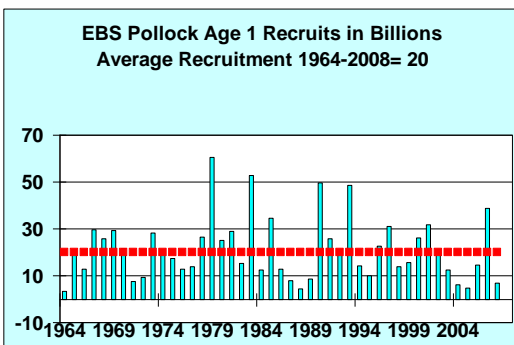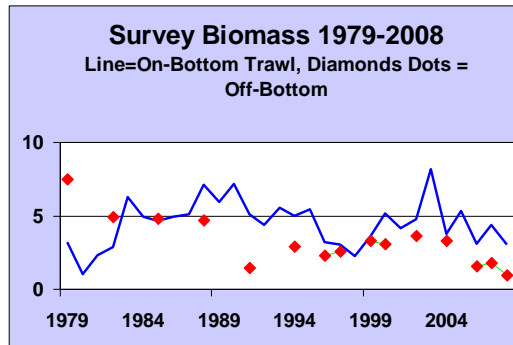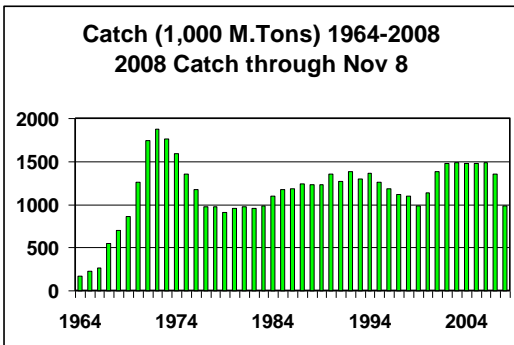*Tier determination/Plan Team discussion and resulting ABCs and OFLs*
The SSC has determined that this stock qualifies for management under Tier 5. Traditionally, the ABC for this stock has been set using a formula similar to the Tier 3 formula, but substituting a reference biomass level of 2 million t for $B_{40\%}$. The Plan Team concurs with the authors' recommendation to continue this practice. Given $F_{40\%}=0.27$, this results in $F_{ABC}=0.022$ and a 2009 ABC of 7,970 t. The projected ABC for 2010 is the same. Following the Tier 5 formula with $M=0.20$, OFL for 2009 is 58,400 t. The OFL for 2010 is the same. As a Tier 5 stock, it is not possible to determine whether Bogoslof pollock is overfished or is approaching an overfished condition.
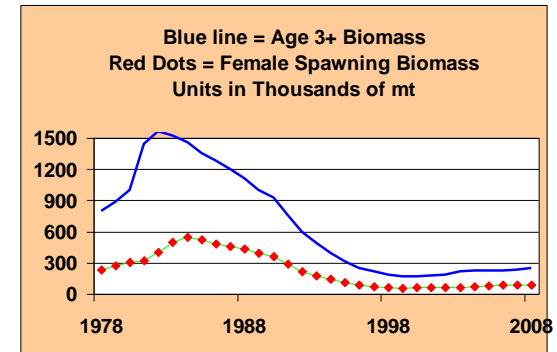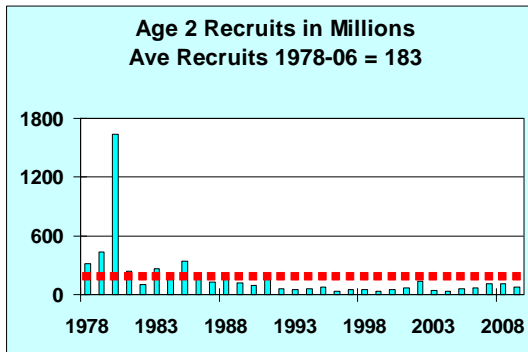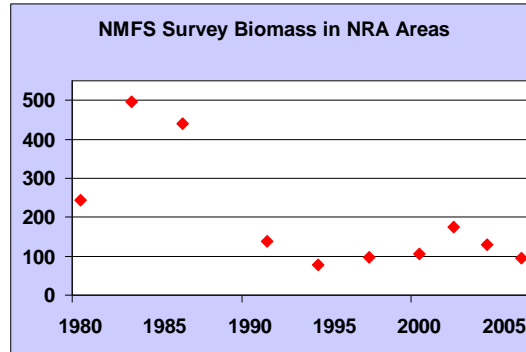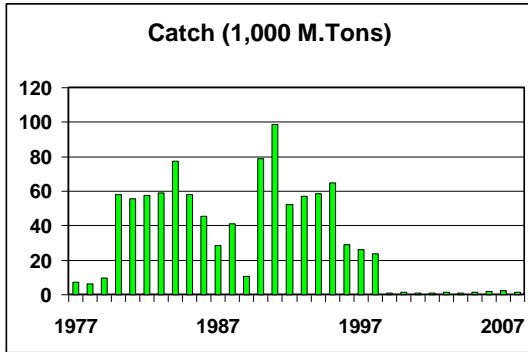
**Slides on Status of Pollock Stocks:**

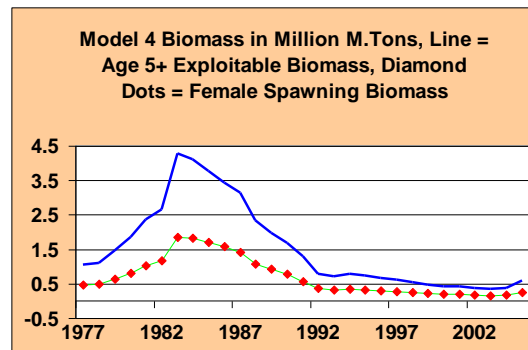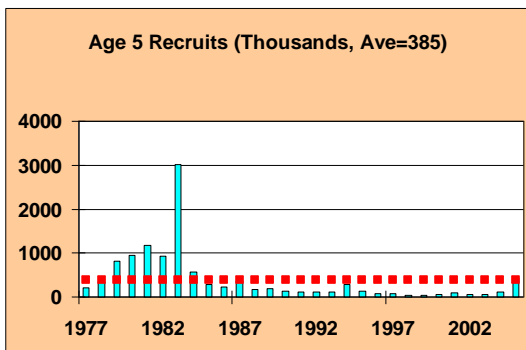## Bottom Temperature Profiles from Surveys, 2003-2008    [Red is warm, Blue is cold]



**Warmer 2003-05**

**Colder 2006-08**

## C1 - EBS Pollock Stock Assessment, Dec 2008



**Catch (1,000 M.Tons) 1964-2008**
**2008 Catch through Nov 8**

**Survey Biomass 1979-2008**
**Line=On-Bottom Trawl, Diamonds Dots = Off-Bottom**

**EBS Pollock Age 1 Recruits in Billions**
**Average Recruitment 1964-2008= 20**

**Model Biomass 1964-2009**
**Line=Age 3+ Biomass, Diamonds Dots = Female Spawning Biomass**

# C1a - Aleutian Islands Pollock Assessment, Dec 2008

**Catch (1,000 M.Tons)**

**NMFS Survey Biomass in NRA Areas**

**Age 2 Recruits in Millions**
**Ave Recruits 1978-06 = 183**

Blue line = Age 3+ Biomass
Red Dots = Female Spawning Biomass
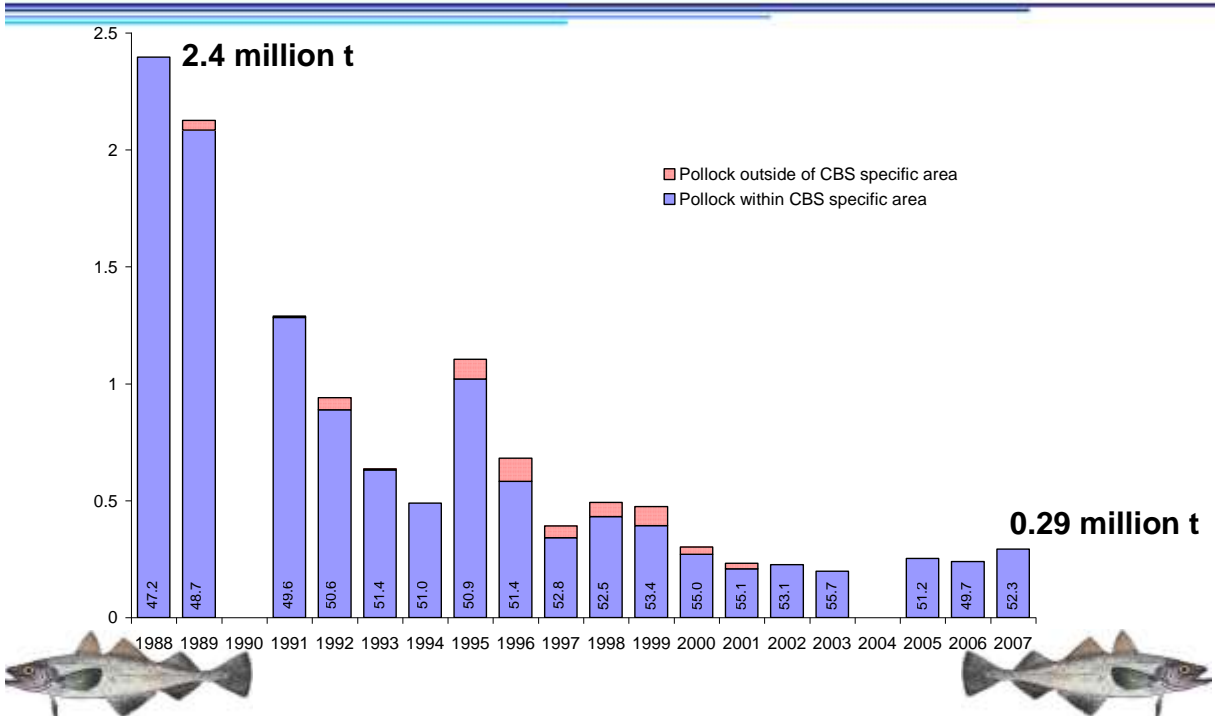Units in Thousands of mt

# C1b - Bogoslof Island Pollock Assessment, Dec 2008

**Catch (1,000 M.Tons)**

**NMFS Survey Biomass in Standard Area**
**(Million M.Tons)**

**Age 5 Recruits (Thousands, Ave=385)**

Model 4 Biomass in Million M.Tons, Line =
Age 5+ Exploitable Biomass, Diamond
Dots = Female Spawning Biomass

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# EIT Survey Biomass



**2.4 million t**

**0.29 million t**
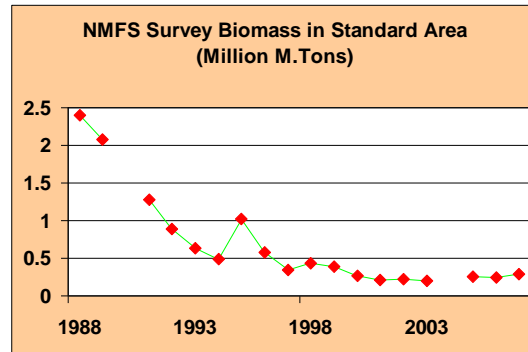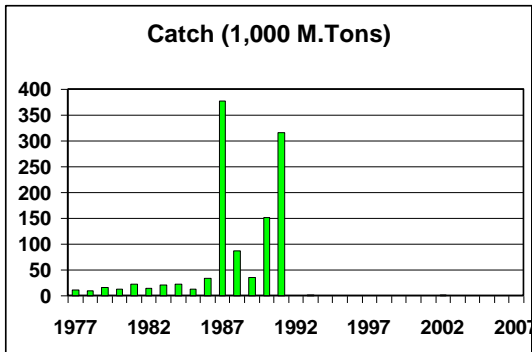
**2008**

### Bering Sea and Aleutian Islands Region

Dec 2008: No stock was being overfished; but abundance of EBS & AI Pollock are below Bmsy