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July 1980

SIDESTRIPE SHRIMP EXPLORATION,  
QUEEN CHARLOTTE ISLANDS, B.C.

MARCH 1980

by

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# ABSTRACT

Carmichael, J. R., and J. A. Boutillier. 1980. Sideshripe shrimp exploration, Queen Charlotte Islands, B.C., March 1980. Can. MS Rep. Fish. Aquat. Sci. No. 1582: 33 p.

This is the second exploratory survey for sideshripe shrimp, Pandalopsis dispar, undertaken as a joint Federal-Provincial project. The main area of exploration was the southern Queen Charlotte Islands with some expanded surveys in areas which in past surveys showed potential. The two resurveyed areas, Smith Sound and Grenville Channel showed increases in fishable areas and production estimates of 11 t and 10 t, respectively. The only area in the Queen Charlotte Islands with reasonable shrimp catches was Sedgewick Bay, in Juan Perez Sound. The annual production estimate for Sedgewick Bay was 5 t/yr.

Key words: Pandalopsis dispar, biomass, sideshripe shrimp, area swept trawl survey.

# RÉSUMÉ

Carmichael, J. R., and J. A. Boutillier. 1980. Sideshripe shrimp exploration, Queen Charlotte Islands, B.C., March 1980. Can. MS Rep. Fish. Aquat. Sci. No. 1582: 33 p.

Il s'agit de la deuxième campagne de pêche exploratoire de la crevette à flanc rayé, Pandalopsis dispar, entreprise conjointement par les gouvernements fédéral et provincial. La prospection a surtout porté sur le sud des îles Reine-Charlotte avec quelques incursions dans des zones qui semblaient prometteuses lors de campagnes antérieures. Dans deux zones prospectées de nouveau, à savoir le détroit de Smith et le chenal Grenville, on a relevé une augmentation de la superficie exploitable et une production estimative de 11 et 10 t respectivement. La baie Sedgewick, dans le détroit de Juan Perez, était le seul endroit des îles Reine-Charlotte où les prises étaient raisonnables avec une production estimative de 5 t l'an.

Mots-clés: Pandalopsis dispar, biomasse, crevette à flanc rayé, zone de chalutage.

## INTRODUCTION

This was the second exploratory trawl survey undertaken in the central and northern inlets and adjacent waters to find commercial stocks of sidestripe shrimp, Pandalopsis dispar. The funding for the project was provided by the British Columbia Marine Resources Branch, Ministry of the Environment, while the supervision, scientific and technical advice, and responsibility for publication was provided through the Shellfish Program of the Pacific Biological Station, Department of Fisheries and Oceans.

## VESSEL AND GEAR

The charter was carried out aboard the fishing vessel M/V NOPSA from February 25 to March 17, 1980. This vessel is a 54-ft fiberglass stern trawler, owned and operated by Mr. J. Horn.

The survey was conducted using a semi-balloon shrimp trawl (70-ft headrope and 57-ft footrope) towed with 4 1/2 x 7 ft metal "Vee" doors. The net was described in greater detail in earlier reports<sup>1</sup>.

## SURVEY AREA AND METHODS

This survey was conducted in Smith Sound, Grenville Channel, and the inlets and adjacent waters of the southern Queen Charlotte Islands. The objective of this charter was to carry out a preliminary exploratory survey of the Queen Charlotte Islands, and to re-evaluate and expand coverage in the previously explored areas of Smith Sound and Grenville Channel.

In order to do this efficiently, a review of the available data was conducted to set criteria for exploration. The criteria established was to concentrate our effort in finding areas with towable mud bottom in the depth range of 40 to 120 fathoms. The areas of exploration were sounded extensively and when an area of suitable bottom was found tows were made. Usable tows lasted from 15 to 30 minutes and ranged in distance from .4 to 1.3 nautical miles.

The total catch from each tow was sorted, weighed, and recorded by species. In addition, the number per kilogram was determined for the sidestripe shrimp, and a random sample of sidestripes was retained and frozen. These samples were subsequently sexed and measured to obtain growth and age data.

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<sup>1</sup>Pacific Biological Station Circular Nos. 76 and 85.

A total of 20 tows was completed during the 22-day charter. These tows are summarized in Appendix Table 1 according to area name, area code letters, set number, and figure number. A detailed record of each tow is shown in the computer print-out in Appendix Table 2 and the position of each tow is illustrated using map tracings of Canadian Hydrographic Service charts.

The small number of tows for the survey was disappointing but unavoidable because suitable bottom for towing could not be found in most of the areas marked for exploration. Sideshapes were found in various concentrations in 16 out of the 20 tows made. Only three areas showed any potential for a sideshape fishery. Of these areas, two were the areas of reassessment, Grenville Channel and Smith Sound, while the third was a new area, Sedgwick Bay in Juan Perez Sound.

Preliminary yield estimates were calculated for Grenville Channel, Smith Sound, and Juan Perez Sound. These estimates were arrived at by a standard area swept calculation which incorporates the horizontal opening of the trawl (30 ft), the mean catch per nautical mile towed, a catch coefficient(1), the total area of shrimp concentration, and an estimated rate of exploitation.

Caution must be used when interpreting the yield estimations for this survey because the biomass is based on a limited number of tows which necessitates approximations when delimiting the areas of concentrations, and estimations for rates of exploitation are based on growth rather than mortality parameters.

The Grenville Channel survey emphasized extension of the grounds located last year<sup>2</sup>. The area of survey was concentrated between Baker Inlet and Klewnuggit Inlet. From the soundings in this area only a small southward extension of grounds was found. It was estimated that this extension would increase the yield from the Grenville area by approximately 3 t to a total of 10 t per year.

Smith Sound was found to have towable bottom and good catches of sideshapes in Alexandra Passage, Browning Channel, and Ahclakerho Inlet, while Blackney Channel, Smith Inlet, and Boswell Inlets were found to be unsuitable for trawling. The yield from the Smith Sound region is estimated to be approximately 11 t per year.

Sedgwick Bay in Juan Perez Sound proved out to be the only newly explored area that has any potential for a commercial fishery with an estimated annual yield of 5 t. Outside of Sedgwick Bay in Juan Perez Sound the bottom proved to be less amenable to towing.

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<sup>2</sup>"Sideshape Shrimp Exploration, British Columbia Central and North Coasts, October and November 1978", Fisheries and Marine service MS Rep. 1520.



The rest of the areas in the Queen Charlotte Islands proved to be unsuitable because of lack of towable bottom, no shrimp, or depth too great for the vessel to fish.

Selwyn Inlet was found to be dotted with reefs and anags which restricted fishing to short tows. The catch rate for the usable tows in the area was between 6 and 9 kg/hr.

Cumshewa Inlet was similar to Selwyn Inlet in that it was found to have a flat mud bottom strewn with isolated rock piles. For the tows that were successfully completed the catch rate varied between a trace and 12 kg/hr.

Dana Inlet was found to have good towable bottom but no shrimp. No towable bottom was located in any of the following locations: Laskeek Bay, Logan Inlet, Richardson Inlet, Atli Inlet, east of Kunghit Island, Louscoone Inlet, and between Anthony Island and West Kunghit Island.

Tasu Sound, Newcombe Inlet, and Fairfax Inlet could not be fished because the mud bottom there was dotted with reefs. Botany Inlet in Tasu Sound was fishable but there were no sidestripes present in the catch.

In Engelfield Bay, the south side was flat but too deep for fishing with the NOPSA, the east end of Hibben Island was fishable but the catch was low, and the north side was rocky and untowable. Security Inlet and Cartwright Sound were found to be unsuitable for trawling.

The results of the survey in the Queen Charlotte Islands were disappointing. It should be pointed out however that some of the area that was noted as unfishable with an otter trawl may be workable with a faster setting, more manoeuvrable beam trawl. In general the area would be best worked with small vessels, which land and market their product locally. The potential for any larger scale fishery was not indicated from this exploratory survey.

#### ACKNOWLEDGMENTS

Thanks are extended to Captain John Horn and his crew for their cooperation and patience, Messrs. T. G. Halsey, and J. Fralik who provided the provincial resources for the project, and Ms. Pat Morberg, and Ms. Carol Roy who aided in administering the provincial funds. The drafting was done by Karina Pasmans. Mr. T. H. Butler provided expert advice in the planning of the project and reviewed the manuscript.





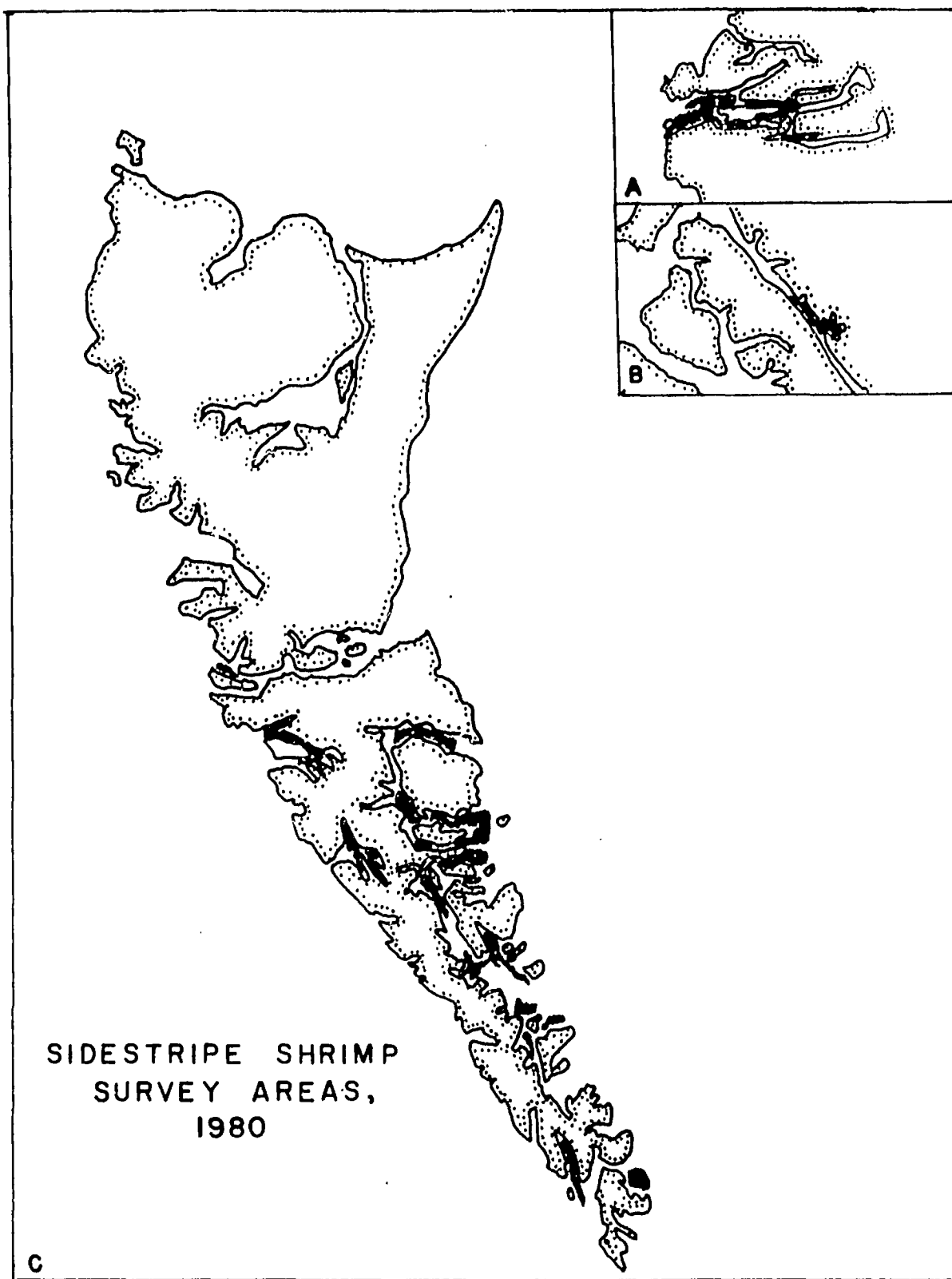


Fig. 1. Area surveyed in 1980 sidestripe shrimp exploration: A. Smith Inlet, B. Grenville Channel, C. Queen Charlotte Islands.



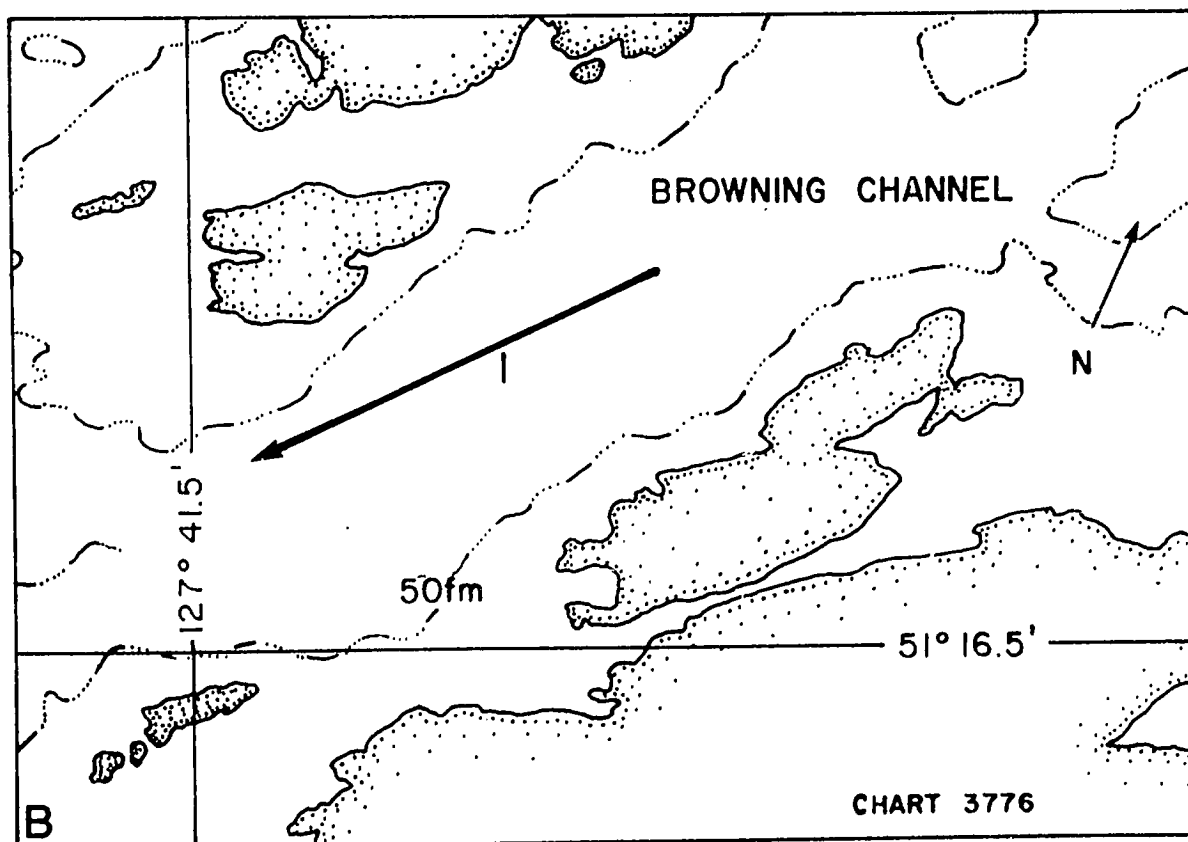
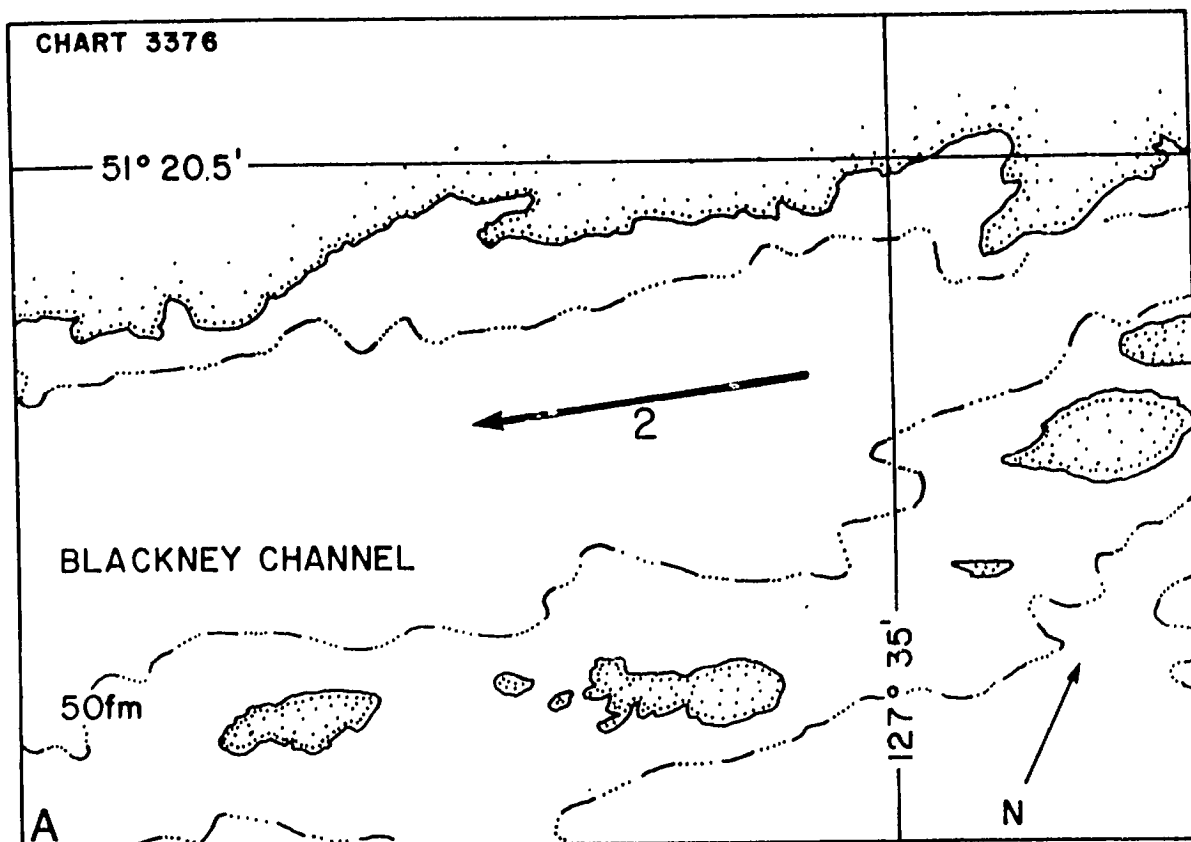


Fig. 2A, B. Tow locations in Smith Sound.



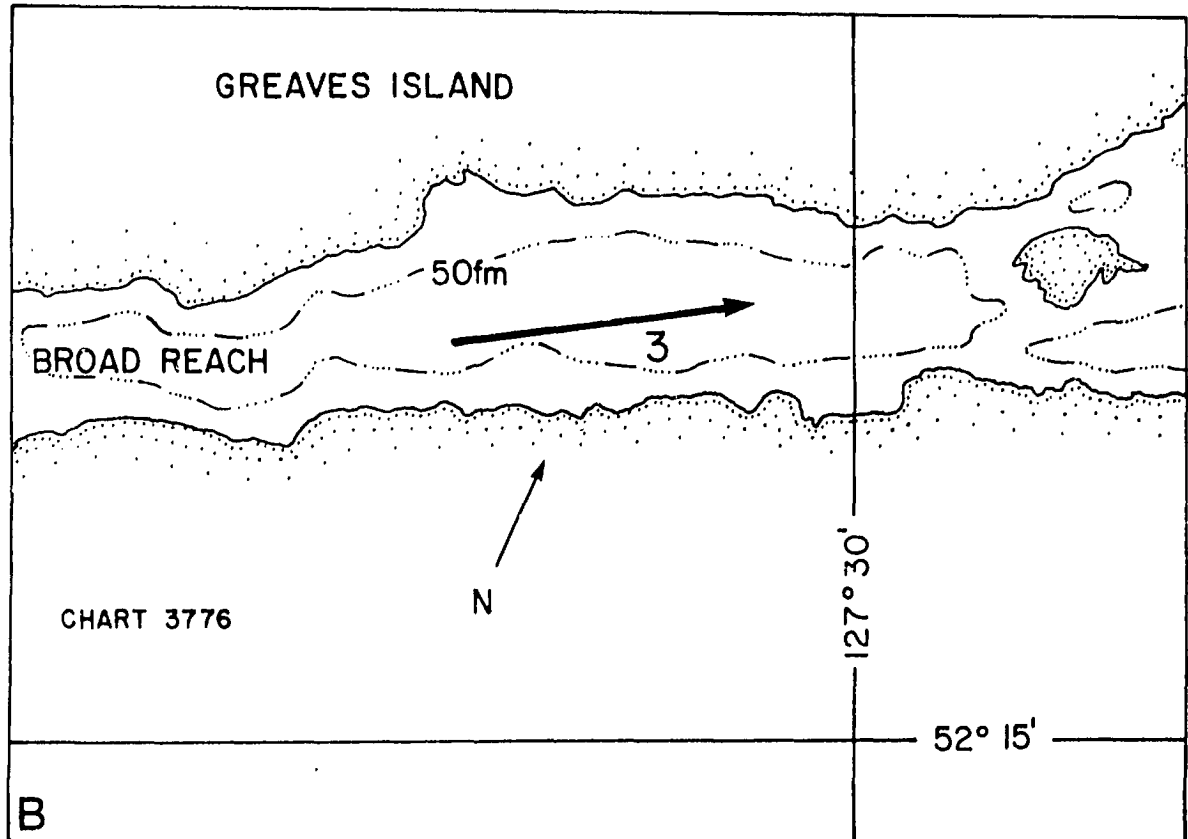
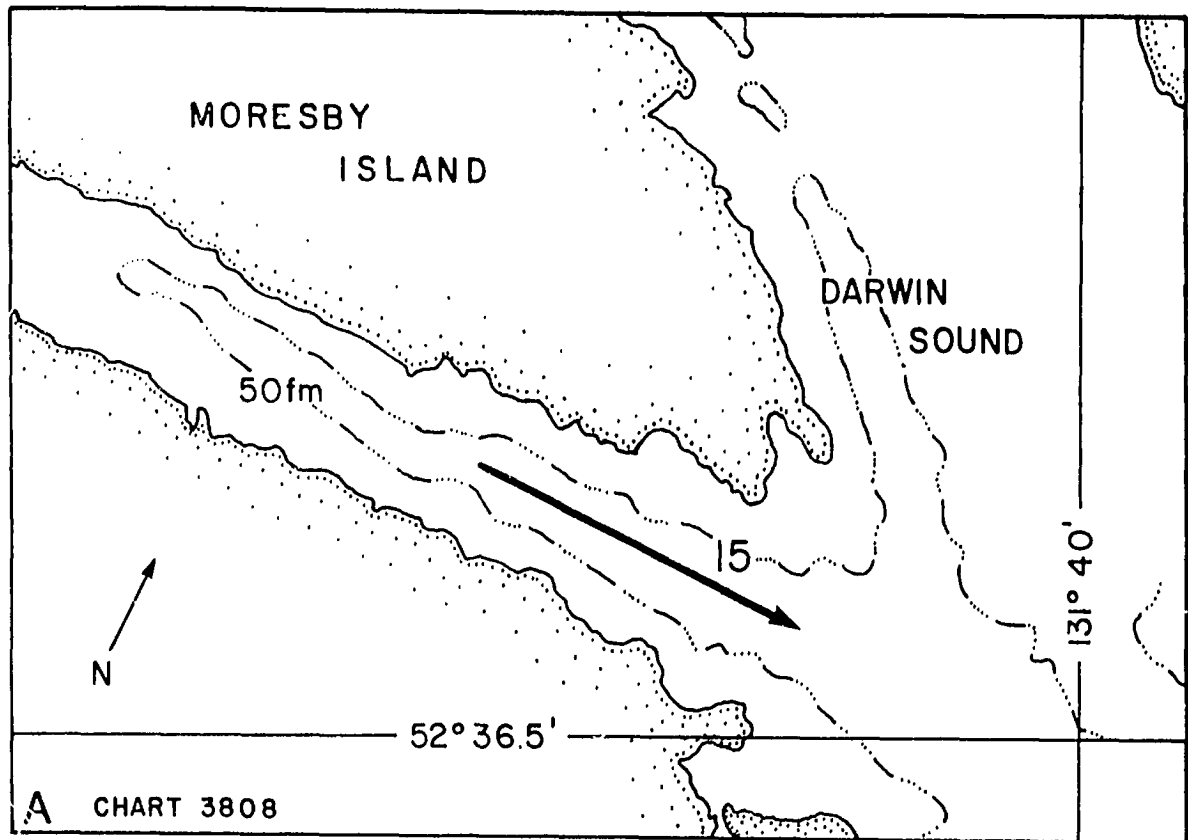


Fig. 3A. Tow locations in Bigsby Inlet.  
Fig. 3B. Tow locations in Smith Inlet.



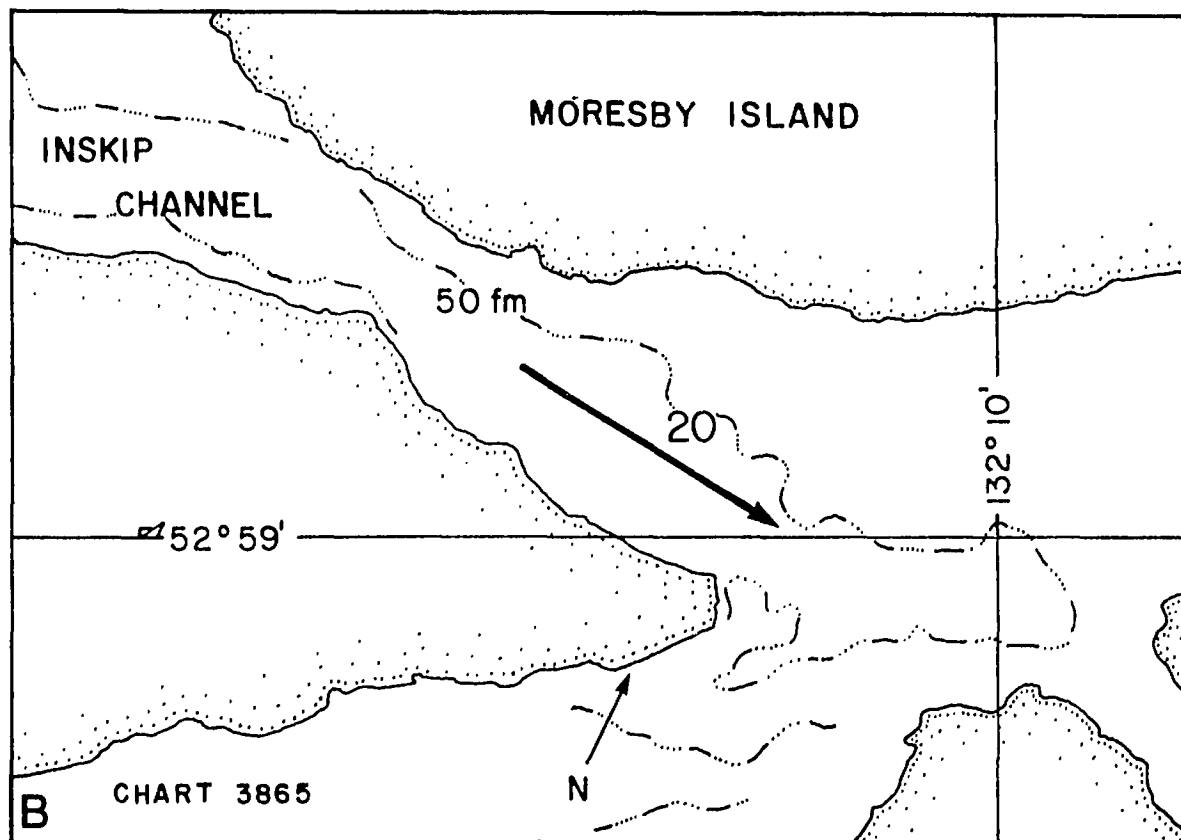
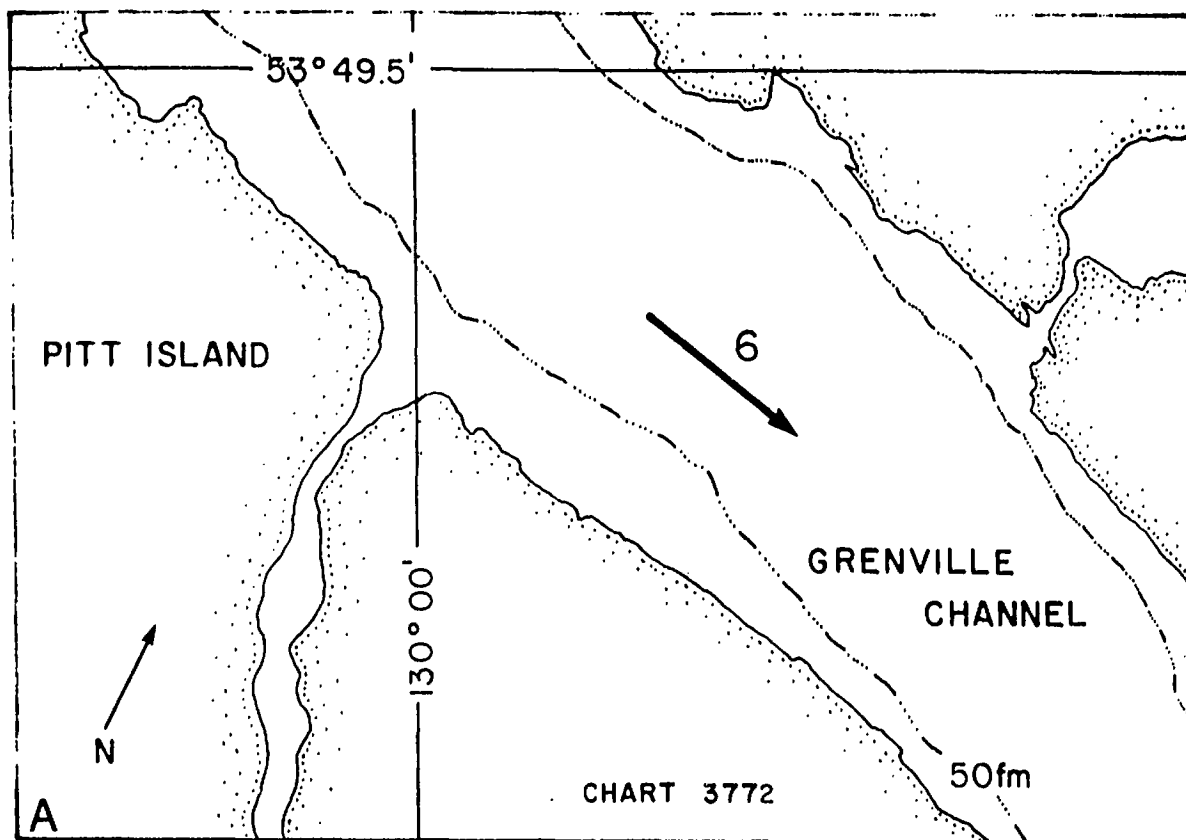


Fig. 4A. Tow locations in Grenville Channel.  
Fig. 4B. Tow locations in Englefield Bay.





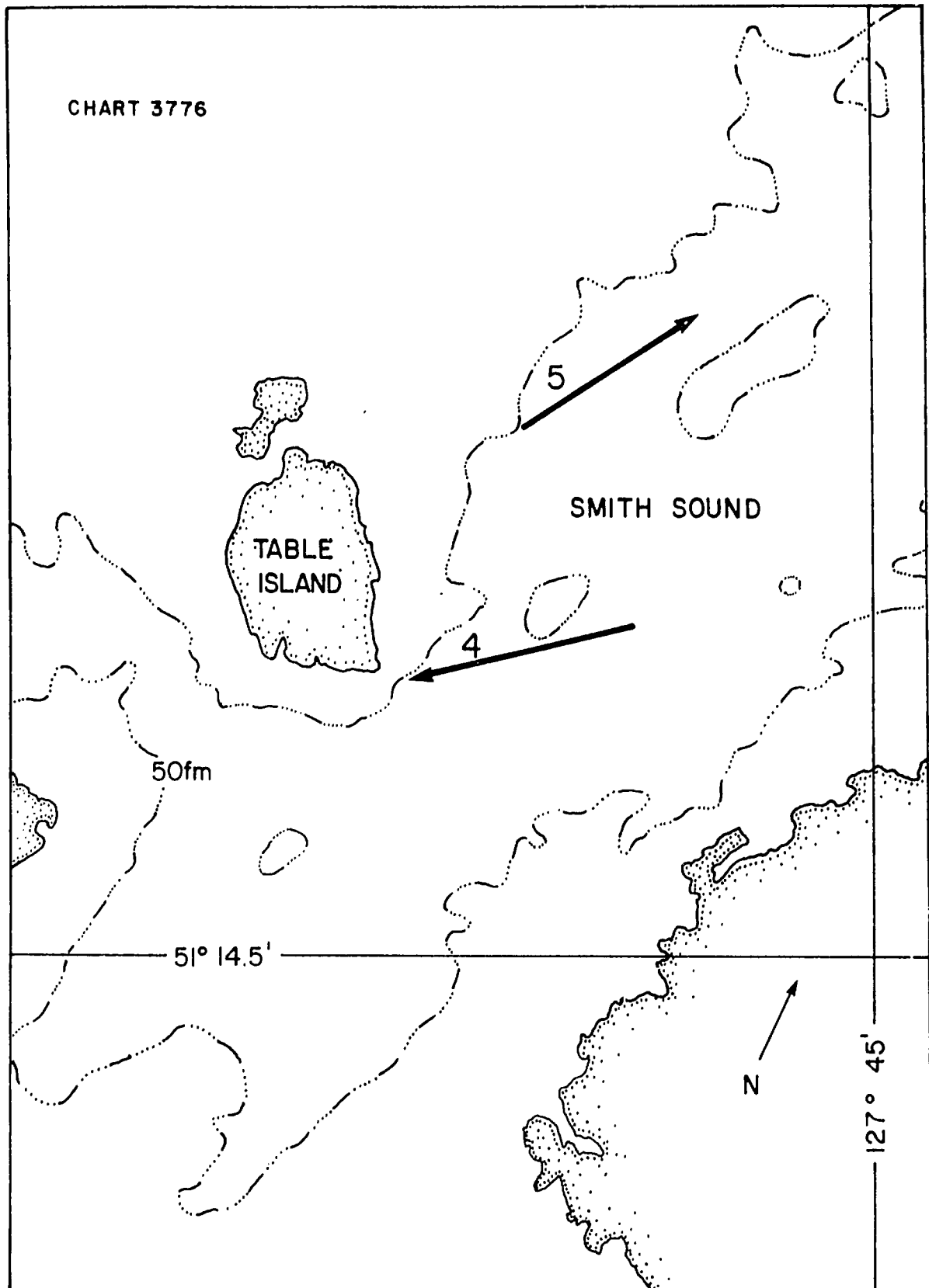


Fig. 5. Tow locations in Smith Sound.



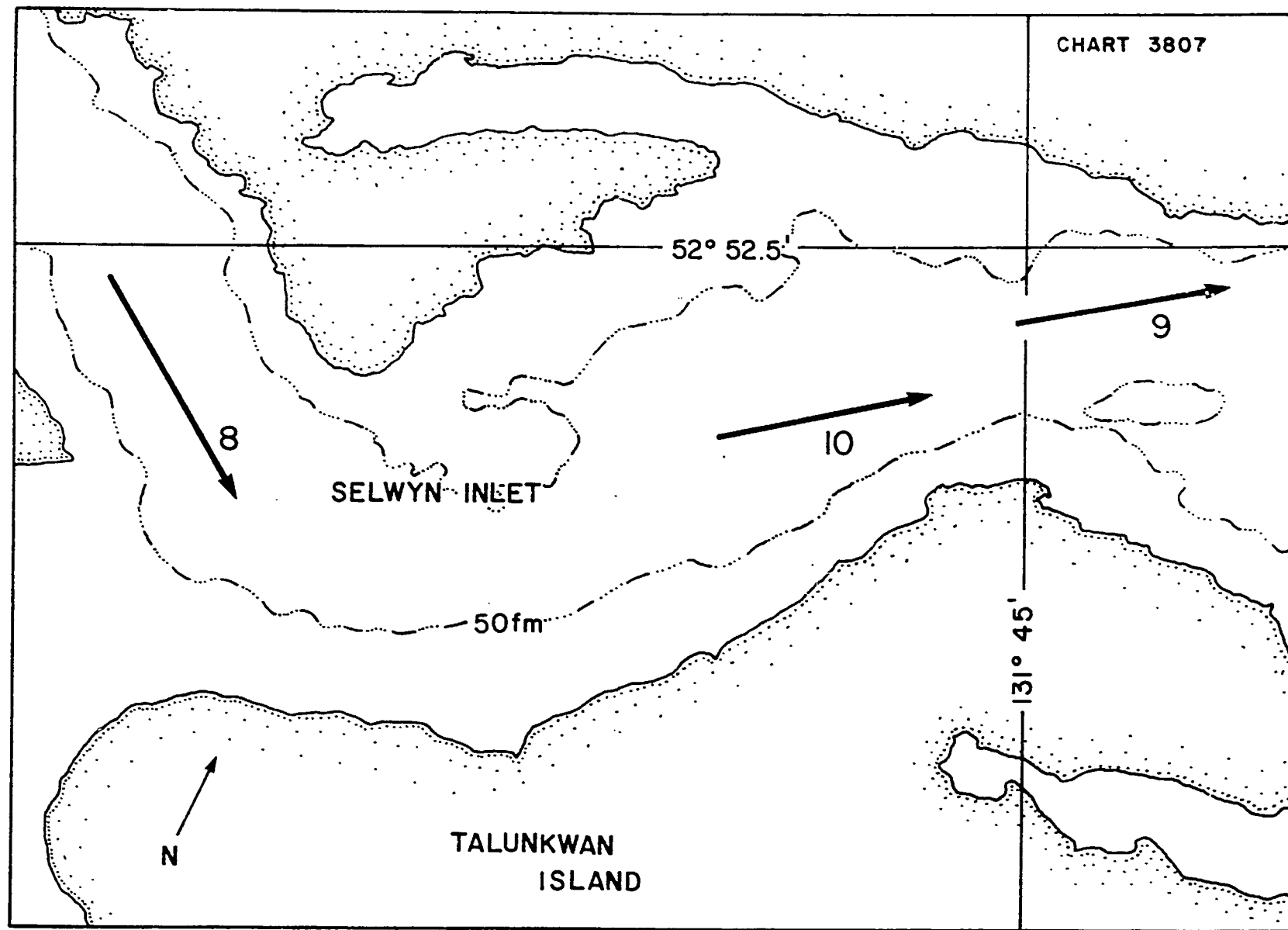


Fig. 6. Tow locations in Selwyn Inlet.

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21  
22



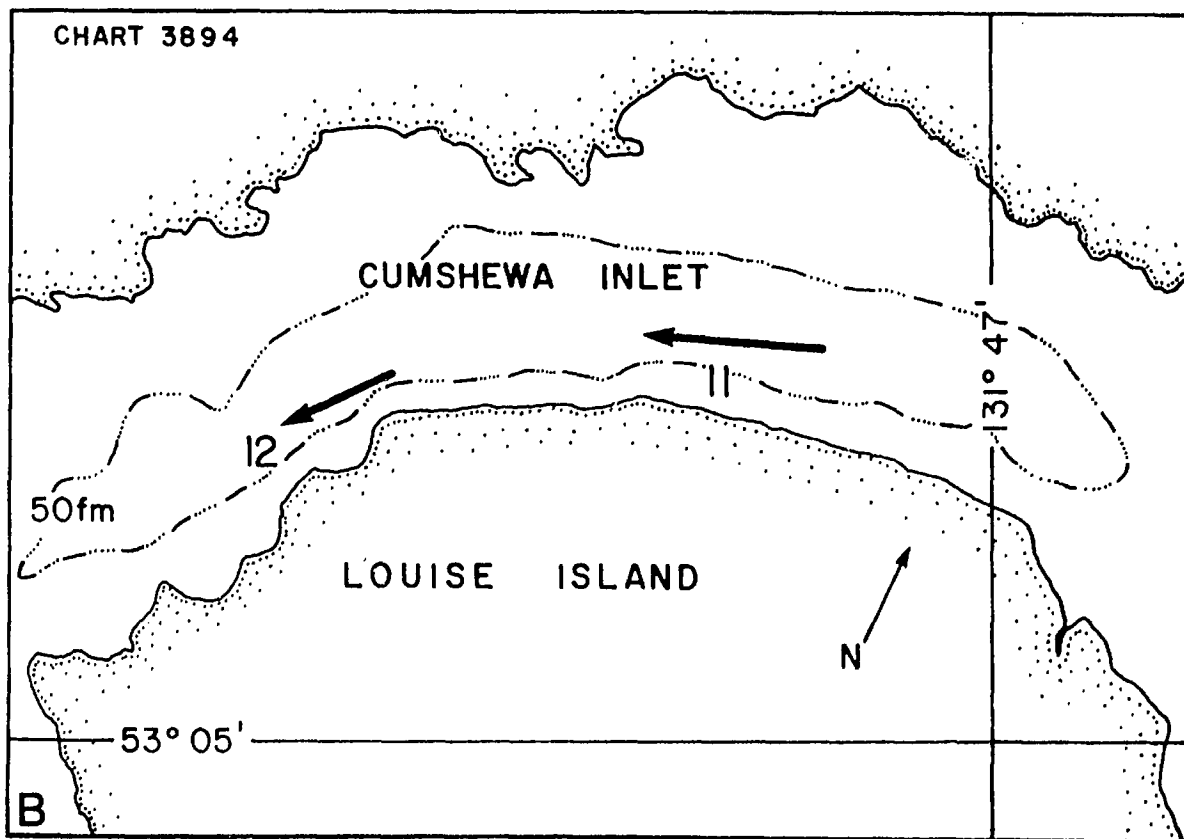
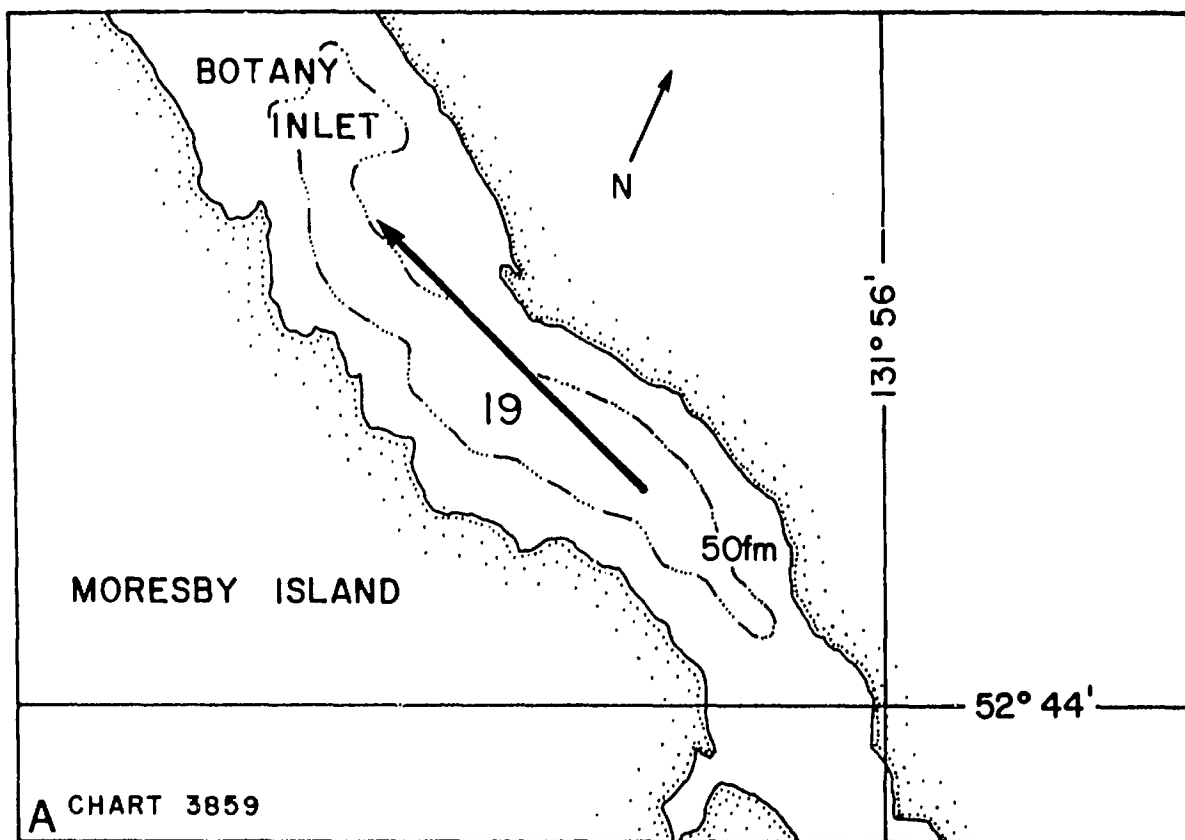


Fig. 7A. Tow locations in Tasu Sound.  
Fig. 7B. Tow locations in Cumshewa Inlet.

2  
2  
2



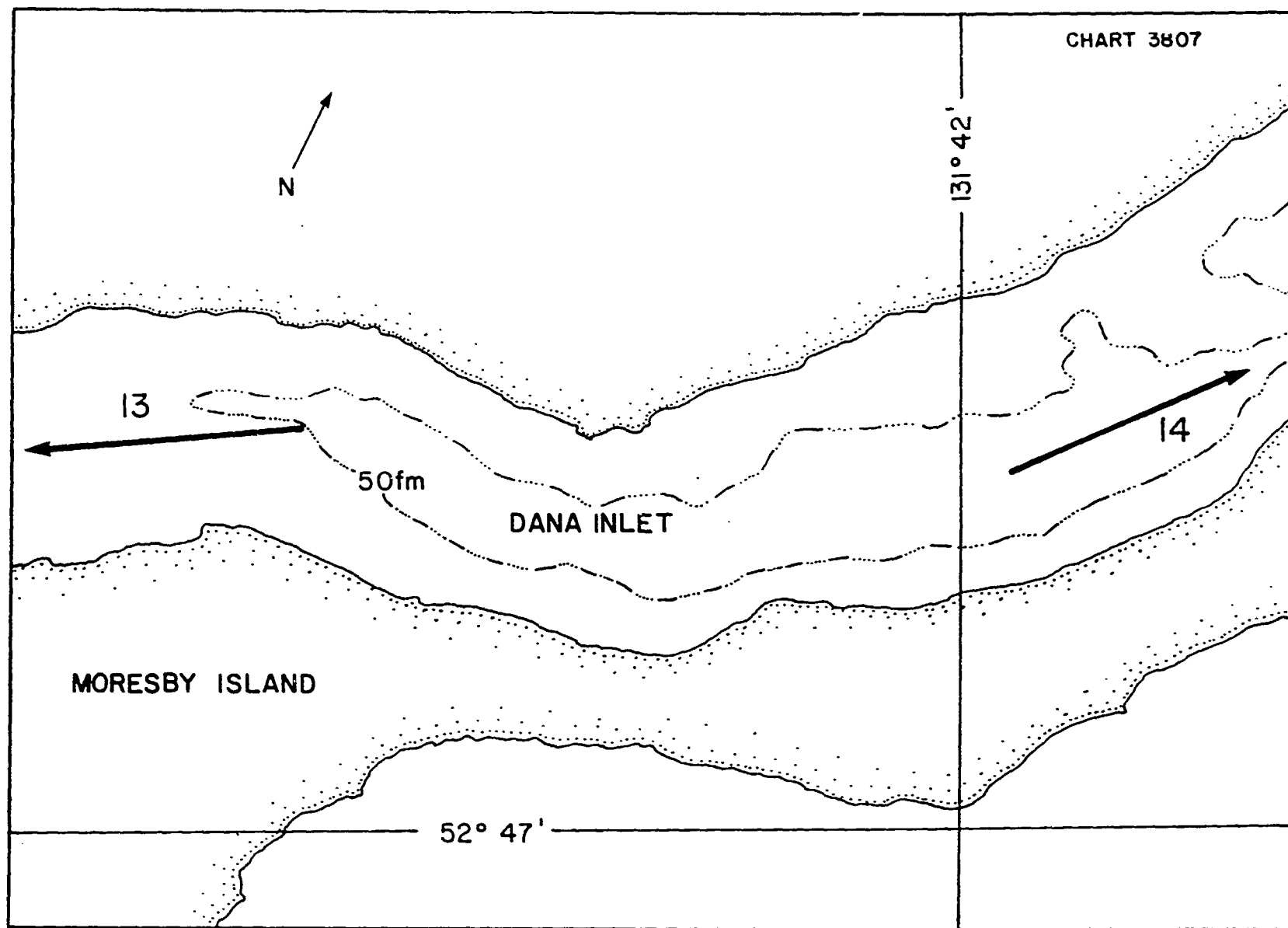


Fig. 8. Tow locations in Dana Inlet.





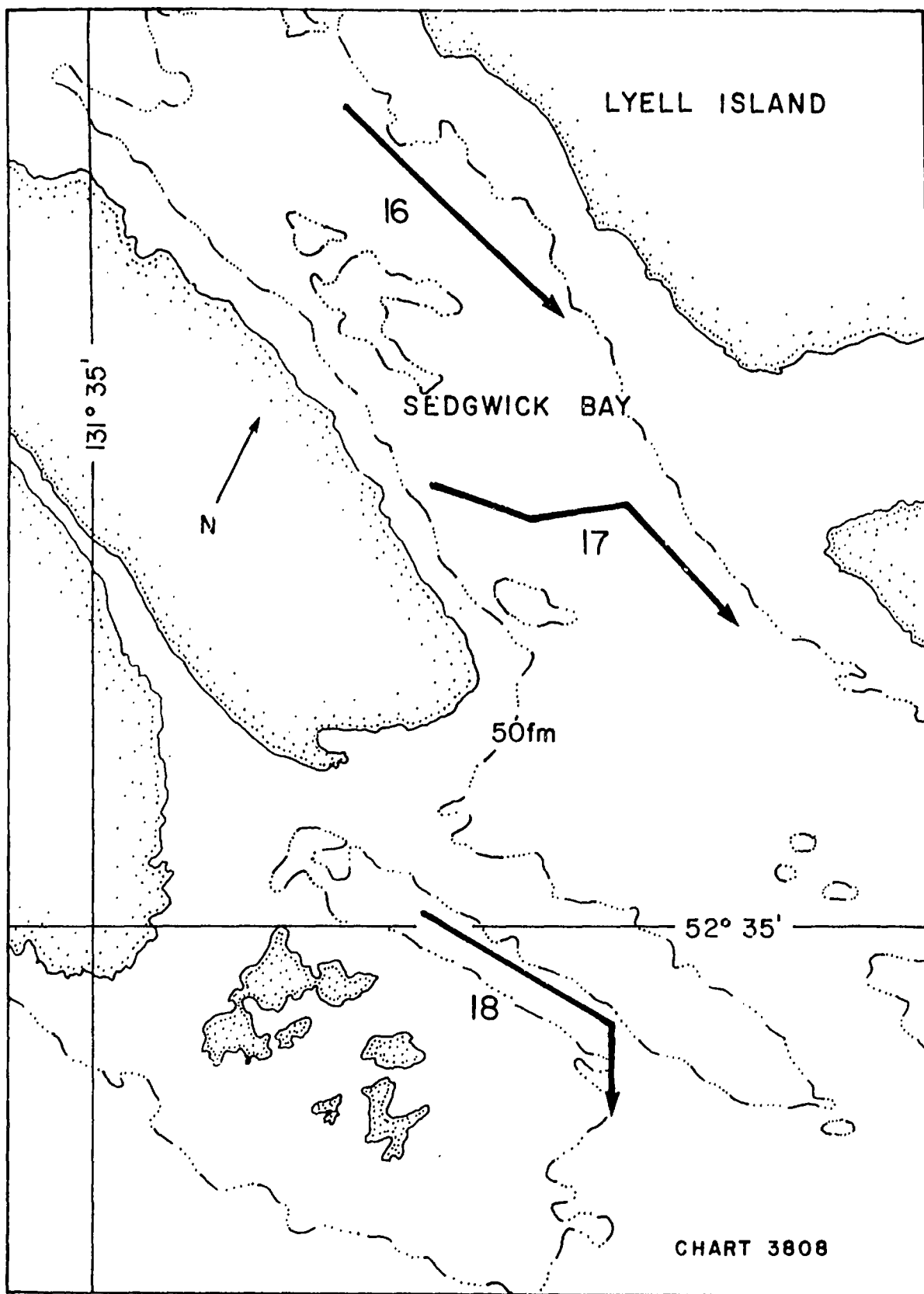


Fig. 9. Tow locations in Sedgewick Bay.



Appendix Table 1. Summary of survey areas and sets.

| Area              | Code | Set no. | Fig. no.     |
|-------------------|------|---------|--------------|
| Cumshewa Inlet    | CMSH | 11,12   | 6B           |
| Dana Inlet        | DANA | 13,14   | 7            |
| Darwin Sound      | DRWN | 15      | 2A           |
| Engelfield        | ENGF | 20      | 3B           |
| Grenville Channel | GVCH | 6       | 3A           |
| Sedgewick Bay     | JPSD | 16-18   | 8            |
| Selwyn Inlet      | SELW | 7-10    | 5            |
| Smith Sound       | SMSD | 1-5     | 1A,B<br>2B,4 |
| Tasu Sound        | TASU | 19      | 6A           |

APPENDIX TABLE 2, SIDESTRIPE EXPLORATION

M.V. NOPSAL, FEB-MAR 1980.

(SEE FOOTNOTE AT END OF TABLE FOR EXPLANATION OF TERMS)

| HAUL NO.              | 1       | 2       | 3       | 4       | 5       | 6       |
|-----------------------|---------|---------|---------|---------|---------|---------|
| DATE                  | FEB. 27 | FEB. 27 | FEB. 28 | FEB. 28 | FEB. 28 | MARCH 1 |
| AREA                  | SMSD    | SMSD    | SMSD    | SMSD    | SMSD    | GVCH    |
| TIME START (PST)      | 1225    | 1530    | 0905    | 1200    | 1345    | 1200    |
| DURATION (HR. MIN)    | .30     | .20     | .15     | .30     | .20     | .20     |
| START N. LAT. (DEG)   | 051     | 051     | 051     | 051     | 051     | 053     |
| (MIN)                 | 17.6    | 19.9    | 16.1    | 15.5    | 16.4    | 48.8    |
| W. LONG. (DEG)        | 127     | 127     | 127     | 127     | 127     | 129     |
| (MIN)                 | 39.4    | 35.4    | 31.8    | 46.4    | 47.0    | 58.9    |
| DIRECTION (DEG. TRUE) | 245     | 262     | 265     | 259     | 056     | 128     |
| FINISH N. LAT. (DEG)  | 051     | 051     | 051     | 051     | 051     | 053     |
| (MIN)                 | 17.1    | 19.8    | 16.2    | 15.7    | 16.8    | 48.5    |
| W. LONG. (DEG)        | 127     | 127     | 127     | 127     | 127     | 129     |
| (MIN)                 | 41.2    | 36.8    | 30.5    | 47.5    | 46.0    | 58.2    |
| DISTANCE NAUT. MI.    | 1.2     | .9      | .8      | .8      | .8      | .4      |
| DEPTH (FATHOMS)       | 81- 90  | 98- 96  | 75- 70  | 60- 56  | 54- 57  | 89- 91  |
| SEE FIGURE NO.        |         |         |         |         |         |         |
| SURFACE TEMP (DEG. C) | ::      | ::      | ::      | ::      | ::      | ::      |
| BOTTOM TEMP. (DEG. C) | ::      | ::      | ::      | ::      | ::      | ::      |
| TYPE OF GEAR          | 6       | 6       | 6       | 6       | 6       | 6       |
| TOTAL CATCH (KG)      | 209     | 126     | 173     | 234     | 189     | 141     |
| REMARKS               | USABLE  | USABLE  | USABLE  | USABLE  | USABLE  | USABLE  |

APPENDIX TABLE 2 CONTINUED

| HAUL NO.         | 1       | 2       | 3       | 4       | 5       | 6       |
|------------------|---------|---------|---------|---------|---------|---------|
| DATE             | FEB. 27 | FEB. 27 | FEB. 28 | FEB. 28 | FEB. 28 | MARCH 1 |
| AREA             | SMSD    | SMSD    | SMSD    | SMSD    | SMSD    | GVCH    |
| CATCH TOTAL (KG) | 209     | 126     | 173     | 234     | 189     | 141     |
| SHRIMP           |         |         |         |         |         |         |
| PINK (BOREALIS)  | 15      | ..      | T       | T       | T       | ..      |
| NUM/KG           | ..      | ..      | ..      | ..      | ..      | ..      |
| SIDESTRIPE       | 51      | T       | 3       | 24      | T       | 24      |
| NUM/KG           | ..      | ..      | 86      | 86      | ..      | 80      |
| OTHER SHRIMP     | T       | T       | T       | ..      | ..      | T       |
| INVERTEBRATES    |         |         |         |         |         |         |
| SPONGES          | T       | ..      | ..      | ..      | ..      | ..      |
| ANEMONE          | ..      | 2       | ..      | T       | T       | ..      |
| CLAMS            | ..      | ..      | ..      | T       | T       | T       |
| TUBEWORMS        | ..      | ..      | ..      | ..      | ..      | ..      |
| OTHERS           | T       | 3       | 1       | T       | 12      | 3       |
| FLATFISH         |         |         |         |         |         |         |
| DOVER SOLE       | T       | 4       | ..      | 13      | 37      | 8       |
| ENGLISH SOLE     | ..      | 2       | ..      | 25      | ..      | ..      |
| FLATHEAD SOLE    | 91      | 13      | ..      | 47      | 74      | T       |
| ROCK SOLE        | 10      | ..      | ..      | 20      | ..      | ..      |
| TURBOT           | T       | ..      | 2       | 27      | 17      | 5       |
| OTHERS           | 4       | ..      | ..      | ..      | 22      | T       |
| ROCKFISH         |         |         |         |         |         |         |
| OTHERS           | T       | T       | ..      | ..      | ..      | T       |
| OTHER ROUND FISH |         |         |         |         |         |         |
| BLACKCOD         | 4       | 25      | 7       | ..      | ..      | 3       |
| HAKE             | T       | 35      | 2       | 2       | 4       | ..      |
| WALLEYE POLLOCK  | 1       | 14      | 10      | 2       | 2       | T       |
| OTHERS           | 2       | T       | ..      | 1       | 3       | T       |
| ELACHII          |         |         |         |         |         |         |
| DOGFISH          | 5       | 15      | 66      | 5       | 18      | 5       |
| RATFISH          | 26      | 6       | 67      | 31      | T       | 84      |
| SKATES           | ..      | 7       | 15      | 37      | ..      | ..      |
| LONG NOSE SKATE  | ..      | ..      | ..      | ..      | ..      | 9       |
| OTHERS           | ..      | ..      | ..      | ..      | ..      | ..      |

APPENDIX TABLE 2 CONTINUED

| HAUL NO.             | 7                | 8       | 9       | 10      | 11      | 12      |
|----------------------|------------------|---------|---------|---------|---------|---------|
| DATE                 | MARCH 2          | MARCH 3 | MARCH 3 | MARCH 3 | MARCH 4 | MARCH 4 |
| AREA                 | SELW             | SELW    | SELW    | SELW    | CMSH    | CMSH    |
| TIME START (PST)     | 1110             | 0900    | 1035    | 1300    | 1115    | 1225    |
| DURATION(HR.MIN)     | .05              | .20     | .20     | .20     | .20     | .20     |
| START N. LAT. (DEG)  | 052              | 052     | 052     | 052     | 053     | 053     |
| (MIN)                | 54.0             | 52.4    | 52.2    | 51.8    | 02.6    | 02.5    |
| W. LONG. (DEG)       | 131              | 131     | 131     | 131     | 131     | 131     |
| (MIN)                | 52.3             | 50.5    | 45.1    | 46.9    | 48.6    | 52.5    |
| DIRECTION (DEG.TRUE) | 150              | 150     | 260     | 258     | 273     | 244     |
| FINISH N. LAT. (DEG) | 000              | 057     | 052     | 052     | 053     | 053     |
| (MIN)                | 00.0             | 51.6    | 52.3    | 51.9    | 02.7    | 02.3    |
| W. LONG. (DEG)       | 100              | 131     | 131     | 131     | 131     | 131     |
| (MIN)                | 00.0             | 49.9    | 41.9    | 45.7    | 50.0    | 52.8    |
| DISTANCE NAUT. MI.   | ..               | .9      | .7      | .7      | .9      | .6      |
| DEPTH (FATHOMS)      | 62- 0            | 80- 87  | 103-115 | 87- 90  | 62- 60  | 59- 63  |
| SEE FIGURE NO.       | -                | 6       | 6       | 6       | 7       | 7       |
| SURFACE TEMP(DEG.C)  | ..               | ..      | ..      | ..      | ..      | ..      |
| BOTTOM TEMP.(DEG.C)  | ..               | ..      | ..      | ..      | ..      | ..      |
| TYPE OF GEAR         | 6                | 6       | 6       | 6       | 6       | 6       |
| TOTAL CATCH (KG)     | 10               | 429     | 87      | 285     | 681     | 553     |
| REMARKS              | SNAG<br>UNUSABLE | USABLE  | USABLE  | USABLE  | USABLE  | USABLE  |

APPENDIX TABLE 2 CONTINUED

| HAUL NO.         | 7       | 8       | 9       | 10      | 11      | 12      |
|------------------|---------|---------|---------|---------|---------|---------|
| DATE             | MARCH 2 | MARCH 3 | MARCH 3 | MARCH 3 | MARCH 4 | MARCH 4 |
| AREA             | SELW    | SELW    | SELW    | SELW    | CMSH    | CMSH    |
| CATCH TOTAL (KG) | 10      | 429     | 87      | 285     | 681     | 553     |
| SHRIMP           |         |         |         |         |         |         |
| PINK (BOREALIS)  | ..      | T       | T       | ..      | ..      | T       |
| NUM/KG           | ..      | ..      | ..      | ..      | ..      | ..      |
| SIDESTRIPE       | ..      | 3       | 2       | 3       | 4       | T       |
| NUM/KG           | ..      | 50      | 82      | 7A      | 36      | ..      |
| OTHER SHRIMP     | T       | ..      | ..      | T       | T       | T       |
| INVERTEBRATES    |         |         |         |         |         |         |
| SPONGES          | ..      | ..      | ..      | ..      | ..      | ..      |
| ANEMONE          | ..      | T       | T       | ..      | 15      | 1       |
| CLAMS            | ..      | ..      | ..      | ..      | ..      | ..      |
| TUBEWORMS        | ..      | ..      | ..      | ..      | ..      | ..      |
| OTHERS           | T       | T       | T       | ..      | 4       | 2       |
| FLATFISH         |         |         |         |         |         |         |
| DOVER SOLE       | ..      | 126     | ..      | 10      | ..      | T       |
| ENGLISH SOLE     | 1       | 186     | T       | 136     | ..      | ..      |
| FLATHEAD SOLE    | ..      | 38      | T       | ..      | 15      | 15      |
| ROCK SOLE        | 3       | ..      | ..      | 21      | ..      | 5       |
| TURBOT           | ..      | ..      | 2       | 34      | 5       | 2       |
| OTHERS           | ..      | 4       | T       | ..      | 1       | ..      |
| ROCKFISH         |         |         |         |         |         |         |
| OTHERS           | ..      | 6       | 2       | 2       | 2       | T       |
| OTHER ROUND FISH |         |         |         |         |         |         |
| BLACKCOD         | T       | ..      | 2       | 7       | ..      | ..      |
| HAKE             | T       | 19      | 57      | 17      | 620     | 520     |
| WALLEYE POLLOCK  | T       | 1       | 1       | 1       | T       | ..      |
| OTHERS           | 1       | 3       | T       | ..      | T       | ..      |
| SELACHII         |         |         |         |         |         |         |
| DOGFISH          | ..      | 32      | 7       | 31      | 10      | 2       |
| RATFISH          | 3       | 11      | 14      | 24      | 3       | 1       |
| SKATES           | 2       | T       | ..      | ..      | 2       | 5       |
| LONG NOSE SKATE  | ..      | ..      | ..      | ..      | ..      | ..      |
| OTHERS           | ..      | ..      | ..      | ..      | ..      | ..      |



APPENDIX TABLE 2 CONTINUED

| HAUL NO.             | 13                 | 14      | 15      | 16      | 17      | 18      |
|----------------------|--------------------|---------|---------|---------|---------|---------|
| DATE                 | MARCH 5            | MARCH 5 | MARCH 6 | MARCH 6 | MARCH 6 | MARCH 6 |
| AREA                 | DANA               | DANA    | DRWN    | JPSD    | JPSD    | JPSD    |
| TIME START (PST)     | 0850               | 1020    | 0840    | 1035    | 1225    | 1610    |
| DURATION(HR.MIN)     | .20                | .20     | .20     | .25     | .20     | .20     |
| START N. LAT. (DEG)  | 052                | 052     | 052     | 052     | 052     | 052     |
| (MIN)                | 48.4               | 48.3    | 37.3    | 38.0    | 36.6    | 35.1    |
| W. LONG. (DEG)       | 135                | 135     | 131     | 131     | 131     | 131     |
| (MIN)                | 47.5               | 41.7    | 47.2    | 33.4    | 33.0    | 33.0    |
| DIRECTION (DEG.TRUE) | 085                | 066     | 105     | 315     | 0-1     | 136     |
| FINISH N. LAT. (DEG) | 052                | 052     | 052     | 052     | 052     | 052     |
| (MIN)                | 48.5               | 48.7    | 36.8    | 37.2    | 36.1    | 34.3    |
| W. LONG. (DEG)       | 135                | 135     | 131     | 131     | 131     | 131     |
| (MIN)                | 45.9               | 40.4    | 48.1    | 32.2    | 31.2    | 31.9    |
| DISTANCE NAUT. MI.   | .9                 | .9      | 1.0     | 1.1     | 1.3     | 1.1     |
| DEPTH (FATHOMS)      | 44- 50             | 65- 67  | 56- 64  | 70- 74  | 71- 79  | 72- 90  |
| SEE FIGURE NO.       | 8                  | 8       | 3A      | 9       | 9       | 9       |
| SURFACE TEMP(DEG.C)  | ::                 | ::      | ::      | ::      | ::      | ::      |
| BOTTOM TEMP.(DEG.C)  | ::                 | ::      | ::      | ::      | ::      | ::      |
| TYPE OF GEAR         | 6                  | 6       | 6       | 6       | 6       | 6       |
| TOTAL CATCH (KG)     | 223                | 579     | 378     | 158     | 168     | 565     |
| REMARKS              | DUMPED<br>ALL JUNK | USABLE  | USABLE  | USABLE  | USABLE  | USABLE  |

APPENDIX TABLE 2 CONTINUED

|    |                  |         |         |         |         |         |         |
|----|------------------|---------|---------|---------|---------|---------|---------|
| 18 | HAUL NO.         | 13      | 14      | 15      | 16      | 17      | 18      |
| 6  | DATE             | MARCH 5 | MARCH 5 | MARCH 6 | MARCH 6 | MARCH 6 | MARCH 6 |
| 90 | AREA             | DANA    | DANA    | DRWN    | JPSD    | JPSD    | JPSD    |
| 10 | CATCH TOTAL (KG) | 223     | 579     | 378     | 158     | 168     | 565     |
| 20 | SHRIMP           |         |         |         |         |         |         |
|    | PINK (BOREALIS)  | T       | T       | 2       | 35      | 42      | T       |
| 52 | NUM/KG           | ..      | ..      | ..      | ..      | ..      | ..      |
| .1 | SIDESTRIPE       | ..      | ..      | T       | 20      | 14      | T       |
|    | NUM/KG           | ..      | ..      | ..      | 50      | 59      | ..      |
| 31 | OTHER SHRIMP     | T       | T       | T       | T       | 1       | 4       |
| .0 | INVERTEBRATES    |         |         |         |         |         |         |
| 36 | SPONGES          | ..      | ..      | ..      | ..      | 20      | 70      |
|    | ANEMONE          | 100     | T       | ..      | ..      | ..      | ..      |
| 52 | CLAMS            | 5       | ..      | T       | ..      | ..      | ..      |
| .3 | TUBEWORMS        | 100     | ..      | ..      | ..      | ..      | ..      |
|    | OTHERS           | T       | T       | 1       | T       | T       | 2       |
| 31 | FLATFISH         |         |         |         |         |         |         |
| .9 | DOVER SOLE       | ..      | ..      | ..      | ..      | ..      | ..      |
| .1 | ENGLISH SOLE     | 2       | 234     | 10      | 1       | ..      | ..      |
|    | FLATHEAD SOLE    | 2       | 18      | 255     | 27      | 35      | 42      |
| 90 | ROCK SOLE        | ..      | ..      | ..      | 5       | ..      | 27      |
|    | TURBOY           | ..      | ..      | 50      | 7       | ..      | ..      |
|    | OTHERS           | 7       | ..      | ..      | ..      | ..      | ..      |
|    | ROCKFISH         |         |         |         |         |         |         |
| .. | OTHERS           | ..      | ..      | ..      | 5       | T       | ..      |
| .. |                  |         |         |         |         |         |         |
| 6  | OTHER ROUND FISH |         |         |         |         |         |         |
|    | BLACKCOD         | 1       | T       | 8       | 9       | 2       | T       |
| 65 | HAKE             | 2       | 300     | T       | ..      | T       | ..      |
|    | WALLEYE POLLOCK  | ..      | 2       | 2       | ..      | T       | T       |
| LE | OTHERS           | T       | T       | ..      | T       | T       | ..      |
|    | SELACHII         |         |         |         |         |         |         |
|    | DOGFISH          | ..      | 15      | ..      | 31      | 51      | 300     |
|    | RATFISH          | 1       | ..      | 35      | 13      | 2       | ..      |
|    | SKATES           | 3       | 10      | 15      | 5       | 1       | 120     |
|    | LONG NOSE SKATE  | ..      | ..      | ..      | ..      | ..      | ..      |
|    | OTHERS           | ..      | ..      | ..      | ..      | ..      | ..      |

APPENDIX TABLE 2 CONTINUED

|                      |         |          |
|----------------------|---------|----------|
| HAUL NO.             | 19      | 20       |
| DATE                 | MARCH 9 | MARCH 11 |
| AREA                 | TASU    | EGLF     |
| TIME START (PST)     | 1135    | 1135     |
| DURATION(HR.MIN)     | .10     | .20      |
| START N. LAT. (DEG)  | 051     | 052      |
| (MIN)                | 44.4    | 59.5     |
| W. LONG. (DEG)       | 132     | 132      |
| (MIN)                | 56.8    | 11.2     |
| DIRECTION (DEG.TRUE) | 315     | 304      |
| FINISH N. LAT. (DEG) | 051     | 052      |
| (MIN)                | 44.9    | 59.0     |
| W. LONG. (DEG)       | 132     | 132      |
| (MIN)                | 57.2    | 11.2     |
| DISTANCE NAUT. MI.   | .7      | .8       |
| DEPTH (FATHOMS)      | 55- 53  | 75- 65   |
| SEE FIGURE NO.       | 7A      | 4B       |
| SURFACE TEMP(DEG.C)  | ..      | ..       |
| BOTTOM TEMP.(DEG.C)  | ..      | ..       |
| TYPE OF GEAR         | 6       | 6        |
| TOTAL CATCH (KG)     | 173     | 348      |
| REMARKS              | USABLE  | USABLE   |

APPENDIX TABLE 2 CONTINUED

| HAUL NO.         | 19      | 20       |
|------------------|---------|----------|
| DATE             | MARCH 9 | MARCH 11 |
| AREA             | TASU    | EGLF     |
| CATCH TOTAL (KG) | 173     | 348      |
| SHRIMP           |         |          |
| PINK (BOREALIS)  | ..      | 1        |
| NUM/KG           | ..      | ..       |
| SIDESTRIPE       | ..      | T        |
| NUM/KG           | ..      | ..       |
| OTHER SHRIMP     | T       | T        |
| INVERTEBRATES    |         |          |
| SPONGES          | ..      | ..       |
| ANEMONE          | ..      | ..       |
| CLAMS            | 74      | ..       |
| TUBEWORMS        | ..      | ..       |
| OTHERS           | ..      | T        |
| FLATFISH         |         |          |
| DOVER SOLE       | ..      | ..       |
| ENGLISH SOLE     | 3       | 2        |
| FLATHEAD SOLE    | 4       | 5        |
| ROCK SOLE        | ..      | ..       |
| TURBOT           | ..      | 24       |
| OTHERS           | ..      | ..       |
| ROCKFISH         |         |          |
| OTHERS           | ..      | 4        |
| OTHER ROUND FISH |         |          |
| BLACKCOD         | 9       | 54       |
| HAKE             | 6       | 2        |
| WALLEYE POLLOCK  | 6       | 221      |
| OTHERS           | ..      | T        |
| SELACHII         |         |          |
| DOGFISH          | ..      | ..       |
| RATFISH          | 71      | 35       |
| SKATES           | ..      | ..       |
| LONG NOSE SKATE  | ..      | ..       |
| OTHERS           | ..      | ..       |

APPENDIX TABLE 2 CONTINUED

TOTAL NUMBER OF HAULS FOR THE CRUISE = 20

TOTAL CATCH BY SPECIES FOR THE CRUISE

| CATEG. CODE | SPECIES         | KG    | PERCENT |       |
|-------------|-----------------|-------|---------|-------|
| 1 SCD       | PINK (BOREALIS) | 95.   | 1.66    |       |
| 1 SCF       | COONSTRIPE      | 0.    | 0.00    | TRACE |
| 1 SCJ       | HUMPHACK        | 0.    | 0.00    | TRACE |
| 1 SDF       | PRAWN           | 5.    | 0.09    |       |
| 1 SEE       | SIDESTRIPE      | 148.  | 2.59    |       |
| 1 SIA       | CRANGON SPP.    | 0.    | 0.00    | TRACE |
| 2 2A0       | SPONGES         | 90.   | 1.58    |       |
| 2 3L0       | ANEMONE         | 118.  | 2.07    |       |
| 2 60A       | CLAMS           | 79.   | 1.38    |       |
| 2 91G       | ROSSIA          | 0.    | 0.00    | TRACE |
| 2 92A       | SQUID           | 2.    | 0.04    |       |
| 2 97A       | OCTOPUS         | 18.   | 0.32    |       |
| 2 OFA       | TUBEWORMS       | 100.  | 1.75    |       |
| 2 4GA       | STARFISH        | 1.    | 0.02    |       |
| 2 51A       | SEA SLUGS       | 0.    | 0.00    | TRACE |
| 2 5AR       | BRITTLE STARS   | 0.    | 0.00    | TRACE |
| 2 6AR       | SEA URCHINS     | 2.    | 0.04    |       |
| 2 6KA       | HEART URCHIN    | 2.    | 0.04    |       |
| 2 6NA       | SEA CUCUMBER    | 0.    | 0.00    | TRACE |
| 2 VMH       | BOX CRAB        | 2.    | 0.04    |       |
| 2 ZAD       | TANNER CRAB     | 1.    | 0.02    |       |
| 3 626       | DOVER SOLE      | 198.  | 3.47    |       |
| 3 628       | ENGLISH SOLE    | 602.  | 10.54   |       |
| 3 612       | FLATHEAD SOLE   | 681.  | 11.93   |       |
| 3 614       | HALIBUT         | 3.    | 0.05    |       |
| 3 610       | REX SOLE        | 14.   | 0.25    |       |
| 3 621       | ROCK SOLE       | 91.   | 1.59    |       |
| 3 625       | SLENDER SOLE    | 19.   | 0.33    |       |
| 3 631       | STARRY FLOUNDER | 2.    | 0.04    |       |
| 3 602       | TURROT          | 175.  | 3.07    |       |
| 4 396       | S. ALUTUS       | 6.    | 0.11    |       |
| 4 398       | S. AURICULATUS  | 2.    | 0.04    |       |
| 4 410       | S. CRAMERI      | 4.    | 0.07    |       |
| 4 418       | S. FLAVIDUS     | 0.    | 0.00    | TRACE |
| 4 437       | S. PINNIGER     | 4.    | 0.07    |       |
| 4 439       | S. PROXIGER     | 5.    | 0.09    |       |
| 5 455       | BLACKCOD        | 131.  | 2.29    |       |
| 5 304       | CYMATOGASTER    | 1.    | 0.02    |       |
| 5 231       | EELPOUTS        | 0.    | 0.00    | TRACE |
| 5 225       | HAKE            | 1586. | 27.78   |       |
| 5 096       | HERRING         | 0.    | 0.00    | TRACE |
| 5 136       | SMELT           | 0.    | 0.00    | TRACE |
| 5 222       | PACIFIC COD     | 9.    | 0.16    |       |
| 5 228       | WALLEYE POLLOCK | 262.  | 4.59    |       |
| 5 546       | POACHERS        | 0.    | 0.00    | TRACE |
| 5 472       | SCULPINS        | 0.    | 0.00    | TRACE |
| 6 044       | DOGFISH         | 593.  | 10.39   |       |
| 6 066       | HATFISH         | 427.  | 7.48    |       |
| 6 051       | SKATES          | 222.  | 3.89    |       |
| 6 59        | LONG NOSE SKATE | 9.    | 0.16    |       |

Footnotes to Appendix Table 2

Area: See Appendix Table 1 for explanation of code letters.

Time Start: Pacific Standard Time.

Type of Gear: 6-70 ft Marinovich semi-balloon trawl.

T: Trace

E: Estimated weight

Conversion Table

1 Metric Ton (1000 kilograms) = 2204 pounds

1 Kilogram (1000 grams) = 2.204 pounds



ACCO<sup>TM/MC</sup>

|           |       |           |
|-----------|-------|-----------|
| YELLOW    | 25970 | JAUNE     |
| BLACK     | 25971 | NOIR      |
| BLUE      | 25972 | BLEU      |
| RL BLUE   | 25973 | BLEU RL   |
| GREY      | 25974 | GRIS      |
| GREEN     | 25975 | VERT      |
| TANGERINE | 25977 | TANGERINE |
| RED       | 25978 | ROUGE     |
| EX-RED    | 25979 | ROUGE EX  |

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