

## **P. Gulf of Maine/Georges Bank Windowpane Flounder by Lisa Hendrickson**

### **1.0 Background**

No stock structure information is available. Therefore, a provisional arrangement has been adopted that recognizes two stock areas based on apparent differences in growth, sexual maturity, and abundance trends between windowpane flounder from Georges Bank and Southern New England. The proportion of total landings contributed by the Gulf of Maine is low, so windowpane flounder landings from Georges Bank are combined with those from the Gulf of Maine and the two regions are assessed as the Gulf of Maine-Georges Bank (GOM-GB) stock.

The GOM-GB windowpane flounder stock has never been formally assessed as part of the SAW/SARC process. The following index-based assessment represents an update of the assessment presented in October 2002 at the Groundfish Assessment Review Meeting (GARM) (NEFSC 2002a). Following the 2002 GARM, a re-evaluation of the overfishing definition was conducted and the status quo was recommended (NEFSC 2002b).

### **2.0 Assessment Results**

#### **2.1 The Fishery**

Commercial landings of windowpane flounder were first recorded in 1975. During 1985-1998 more than 50% of the windowpane landings were from the GOM-GB stock. Since 2001, the trend has reversed and most of the windowpane landings have come from the SNE-MAB stock. Landings increased sharply between 1982 and 1985, from 400 to 2,100 mt, then ranged between 1,100 and 1,800 mt through 1990 (Table P1 and Figure P1). Following a 1991 record high of 2,900 mt, landings declined sharply to 300 mt in 1994. High landings during the early 1990's probably reflected an expansion of the fishery to offshore areas, as well as targeting of windowpane flounder as an alternative to depleted groundfish stocks. Landings declined from 700 mt in 1996 to about 50 mt in 1999 and have since been at the lowest levels recorded, ranging from 12 to 45 mt.

Discards of windowpane flounder have never been quantified and were not evaluated for this assessment update. Therefore, only the landings are included in the calculation of exploitation indices.

#### **2.2 Research Survey Indices**

Relative biomass indices, stratified mean weights (kg) per tow, of GOM-GB windowpane flounder from the NEFSC autumn bottom trawl surveys, conducted during 1963-2004, are presented in Table P1 and Figure P2. Survey biomass indices are highly variable and ranged between 0.16 and 1.56 kg per tow during 1972-1983. Following a time series peak of 2.14 kg per tow, in 1984, biomass indices declined rapidly to 0.17 kg per tow in 1991. Biomass indices increased again after 1991 and reached 1.66 kg per tow in 1998. However, the high 1998 index is primarily attributable to a large catch of windowpane at one station. Biomass declined in 1999 then remained fairly stable through 2004.

### 2.3 Biological Reference Points

Biological reference points for GOM-GB windowpane flounder were derived from survey-based proxies of biomass and exploitation rates and are based on an MSY estimate (1,000 mt) from an ASPIC model (NEFSC 2002b). The threshold  $F$  is defined as an  $F_{MSY}$  proxy (= 1.11) when the NEFSC autumn survey index is greater than 0.94 kg per tow (equal to a  $B_{MSY}$  proxy) and declines linearly to zero at 50% of the  $B_{MSY}$  proxy (= 0.47 kg/tow). The target exploitation index is defined as 60% of the  $F_{MSY}$  proxy (= 0.67) when the autumn survey index is greater than 0.94 kg/tow and declines linearly to zero at 0.47 kg/tow.

### 2.4 Relative Exploitation Rates and Stock Status

Relative exploitation rates (landings/NEFSC autumn survey biomass index) have been declining since reaching a peak in 1991 (Table P1 and Figure P3) and were below the  $F_{MSY}$  proxy (=1.11) during 1997-2004. The 2002-2004 autumn survey mean biomass index is 0.78 kg/tow and the 2002-2004 mean exploitation index (landings/NEFSC autumn survey biomass index) is 0.02 (Table P3 and Figure P2). Therefore, the stock was not overfished and overfishing was not occurring in 2004 (Figure P4).

During 2002-2004, autumn survey biomass indices declined and in 2003 and 2004 were below the levels projected in Amendment 13 (Figure P5).

### 3.0 Sources of Uncertainty

3.1 The influence of discards on the evaluation of current stock status relative to biological reference points is unclear.

### 4.0 Research Recommendations

4.1 Include discards in the estimated catch.

### 5.0 Panel Discussion

The Panel noted that discards are not included in the estimate of the relative exploitation index and recommends that future assessments attempt to estimate discards. In addition, the NMFS inshore survey strata are not used in the calculation of the trawl survey index and the Panel recommends that these be included in future assessments. If these recommendations are adopted, the reference points will need to be re-evaluated.

### 6.0 Literature Cited

NEFSC [Northeast Fisheries Science Center]. 2002a. [Assessment of 20 northeast groundfish stocks through 2001](#): A report of the Groundfish Assessment Review Meeting (GARM), Northeast Fisheries Science Center, Woods Hole, Massachusetts, October 8-11, 2002. *Northeast Fish. Sci. Cent. Ref. Doc.* 02-16. 511 p.

NEFSC [Northeast Fisheries Science Center]. 2002b. Final report of the working group on re-evaluation of biological reference points for New England groundfish. 231 p.

Table P1. Landings (mt), NEFSC autumn survey biomass indices (stratified mean kg per tow, offshore strata 13-29 and 37-40), and exploitation indices (landings/autumn survey biomass index) for Gulf of Maine-Georges Bank windowpane flounder during 1963-2004. Landings include Statistical Areas beginning with 51 and 52, with the exception of 526, 530-539 and 541.

Year	Landings <sup>1</sup> (mt)	Biomass Indices (kg per tow)	Exploitation Indices (landings/biomass index)
1963		0.24	
1964		0.10	
1965		0.17	
1966		0.48	
1967		0.52	
1968		0.26	
1969		0.64	
1970		0.19	
1971		0.16	
1972		0.57	
1973		1.53	
1974		0.82	
1975	1,300	0.39	3.38
1976	1,516	1.17	1.30
1977	1,099	1.56	0.71
1978	923	1.15	0.80
1979	856	0.73	1.18
1980	408	0.63	0.65
1981	413	0.79	0.52
1982	411	0.49	0.83
1983	460	0.55	0.84
1984	743	2.14	0.35
1985	2,141	0.94	2.29
1986	1,842	1.11	1.67
1987	1,396	0.65	2.16
1988	1,377	0.65	2.12
1989	1,577	0.41	3.81
1990	1,078	1.13	0.96
1991	2,862	0.17	16.74
1992	1,519	0.38	4.01
1993	1,212	0.62	1.96
1994	300	0.31	0.97
1995	700	0.80	0.87
1996	700	0.50	1.40
1997	418	0.43	0.96
1998	396	1.66	0.24
1999	46	0.73	0.06
2000	142	0.73	0.20
2001	45	0.92	0.05
2002	12	0.89	0.01
2003	17	0.77	0.02
2004	25	0.68	0.04

<sup>1</sup> Landings from 1995-2004 were prorated based on Vessel Trip Reports.

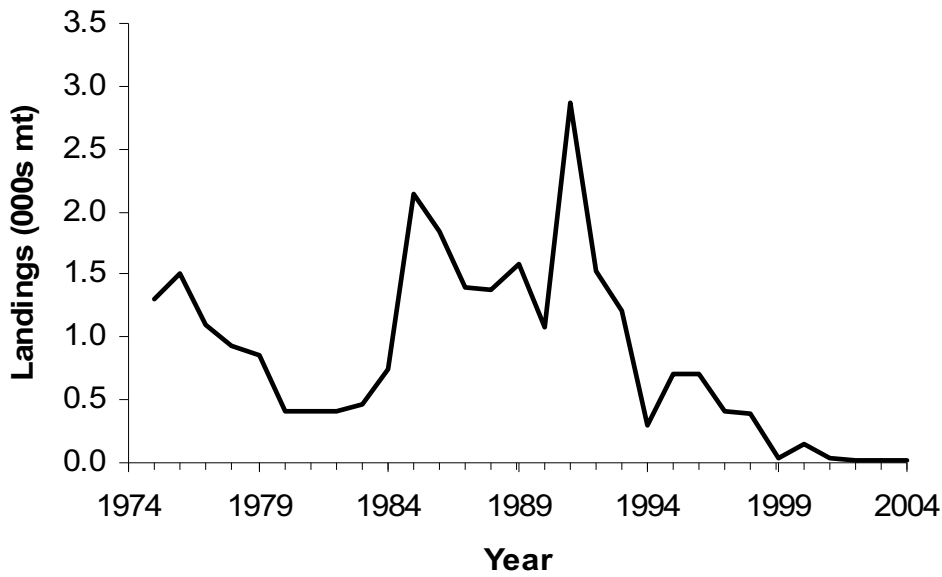


Figure P1. Commercial landings of Gulf of Maine-Georges Bank windowpane flounder during 1975-2004.

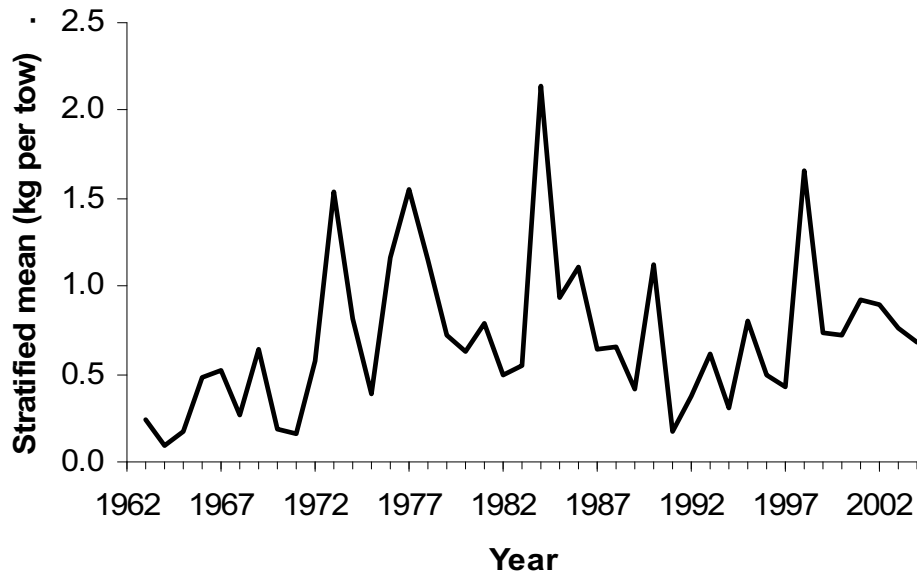


Figure P2. Relative biomass indices (stratified mean kg per tow) for Gulf of Maine-Georges Bank windowpane flounder from the NEFSC autumn bottom trawl surveys conducted during 1963-2004.

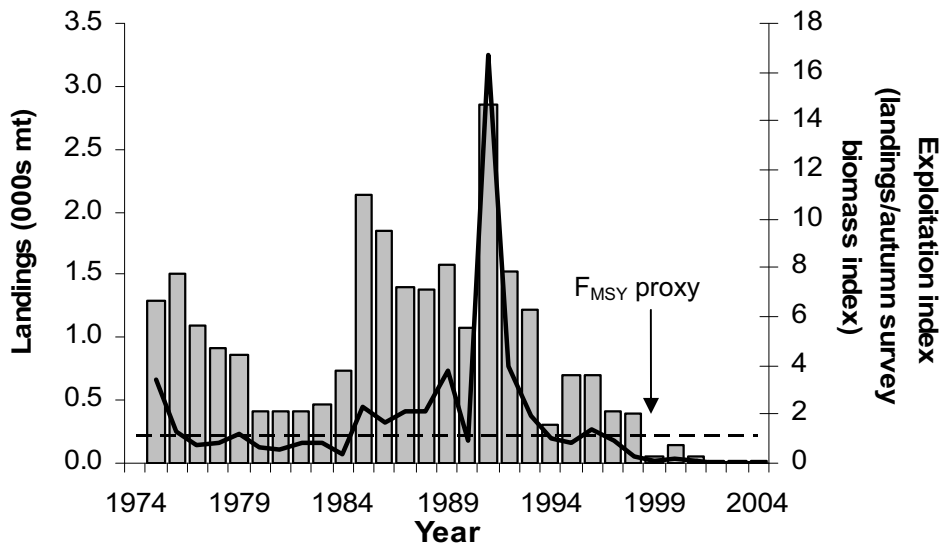


Figure P3. Relative exploitation indices (landings/autumn survey biomass indices) and landings (mt) of Gulf of Maine-Georges Bank windowpane flounder during 1975-2004.

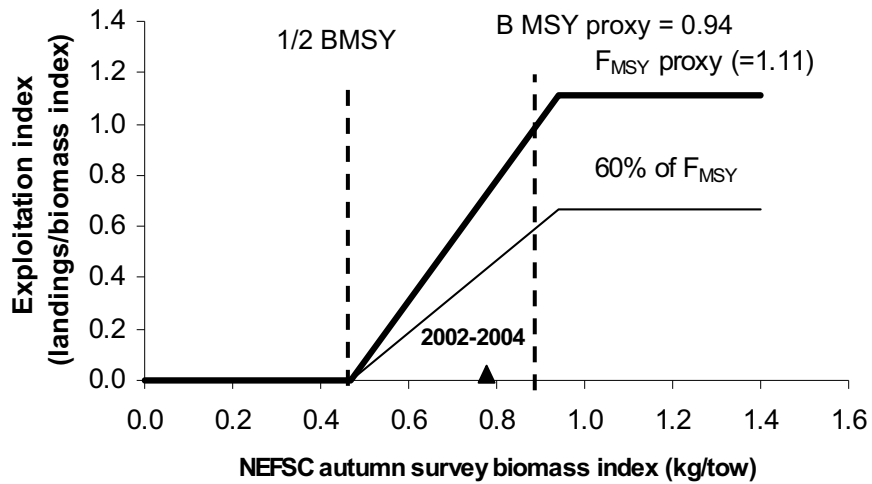


Figure P4. Harvest control rule for GOM-GB windowpane flounder based on survey equivalents of MSY-based reference points and the 2002-2004 means of the exploitation and biomass indices.

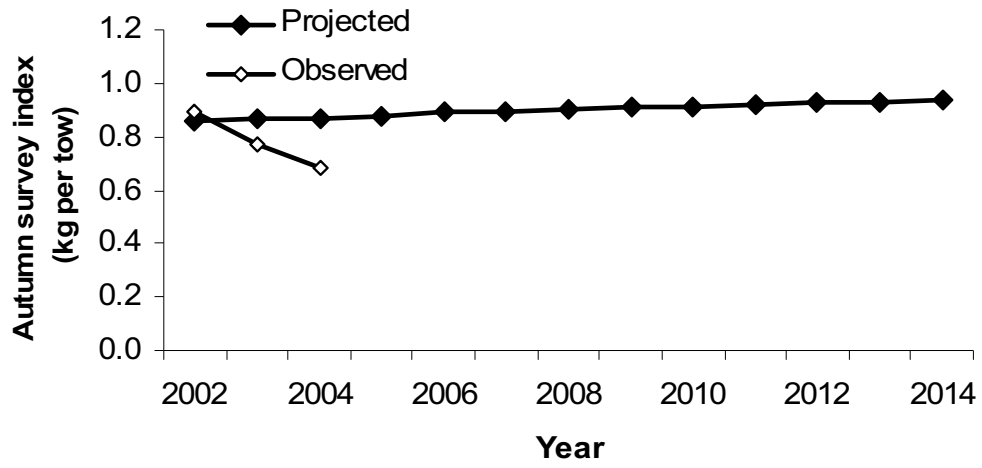


Figure P5. Observed autumn survey biomass indices, during 2002-2004, in relation to Amendment 13 projections of the survey biomass indices for GOM-GB windowpane flounder.