

Table B1. Landings (mt) of Georges Bank winter flounder, by statistical area and country, during 1964-2000.

YEAR	522-525 561-562	5Ze ² (521-526 and 541-562)		5Z (521-562)		TOTAL
	USA ¹	CANADA	USSR	CANADA	USSR	
1964	1,371			146		1,517
1965	1,176			199	312	1,687
1966	1,877			164	156	2,197
1967	1,917			83	349	2,349
1968	1,570	57	372			1,999
1969	2,167	116	235			2,518
1970	2,615	61	40			2,716
1971	3,092	62	1,029			4,183
1972	2,805	8	1,699			4,512
1973	2,269	14	693			2,976
1974	2,124	12	82			2,218
1975	2,409	13	515			2,937
1976	1,877	15	1			1,893
1977	3,572	15	7			3,594
1978	3,185	65				3,250
1979	3,045	19				3,064
1980	3,931	44				3,975
1981	3,993	19				4,012
1982	2,961	19				2,980
1983	3,894	14				3,908
1984	3,927	4				3,931
1985	2,151	12				2,163
1986	1,762	25				1,787
1987	2,637	32				2,669
1988	2,804	55				2,859
1989	1,880	11				1,891
1990	1,898	55				1,953
1991	1,814	14				1,828
1992	1,822	27				1,849
1993	1,662	21				1,683
1994	907	65				972
1995	706	54				760
1996	1,265	71				1,336
1997	1,287	143				1,430
1998	1,243	93				1,336
1999	938	104				1,042
2000	1,677	161				1,838

¹ USA landings prior to 1985 include those from Statistical Areas 551 and 552 and landings during 1994-2000 were prorated from Vessel Trip Reports based on gear, month and state.

² Includes landings from statistical areas 521 and 526; outside of the Georges Bank winter flounder stock area.

Table B2. U.S. landings (mt) and percentage of landings of Georges Bank winter flounder (statistical areas 522-525, 551-552, 561-562), by gear type, during 1964-2000. General canvas landings are not included.

	Landings by Gear Type (mt)				Percentage of Landings		
	Trawl	Scallop Dredge	Other	Total	Trawl	Scallop Dredge	Other
1964	1,360.2	--	11.2	1,371	99.2	--	0.8
1965	1,175.1	--	0.8	1,176	99.9	--	0.1
1966	1,851.3	--	25.8	1,877	98.6	--	1.4
1967	1,915.5	--	1.8	1,917	99.9	--	0.1
1968	1,565.3	--	4.6	1,570	99.7	--	0.3
1969	2,165.0	--	1.8	2,167	99.9	--	0.1
1970	2,610.6	--	4.4	2,615	99.8	--	0.2
1971	3,086.9	--	4.8	3,092	99.8	--	0.2
1972	2,796.6	--	7.9	2,805	99.7	--	0.3
1973	2,265.2	--	3.5	2,269	99.8	--	0.2
1974	2,116.5	--	7.7	2,124	99.6	--	0.4
1975	2,386.6	--	22.6	2,409	99.1	--	0.9
1976	1,874.7	--	2.6	1,877	99.9	--	0.1
1977	3,570.4	--	1.6	3,572	100.0	--	<0.1
1978	3,166.5	17.9	1.1	3,186	99.4	0.6	<0.1
1979	3,019.8	24.9	0.0	3,045	99.2	0.8	<0.1
1980	3,887.9	42.5	0.3	3,931	98.9	1.1	<0.1
1981	3,935.3	53.5	3.7	3,993	98.6	1.3	0.1
1982	2,919.5	41.2	0.1	2,961	98.6	1.4	<0.1
1983	3,864.0	25.4	7.2	3,897	99.2	0.7	0.2
1984	3,899.9	18.5	11.1	3,930	99.2	0.5	0.3
1985	2,146.3	3.1	3.2	2,153	99.7	0.1	0.1
1986	1,724.3	36.0	2.3	1,763	97.8	2.0	0.1
1987	2,560.6	77.6	0.0	2,639	97.0	2.9	<0.1
1988	2,699.5	106.5	0.0	2,806	96.2	3.8	<0.1
1989	1,761.7	119.7	0.1	1,881	93.6	6.4	<0.1
1990	1,779.6	118.2	1.6	1,899	93.7	6.2	0.1
1991	1,673.7	141.2	1.8	1,816	92.2	7.8	<0.1
1992	1,677.8	136.4	8.7	1,823	92.0	7.5	0.5
1993	1,535.2	115.5	12.4	1,663	92.3	6.9	0.7
1994	909.4	52.9	9.4	972	93.6	5.4	1.0
1995	713.1	37.0	10.0	760	93.8	4.9	1.3
1996	1,243.8	71.2	20.6	1,336	93.1	5.3	1.5
1997	1,337.9	80.0	11.9	1,430	93.6	5.6	0.8
1998	1,241.7	0.7	0.6	1,243	99.9	<0.1	<0.1
1999	924.8	9.3	3.7	938	98.6	1.0	0.4
2000	1,658.5	18.4	0.0	1,677	98.9	1.1	0.0

Table B3. USA landings (mt) of Georges Bank winter flounder, during 1964-1993, by tonnage class (TC2 = 5-50 GRT, TC3 = 51-150 GRT, TC4 = 151-500 GRT) for otter trawl and scallop dredge landings.¹

Year	Landings (mt)							Percentage of Total Landings						
	Otter Trawl Tonnage Class			Scallop Dredge Tonnage Class			All Others	Otter Trawl Tonnage Class			Scallop Dredge Tonnage Class			All Others
	2	3	4	2	3	4		2	3	4	2	3	4	
1964	74.0	927.8	358.4	0.0	0.0	0.0	11.2	5.4	67.7	26.1	0.0	0.0	0.0	0.8
1965	81.4	694.3	399.4	0.0	0.0	0.0	0.9	6.9	59.0	34.0	0.0	0.0	0.0	0.1
1966	54.2	1188.	630.0	0.0	0.0	0.0	4.2	2.9	63.3	33.6	0.0	0.0	0.0	0.2
1967	46.4	1074.	794.9	0.0	0.0	0.0	1.8	2.4	56.0	41.5	0.0	0.0	0.0	0.1
1968	34.4	1039.	491.4	0.0	0.0	0.0	4.6	2.2	66.2	31.3	0.0	0.0	0.0	0.3
1969	6.6	1542.	616.2	0.0	0.0	0.0	1.8	0.3	71.2	28.4	0.0	0.0	0.0	0.1
1970	16.2	2003.	590.6	0.0	0.0	0.0	4.4	0.6	76.6	22.6	0.0	0.0	0.0	0.2
1971	66.8	2282.	737.6	0.0	0.0	0.0	4.8	2.2	73.8	23.9	0.0	0.0	0.0	0.2
1972	36.4	2233.	527.1	0.0	0.0	0.0	7.9	1.3	79.6	18.8	0.0	0.0	0.0	0.3
1973	22.0	1726.	516.7	0.0	0.0	0.0	3.5	1.0	76.1	22.8	0.0	0.0	0.0	0.2
1974	15.8	1532.	568.4	0.0	0.0	0.0	7.7	0.7	72.1	26.8	0.0	0.0	0.0	0.4
1975	9.5	1855.	544.6	0.0	0.0	0.0	0.0	0.4	77.0	22.6	0.0	0.0	0.0	0.0
1976	2.2	1487.	386.1	0.0	0.0	0.0	1.6	0.1	79.2	20.6	0.0	0.0	0.0	0.1
1977	33.2	2901.	636.4	0.0	0.0	0.0	1.1	0.9	81.2	17.8	0.0	0.0	0.0	<0.1
1978	10.5	2541.	615.7	0.0	7.6	10.3	0.2	0.3	79.8	19.3	0.0	0.2	0.3	<0.1
1979	34.7	2436.	548.8	0.0	18.1	6.8	0.2	1.1	80.0	18.0	0.0	0.6	0.2	<0.1
1980	70.3	3112.	705.3	2.9	19.6	20.1	0.4	1.8	79.2	17.9	<0.1	0.5	0.5	<0.1
1981	26.3	3087.	822.5	0.0	19.0	34.5	2.5	0.7	77.3	20.6	0.0	0.5	0.9	0.1
1982	29.2	2194.	693.4	0.0	26.9	14.2	2.5	1.0	74.1	23.4	0.0	0.9	0.5	0.1
1983	10.7	2641.	1218.	0.0	4.7	20.7	0.8	0.3	67.8	31.3	0.0	0.1	0.5	<0.1
1984	10.3	2551.	1349.	0.0	8.2	10.2	0.4	0.3	64.9	34.3	0.0	0.2	0.3	<0.1
1985	4.1	1316.	829.0	0.0	1.8	1.4	0.0	0.2	61.2	38.5	0.0	0.1	0.1	0.0
1986	0.0	1222.	504.2	0.1	6.6	29.3	0.0	0.0	69.4	28.6	<0.1	0.4	1.7	0.0
1987	0.4	1899.	660.7	0.0	14.5	63.5	0.0	<0.	72.0	25.0	0.0	0.5	2.4	<0.1
1988	2.6	1917.	778.9	0.1	29.2	77.2	0.0	0.1	68.4	27.8	<0.1	1.0	2.8	<0.1
1989	0.0	1250.	511.2	0.1	24.4	95.3	0.1	0.0	66.5	27.2	<0.1	1.3	5.1	<0.1
1990	0.3	1256.	524.1	0.0	27.6	90.6	0.1	<0.	66.2	27.6	<0.1	1.5	4.8	<0.1
1991	4.5	1225.	444.8	0.7	22.7	117.9	0.0	0.2	67.5	24.5	<0.1	1.2	6.5	<0.1
1992	0.6	1221.	464.7	0.1	29.8	106.5	0.0	<0.	67.0	25.5	<0.1	1.6	5.8	<0.1
1993	0.0	1145.	402.1	0.0	26.7	88.8	0.0	<0.	68.9	24.2	0.0	1.6	5.3	0.0

¹ Vessel tonnage class was not used to prorate the landings during 1994-2000.

Table B4. U.S. landings (mt) of Georges Bank winter flounder, by market category, during 1980 -2000.

	Landings (mt) by Market Category								Landings (%) by Market Category							
	1200 Unclassified	1201 Lemon Sole	1204 Extra Large	1202 Large	1205 Large/ Mixed	1203 Small	1206 Medium	1207 Peewee	1200 Unclassified	1201 Lemon Sole	1204 Extra Large	1202 Large	1205 Large/ Mixed	1203 Small	1206 Medium	1207 Peewee
1980	101	824	0	745	0	2,257	0	0	2.6	21.0	0.0	19.0	0.0	57.4	0.0	0.0
1981	31	902	0	748	0	2,310	0	0	0.8	22.6	0.0	18.7	0.0	57.9	0.0	0.0
1982	137	517	33	549	10	1,666	47	1	4.6	17.5	1.1	18.5	0.3	56.3	1.6	<0.1
1983	68	1,506	160	361	25	1,758	14	1	1.7	38.6	4.1	9.3	0.6	45.1	0.4	<0.1
1984	154	370	6	2,029	4	1,231	28	108	3.9	9.4	0.2	51.6	0.1	31.3	0.7	2.7
1985	76	573	110	264	46	1,076	2	3	3.5	26.6	5.1	12.3	2.1	50.0	0.1	0.1
1986	183	176	2	741	0	540	45	76	10.4	10.0	0.1	42.0	0.0	30.6	2.6	4.3
1987	118	241	2	1,027	0	974	38	238	4.5	9.1	0.1	38.6	0.0	36.9	1.4	9.0
1988	149	164	1	995	<1	1,269	34	194	5.3	5.8	<0.1	35.5	<0.1	45.2	1.2	6.9
1989	127	110	<1	717	<1	751	37	138	6.8	5.8	<0.1	38.1	<0.1	39.9	2.0	7.3
1990	112	71	<1	629	0	882	57	149	5.9	3.7	<0.1	33.1	0	46.4	3.0	7.8
1991	152	54	<1	680	0	792	46	92	8.4	3.0	<0.1	37.5	0	43.6	2.5	5.1
1992	151	64	<1	673	<1	767	26	140	8.3	3.5	<0.1	36.9	<0.1	42.1	1.4	7.7
1993	119	89	<1	634	<1	712	22	86	7.2	5.4	<0.1	38.1	0.1	42.8	1.3	5.2
1994	33	60	***	380	***	433	2	***	3.6	6.6	***	41.9	***	47.7	0.2	***
1995	70	40	***	245	***	351	<1	***	9.9	5.7	***	34.7	***	49.7	<0.1	***
1996	191	67	***	414	***	577	15	***	15.1	5.3	***	32.8	***	45.6	1.2	***
1997	424	45	0	453	1	215	91	58	32.9	3.5	0.0	35.2	<0.1	16.7	7.1	4.5
1998	18	54	1	490	0	543	120	16	1.4	4.3	0.1	39.5	0	43.7	9.7	1.3
1999	36	49	0	404	0	356	71	22	3.8	5.2	0.0	43.1	0.0	38.0	7.6	2.3
2000	36	111	2	684	0	678	143	24	2.1	6.6	0.1	40.8	0.0	40.4	8.5	1.4

*** Prorated into other market categories.

Table B5. Estimates of kept weight (mt), discarded weight (mt) and discard ratios (discards/kept) for Georges Bank winter flounder collected by the NEFSC Sea Sampling Program observers. Estimates of total discards (mt) are based on the product of discard ratios and reported landings (mt) by quarter and gear type (trawl, scallop dredge).

	Trawl					Dredge				
	Qtr1	Qtr2	Qtr3	Qtr4	Total	Qtr1	Qtr2	Qtr3	Qtr4	Total
1989										
Trips	2	5	6	2	15	0	0	0	0	0
Total kept (mt)	1.333	2.663	2.391	2.381	8.769	0.000	0.000	0.000	0.000	0.000
Total discard (mt)	0.005	0.053	0.041	0.000	0.099	0.000	0.000	0.000	0.000	0.000
Ratio discard/kept	0.004	0.020	0.017	0.000	0.011	0.000	0.000	0.000	0.000	0.000
Total landings (mt)	486.750	567.164	374.791	331.684	1760.389	13.191	15.824	39.213	51.428	119.656
Total discards (mt)	1.822	11.206	6.399	0.063	19.491	0.000	0.000	0.000	0.000	0.000
1990										
Trips	3	2	2	2	9	0	0	0	0	0
Total kept (mt)	1.014	1.865	3.034	1.051	6.964	0.000	0.000	0.000	0.000	0.000
Total discard (mt)	0.015	0.017	0.004	0.003	0.039	0.000	0.000	0.000	0.000	0.000
Ratio discard/kept	0.015	0.009	0.001	0.003	0.006	0.000	0.000	0.000	0.000	0.000
Total landings (mt)	437.928	729.250	382.837	229.805	1779.820	14.341	15.458	44.892	43.410	118.101
Total discards (mt)	6.662	6.739	0.515	0.595	14.511	0.000	0.000	0.000	0.000	0.000
1991										
Trips	4	0	4	1	9	0	0	0	0	0
Total kept (mt)	2.629	0.000	0.040	0.358	3.027	0.000	0.000	0.000	0.000	0.000
Total discard (mt)	0.007	0.000	0.000	0.005	0.012	0.000	0.000	0.000	0.000	0.000
Ratio discard/kept	0.003	0.000	0.000	0.013	0.004	0.000	0.000	0.000	0.000	0.000
Total landings (mt)	442.979	634.951	226.476	368.799	1673.205	18.271	25.179	58.600	39.033	141.083
Total discards (mt)	1.223	0.000	0.000	4.668	5.891	0.000	0.000	0.000	0.000	0.000
1992										
Trips	5	2	1	2	10	0	2	0	2	4
Total kept (mt)	2.427	2.295	0.105	1.133	5.959	0.000	0.021	0.000	0.298	0.319
Total discard (mt)	0.018	0.033	0.000	0.001	0.051	0.000	0.002	0.000	0.039	0.041
Ratio discard/kept	0.007	0.014	0.000	0.001	0.009	0.000	0.087	0.000	0.131	0.128
Total landings (mt)	366.970	726.073	315.390	276.801	1685.234	6.883	25.454	52.863	51.089	136.289
Total discards (mt)	2.675	10.333	0.000	0.222	13.230	0.000	2.212	0.000	6.687	8.900
1993										
Trips	3	6	1	2	12	1	2	1	1	5
Total kept (mt)	0.152	3.699	0.046	1.039	4.937	0.000	0.085	0.150	0.003	0.238
Total discard (mt)	0.001	0.003	0.004	0.010	0.018	0.000	0.023	0.000	0.000	0.024
Ratio discard/kept	0.006	0.001	0.078	0.010	0.004	0.000	0.271	0.003	0.000	0.101
Total landings (mt)	344.453	719.568	255.278	224.887	1544.186	24.977	20.373	34.293	35.781	115.424
Total discards (mt)	2.056	0.618	20.022	2.159	24.855	0.000	5.527	0.104	0.000	5.631
1994										
Trips	7	6	2	2	17	0	1	1	2	4
Total kept (mt)	0.605	1.557	0.332	0.735	3.229	0.000	0.093	0.068	0.011	0.171
Total discard (mt)	0.012	0.024	0.000	0.015	0.051	0.000	0.063	0.015	0.005	0.083
Ratio discard/kept	0.020	0.015	0.000	0.020	0.016	0.000	0.677	0.228	0.458	0.485
Total landings (mt)	122.622	238.031	235.972	312.760	909.385	4.766	13.126	15.395	19.611	52.898
Total discards (mt)	2.484	3.675	0.000	6.174	12.333	0.000	8.880	3.513	8.986	21.379
1995										
Trips	5	3	1	1	10	1	0	2	0	3
Total kept (mt)	1.666	3.579	1.701	4.560	11.505	0.040	0.000	0.023	0.000	0.063
Total discard (mt)	0.011	0.005	0.002	0.002	0.020	0.001	0.000	0.000	0.000	0.001
Ratio discard/kept	0.007	0.001	0.001	0.000	0.002	0.034	0.000	0.000	0.000	0.022
Total landings (mt)	72.654	232.642	298.806	108.966	713.068	2.568	11.066	18.090	5.321	37.045
Total discards (mt)	0.495	0.295	0.319	0.043	1.151	0.088	0.000	0.000	0.000	0.088

Table B5 (Cont.). Estimates of kept weight, discarded weight and discard ratios (discards/kept) for Georges Bank winter flounder collected by the NEFSC Sea Sampling Program observers. Estimates of total discards are based on the product of discard ratios and reported landings by quarter and gear type (trawl, scallop dredge).

	Trawl					Dredge				
	Qtr1	Qtr2	Qtr3	Qtr4	Total	Qtr1	Qtr2	Qtr3	Qtr4	Total
1996										
Trips	2	6	0	1	9	1	0	1	1	3
Total kept (mt)	0.064	8.605	0.000	2.948	11.617	0.058	0.000	0.000	0.008	0.066
Total discard (mt)	0.000	0.074	0.000	0.002	0.077	0.006	0.000	0.067	0.000	0.074
Ratio discard/kept	0.000	0.009	0.000	0.001	0.007	0.109	0.000	0.000	0.035	1.120
Total landings (mt)	53.485	543.636	355.963	290.765	1,243.849	2.074	37.695	22.030	9.429	71.228
Total discards (mt)	0.000	4.700	0.000	0.224	4.924	0.227	0.000	0.000	0.326	0.553
1997										
Trips	2	0	2	0	4	0	1	1	0	2
Total kept (mt)	0.076	0.000	0.362	0.000	0.439	0.000	0.041	0.067	0.000	0.108
Total discard (mt)	0.000	0.000	0.000	0.000	0.000	0.000	0.131	0.473	0.000	0.604
Ratio discard/kept	0.000	0.000	0.000	0.000	0.000	0.000	3.165	7.052	0.000	5.572
Total landings (mt)	55.469	546.706	424.702	310.990	1,337.867	1.672	37.908	26.714	13.735	80.029
Total discards (mt)	0.000	0.000	0.000	0.000	0.000	0.000	119.969	188.395	0.000	308.363
1998										
Trips	1	0	2	0	3	0	2	0	2	4
Total kept (mt)	0.001	0.000	10.520	0.000	10.521	0.000	0.086	0.000	0.000	0.086
Total discard (mt)	0.000	0.000	0.008	0.000	0.008	0.000	0.174	0.000	0.005	0.180
Ratio discard/kept	0.000	0.000	0.001	0.000	0.001	0.000	2.038	0.000	0.000	2.038
Total landings (mt)	63.356	482.347	373.759	322.238	1,241.700	0.120	0.176	0.264	0.140	0.700
Total discards (mt)	0.000	0.000	0.374	0.000	0.374	0.000	0.366	0.000	0.000	0.366
1999										
Trips	0	2	1	2	5	0	1	8	0	9
Total kept (mt)	0.000	5.665	0.055	3.032	8.752	0.000	0.007	0.030	0.000	0.037
Total discard (mt)	0.000	0.170	0.001	0.006	0.177	0.000	0.035	0.010	0.000	0.045
Ratio discard/kept	0.000	0.021	0.003	0.024	0.048	0.000	5.200	0.322	0.000	5.522
Total landings (mt)	56.749	372.190	209.096	286.765	924.800	0.401	1.007	1.408	6.484	9.300
Total discards (mt)	0.000	7.816	0.627	6.882	15.325	0.000	5.236	0.453	0.000	5.689
2000										
Trips	4	2	3	4	13	0	1	0	0	1
Total kept (mt)	2.586	0.722	11.834	13.341	28.483	0.000	0.000	0.000	0.000	0.000
Total discard (mt)	0.002	0.015	0.036	0.315	0.368	0.000	0.002	0.000	0.000	0.002
Ratio discard/kept	0.001	0.021	0.003	0.024	0.049	0.000	0.000	0.000	0.000	0.000
Total landings (mt)	83.612	718.009	408.291	448.588	1,658.500	0.392	1.010	1.196	15.802	18.400
Total discards (mt)	0.0854	15.078	1.225	10.766	27.154	0.000	0.000	0.000	0.000	0.000

Table B6. Distribution of trips and tows where Georges Bank winter flounder were sampled in the sea scallop dredge fishery, by NEFSC observers in 2000, in re-opened portions of Closed Areas 1 and 2 combined. Monthly kept weight (mt), discarded weight (mt) and ratios of discarded/kept weight of Georges Bank winter flounder are also presented.

	Month							Total
	6	7	8	9	10	11	12	
Trips	20	29	5	0	43	27	18	176
N and (%) tows with winter flounder catch	249 (15.9%)	254 (8.2%)	16 (2.0%)	0	624 (59.5%)	528 (79.4%)	440 (81.3%)	2,111 (27.3%)
Total kept (mt)	0.040	0.057	0.005	0	3.624	1.622	12.908	18.256
Total discard (mt)	0.919	0.543	0.020	0	3.306	3.277	2.549	10.614
Ratio discard/kept	22.975	9.526	4.000	0	0.912	2.020	0.197	0.581

Table B7. Length frequency data, by quarter, for Georges Bank winter flounder collected by the NEFSC Sea Sampling Program observers during 1989-2000.

	Trawl					Dredge					Other				
	1	2	3	4	Total	1	2	3	4	Total	1	2	3	4	Total
1989															
No. trips (kept)	1	2	2	1	6					0					0
No. trips (discards)	1	1	1	0	3					0					0
No. lengths (kept)	28	298	20	54	400					0					0
No. lengths (discards)	2	48	20	0	70					0					0
1990															
No. trips (kept)	3	1	1	2	7					0					0
No. trips (discards)	1	1	1	0	3					0					0
No. lengths (kept)	121	529	593	287	1,530					0					0
No. lengths (discards)	3	15	4	0	22					0					0
1991															
No. trips (kept)	3	0	0	1	4					0					0
No. trips (discards)	2	0	0	0	2					0					0
No. lengths (kept)	474	0	0	21	495					0					0
No. lengths (discards)	5	0	0	0	5					0					0
1992															
No. trips (kept)	2	0	1	1	4	0	0	0	2	2					0
No. trips (discards)	2	0	0	0	2	0	0	0	1	1					0
No. lengths (kept)	308	0	20	10	338	0	0	0	39	39					0
No. lengths (discards)	15	0	0	0	15	0	0	0	1	1					0
1993															
No. trips (kept)	1	2	0	1	4	0	0	1	0	1	0	1	1	0	2
No. trips (discards)	1	1	0	1	3	1	1	0	0	2	0	1	0	0	1
No. lengths (kept)	4	100	0	169	273	0	0	6	0	6	0	23	7	0	30
No. lengths (discards)	2	1	0	2	5	1	2	0	0	3	0	24	0	0	24
1994															
No. trips (kept)	4	3	0	1	8	0	1	0	2	3					0
No. trips (discards)	2	0	0	0	2	0	1	0	1	2					0
No. lengths (kept)	82	27	0	94	203	0	22	0	2	24					0
No. lengths (discards)	6	0	0	0	6	0	32	0	1	33					0
1995															
No. trips (kept)	3	3	1	1	8	1	0	1	0	2	1	0	0	0	1
No. trips (discards)	0	2	1	1	4					0					0
No. lengths (kept)	700	869	611	950	3,130	7	0	2	0	9	28	0	0	0	28
No. lengths (discards)	0	5	2	4	11					0					0
1996															
No. trips (kept)	2	5	0	1	8	1	0	0	0	1					0
No. trips (discards)	0	3	0	1	4	1	0	0	0	1					0
No. lengths (kept)	16	1778	0	106	1,900	13	0	0	0	13					0
No. lengths (discards)	0	38	0	1	39	2	0	0	0	2					0
1997															
No. trips (kept)	1	0	1	0	2	0	1	1	0	2					0
No. trips (discards)	0	0	0	0	0	0	1	1	0	2					0
No. lengths (kept)	4	0	91	0	95	0	14	11	0	25					0
No. lengths (discards)	0	0	0	0	0	0	35	239	0	274					0
1998															
No. trips (kept)	0	0	2	0	2	0	1	0	0	1					0
No. trips (discards)	0	0	1	0	1	0	1	1	0	2					0
No. lengths (kept)	0	0	143	0	143	0	44	0	0	44					0
No. lengths (discards)	0	0	1	0	1	0	70	1	0	71					0
1999															
No. trips (kept)	0	1	1	1	3	0	1	1	0	2					0
No. trips (discards)	0	1	1	1	3	0	1	1	0	2					0
No. lengths (kept)	0	83	18	89	190	0	3	1	0	4					0
No. lengths (discards)	0	16	10	9	35	0	10	2	0	12					0
2000															
No. trips (kept)	2	2	3	4	11					0					0
No. trips (discards)	0	0	2	2	4	0	1	0	0	1					0
No. lengths (kept)	113	54	324	184	675					0					0
No. lengths (discards)	0	0	72	31	103	0	2	0	0	2					0

Table B8. Estimates of kept and discarded weight (mt) and discard ratios (discards/kept), by quarter, of Georges Bank winter flounder reported by commercial operators in the Vessel Trip Report database. Estimates of total discards (mt) are based on the product of discard ratios and reported landings by quarter and gear type (trawl, scallop dredge).

	Trawl					Dredge				
	1	2	3	4	Total	1	2	3	4	Total
1994										
Trips	1	64	67	50	182	0	11	9	4	24
Total kept (mt)	0.544	76.865	84.908	73.636	235.952	0.000	0.832	0.794	0.395	2.021
Total discard (mt)	0.000	1.525	1.963	2.112	5.600	0.000	0.351	1.169	0.710	2.229
Ratio discard/kept	0.000	0.020	0.023	0.029	0.024	0.000	0.421	1.473	1.799	1.103
Total landings (mt)	122.622	238.031	235.972	312.760	909.385	4.766	13.126	15.395	19.611	52.898
Total discards (mt)	0.000	4.723	5.456	8.968	19.147	0.000	5.529	22.670	35.277	63.477
1995										
Trips	23	29	26	26	104	0	0	11	6	17
Total kept (mt)	21.809	36.147	29.643	42.697	130.296	0.000	0.000	0.640	0.329	0.969
Total discard (mt)	0.281	0.714	0.774	3.342	5.112	0.000	0.000	1.769	0.138	1.907
Ratio discard/kept	0.013	0.020	0.026	0.078	0.039	0.000	0.000	2.766	0.420	1.969
Total landings (mt)	72.654	232.642	298.806	108.966	713.068	2.568	11.066	18.090	5.321	37.045
Total discards (mt)	0.937	4.598	7.801	8.529	21.865	0.000	0.000	50.036	2.235	52.272
1996										
Trips	22	45	59	34	160	0	4	11	4	19
Total kept (mt)	7.317	83.146	123.483	50.979	264.924	0.000	0.143	0.946	0.277	1.365
Total discard (mt)	0.032	1.867	1.498	0.215	3.612	0.000	0.721	2.676	0.068	3.466
Ratio discard/kept	0.004	0.022	0.012	0.004	0.014	0.000	5.048	2.830	0.246	2.538
Total landings (mt)	53.485	543.636	355.963	290.765	1,243.849	2.074	37.695	22.030	9.429	71.228
Total discards (mt)	0.232	12.204	4.318	1.229	17.983	0.000	190.270	62.339	2.319	254.928
1997										
Trips	23	0	29	21	73	0	10	8	2	20
Total kept (mt)	16.370	0.000	63.921	37.388	117.680	0.000	0.458	0.562	0.091	1.111
Total discard (mt)	0.150	0.000	0.311	0.559	1.019	0.000	0.968	0.469	0.045	1.483
Ratio discard/kept	0.009	0.000	0.005	0.015	0.009	0.000	2.114	0.835	0.500	1.335
Total landings (mt)	55.469	546.706	424.702	310.990	1,337.867	1.672	37.908	26.714	13.735	80.029
Total discards (mt)	0.507	0.000	2.064	4.648	7.220	0.000	80.132	22.298	6.868	109.297
1998										
Trips	2	10	8	10	30	5	4	1	7	17
Total kept (mt)	0.071	38.190	34.208	31.003	103.472	0.293	0.198	0.136	0.361	0.988
Total discard (mt)	0.002	0.188	0.138	0.179	0.507	0.363	3.280	0.454	2.908	7.005
Ratio discard/kept	0.028	0.005	0.004	0.006	0.005	1.239	16.566	3.338	8.055	7.090
Total landings (mt)	63.356	482.347	373.759	322.238	1,241.700	0.120	0.176	0.264	0.140	0.700
Total discards (mt)	1.785	2.374	1.508	1.860	7.527	0.149	2.916	0.881	1.128	5.073
1999										
Trips	0	8	7	9	24	4	9	9	8	30
Total kept (mt)	0.000	29.178	13.267	12.630	55.075	0.181	0.267	0.045	0.136	0.629
Total discard (mt)	0.000	0.123	0.168	0.059	0.350	1.428	1.603	0.539	0.682	4.252
Ratio discard/kept	0.000	0.004	0.013	0.005	0.006	7.890	6.004	11.978	5.015	6.760
Total landings (mt)	56.749	372.190	209.096	286.765	924.800	0.401	1.007	1.408	6.484	9.300
Total discards (mt)	0.000	1.569	2.648	1.340	5.556	3.164	6.046	16.865	32.515	58.590
2000										
Trips	4	14	8	12	38	1	8	4	5	18
Total kept (mt)	2.091	55.668	26.308	28.620	112.687	0.000	0.009	0.136	0.045	0.190
Total discard (mt)	0.181	0.177	0.310	0.118	0.786	0.005	0.701	0.186	1.343	2.235
Ratio discard/kept	0.087	0.003	0.012	0.004	0.007	0.000	77.889	1.368	29.844	11.763
Total landings (mt)	83.612	718.009	408.291	448.588	1,658.500	0.392	1.010	1.196	15.802	18.400
Total discards (mt)	7.238	2.283	4.811	1.850	16.181	0.000	78.668	1.636	471.602	551.905

Table B9. Port sampling of U.S. winter flounder landings for length and age composition from Georges Bank (Statistical Areas 522-525, 551-562), 1980-2000. Total number of samples does not include 15 unclassified (market category 1200) samples from 1980 (1), 1981 (2), 1982 (4), 1985 (1), 1986 (1), 1990 (4), 1991 (1).

Year	Number of Samples by Market Category and Quarter																			Annual Sampling Intensity (mt landed/sample)		
	Total Samples	Number of Length Samples	Number of Age Samples	Lemon Sole (1201) Extra-Large (1204)					Large (1202) Large/Mixed (1205)					Small (1203) Medium (1206) Pee-Wee (1207)					1201 1204	1202 1205	1203 1206 1207	
				Q1	Q2	Q3	Q4	Tot	Q1	Q2	Q3	Q4	Tot	Q1	Q2	Q3	Q4	Tot	Lemon	Large	Small	
1980	8	863	226	0	0	1	0	1	2	2	1	0	5	1	0	1	0	2	445	217	----	
1981	1	268	77	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	355	----	----	
1982	26	2,900	739	0	1	6	2	9	0	1	6	3	10	0	1	5	1	7	26	71	190	
1983	36	4,493	874	0	3	2	1	6	2	5	6	2	15	2	3	9	1	15	37	42	84	
1984	24	2,855	593	0	1	3	1	5	3	3	4	3	13	1	2	0	3	6	135	111	48	
1985	38	3,927	827	1	2	5	1	9	2	4	9	1	16	2	3	7	1	13	50	28	75	
1986	29	2,822	563	1	1	0	3	5	2	3	3	2	10	1	6	3	4	14	178	67	144	
1987	33	3,108	618	2	1	1	2	6	4	3	3	1	11	5	3	4	4	16	87	51	131	
1988	34	2,959	693	2	2	1	2	7	4	3	3	1	11	4	4	4	4	16	86	61	111	
1989	16	1,470	280	1	1	0	0	2	3	2	0	1	6	1	3	3	1	8	412	124	282	
1990	34	3,469	737	0	0	0	1	1	3	3	4	3	13	6	7	3	4	20	902	58	116	
1991	35	3,137	698	1	1	1	1	4	6	6	2	2	16	6	3	3	3	15	129	37	114	
1992	35	3,034	688	1	2	1	1	5	5	4	3	3	15	6	5	3	1	15	301	36	118	
1993	16	1,435	338	1	2	0	1	4	3	2	0	0	5	1	5	0	1	7	93	408	195	
1994	17	1,345	330	0	1	1	1	3	1	2	2	1	6	1	3	3	1	8	20	64	54	
1995	14	1,137	274	1	1	0	2	4	1	0	0	3	4	2	1	0	3	6	10	17	104	
1996	11	1,064	236	0	2	1	1	4	0	2	1	1	4	0	1	1	1	3	17	104	192	
1997	15	1,155	225	0	0	0	1	1	1	0	1	0	2	3	2	1	5	11	45	227	33	
1998	4	317	60	0	0	0	0	0	0	1	0	0	1	0	1	1	1	3	----	490	340	
1999 ¹	5	296	66	0	0	0	0	0	0	0	0	0	0	2	1	0	1	4	----	----	112	
2000	23	1,659	385	0	0	1	5	6	1	0	0	4	5	4	5	2	1	12	19	137	70	

¹ Includes one unclassified sample (market category 1200) during Quarter 2.

Table B10. Data pooling procedures used to apply frequency samples to landings by market category to estimate catch (numbers) at age of Georges Bank winter flounder, 1982-2000.

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Market Category Comments
Year					
1982	Pooled		X	X	1204 (Extra Large) pooled with 1201 Lemon Sole 1205 (Large/Mixed) pooled with 1202 (Large) 1206 (Medium) and 1207 (Peewee) pooled with 1203 (Small)
1983	Pooled		X	X	
1984	Pooled		Pooled		
1985	X	X	X	X	
1986	X	X	Pooled		
1987	X	X	X	X	
1988	X	X	X	X	
1989	X	X	Pooled		
1990	X	X	X	X	
1991	X	X	X	X	
1992	X	X	X	X	
1993	X	Pooled			
1994	Pooled		X	X	
1995	X	X	Pooled		
1996	Pooled		X	X	
1997	X	X	Pooled		
1998	Pooled				Pooled all market categories and included all length data from otter trawl observer trips
1999	Pooled				
2000	Pooled		Pooled		Pooled market categories as in 1994-97

Table B11. Estimated landings (in numbers, thousands) at age and weight (mt) at age of Georges Bank winter flounder during 1982-2000.

	Landings at Age										Total
	1	2	3	4	5	6	7	8	9	10+	
1982	---	353	1,707	1,048	511	258	117	101	30	33	4,157
1983	10	787	2,902	1,454	551	206	221	134	47	127	6,438
1984	---	282	570	1,371	1,408	635	303	230	169	217	5,186
1985	20	805	693	812	491	112	51	22	20	8	3,031
1986	---	665	1,328	235	229	131	49	23	7	9	2,675
1987	---	1,294	1,681	899	133	89	40	35	25	21	4,217
1988	---	835	2,774	843	197	90	46	24	7	17	4,832
1989	---	1,381	1,222	509	147	107	29	22	6	4	3,427
1990	---	295	2,032	668	185	46	8	7	0	3	3,241
1991	---	593	1,270	951	136	38	30	18	9	4	3,047
1992	---	796	756	727	468	92	32	15	11	4	2,902
1993	37	301	1,143	451	320	163	21	13	5	7	2,461
1994	---	533	582	246	67	57	34	9	4	3	1,536
1995	264	679	267	188	76	19	14	4	3	1	1,513
1996	---	737	567	240	157	104	38	29	10	6	1,888
1997	---	480	1,115	590	132	35	11	7	2	13	2,385
1998	8	112	1,421	629	76	20	7	0	3	0	2,275
1999	32	599	814	274	136	30	8	0	0	0	1,893
2000	0	484	1,282	474	285	213	55	27	25	7	2,852

	Weight at Age										Total
	1	2	3	4	5	6	7	8	9	10+	
1982	---	100	761	818	531	317	161	164	61	68	1,713
1983	2	220	1,308	971	495	204	253	169	69	218	3,908
1984	---	82	266	803	1,049	566	318	272	221	354	3,931
1985	3	326	360	634	515	152	78	38	40	16	2,163
1986	---	264	810	183	235	156	69	37	13	21	1,786
1987	---	500	924	781	148	108	64	56	47	42	2,669
1988	---	292	1,416	641	227	119	74	42	14	34	2,859
1989	---	498	565	422	159	142	44	40	12	10	1,891
1990	---	135	1,035	505	183	61	15	12	1	6	1,953
1991	---	249	615	671	134	54	47	33	16	9	1,828
1992	---	310	373	541	425	110	43	24	17	6	1,849
1993	9	116	614	342	301	211	34	25	12	17	1,683
1994	---	201	318	218	75	76	52	17	8	6	972
1995	75	268	159	124	76	24	21	6	5	1	760
1996	---	304	348	217	172	150	60	51	20	13	1,336
1997	---	174	596	414	133	50	18	13	4	28	1,430
1998	2	48	653	400	80	25	11	0	6	0	1,225
1999	7	224	332	187	132	43	13	0	0	0	938
2000	---	183	533	236	261	259	78	42	38	12	1,641

Table B12. Estimated mean length (cm) at age and mean weight (kg) at age for Georges Bank winter flounder from the commercial landings at age.

	Mean Length at Age										All
	1	2	3	4	5	6	7	8	9	10+	Ages
1982	--	30.68	35.36	42.42	46.54	49.11	50.91	53.68	57.46	58.03	40.21
1983	26.67	30.53	35.49	40.29	44.40	45.78	47.88	49.40	52.00	54.51	38.26
1984	--	31.05	36.05	38.72	41.75	44.31	46.61	48.42	50.00	53.61	41.41
1985	26.07	34.12	36.74	42.27	46.62	50.72	52.72	54.85	57.61	57.50	40.15
1986	--	33.99	39.13	42.18	46.12	48.37	51.04	53.37	55.08	60.42	39.53
1987	--	33.72	37.77	43.88	47.44	48.70	53.17	53.34	56.02	57.67	38.87
1988	--	32.77	36.76	41.95	48.01	50.16	53.28	55.15	57.79	58.16	38.05
1989	--	32.95	35.45	43.16	46.86	50.32	52.52	55.52	58.64	61.33	36.93
1990	--	35.72	36.93	41.91	45.74	50.39	57.26	56.46	62.00	60.83	38.64
1991	--	34.65	36.06	40.85	45.69	51.67	53.27	56.00	56.35	59.56	38.35
1992	--	33.90	36.53	41.71	44.37	48.43	49.74	53.89	52.20	54.73	39.07
1993	29.66	33.68	37.57	41.80	44.74	49.83	54.10	56.30	60.05	60.23	39.86
1994	---	33.53	37.75	44.09	47.56	50.36	52.13	56.16	56.64	58.48	38.73
1995	30.80	33.94	38.93	40.05	45.41	49.35	52.23	55.52	56.88	63.00	36.07
1996	---	34.65	39.32	44.42	47.08	51.64	53.20	55.39	57.29	57.53	40.15
1997	---	33.19	37.42	40.90	45.75	51.51	52.96	56.36	59.00	58.25	38.36
1998	30.00	35.82	36.60	40.45	47.77	50.93	55.60	---	59.00	---	38.18
1999	29.68	34.51	35.53	41.85	46.91	52.88	56.08	---	---	---	37.21
2000	---	34.87	35.89	37.95	46.13	50.74	53.48	54.54	54.67	---	38.92

	Mean Weight at Age										All
	1	2	3	4	5	6	7	8	9	10+	Ages
1982	--	0.283	0.444	0.779	1.041	1.228	1.375	1.623	2.007	2.078	0.717
1983	0.181	0.279	0.451	0.668	0.899	0.991	1.144	1.261	1.475	1.713	0.607
1984	--	0.292	0.467	0.585	0.744	0.891	1.050	1.180	1.308	1.626	0.758
1985	0.168	0.405	0.522	0.782	1.050	1.366	1.541	1.743	2.035	2.011	0.714
1986	--	0.398	0.617	0.778	1.029	1.194	1.420	1.601	1.764	2.351	0.668
1987	--	0.385	0.549	0.868	1.107	1.217	1.582	1.605	1.861	2.038	0.633
1988	--	0.350	0.510	0.760	1.149	1.323	1.594	1.770	2.053	2.090	0.592
1989	--	0.359	0.459	0.826	1.076	1.332	1.522	1.804	2.131	2.450	0.552
1990	--	0.457	0.510	0.757	0.992	1.339	1.983	1.909	2.531	2.388	0.603
1991	--	0.418	0.479	0.702	0.985	1.438	1.582	1.853	1.897	2.250	0.600
1992	--	0.390	0.494	0.744	0.906	1.185	1.321	1.656	1.552	1.727	0.637
1993	0.250	0.384	0.537	0.758	0.941	1.294	1.657	1.880	2.299	2.324	0.684
1994	---	0.377	0.546	0.886	1.118	1.338	1.499	1.867	1.910	2.133	0.633
1995	0.283	0.394	0.597	0.660	0.999	1.287	1.582	1.798	1.941	2.662	0.503
1996	---	0.413	0.614	0.903	1.096	1.442	1.582	1.788	1.982	2.013	0.707
1997	---	0.363	0.534	0.702	1.011	1.429	1.555	1.879	2.167	2.092	0.600
1998	---	0.259	0.458	0.494	0.684	1.134	1.375	1.806	---	2.167	0.579
1999	0.252	0.415	0.454	0.758	1.079	1.551	1.854	---	---	---	0.550
2000	---	0.423	0.466	0.558	1.024	1.361	1.602	1.702	1.712	1.902	0.645

Table B13. Nominal landings per unit effort (mt landed/day fished) of winter flounder, by ton class, for all Georges Bank otter trawl trips landing winter flounder from 1964 to 1993.

Year	Ton Class 2			Ton Class 3			Ton Class 4			Total		
	L	DF	LPUE	L	DF	LPUE	L	DF	LPUE	L	DF	LPUE
1964	74	350	0.21	927	3,101	0.30	358	2,297	0.16	1,359	5,748	0.24
1965	81	280	0.24	694	3,652	0.19	399	2,782	0.14	1,174	6,714	0.17
1966	54	216	0.25	1,189	3,798	0.37	630	2,766	0.23	1,873	6,780	0.28
1967	46	142	0.32	1,073	3,187	0.34	794	2,268	0.35	1,914	5,596	0.34
1968	34	120	0.28	1,039	3,518	0.29	491	1,521	0.32	1,564	5,159	0.30
1969	7	49	0.14	1,541	4,147	0.37	616	1,404	0.44	2,163	5,600	0.39
1970	16	55	0.29	2,002	4,380	0.46	590	1,142	0.52	2,609	5,576	0.47
1971	67	162	0.41	2,281	5,046	0.45	737	1,351	0.54	3,085	6,558	0.47
1972	36	103	0.35	2,232	5,239	0.43	527	1,118	0.47	2,795	6,461	0.43
1973	22	99	0.22	1,725	4,084	0.42	516	906	0.57	2,264	5,089	0.44
1974	16	72	0.22	1,531	5,170	0.30	568	1,231	0.46	2,115	6,473	0.33
1975	9	52	0.17	1,854	5,316	0.35	544	1,076	0.50	2,407	6,445	0.37
1976	2	24	0.09	1,486	4,992	0.30	386	607	0.64	1,874	5,624	0.33
1977	33	103	0.32	2,899	5,548	0.53	636	728	0.87	3,568	6,379	0.56
1978	11	48	0.23	2,539	4,496	0.56	615	798	0.77	3,165	5,242	0.59
1979	35	120	0.29	2,434	3,992	0.62	548	948	0.58	3,018	5,060	0.60
1980	70	148	0.48	3,110	4,182	0.75	705	1,241	0.57	3,885	5,571	0.70
1981	26	134	0.19	3,085	4,370	0.71	823	1,836	0.45	3,934	6,340	0.62
1982	29	78	0.37	2,193	4,452	0.49	692	1,815	0.38	2,914	6,345	0.46
1983	11	22	0.48	2,634	4,320	0.61	1,21	2,394	0.51	3,864	6,736	0.57
1984	10	24	0.43	2,549	6,472	0.39	1,33	3,329	0.40	3,897	9,825	0.40
1985	4	29	0.14	1,312	5,393	0.24	828	2,668	0.31	2,145	8,090	0.27
1986	0	0	-----	1,219	4,845	0.25	504	1,957	0.26	1,723	6,802	0.25
1987	<1	3	0.13	1,898	6,647	0.29	660	2,290	0.29	2,559	8,940	0.29
1988	3	12	0.23	1,917	7,594	0.25	778	2,665	0.29	2,697	10,27	0.26
1989	<1	<1	<0.01	1,242	5,866	0.21	488	2,246	0.22	1,730	8,112	0.21
1990	<1	9	0.04	1,256	5,030	0.25	522	2,257	0.23	1,778	7,295	0.24
1991	5	5	0.42	1,224	5,351	0.23	444	2,175	0.20	1,672	7,537	0.22
1992	<1	1	0.12	1,216	6,160	0.20	460	2,472	0.19	1,677	8,638	0.19
1993	<1	1	0.02	1,139	7,097	0.16	393	2,291	0.17	1,532	9,388	0.16

Table B14. Nominal landings per unit effort (landed/day fished) of winter flounder by ton class for directed winter flounder otter trawl trips (landings \geq 50% of trip) on Georges Bank from 1964 to 1993.

Year	Ton Class 2			Ton Class 3			Ton Class 4			Total		
	L	DF	LPUE	L	DF	LPUE	L	DF	LPUE	L	DF	LPUE
1964	10	5	2.00	131	66	1.98	30	7	2.86	161	78	2.06
1965	0	0	-----	242	98	2.47	28	8	3.50	207	106	2.55
1966	2	2	1.00	108	52	2.08	5	2	2.50	115	56	2.05
1967	6	4	1.50	151	96	1.57	33	14	2.36	190	114	1.67
1968	9	14	0.64	162	90	1.80	18	9	2.00	189	113	1.67
1969	0	0	-----	140	61	2.30	86	24	3.58	226	85	2.66
1970	0	0	-----	431	186	2.32	80	30	2.67	511	216	2.36
1971	24	14	1.71	457	212	2.16	121	61	1.98	602	287	2.10
1972	14	7	2.00	515	267	1.93	84	47	1.79	613	321	1.91
1973	0	0	-----	465	251	1.85	94	45	2.09	559	296	1.89
1974	0	0	-----	294	174	1.69	132	52	2.54	426	226	1.88
1975	5	4	1.25	654	381	1.72	158	84	1.88	817	469	1.74
1976	0	0	-----	496	302	1.64	143	90	1.59	639	392	1.63
1977	6	6	1.00	743	328	2.26	200	74	2.70	949	408	2.32
1978	5	6	0.83	678	340	1.99	50	25	2.00	733	371	1.98
1979	9	5	1.80	759	398	1.91	55	23	2.39	823	426	1.93
1980	28	18	1.55	1,33	642	2.08	137	36	3.80	1,502	696	2.16
1981	6	3	2.00	1,31	670	1.96	138	58	2.38	1,460	731	2.00
1982	8	6	1.35	894	533	1.68	158	62	2.54	1,060	601	1.76
1983	9	7	1.23	1,22	685	1.79	277	116	2.39	1,509	807	1.87
1984	6	4	1.48	913	860	1.06	333	242	1.38	1,252	1,106	1.13
1985	0	0	-----	400	657	0.61	208	246	0.84	607	904	0.67
1986	0	0	-----	435	827	0.53	100	157	0.64	535	983	0.54
1987	0	0	-----	508	925	0.55	112	160	0.70	621	1,085	0.57
1988	2	7	0.27	403	769	0.52	150	215	0.70	554	991	0.56
1989	0	0	-----	251	530	0.47	59	95	0.63	310	625	0.50
1990	0	0	-----	259	463	0.56	58	79	0.74	317	542	0.59
1991	0	0	-----	306	489	0.63	61	68	0.89	366	557	0.66
1992	0	0	-----	292	564	0.52	61	80	0.76	353	644	0.55
1993	0	0	-----	209	481	0.43	32	49	0.65	241	530	0.45

Table B15 . Standardized, stratified abundance (numbers) and biomass (weight) indices for Georges Bank winter flounder from the U.S. NEFSC Spring and Autumn (offshore strata 13-22) and Canadian Spring (strata 5Z1-Z4) research vessel bottom trawl surveys. Door standardization coefficients of 1.46 (numbers) and 1.39 (weight) were applied to pre-1985 U.S. survey indices to account for catchability differences between survey trawl doors.

	U.S. Spring Survey		U.S. Autumn Survey		Canadian Spring Survey	
	Number per tow	Weight (kg) per tow	Number per tow	Weight (kg) per tow	Number per tow	Weight (kg) per tow
1963			1.20	1.82		
1964			1.30	1.82		
1965			2.15	2.05		
1966			5.16	5.66		
1967	<i>Spring Survey initiated in 1968</i>		1.79	2.07		
1968	2.70	3.11	1.31	1.07		
1969	3.14	4.29	2.37	2.39		
1970	1.86	2.29	5.62	6.49		
1971	1.84	2.17	1.32	1.26		
1972	4.95	5.32	1.26	1.58		
1973	2.95	3.51	1.22	1.20		
1974	6.05	5.78	1.19	1.46		
1975	1.96	1.41	3.79	2.06		
1976	4.67	3.01	5.99	3.93		
1977	3.79	1.58	4.86	3.99		
1978	7.07	5.06	4.06	3.10		
1979	1.74	2.21	5.07	3.83		
1980	3.22	2.80	1.66	1.87		
1981	3.73	3.75	3.83	2.43		
1982	2.30	1.52	5.30	2.69		
1983	8.41	7.11	2.73	2.36		
1984	5.53	5.60	3.93	2.45		
1985	3.84	2.65	1.98	1.12		
1986	2.00	1.21	3.58	2.18	<i>Canadian Survey initiated in 1987</i>	
1987	2.80	1.25	0.76	0.89	1.24	1.74
1988	2.93	1.65	4.08	1.27	4.31	2.75
1989	1.30	0.76	1.56	1.05	4.05	1.95
1990	2.80	1.57	0.50	0.35	4.93	2.64
1991	2.40	1.32	0.27	0.14	1.98	1.38
1992	1.42	0.90	0.68	0.38	0.51	0.59
1993	1.02	0.57	1.17	0.66	3.53	1.76
1994	1.29	0.58	0.87	0.58	5.10	2.01
1995	2.61	1.49	2.36	1.34	5.63	1.96
1996	2.31	1.50	1.54	1.76	4.12	2.30
1997	1.61	1.19	1.74	1.53	4.58	3.09
1998	0.76	0.72	1.78	1.57	1.14	1.21
1999	3.83	3.48	2.60	2.64	1.25	1.89
2000	4.42	3.69	2.16	2.66	1.48	2.22
2001	1.29	1.22			2.28	2.54

Table B16. Stratified mean numbers per tow at age of Georges Bank winter flounder caught in the NEFSC spring research vessel bottom trawl surveys (offshore strata 13-22) during 1982-2001. A trawl door standardization coefficient of 1.46 has been applied to indices prior to 1985 to account for changes in catchability due to a change in trawl doors.

Year	Age											Total
	0	1	2	3	4	5	6	7	8	9	10 +	
1982	0.00	0.07	0.78	0.38	0.59	0.17	0.15	0.04	0.01	0.03	0.0	2.259
1983	0.00	0.02	1.02	3.13	1.58	0.67	0.69	0.56	0.42	0.12	0.1	8.405
1984	0.00	0.03	0.14	1.91	1.53	0.45	0.54	0.47	0.26	0.02	0.1	5.530
1985	0.00	0.00	1.85	0.62	0.62	0.39	0.22	0.04	0.02	0.04	0.0	3.837
1986	0.00	0.25	0.66	0.73	0.11	0.16	0.07	0.00	0.00	0.00	0.0	2.003
1987	0.00	0.16	1.64	0.58	0.29	0.09	0.00	0.00	0.02	0.00	0.0	2.803
1988	0.00	0.07	0.53	1.43	0.68	0.11	0.04	0.01	0.00	0.02	0.0	2.925
1989	0.00	0.04	0.53	0.26	0.22	0.15	0.01	0.00	0.05	0.00	0.0	1.299
1990	0.00	0.12	0.61	1.56	0.33	0.09	0.07	0.00	0.00	0.00	0.0	2.803
1991	0.00	0.27	0.34	0.82	0.58	0.27	0.03	0.02	0.00	0.04	0.0	2.403
1992	0.00	0.07	0.60	0.29	0.13	0.14	0.10	0.00	0.02	0.02	0.0	1.416
1993	0.00	0.17	0.27	0.33	0.15	0.00	0.04	0.01	0.02	0.00	0.0	1.018
1994	0.00	0.12	0.57	0.40	0.10	0.03	0.04	0.00	0.00	0.00	0.0	1.292
1995	0.00	0.14	0.78	1.25	0.29	0.10	0.02	0.00	0.00	0.00	0.0	2.613
1996	0.00	0.03	1.21	0.43	0.48	0.06	0.02	0.04	0.00	0.00	0.0	2.314
1997	0.00	0.02	0.19	0.53	0.66	0.11	0.02	0.02	0.00	0.02	0.0	1.609
1998	0.00	0.00	0.02	0.16	0.42	0.12	0.00	0.02	0.00	0.00	0.0	0.762
1999	0.00	0.22	0.54	0.61	1.29	0.88	0.19	0.05	0.01	0.00	0.0	3.831
2000	0.00	0.01	0.61	1.01	0.62	1.13	0.65	0.11	0.07	0.00	0.0	4.419
2001	0.00	0.00	0.07	0.32	0.27	0.16	0.19	0.26	0.00	0.00	0.0	1.293

Table B17. Stratified mean numbers per tow at age of Georges Bank winter flounder caught in the NEFSC autumn research vessel bottom trawl surveys (offshore strata 13-22) during 1982-2000. A trawl door standardization coefficient of 1.46 has been applied to indices prior to 1985 to account for changes in catchability due to a change in trawl doors.

Year	Age											Total
	0	1	2	3	4	5	6	7	8	9	10+	
1982	0.28	1.96	2.14	0.43	0.33	0.12	0.01	0.00	0.00	0.00	0.0	5.301
1983	0.08	0.06	0.58	1.13	0.49	0.05	0.19	0.08	0.03	0.00	0.0	2.726
1984	0.23	0.66	0.99	0.91	0.81	0.23	0.05	0.01	0.01	0.00	0.0	3.933
1985	0.10	0.32	0.99	0.41	0.07	0.02	0.02	0.00	0.00	0.00	0.0	1.979
1986	0.20	1.09	1.56	0.36	0.20	0.04	0.02	0.02	0.00	0.00	0.0	3.575
1987	0.00	0.05	0.20	0.21	0.12	0.00	0.07	0.06	0.02	0.00	0.0	0.762
1988	0.04	2.92	0.63	0.38	0.04	0.00	0.02	0.02	0.00	0.00	0.0	4.084
1989	0.02	0.09	1.06	0.07	0.14	0.07	0.05	0.00	0.02	0.00	0.0	1.560
1990	0.00	0.08	0.06	0.30	0.00	0.05	0.00	0.00	0.00	0.00	0.0	0.498
1991	0.10	0.04	0.00	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.0	0.268
1992	0.00	0.02	0.46	0.15	0.00	0.02	0.00	0.00	0.00	0.00	0.0	0.677
1993	0.00	0.59	0.13	0.24	0.17	0.02	0.00	0.00	0.00	0.00	0.0	1.166
1994	0.00	0.16	0.42	0.15	0.08	0.03	0.00	0.00	0.00	0.00	0.0	0.870
1995	0.01	0.96	0.89	0.36	0.04	0.04	0.00	0.00	0.01	0.00	0.0	2.357
1996	0.00	0.12	0.33	0.62	0.24	0.05	0.09	0.06	0.00	0.00	0.0	1.539
1997	0.01	0.07	0.68	0.57	0.29	0.06	0.02	0.00	0.00	0.00	0.0	1.744
1998	0.09	0.27	0.24	0.62	0.35	0.16	0.01	0.02	0.00	0.00	0.0	1.784
1999	0.01	0.38	0.78	0.34	0.32	0.60	0.08	0.02	0.02	0.00	0.0	2.595
2000	0.01	0.05	0.49	0.49	0.30	0.45	0.21	0.05	0.06	0.00	0.0	2.164

Table B18. Stratified mean numbers per tow at age of Georges Bank winter flounder in Canadian Spring research vessel bottom trawl surveys (strata 5Z1-5Z4). Indices of stratified mean number per tow at length were partitioned by age using NEFSC spring survey age keys. The 2000 and 2001 survey age keys were supplemented with quarter one commercial ages for fish greater than 48 and 39 cm in length, respectively.

Year	Age											Total
	0	1	2	3	4	5	6	7	8	9	10+	
1987	0.00	0.00	0.11	0.21	0.64	0.27	0.00	0.00	0.00	0.00	0.0	1.241
1988	0.00	0.16	0.82	2.23	0.89	0.16	0.01	0.02	0.00	0.00	0.0	4.306
1989	0.00	0.08	1.96	1.00	0.71	0.22	0.05	0.00	0.00	0.00	0.0	4.050
1990	0.00	0.08	1.24	3.12	0.26	0.14	0.05	0.00	0.00	0.00	0.0	4.925
1991	0.00	0.06	0.33	0.40	0.93	0.20	0.02	0.00	0.00	0.00	0.0	1.984
1992	0.00	0.00	0.02	0.06	0.20	0.07	0.13	0.00	0.00	0.00	0.0	0.513
1993	0.00	1.18	0.66	0.97	0.41	0.03	0.17	0.06	0.00	0.00	0.0	3.529
1994	0.00	0.01	3.31	1.15	0.31	0.19	0.07	0.03	0.00	0.00	0.0	5.100
1995	0.00	1.57	2.45	1.27	0.21	0.08	0.00	0.01	0.00	0.00	0.0	5.630
1996	0.00	0.89	1.25	0.93	0.64	0.21	0.08	0.08	0.00	0.01	0.0	4.124
1997	0.00	0.00	0.98	1.57	1.55	0.39	0.01	0.01	0.02	0.01	0.0	4.579
1998	0.00	0.01	0.00	0.19	0.62	0.25	0.03	0.00	0.00	0.00	0.0	1.135
1999	0.00	0.05	0.24	0.23	0.40	0.23	0.05	0.01	0.00	0.00	0.0	1.247
2000	0.00	0.01	0.01	0.14	0.13	0.35	0.38	0.11	0.24	0.08	0.0	1.482
2001	0.00	0.31	0.20	0.36	0.41	0.30	0.29	0.31	0.04	0.02	0.0	2.276

Table B19. Estimates of instantaneous total mortality (Z) and fishing mortality (F) for Georges Bank winter flounder derived from NEFSC spring and autumn and Canadian spring research vessel bottom trawl survey data. Estimates were made using 3-year running sums of numbers at age.

	<u>NEFSC Spring²</u>		<u>NEFSC Autumn²</u>		<u>Canadian Spring</u>		<u>Geometric Mean³</u>	
	Z	F ¹	Z	F ¹	Z	F ¹	Z	F ¹
1981-83	0.382	0.182	0.409	0.209	----	---	0.395	0.195
1982-84	0.501	0.301	0.510	0.310	---	---	0.505	0.305
1983-85	1.144	0.944	0.848	0.648	---	---	0.985	0.785
1984-86	0.558	1.358	1.047	0.847	---	---	1.277	1.077
1985-87	1.350	1.150	1.463	1.263	---	---	1.405	1.205
1986-88	1.107	0.907	0.895	0.695	---	---	0.995	0.795
1987-89	1.067	0.867	0.906	0.706	---	---	0.984	0.784
1988-90	0.855	0.655	1.112	0.912	1.467	1.267	0.975	0.775
1989-91	0.802	0.602	1.079	0.879	1.265	1.065	0.930	0.730
1990-92	0.899	0.699	1.806	1.606	1.388	1.188	1.274	1.074
1991-93	1.247	1.047	0.834	0.634	1.042	0.840	1.020	0.820
1992-94	1.066	0.866	0.758	0.558	1.059	0.859	0.899	0.699
1993-95	0.891	0.691	0.752	0.552	0.922	0.722	0.819	0.619
1994-96	0.994	0.794	0.555	0.355	0.722	0.522	0.742	0.542
1995-97	1.388	1.188	0.648	0.448	0.712	0.512	0.948	0.748
1996-98	0.322	0.122	0.586	0.386	1.081	0.881	0.434	0.234
1997-99	0.119	-0.081	0.472	0.272	1.303	1.103	0.237	0.037
1998-2000	0.391	0.191	0.481	0.281	0.712	0.512	0.434	0.234

¹ Instantaneous natural mortality (M) assumed to be 0.20.

² Estimates derived from:

Spring: $\ln \left(\frac{\sum \text{age } 4+ \text{ for years } i \text{ to } j}{\sum \text{age } 5+ \text{ for years } i+1 \text{ to } j+1} \right)$

Autumn: $\ln \left(\frac{\sum \text{age } 3+ \text{ for years } i-1 \text{ to } j-1}{\sum \text{age } 4+ \text{ for years } i \text{ to } j} \right)$

³ Geometric mean computed from U.S. survey indices

Table B20. Proportion mature at age for female winter flounder sampled by the NEFSC spring research vessel survey from 1982 to 1998. Logistic regression equations and age at 50% maturation are presented annually and for data pooled across the entire time series.

Year	N	Age					Logistic Regression Coefficients		
		1	2	3	4	5	a	b	A ₅₀
1982	23	0.00	0.44	1.00	1.00	1.00	18.30	9.04	2.02
1983	79	0.00	0.14	0.56	1.00	1.00	6.38	2.22	2.87
1984	54	0.00	0.80	1.00	0.93	0.93	17.70	9.54	1.85
1985	40	0.03	0.62	0.99	1.00	1.00	----	----	----
1986	39	0.00	1.00	1.00	1.00	1.00	19.83	13.59	1.46
1987	67	0.00	0.83	1.00	1.00	1.00	18.44	10.00	1.84
1988	42	0.00	0.13	0.95	1.00	1.00	11.88	4.96	2.39
1989	15	0.00	0.20	1.00	1.00	1.00	24.56	11.58	2.12
1990	43	0.00	0.44	1.00	1.00	1.00	23.80	11.79	2.02
1991	34	0.00	0.00	1.00	1.00	1.00	34.25	14.10	2.43
1992	31	0.00	0.54	0.78	1.00	1.00	3.28	1.64	2.00
1993	21	0.00	1.00	1.00	1.00	1.00	—	—	---
1994	30	0.00	0.79	0.86	1.00	1.00	3.49	2.16	1.62
1995	21	0.00	0.33	1.00	1.00	1.00	24.48	11.90	2.06
1996	43	0.00	0.76	1.00	1.00	1.00	18.23	9.70	1.88
1997	9	0.00	0.67		1.00	1.00	13.98	7.34	1.91
1998	10	0.00		1.00	1.00	1.00	—	—	---
1982-98	561	0.00	0.62	0.92	0.99	1.00	3.99	2.18	1.83

Table B21. Sequential history of ASPIC surplus production model runs for Georges Bank winter flounder.

	SAW 28 Run	SAW 28 Run	SAW 28 Update	Run 3 ¹
Input Data	Total landings, 1964-1997 US Autumn survey, 1964-1997 US Spring survey, 1968-1998, lagged back one year CA Spring survey, 1987-1998, lagged back one year	Total landings, 1964-1997 US Autumn survey, 1964-1997 US Spring survey, 1968-1998, lagged back one year CA Spring survey, 1987-1998, lagged back one year	Total landings, 1964-2000 US Autumn survey, 1964-2000 US Spring survey, 1968-2001, lagged back one year CA Spring survey, 1987-2001, lagged back one year	Total landings, 1964-2000 US Autumn survey, 1964-2000 US Spring survey, 1968-2001, lagged back one year
CA survey strata	5Z1-8	5Z1-4	5Z1-4	
Total Objective Function	1.873	2.040	2.241	1.942
B coverage	0.802	0.824	0.785	0.917
B nearness	1.000	1.000	1.000	1.000
R ² in CPUE				
U.S. Autumn Survey	0.323	0.319	0.316	0.340
U.S. Spring Survey	0.273	0.262	0.226	0.208
CA Spring Survey	0.508	-0.128	-0.537	-
B1 Ratio	0.551	0.603	0.585	0.582
r	0.538	0.520	0.508	0.646
F ₂₀₀₀			0.217	0.208
F _{msv}	0.269	0.260	0.254	0.323
B _{msv} (mt)	11,410	11,570	11,950	9,355
MSY (mt)	3,068	3,011	3,034	3,020

¹ Run 3 was used to re-estimate biological reference points and to evaluate stock status in 2000.

Table B22. Estimates of fishing mortality, biomass (000s mt), and surplus production (000s mt) from an ASPIC surplus production model (Run 3) for the Georges Bank winter flounder stock during 1964-2000.

Year	Estimated Total Fishing Mortality	Estimated Starting Biomass (000s mt)	Estimated Average Biomass (000s mt)	Observed Total Yield (000s mt)	Estimated Surplus Production (000s mt)	Ratio of F to FMSY	Ratio of B to BMSY
1964	0.253	5.447	6.005	1.517	2.629	0.783	0.582
1965	0.236	6.559	7.147	1.687	2.848	0.731	0.701
1966	0.271	7.720	8.116	2.197	2.965	0.839	0.825
1967	0.266	8.488	8.831	2.349	3.009	0.824	0.907
1968	0.207	9.148	9.674	2.001	3.013	0.641	0.978
1969	0.242	10.160	10.400	2.518	2.981	0.750	1.086
1970	0.253	10.620	10.750	2.719	2.953	0.784	1.136
1971	0.410	10.860	10.210	4.183	2.990	1.269	1.161
1972	0.510	9.665	8.852	4.512	3.005	1.579	1.033
1973	0.365	8.158	8.155	2.976	2.970	1.131	0.872
1974	0.259	8.152	8.554	2.218	2.996	0.803	0.871
1975	0.327	8.930	8.971	2.937	3.015	1.014	0.955
1976	0.197	9.008	9.590	1.889	3.014	0.610	0.963
1977	0.366	10.130	9.823	3.594	3.011	1.133	1.083
1978	0.345	9.551	9.429	3.250	3.020	1.068	1.021
1979	0.330	9.320	9.297	3.064	3.020	1.021	0.996
1980	0.454	9.276	8.758	3.975	3.005	1.406	0.992
1981	0.519	8.306	7.725	4.012	2.925	1.609	0.888
1982	0.417	7.219	7.152	2.980	2.852	1.291	0.772
1983	0.606	7.091	6.459	3.911	2.726	1.876	0.758
1984	0.776	5.907	5.068	3.933	2.379	2.404	0.631
1985	0.498	4.352	4.347	2.165	2.155	1.543	0.465
1986	0.392	4.342	4.564	1.788	2.227	1.214	0.464
1987	0.587	4.781	4.547	2.671	2.222	1.820	0.511
1988	0.741	4.332	3.863	2.861	1.977	2.294	0.463
1989	0.557	3.448	3.398	1.892	1.795	1.725	0.369
1990	0.604	3.351	3.234	1.954	1.727	1.872	0.358
1991	0.605	3.124	3.025	1.830	1.637	1.874	0.334
1992	0.671	2.931	2.759	1.850	1.518	2.077	0.313
1993	0.692	2.599	2.435	1.684	1.367	2.142	0.278
1994	0.390	2.283	2.490	0.972	1.393	1.209	0.244
1995	0.241	2.704	3.155	0.760	1.691	0.746	0.289
1996	0.336	3.635	3.975	1.336	2.020	1.041	0.389
1997	0.301	4.318	4.744	1.430	2.284	0.934	0.462
1998	0.230	5.173	5.792	1.335	2.577	0.714	0.553
1999	0.142	6.415	7.329	1.042	2.869	0.440	0.686
2000	0.208	8.242	8.843	1.839	3.007	0.644	0.881

Table B23. Results from a retrospective analysis of an ASPIC surplus production model (Run 3) for Georges Bank winter flounder.

Terminal Year	1995	1996	1997	1998	1999	2000
Total Objective Function	1.676	1.711	1.804	1.827	1.835	1.942
B coverage	1.058	1.015	0.883	0.935	0.962	0.917
B nearness	1.000	1.000	1.000	1.000	1.000	1.000
R ² in CPUE						
U.S. Autumn Survey	0.340	0.338	0.329	0.336	0.342	0.340
U.S. Spring Survey	0.203	0.221	0.258	0.241	0.247	0.208
B1 Ratio	0.590	0.573	0.569	0.565	0.553	0.582
r	0.847	0.790	0.613	0.684	0.729	0.646
F _{msy}	0.423	0.395	0.307	0.342	0.365	0.323
B _{msy} (mt)	7,206	7,697	9,886	8,870	8,343	9,355
MSY (mt)	3,050	3,041	3,031	3,032	3,041	3,020
B ₁₉₉₅ /B _{MSY}	0.333	0.316	0.272	0.286	0.288	0.289
F ₁₉₉₅ /F _{MSY}	0.600	0.646	0.802	0.742	0.726	0.746

Table B24. Virtual Population Analyses (VPA) sensitivity runs pertaining to Georges Bank winter flounder for estimated ages 2-6 during 1982-2000.

	Base Run	Run 2	Run 3	Run 4
Catch at Age	Observer data only in 1999	Observer data only in 1999	Observer data only in 1999	Observer data only in 1999
Survey Tuning Indices	US spring, ages 1-7 CA spring, ages 1-7 US autumn, ages 2-7, lagged	US spring, ages 1-7 CA spring, ages 4-7 US autumn, ages 3-6, lagged	US spring, ages 1-7 US autumn, ages 2-7, lagged	US spring, ages 1-7

Mean Square Residual	1.03197	0.66895	0.78429	0.56738
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CV (%)

N age 2	47	60	53	55
N age 3	43	45	44	49
N age 4	51	43	51	64
N age 5	36	31	36	46
N age 6	33	28	34	43

2000 F_{4-6}	0.35	0.32	0.29	0.36
1997 F_{4-6}	0.86	0.85	0.82	0.89

2000 Biomass (mt)	5,162	6,322	6,889	5,789
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Table B25. Stock size (numbers, thousands) and fishing mortality rates, during 1982-2001, of Georges Bank winter flounder estimated from a Virtual Population Analysis (Run 2).

Stock numbers (January 1, thousands)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Age																				
1	4,627	2,725	6,089	5,962	8,025	5,293	8,964	5,150	3,286	4,211	2,317	2,210	4,058	7,192	7,577	3,591	5,149	5,206	812	0
2	8,236	3,788	2,222	4,985	4,863	6,570	4,333	7,339	4,216	2,690	3,447	1,897	1,776	3,322	5,650	6,203	2,940	4,209	4,258	665
3	6,532	6,424	2,389	1,564	3,353	3,380	4,208	2,792	4,759	3,185	1,667	2,102	1,281	972	2,106	3,959	4,645	2,306	3,158	3,048
4	3,382	3,803	2,634	1,440	654	1,544	1,246	936	1,180	2,059	1,459	680	686	522	554	1,211	2,233	2,517	1,478	1,426
5	1,263	1,821	1,799	916	445	322	451	258	305	362	825	536	149	339	257	236	458	1,259	1,771	781
6	762	572	992	198	306	157	143	191	78	83	173	252	150	61	210	69	74	306	867	1,192
7	822	1,453	1,406	175	204	211	146	106	28	131	113	71	133	65	165	66	36	80	460	791
1+	25,624	20,586	17,530	15,240	17,849	17,478	19,493	16,772	13,853	12,721	10,002	7,749	8,233	12,474	16,519	15,335	15,535	15,883	12,804	7,904

Fishing Mortality

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Age																			
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.00	0.00	0.00	0.00	0.00
2	0.05	0.26	0.15	0.20	0.16	0.25	0.24	0.23	0.08	0.28	0.29	0.19	0.40	0.26	0.16	0.09	0.04	0.09	0.13
3	0.34	0.69	0.31	0.67	0.58	0.80	1.30	0.66	0.64	0.58	0.70	0.92	0.70	0.36	0.35	0.37	0.41	0.24	0.59
4	0.42	0.55	0.86	0.97	0.51	1.03	1.38	0.92	0.98	0.71	0.80	1.32	0.50	0.51	0.65	0.77	0.37	0.15	0.44
5	0.59	0.41	2.00	0.90	0.84	0.61	0.66	1.00	1.10	0.54	0.99	1.08	0.69	0.28	1.12	0.96	0.20	0.17	0.20
6	0.47	0.51	1.23	0.97	0.64	0.97	1.17	0.96	1.04	0.70	0.89	1.26	0.54	0.42	0.80	0.82	0.34	0.16	0.32
7	0.47	0.51	1.23	0.97	0.64	0.97	1.17	0.96	1.04	0.70	0.89	1.26	0.54	0.42	0.80	0.82	0.34	0.16	0.32
Average F (4-6)	0.49	0.49	1.36	0.95	0.66	0.87	1.07	0.96	1.04	0.65	0.89	1.22	0.58	0.40	0.86	0.85	0.31	0.16	0.32

Table B26. Mean biomass (mt) and spawning stock biomass (mt), during 1982-2000, of Georges Bank winter flounder estimated from a Virtual Population Analysis (Run 2).

Mean Biomass

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Age																			
1	839	446	1,104	906	1,455	959	1,625	934	596	763	420	496	736	1,808	1,374	651	933	1,250	147
2	2,056	847	547	1,667	1,623	2,047	1,227	2,150	1,677	896	1,058	603	503	1,051	1,964	1,955	676	1,822	1,531
3	2,250	1,917	876	543	1,423	1,176	1,110	865	1,644	1,070	544	679	462	444	993	1,610	1,591	1,003	1,015
4	1,967	1,788	953	662	364	771	477	466	530	953	686	266	437	247	337	543	840	1,692	610
5	908	1,227	541	584	285	245	348	162	170	252	438	286	110	269	157	142	258	1,136	1,498
6	682	406	471	160	246	113	103	150	60	79	126	172	141	59	191	62	65	398	921
7	969	1,395	948	178	218	215	140	109	33	152	102	71	154	82	182	77	27	124	599
1+	9,671	8,026	5,439	4,698	5,613	5,526	5,031	4,836	4,707	4,164	3,373	2,572	2,542	3,960	5,196	5,039	4,389	7,425	6,322

Spawning Stock Biomass

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Age																			
1	39	19	43	32	58	40	67	34	23	30	17	22	29	83	56	32	36	51	5
2	1,128	526	307	847	756	1,078	679	1,168	777	456	562	314	312	550	1,161	1,016	412	739	838
3	2,177	1,957	795	523	1,456	1,322	1,411	964	1,761	1,306	647	783	500	420	946	1,693	1,710	738	1,209
4	2,261	1,861	1,141	716	375	915	612	506	576	1,071	746	320	428	283	357	681	1,065	1,439	681
5	1,197	1,405	849	600	337	264	395	191	222	282	542	362	120	302	175	186	305	888	1,500
6	785	525	694	165	301	145	137	195	76	86	157	212	151	68	214	73	74	305	986
7	1,209	1,758	1,393	248	283	300	204	153	46	200	139	104	196	101	245	104	33	143	720
1+	8,795	8,050	5,223	3,131	3,565	4,064	3,504	3,211	3,481	3,431	2,810	2,118	1,735	1,807	3,154	3,786	3,635	4,302	5,940

Table B27. Summary of target and threshold biomass (kg/tow) and fishing mortality rate proxies for the current and proposed control rules, derived from ASPIC surplus production models, for Georges Bank winter flounder.

	Target Biomass Proxy (kg/tow)	Threshold Biomass Proxy (kg/tow)	Target Fishing Mortality Proxy	Threshold Fishing Mortality Proxy
Proposed	2.49	1.24	0.91	1.21
Current	2.73	1.37	0.84	1.13

Table B28. Annual relative exploitation rates (catch/autumn survey biomass index), during 1964-2000, for Georges Bank winter flounder.

Year	Landings (000s kg)	Autumn Survey (kg/tow)	Exploitation Index (catch/survey index)
1964	1.517	1.822	0.833
1965	1.687	2.050	0.823
1966	2.197	5.655	0.389
1967	2.349	2.074	1.133
1968	1.999	1.072	1.865
1969	2.518	2.385	1.056
1970	2.716	6.490	0.418
1971	4.183	1.259	3.322
1972	4.512	1.580	2.856
1973	2.976	1.195	2.490
1974	2.218	1.464	1.515
1975	2.937	2.061	1.425
1976	1.893	3.925	0.482
1977	3.594	3.992	0.900
1978	3.250	3.100	1.048
1979	3.064	3.829	0.800
1980	3.975	1.865	2.131
1981	4.012	2.434	1.648
1982	2.980	2.692	1.107
1983	3.908	2.363	1.654
1984	3.931	2.445	1.608
1985	2.163	1.119	1.933
1986	1.787	2.178	0.820
1987	2.669	0.889	3.002
1988	2.859	1.273	2.246
1989	1.891	1.051	1.799
1990	1.953	0.346	5.645
1991	1.828	0.136	13.441
1992	1.849	0.384	4.815
1993	1.683	0.663	2.538
1994	0.972	0.578	1.682
1995	0.760	1.337	0.568
1996	1.336	1.756	0.761
1997	1.430	1.534	0.932
1998	1.336	1.565	0.854
1999	1.042	2.641	0.395
2000	1.838	2.660	0.690