DFO Atlantic Fisheries
Stock Status Report 96/26

Stock Status Report

Grand Banks of Newfoundland (NAFO Div. 3LN)

Iceland Scallops

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STOCK STATUS REPORT
GRAND BANKS OF NEWFOUNDLAND (NAFO DIV. 3LN) 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 April-May 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, but has now expanded into St. Pierre Bank (1989) and the Grand Banks (1993). Each area is now regulated by catch levels and by seasons. Currently TACs on the Grand Banks apply only to specific subareas within 3L and 3N.

The Fishery

The directed fishery for Iceland scallops on the Grand Banks of Newfoundland is quite recent. After several years of exploratory fishing and commercial trials, fishing activity began in earnest in 1993 with a total of 10 vessels participating. The majority of removals in the first year had come from NAFO Div. 3L, the remainder (3 t) being from 3N. A variety of gear types are used including the Labrador rake, the New Bedford rake and traditional Digby buckets. Catch rates are highly variable with meat count typically in the 40-80/lb range. Nominal catch has increased in each of the two years following. The high economic return resulted in a six-fold increase in 1994 in the number of vessels (to 57). Total number of active vessels declined in 1995 to 48.

Nominal catch (t, round) and effort of Iceland scallops from NAFO Div. 3LNO. All figures are based on the species-specific conversion factor of 9.2.

		NAFO Division			
Year	No. vessels	3L	3N	3O	3LNO
1992	1	17	2	-	19
1993	10	456	3	-	459
1994	57	91	4,478	2	4,571
1995	48	174	6,126	3	6,303
Totals		738	10,609	5	11,352

Of this 33 (or 75%) were in the 55-65 ft range. In just three years the accumulated catch from the Grand Banks of Newfoundland has surpassed 11,000 t round. Over half (56%) of this was taken in 1995. The majority (93%) of removals came from NAFO Div. 3N, particularly from the highly productive grounds near the Lilly Canyon and Carson Canyon. Scallop meats here tend to be larger (low meat counts) than elsewhere on the banks and consequently attracts most of the effort. The inordinately high effort into these areas specifically to obtain low count

catches has quickly resulted in an increase in the proportions in the catch of small meats to larger ones. Also, overall mean catch rates have decreased by 20% in 1995. Extreme caution should be exercised in harvesting this limited concentration along the canyons.

Catch rates (lb meats/tow) in 1994 and 1995:

Year	Range	Mean
1994	22-35	27
1995	17-43	21

Changes in percent composition of meat counts in scallop catches from 3N (Lilly Canyon/Carson Canyon), 1994-95.

Meat count (nos./lb.)	April 1994	October 1994	August 1995
1-9	0	0.1	0
10-19	2.4	1.5	0
20-29	34.8	29.2	0.4
30-39	40.2	36.6	5.5
40-49	17.5	22.0	21.5
50-59	4.0	8.0	25.2
60-69	0.9	2.2	23.3
70-79	0.3	0.3	12.7
80+	0.1	0.1	11.4
N	2,209	1,071	1,629

Subareas within 3L and 3N were placed under a TAC regime in 1995: 1000 t shellstock for 3L (northern area) and 3000 t shellstock for 3N (Lilly and Carson Canyons).

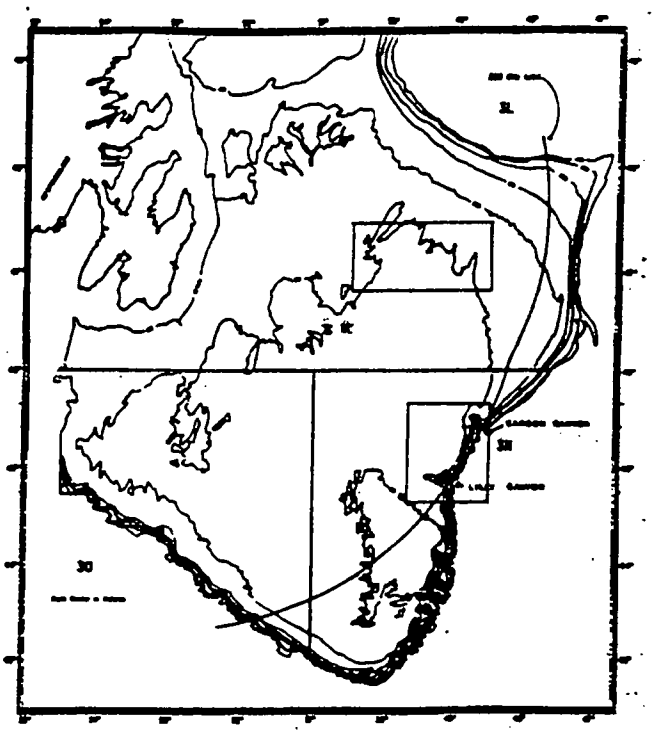

Fig. 1. Two areas (boxes), one each in NAFO Div. 3L and 3N under TACs in 1995.

Nominal catch from the Grand Banks in 1995, including the two areas each managed by TAC is estimated at 6,303 t round. Much of the interest remained around the Canyons which together produced nearly 50% of total removals. Once the TAC had been taken the fleet moved on to aggregations just outside of the "box" in 3N. Trending northeastwards, these aggregations appear to be contiguous to those around the Canyons.

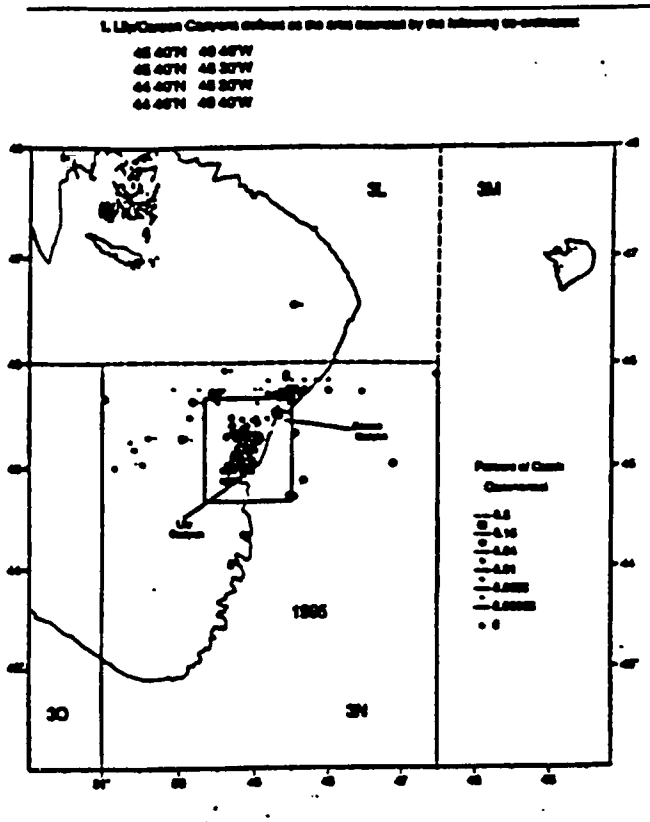

Fig. 2. Distribution of fishing effort in NAFO Div. 3LN in 1995.

In sum, this "new" non-TAC area produced almost as much as the Canyons (2,913 t versus 3,023 t round or 48% of total). Only sporadic effort (77 days total) was expended outside of these two areas resulting in a further removal of 188 t (or 3% of the nominal catch in 1995).

Research Surveys

While several exploratory surveys, both private and public, have been conducted over the Grand Banks, quantitative information on resource abundance is scant. The sporadicity of good catches has suggested the occurrence of massive beds to be unlikely. Scientific surveys were conducted in 1989 (3N) and 1994 (3LN). An acoustic seabed classification system using ROXANN was deployed in 1996 to identify areas in NAFO Div. 3N most likely to contain scallop aggregations. The survey was run between 45°40'N and 46°00'N. This will greatly assist us with a cost-effective survey in the near future, possibly as early as next year.

The most recent (1994) survey estimated scallop biomass around the Canyons (NAFO Div. 3N) at between 19,600 and 38,000 t (mean = 28,800 t) round. A 3,000 t TAC had been recommended (10% exploitation rate). Similarly, total biomass in an area surveyed in 3L pointed to a biomass between 4,000 and 15,000 t(mean = 9,500 t) round. Again, using a 10% exploitation rate a TAC of 1,000 t shellstock had been recommended for 3L.

In 1995, a resource survey was conducted into the aggregation extending northeastwards from the canyons, including portions of NAFO Div. 3LN that straddle the 200 mi Canadian Economic Zone.

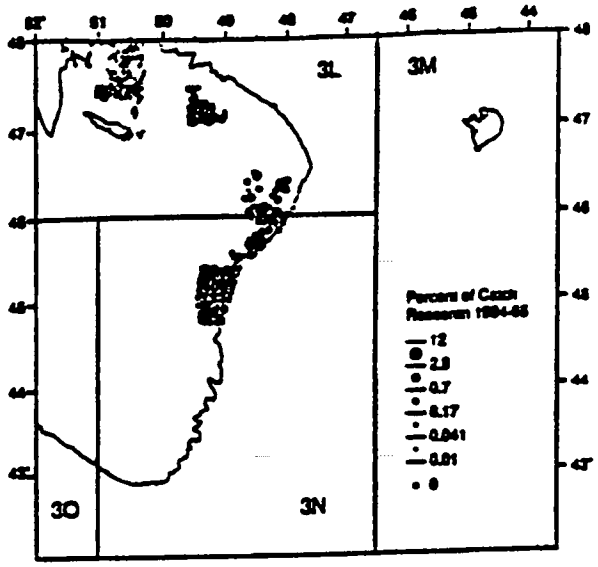

Fig. 3. Areas surveyed in 1989 (3N), 1994 (3L and 3N (canyons)), and 1995 (3LN, nose of the Grand Banks).

Using ROXANN approximately 2,144 n mi^2 of seabed was first classified to determine extent of benthic assemblages likely to contain scallops. About 1,152 out of 2,144 mi^2 (or 52%) were in 3L and the remaining 27 (or 48%) were in 3N. Scallops from 3N are slightly larger, provide higher yield than scallops from 3L (12.8% versus 11.3% respectively) and hence lower counts (40 versus 55/lb).

Two aggregations were identified where scallop densities are significantly higher than the area surrounding (97 and 158 lb versus 20 lb/one mile tow

with a 12 ft New Bedford rake). Patch estimates each covering approximately 50 and 138 n mi^2 were developed for the aggregations. Using a 20% gear efficiency as in previous years we estimate fishable biomass at 15,000-45,000 ($\bar{x}$ = 30,000 t) round. At 10% exploitation this would suggest a catch in 1996 of approximately 3,000 t round for the new area.

Outlook

We now have estimates of abundance for three aggregations of Iceland scallops on the Grand Banks of Newfoundland. It should be emphasized that the fishery is still taking the accumulated biomass from several years recruitment. This is reflected in the CPUE trends which appear to indicate that the fleet moves around to locate and fish 'hot' spots but move on once the catch drops below some threshold level. Based on the 1994 survey, it is proposed that the 1995 TAC of 3,000 t shellstock for the Canyons be continued into 1996. It should be noted, however, that as of May 18, 1996 some 2,400 t have already been taken under an interim quota management. This leaves a residual TAC of only 600 t for the Canyons.

In the absence of any significant removals from 3L, the TAC of 1,000 t round for this area can be continued. In addition to the above a further catch of 3,000 t round is proposed for the new area bounded by 45°30'N, 46°30'N and 47°30'W, 49°40'W.

There are other areas where scallop densities may be sufficiently high to warrant commercial activity. However, we have no information on the size and distribution of these aggregations.

For More Information

Research Document:
Naidu, K.S., F.M. Cahill, E.M. Seward, and P. J. Veitch. 1996. The burgeoning fishery for Iceland scallops on the Grand Banks of Newfoundland. DFO Atl. Res. Doc. 96/76.

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