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Catches of Northern Shrimp (*Pandalus borealis*) off West Greenland, 1999–2006.

by

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**Introduction**

Catch data from the fishery for northern shrimp on the West Greenland shelf since 1999 has been reviewed in order to clarify uncertainties and to resolve conflicts between different sources, and with a view to arriving at an agreed catch series for use in the current assessment.

**Material and Methods**

Catch reports were obtained from the following sources:

- the aggregated quota drawdowns recorded by the Greenland Fishery and Licence Control (GFLK) for fisheries in the Greenland EEZ. These are available weekly, with a running sum for the year, or retrospectively for a given period. There were available week-52 reports for 2002 through 2005, and yearly totals were obtained in July 2007 for 1999 through 2006.
- STATLANT 21A reports for both SA1 and for SA0, fetched in July 2007. NAFO Subarea 1 is the Greenland EEZ on the West Greenland shelf, but Subarea 0 includes parts of the Canadian EEZ that are further west, off the West Greenland shelf, where shrimp may or may not be fished, and if they were would be from another stock.
- Greenland logbooks existing as extensive files in the Greenland Institute of Natural Resources, as well as on the database of the Greenland Fishery and Licence Control.
- The Commercial Quota Reports posted on the website of the Canadian Department of Fisheries and Oceans (DFO) by the Department's statistical section. These statistics do report that part of SA 0 on the West Greenland shelf, defined by Canada as Shrimp Fishing Area 1 (SFA1) separately from other parts of the Subarea.
- Catch data for SFA1 obtained from observer logbook records provided by DFO. For years up to 2005 I used the last version of the data received in Oct. 2006, and for 2006 the update received in Sept. 2007.
- Catch series used in the assessment approved by STACFIS at the NAFO shrimp meeting in 2004 (SCR Docs 04/75 and 4/76).

Not looked at in this review was STATLANT 21A data fetched in summer 2006 for use in the 2006 assessment.

## Discussion and Results

Catch reporting in the West Greenland fishery has suffered recent upheavals. Up to 2003, logbook records under-reported catches, owing to a prevalent system of overpacking under which packed weight exceeded nominal weight; the nominal weight however being that recorded in the logbook and on sales slips. From 2004 logbook records have been required to be the live weight of the catch and overpacking has been forbidden, and in 2003 a series of annual correction factors was presented to the NAFO Scientific Council (SCR Doc. 03/74). For shrimp produced<sup>1</sup> on board by the sea-going fleet the logbook entry for the 'live weight' is arrived at in practice by adding a correction factor to the packed weight. Discards are separately recorded in the logbooks.

Up to 2004, quota drawdowns relied on sales slips and therefore suffered from the same under-reporting problems as the logbooks. Since the change in the regulations in 2004, quota drawdown for shrimps produced at sea by the sea-going fleet have been based on logbook records of live weight, including discards. However, quota drawdowns for shrimp landed for processing at shore stations in Greenland—i.e. nearly 100% of the catch of the coastal fleet and a required 25% of the catch of the sea-going fleet, totalling 50–60% of the Greenland catch—have continued to be based on sold weights, which are less than both live-caught and landed weights by an allowance for crushed, broken, or otherwise unusable shrimps. A recent proposal to amend the law so that all quota drawdowns and tactical fishery management would be based on live weights was withdrawn after the industry protested at the expected resulting reduction in allowed catches. Therefore, although the quota drawdown records might be accurate, as they are scrutinised both by regulators and industry, they continue to be partly one thing, partly another, and are not a suitable source of catch data for assessment modelling. However, owing to a misapprehension, they were used as the source of catch data for the assessment in 2006.

STATLANT data is derived from reports made by national agencies responsible for fisheries statistics. It appears often to be late—owing to the time it takes to work through the various systems—and sometimes wildly at variance with other sources. For Greenland (SA1), the STATLANT data for 2005 and 2006 appears to be in arrears, and for Canadian OA data the reports for 2000 and 2003 are at variance with other sources. Being a large-scale international system, it is not apt to provide fine-scale information.

The Canadian Quota Report pages give the appearance of being conscientiously maintained and provide detailed information on catches for shrimp fishery management areas that are smaller than NAFO Divisions, by quota. They also tabulate TACs and quotas, now both as originally allowed and subsequently adjusted<sup>2</sup>. Monthly or seasonal data on catches is not available from this source.

The Canadian fishery in SFA1 is reported as having 100% observer coverage, and observers' logbooks provide another source of data on catch and bycatch.

The collected data for the years 1999–2007 has been tabulated. For Greenland data in 1999 and 2001, the catches used in SCR 04/75 and 04/76 were close to the STATLANT 21 catch data if the overpacking correction from SCR 03/74 was applied. For 2000, the catch used in SCR 04/75 was between the corrected STATLANT 21 catch and the corrected logbook catches, but closer to STATLANT. For 2002–2003, the catches in SCR 04/75 were closest to the corrected logbooks. Therefore, catches in SA1 used in the 2007 assessment are: up to 1998, catch series from SCR 04/75; for 1999 to 2001, STATLANT 21 as fetched in July 2007, with overpacking correction from SCR 03/74; for 2002–2003, logbook data with overpacking correction; for later years, logbook data uncorrected.

For all years, I have preferred the DFO Quota Reports as the source for catches in Canadian SFA1; given the large discrepancies for 2000 and 2003 between the Quota Reports and STATLANT 21 data it seems unwise to rely on the latter. And although the summed observer logbook records from Canada for SFA1 disagree in all years with the Quota Reports, the differences remain generally below 15% (although for 2006 they differ by much more than this), and it looks as though these two sources do constitute some kind of attempt to report the same thing. This is not always true for the Canadian STATLANT data, which at times appears to be reporting something completely different.

The resulting catch series used in the 2007 assessment is that given in the twelfth line of the Table. Catches in 2003–2005 are made 8–12% larger those used in 2006, owing to the abandonment of the GFLK quota drawdowns as the source of catch information and their replacement by logbook records. The catch for 2002 is made 0.08% less than that used in 2006.

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<sup>1</sup> i.e. prepared and packed as a consumer product.

<sup>2</sup> e.g. for overruns on quotas in (a) previous year(s). Adjustments tend to be less than 5 tons.

## Conclusion

Up to 1998, the catch series used in the 2007 assessment is that used in 2004. From 1999, catches used are as given in the twelfth line of the Table. For 1999–2001 these are Greenland STATLANT 21A, corrected for under-reporting, added to Canadian Quota Reports for SFA1. For 2001–2003, they are Greenland logbooks, corrected for under-reporting, added to Canadian Quota Reports for SFA1. After 2003, they are Greenland logbooks uncorrected, added to Canadian Quota Reports for SFA1. Catches for 2003–2005 are 8–12% larger those used in 2006, owing to the abandonment of the GFLK quota drawdowns as the source of catch information and their replacement by logbook records. Since the catches that might be sustained in future are reckoned from the catches that have been sustained in the past, this change may entrain further increases in those estimates.

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Table: Annual catch and TAC data (mt) for the fishery for Northern Shrimp on the West Greenland shelf.

Source (date fetched)	1999	2000	2001	2002	2003	2004	2005	2006	2007
GFLK <sup>†</sup> year (07-07-05) (SA 1)	69 937	74 177	77 343	100 903	94 961	119 942	129 647	127 484	
GFLK <sup>†</sup> week 52				95 046	92 864	121 429	131 630	—	
Overpacking correction (%) (SCR 03/74)	21.843	21.812	21.816	22.227	21.862	0	0	0	0
STATLANT <sup>#</sup> (SA1) (07-07-05)	73 990	79 120	81 517	103 645	78 433	134 052	3699	3629	
STATLANT <sup>#</sup> (SA1) (corrected)	90 152	96 378	99 301	126 682	95 580	134 052	3699	3629	
Logbooks, SA 1 (07-08-17) <sup>‡</sup>	70 098	76 349	81 060	105 480	100 963	135 212	147 695	150 536	75 194
Logbooks, corrected	85 409	93 002	98 744	128 925	123 036	135 212	147 695	150 536	75 194
SCR 04/75, SA 1 (corrected)	90 145 <sub>s</sub>	95 424	99 156 <sub>s</sub>	128 906 <sub>l</sub>	123 845 <sub>l</sub>	—	—	—	
STATLANT <sup>#</sup> (0A) (07-07-05)	2093	659	2958	6053	2170	6861	6410	0	
DFO Commercial statistics SFA1 <sup>§</sup> (07-09-11)	2046	1590	3625	6247	7137	7021	6921	4127	0
DFO, Observer logbooks <sup>¶</sup>	2100	1671	3566	6504	6608	7209	6088	2909	
Total Catch for 2007 Assessment	92 198 <sub>s</sub>	97 968 <sub>s</sub>	102 926 <sub>s</sub>	135 172 <sub>l</sub>	130 173 <sub>l</sub>	142 233 <sub>l</sub>	154 616 <sub>l</sub>	154 663 <sub>l</sub>	
Total Catch for 2006 Assessment	92 200	98 000	102 900	136 300	120 300	128 500	138 600		
TACs									
Greenland SA1 offshore	39 294	40 109	53 609	54 600	57 000	75 452	74 100	74 100	74 100
Greenland SA1 inshore	34 206	37 566	39 341	36 550	43 000	55 900	55 900	55 900	55 900
SA1 EU	None	None	None	None	1000	4000	4000	4000	4000
Total Greenland SA1	73 500	77 675	92 950	91 150	101 000	135 352	134 000	134 000	134 000
Canada SFA1	9350	9350	9350	12 040	14 167	14 167	18 453*	18 380*	18 417
Advised by SC		65 000	85 000	85 000	100 000	130 000	130 000	130 000	130 000

<sup>†</sup> quota drawdowns recorded in the GFLK data base; year's total fetched in July 2007 as well as contemporary report from week 52 of the year. <sup>#</sup> sum of species 632 (Northern Prawn) and species 639 (Pink Shrimps NS). <sup>‡</sup> since 2004 legally required to be 'live weight' and includes discards; the data fetched in July 2007 was for the period since Jan. 2006 and was used to update existing files held by Grønlands Naturinstitut. <sup>§</sup> Canadian Shrimp Fishing Area 1 is NAFO SubArea 0 east of longitude 60°30' W; \* adjusted; ref. J. Conlin, e-mails, 07-07-04. <sup>¶</sup> provided for 1999–2005 through David Orr in St John's, for 2006 through Tim Siferd in Winnipeg.