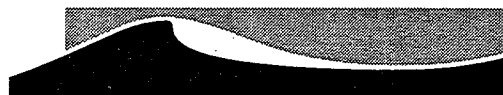


# CRUISE REPORT SS 02/97

February 12 – March 12, 1997  
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MARINE RESEARCH



## ITINERARY

Leg 1 Departed Cairns: 1800 h Wednesday, 12 February 1997  
Arrived Gove: 1000 h Monday, 3 March 1997

Leg 2 Departed Gove: 1630 h Monday, 3 March 1997  
Arrived Darwin: 0830 h Wednesday, 12 March 1997

## CRUISE OBJECTIVES

1. Survey all vertebrate and invertebrate bycatch species from prawn and fish trawls from adjacent waters in nine different prawn trawl grounds in the Torres Straits and the NPF (Northern Prawn Fishery).
2. Sample bycatch from nine different prawn trawl grounds in the Torres Straits and the NPF.
3. Test the survival of trawled sea snakes in aquaria.
4. Ground truth acoustic seabed signal data collected by RoxAnn, by collecting benthos samples with a Church dredge (David Vance).
5. Attempt to validate the ageing of leiognathid otoliths using chemical (tetracycline) marks (J. Staunton Smith).
6. Collect saurid specimens for phylogenetic analyses (Nick Elliott).
7. Photograph and collect specimens for the Handbook of Commercial Fishes project (Nick Elliott for Gordon Yearsley).

## AREA OF OPERATION

Nine 'high effort' prawn trawl areas within the Torres Straits and the NPF, between 10°S–17°S and 130°E–143°E (Fig. 1).

## RESULTS

- 1 All vertebrate and invertebrate bycatch was identified on board, with any uncertain species retained for identification at the Cleveland laboratory, Queensland Museum or Hobart Marine laboratories.
- 2 Bycatch were sampled from all nine prawn trawl grounds in Figure 1.
- 3 A total of 24 live sea snakes were kept in sea water tanks for survival experiments.
- 4 Dredge samples were taken at 7 of the 9 locations for use in characterising the bottom type using RoxAnn data.
- 5 After several attempts, live leiognathids were obtained off Duyfken Point and injected with tetracycline for age validation experiments.
- 6 Nick Elliott collected genetic samples of saurids from all possible locations.
- 7 Numerous specimens were photographed and tissue samples for genetic finger printing were taken for use in the Handbook of Commercial Fishes project.
- 8 Seven subsampling prawn trawl experiments ('Box-the-Lot') were completed, ranging in catch from 70 to 270 kg.

## CRUISE NARRATIVE

*Southern Surveyor* left Cairns at 1800 h on Wednesday, 12 February 1997, and steamed to Torres Straits. At a cruise debriefing soon after departure, Leg 1 objectives were explained, shifts allocated and first-time participants informed of ship safety and day to day house-keeping procedures. The Master, Bruce Wallis, advised of a Muster drill the next day at 1030 h; this drill was successfully completed.

One attempt was made to catch live leiognathids with the 2 fathom prawn try net, but all were dead on deck. One attempt to tow the same net with the ships inflatable dinghy in shallower water close to shore failed due to outboard engine problems. During the 2 day steam to the Torres Straits prawn grounds, the new PC-based data entry system in the fish laboratory was fully tested and demonstrated to other members of the scientific crew. The new length frequency fish boards were also tested and the data entry procedure performed well for most sized fish. *Southern Surveyor* arrived at the commercial prawn grounds on the evening of Friday, 14 February and the first prawn trawl was deployed at 2300 h. All prawn and fish trawls were of 30 minutes duration, except for the 7 subsample experiment trawls, while dredge tows were for 15 minutes (see Appendix). Subsample experiment trawls varied in duration in order to control the total catch which ranged from 70 to 270 kg. Night trawling had priority over daytime fish trawling such that the planned time at each of the nine locations was based on night prawn trawling, when such prawn trawling was completed at each site, the day time steaming time resulted in the fish trawling being displaced.

### Night time sampling

The schedule listed in Table 1 shows the sequence of operations carried out at all locations. Because of the need to exchange crew in Gove before the Groote Eylandt work was completed, South Groote and North Groote were sampled alternately to optimise use of night time in those areas and still arrive in Gove Harbour at the appropriate time. Sampling strategy for prawn trawling was based on an average of 8 trawls per night. During the cruise, this average was exceeded on most nights with up to 14 trawls completed on 5 nights. No nights were

lost during the cruise although 2 nights were partially lost due to time constraints in steaming to Gove and from Gove at the end of leg 1, the beginning of leg 2 and on the last night of leg 2, before commencing the 12 hour steam to Darwin from Bathurst Island.

Trawling proceeded smoothly throughout the cruise with only one gear delay. On the night of 27 February, a prawn trawl bridle was snapped by unexpected hard bottom or reef and almost 4 hours were lost in removing and replacing the damaged net.

A total of 276 prawn trawls were completed at an average of 11.5 trawls per night; 64 Engels fish trawls were completed over 18 trawlable days at an average of 3.6 trawls per day. In addition, 8 dredge tows were completed.

*Southern Surveyor* sailed for Darwin soon after completion of the 2 hour 'Box-the-Lot' trawl for a subsampling experiment on the evening of Tuesday, 11 March and tied up at the Stokes Hill wharf, Darwin, the next morning at 0830 h.

### **Daytime sampling**

In most locations, the Engels Hi-rise fish trawl was used for one day less than the number of prawn trawling nights because of the day time steaming to the next location. Up to 5 fish trawls were completed per day, with at least an hour lost each way steaming out of the prawn grounds, into untrawled grounds and returning each night to the prawn grounds.

A 12 mm mesh codend cover was used in a similar fashion to that in the Florida Flyer prawn net to help identify which species may be able to escape trawl codends. Where possible, fish trawls were deployed in both deeper and shallower waters than the prawn grounds to identify species beyond the threat of capture by prawn trawlers. Some difficulties were experienced with twisted bridle wires and these were replaced once during the cruise.

All cruise data were copied on to a cassette tape for down-loading to the Cleveland SUN Sparc station.

### **SUMMARY**

The cruise objectives were all met with very few delays or schedule changes required. Trawling activities were not compromised by weather which resulted in the completion of 276 prawn trawls, 64 fish trawls and 8 dredge tows. In general, the new data entry software worked very well although some inconsistencies were experienced with the station log data entry mostly due to individual operators. The new fish measuring boards were well received by all operators, but noticeably slow to open the software. The data collected from this cruise will allow a comprehensive description of vertebrate and invertebrate prawn trawl bycatch across the NPF and Torres Straits.

### **REPORTING OF RESULTS**

The results will be analysed and reported in the scientific literature where appropriate. All the collected data resides on the Oracle database at the CSIRO Marine Laboratories in Cleveland.

## PERSONNEL

(Note: unless otherwise stated, all personnel are staff of the CSIRO Division of Marine Research or students based at CSIRO Cleveland.)

### SCIENTIFIC CREW

John Salini	Cruise Leader
David Brewer	Alternate Cruise Leader
Don Heales	
Margaret Farmer	
Ted Wassenberg	
Lindsay MacDonald	(Leg 1) Electronics
David Vance	(Leg 1)
Nick Elliott	(Leg 1)
Kate Yoemans	(Leg 1) (QDPI)
Jonathan Staunton Smith	(Leg 1)
Jane Lancaster	(Leg 1) (PhD, UK)
John Kennedy	(Leg 1) (Qld. Museum)
Matt Sherlock	(Leg 2) Electronics
Clive Liron	(Leg 2)
Yougan Wang	(Leg 2)
David Die	(Leg 2)
D. Mason Posner	(Leg 2) (PhD, UCLA)
Ed Gillespie	(Leg 2) (MSc, UK)
Natalie Mykityowich	(Leg 2) (Northern Rivers Uni)

### SHIP'S CREW

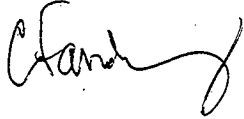
Bruce Wallis	(Leg 1) Master
Ian Taylor	(Leg 2) Master
Roger Pepper	First Mate/Fishing Master
John Boyes	Second Mate/Fishing Master
Bob Agoni	Chief Engineer
Rick Miller	First Engineer
John Hinchliffe	Electrical Engineer
Terry Lightfoot	Chief Steward
Don Collins	Chief Cook
Wayne Hatton	Second Cook
Len Darling	Bosun
Alan Brownlie	A. B.
Malcolm McDougall	A. B.
Phil Lee	Greaser
Graeme McDougall	A. B.
Bill Weetman	A. B.
Lou Jacomos	A. B.
Tony Hearne	A. B.

## ACKNOWLEDGMENTS

We thank the Master, Bruce Wallis; the Fishing Masters, Roger Pepper and John Boyes and the crew of *Southern Surveyor* for their skills and frequent enthusiastic help. The galley staff were able to provide a consistent supply of vegetables and fruit to the end of the cruise.



John Salini  
Cruise Leader



Chris Fandry  
Acting Chief, CSIRO Marine Research

Date

## CONTACTS

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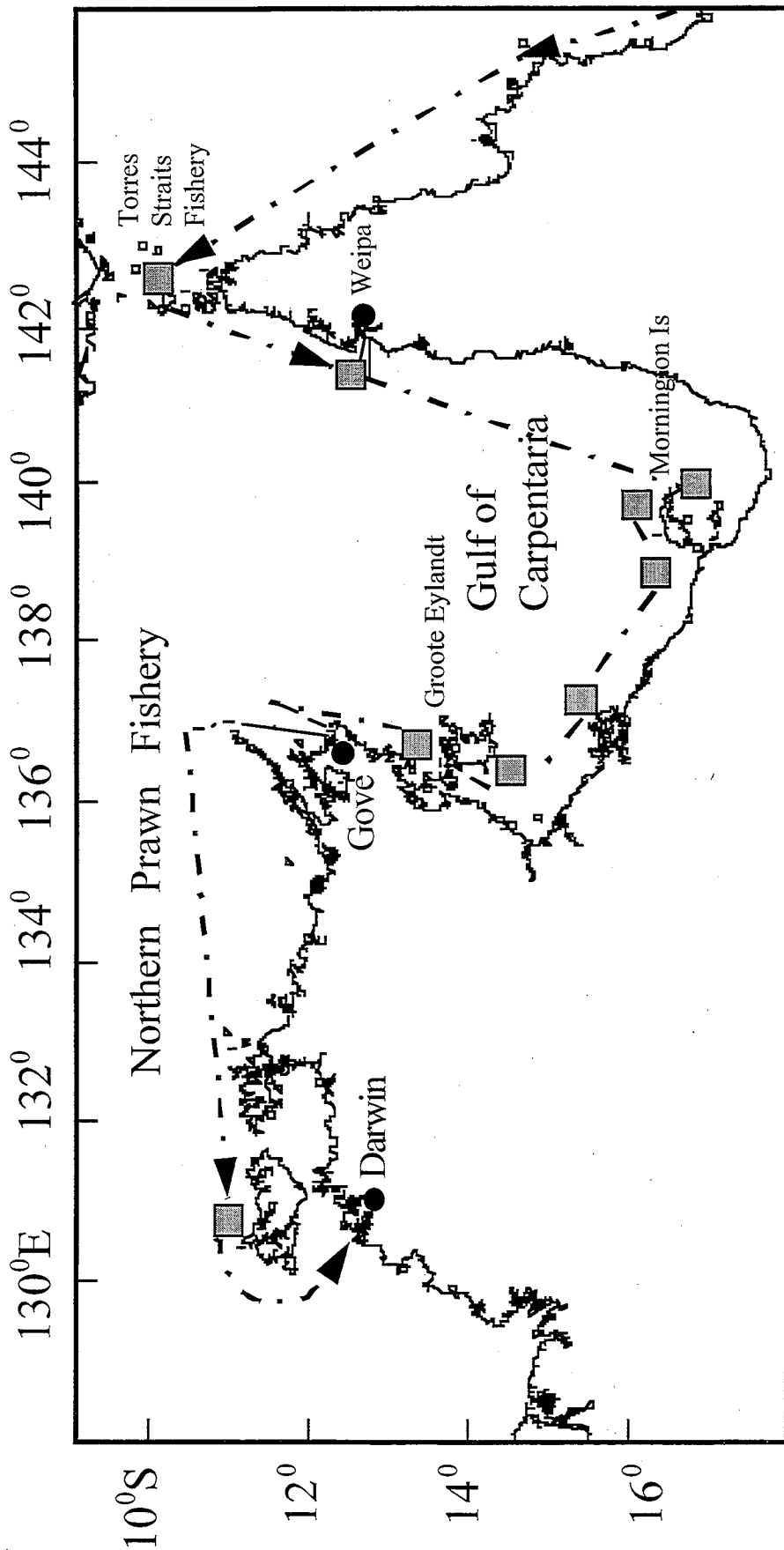
This report may not be cited without reference to the author(s).

## DISTRIBUTION

Normal circulation  
Cruise participants



Figure 1. Cruise track followed for prawn and fish trawling in nine areas within the Northern Prawn Fishery and Torres Straits. The chronological sequence around Groote Eylandt differed in that in order to minimise lost night time trawling and arrive in Gove on time, North Groote was trawled before South Groote was completed (see narrative).



## APPENDIX 1

Stations occupied by *Southern Surveyor* during Cruise SS297

Time: start time in 24 hour format; FF: Florida Flyer prawn trawl Engels: Engels Hi-rise demersal net; Try gear: 2 fathom otter trawl; Dredge: 3 m Church Dredge; StartLat: start latitude; StartLong: start longitude; EndLat: end latitude; EndLong: end longitude; Depth: depth in metres.

\* Box-the-lot stations.

Stn No.	Date	Start time	End time	StartLat	StartLong	EndLat	EndLong	Depth	Trawl net
1	12-02-97	20:12	20:22	16°38.200'	145 44.200'	16°37.700'	145 43.900'	23.2	Try gear
2	13-02-97	09:05	09:15	14°48.700'	145 14.600'	14°48.300'	145 13.900'	18.1	Try gear
3	13-02-97	09::30	09:40	14°46.500'	145 11.200'	14°46.600'	145 11.300'	13.1	Try gear
4	13-02-97	18:45	18:50	14°06.900'	143°54.600'	14°06.900'	143°53.900'	20.7	Try gear
5	13-02-97	19:00	19:30	14°06.600'	143°52.400'	14°05.900'	143°51.000'	19.5	Try gear
6	14-02-97	23:01	23:25	10°09.900'	143°05.000'	10°08.700'	143°05.700'	23.9	FF
7	14-02-97	23:45	00:15	10°08.000'	143°05.800'	10°09.400'	143°05.300'	18	FF
8	15-02-97	01:20	01:30	10°06.600'	143°06.700'	10°06.500'	143°05.500'	21	FF
9	15-02-97	02:10	02:40	10°06.600'	143°04.100'	10°06.400'	143°02.800'	22.4	FF
10	15-02-97	03:04	03:34	10°05.000'	143°03.900'	10°05.100'	143°05.700'	22.8	FF
11	15-02-97	04:04	04:34	10°05.000'	143°07.700'	10°04.900'	143°09.200'	25	FF
12	15-02-97	05:04	05:34	10°03.700'	143°08.300'	10°02.100'	143°08.900'	21	FF
13	15-02-97	09:20	09:50	10°16.400'	142°55.500'	10°14.900'	142°54.500'	23.6	Engels
14	15-02-97	11:15	11:45	10°16.600'	142°55.900'	10°15.400'	142°57.500'	23.2	Engels
15	15-02-97	13:20	13:50	10°18.100'	142°59.500'	10°16.400'	143°00.300'	22.8	Engels
16	15-02-97	15:30	16:00	10°13.300'	142°58.000'	10°14.900'	142°58.000'	22.8	Engels
17	15-02-97	17:06	17:16	10°17.900'	142°57.200'	10°18.000'	142°56.900'	22.4	Try gear
18	15-02-97	19:00	19:15	10°15.100'	142°57.700'	10°14.400'	142°58.100'	22.4	FF
19	15-02-97	20:07	20:37	10°12.800'	142°59.700'	10°12.700'	143°00.900'	22.8	FF
20	15-02-97	20:57	21:27	10°11.800'	143°01.800'	10°11.700'	143°03.200'	28.6	FF
21	15-02-97	21:49	22:19	10°10.500'	143°03.100'	10°10.300'	143°01.300'	21.2	FF
22	15-02-97	22:39	23:09	10°09.000'	143°01.100'	10°09.000'	143°02.700'	23.6	FF
23	15-02-97	23:25	23:55	10°08.600'	143°03.400'	10°08.600'	143°05.000'	23.2	FF
24	16-02-97	00:18	00:46	10°07.900'	143°06.000'	10°06.400'	143°06.600'	22.4	FF
25	16-02-97	01:21	01:50	10°08.400'	143°06.000'	10°09.200'	143°05.000'	23.6	FF
26	16-02-97	02:03	02:36	10°09.700'	143°04.500'	10°10.700'	143°03.200'	24.6	FF
27	16-02-97	03:26	03:56	10°11.600'	143°02.100'	10°10.800'	143°03.900'	24.8	FF
28	16-02-97	04:09	04:40	10°10.400'	143°03.900'	10°09.500'	143°02.300'	25.3	FF
29	16-02-97	04:55	05:25	10°10.000'	143°01.700'			20	FF
30	16-02-97	06:05	06:35	10°13.100'	143°00.100'	10°12.000'	143°00.900'	17	FF
31	16-02-97	06:50	07:00	10°12.500'	143°00.300'	10°12.700'	143°00.000'	22	Try gear
32	16-02-97	09:20	09:50	10°18.600'	142°58.600'	10°20.100'	142°58.400'	23.5	Engels
33	16-02-97	10:35	11:05	10°18.600'	142°58.600'	10°20.100'	142°58.400'	23.5	Engels
34	16-02-97	11:50	12:20	10°20.300'	143°00.000'	10°18.900'	143°00.900'	24.8	Engels
35	16-02-97	13:46	14:16	10°17.500'	143°01.400'	10°18.900'	143°01.500'	21.6	Engels
36	16-02-97	15:10	15:40	10°20.600'	143°01.400'	10°19.400'	143°01.100'	22.8	Engels
37	16-02-97	17:06	17:16	10°14.100'	142°58.900'	10°13.700'	142°58.700'	22.0	Try gear
38	16-02-97	18:55	19:05	10°14.900'	142°58.000'	10°14.100'	142°58.100'	17	Try gear
39	16-02-97	19:23	19:53	10°13.000'	142°58.700'	10°11.800'	142°59.800'	22.4	FF
40	16-02-97	20:12	20:42	10°10.800'	143°00.700'	10°09.900'	143°01.800'	26.4	FF
41	16-02-97	21:00	21:31	10°09.400'	143°02.500'	10°08.800'	143°04.200'	24.8	FF
42	16-02-97	21:48	22:19	10°08.600'	143°03.700'	10°08.800'	143°01.800'	23.2	FF
43	16-02-97	22:40	23:11	10°09.500'	143°00.900'	10°11.300'	143°00.100'	24.0	FF
44	16-02-97	23:29	00:01	10°11.500'	143°00.500'	10°10.900'	143°02.400'	23.2	FF
45	17-02-97	00:16	00:46	10°10.500'	143°03.100'	10°09.300'	143°02.000'	24.4	FF
46	17-02-97	01:10	01:40	10°08.800'	143°02.500'	10°08.400'	143°04.800'	24.4	FF

Stn No.	Date	Start time	End time	StartLat	StartLong	EndLat	EndLong	Depth	Trawl net
47	17-02-97	02:17	02:47	10°07.600'	143°05.700'	10°06.500'	143°04.700'	22.8	FF
48	17-02-97	03:01	03:31	10°06.000'	143°04.600'	10°04.400'	143°06.500'	22	FF
49 *	17-02-97	03:52	04:22	10°04.200'	143°07.500'	10°07.400'	143°05.500'	23.2	FF
50	18-02-97	00:36	01:06	12°26.700'	141°30.700'	12°26.700'	141°30.700'	24	FF
51	18-02-97	01:20	01:50	12°28.400'	141°30.500'	12°30.300'	141°30.000'	25.9	FF
52	18-02-97	01:46	02:17	12°31.400'	141°29.900'	12°32.900'	141°29.700'	26.8	FF
53	18-02-97	02:30	03:00	12°33.800'	141°29.600'	12°35.400'	141°29.300'	25.6	FF
54	18-02-97	03:18	03:46	12°36.500'	141°29.100'	12°38.200'	141°28.800'	25.3	FF
55	18-02-97	04:26	04:55	12°36.100'	141°28.300'	12°34.600'	141°28.300'	27.6	FF
56	18-02-97	05:09	05:40	12°33.900'	141°28.300'	12°32.300'	141°28.400'	29.2	FF
57	18-02-97	05:56	06:28	12°31.500'	141°28.500'	12°30.200'	141°28.800'	30.0	FF
58	18-02-97	08:46	09:16	12°36.000''	141°21.901	12°34.700'	141°22.300'	38.2	Engels
59	18-02-97	09:48	10:18	12°33.100'	141°22.500'	12°31.700'	141°22.500'	38.4	Engels
60	18-02-97	10:58	11:28	12°30.000''	141°22.100'	12°28.600'	141°21.800'	40.8	Engels
61	18-02-97	12:13	12:43	12°28.400'	141°19.100'	12°29.100'	141°17.400'	44	Engels
62	18-02-97	13:24	13:54	12°32.300'	141°16.800'	12°34.300'	141°16.700'	45.2	Engels
63	18-02-97	19:24	19:55	12°40.300'	141°29.500'	12°42.200'	141°29.200'	22	FF
64	18-02-97	20:15	20:45	12°43.800'	141°29.100'	12°45.600'	141°29.300'	23.2	FF
65	18-02-97	21:11	21:41	12°47.400'	141°29.500'	12°45.700'	141°29.300'	24	FF
66	18-02-97	22:02	22:33	12°49.300'	141°30.200'	12°49.200'	141°29.500'	22.8	FF
67	18-02-97	23:01	23:31	12°49.400'	141°30.200'	12°47.600'	141°31.000'	22.8	FF
68	19-02-97	00:00	00:30	12°48.700'	141°31.400'	12°50.500'	141°31.400'	22.4	FF
69	19-02-97	00:48	01:18	12°49.900'	141°30.700'	12°48.200'	141°30.100'	23.6	FF
70	19-02-97	01:55	02:25	12°46.900'	141°30.700'	12°45.400'	141°31.700'	21.6	FF
71	19-02-97	02:46	03:16	12°42.600'	141°32.300'	12°40.700'	141°32.300'	18.4	FF
72	19-02-97	03:32	04:02	12°39.900'	141°31.800'	12°38.800'	141°30.400'	18.4	FF
73	19-02-97	04:23	04:53	12°38.000''	141°29.400'	12°36.500'	141°29.500'	23.2	FF
74	19-02-97	06:35	06:50	12°35.200'	141°29.400'	12°31.800'	141°29.800'	25.6	Dredge
75	20-02-97	14:39	14:54	12°35.900'	141°30.000'	12°36.800'	141°30.100'	23.1	Dredge
76	20-02-97	19:17	19:50	16°44.800'	140°02.000'	16°44.800'	139°59.900'	24.0	FF
77	20-02-97	20:06	20:36	16°44.800'	139°58.500'	16°44.600'	139°56.900'	25.2	FF
78	20-02-97	20:52	21:24	16°44.500'	139°55.700'	16°43.700'	139°54.200'	27.2	FF
79	20-02-97	21:40	22:12	16°42.500'	139°54.800'	16°41.000'	139°56.100'	34.0	FF
80	20-02-97	22:37	23:13	16°40.600'	139°57.500'	16°41.700'	139°56.600'	34.1	FF
81	20-02-97	23:30	00:03	16°42.400'	139°56.200'	16°43.500'	139°55.400'	33.6	FF
82	21-02-97	00:15	00:45	16°44.000''	139°55.000'	16°45.400'	139°54.200'	28	FF
83	21-02-97	01:02	01:32	16°46.000''	139°53.800'	16°47.300'	139°52.900'	22	FF
84	21-02-97	01:47	02:17	16°47.800'	139°53.000'	16°47.500'	139°55.400'	21.2	FF
85	21-02-97	02:30	03:00	16°46.200'	139°53.700'	16°47.400'	139°58.700'	21.2	FF
86	21-02-97	03:36	04:06	16°43.800'	139°59.900'	16°43.700'	140°01.700'	23.6	FF
87	21-02-97	04:23	04:58	16°43.200'	140°02.300'	16°43.000'	140°04.500'	24	FF
88	21-02-97	05:15	05:45	16°42.000''	140°04.900'	16°41.700'	140°02.900'	24	FF
89	21-02-97	08:24	08:56	16°27.900'	140°09.400'	16°25.400'	140°12.500'	28.2	Engels
90	21-02-97	10:06	10:38	16°24.600'	140°11.200'	16°30.800'	140°13.600'	28	Engels
91	21-02-97	11:14	11:45	16°28.900'	140°13.400'	16°24.200'	140°03.800'	40.8	Engels
92	21-02-97	14:14	14:43	16°24.800'	140°04.200'	16°24.400'	140°07.500'	31.8	Engels
93	21-02-97	15:38	16:08	16°23.300'	140°06.200'	16°24.400'	140°07.500'	31.8	Engels
94	21-02-97	16:57	17:35	16°24.900'	140°12.200'	16°26.800'	140°11.800'	30	Engels
95	21-02-97	19:45	20:15	16°31.900'	140°11.500'	16°31.700'	140°09.500'	30.8	FF
96	21-02-97	21:16	21:46	16°31.700'	140°08.400'	16°31.700'	140°06.600'	34	FF
97	21-02-97	21:20	21:50	16°32.600'	140°06.200'	16°34.100'	140°06.100'	34	FF
98	21-02-97	22:03	22:33	16°34.900'	140°06.000'	16°36.500'	140°06.000'	29.6	FF
99	21-02-97	22:52	23:22	16°37.100''	140°05.700'	16°36.600'	140°03.900'	30.4	FF

Stn No.	Date	Start time	End time	StartLat	StartLong	EndLat	EndLong	Depth	Trawl net
100	21-02-97	23:38	00:13	16°36.600'	140°03.000'	16°36.400'	140°00.900'	29.6	FF
101	22-02-97	00:30	01:06	16°37.200'	140°00.800'	16°38.300'	140°02.100'	30.8	FF
102	22-02-97	01:23	02:00	16°38.900'	140°02.900'	16°40.100'	140°04.300'	28.0	FF
103	22-02-97	02:16	02:50	16°40.300'	140°05.401'	16°39.900'	140°07.400'	26.8	FF
104	22-02-97	03:03	03:33	16°40.200'	140°07.300'	16°40.600'	140°05.500'	28.4	FF
105	22-02-97	04:11	05:16	16°41.000'	140°05.200'	16°37.800'	140°02.100'	26.4	FF
106 *	22-02-97	04:11	05:16	16°41.000'	140°05.200'	16°37.800'	140°02.100'	26.4	FF
107 *	22-02-97	04:11	05:16	16°41.000'	140°05.200'	16°37.800'	140°02.100'	26.4	FF
108	22-02-97	15:00	15:30	15°42.000'	140°00.200'	15°43.500'	139°59.200'	43.2	Engels
109	22-02-97	16:31	17:03	15°45.000'	139°54.800'	15°45.300'	139°53.200'	44.4	Engels
110	22-02-97	19:35	20:11	15°55.800'	139°34.600'	15°56.900'	139°32.300'	40.7	FF
111	22-02-97	20:27	21:01	15°57.300'	139°31.300'	15°58.900'	139°29.600'	42.8	FF
112	22-02-97	21:17	21:52	15°59.400'	139°28.500'	15°59.600'	139°25.900'	42.0	FF
113	22-02-97	22:09	22:41	15°59.700'	139°24.500'	15°59.700'	139°22.300'	41.6	FF
114	22-02-97	23:08	23:41	16°01.500'	139°21.900'	16°01.700'	139°23.300'	39.5	FF
115	22-02-97	23:59	0:34	16°01.700'	139°24.300'	16°01.800'	139°25.600'	43.2	FF
116	23-02-97	01:00	01:30	16°01.900'	139°25.800'	16°01.200'	139°27.800'	38	FF
117	23-02-97	01:45	02:15	16°01.100'	139°27.500'	16°01.400'	139°25.600'	38.9	FF
118	23-02-97	02:34	03:04	16°01.700'	139°24.200'	16°02.000'	139°22.300'	43.6	FF
119	23-02-97	03:26	03:56	16°02.500'	139°22.100'	16°02.500'	139°23.300'	41.2	FF
120	23-02-97	04:18	04:48	16°02.400'	139°24.200'	16°02.400'	139°25.500'	39	FF
121	23-02-97	05:11	05:41	16°02.900'	139°25.600'	16°03.100'	139°23.800'	42	FF
122	23-02-97	09:10	09:42	15°47.500'	139°30.500'	15°46.100'	139°29.700'	43.6	Engels
123	23-02-97	10:13	10:52	15°43.600'	139°28.000'	15°43.500'	139°26.100'	44.4	Engels
124	23-02-97	11:26	12:05	15°43.600'	139°21.900'	15°43.700'	139°20.200'	42.6	Engels
125	23-02-97	13:37	14:07	15°44.000'	139°15.200'	15°44.200'	139°13.600'	46.4	Engels
126	23-02-97	14:34	15:28	15°39.500'	139°14.600'	15°39.900'	139°15.700'	47.6	Engels
127	23-02-97	16:29	16:59	15°40.500'	139°22.300'	15°40.800'	139°23.700'	46.8	Engels
128	23-02-97	19:49	20:19	15°54.700'	139°38.400'	15°54.800'	139°36.200'	41.6	FF
129	23-02-97	20:37	21:07	15°54.900'	139°35.000'	15°54.900'	139°33.100'	43.2	FF
130	23-02-97	21:25	21:55	15°54.900'	139°32.000'	15°54.800'	139°30.000'	40.8	FF
131	23-02-97	22:08	22:38	15°54.800'	139°28.800'	15°54.700'	139°26.800'	42.8	FF
132	23-02-97	22:50	23:20	15°54.700'	139°25.600'	15°54.600'	139°23.400'	42	FF
133	23-02-97	23:39	00:29	15°54.500'	139°22.500'	15°54.600'	139°20.300'	40	FF
134	24-02-97	00:22	00:55	15°54.800'	139°20.000'	15°56.000'	139°20.900'	42.4	FF
135	24-02-97	01:10	01:47	15°56.400'	139°21.600'	15°57.000'	139°23.100'	42.0	FF
136	24-02-97	02:02	02:36	15°57.000'	139°23.900'	15°56.900'	139°25.500'	42.4	FF
137	24-02-97	02:52	03:26	15°56.900'	139°26.500'	15°56.800'	139°28.100'	39.2	FF
138*	24-02-97	03:48	05:48	15°56.700'	139°29.000'	15°56.300'	139°21.600'	38.0	FF
139	24-02-97	06:45	07:00	15°56.300'	139°21.900'	15°55.800'	139°21.000'	42.0	Dredge
140	24-02-97	11:37	12:07	16°10.400'	138°58.900'	16°10.900'	138°57.200'	28.4	Engels
141	24-02-97	14:22	14:52	16°06.000'	138°40.600'	16°06.100'	138°38.800'	29.8	Engels
142	24-02-97	16:12	16:49	16°02.600'	138°31.600'	16°02.800'	138°33.200'	30.8	Engels
143	24-02-97	19:22	19:57	16°20.100'	138°33.000'	16°20.300'	138°35.000'	28.4	FF
144	24-02-97	20:09	20:43	16°20.300'	138°35.800'	16°20.200'	138°37.700'	28.0	FF
145	24-02-97	20:54	21:28	16°20.100'	138°38.400'	16°20.000'	138°40.100'	26.4	FF
146	24-02-97	21:38	22:10	16°20.000'	138°40.600'	16°20.000'	138°42.300'	27.2	FF
147	24-02-97	22:55	23:26	16°19.900'	138°45.500'	16°19.800'	138°47.000'	28.4	FF
148	24-02-97	23:39	00:09	16°19.800'	138°47.800'	16°20.000'	138°49.600'	27.2	FF
149	25-02-97	00:23	00:53	16°20.000'	138°49.900'	16°20.200'	138°51.800'	26.8	FF
150	25-02-97	01:11	01:41	16°20.200'	138°52.600'	16°20.400'	138°54.400'	27.6	FF
151	25-02-97	01:58	02:28	16°20.300'	138°55.000'	16°20.200'	138°56.900'	26.8	FF
152	25-02-97	02:53	03:23	16°21.900'	138°57.100'	16°21.800'	138°55.100'	25.6	FF
153	25-02-97	03:39	04:09	16°21.800'	138°54.300'	16°21.700'	138°52.000'	26.8	FF
154	25-02-97	04:23	04:53	16°21.700'	138°51.400'	16°21.800'	138°49.300'	26.2	FF

Stn No.	Date	Start time	End time	StartLat	StartLong	EndLat	EndLong	Depth	Trawl net
155	25-02-97	05:08	05:38	16°21.800'	138°48.500'	16°21.900'	138°46.900'	27.2	FF
156	25-02-97	05:46	06:16	16°21.800'	138°46.300'	16°21.800'	138°44.200'	26.8	FF
157	25-02-97	09:29	10:06	16°05.400'	138°29.200'	16°03.500'	138°29.100'	30.8	Engels
158	25-02-97	11:02	11:41	16°05.700'	138°25.700'	16°03.700'	138°25.800'	31.6	Engels
159	25-02-97	13:20	14:03	15°56.400'	138°21.000'	15°58.600'	138°21.200'	35.6	Engels
160	25-02-97	15:09	15:47	15°52.000'	138°21.300'	15°54.100'	138°21.400'	37.6	Engels
161	25-02-97	19:55	20:25	16°21.200'	138°29.900'	16°21.200'	138°27.600'	26.8	FF
162	25-02-97	20:45	21:15	16°21.400'	138°26.900'	16°21.500'	138°25.100'	25.6	FF
163	25-02-97	21:27	21:57	16°21.500'	138°24.400'	16°21.600'	138°22.400'	24.4	FF
164	25-02-97	22:33	23:02	16°22.300'	138°21.000'	16°22.400'	138°19.000'	22.8	FF
165	25-02-97	23:17	23:47	16°22.400'	138°18.400'	16°22.400'	138°16.700'	21.2	FF
166	26-02-97	00:10	00:52	16°23.100'	138°18.200'	16°23.100'	138°20.600'	18.4	FF
167	26-02-97	01:13	01:44	16°22.800'	138°22.100'	16°22.300'	138°23.900'	22.2	FF
168	26-02-97	01:56	02:33	16°22.200'	138°24.800'	16°22.000'	138°26.800'	23.6	FF
169	26-02-97	02:51	03:30	16°21.900'	138°28.300'	16°21.700'	138°30.400'	26.0	FF
170*	26-02-97	04:12	05:49	16°21.600'	138°28.300'	16°22.400'	138°22.900'	25.6	FF
172	26-02-97	06:40	06:55	16°22.100'	138°26.800'	16°22.100'	138°27.700'	24.4	Dredge
173	26-02-97	16:19	17:03	15°10.500'	137°55.400'	15°12.700'	137°55.400'	53.1	Engels
174	26-02-97	19:28	20:03	15°11.500'	137°35.000'	15°13.400'	137°34.500'	47.1	FF
175	26-02-97	20:14	20:49	15°14.200'	137°34.300'	15°16.200'	137°33.900'	45.2	FF
176	26-02-97	20:59	21:33	15°16.800'	137°33.700'	15°18.800'	137°33.300'	42.8	FF
177	26-02-97	21:43	22:17	15°19.300'	137°33.100'	15°21.300'	137°33.000'	42.0	FF
178	26-02-97	22:32	23:05	15°22.400'	137°33.100'	15°24.300'	137°33.300'	40.4	FF
179	26-02-97	23:20	23:51	15°25.200'	137°34.100'	15°25.200'	137°35.800'	40.8	FF
180	27-02-97	00:04	00:34	15°25.200'	137°36.800'	15°25.200'	137°38.400'	42.8	FF
181	27-02-97	00:52	01:22	15°25.200'	137°39.500'	15°25.100'	137°41.100'	42	FF
182	27-02-97	01:39	02:09	15°25.100'	137°42.200'	15°25.000'	137°43.800'	44.8	FF
183	27-02-97	02:23	02:53	15°24.900'	137°44.600'	15°24.900'	137°46.200'	46.8	FF
184	27-02-97	03:05	03:35	15°25.700'	137°47.200'	15°27.100'	137°47.700'	48	FF
185	27-02-97	03:57	04:27	15°27.500'	137°47.300'	15°27.400'	137°45.600'	47.6	FF
186	27-02-97	04:39	05:09	15°27.500'	137°44.300'	15°27.500'	137°42.300'	46.8	FF
187	27-02-97	05:33	06:03	15°27.400'	137°41.200'	15°27.500'	137°39.600'	43.6	FF
188	27-02-97	09:03	09:40	15°14.200'	137°59.600'	15°12.800'	137°59.800'	52.8	Engels
189	27-02-97	10:49	11:30	15°11.200'	138°06.800'	15°09.900'	138°07.000'	54.4	Engels
190	27-02-97	12:55	13:25	15°03.400'	138°07.300'	15°04.900'	138°07.300'	56	Engels
191	27-02-97	15:15	15:45	15°00.100'	137°58.400'	15°01.900'	137°58.500'	56.4	Engels
192	27-02-97	19:42	20:12	15°09.800'	137°29.100'	15°09.700'	137°31.200'	44.8	FF
193	27-02-97	20:28	20:58	15°10.100'	137°31.100'	15°11.000'	137°29.800'	46.4	FF
194	27-02-97	21:17	21:47	15°11.900'	137°29.100'	15°12.800'	137°30.600'	30	FF
195	28-02-97	01:49	02:27	15°16.300'	137°31.400'	15°18.500'	137°32.500'	42.4	FF
196	28-02-97	02:37	03:13	15°19.100'	137°32.800'	15°21.100'	137°33.700'	42.0	FF
197	28-02-97	03:26	04:01	15°21.500'	137°34.100'	15°19.600'	137°34.400'	43.2	FF
198	28-02-97	04:13	04:50	15°18.800'	137°34.600'	15°16.600'	137°35.000'	42.0	FF
199	28-02-97	05:00	05:36	15°16.100'	137°35.000'	15°14.100'	137°35.500'	44.0	FF
200	28-02-97	05:49	06:27	15°13.300'	137°35.700'	15°11.000'	137°36.200'	45.2	FF
201	28-02-97	08:34	09:04	15°02.400'	137°53.800'	15°01.900'	137°55.300'	55.2	Engels
202	28-02-97	09:42	10:12	14°59.500'	137°56.900'	14°57.700'	137°57.100'	55.6	Engels
203	28-02-97	11:12	11:42	14°57.600'	137°57.100'	14°58.300'	137°58.400'	56.4	Engels
204	28-02-97	13:13	13:43	15°03.400'	137°55.400'	15°04.900'	137°54.600'	55.2	Engels
205	28-02-97	14:51	15:21	15°02.900'	137°51.700'	15°01.300'	137°51.500'	54.4	FF
206	28-02-97	20:06	20:41	15°02.500'	137°05.400'	15°02.400'	137°07.300'	38	FF
207	28-02-97	21:23	21:57	15°02.300'	137°03.000'	15°02.200'	137°01.600'	37.6	FF
208	28-02-97	22:12	22:43	15°02.100'	137°00.400'	15°02.200'	136°58.800'	36.8	FF
209	28-02-97	22:56	23:30	15°02.200'	136°57.500'	15°02.200'	136°56.100'	35.6	FF
210	28-02-97	23:41	00:16	15°02.300'	136°55.000'	15°02.300'	136°53.300'	34.8	FF

Stn No.	Date	Start time	End time	StartLat	StartLong	EndLat	EndLong	Depth	Trawl net
211	01-03-97	00:26	00:56	15°02.400'	136°52.500'	15°02.400'	136°51.000'	34.4	FF
212	01-03-97	01:13	01:43	15°02.400'	136°50.200'	15°02.500'	136°48.400'	33.2	FF
213	01-03-97	01:52	02:22	15°02.500'	136°47.700'	15°02.600'	136°45.900'	32.4	FF
214	01-03-97	02:35	03:05	15°02.700'	136°45.000'	15°02.800'	136°43.200'	31.2	FF
215*	01-03-97	03:35	05:35	15°02.500'	136°41.400'	15°02.200'	136°50.300'	30.4	FF
216*	01-03-97	03:35	05:35	15°02.500'	136°41.400'	15°02.200'	136°50.300'	30.4	FF
217	01-03-97	11:10	11:40	14°34.800'	137°15.100'	14°33.100'	137°15.600'	46.4	Engels
218	01-03-97	13:27	14:02	14°28.700'	137°15.800'	14°30.300'	137°15.800'	48.4	Engels
219	01-03-97	14:49	15:19	14°31.800'	137°10.900'	14°33.400'	137°10.600'	45.2	Engels
220	01-03-97	15:49	16:19	14°35.300'	137°08.000'	14°36.900'	137°07.800'	43.2	Engels
221	01-03-97	19:55	20:25	14°37.500'	136°57.500'	14°37.100'	136°55.900'	40	FF
222	01-03-97	20:34	21:04	14°37.000'	136°55.700'	14°36.600'	136°53.900'	39.6	FF
223	01-03-97	20:55	21:25	14°36.100'	136°52.700'	14°35.300'	136°51.300'	33	FF
224	01-03-97	21:42	22:12	14°34.900'	136°51.000'	14°35.900'	136°52.400'	37.2	FF
225	01-03-97	22:38	23:08	14°35.000'	136°51.000'	14°34.400'	136°49.600'	37.2	FF
226	01-03-97	23:20	23:50	14°34.100'	136°48.700'	14°33.600'	136°47.300'	36.8	FF
227	02-03-97	00:36	02:11	14°32.900'	136°46.600'	14°34.400'	136°43.700'	35.6	FF
228	02-03-97	01:29	02:08	14°31.700'	136°44.100'	14°34.200'	136°43.700'	35.2	FF
229	02-03-97	02:18	02:48	14°34.700'	136°43.400'	14°34.800'	136°41.200'	33.6	FF
230	02-03-97	03:05	03:35	14°34.800'	136°41.000'	14°35.300'	136°42.800'	33.6	FF
231	02-03-97	03:48	04:18	14°35.500'	136°43.700'	14°35.800'	136°45.800'	34.0	FF
232	02-03-97	04:09	04:39	14°35.700'	136°45.000'	14°36.300'	136°48.900'	34.0	FF
233	02-03-97	05:27	05:57	14°36.400'	136°49.600'	14°36.700'	136°51.800'	36.0	FF
234	02-03-97	06:17	06:47	14°36.700'	136°52.300'	14°34.900'	136°49.900'	37.2	FF
235	02-03-97	08:42	09:12	14°34.500'	136°49.700'	14°35.000'	136°50.700'	37.2	Dredge
236	02-03-97	11:31	12:01	14°21.600'	137°11.200'	14°19.300'	137°11.500'	48.4	Engels
237	02-03-97	19:27	19:57	13°17.800'	136°45.500'	13°19.700'	136°45.500'	33.2	FF
238	02-03-97	20:13	20:43	13°20.300'	136°45.200'	13°18.200'	136°45.200'	31.6	FF
239	02-03-97	21:07	21:37	13°17.600'	136°44.600'	13°15.200'	136°44.600'	31.6	FF
240	02-03-97	22:00	22:30	13°14.300'	136°44.500'	13°16.300'	136°44.500'	32.8	FF
241 *	02-03-97	22:54	01:00	13°17.600'	136°44.700'	13°08.700'	136°44.900'	32.4	FF
242 *	02-03-97	22:54	01:00	13°17.600'	136°44.700'	13°08.700'	136°44.900'	32.4	FF
243	04-03-97	2:15	2:45	13°06.900'	136°44.300'	13°08.600'	136°44.300'	37.2	FF
244	04-03-97	03:28	04:03	13°09.400'	136°44.300'	13°11.600'	136°44.300'	34.4	FF
245	04-03-97	04:14	04:53	13°12.500'	136°44.200'	13°14.900'	136°44.200'	33.2	FF
246	04-03-97	05:06	05:42	13°15.900'	136°44.200'	13°18.100'	136°44.400'	32.4	FF
247	04-03-97	05:52	06:28	13°18.700'	136°44.500'	13°21.000'	136°45.200'	31.2	FF
248	04-03-97	06:53	07:20	13°20.800'	136°45.400'	13°19.300'	136°45.400'	31.2	Dredge
249	04-03-97	19:23	20:01	14°24.500'	136°25.300'	14°24.400'	136°23.000'	28.4	FF
250	04-03-97	20:13	20:47	14°24.500'	136°22.200'	14°24.500'	136°20.200'	26.4	FF
251	04-03-97	21:05	21:41	14°24.600'	136°18.700'	14°24.500'	136°16.600'	26.4	FF
252	04-03-97	22:13	22:47	14°22.300'	136°16.000'	14°20.100'	136°16.100'	25.6	FF
253	04-03-97	22:59	23:34	14°19.900'	136°15.700'	14°21.000'	136°14.200'	24.4	FF
254	04-03-97	23:47	00:20	14°21.800'	136°13.700'	14°23.600'	136°13.500'	23.6	FF
255	05-03-97	0:24	0:54	14°24.700'	136°12.700'	14°24.700'	136°11.200'	23.2	FF
256	05-03-97	1:14	1:44	14°24.800'	136°11.400'	14°26.000'	136°12.800'	19.6	FF
257	05-03-97	2:05	2:35	14°26.600'	136°14.200'	14°26.800'	136°16.100'	22.8	FF
258	05-03-97	2:50	3:20	14°26.600'	136°17.000'	14°26.700'	136°19.000'	23.6	FF
259*	05-03-97	3:45	5:45	14°26.200'	136°18.200'	14°23.500'	136°12.200'	24	FF
260*	05-03-97	3:45	5:45	14°26.200'	136°18.200'	14°23.500'	136°12.200'	24	FF
261*	05-03-97	3:45	5:45	14°26.200'	136°18.200'	14°23.500'	136°12.200'	24	FF
262	05-03-97	14:55	15:30	13°26.300'	137°00.400'	13°24.400'	137°00.800'	48.8	Engels
263	05-03-97	16:25	16:55	13°20.400'	136°57.200'	13°18.800'	136°57.800'	46	Engels
264	05-03-97	19:12	19:42	13°18.000'	136°40.700'	13°16.400'	136°40.000'	30	FF
265	05-03-97	19:55	20:25	13°15.600'	136°39.800'	13°14.000'	136°39.200'	30	FF

Stn No.	Date	Start time	End time	StartLat	StartLong	EndLat	EndLong	Depth	Trawl net
266	05-03-97	20:40	21:10	13°12.900'	136°38.800'	13°11.100'	136°39.100'	29	FF
267	05-03-97	21:25	21:55	13°10.100'	136°39.100'	13°08.300'	136°39.400'	35.6	FF
268	05-03-97	22:00	22:30	13°07.900'	136°39.400'	13°06.100'	136°40.000'	29.6	FF
269	05-03-97	22:50	23:20	13°05.500'	136°40.700'	13°06.400'	136°42.200'	34	FF
270	05-03-97	23:27	23:57	13°06.800'	136°42.300'	13°08.300'	136°42.400'	29.2	FF
271	06-03-97	0:10	0:40	13°09.000'	136°42.800'	13°10.100'	136°43.900'	34.4	FF
272	06-03-97	01:27	02:01	13°11.200'	136°44.500'	13°12.700'	136°45.000'	33.2	FF
273	06-03-97	02:12	02:47	13°13.400'	136°45.200'	13°15.200'	136°45.200'	33.6	FF
274	06-03-97	02:59	03:35	13°15.800'	136°45.400'	13°17.700'	136°45.500'	33.6	FF
275	06-03-97	03:46	04:21	13°18.300'	136°45.700'	13°20.100'	136°45.900'	33.2	FF
276	06-03-97	04:33	05:13	13°20.400'	136°46.200'	13°17.900'	136°46.400'	33.2	FF
277	06-03-97	05:24	06:01	13°17.000'	136°46.400'	13°14.800'	136°46.400'	34.4	FF
278	06-03-97	08:47	09:30	13°12.600'	137°01.300'	13°10.800'	137°02.000'	48.0	Engels
279	08-03-97	0:14	0:44	10°53.500'	132°30.200'	10°53.600'	132°29.000'	29.2	FF
280	08-03-97	1:00	1:30	10°53.600'	132°28.400'	10°53.700'	132°27.100'	28.4	FF
281	08-03-97	1:56	2:24	10°54.400'	132°27.200'	10°54.300'	132°29.100'	26	FF
282	08-03-97	3:11	3:40	10°54.900'	132°27.500'	10°54.800'	132°26.200'	24.4	FF
283	08-03-97	4:00	4:30	10°54.700'	132°24.900'	10°54.800'	132°23.900'	26	FF
284	08-03-97	4:55	5:25	10°55.100'	132°22.700'	10°55.300'	132°21.200'	27.2	FF
285	08-03-97	5:45	6:15	10°55.400'	132°20.200'	10°55.300'	132°18.700'	24.8	FF
286	08-03-97	8:25	8:40	10°55.100'	132°22.500'	10°55.100'	132°21.600'	26	Dredge
287	08-03-97	20:00	20:30	10°59.400'	130°38.800'	10°59.400'	130°37.500'	44.4	FF
288	08-03-97	21:10	21:40	11°00.400'	130°35.500'	11°01.100'	130°34.500'	43.2	FF
289	08-03-97	22:05	22:35	11°01.600'	130°33.100'	11°01.700'	130°31.800'	42	FF
290	08-03-97	23:00	23:30	11°02.800'	130°31.800'	11°02.800'	130°33.700'	39.6	FF
291	09-03-97	23:50	0:20	11°03.000'	130°33.500'	11°02.900'	130°32.000'	40	FF
292	09-03-97	0:59	1:31	11°02.100'	130°29.600'	11°01.100'	130°28.200'	41.6	FF
293	09-03-97	1:45	2:15	11°00.800'	130°27.500'	11°00.800'	130°26.000'	44	FF
294	09-03-97	2:30	3:00	11°00.900'	130°25.000'	11°00.800'	130°23.600'	43.2	FF
295	09-03-97	3:14	3:44	11°00.800'	130°22.900'	11°00.700'	130°21.400'	41.6	FF
296	09-03-97	4:01	4:31	11°00.000'	130°21.400'	11°00.000'	130°23.400'	42.4	FF
297	09-03-97	4:55	5:25	11°01.300'	130°24.300'	11°01.500'	130°26.200'	39.6	FF
298	09-03-97	6:09	6:25	10°59.500'	130°26.500'	10°58.600'	130°26.800'	46	Dredge
299	09-03-97	9:00	9:35	10°42.600'	130°27.500'	10°41.700'	130°29.100'	69.6	Engels
300	09-03-97	10:30	11:05	10°39.500'	130°29.500'	10°38.800'	130°28.000'	75.6	Engels
301	09-03-97	11:45	12:15	10°35.100'	130°28.500'	10°34.700'	130°29.600'	85.2	Engels
302	09-03-97	13:45	14:15	10°41.300'	130°33.000'	10°41.200'	130°35.300'	66	Engels
303	09-03-97	16:24	16:54	10°55.200'	130°36.000'	10°55.200'	130°38.000'	53.6	Engels
304	09-03-97	19:32	20:02	11°04.400'	130°39.700'	11°04.000'	130°38.300'	36.8	FF
305	09-03-97	20:20	20:50	11°03.300'	130°38.300'	11°01.800'	130°39.500'	39.2	FF
306	09-03-97	21:04	21:34	11°01.700'	130°39.100'	11°02.300'	130°37.600'	41.2	FF
307	09-03-97	21:57	22:26	11°02.800'	130°36.600'	11°03.400'	130°35.200'	40	FF
308	09-03-97	22:38	23:08	11°03.600'	130°34.600'	11°03.700'	130°33.000'	37.2	FF
309	09-03-97	23:21	23:51	11°04.300'	130°33.000'	11°04.500'	130°34.700'	36.4	FF
310	10-03-97	0:10	0:40	11°04.200'	130°35.200'	11°03.200'	130°34.000'	37.2	FF
311	10-03-97	1:00	1:30	11°02.500'	130°32.800'	11°01.700'	130°31.400'	41.2	FF
312	10-03-97	1:50	2:20	11°01.100'	130°30.400'	11°00.200'	130°29.200'	44	FF
313	10-03-97	2:40	3:10	11°00.000'	130°29.600'	11°00.400'	130°31.400'	45.2	FF
314	10-03-97	3:30	4:00	11°00.800'	130°33.000'	11°01.300'	130°34.900'	44.8	FF
315	10-03-97	4:20	4:50	11°01.500'	130°36.600'	11°01.500'	130°38.600'	43.2	FF
316	10-03-97	5:05	5:35	11°01.200'	130°38.800'	11°00.200'	130°37.900'	42.8	FF
317	10-03-97	5:55	6:25	10°59.800'	130°36.900'	10°59.800'	130°35.900'	44.4	FF
319	10-03-97	11:20	11:50	10°50.000'	130°35.000'	10°50.200'	130°33.700'	59.6	Engels
320	10-03-97	13:15	13:45	10°51.000'	130°27.200'	10°51.700'	130°26.200'	61.2	Engels
321	10-03-97	14:17	14:48	10°53.000'	130°23.900'	10°53.500'	130°22.600'	61.2	Engels

Sta No.	Date	Start time	End time	StartLat	StartLong	EndLat	EndLong	Depth	Trawl net
322	10-03-97	15:40	16:10	10°55.400'	130°17.200'	10°56.800'	130°16.100'	59.7	Engels
323	10-03-97	19:48	20:25	11°03.900'	130°12.400'	11°03.700'	130°10.900'	33.2	FF
324	10-03-97	20:39	21:15	11°03.800'	130°10.200'	11°03.200'	130°08.900'	35.6	FF
325	10-03-97	21:48	22:21	11°04.500'	130°09.400'	11°02.400'	130°11.500'	30.0	FF
326	10-03-97	22:36	23:12	11°01.900'	130°12.400'	11°02.400'	130°11.700'	43.2	FF
327	10-03-97	23:25	00:00	11°02.600'	130°11.400'	11°03.600'	130°10.700'	40.0	FF
328	11-03-97	23:45	0:14	11°03.600'	130°11.200'	11°02.700'	130°12.900'	37.2	FF
329	11-03-97	1:00	1:30	10°58.200'	130°13.500'	10°56.900'	130°14.800'	56	FF
330	11-03-97	2:00	2:30	10°55.400'	130°17.000'	10°54.700'	130°18.600'	58.4	FF
331	11-03-97	3:24	3:54	11°00.000'	130°19.400'	11°00.700'	130°21.000'	41.6	FF
332	11-03-97	4:10	4:40	11°01.000'	130°22.200'	11°01.400'	130°23.800'	37.2	FF
333	11-03-97	4:54	5:24	11°01.100'	130°24.800'	11°01.200'	130°26.700'	40	FF
334	11-03-97	5:40	6:10	11°01.200'	130°27.700'	11°01.300'	130°29.700'	42.4	FF
335	11-03-97	8:45	9:15	11°05.300'	130°36.500'	11°04.800'	130°35.400'	35.2	Engels
336	11-03-97	10:54	11:36	11°07.700'	130°37.700'	11°07.500'	130°35.600'	30.0	Engels
337	11-03-97	15:52	16:29	11°03.900'	130°05.599'	11°02.700'	130°06.400'	46.4	Engels
338	11-03-97	19:28	21:23	11°00.300'	130°13.400'	11°03.900'	130°10.200'	51.2	FF