

Stock Status Report
Strait of Belle Isle (NAFO Div. 4R)
Iceland Scallops

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April 1996

STOCK STATUS REPORT STRAIT OF BELLE ISLE (NAFO DIV. 4R) ICELAND SCALLOPS

Background

Iceland scallops are widely distributed within the subarctic. In Newfoundland, populations are normally found in waters from 55 m-200 m, usually on hard bottom with variable substrate composition consisting largely of sand, gravel, shell fragments, and stones. Being a filter feeder, the species is most abundant in areas with strong currents as in the Strait of Belle Isle in the northeastern Gulf of St. Lawrence. Other areas where Iceland scallops are found in commercial quantities include St. Pierre Bank (Div. 3Ps) and Grand Bank. Elsewhere, they are harvested in Greenland, Iceland, Norway and Russia.

Unlike many species of scallops, the Iceland scallop is dioecious (i.e. each animal is either male or female). They become sexually mature at three to six years of age. Spawning in Newfoundland begins around May-June and is thought to be triggered by short-term variations in temperature. The species is highly fecund producing millions of eggs which are externally fertilized. Larvae are planktonic for up to 10 weeks before settling out on substrates, including shell debris and filamentous materials. Settlement is gregarious resulting in densities sometimes approaching 100 animals per square meter.

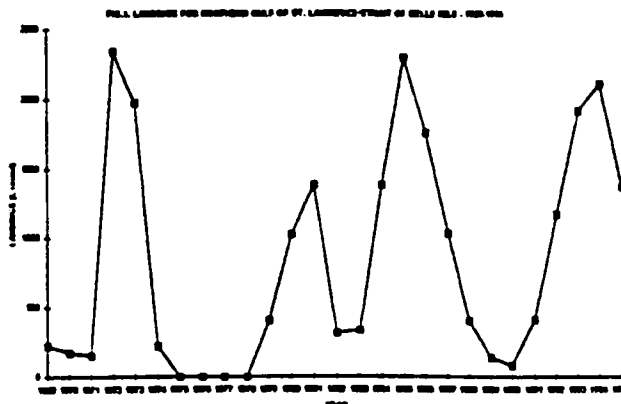
Growth rates and meat yield vary from one area to another. It takes approximately 7-8 years to reach commercial size of about 65 mm (or 2.5") in shell height. The animals frequently live in excess of 25 years, but seldom exceed sizes greater than 100 mm (or 4").

The directed fishery for Iceland scallops in Newfoundland began in the Strait of Belle Isle in 1969. Until recently, other than vessel size restrictions, the fishery remained largely unregulated. Quotas were first put in place in 1993 and have ranged between 1500 and 2000 t.

In addition to the Strait of Belle Isle, directed fisheries for the Iceland scallop commenced on St. Pierre Bank and the eastern Grand Banks of Newfoundland in 1989 and 1993 respectively. Each stock is now regulated by catch levels and by seasons.

The Fishery

From its inception the amount of effort in the day-fishery in the Strait of Belle Isle was based on price and availability of scallops relative to other species. Four strong peaks in landings are evident: 1972-73, 1980-81, 1984-86, and 1992 to present. In the past, each peak was followed by several consecutive years of poor catches. The sharp increase in landings in 1972 and 1973 was concomitant with a changeover to 2.5" rings from 3.0" rings in scallop rakes. The widespread use of the more efficient "Labrador rake" beginning in the mid-1980's also contributed to the higher landings thereafter as did record prices and exploitation of new grounds.



Beginning in 1991, the bulk of the fishery returned south of 51°25'N to beds once considered most prolific. Scallop aggregations here had apparently recovered following an extended fallow period.

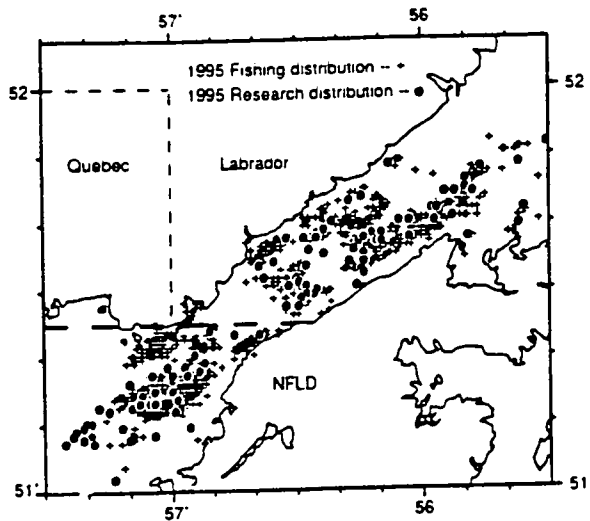
Nominal fishing effort increased dramatically between 1990 (11 vessels) and 1994 (80 vessels) but declined in 1995 (40 vessels). Overall catch rates in 1994 dropped by 30% from 1993. As well, within season catch rates in 1994 declined from 89 lb/tow to 74 lb/tow.

In 1995, all measures of CPUEs examined continued the downward trend detected in 1994. Overall, catch/tow in comparable zones declined to 57 lb/tow from 70 lb/tow in 1994, a drop of 19%. Also, contributions to total catch south of 51°25'N continued to decline in 1995 (from 90% in 1993 to only 46% in 1995). Catch rates in this area experienced a further decline of 32% in 1995 from the 30% reduction already noted between 1993 and 1994. Fishing effort has become increasingly dispersed. Removals from the exploratory area to the north of a line drawn from Cape Bauld to Chateau Point continue to be low. The pattern of decline shown by the CPUE data has been corroborated by a number of stakeholders directly involved in the fishery.

Research Surveys

Research surveys were conducted annually between 1973-76 and 1980-82 but became less frequent thereafter. A survey in 1995, the first in eight years, combined acoustics and dredge haul sampling. Approximately 70% of the survey area (599 out of 847 mi²) was found to be unsuitable for scallops. Catch rates were low throughout. The stock is presently composed of local concentrations of old individuals. Scarcity of juveniles throughout the area surveyed suggested that prospects for recruitment in the short-to-medium term are poor. Biomass is estimated at 10,000-14,000 t (\bar{x} = 12,000 round). A 10% exploitation rate is usually considered appropriate for this slow growing species. This would suggest a catch in 1996 in the range of 1000-1400 t.

Survey coverage (closed circles) relative to distribution of fishing effort in 1995.



Ecological Factors

Anecdotal reports suggest that starfish numbers (a major predator of scallops) have increased dramatically in the Strait of Belle Isle. The high proportion of cluckers to live scallops observed in 1995 supports this observation. There is also a high gear induced non-yield mortality in this fishery.

Nearly all (90%) of the scallops were shucked at sea and shells thrown overboard. The discarded shells constitute a preferred settlement material for scallop larvae. This fishery operates over nursery areas and recently settled seed are particularly vulnerable to intense fishing activity.

Outlook

The residual biomass is made up of old scallops. Recruitment appears to be low throughout. Consequently, there is little potential for growth in standing stock. Even at a 10% exploitation rate, declines in stock biomass and catch rates are inevitable. Rebuilding of the stock may be hampered by the fact that the fishery continues to operate over nursery grounds. This is compounded by the limited area available for expansion.

Monthly CPUE estimates for the Iceland scallop fishery in the northern Gulf of St. Lawrence 1994 and 1995. (1994 data re-examined to make area-specific comparisons).

Year	Month	Removals (t, round)	CPUE lb/tow
1994	May	1.4	43
	June	755.3	76
	July	927.1	73
	August	229.1	58
	September	191.4	59
	October	1.1	58
1994 totals		2105.4	70
1995	June	237.5	57
	July	462	57
	August	434.8	60
	September	201.6	53
	October	16.1	46
1995 totals		1352	57
% reduction 1994-95		36	19

For More Information

Research Document:
 Naidu, K.S., F.M. Cahill, and E.M. Seward.
 1996. Abundance of Iceland scallops in NAFO Div. 4R (Strait of Belle Isle) declines further in 1995. DFO Atl. Res. Doc. 96/xx.

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