BSAI Plan Team Members
(12 Members)

NPFMC -- Jane DiCosimo

NMFS -- Loh-Lee Low
    Mike Sigler
    Grant Thompson
    Lowell Fritz
    Kerim Aydin
    Andy Smoker

USF&W -- Kathy Kuletz

ADF&G -- Ivan Vining

Univ.Alaska-- Brenda Norcross

WDF&W -- Farron Wallace

Halibut Comm-- Bill Clark
BSAI SAFE Reports
(Many Contributors from Various Agencies and Universities)

21 Authors for Status of Stocks Section
78 Contributors to Ecosystems Section
5 Authors for Economics Chapter
Total U.S. Landings
4.3 million mt (2001)
(From NOAA Fisheries 2001 Report, Our Nation's Living Resources)
Alaska Landings
2.5 million mt (1998-2001)
(From OLO, 4 Yr Average)

- Groundfish: 81%
- Salmon: 15%
- Herring: 2%
- Shellfish: 2%
- Nearshore: 0%
Alaska Groundfish Landings

2.027 million mt (2000-2002)

(from Table 1, Economics Section, 3 Yr Average)
Bering Sea-Aleutians Groundfish Catch
25 Year History (in thousands of mt)
(from Table 1, Economics Section)
BSAI SAFE

1. Assessment Theme
2. Overview
3. Species-by-Species Review
4. Summary of Changes
Assessment Theme

ABC = Biomass x Exploitation Rate

1. Determine Biomass from
   -- Surveys….Hydroacoustics, Trawls
   -- Models…..Age or Length-Structure Models

2. Determine Exploitation Rates
   (By Catch Control Rules of Tier System)
   -- F overfishing ....... Example F_{35\%}
   -- F abc ............... Example F_{40\%}
Tier System

Evaluate Quality of Information about Population Dynamics of the Stocks and Use Catch Control Rules according to 6 Tiers of Data Quality (Page 3 of SAFE Summary)

Tier 1 -- Most Information - reliable B, Bmsy, pdf of Fmsy
Tier 2 -- Less Information - reliable B, Bmsy, Fmsy, F35, F40
Tier 3 - reliable B, B40, F35, F40
Tier 4 - reliable B, F35, F40
Tier 5 -- reliable B and M
Tier 6 - reliable Catch History Data
Overview of Exploitable Biomass
By
Major Species Groups
BSAI Exploitable Biomass
Yr 2003 Total = 19.869 MMT
(up 94,500 mt from 2002)

Pollock-EBS 56%
Pacific Cod 8%
Flatfish Total 26%
Sablefish 0%
Rockfish Total 3%
Atka Mackerel 1%
Others 4%
Pollock-Bogoslof 1%
Pollock-Al 1%
BSAI Flatfish Complex Biomass
Yr 2003 Total = 5.193 MMT
(up 320,000 mt from 2002)

Rock Sole 22%
Flathead Sole 9%
Alaska Plaice 20%
Other flatfish 2%
Yellowfin Sole 30%
Arrowtooth Flounder 13%
Greenland Turbot 3%
BSAI Rockfish Complex Biomass
Yr 2003 Total = 555,200 MT
(down 40,800 mt from 2002)

- Northern: 26%
- Others: 6%
- Shortraker: 4%
- Rougheye: 2%
- POP: 63%
Overview of Plan Team Estimated ABCs

By Major Species Groups
BSAI Groundfish Complex ABCs
2004 Total = 3.664 MMT
(Up 347,700 mt from 2003 - mostly from EBS Pollock)
BSAI Flatfish Complex ABC
2004 Total = 651,140 MT
(Up 90,300 mt from 2003)

- Alaska Plaice: 31%
- Rock Sole: 21%
- Arrowtooth Flounder: 18%
- Yellowfin Sole: 17%
- Greenland Turbot: 1%
- Other Flatfish: 3%
- Flatfish Sole: 9%
BSAI Rockfish Complex ABCs

2004 Total = 22,495 MT
(down 2,300 mt from 2003)

- Northern: 31%
- Shortraker: 2%
- Rougheye: 1%
- OtherRock EBS: 4%
- OtherRock AI: 3%
- POP: 59%
Description

Species-by-Species
EBS Pollock Assessment
Notable Features

1. 2003 Surveys
   Bottom Trawl Biomass = 8.51 mmt, up 77% from 2002
   Very warm

2. 2003 Models:
   7 scenarios of Age-Structure Models, Used Model 1
   Age3+ Biomass for 2003 = 11 mmt, down 1% from last year's estimate

3. Recruitment
   1999 & 2000 Year Classes both Above Average
Temperature trends

Average summer bottom temperature, degrees C


Temperature: 0, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4
2003  8.51 mmt
2003 winter (warm)

Jan 20th - May 1st, 2003

Pollock catch
531 thousand tons total reported

Source: NMFS Observer database
2003 summer-fall fishery

Pollock catch
737 thousand tons total reported

Jun 1 - Oct 16, 2003

Source: NMFS Observer database
EBS pollock biomass trend

Age 3+ mid-year biomass

Thousands of tons

Year


2002 Assessment
EBS Pollock

Ave 26Yr Age 1 R = 26 Billion

Biomass (million mt)

Catch
Age 1 Billions
Biomass

2000

2000 2002 2004
Aleutian Island Region Pollock Assessment

1. New age structured assessment; but needs further development

2. Depend on Survey Biomass
   - 1991 167,140
   - 1994 77,503
   - 1997 93,512
   - 2000 105,554
   - 2002 175,000

3. ABC from Tier 5 = 39,400 mt
Bogoslof Region
Pollock Survey Biomass

Biomass (MMT)
Bogoslof Region Pollock ABC

1. Plan Team Method Uses Tier 5
   ABC max permissible = Biomass $\times$ 0.75 M
   $ABC = 29,700$ mt

2. SSC Method Uses 2 mmt as Target Biomass and since 2003 Biomass was less than 10% of Target
   ABC was adjusted down by formula to 2,570 mt
Pacific Cod Assessment
Notable Features

1. 2003 Surveys
   EBS Trawl Biomass = 605,681 mt, down 2%

2. 2003 Model
   Update of Last Year’s Model
   Estimated 2004 Age 3+ Biomass = 1,660,000 mt
down 1% from 2003, down 3% from projected

3. Recruitment
   -- 3 Recent year classes above average
BSAI Pacific Cod

Average Recruits = 244 million fish

Biomass (1000 mt)

- **Catch**
- **Age 3 Millions**
- **Age 3+Bio**

**2000**
Yellowfin Sole Assessment

Notable Features

1. Survey biomass
   Relatively high biomass, doubled from 1975-79
   Declining in recent years

2. Models
   Estimated 2003 Age 3+ Biomass = 1.55 mmt,
   no change from last year
   biomass is still high and possibly stabilizing

3. Recruitment
   Ricker S/R curve fitted
   MSY calculated for two time periods.
   Discussion of Tier 1 implications
EBS Yellowfin Sole

Biomass (1000 mt)

- Catch
- Age 5 Billions
- Age 2+Biom

Ave 40 Yr Age 5 R = 1.4 Billion
1. **Survey Biomass**
   The 2003 shelf trawl survey estimate 553,900 mt
   56% increase from 2002.

2. **Assessment model**
   Estimated 2004 Age 1+ Biomass = 696,400 mt,
   17% increase from last year's estimate.
   *Change primarily due to new model configuration*
   Equal emphasis on all data
   Used sex ratio data
   Allowed estimation of sex-specific natural mortality rate
   Temperature effect on \( q \) explored
EBS Arrowtooth Flounder

Ave 25 Yr age 2 R = 303 Millions

Biomass (1000 mt)

Catch
Age 2 Millions
Age 1+Biom

Years: 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 2000, 2002
EBS Greenland Turbot

Ave 30 Yr Age 1 R = 21 Millions
Rock sole Assessment
Notable Features

1. Survey Biomass
   The 2003 shelf survey estimate 2.1 mmt
   An increase from the 2002 level

2. Models
   Survey $q$ estimated with prior
   From herding experiment data
   Estimated $q = 1.45$
   Temperature effect on $q$
   not evident for this species
EBS Rock Sole

Ave 27Yr Age 4 R = 0.96 Billions
Flathead sole Assessment
Notable Features

1. Survey Biomass
   The 2003 shelf survey estimate 529,000 mt
   Slight decrease from 2002

2. Models
   Recent recruitment low
   ABC 61,900 t
   Slight decrease from 2002
   Temperature effect on q was incorporated
EBS Flathead Sole

- **Catch**
- **Age 3 Billions**
- **Age 3+Biom**

Ave 27Yr Age 3 R = 0.67 Billions
Alaska Plaice Assessment
Notable Features

1. Survey Biomass
   The 2003 shelf survey estimate 467,000 mt
   Slight increase from 2002

2. Models
   Length composition data used in assessment
   12 years of survey length data
   Estimated growth curve re-computed
   ABC increased
   From 137,015 mt in 2002 to 203,056 mt in 2003
EBS Alaska Plaice

Ave 28 Yr Age 3 R = 1.37 Billions

Catch
Age 3 Billions
Age 1+Biom
POP Assessment
Notable Features

1. Assessment model
   Combined BSAI areas

2. Biomass Trend
   Stable in recent years after some rebuilding
   Recruitment
   Poorer Recruitment in recent years
   1988 YC most recent above average year class
**Bering Sea/Aleutians POP**

**Biomass (1000 mt)**

- **Catch**
- **Age 3 Millions**
- **Age 3+Biom**

*Ave 35 Yr Age 3 R = 63 Millions*
Other Red Rockfish Assessment

Species split

1. Original Species Splits
   Pacific ocean perch
   Other Red Rockfish through Year 2000: Northern/Sharpchin vs Shortraker/Rougheye

2. New Splits:
   Northern, Shortraker, Rougheye
   Sharpchin is merged into Other Rockfish category
Northern Rockfish Assessment

Notable Features

1. New age-structured assessment
   Made possible by reading archived otoliths
   Shift to Tier 3 from Tier 5

2. Biomass Trend
   Stable

3. Recruitment
   Good in recent years
Bering Sea/Aleutians Northern Rockfish

Biomass (1000 mt)

Catch
Age 3 Millions
Age 3 + Biom

Ave 20 Yr Age 3 R = 35 Millions
Shortraker and Rougheye Assesments

Notable Features

1. In 2001 & 2002, managed as a group
2. Now separated
   Observer Program & NMFS track separately
3. Tier 5 ABC

Based on Average 1991-2002 biomass:

<table>
<thead>
<tr>
<th>Species</th>
<th>Biomass</th>
<th>ABC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortraker</td>
<td>23,400 mt</td>
<td>526 mt</td>
</tr>
<tr>
<td>Rougheye</td>
<td>10,400 mt</td>
<td>195 mt</td>
</tr>
</tbody>
</table>
Other Rockfish Assessments

Notable Features

1. Presently Managed as a Complex (8 species)
2. Author recommend separating shortspine thornyhead & manage as tier 5
   Remaining other rockfish stay in Tier 6
3. Plan Team disagreed as procedure needs further evaluation and recommends Mgmt as before.
   Thus Plan Team ABC is according to Tier 5:

<table>
<thead>
<tr>
<th>Stock</th>
<th>Year</th>
<th>Survey</th>
<th>Biomass</th>
<th>ABC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBS</td>
<td>2004</td>
<td>18,000</td>
<td></td>
<td>960</td>
</tr>
<tr>
<td>AI</td>
<td>2004</td>
<td>15,000</td>
<td></td>
<td>634</td>
</tr>
</tbody>
</table>
Atka Mackerel Assessment
Notable Features

1. Survey Biomass 2002 = 773,000 mt up 51% from 2000 survey; Shows high variability.
2. Yr 2004 Model 3+ biomass = 286,200 mt, down 15% from Yr 2003; Probably an underestimate.
3. Max Permissible F40 would yield ABC = 66,700 mt an increase from last year (51,000 mt)
4. ABC = 66,700
5. 1998, 1999 Year Classes showing strength
Aleutian Islands Atka Mackerel

Ave 26 Yr Age 1 R = 424 Millions

Biomass (1000 mt)

Catch
Age 1 Millions
Age 3+Biom

0 100 200 300 400 500 600 700 800 900 1000 1100 1200
Squid and other species Assessment
Notable Features

1. Squid ABC is calculated under Tier 6
   .... average catch from 1977-1995

2. Other species: author recommends managing by major taxonomic groups

<table>
<thead>
<tr>
<th>Species</th>
<th>Biomass (mt)</th>
<th>ABC (mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharks</td>
<td>29,300</td>
<td>1,980</td>
</tr>
<tr>
<td>Skates</td>
<td>484,000</td>
<td>36,300</td>
</tr>
<tr>
<td>Sculpins</td>
<td>212,000</td>
<td>23,800</td>
</tr>
<tr>
<td>Octopus</td>
<td>4,980</td>
<td>1,120</td>
</tr>
</tbody>
</table>
## Summary (From Table 4) (Pollock)

<table>
<thead>
<tr>
<th>Stock</th>
<th>Biomass (mt)</th>
<th>ABC (mt)</th>
<th>ABC Change from 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollock, EBS</td>
<td>11,000,000</td>
<td>2,560,000</td>
<td>Up 10 %</td>
</tr>
<tr>
<td>Pollock, AI</td>
<td>175,000</td>
<td>39,400</td>
<td>Up 34%</td>
</tr>
<tr>
<td>Pollock, Bogoslof</td>
<td>198,000</td>
<td>29,700 (PT)</td>
<td>Down 13%</td>
</tr>
</tbody>
</table>
## Summary (from Table 4)
(Cod and Sablefish)

<table>
<thead>
<tr>
<th>Stock</th>
<th>Biomass (mt)</th>
<th>ABC (mt)</th>
<th>ABC Change from 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacific Cod, BSAI</td>
<td>1,680,000</td>
<td>223,000</td>
<td>Same</td>
</tr>
<tr>
<td>Sablefish, EBS</td>
<td>31,000</td>
<td>3,010</td>
<td>Up 4 %</td>
</tr>
<tr>
<td>Sablefish, AI</td>
<td>39,000</td>
<td>3,450</td>
<td>Up 11 %</td>
</tr>
</tbody>
</table>
## Summary (from Table 4)  
(Flatfishes)

<table>
<thead>
<tr>
<th>Stock</th>
<th>Biomass (mt)</th>
<th>ABC (mt)</th>
<th>ABC Change from 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>YellFn. Sole</td>
<td>1,550,000</td>
<td>114,000</td>
<td>Same</td>
</tr>
<tr>
<td>Grn. Turbot</td>
<td>112,000</td>
<td>4,740</td>
<td>Down 19 %</td>
</tr>
<tr>
<td>Arrow. Fl</td>
<td>597,000</td>
<td>115,000</td>
<td>Up 3 %</td>
</tr>
<tr>
<td>Rock Sole</td>
<td>877,000</td>
<td>139,000</td>
<td>Up 26 %</td>
</tr>
<tr>
<td>Flathead S</td>
<td>550,000</td>
<td>61,900</td>
<td>Down 6 %</td>
</tr>
<tr>
<td>Alaska Plaice</td>
<td>1,080,000</td>
<td>203,000</td>
<td>Up 48 %</td>
</tr>
<tr>
<td>Other Flats</td>
<td>107,000</td>
<td>13,500</td>
<td>Down 16%</td>
</tr>
</tbody>
</table>
## Summary (from Table 4)

(Rockfishes)

<table>
<thead>
<tr>
<th>Stock</th>
<th>Biomass (mt)</th>
<th>ABC (mt)</th>
<th>ABC Change from 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>POP, BSAI</td>
<td>375,000</td>
<td>13,300</td>
<td>Down 12 %</td>
</tr>
<tr>
<td>Northern R</td>
<td>142,000</td>
<td>6,880</td>
<td>Down 3 %</td>
</tr>
<tr>
<td>ShortRaker</td>
<td>23,400</td>
<td>526</td>
<td>New Category</td>
</tr>
<tr>
<td>Rougheye</td>
<td></td>
<td>195</td>
<td>New Category</td>
</tr>
<tr>
<td>Other R, EBS</td>
<td>18,300</td>
<td>960</td>
<td>Same</td>
</tr>
<tr>
<td>Other R, AI</td>
<td>12,100</td>
<td>634</td>
<td>Same</td>
</tr>
</tbody>
</table>
Summary (from Table 4)  
(Atka Mackerel & Other Species)

<table>
<thead>
<tr>
<th>Stock</th>
<th>Biomass (mt)</th>
<th>ABC (mt)</th>
<th>ABC Change From 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atka Mackerel</td>
<td>286,000</td>
<td>66,700</td>
<td>Up 6 %</td>
</tr>
<tr>
<td>Squid</td>
<td>NA</td>
<td>1,970</td>
<td>Same</td>
</tr>
<tr>
<td>Other Species</td>
<td>695,000</td>
<td>Various</td>
<td>New Species Breakdown, SSSO</td>
</tr>
</tbody>
</table>
### Adjustments of ABCs Below Max. Permissible Levels - due To Uncertainties -

<table>
<thead>
<tr>
<th>Stock</th>
<th>Maximum Permissible ABC (mt)</th>
<th>Recommend ABC (mt)</th>
<th>Main Reasons for Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollock, Bogoslof</td>
<td>29,700 (Plan Team)</td>
<td>2,570 (SSC)</td>
<td>SSC Procedure</td>
</tr>
<tr>
<td>Pacific Cod</td>
<td>297,000</td>
<td>223,000</td>
<td>Risk-averse adjustment due to q, M uncertainty</td>
</tr>
<tr>
<td>Green. Turbot</td>
<td>15,700</td>
<td>4,740</td>
<td>Low B &amp; R</td>
</tr>
<tr>
<td>Sablefish, All</td>
<td>25,400</td>
<td>23,000</td>
<td>Simulated Catch</td>
</tr>
</tbody>
</table>
Adjustments to ABCs due to Ecosystems

1. The Team did not make specific adjustments to ABCs for ecosystem concerns
2. General concerns about uncertainties have already been built into the Analyses
## Differences of ABCs
**Plan Team vs SSC**

<table>
<thead>
<tr>
<th>Stock</th>
<th>Plan Team</th>
<th>SSC</th>
<th>Main Reasons for Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollock, Bogoslof</td>
<td>29,700</td>
<td>2,570</td>
<td>B is 10% of B target of 2 mmt</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff = 27,130</td>
</tr>
<tr>
<td>Other Species (Sculpins, Skates, Sharks, Octopi)</td>
<td>Species Breakdown, Tier 5, ABC adds up to 63,200</td>
<td>Species Breakdown, Tiers 5 &amp; 6 Combine and Stair-step increase from 1997 ABC= 46,810</td>
<td>Quality of Data Diff = 16,390</td>
</tr>
</tbody>
</table>
BSAI Groundfish Complex
Yr 1999 to Yr 2003

- Exploitable Biomass
  - 19.87 mmt for Yr 2003
  - Historical High

- ABC
  - 3.664 mmt for Yr 2003
  - Historical High
Summary for 2003

- ABC = 3,664,065 mt
- Max TAC = 2 million mt (< 55% of ABC)
- Catch in 2003 thru Nov 8 = 1,957,029 mt
# Catch (2001-2003)

<table>
<thead>
<tr>
<th>Year</th>
<th>Catch</th>
<th>Difference from 2 mmt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1,815,227</td>
<td>184,773</td>
</tr>
<tr>
<td>2002</td>
<td>1,937,386</td>
<td>62,614</td>
</tr>
<tr>
<td>2003 (thru Nov 8)</td>
<td>1,957,029</td>
<td>42,971</td>
</tr>
</tbody>
</table>