



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Fisheries Science Center
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CRUISE REPORT¹

VESSEL: *Oscar Elton Sette*, Cruise 06-07 (OES-43) (Fig. 1)

CRUISE PERIOD: June 5–July 3, 2006

AREA OF OPERATION: Northwestern Hawaiian Islands (NWHI)

TYPE OF OPERATION: Personnel from the Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS), NOAA conducted lobster trapping operations in the waters of the Northwestern Hawaiian Islands.

ITINERARY:

5 June Start of cruise. On board Carole Berini, Eric Cruz, Logan Eichhorn, Christopher Harvey, Aris Lebsack, Ameer Lewis, Garrett McNulty, Robert Moffitt, Joseph O'Malley, and Justin Reinicke. Departed Snug Harbor in transit to Necker Island.

7 June Arrived at Necker Island and commenced lobster trapping.

8-9 June Continued lobster trapping.

10 June Disembarked McNulty and O'Malley to charter fishing vessel. Continued lobster trapping.

11-20 June Continued lobster trapping.

21 June Hauled lobster traps and departed Necker Island; transited to Maro Reef.



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- 23 June Arrived Maro Reef and commenced lobster trapping.
- 24-29 June Continued lobster trapping.
- 30 June Hauled lobster traps and departed Maro Reef; headed toward Pearl Harbor, Oahu.
- 3 July Arrived in Honolulu. End of cruise

MISSIONS AND RESULTS:

- A. Collected data on abundance and species composition of trap-captured lobster at two banks in the NWHI to compare with results of previously collected data.
1. A total of 1,586 spiny lobster, *Panulirus marginatus*; 3,020 slipper lobster, *Scyllarides squammosus*; 39 ridgeback slipper lobster, *S. haanii*; and 17 Chinese slipper lobster, *Parribacus antarcticus*, were caught in 291 lobster trapping stations (Table 1) conducted on adult lobster fishing grounds using black plastic (Fathom's Plus) lobster traps with a 1-by-2 in mesh. Each station consisted of a single string of traps. Strings were composed of either 8 or 20 traps separated by 20 fathoms of ground line. Traps were baited with 1.5-2.0 lb of cut mackerel and soaked overnight. Traps were generally set within one of two depth regimes: 10-20 or 20-35 fathoms.
 2. Our total effort at Maro Reef was 1,039 trap nights yielding a total of 916 spiny lobster, 2,348 slipper lobster, 18 ridgeback slipper lobster, and 14 Chinese slipper lobster. Catch rates of spiny lobster were moderate at Maro Reef, approximately 0.88 spiny lobster per trap night for all depths and locations. This is up from the 2005 value of 0.68. Catch rates of slipper lobster were high at approximately 2.26 slipper lobster per trap-night (down from 2002, 2003, 2004, and 2005 catch rates of 3.29, 3.22, 3.27, and 2.38, respectively).

Current and historical catch rates for lobster (number per trap night) at Maro Reef by quad are shown in Tables 2-3 below. All data presented below are based on gross catch rates and should not be interpreted as a thoroughly analyzed assessment.

3. Our total effort at Necker Island was 2,211 trap nights yielding 670 spiny lobster, 672 slipper lobster, 21 ridgeback slipper lobster, and 3 Chinese slipper lobster. Catch rates of spiny lobster were moderately low at 0.30 lobster per trap night (lower than the 2003, 2004, and 2005 catch rates of 0.44, 0.42, and 0.34, respectively and considerably lower than the 2001 and 2000 catch rates of 0.71 and 0.83, respectively). The slipper lobster catch rate of 0.30 lobster per trap night was slightly higher than the 2004 and 2005 catch rates of 0.26 and 0.27, respectively and slightly lower than the 2002 and 2001 catch rates of 0.33 for each year.

Current and historical catch rates for lobster (number per trap night) at Necker Island by quad are shown in Tables 4-5 below. All data presented below are based on gross catch rates and should not be interpreted as a thoroughly analyzed assessment.

- B. Obtain length-frequency data on spiny and slipper lobsters to compare with those of previous years and to refine estimates of growth and mortality.

All lobster captured were sexed and measured. The presence or absence of eggs was recorded for all females. Data were returned to the Laboratory for computer entry and future analysis. Pleopod measurements were taken from nearly all female spiny lobster and slipper lobster. Data on the length of the female pleopod relative to carapace length will be used to estimate size at maturity for female spiny and slipper lobsters. Current year's data can be compared to previously collected data to determine interannual variation in size at maturity for lobster populations.

- C. Record and release any tagged lobster at the capture location.

A total 37 tagged spiny and 25 tagged slipper lobsters were caught and re-released at Necker and 35 tagged spiny and 119 tagged slipper lobsters were caught and re-released at Maro Reef.

- D. Conduct videotaping of lobster release cage operations.

Videotaping of lobster release cage operations was not conducted because of time and equipment constraints.

- E. Conduct bottomfishing and collect biological data.

A total of nine bottomfishing operations (Table 6) were conducted. Length measurements, otoliths, and genetic samples (fin clips) were collected from 53 ehu, *Etelis carbunculus*; 6 hapuupuu, *Epinephelus quernus*; 16 gindai, *Pristipomoides zonatus*; 4 kalekale, *Pristipomoides seiboldii*; and 2 yellowtail kalekale, *Pristipomoides auricilla*. Length measurements were also collected from an additional 3 ehu; 2 gindai; 7 hapuupuu, *Epinephelus quernus*; 1 kahala, *Seriola dumerili*; 1 nohu, *Pontinus macrocephalus*; and 1 Schlegel's grouper, *Caprodon schlegelii*.

- F. Collect genetic material from select crustacean and fish species (in addition to those bottomfish listed above).

Tissue samples from several species were collected and turned over to various investigators at the University of Hawaii for their ongoing projects. These samples included:

Species	# Necker	# Maro Reef
<i>Dardanus gemmatus</i>	10	10
<i>Dardanus brachyops</i>	10	10
<i>Charybdis hawaiiensis</i>	34	43
<i>Gymnothorax undulates</i>	2	25
<i>Gymnothorax steindachneri</i>	19	4
<i>Gymnothorax flavimarginatus</i>	0	3
<i>Gymnothorax meleagris</i>	2	0
<i>Gymnothorax eurostus</i>	2	0
<i>Lutjanus kasmira</i>	26	14
<i>Coryphaena hippurus</i>	1	0

**SCIENTIFIC
PERSONNEL:**

Robert B. Moffitt, Chief Scientist, National Marine Fisheries Service (NMFS), Pacific Islands Fisheries Science Center (PIFSC).

Carole Berini, Research Technician, Joint Institute for Marine and Atmospheric Research (JIMAR), University of Hawaii (UH)

Eric Cruz, Research Technician, JIMAR, UH

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(/s/Robert B. Moffitt)

Submitted by: _____

Robert B. Moffitt
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Approved by: _____

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Attachments

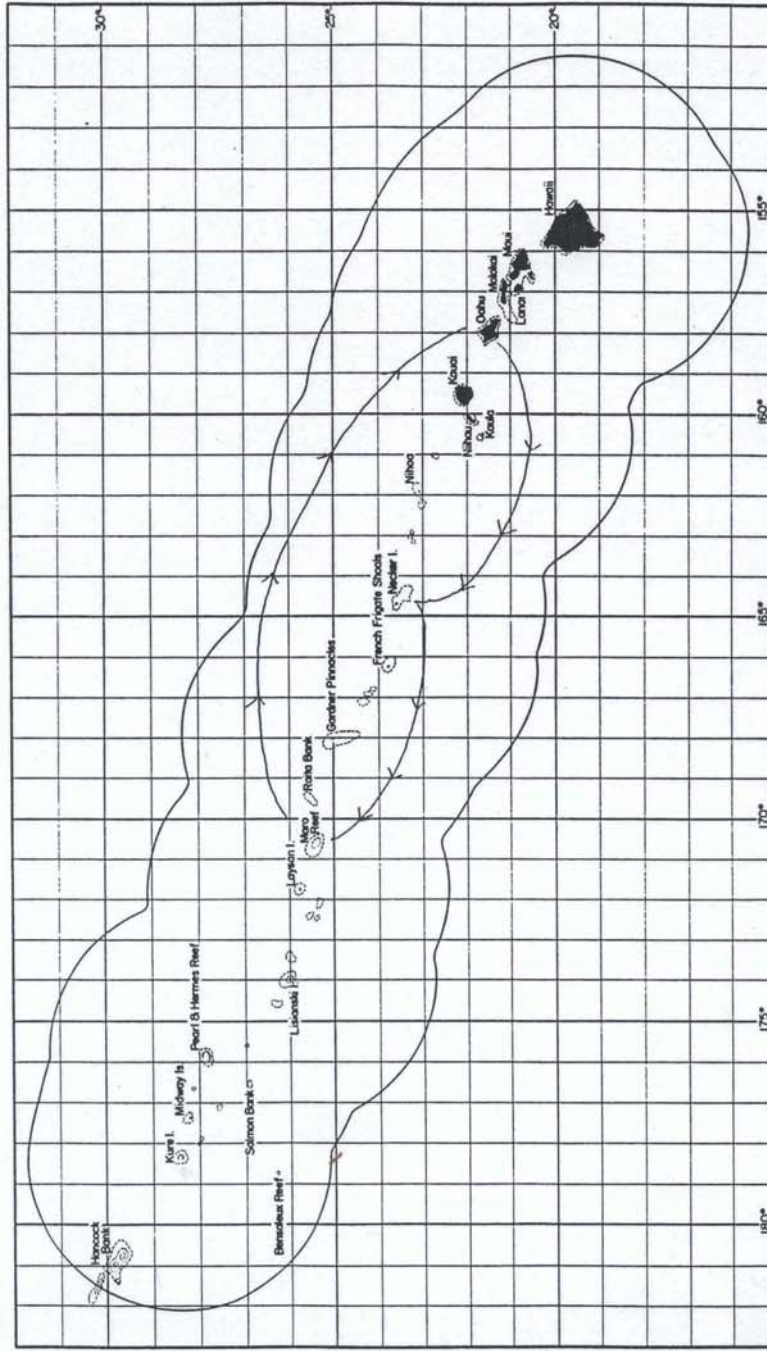


Figure 1.--Track of the NOAA ship Oscar Elton Sette cruise OES-06-07 (OES-43), June 5 to July 3, 2006.

Table 1. List of Lobster Trapping Stations

Station #	Date	Latitude	Longitude	Depth (fm)
4	7 June	23° 36.875'N	164° 44.675'W	16
5	7 June	23° 36.807'N	164° 44.937'W	15
6	7 June	23° 36.774'N	164° 45.221'W	16
7	7 June	23° 36.700'N	164° 45.540'W	15
8	7 June	23° 36.623'N	164° 45.878'W	15
9	7 June	23° 36.540'N	164° 46.193'W	15
10	7 June	23° 36.459'N	164° 46.513'W	16
11	7 June	23° 36.376'N	164° 46.844'W	17
12	7 June	23° 36.299'N	164° 47.175'W	18
13	7 June	23° 36.721'N	164° 47.504'W	18
14	7 June	23° 37.480'N	164° 47.668'W	27-28
15	7 June	23° 37.445'N	164° 46.983'W	27-33
16	7 June	23° 37.452'N	164° 46.419'W	27-33
17	7 June	23° 37.395'N	164° 45.627'W	16-20
23	8 June	23° 33.653'N	164° 48.841'W	17
24	8 June	23° 33.387'N	164° 48.789'W	16
25	8 June	23° 33.086'N	164° 48.727'W	16
26	8 June	23° 32.786'N	164° 48.668'W	17
27	8 June	23° 32.473'N	164° 48.639'W	16
28	8 June	23° 32.174'N	164° 48.608'W	15
29	8 June	23° 31.881'N	164° 48.574'W	14
30	8 June	23° 31.575'N	164° 48.575'W	14
31	8 June	23° 31.117'N	164° 48.331'W	18
32	8 June	23° 30.896'N	164° 48.018'W	14
33	8 June	23° 32.641'N	164° 50.549'W	31-33
34	8 June	23° 33.170'N	164° 50.884'W	34-36
35	8 June	23° 33.752'N	164° 51.221'W	37-41
36	8 June	23° 34.417'N	164° 51.350'W	42-43
42	9 June	23° 30.141'N	164° 43.798'W	14
43	9 June	23° 30.083'N	164° 44.091'W	13
44	9 June	23° 30.047'N	164° 44.472'W	13
45	9 June	23° 30.011'N	164° 44.737'W	13
46	9 June	23° 29.972'N	164° 45.048'W	13
47	9 June	23° 29.932'N	164° 45.365'W	13
48	9 June	23° 29.896'N	164° 45.683'W	13
49	9 June	23° 29.855'N	164° 45.955'W	14
50	9 June	23° 29.811'N	164° 46.272'W	14
51	9 June	23° 29.771'N	164° 46.574'W	20
52	9 June	23° 29.470'N	164° 46.266'W	14-18
53	9 June	23° 29.370'N	164° 45.535'W	21-27
54	9 June	23° 29.594'N	164° 44.913'W	24-25
55	9 June	23° 29.703'N	164° 44.290'W	25-29

Station #	Date	Latitude	Longitude	Depth (fm)
62	10 June	23° 29.778'N	164° 42.020'W	29-31
63	10 June	23° 29.675'N	164° 41.363'W	25-27
64	10 June	23° 29.371'N	164° 40.751'W	27-28
65	10 June	23° 29.603'N	164° 40.072'W	23-25
66	10 June	23° 30.440'N	164° 39.401'W	14
67	10 June	23° 30.385'N	164° 39.751'W	14
68	10 June	23° 30.334'N	164° 40.115'W	14
69	10 June	23° 30.270'N	164° 40.494'W	14
70	10 June	23° 30.223'N	164° 40.868'W	13
71	10 June	23° 30.181'N	164° 41.188'W	14
72	10 June	23° 30.125'N	164° 41.537'W	13
73	10 June	23° 30.076'N	164° 41.823'W	13
74	10 June	23° 30.047'N	164° 42.162'W	16
75	10 June	23° 30.073'N	164° 42.540'W	14
81	11 June	23° 21.812'N	164° 36.548'W	18-25
82	11 June	23° 22.049'N	164° 36.002'W	14-15
83	11 June	23° 22.283'N	164° 35.456'W	15-16
84	11 June	23° 22.570'N	164° 34.886'W	16
85	11 June	23° 21.998'N	164° 33.446'W	16
86	11 June	23° 21.895'N	164° 33.776'W	16
87	11 June	23° 21.794'N	164° 34.110'W	16
88	11 June	23° 21.686'N	164° 34.461'W	17
89	11 June	23° 21.566'N	164° 34.840'W	16
90	11 June	23° 21.469'N	164° 35.196'W	15
91	11 June	23° 21.373'N	164° 35.549'W	16
92	11 June	23° 21.277'N	164° 35.878'W	15
93	11 June	23° 21.174'N	164° 36.253'W	15
94	11 June	23° 21.079'N	164° 36.606'W	15
98	12 June	23° 23.035'N	164° 24.328'W	14
99	12 June	23° 23.022'N	164° 25.027'W	12-14
100	12 June	23° 22.933'N	164° 25.718'W	11-13
101	12 June	23° 22.968'N	164° 26.424'W	12
102	12 June	23° 22.995'N	164° 27.370'W	10
103	12 June	23° 23.009'N	164° 27.697'W	12
104	12 June	23° 23.026'N	164° 27.997'W	13
105	12 June	23° 23.040'N	164° 28.320'W	13
106	12 June	23° 23.060'N	164° 28.678'W	13
107	12 June	23° 23.081'N	164° 29.014'W	13
108	12 June	23° 23.103'N	164° 29.361'W	14
109	12 June	23° 23.113'N	164° 29.623'W	14
110	12 June	23° 23.127'N	164° 30.057'W	14
111	12 June	23° 23.151'N	164° 30.435'W	14
114	13 June	23° 15.807'N	164° 26.825'W	20-24
115	13 June	23° 15.691'N	164° 26.194'W	25-26

Station #	Date	Latitude	Longitude	Depth (fm)
116	13 June	23° 15.567'N	164° 25.557'W	26-27
117	13 June	23° 15.458'N	164° 24.930'W	27-31
118	13 June	23° 16.247'N	164° 23.767'W	16
119	13 June	23° 16.403'N	164° 24.102'W	16
120	13 June	23° 16.565'N	164° 24.449'W	16
121	13 June	23° 16.761'N	164° 24.867'W	16
122	13 June	23° 16.911'N	164° 25.187'W	16
123	13 June	23° 17.099'N	164° 25.578'W	16
124	13 June	23° 17.278'N	164° 25.940'W	16
125	13 June	23° 17.469'N	164° 26.317'W	16
126	13 June	23° 17.717'N	164° 26.895'W	17
129	14 June	23° 14.139'N	164° 20.924'W	16-18
130	14 June	23° 14.104'N	164° 20.313'W	17
131	14 June	23° 14.015'N	164° 19.722'W	16-28
132	14 June	23° 13.928'N	164° 19.147'W	28-31
133	14 June	23° 15.916'N	164° 17.937'W	18
134	14 June	23° 15.838'N	164° 18.254'W	17
135	14 June	23° 15.580'N	164° 18.580'W	18
136	14 June	23° 15.654'N	164° 18.891'W	18
137	14 June	23° 15.562'N	164° 19.215'W	18
138	14 June	23° 15.470'N	164° 19.513'W	18
139	14 June	23° 15.371'N	164° 19.850'W	18
140	14 June	23° 15.282'N	164° 20.163'W	17
141	14 June	23° 15.182'N	164° 20.479'W	18
142	14 June	23° 15.088'N	164° 20.786'W	16
148	15 June	23° 22.890'N	164° 16.703'W	22-28
149	15 June	23° 22.339'N	164° 16.530'W	19-26
150	15 June	23° 21.719'N	164° 16.306'W	27-28
151	15 June	23° 21.119'N	164° 16.116'W	28
152	15 June	23° 19.919'N	164° 16.336'W	16
153	15 June	23° 19.833'N	164° 16.781'W	17
154	15 June	23° 19.722'N	164° 17.161'W	17
155	15 June	23° 19.698'N	164° 17.523'W	18
156	15 June	23° 19.625'N	164° 17.913'W	17
157	15 June	23° 19.549'N	164° 18.316'W	18
158	15 June	23° 19.487'N	164° 18.681'W	17
159	15 June	23° 19.426'N	164° 19.048'W	18
160	15 June	23° 19.363'N	164° 19.426'W	18
161	15 June	23° 19.296'N	164° 19.811'W	19
169	16 June	23° 27.579'N	164° 20.643'W	29-33
170	16 June	23° 27.795'N	164° 21.294'W	29-30
171	16 June	23° 27.934'N	164° 21.987'W	20-29
172	16 June	23° 27.935'N	164° 22.711'W	127-34
173	16 June	23° 27.848'N	164° 24.075'W	16

Station #	Date	Latitude	Longitude	Depth (fm)
174	16 June	23° 27.899'N	164° 24.470'W	15
175	16 June	23° 27.948'N	164° 24.915'W	16
176	16 June	23° 27.980'N	164° 25.355'W	15
177	16 June	23° 28.019'N	164° 25.794'W	16
178	16 June	23° 28.063'N	164° 26.063'W	16
179	16 June	23° 28.098'N	164° 26.684'W	16
180	16 June	23° 28.135'N	164° 27.109'W	15
181	16 June	23° 28.176'N	164° 27.566'W	16
182	16 June	23° 28.210'N	164° 28.017'W	16
188	17 June	23° 30.216'N	164° 28.079'W	30-31
189	17 June	23° 30.488'N	164° 28.611'W	29
190	17 June	23° 30.741'N	164° 29.185'W	24-28
191	17 June	23° 30.979'N	164° 29.739'W	18-23
192	17 June	23° 29.942'N	164° 29.787'W	15
193	17 June	23° 29.882'N	164° 30.098'W	16
194	17 June	23° 29.819'N	164° 30.398'W	16
195	17 June	23° 29.749'N	164° 30.732'W	15
196	17 June	23° 29.680'N	164° 31.063'W	15
197	17 June	23° 29.612'N	164° 31.395'W	15
198	17 June	23° 29.545'N	164° 31.750'W	15
199	17 June	23° 29.484'N	164° 32.088'W	15
200	17 June	23° 29.417'N	164° 32.462'W	15
201	17 June	23° 29.361'N	164° 32.776'W	16
208	18 June	23° 31.328'N	164° 32.835'W	14
209	18 June	23° 31.347'N	164° 32.147'W	15
210	18 June	23° 31.369'N	164° 33.473'W	15
211	18 June	23° 31.418'N	164° 33.828'W	15
212	18 June	23° 31.446'N	164° 34.164'W	15
213	18 June	23° 31.471'N	164° 34.495'W	15
214	18 June	23° 31.497'N	164° 34.817'W	16
215	18 June	23° 31.526'N	164° 35.165'W	16
216	18 June	23° 31.550'N	164° 35.465'W	16
217	18 June	23° 31.578'N	164° 35.801'W	16
218	18 June	23° 33.173'N	164° 36.166'W	15
219	18 June	23° 33.117'N	164° 35.485'W	15-16
220	18 June	23° 33.041'N	164° 34.825'W	16
221	18 June	23° 32.979'N	164° 34.203'W	15
228	19 June	23° 39.643'N	164° 35.099'W	19-26
229	19 June	23° 39.225'N	164° 34.622'W	15-19
230	19 June	23° 38.758'N	164° 34.122'W	15
231	19 June	23° 38.293'N	164° 33.656'W	15-16
232	19 June	23° 36.769'N	164° 34.866'W	16
233	19 June	23° 36.681'N	164° 35.183'W	15
234	19 June	23° 36.614'N	164° 35.478'W	15

Station #	Date	Latitude	Longitude	Depth (fm)
235	19 June	23° 36.529'N	164° 35.828'W	16
236	19 June	23° 36.447'N	164° 36.185'W	15
237	19 June	23° 36.385'N	164° 36.506'W	16
238	19 June	23° 36.315'N	164° 36.827'W	16
239	19 June	23° 36.243'N	164° 37.155'W	15
240	19 June	23° 36.175'N	164° 37.472'W	15
241	19 June	23° 36.108'N	164° 37.784'W	15
248	20 June	23° 39.969'N	164° 36.548'W	27-33
249	20 June	23° 39.899'N	164° 37.239'W	24-25
250	20 June	23° 39.764'N	164° 38.207'W	24-28
251	20 June	23° 39.685'N	164° 38.820'W	27-29
252	20 June	23° 38.606'N	164° 38.349'W	15
253	20 June	23° 38.538'N	164° 38.664'W	14
254	20 June	23° 38.487'N	164° 38.977'W	15
255	20 June	23° 38.428'N	164° 39.318'W	15
256	20 June	23° 38.366'N	164° 39.678'W	16
257	20 June	23° 38.298'N	164° 40.027'W	15
258	20 June	23° 38.215'N	164° 40.383'W	16
259	20 June	23° 38.138'N	164° 40.702'W	15
260	20 June	23° 38.052'N	164° 41.057'W	15
261	20 June	23° 37.983'N	164° 41.359'W	15
271	23 June	25° 17.533'N	170° 39.368'W	34-38
272	23 June	25° 17.376'N	170° 38.745'W	29-31
273	23 June	25° 17.212'N	170° 38.114'W	27-28
274	23 June	25° 17.084'N	170° 37.665'W	28-32
275	23 June	25° 17.665'N	170° 37.631'W	13
276	23 June	25° 17.789'N	170° 38.010'W	14
277	23 June	25° 17.892'N	170° 38.352'W	14
278	23 June	25° 18.022'N	170° 38.707'W	14
279	23 June	25° 18.129'N	170° 39.025'W	14
280	23 June	25° 18.248'N	170° 39.381'W	14
281	23 June	25° 18.360'N	170° 39.716'W	14
282	23 June	25° 18.478'N	170° 40.062'W	14
283	23 June	25° 18.581'N	170° 40.378'W	14
284	23 June	25° 18.684'N	170° 40.694'W	14
296	24 June	25° 26.415'N	170° 45.753'W	17-18
297	24 June	25° 26.836'N	170° 45.162'W	17-18
298	24 June	25° 27.217'N	170° 44.511'W	16-17
299	24 June	25° 27.572'N	170° 43.980'W	15-16
300	24 June	25° 28.831'N	170° 43.114'W	15
301	24 June	25° 28.596'N	170° 43.434'W	15
302	24 June	25° 28.372'N	170° 43.748'W	15
303	24 June	25° 28.149'N	170° 44.057'W	16
304	24 June	25° 27.933'N	170° 44.369'W	17

Station #	Date	Latitude	Longitude	Depth (fm)
305	24 June	25° 27.707'N	170° 44.686'W	16
306	24 June	25° 27.478'N	170° 45.006'W	17
307	24 June	25° 27.278'N	170° 45.303'W	17
308	24 June	25° 27.077'N	170° 45.625'W	16
309	24 June	25° 26.876'N	170° 45.941'W	17
317	25 June	25° 38.256'N	170° 43.756'W	23-24
318	25 June	25° 38.246'N	170° 44.354'W	23
319	25 June	25° 38.239'N	170° 45.120'W	23-25
320	25 June	25° 38.244'N	170° 45.869'W	25-29
321	25 June	25° 37.662'N	170° 46.036'W	15
322	25 June	25° 37.501'N	170° 46.398'W	14
323	25 June	25° 37.359'N	170° 46.716'W	15
324	25 June	25° 37.206'N	170° 47.066'W	15
325	25 June	25° 37.067'N	170° 47.373'W	15
326	25 June	25° 36.910'N	170° 47.747'W	15
327	25 June	25° 36.723'N	170° 48.211'W	15
328	25 June	25° 36.599'N	170° 48.505'W	15
329	25 June	25° 36.447'N	170° 48.852'W	15
330	25 June	25° 36.282'N	170° 49.249'W	15
342	26 June	25° 34.459'N	170° 36.746'W	13-14
343	26 June	25° 34.106'N	170° 37.398'W	13
344	26 June	25° 33.777'N	170° 38.051'W	13
345	26 June	25° 33.437'N	170° 38.760'W	13
346	26 June	25° 34.786'N	170° 38.952'W	13
347	26 June	25° 34.600'N	170° 39.301'W	13
348	26 June	25° 34.409'N	170° 39.658'W	13
349	26 June	25° 34.221'N	170° 40.068'W	13
350	26 June	25° 34.042'N	170° 40.374'W	13
351	26 June	25° 33.871'N	170° 40.713'W	13
352	26 June	25° 33.677'N	170° 41.085'W	13
353	26 June	25° 33.464'N	170° 41.479'W	14
354	26 June	25° 33.274'N	170° 41.831'W	13
355	26 June	25° 33.096'N	170° 42.164'W	14
368	27 June	25° 29.416'N	170° 29.383'W	11
369	27 June	25° 29.158'N	170° 29.153'W	12
370	27 June	25° 28.887'N	170° 28.894'W	11
371	27 June	25° 28.629'N	170° 28.657'W	13
372	27 June	25° 28.339'N	170° 28.388'W	12
373	27 June	25° 28.094'N	170° 28.161'W	12
374	27 June	25° 27.777'N	170° 27.866'W	12
375	27 June	25° 27.531'N	170° 27.635'W	12
376	27 June	25° 27.272'N	170° 27.390'W	12
377	27 June	25° 26.983'N	170° 27.122'W	13
378	27 June	25° 29.576'N	170° 24.493'W	48-90

Station #	Date	Latitude	Longitude	Depth (fm)
379	27 June	25° 30.621'N	170° 27.013'W	21-26
380	27 June	25° 31.238'N	170° 27.703'W	25-26
381	27 June	25° 31.654'N	170° 28.203'W	26-28
395	28 June	25° 25.373'N	170° 22.427'W	27-29
396	28 June	25° 24.786'N	170° 22.095'W	25-28
397	28 June	25° 24.156'N	170° 21.775'W	28
398	28 June	25° 25.401'N	170° 23.293'W	15
399	28 June	25° 25.415'N	170° 23.645'W	14
400	28 June	25° 25.436'N	170° 24.010'W	15
401	28 June	25° 25.461'N	170° 24.342'W	15
402	28 June	25° 25.473'N	170° 24.676'W	14
403	28 June	25° 25.489'N	170° 25.031'W	14
404	28 June	25° 25.511'N	170° 25.389'W	13
405	28 June	25° 25.546'N	170° 25.760'W	13
406	28 June	25° 25.658'N	170° 26.086'W	12
407	28 June	25° 25.784'N	170° 26.404'W	14
420	29 June	25° 15.499'N	170° 26.408'W	13-14
421	29 June	25° 15.398'N	170° 27.094'W	13-15
422	29 June	25° 15.317'N	170° 27.797'W	13-15
423	29 June	25° 16.006'N	170° 27.545'W	13
424	29 June	25° 16.020'N	170° 27.908'W	13
425	29 June	25° 16.029'N	170° 28.254'W	14
426	29 June	25° 16.035'N	170° 28.626'W	14
427	29 June	25° 16.042'N	170° 28.996'W	14
428	29 June	25° 16.049'N	170° 29.367'W	14
429	29 June	25° 16.059'N	170° 29.735'W	14
430	29 June	25° 16.067'N	170° 30.116'W	14
431	29 June	25° 16.084'N	170° 30.527'W	13
432	29 June	25° 16.100'N	170° 30.906'W	13

Table 2. Maro Reef lobster catch rates (#/trap-night) for strings of 8 traps

Spiny Lobster																				
Quad	1977	1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2-4	5.46	2.23	2.04	2.99	0.35		0.36	0.21	0.29	0.41	0.50	0.32	0.28	0.22	0.29	0.11	0.49	0.65	1.08	1.33
2-6	4.82	3.03	3.08	5.73	0.03		0.00	0.05	0.06	0.12	0.09	0.05	0.32	0.13	0.20	0.18	0.09	0.22	0.48	0.62
4-4												0.04	0.14	0.38		0.11	0.40	0.40	0.99	1.46
4-7	3.17	1.33	3.36	1.83	0.94	0.42	0.91	0.52	0.15	0.02	0.06	0.09	0.12	0.10	0.24	0.14	0.71	0.40	0.87	0.52
5-4														0.48		0.30	0.49		0.73	2.96
5-6	3.43	1.23	2.72	2.23	0.49	0.35	0.59	0.30	0.39	0.15	0.16	0.25	0.14	0.39	0.21	0.22	0.36	0.14	0.64	0.78
6-7	3.60	2.47	3.99	4.16	0.57	0.20	0.60	0.08	0.02	0.01	0.05	0.01	0.02	0.12	0.09	0.06	0.08	0.08	0.06	0.21
mean	4.10	2.06	3.04	3.39	0.48	0.32	0.49	0.23	0.18	0.14	0.17	0.13	0.17	0.26	0.21	0.14	0.37	0.32	0.69	1.13
Slipper Lobster																				
Quad	1977	1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2-4			0.18		0.40		3.54		4.70	3.44	3.00	2.91	4.19	2.12	3.73	3.36	2.20	3.19	1.46	1.64
2-6			0.39		0.57		4.59		3.33	2.66	5.16	4.18	5.59	4.65	9.33	13.65	12.99	8.12	5.05	5.86
4-4												4.28	3.86	1.69		4.96	4.62	5.44	3.25	2.54
4-7			0.05		0.07	0.40	0.51		0.26	0.12	0.66	0.71	0.65	0.56	0.91	0.35	0.23	0.88	0.33	0.49
5-4														2.74		3.20	5.19		0.57	3.16
5-6			0.41		0.07	0.85	1.66		1.56	0.90	4.11	4.34	2.44	2.21	5.94	1.72	1.90	3.26	5.00	5.21
6-7			0.48		0.14	2.74	3.21		2.84	4.65	3.76	3.86	3.81	2.65	4.95	2.95	4.04	5.42	2.55	1.76
mean			0.30		0.25	1.33	2.70		2.54	2.35	3.34	3.38	3.42	2.37	4.97	4.41	4.45	4.39	2.60	2.95

Table 3. Maro Reef lobster catch rates (#/trap-night) for strings of 20 traps

		Spiny Lobster																		
Quad	1977	1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2-4			0.58		0.20		0.26		0.40	0.22	0.55	0.42	0.46	0.73	0.81	0.22	0.86	1.01	1.06	1.75
2-5																	0.28			
2-6			0.37		0.05		0.36		0.00	0.02	0.01	0.00	0.01	0.12	0.01	0.01	0.00	0.02	0.00	0.01
4-4												0.00	0.05	0.35		0.04	0.02	0.16	0.22	0.45
4-7			2.73		0.65	0.51	0.43		0.10	0.08	0.18	0.04	0.11	0.15	0.22	0.10	0.22	0.34	1.21	0.44
5-4														0.15		0.12	0.08		1.46	0.81
5-6			1.50		0.30	0.32	0.60		0.19	0.13	0.18	0.04	0.14	0.25	0.24	0.35	0.18	0.18	0.49	0.79
6-7			0.61		0.67	0.21	0.24		0.02	0.08	0.10	0.20	0.10	0.13	0.06	0.14	0.31	0.18	0.18	0.28
mean			1.16		0.37	0.35	0.38		0.40	0.11	0.20	0.12	0.15	0.27	0.27	0.16	0.24	0.32	0.66	0.65
		Slipper Lobster																		
	1977	1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2-4		0.75	1.63	1.51	2.05		1.14		1.35	1.33	2.15	2.57	3.64	1.05	5.00	3.60	3.64	1.88	1.60	0.97
2-5																	4.48			
2-6		0.25	2.00	0.86	0.02		0.22		0.12	0.12	0.09	0.60	0.71	0.18	0.86	1.52	0.48	1.21	0.46	0.40
4-4												1.50	2.02	1.62		3.05	1.82	2.39	2.29	2.13
4-7		0.22	0.22	0.18	0.57	0.21	1.02		0.38	0.28	0.68	0.68	0.65	0.48	0.86	0.52	0.34	0.71	0.49	0.49
5-4														1.20		6.09	0.70		4.18	1.15
5-6		1.60	1.60	0.70	0.07	1.59	2.30		1.02	0.85	2.15	5.02	2.26	2.12	4.06	4.19	3.15	4.73	4.99	4.49
6-7		1.65	1.75	2.56	2.63	2.26	1.55		0.45	1.88	1.42	2.32	1.87	1.28	1.34	1.08	1.30	1.95	1.26	0.75
mean		0.89	1.44	1.16	1.19	1.35	1.25		0.66	0.89	1.30	2.12	1.86	1.13	2.42	2.18	1.99	2.15	2.18	1.48

Table 4. Necker lobster catch rates (#/trap-night) for strings of 8 traps

		Spiny Lobster															
Quad	1985	1987	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006
2-3									1.19	0.16	0.38	0.32	0.25	0.10	0.18		0.08
2-4										0.52	0.23	0.26	0.21	0.46	0.59	0.09	0.14
3-2									1.12	0.77	0.32	0.41	0.50	0.26		0.09	0.42
3-4										0.38	0.30	0.23	0.49	0.19	0.29	0.06	0.23
3-5									1.35	0.82	0.46	0.65	0.52	0.32	1.08	0.34	0.35
4-4									1.35	1.07	0.78	1.09	1.05	1.55	1.84	0.85	1.08
4-5										1.81	1.50	1.36	1.81	1.16		0.78	0.66
5-5		1.43	1.39	1.54	1.06	0.79	1.29	1.54	0.78	0.45	0.57	0.86	1.15	0.84	1.42	1.05	0.96
5-6		0.21	0.78	1.55	1.31	0.65	0.59	0.76	1.37	1.06	1.18	0.74	1.65	0.04	0.46	0.81	0.26
5-7	2.35	0.85	1.30	2.96	3.61	2.90	2.76	3.00	1.69	1.46	1.82	1.52	1.65	1.74	0.33	0.11	0.38
5-8		4.85	2.73	7.4	9.50	3.34	5.15	4.11	3.34	1.46	1.11	0.96	1.14	0.50	0.32	0.24	0.30
6-5		3.36	0.53	0.59	0.12	0.21	0.34	0.38	0.24	0.05	0.06	1.31	0.15	0.04	0.14	0.20	0.33
6-6		1.46	3.20	5.99	8.41	5.61	4.65	4.50	1.88	1.53	2.16	2.02	1.24	0.44	0.48	0.51	0.35
6-7		2.10							0.94	0.80	0.63	0.66	0.75	0.55	0.02	0.13	0.16
mean	2.35	2.04	1.66	3.34	4.00	2.25	2.46	2.38	1.39	0.88	0.82	0.89	0.90	0.58	0.60	0.40	0.41
		Slipper Lobster															
Quad	1985	1987	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006
2-3									0.30	0.38	0.44	0.52	0.32	0.40	0.26		0.28
2-4										0.22	0.34	0.21	0.20	0.46	0.11	0.16	0.08
3-2									0.55	1.01	0.66	0.71	0.35	0.59		0.28	0.40
3-4										0.16	0.05	0.11	0.16	0.11	0.08	0.08	0.07
3-5									0.44	0.71	0.31	0.41	0.23	0.19	0.05	0.28	0.16
4-4									0.58	1.18	0.71	0.45	0.43	0.72	0.66	0.49	0.48
4-5										0.32	0.24	0.25	0.34	0.32		0.40	0.31
5-5		0.13	0.06	0.26	0.15	0.06	0.16	0.05	0.08	0.15	0.14	0.08	0.10	0.10	0.12	0.15	0.16
5-6		0.16	0.01	0.94	1.15	0.47	0.32	0.41	0.49	0.72	0.83	0.62	0.99	0.88	0.73	0.46	0.45
5-7	0.32	0.20	0.09	0.82	0.89	0.86	0.42	0.27	0.13	0.37	0.28	0.20	0.22	0.55	0.33	0.21	0.46
5-8		0.07	0.04	0.35	0.65	0.37	0.35	0.59	0.21	0.62	0.38	0.54	0.42	0.32	0.40	0.49	0.50
6-5		0.04	0.01	0.22	0.25	0.18	0.42	0.44	0.09	0.08	0.20	0.20	0.19	0.05	0.42	0.09	0.20
6-6		0.10	0.00	0.18	0.41	0.36	0.60	0.76	0.19	0.37	0.32	0.48	0.86	0.44	0.46	0.62	0.29
6-7		0.25							0.29	0.68	0.69	0.62	0.82	0.99	0.41	0.41	0.41
mean	0.32	0.14	0.04	0.46	0.58	0.38	0.38	0.42	0.30	0.50	0.40	0.39	0.40	0.44		0.34	0.32

Table 5. Necker lobster catch rates (#/trap-night) for strings of 20 traps

		Spiny Lobster														
Quad	1987	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006
2-3								0.48	0.11	0.30	0.08	0.41	0.11	0.12		0.05
2-4									0.22	0.36	0.70	0.28	0.06	0.20	0.08	0.02
3-2								0.20	0.11	0.36	0.54	0.38	0.18		0.06	0.06
3-4									0.42	0.19	0.27	0.20	0.59	0.49	0.22	0.16
3-5								0.86	0.23	0.68	0.68	0.38	0.18	0.34	0.10	0.04
4-4								0.08	0.29	0.70	0.13	0.22	0.21	0.20	0.18	0.16
4-5									0.22	0.15	0.00	0.21	0.33		0.37	0.33
5-5	0.70	0.83	1.53	0.99	0.70	1.64	2.24	1.38	0.68	0.95	0.77	0.76	0.98	0.70	0.87	0.72
5-6	0.37	1.21	2.20	0.54		0.69	0.60	0.27	0.65	0.55	0.39	1.05	0.20	0.18	0.18	0.09
5-7	0.63	3.85	1.30	2.09	2.30	2.19	1.18	2.11	0.91	0.24	1.47	1.70	0.66	0.20	0.48	0.35
5-8	5.39	11.75	9.60	4.06	2.92	2.80	2.03	1.40	1.30	0.05	0.38	0.48	0.40	0.03	0.21	0.06
6-5	5.42	9.63	5.90	6.26	7.42	7.50	7.96	3.32	1.16	0.29	0.90	0.12	0.06	0.12	0.78	0.36
6-6	3.00	7.37	2.65	4.63	1.59	8.68	2.22	2.26	1.00	0.75	1.31	0.62	0.27	0.10	0.16	0.25
6-7	2.18							0.87	0.57	1.06	0.95	0.54	0.15	0.22	0.08	0.11
mean	2.53	5.77	3.86	3.10	2.99	3.92	2.71	1.20	0.56	0.47	0.61	0.53	0.31	0.24	0.29	0.20
		Slipper Lobster														
Quad	1987	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006
2-3								0.31	0.15	0.25	0.08	0.18	0.18	0.09		0.16
2-4									0.04	0.25	0.50	0.20	0.19	0.14	0.02	0.44
3-2								0.20	0.10	0.56	0.49	0.32	0.10		0.22	0.12
3-4									0.05	0.06	0.08	0.08	0.09	0.05	0.05	0.01
3-5								0.16	0.07	0.29	0.37	0.30	0.22	0.19	0.05	0.16
4-4								0.11	0.15	0.30	0.08	0.29	0.11	0.22	0.22	0.18
4-5									0.26	0.24	0.05	0.36	0.28		0.10	0.24
5-5	0.23	0.13	0.10	0.19	0.00	0.09	0.11	0.04	0.05	0.06	0.07	0.05	0.06	0.06	0.14	0.09
5-6	0.63	1.10	0.22	0.61		0.68	0.36	0.29	0.22	0.21	0.15	0.19	0.16	0.22	0.18	0.54
5-7	0.43	0.72	0.30	0.44	0.05	0.31	0.01	0.51	0.31	0.12	0.30	0.20	0.25	0.22	0.21	0.31
5-8	0.47	0.95	0.15	0.11	0.12	0.20	0.19	0.05	0.10	0.05	0.23	0.44	0.15	0.18	0.11	0.15
6-5	0.83	0.32	0.50	0.99	0.68	0.80	1.02	0.67	1.45	0.54	0.79	0.34	0.46	0.10	0.81	0.79
6-6	1.12	0.65	0.30	0.66	0.41	1.15	1.64	0.79	0.91	0.94	0.59	0.61	0.44	0.18	0.54	0.19
6-7	1.37							0.30	0.42	0.50	0.62	0.21	0.40	0.61	0.31	0.80
mean	0.73	0.65	0.26	0.50	0.25	0.54	0.56	0.31	0.31	0.31	0.31	0.27	0.22	0.19	0.23	0.30

Table 6. Bottomfishing Stations

Station #	Date	Latitude	Longitude	Depth (fm)
3	7 June	23° 29.087'N	164° 45.464'W	130-170
37	8 June	23° 29.153'N	164° 45.461'W	106-142
56	9 June	23° 27.681'N	164° 36.787'W	50-90
76	10 June	23° 29.415'N	164° 44.792'W	40-130
95	11 June	23° 19.250'N	164° 38.662'W	40-150
270	23 June	25° 19.108'N	170° 47.720'W	58-160
356	26 June	25° 17.281'N	170° 39.524'W	104-157
433	29 June	25° 16.128'N	170° 35.146'W	96-100
434	29 June	25° 17.305'N	170° 39.568'W	108-143