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GEORGES BANK SCALLOPS

Three strong year-classes, those of 1957, 1972 and 1982, have produced major peaks in landing in the last 30 years of the Georges Bank scallop fishery. In Division 5Zc, the 1972 year-class resulted in peak landings of about 11,000t in 1977 and 1978. Landings subsequently decreased almost steadily to 2000t in 1984, except for a brief increase in 1981 as a result of increased Canadian and U.S. fishing effort and a relaxation of the enforcement of the meat count regulation for the Canadian fleet. Catches have generally been increasing since, to reach almost 6,150t in 1992, very close to the 6200t TAC. The fishing pattern has changed over the years with more catches being taken during the first quarter in recent years.

The fishery has been under meat count regulations since 1973 and a revised Canadian regulation requiring a meat count of 39 meats/500 g was adopted in 1983. On January 1, 1986, it was reduced to 33 meats/500 g. Since 1986, the offshore scallop industry has operated under an Enterprise Allocation system for Georges Bank.

Commercial catch rates in kg per fishing day increased from 500 kg/day in 1972 to more than 1400 kg/day in 1977-78. They subsequently decreased gradually to their lowest value (340 kg/day) in 1984. Catch rates increased abruptly to about 1200 kg/day in 1986-87 before decreasing to 740 kg/day in 1988. They recovered gradually thereafter to 1350 kg/day in 1991 and decreased slightly to 1300 kg/day in 1992.

Research surveys have been conducted since 1978 to estimate biomass. The 1992 biomass estimate is the highest recorded since 1981. The survey also suggests that the 1988 and 1989 year-classes are strong, but preliminary indications are that the 1990 year-class is weak.

Biomass was also estimated using Sequential Population Analyses calibrated separately with commercial catch rates and with research surveys. The results using the two indices of abundance were comparable. They suggest that biomass has been increasing steadily over the past five years. This increase in biomass, which is due in part to the good to strong 1988 and 1989 year-classes, is responsible for this rising trend in fishery performance. However, the analyses show that fishing mortality is high on age 4-6 scallops and particularly on age 5 with the mortality on these three age groups combined estimated to have ranged between 0.62 and 0.75 in the last five years. The high exploitation rate on age 5 means that the year-classes of 1988 and 1989 will pass out of the fishery after 1994 and biomass will likely decrease because subsequent recruitment appears weak.

Various catch options for 1993 were considered.

No. 1	Options	F _{values} on age 5	Biomass (t)*	Catch (t)
1	F _{0.1}	0.70	17,058	5,200
2	F _{replacement yield}	0.86	16,044	6,100
3	F _{1992 TAC}	0.89	15,880	6,200
4	F _{1992 effort}	1.09	14,790	7,150
5	F _{max}	1.10	14,754	7,150

*First of January biomass

The option of setting the 1993 TAC at the 1992 level (6,200t) is one that would result in maintaining the biomass at the same level for the beginning of 1994. Thus, a lower harvest would allow a further increase in biomass during 1993, a higher harvest would cause a decrease. As noted above, the biomass will likely decrease after the end of 1993 as the biomass of the 1988 and 1989 year-classes declines, without a recruiting year-class sufficiently strong to balance the decline. Thus, the success of the 1994-95 fishery will depend largely upon the survivors of the 1988 and 1989 year-classes. This will be the case particularly in 1995 when the 1988 year-class will already have effectively passed through the fishery and the harvest will be dependent on the 1989 year-class and how hard it has been fished since it started recruiting to the fishery in late 1992.