Summary of the 19th North Pacific Albacore Workshop
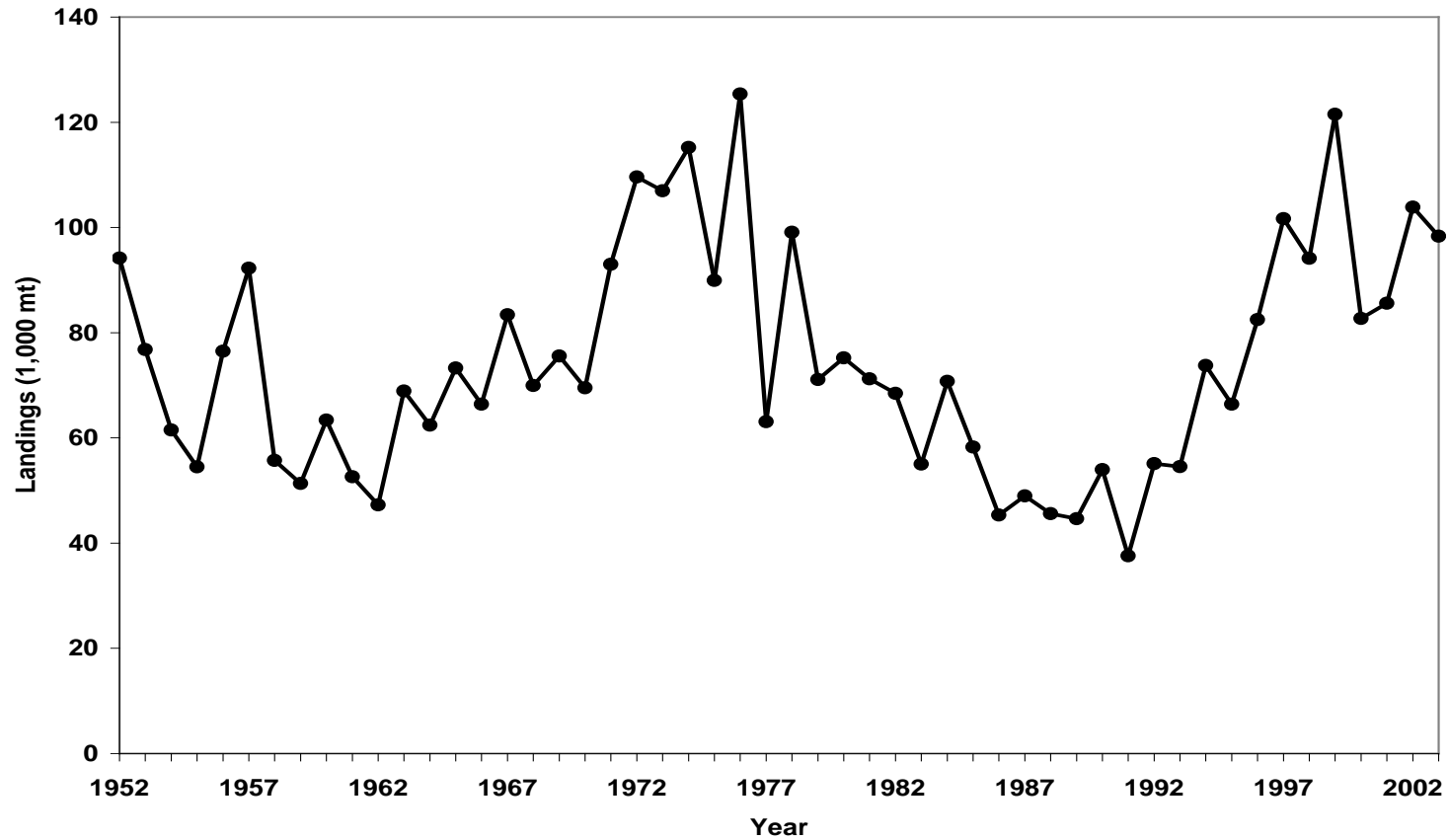
Outline of Presentation

- Fishery Statistics
- Biological Studies
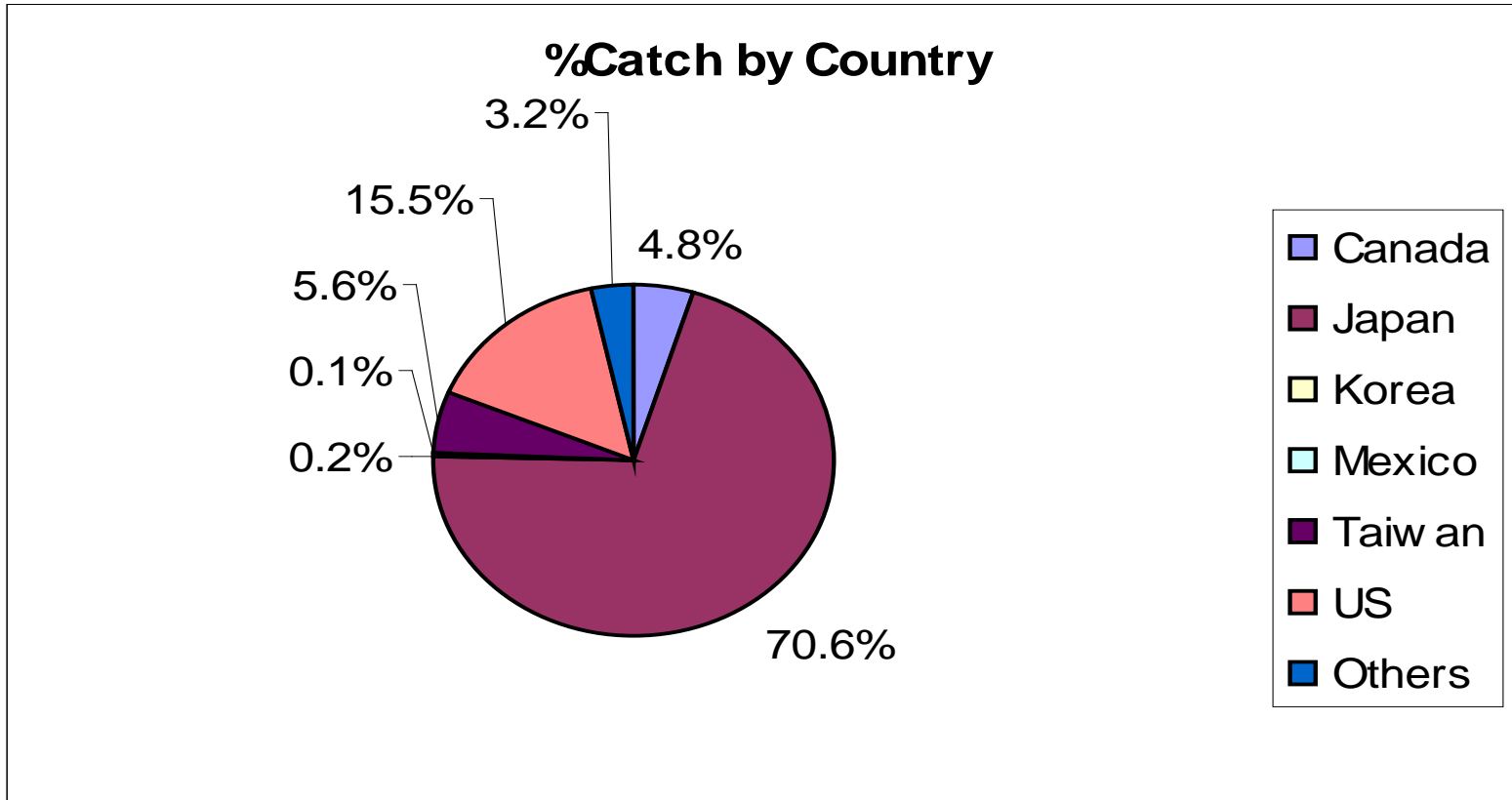- Stock Assessment

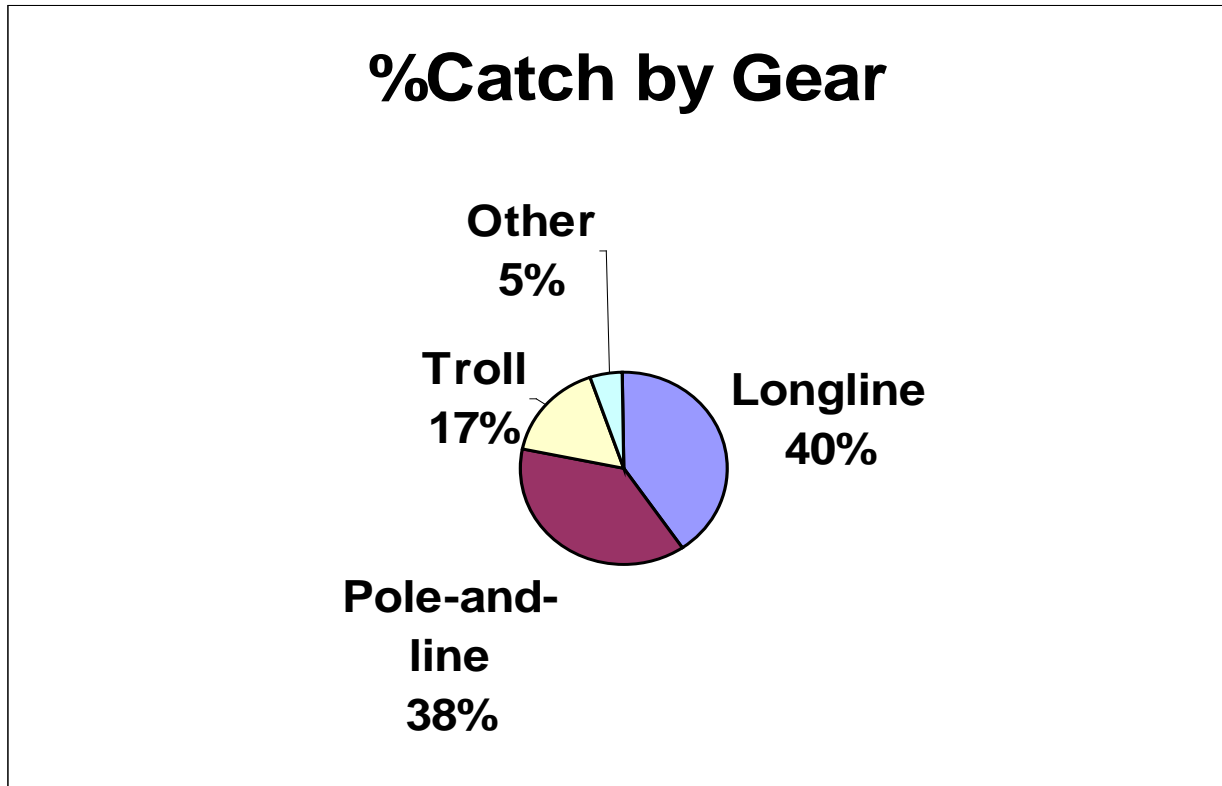# Fishery Statistics (cont'd.)

Fishery Statistics (cont'd.)

%Catch by Country

☐	Canada
■	Japan
☐	Korea
☐	Mexico
■	Taiw an
☐	US
■	Others

3.2%
15.5%
5.6%
0.1%
0.2%
4.8%
70.6%

Canada

Fisheries Statistics (cont'd.)

%Catch by Gear

Pie chart "%Catch by Gear":
- Longline 40%
- Pole-and-line 38%
- Troll 17%
- Other 5%

Biological Studies

- **Studies were reviewed that addressed:**
  - **age and growth (Taiwan)**
  - **sex ratio and maturity (Taiwan)**
  - **ongoing archival tagging projects (Japan, USA)**
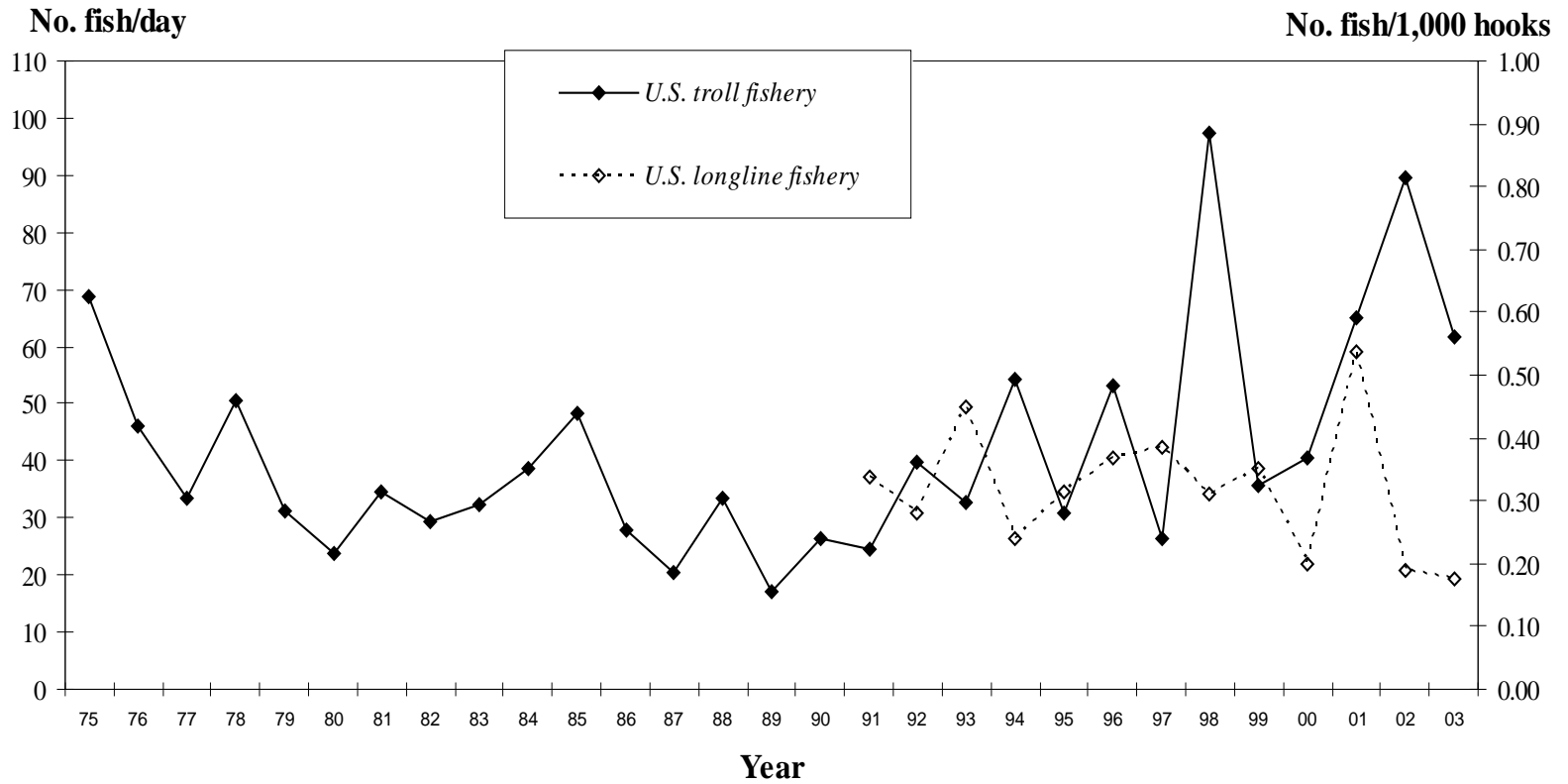 - **analysis of historical dart tag data (Japan)**

Canada

VPA-2BOX Model Analysis: Input Data

- **Catch-at-age matrices**
  - **Eastern Pacific Ocean (USA)**
  - **Western Pacific Ocean (Japan, Taiwan)**

- **Abundance Indices**
  - **U.S./Canada Troll (ages 2,3,4,5)**
  - **U.S. Longline (ages 6-9+)**
  - **Japan Pole-and-Line (ages 2,3,4,5)**
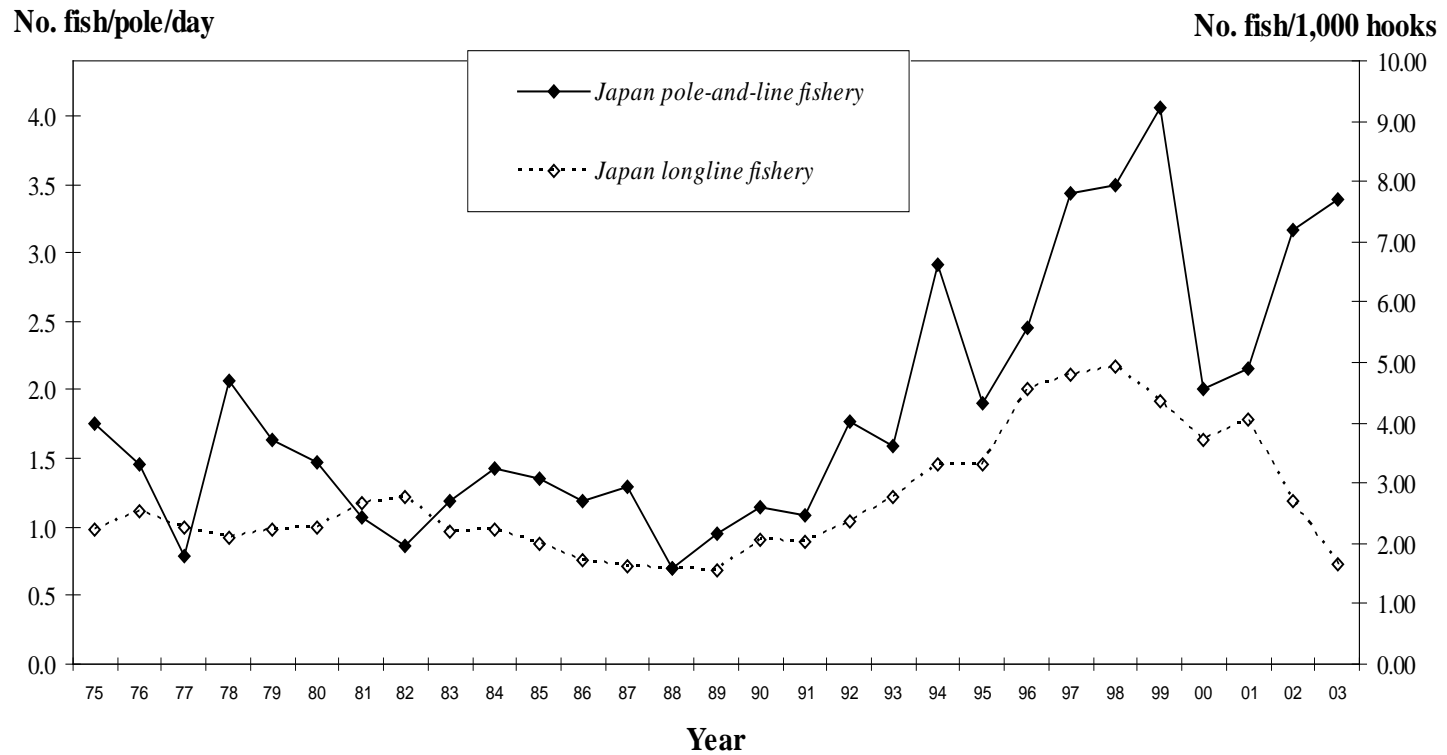 - **Japan Longline (3,4,5,6,7,8,9+)**

Canada

VPA-2BOX Model Analysis: Indices of abundance

VPA-2BOX Model Analysis: Indices of abundance

VPA-2BOX Model Analysis: Biological assumptions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mat.	0	0	0	0	0.5	1	1	1	1	1	1	1	1	1
Wt.	0.85	2.62	5.44	9.13	13.46	18.16	23.03	27.88	32.59	37.06	41.24	45.09	48.6	51.76
M	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Sel.	0.01	0.11	0.37	0.58	0.30	0.34	0.67	1	1	1	1	1	1	1

Stock Assessment Conclusions: Biomass
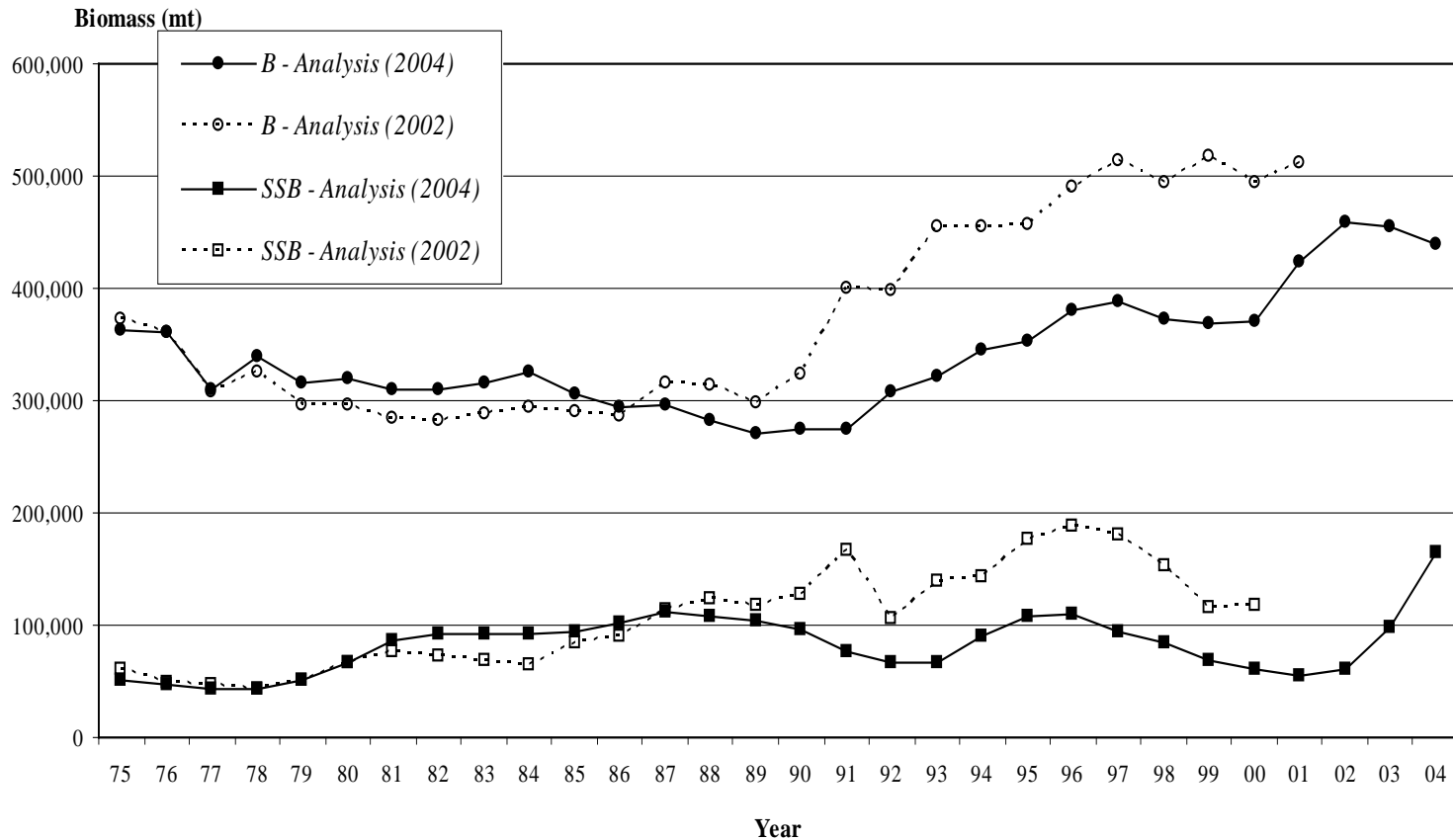
Figure 17. Total stock biomass (*B*, mt) and spawning stock biomass (*SSB*, mt) time series (1975-04)
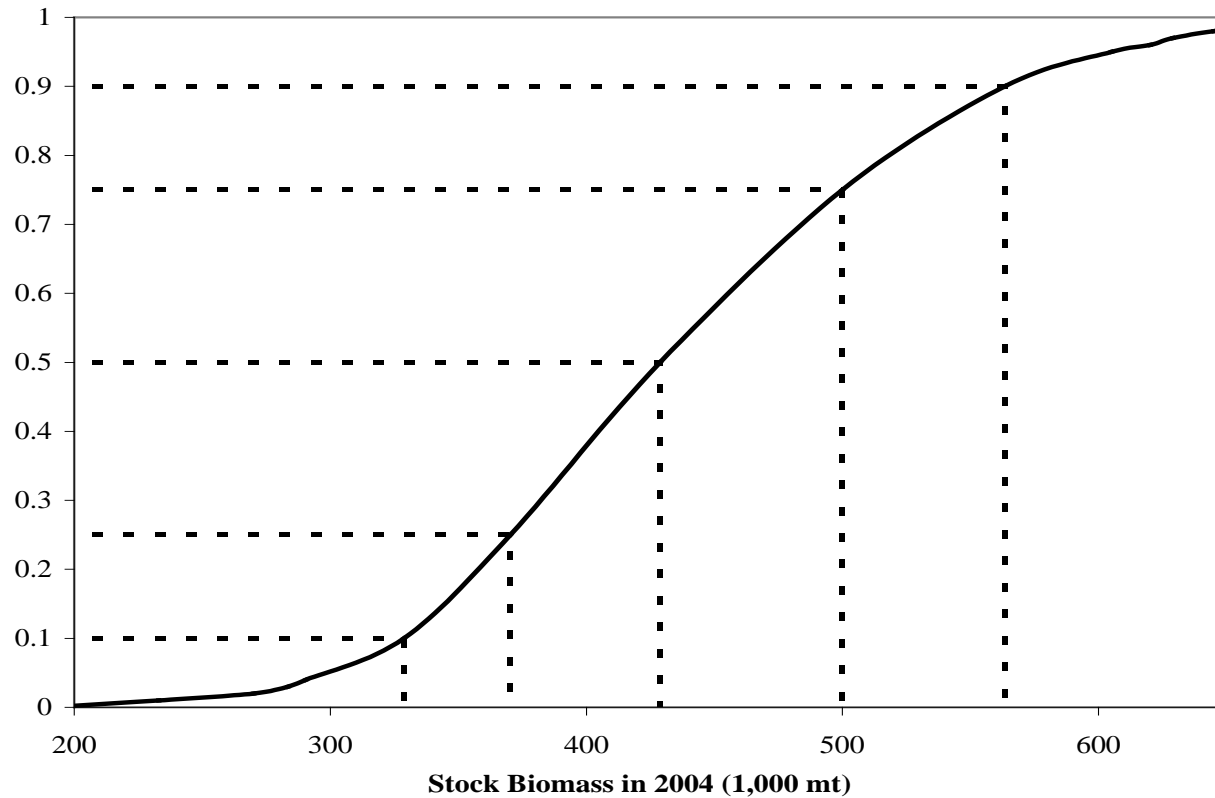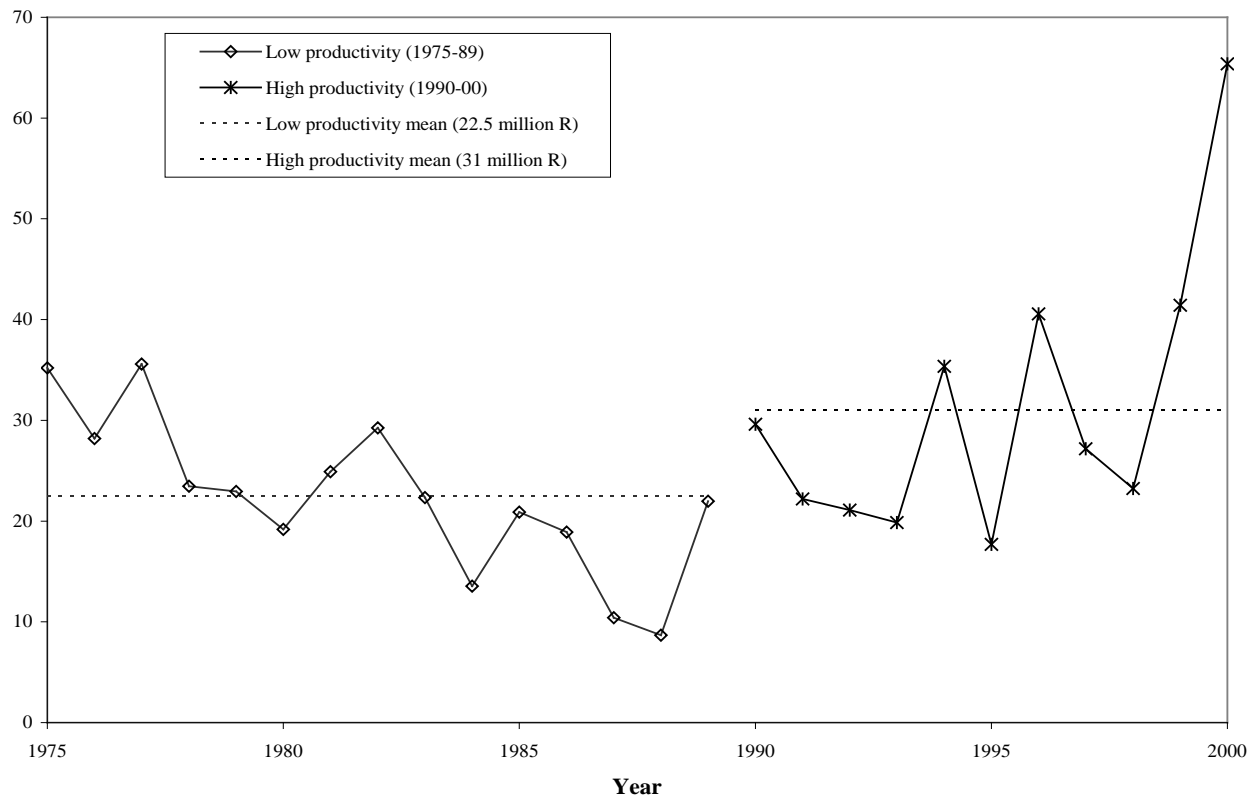
Stock Assessment Conclusions: Recruitment

Recruits (millions)

Legend:
- Low productivity (1975-89)
- High productivity (1990-00)
- Low productivity mean (22.5 million R)
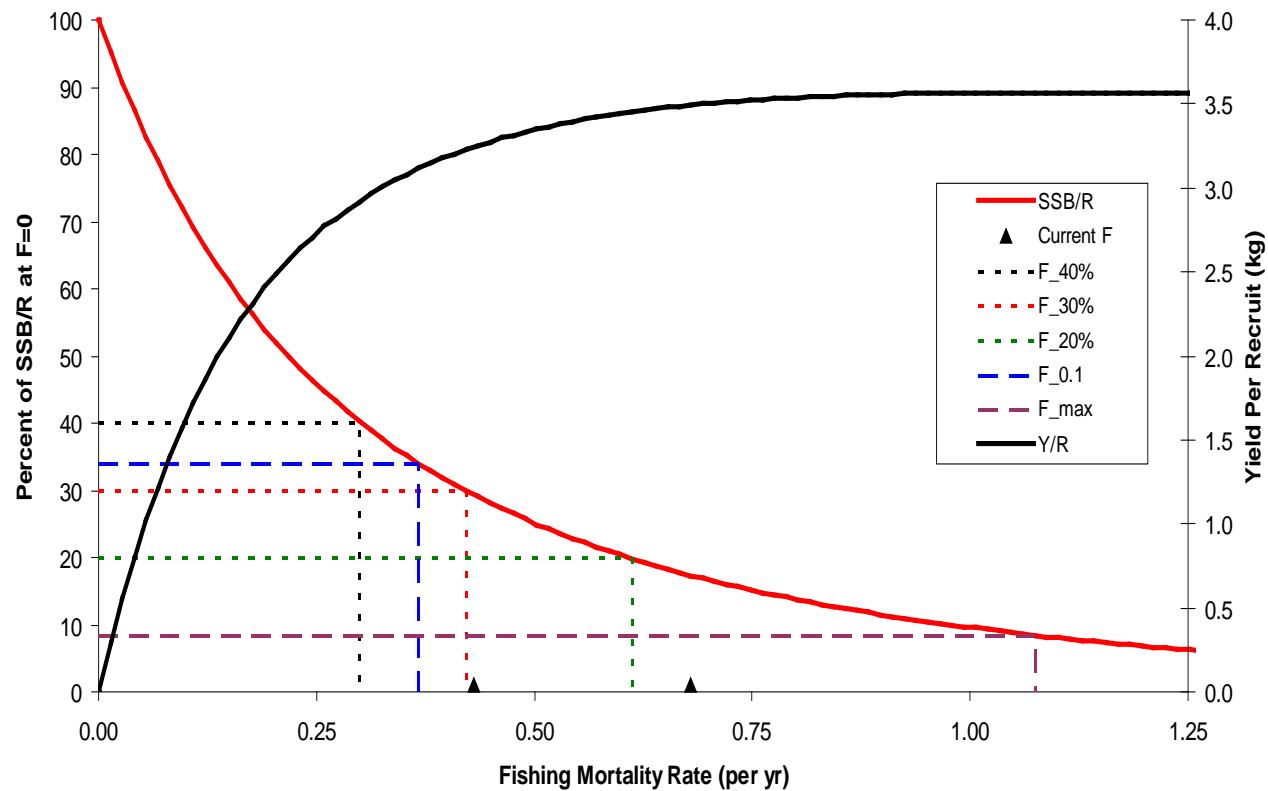- High productivity mean (31 million R)

Year

Canada

Stock Assessment Conclusions: Biological Reference Points

- **Uncertainty analysis based on 4 model configurations:**
  - **'Low productivity'/'Low F'**
  - **'Low productivity'/'High F'**
  - **'High productivity'/'Low F'**
  - **'High productivity'/'High F'**

Canada

Stock Assessment Conclusions: Biological Reference Points

Stock vs Reference Points
high productivity/low F

	F (per yr)		C (1,000 mt per yr)		B (1,000 mt)	Percent of unfished		SSB at mid-yr (1,000 mt)	Percent of unfished
No Fishing	0.00	$C_0 =$	0	$B_0 =$	1,153	100	$SSB_0 =$	724	100
$F_{2003} =$	**0.43**	**$C_{2004} =$**	**98**	**$B_{2004} =$**	**438**	38%	**$SSB_{2004} =$**	**165**	23%
$F_{40\%} =$	0.30	$C_{MSY} =$	91	$B_{MSY} =$	656	57%	$SSB_{MSY} =$	291	40%
$F_{30\%} =$	0.42	$C_{MSY} =$	100	$B_{MSY} =$	562	49%	$SSB_{MSY} =$	216	30%
$F_{0.1} =$	0.37	$C_{MSY} =$	97	$B_{MSY} =$	600	52%	$SSB_{MSY} =$	246	34%
$F_{20\%} =$	0.61	$C_{Limit} =$	107	$B_{Limit} =$	464	40%	$SSB_{Limit} =$	144	20%
$F_{Max} =$	1.07	$C_{Limit} =$	110	$B_{Limit} =$	334	29%	$SSB_{Limit} =$	61	8%
		$C_{2010} =$	**92**	**$B_{2010} =$**	**534**		**$SSB_{2010} =$**	**190**	

Potential F_{MSY} Proxy Reference Points

Potential F_{Limit} Reference Points

Stock vs Reference Points
high productivity/high F

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Potential F_{MSY} **Proxy Reference Points**	**$F_{2003} =$**	**0.68**	**$C_{2004} =$**	**98**	**$B_{2004} =$**	**438**	38%	**$SSB_{2004} =$**	**165**	23%
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	$F_{Max} =$	1.07	$C_{Limit} =$	110	$B_{Limit} =$	334	29%	$SSB_{Limit} =$	61	8%
			$C_{2010} =$	**104**	**$B_{2010} =$**	**432**		**$SSB_{2010} =$**	**117**	

Canada
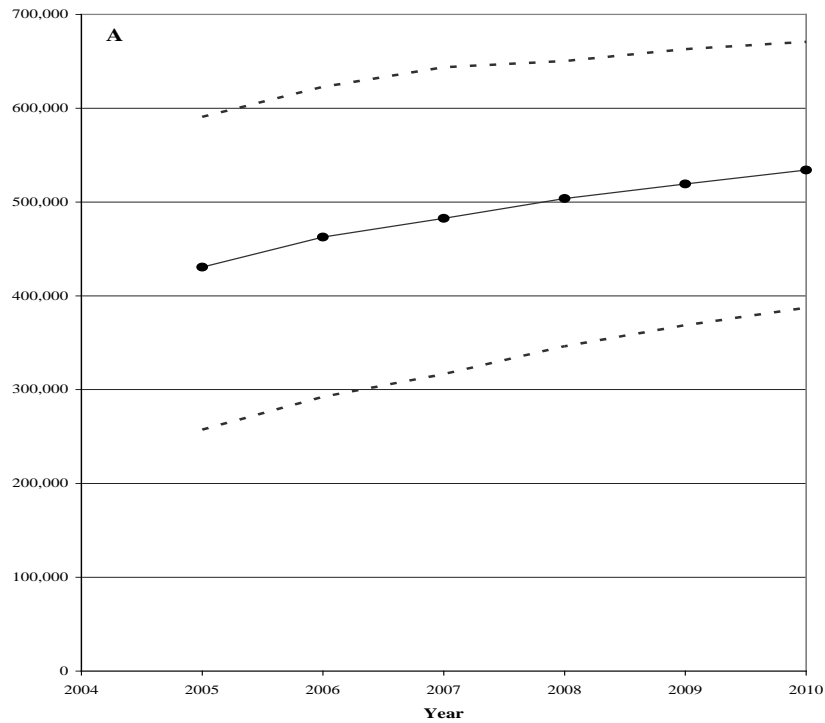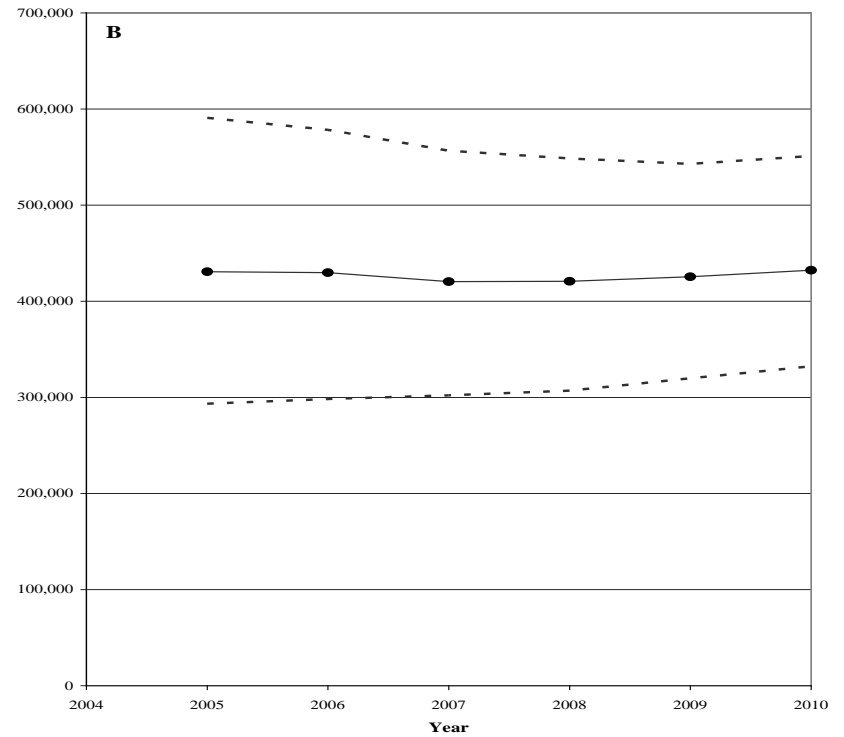
Biomass Projections
high p/low F   high p/highF

Spawning Stock Biomass Projections
high p/low F　　　　　　high p/high F

Stock vs Reference Points
low productivity/low F

	F (per yr)		C (1,000 mt per yr)		B (1,000 mt)	Percent of unfished		SSB at mid-yr (1,000 mt)	Percent of unfished
No Fishing	0.00	$C_0 =$	0	$B_0 =$	837	100	$SSB_0 =$	525	100
Potential F_{MSY} **Proxy Reference Points**	$F_{2003} =$ **0.43**	$C_{2004} =$	**98**	$B_{2004} =$	**438**	52%	$SSB_{2004} =$	**165**	31%
	$F_{40\%} =$ 0.30	$C_{MSY} =$	66	$B_{MSY} =$	476	57%	$SSB_{MSY} =$	211	40%
	$F_{30\%} =$ 0.42	$C_{MSY} =$	73	$B_{MSY} =$	408	49%	$SSB_{MSY} =$	157	30%
	$F_{0.1} =$ 0.37	$C_{MSY} =$	70	$B_{MSY} =$	435	52%	$SSB_{MSY} =$	178	34%
Potential F_{Limit} **Reference Points**	$F_{20\%} =$ 0.61	$C_{Limit} =$	78	$B_{Limit} =$	337	40%	$SSB_{Limit} =$	104	20%
	$F_{Max} =$ 1.07	$C_{Limit} =$	80	$B_{Limit} =$	243	29%	$SSB_{Limit} =$	44	8%
		$C_{2010} =$	**76**	$B_{2010} =$	**419**		$SSB_{2010} =$	**162**	

Canada

Stock vs Reference Points
low productivity/high F

	F (per yr)		C (1,000 mt per yr)		B (1,000 mt)	Percent of unfished		SSB at mid-yr (1,000 mt)	Percent of unfished
No Fishing	0.00	$C_0 =$	0	$B_0 =$	837	100	$SSB_0 =$	525	100
	$F_{2003} =$ **0.68**	$C_{2004} =$	**98**	$B_{2004} =$	**438**	52%	$SSB_{2004} =$	**165**	31%
Potential	$F_{40\%} =$ 0.30	$C_{MSY} =$	66	$B_{MSY} =$	476	57%	$SSB_{MSY} =$	211	40%
F_{MSY} Proxy	$F_{30\%} =$ 0.42	$C_{MSY} =$	73	$B_{MSY} =$	408	49%	$SSB_{MSY} =$	157	30%
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Points									
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F_{Limit}	$F_{Max} =$ 1.07	$C_{Limit} =$	80	$B_{Limit} =$	243	29%	$SSB_{Limit} =$	44	8%
Reference		$C_{2010} =$	**83**	$B_{2010} =$	**332**		$SSB_{2010} =$	**98**	
Points									

Canada
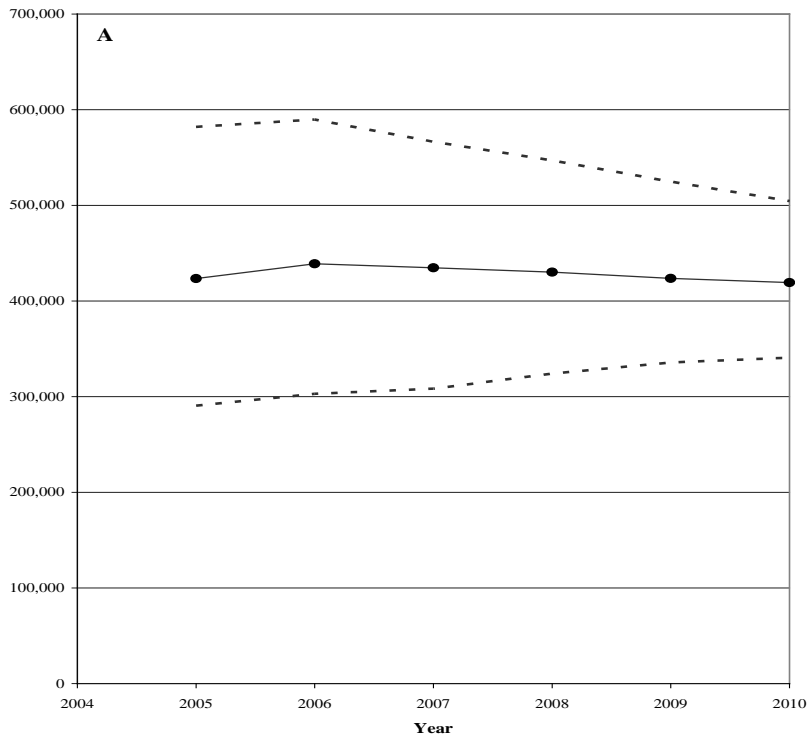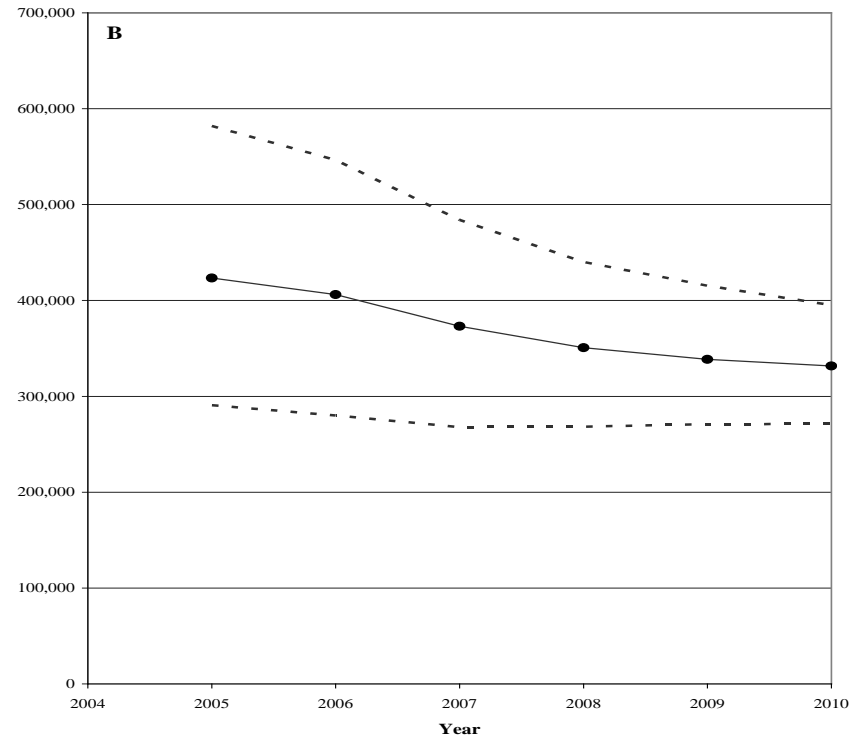
Biomass Projections
low p/low F   low p/high F

Spawning Stock Biomass Projections
low p/low F   low p/high F

Canada
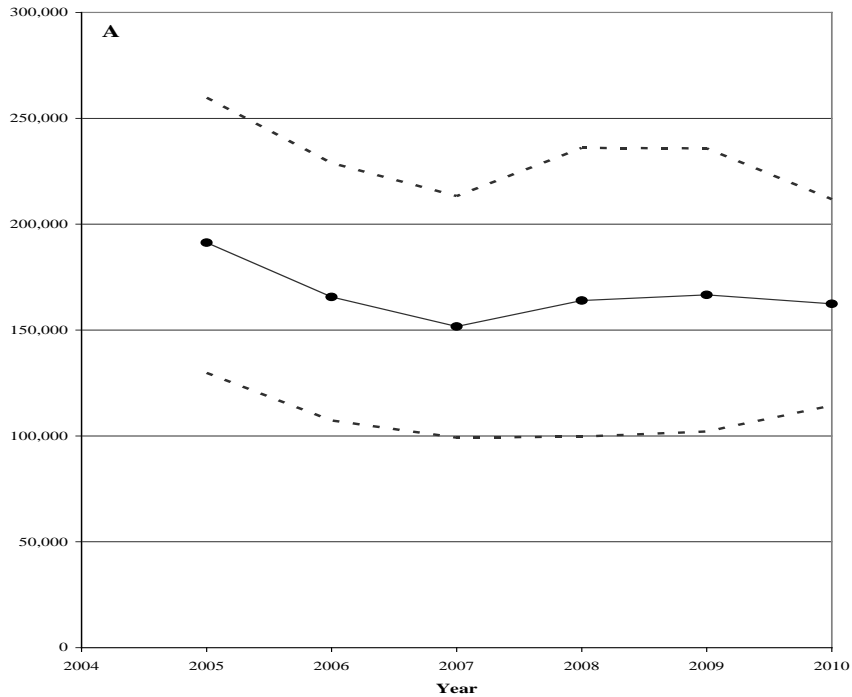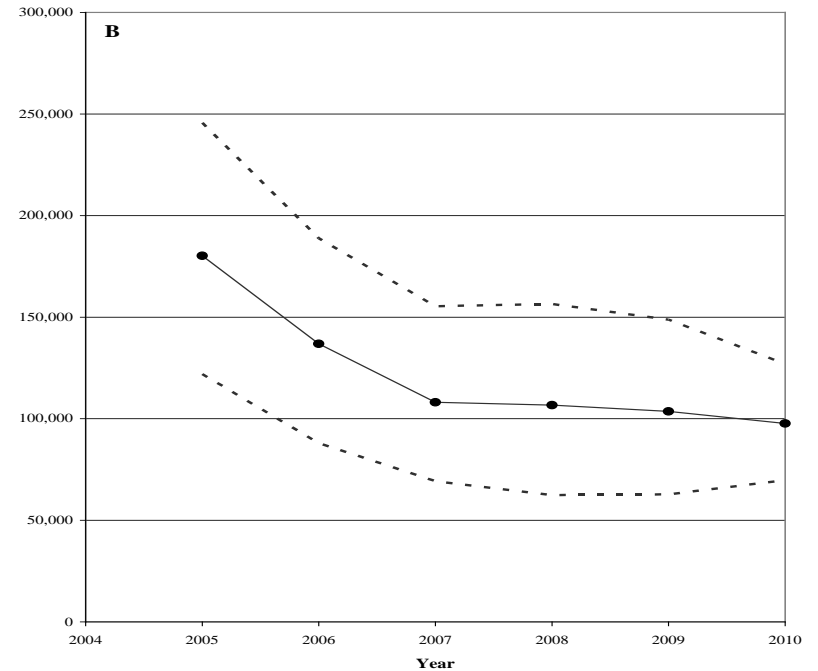
Stock Assessment Conclusions: Summary

- **2004 SSB largely reflective of a very strong 1999 year-class**
- **R declined since 1999 to levels more typical of time series**
- **Results in forecasting reduced levels of SSB; particularly with high F scenarios**
- **population fished between roughly F17% (i.e., F2003 = 0.68) and F30% (i.e., F2003 = 0.43)**
- **Declining R coupled with currently high Fs may be cause for concern regarding the current status of North Pacific albacore**
- **If F continues at assumed levels it is unlikely that SSB will rebuild to SSB(msy) within 5 years**
- **Results similar to previous assessment in 2002**

Canada

The End – Thank You