



Transboundary Resource Assessment Committee

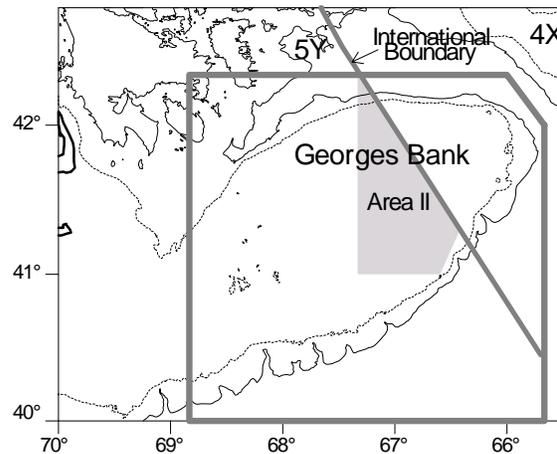
Status Report 2004/03

**GEORGES BANK**

**YELLOWTAIL**

**FLOUNDER**

[5Zhjmn;  
522,525,551,552,561,562]



*Summary*

- Combined Canada and USA catches in 2003 were approximately 6,800 mt.
- Adult biomass has generally increased since the mid 1990s.
- Recent year classes are larger than year classes in the mid 1980s.
- Fishing mortality for fully recruited ages 4+ fluctuated about 0.7 since 1996 and has not been below the reference point of 0.25 since at least 1973.
- Truncated age structure in the surveys and change in distribution indicate current productivity may be limited relative to historical levels, although this may be confounded by spatial differences in management.
- With an assumed total catch of 7,900 mt in 2004, the combined Canada/USA 2005 catch at  $F_{ref}$  would be about 4,000 mt. However, alternative models examined, which make different selectivity assumptions, would produce higher catch in 2005, but still lower than the 2004 catch quota of 7,900 mt. If the retrospective pattern observed in the VPA reflects reality, the calculated catch quota for 2005 will be overly optimistic to achieve the  $F$  reference level.



**Catches, Biomass (thousands mt); Recruits (millions)**

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Avg <sup>1</sup>	Min <sup>1</sup>	Max <sup>1</sup>
Canada	Quota		0.4	0.4	0.8	1.2	2.0	3.0	3.4	2.9	2.2	1.9			
	Landed	2.1	0.5	0.5	0.8	1.2	2.0	2.9	2.9	2.6	2.1		1.7	0.5	2.9
	Discard <sup>2</sup>			0.2	0.2	0.3	0.2	0.1	0.8	0.5	1.1		0.4	0.2	1.1
USA	Quota											6.0			
	Landed	1.6	0.3	0.8	1.0	1.8	2.0	3.7	3.8	2.5	3.3		5.1	0.3	16.0
	Discard	0.2	<0.1	<0.1	<0.1	0.1	0.4	0.3	0.5	0.5	0.3		0.6	<0.1	3.0
Total	Quota											7.9			
	Catch	3.9	0.8	1.3	1.8	3.1	4.4	6.9	7.8	6.1	6.8		6.4	0.8	16.6
	Adult Biomass <sup>4</sup>	4.4	1.6	2.8	4.2	5.5	7.2	9.6	9.7	7.9	11.9	16.2	7.3 <sup>3</sup>	1.5 <sup>3</sup>	25.7 <sup>3</sup>
	Age 1 Recruits	8.7	9.6	11.7	16.3	22.4	23.7	19.0	29.1	35.2	21.2		22.1	5.8	67.3
	Fishing mortality <sup>5</sup>	2.33	0.96	0.63	0.70	0.73	0.64	0.86	0.90	0.69	0.64		1.06	0.64	2.33
	Exploitation Rate <sup>5</sup>	85%	57%	43%	46%	48%	43%	53%	55%	46%	43%		58%	43%	85%

<sup>1</sup>1973 - 2003

<sup>2</sup>estimates for discards from Canadian scallop fishery prior to 1996 are not available

<sup>3</sup>1973 - 2004

<sup>4</sup>ages 3+ from VPA(ADAPT)

<sup>5</sup>ages 4+ from VPA(ADAPT)

**Fishery**

**Total catches** of Georges Bank yellowtail flounder reached historical highs of about 20,000 mt during the mid 1960s to mid 1970s. The USA fishery made most of the catches, although there were catches by other countries during the late 1960s and early 1970s. The combined Canada/USA catch has increased since 1995, and in 2003 was 6,807 mt (Figure 1).

**Canadian catches** for 2003 were 3,193 mt, and exceeded the TAC of 2,266 mt. The Canadian directed fishery started in 1993 and landings of 2,160 mt occurred in 1994. Under quota control for the first time in 1995, catches were 501 mt. Canadian catches of unspecified flounder from the Georges Bank groundfish fishery have been substantial in the past (523 mt and 811 mt in 1993 and 1994, respectively). Industry sources have indicated that most of the unspecified flounder catches were yellowtail flounder and these have been pro-rated to the yellowtail catches. With improvements in reporting practices through dockside monitoring, catches of unspecified flounder have decreased substantially, and in 2003 were estimated to be only 18 mt. The Canadian scallop fishery has not been allowed to land yellowtail flounder since 1996. Some of the catch of yellowtail from the Canadian scallop fishery is reported in the landings prior to 1996 but additional amounts are thought to have been discarded. Discards of yellowtail flounder in the offshore scallop fishery are included in the 1996-2003 Canadian catch and have averaged 417 mt. In 2003, an estimated 1,086 mt of yellowtail were discarded from the offshore scallop fishery. Age composition of discards for all years was not available for the assessment. Only 0.9% of the landings were less than 30 cm.

**USA catches** for 2003 were 3,614 mt, a 17% increase from 2002, with landings of 3,343 mt and discards of 271 mt. Fishing trips for yellowtail flounder on Georges Bank

are made along the southern and western edges of Closed Area II. Discards came mostly from the scallop fishery. However, minimal logbook data and low observer coverage cause much uncertainty in the estimates of the total discard amount and the size distribution of the discards. The majority of discards (88%) were estimated to be in the 30-40 cm size range. Of the total catch, 3% was below 33 cm.

Ages 2-4 make up most of the **combined Canada/USA catch**, with very low catches of age 1 fish since 1995, following implementation of larger mesh in the cod end of commercial trawl gear in both countries. Ages 2 and 3 dominated Canadian catches, and ages 3 and 4 dominated USA catches in 2003. The Canadian fishery in 2003 was comprised mainly of fish in the 33-44 cm size range, while the USA fishery proportionately captured more large fish (33-52 cm). Seasonal and geographic differences between Canadian and USA fisheries may account for some of the difference in age composition observed in 2003. Most of the USA fishery catches (63%) occurred during the first half of the year, while most of the Canadian catches (82%) occurred during the second half. Both the Canadian and USA fisheries were well sampled in 2003, however, low sampling rates for the USA fishery in the past and the continued lack of production aging for the Canadian fishery has reduced the reliability of the reconstruction of the catch and length at age in previous years.

### ***Harvest Strategy and Reference Points***

The Transboundary Management Guidance Committee has adopted a strategy to maintain a low to neutral risk of exceeding the fishing mortality limit reference,  $F_{ref} = 0.25$ . When stock conditions are poor, fishing mortality rates should be further reduced to promote rebuilding.

### ***State of Resource***

An age structured analytical assessment (VPA) that used fishery catch statistics and sampling for size and age composition of the catch for 1973 to 2003 was examined. The VPA was calibrated to trends in abundance from three bottom trawl research surveys, NMFS spring, NMFS fall and DFO and a recruitment index from the NMFS scallop survey. Retrospective analysis is used to detect a pattern of inconsistencies with a tendency to over or underestimate fishing mortality, biomass, and recruitment relative to the terminal year estimate. This VPA continues to display a severe retrospective pattern, updating population biomass estimates to lower values than previously determined, compromising interpretation of results. The state of the resource was based on survey observations and the range of results from the current benchmark assessment method (VPA). Surplus production modeling, which has been used in the past to corroborate the VPA results, diverged and did not seem consistent with recent survey biomass trends (Figures 2 and 3). The outlook was tempered by additional analyses using other age based assessment models.

**Population biomass** (ages 3+) continued its increase from a low of 1,594 mt in 1995 to 16,159 mt in 2004 (Figure 3). However, the retrospective pattern observed in the VPA

has resulted in changes to the terminal year population biomass to lower levels when updated.

**Recruitment** has improved since the mid 1990s, averaging 27 million age-1 fish during the past five years (Figure 3). Recent year classes are larger than year classes in the mid 1980s. Previous assessments had indicated the presence of some large year classes, but their magnitudes have subsequently been estimated to be much smaller.

**Fishing mortality** for fully recruited ages 4+ fluctuated about 0.7 since 1996 and has not been below the reference point of 0.25 since at least 1973 (Figure 1). This contrasts with the perception of reduced fishing mortality due to management measures including closed areas, reduced effort and low quotas.

### *Productivity*

Attributes like age structure and spatial distribution reflect possible fluctuations in the productive potential and can be used to qualify reference points and acceptable risk. In both absolute numbers and percent composition, the **population age structure** estimated by the VPA displays a truncated pattern with fewer old fish than expected given the perception of low fishing mortality rates (Figure 4). The **spatial distribution** patterns in recent years have been consistent but show an absence of adult fish in part of the range relative to the 1960s. Observed DFO survey average weights at length, used to reflect **condition**, did not change appreciably from the values in 2002. Truncated age structure in the surveys and change in distribution indicate current productivity may be limited relative to historical levels, although this may be confounded by spatial differences in management.

### *Outlook*

The outlook is provided in terms of deterministic projections of catch quotas. With an assumed total catch of 7,900 mt in 2004, recruitment in 2004 and 2005 set equal to 27 million age-1 fish (average of the previous five years), and a partial recruitment estimated as the average of the previous five years, the combined Canada/USA 2005 catch at  $F_{ref} = 0.25$  would be about 4,000 mt. However, alternative models examined, which make different selectivity assumptions, would produce higher catch in 2005, but still lower than the 2004 catch quota of 7,900 mt. If the retrospective pattern observed in the VPA reflects reality, the calculated catch quota for 2005 will be overly optimistic to achieve the F reference level.

Given the uncertainties in stock status, no medium term projections were conducted.

### *Special Considerations*

Consistent management by Canada and USA is required to ensure that conservation objectives are not compromised.

A benchmark assessment will be conducted prior to the next assessment. Large, persistent differences in age structure in various areas due to management effects were explored as a source of the retrospective pattern. Spatially explicit population models should be explored.

Discards appear to be a large source of catch. Efforts should be made to quantify the level and age structure of these discards through consistent and credible monitoring of the scallop fishery.

***Source Documents***

Legault, C.M., and H.H. Stone. 2004. Stock assessment of Georges Bank (5Zhjmn) yellowtail flounder. TRAC Reference Document 2004/03.

TRAC, 2004. Proceedings of the Seventh Meeting of the Transboundary Resources Assessment Committee (TRAC); 15–18 June 2004. TRAC Proceedings 2004/01.

***Correct Citation:***

TRAC, 2004. Georges Bank yellowtail flounder. TRAC Status Report 2004/03.

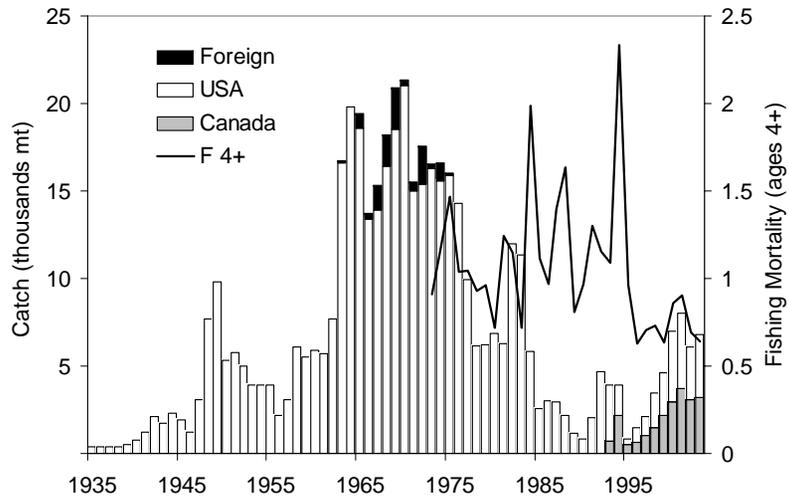


Figure 1. Catches and fishing mortality.

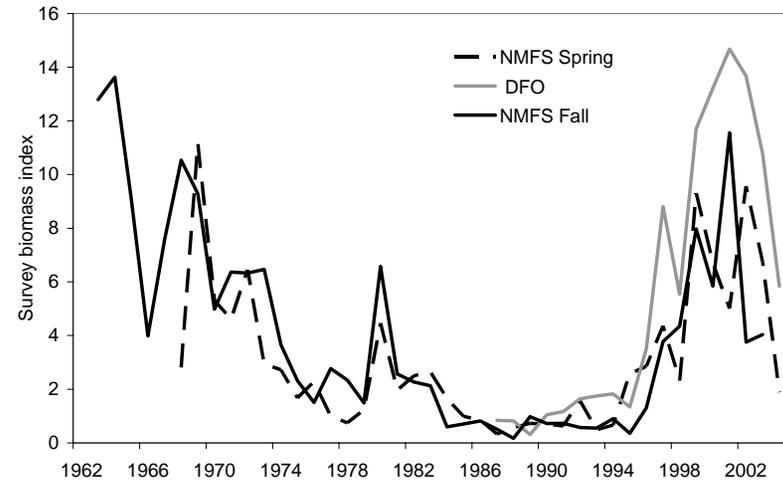


Figure 2. Survey biomass indices.

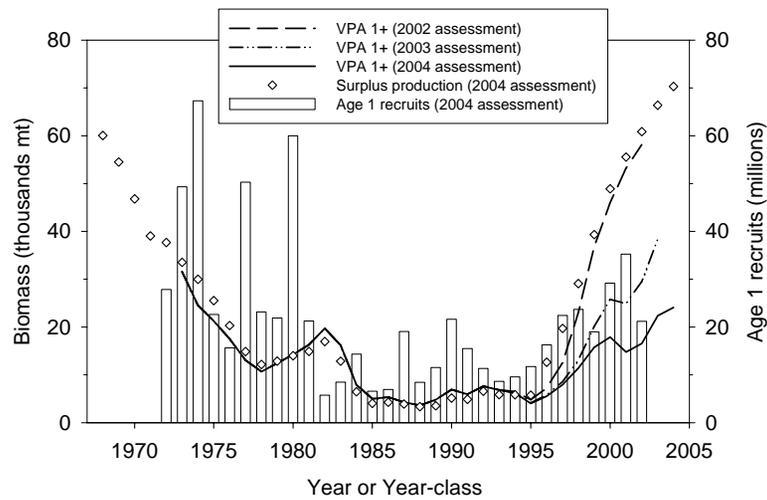


Figure 3. Biomass and recruitment.

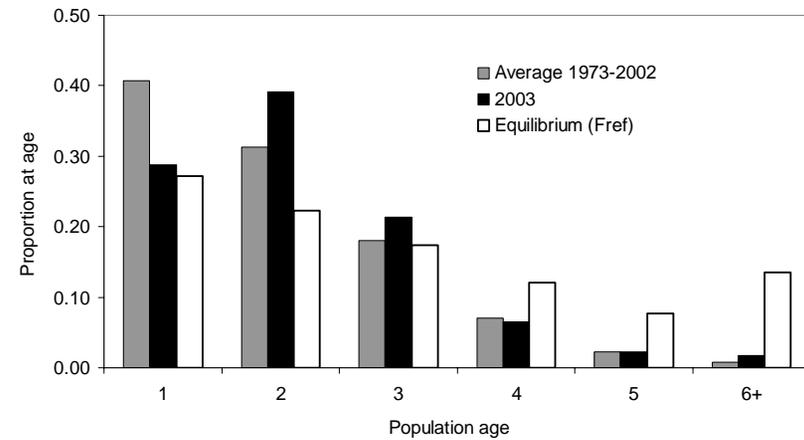


Figure 4. Population age structure.