



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL MARINE FISHERIES SERVICE/NOAA FISHERIES**  
Pacific Islands Fisheries Science Center  
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## CRUISE REPORT<sup>1</sup>

**VESSEL:** *Oscar Elton Sette*, Cruise 09-05 (SE-73)

**CRUISE PERIOD:** May 31–June 27, 2009

**AREA OF OPERATION:** Northwestern Hawaiian Islands (NWHI) (Fig. 1)

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

### ITINERARY:

31 May	Start of cruise. On board Ryan Buzzetti, Richard Cardinale, Eric Cruz, Jarrod Davis, Wendy Kordesch, Joshua Lee, Nicole Macias, Garrett McNulty, Robert Moffitt, Jennifer Nannen, and Judy Walker. Departed Pearl Harbor at 1600; started transit to Necker Island.
2 June	Arrived at Necker Island. Commenced lobster trapping and bottomfishing operations.
3-14 June	Continued lobster trapping and commenced bottomfishing operations.
15 June	Hauled lobster traps and departed Necker Island; started transit to Maro Reef.
17 June	Arrived at Maro Reef and commenced lobster trapping and bottomfishing operations.
18-23 June	Continued lobster trapping and bottomfishing operations.

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<sup>1</sup> PIFSC Cruise Report CR-09-014  
Issued 6 August 2009



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|---------|---|
| 24 June | Hauled lobster traps and departed Maro Reef; started transit to Tern Island, French Frigate Shoals.   |
| 25 June | Arrived at Tern Island. Embarked James Bourke, Irene Nurzia-Humburg, Sheri Saari, and David Zabriskie. Started transit to Pearl Harbor, Oahu. |
| 27 June | Arrived in Pearl Harbor, Oahu. 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 1,156 spiny lobster, *Panulirus marginatus*; 3,439 slipper lobster, *Scyllarides squammosus*; 43 ridgeback slipper lobster, *S. haanii*; and 17 Chinese slipper lobster, *Parribacus antarcticus*, were caught in 280 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, each 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 1,116 trap-nights yielding a total of 787 spiny lobster, 2,744 slipper lobster, 7 ridgeback slipper lobster, and 14 Chinese slipper lobster. Catch rates of spiny lobster were moderate at Maro Reef, approximately 0.60 spiny lobster per trap-night for all depths and locations. This is similar to the 2005 value of 0.68 and down from the 2006 and 2007 values of 0.88 and 0.85, respectively. Catch rates of slipper lobster were high at approximately 2.18 slipper lobster per trap-night (continuing a downward trend from 2002 through 2007 with catch rates of 3.29, 3.22, 3.27, 2.38, and 2.26, 2.20, 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 2,057 trap nights yielding 369 spiny lobster, 695 slipper lobster, 36 ridgeback slipper lobster, and 3 Chinese slipper lobster. Catch rates of spiny lobster were very low at 0.18 lobster per trap night (identical

to the 2007 catch rate but lower than the 2003, 2004, 2005, and 2006 catch rates of 0.44, 0.42, 0.34, and 0.30, respectively and considerably lower than the 2001 and 2000 catch rates of 0.71 and 0.83, respectively). The slipper lobster catch rate of 0.34 lobster per trap night was higher than the 2004, 2005, and 2006 catch rates of 0.26, 0.27, and 0.30, respectively and considerably higher than the 2007 catch rate of 0.15. It should be noted that due to a medical evacuation, several of our study sites were not visited in 2007. Since different study sites have varying historical lobster abundances, the 2007 catch rates may not be comparable to other year's rates.

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 was 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 lobster. 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 25 tagged spiny and 23 tagged slipper lobster were caught at Necker and 26 tagged spiny and 102 tagged slipper lobster were caught at Maro Reef.

- D. Conduct bottomfishing and collect biological data.

A total of ten bottomfishing operations (Table 6) were conducted. A total of 49 ehu, *Etelis carbunculus*; 26 hapuupuu, *Epinephelus quernus*; 11 gindai, *Pristipomoides zonatus*; 9 kalekale, *Pristipomoides seiboldii*; 1 yellowtail kalekale, *Pristipomoides auricilla*; 4 kahala, *Seriola dumerili*; 3 nohu, *Pontinus macrocephalus*; 1 uku, *Aprion virescens*; 5 opakapaka, *Pristipomoides filamentosus*; and 5 Butaguchi, *Pseudocaranx dentex* were caught. An additional 18 uku, *Aprion virescens*, were caught using surface trolling gear. Length measurements were taken on all fish. Otoliths and gonads were collected from all of the above except the kahala and nohu. Genetic samples were collected from the opakapaka and butaguchi.

**SCIENTIFIC  
PERSONNEL:**

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

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

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Eric Cruz, Research Technician, JIMAR, UH

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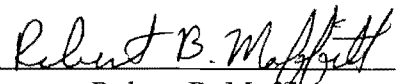
Joshua Lee, Research Technician, JIMAR, UH

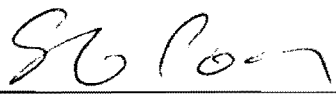
Nicole Macias, Teacher at Sea

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Submitted by:   
Robert B. Moffitt  
Chief Scientist

Approved by:   
Samuel G. Pooley  
Science Director  
Pacific Islands Fisheries Science Center

Attachments

Table 1.--List of lobster trapping stations.

Station #	Date	Latitude	Longitude	Depth (fm)
1	2 June	23°15.148'N	164°20.075'W	17.5
2	2 June	23°15.245'N	164°20.366'W	18
3	2 June	23°15.336'N	164°20.078'W	18
4	2 June	23°15.408'N	164°19.823'W	18
5	2 June	23°15.480'N	164°19.552'W	18
6	2 June	23°15.555'N	164°19.282'W	18
7	2 June	23°15.633'N	164°19.079'W	18
8	2 June	23°15.716'N	164°18.754'W	18
9	2 June	23°15.800'N	164°18.490'W	18
10	2 June	23°15.887'N	164°18.236'W	18
11	2 June	23°14.030'N	164°18.902'W	27.5
12	2 June	23°14.048'N	164°19.597'W	16.5-20
13	2 June	23°14.117'N	164°20.305'W	16.6-25
14	2 June	23°14.185'N	164°21.017'W	25-26
18	3 June	23°17.058'N	164°25.512'W	16.3
19	3 June	23°16.945'N	164°25.245'W	16.1
20	3 June	23°16.829'N	164°25.012'W	15.9
21	3 June	23°16.711'N	164°24.757'W	15.9
22	3 June	23°16.592'N	164°24.493'W	16.1
23	3 June	23°16.467'N	164°24.212'W	16.1
24	3 June	23°16.334'N	164°23.956'W	16.1
25	3 June	23°16.211'N	164°23.704'W	15.8
26	3 June	23°16.093'N	164°23.464'W	15.5
27	3 June	23°15.895'N	164°23.677'W	16.1
28	3 June	23°15.464'N	164°24.974'W	25-28
29	3 June	23°15.593'N	164°25.639'W	26.4-29.4
30	3 June	23°15.729'N	164°26.523'W	17.5-25.2
31	3 June	23°16.020'N	164°27.895'W	26-38.8
36	4 June	23°21.112'N	164°36.597'W	16.5
37	4 June	23°21.167'N	164°36.362'W	15
38	4 June	23°21.228'N	164°36.133'W	17.5
39	4 June	23°21.304'N	164°35.863'W	18
40	4 June	23°21.365'N	164°35.628'W	17
41	4 June	23°21.435'N	164°35.368'W	17
42	4 June	23°21.504'N	164°35.111'W	19
43	4 June	23°21.577'N	164°34.869'W	19
44	4 June	23°21.655'N	164°34.568'W	19.3
45	4 June	23°21.718'N	164°34.339'W	19.5
46	4 June	23°22.435'N	164°34.890'W	17.5-18.5
47	4 June	23°22.253'N	164°35.499'W	17.5-23
48	4 June	23°22.035'N	164°36.096'W	19-32
49	4 June	23°22.243'N	164°36.405'W	12.3-25.9

Station #	Date	Latitude	Longitude	Depth (fm)
56	5 June	23°23.025'N	164°25.102'W	14-15
57	5 June	23°23.002'N	164°25.748'W	14.5-15
58	5 June	23°22.964'N	164°26.385'W	13.5-14.5
59	5 June	23°22.941'N	164°26.034'W	14.5
60	5 June	23°22.940'N	164°27.993'W	14
61	5 June	23°22.939'N	164°28.298'W	15
62	5 June	23°22.943'N	164°28.622'W	15.5
63	5 June	23°22.944'N	164°28.923'W	15
64	5 June	23°22.949'N	164°29.348'W	16
65	5 June	23°22.955'N	164°29.710'W	17
66	5 June	23°22.956'N	164°29.954'W	17
67	5 June	23°22.965'N	164°30.234'W	17.5
68	5 June	23°22.981'N	164°30.501'W	17.5
69	5 June	23°22.988'N	164°30.808'W	17
72	6 June	23°19.719'N	164°16.032'W	17.5
73	6 June	23°19.739'N	164°16.344'W	17.5
74	6 June	23°19.762'N	164°16.631'W	18.5
75	6 June	23°19.785'N	164°16.943'W	18.5
76	6 June	23°19.805'N	164°17.229'W	19.5
77	6 June	23°19.830'N	164°17.534'W	20
78	6 June	23°19.853'N	164°17.872'W	20.5
79	6 June	23°19.868'N	164°18.159'W	21
80	6 June	23°19.883'N	164°18.434'W	21.5
81	6 June	23°19.900'N	164°18.703'W	21.5
82	6 June	23°20.059'N	164°15.726'W	19-28
83	6 June	23°20.740'N	164°15.931'W	18.5-35
84	6 June	23°21.381'N	164°16.099'W	19-36
85	6 June	23°22.094'N	164°16.301'W	19.5-36
90	7 June	23°27.838'N	164°24.338'W	17.5
91	7 June	23°27.939'N	164°24.606'W	18
92	7 June	23°28.033'N	164°24.868'W	18.5
93	7 June	23°28.112'N	164°25.112'W	18
94	7 June	23°28.176'N	164°25.387'W	19
95	7 June	23°28.235'N	164°25.660'W	18
96	7 June	23°28.292'N	164°25.930'W	19
97	7 June	23°28.352'N	164°26.228'W	18
98	7 June	23°28.405'N	164°26.462'W	18
99	7 June	23°28.461'N	164°26.761'W	18
100	7 June	23°27.988'N	164°21.461'W	38
101	7 June	23°28.089'N	164°22.098'W	37-38
102	7 June	23°28.171'N	164°22.708'W	39-41
103	7 June	23°28.218'N	164°23.572'W	34-42
112	8 June	23°31.175'N	164°33.005'W	17.5

Station #	Date	Latitude	Longitude	Depth (fm)
113	8 June	23°31.226'N	164°33.315'W	17.5
114	8 June	23°31.282'N	164°33.619'W	17.5
115	8 June	23°31.325'N	164°33.856'W	17.5
116	8 June	23°31.384'N	164°34.141'W	17.5
117	8 June	23°31.439'N	164°34.396'W	16.5
118	8 June	23°31.495'N	164°34.677'W	17.5
119	8 June	23°31.554'N	164°34.952'W	17.5
120	8 June	23°31.607'N	164°35.220'W	17.8
121	8 June	23°31.667'N	164°35.506'W	16.5
122	8 June	23°33.122'N	164°36.106'W	16.5-17.5
123	8 June	23°33.059'N	164°35.467'W	18
124	8 June	23°33.004'N	164°34.925'W	17.5-19
125	8 June	23°32.953'N	164°34.343'W	17.5
133	9 June	23°36.612'N	164°35.023'W	18.5
134	9 June	23°36.553'N	164°35.278'W	18
135	9 June	23°36.487'N	164°35.555'W	18
136	9 June	23°36.416'N	164°35.840'W	18.5
137	9 June	23°36.352'N	164°36.101'W	18.5
138	9 June	23°36.283'N	164°36.411'W	18
139	9 June	23°36.226'N	164°36.676'W	18
140	9 June	23°36.172'N	164°36.945'W	18
141	9 June	23°36.118'N	164°37.222'W	17.5
142	9 June	23°36.067'N	164°37.497'W	18
143	9 June	23°39.602'N	164°35.679'W	21.5-25
144	9 June	23°39.347'N	164°35.194'W	20-21
145	9 June	23°38.868'N	164°33.886'W	22-23
146	9 June	23°38.444'N	164°33.192'W	23-28.5
153	10 June	23°38.339'N	164°38.151'W	15.2
154	10 June	23°38.354'N	164°38.437'W	15
155	10 June	23°38.354'N	164°38.724'W	15.9
156	10 June	23°38.348'N	164°39.001'W	15.1
157	10 June	23°38.347'N	164°39.299'W	15.3
158	10 June	23°38.342'N	164°39.603'W	15.8
159	10 June	23°38.343'N	164°39.906'W	16
160	10 June	23°38.339'N	164°40.186'W	15.7
161	10 June	23°38.334'N	164°40.499'W	16.2
162	10 June	23°38.334'N	164°40.800'W	15.4
163	10 June	23°39.545'N	164°38.686'W	23-26
164	10 June	23°39.693'N	164°38.065'W	24-26
165	10 June	23°39.817'N	164°37.572'W	27-30
166	10 June	23°39.938'N	164°36.799'W	31.5-32
175	11 June	23°36.912'N	164°44.541'W	16.2
176	11 June	23°36.839'N	164°44.825'W	16.1

Station #	Date	Latitude	Longitude	Depth (fm)
177	11 June	23°36.767'N	164°45.115'W	16
178	11 June	23°36.695'N	164°45.414'W	16
179	11 June	23°36.626'N	164°45.702'W	16.2
180	11 June	23°36.561'N	164°46.007'W	15.6
181	11 June	23°36.494'N	164°46.312'W	16.1
182	11 June	23°36.431'N	164°46.607'W	16.8
183	11 June	23°36.369'N	164°46.900'W	17.5
184	11 June	23°36.307'N	164°47.198'W	18.6
185	11 June	23°37.494'N	164°47.772'W	29.5-30
186	11 June	23°37.474'N	164°47.226'W	30.5-34
187	11 June	23°37.452'N	164°46.618'W	33-35
188	11 June	23°37.429'N	164°46.121'W	23-34
194	12 June	23°31.703'N	164°48.292'W	14.1
195	12 June	23°31.926'N	164°48.391'W	15.8
196	12 June	23°32.133'N	164°48.483'W	15.6
197	12 June	23°32.348'N	164°48.561'W	15.8
198	12 June	23°32.579'N	164°48.644'W	16.2
199	12 June	23°32.830'N	164°48.734'W	16.8
200	12 June	23°33.046'N	164°48.806'W	16.2
201	12 June	23°33.292'N	164°48.893'W	16.2
202	12 June	23°33.506'N	164°48.965'W	16.1
203	12 June	23°33.759'N	164°49.046'W	16.7
204	12 June	23°33.317'N	164°50.969'W	33-34.4
205	12 June	23°32.889'N	164°50.731'W	33-40.8
206	12 June	23°32.471'N	164°50.468'W	32.1-40.8
207	12 June	23°31.992'N	164°50.047'W	32.1-47
211	13 June	23°30.086'N	164°44.034'W	13.2
212	13 June	23°30.061'N	164°44.307'W	12
213	13 June	23°30.039'N	164°44.554'W	13
214	13 June	23°30.013'N	164°44.814'W	12.3
215	13 June	23°29.994'N	164°45.069'W	13
216	13 June	23°29.973'N	164°45.374'W	13.4
217	13 June	23°29.960'N	164°45.607'W	13.2
218	13 June	23°29.929'N	164°45.872'W	13.2
219	13 June	23°29.909'N	164°46.107'W	14.2
220	13 June	23°29.885'N	164°46.358'W	14.2
221	13 June	23°29.432'N	164°45.952'W	13.2-13.3
222	13 June	23°29.551'N	164°45.332'W	12.7-17.6
223	13 June	23°29.663'N	164°44.780'W	19.3-25.3
224	13 June	23°29.714'N	164°44.225'W	26.1-32.5
230	14 June	23°30.348'N	164°39.854'W	13.5
231	14 June	23°30.314'N	164°40.127'W	13.7
232	14 June	23°30.280'N	164°40.395'W	13.5



Station #	Date	Latitude	Longitude	Depth (fm)
233	14 June	23°30.241'N	164°40.653'W	13.2
234	14 June	23°30.200'N	164°40.941'W	13.4
235	14 June	23°30.165'N	164°41.179'W	13.7
236	14 June	23°30.139'N	164°41.447'W	13.8
237	14 June	23°30.108'N	164°41.720'W	12.8
238	14 June	23°30.080'N	164°41.953'W	13.2
239	14 June	23°30.057'N	164°42.200'W	13.3
240	14 June	23°29.763'N	164°42.086'W	28.5-34.7
241	14 June	23°29.728'N	164°41.491'W	16.8-26.2
242	14 June	23°29.673'N	164°40.866'W	15.7-24.5
243	14 June	23°29.638'N	164°40.283'W	22.3-22.7
249	17 June	25°16.049'N	170°28.173'W	13.8
250	17 June	25°16.048'N	170°28.424'W	14.2
251	17 June	25°16.051'N	170°28.692'W	14.3
252	17 June	25°16.049'N	170°28.949'W	15.0
253	17 June	25°16.045'N	170°29.204'W	14.4
254	17 June	25°16.054'N	170°29.480'W	14.9
255	17 June	25°16.057'N	170°29.736'W	14.6
256	17 June	25°16.063'N	170°30.015'W	14.2
257	17 June	25°16.066'N	170°30.271'W	13.8
258	17 June	25°16.064'N	170°30.538'W	13.6
259	17 June	25°15.345'N	170°28.039'W	13.7-13.8
260	17 June	25°15.478'N	170°27.451'W	13.7-15
261	17 June	25°15.669'N	170°26.858'W	13.9-14.6
262	17 June	25°15.855'N	170°26.317'W	14.7-14.9
274	18 June	25°17.612'N	170°37.567'W	15.3
275	18 June	25°17.718'N	170°37.849'W	15.4
276	18 June	25°17.808'N	170°38.093'W	16.5
277	18 June	25°17.900'N	170°38.340'W	16.5
278	18 June	25°17.992'N	170°38.588'W	17
279	18 June	25°18.081'N	170°38.834'W	16.4
280	18 June	25°18.175'N	170°39.077'W	16.5
281	18 June	25°18.261'N	170°39.312'W	17.5
282	18 June	25°18.357'N	170°39.566'W	16.8
283	18 June	25°18.439'N	170°39.782'W	15.6
284	18 June	25°17.744'N	170°39.399'W	27.5-29.7
285	18 June	25°17.547'N	170°38.889'W	27.7-30.5
286	18 June	25°17.356'N	170°38.347'W	27-30
287	18 June	25°17.168'N	170°37.768'W	27-30.5
299	19 June	25°28.810'N	170°43.542'W	17.5
300	19 June	25°28.673'N	170°43.788'W	17.8
301	19 June	25°28.555'N	170°43.997'W	17.5
302	19 June	25°28.416'N	170°44.225'W	18

Station #	Date	Latitude	Longitude	Depth (fm)
303	19 June	25°28.294'N	170°44.431'W	18
304	19 June	25°28.148'N	170°44.669'W	19.8
305	19 June	25°28.027'N	170°44.869'W	19.5
306	19 June	25°27.886'N	170°45.096'W	20.5
307	19 June	25°27.758'N	170°45.301'W	20.5
308	19 June	25°27.617'N	170°45.531'W	20.5
309	19 June	25°26.363'N	170°46.127'W	20.5
310	19 June	25°26.670'N	170°45.645'W	19.9-20.8
311	19 June	25°26.988'N	170°45.159'W	20.5-20.8
312	19 June	25°27.274'N	170°44.705'W	19.5-20
316	20 June	25°37.348'N	170°45.741'W	17.5
317	20 June	25°37.297'N	170°46.066'W	17.5
318	20 June	25°37.239'N	170°46.349'W	17.6
319	20 June	25°37.176'N	170°46.631'W	17.5
320	20 June	25°37.114'N	170°46.914'W	17.6
321	20 June	25°37.041'N	170°47.251'W	18
322	20 June	25°36.975'N	170°47.550'W	18
323	20 June	25°36.921'N	170°47.822'W	18.6
324	20 June	25°36.868'N	170°48.098'W	18.2
325	20 June	25°36.813'N	170°48.387'W	17.5
326	20 June	25°38.156'N	170°46.415'W	27.5-28
327	20 June	25°38.203'N	170°45.817'W	26-27
328	20 June	25°38.218'N	170°45.311'W	25-25.5
329	20 June	25°38.225'N	170°44.794'W	25
338	21 June	25°34.471'N	170°39.521'W	15.5
339	21 June	25°34.352'N	170°39.754'W	15.6
340	21 June	25°34.225'N	170°39.999'W	15.7
341	21 June	25°34.094'N	170°40.253'W	14.7
342	21 June	25°33.964'N	170°40.499'W	16.5
343	21 June	25°33.833'N	170°40.750'W	16.6
344	21 June	25°33.707'N	170°40.988'W	16.3
345	21 June	25°33.571'N	170°41.238'W	15.8
346	21 June	25°33.445'N	170°41.474'W	18.3
347	21 June	25°33.313'N	170°41.729'W	15.7
348	21 June	25°33.474'N	170°38.804'W	15-15.6
349	21 June	25°33.671'N	170°38.348'W	15-16.5
350	21 June	25°33.888'N	170°37.855'W	16
351	21 June	25°34.130'N	170°37.325'W	15.5-16.5
363	22 June	25°31.832'N	170°28.475'W	27.5-28.5
364	22 June	25°31.528'N	170°28.072'W	28-29
365	22 June	25°31.196'N	170°27.645'W	29.5
366	22 June	25°30.780'N	170°27.114'W	30-30.5
367	22 June	25°27.616'N	170°27.652'W	15

Station #	Date	Latitude	Longitude	Depth (fm)
368	22 June	25°27.859'N	170°27.873'W	15
369	22 June	25°28.021'N	170°28.015'W	14.8
370	22 June	25°28.162'N	170°28.142'W	14.7
371	22 June	25°28.348'N	170°28.305'W	14.5
372	22 June	25°28.555'N	170°28.489'W	15
373	22 June	25°28.730'N	170°28.646'W	15
374	22 June	25°28.925'N	170°28.818'W	14.8
375	22 June	25°29.105'N	170°28.969'W	15.2
376	22 June	25°29.283'N	170°29.110'W	14.5
391	23 June	25°25.448'N	170°23.817'W	17.7
392	23 June	25°25.468'N	170°24.077'W	17.6
393	23 June	25°25.478'N	170°24.278'W	17.5
394	23 June	25°25.492'N	170°24.534'W	17.7
395	23 June	25°25.501'N	170°24.777'W	18
396	23 June	25°25.509'N	170°25.031'W	17.5
397	23 June	25°25.513'N	170°25.278'W	16.9
398	23 June	25°25.523'N	170°25.514'W	16.8
399	23 June	25°25.539'N	170°25.781'W	17
400	23 June	25°25.552'N	170°26.030'W	15.8
401	23 June	25°25.628'N	170°22.857'W	22.5-27.5
402	23 June	25°25.181'N	170°22.514'W	22.5-26
403	23 June	25°24.760'N	170°22.153'W	28-31.5
404	23 June	25°24.334'N	170°21.794'W	33.5-36.5

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	2007	2009
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	1.40	1.04
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	1.10	0.09
4-4												0.04	0.14	0.38		0.11	0.40	0.40	0.99	1.46	0.96	0.81
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	0.78	0.41
5-4														0.48		0.30	0.49		0.73	2.96	2.04	3.02
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	1.01	1.00
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	0.15	0.11
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	1.06	0.93

Slipper Lobster																						
Quad	1977	1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2009
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	1.50	2.67
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	4.35	9.85
4-4												4.28	3.86	1.69		4.96	4.62	5.44	3.25	2.54	4.30	5.66
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	0.30	0.05
5-4														2.74		3.20	5.19		0.57	3.16	3.84	3.79
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	4.84	2.55
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	2.55	1.74
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	3.10	3.76

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	2007	2009
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	1.81	1.30
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	0.00	.01
4-4												0.00	0.05	0.35		0.04	0.02	0.16	0.22	0.45	0.23	.41
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	0.53	.34
5-4														0.15		0.12	0.08		1.46	0.81	0.58	.51
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	1.10	.71
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	0.24	.09
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	0.64	0.48

Slipper Lobster																						
	1977	1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2009
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	1.02	1.65
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	0.09	.26
4-4												1.50	2.02	1.62		3.05	1.82	2.39	2.29	2.13	1.99	1.83
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	0.52	.09
5-4														1.20		6.09	0.70		4.18	1.15	0.79	.85
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	3.24	2.06
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	1.43	1.32
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	1.30	1.15

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	2007	2009
2-3									1.19	0.16	0.38	0.32	0.25	0.10	0.18		0.08	0.06	0.04
2-4										0.52	0.23	0.26	0.21	0.46	0.59	0.09	0.14	0.16	0.26
3-2									1.12	0.77	0.32	0.41	0.50	0.26		0.09	0.42	0.22	0.10
3-4										0.38	0.30	0.23	0.49	0.19	0.29	0.06	0.23	0.14	0.06
3-5									1.35	0.82	0.46	0.65	0.52	0.32	1.08	0.34	0.35	0.21	0.13
4-4									1.35	1.07	0.78	1.09	1.05	1.55	1.84	0.85	1.08		0.80
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		0.49
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	0.22	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	0.34	0.31
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		0.20
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		0.17
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		0.29
6-7		2.10							0.94	0.80	0.63	0.66	0.75	0.55	0.02	0.13	0.16		0.09
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	0.19	0.25

Slipper Lobster																			
Quad	1985	1987	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006	2007	2009
2-3									0.30	0.38	0.44	0.52	0.32	0.40	0.26		0.28	0.13	0.39
2-4										0.22	0.34	0.21	0.20	0.46	0.11	0.16	0.08	0.03	0.09
3-2									0.55	1.01	0.66	0.71	0.35	0.59		0.28	0.40	0.21	0.24
3-4										0.16	0.05	0.11	0.16	0.11	0.08	0.08	0.07	0.01	0.01
3-5									0.44	0.71	0.31	0.41	0.23	0.19	0.05	0.28	0.16	0.16	0.31
4-4									0.58	1.18	0.71	0.45	0.43	0.72	0.66	0.49	0.48		0.93
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		0.04
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	0.23	0.50
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	0.33	0.51
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		0.46
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		0.16
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		0.53
6-7		0.25							0.29	0.68	0.69	0.62	0.82	0.99	0.41	0.41	0.41		0.29
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	0.16	0.34

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	2007	2009
2-3								0.48	0.11	0.30	0.08	0.41	0.11	0.12		0.05	0.10	0.00
2-4									0.22	0.36	0.70	0.28	0.06	0.20	0.08	0.02	0.23	0.06
3-2								0.20	0.11	0.36	0.54	0.38	0.18		0.06	0.06	0.13	0.13
3-4									0.42	0.19	0.27	0.20	0.59	0.49	0.22	0.16	0.08	0.06
3-5								0.86	0.23	0.68	0.68	0.38	0.18	0.34	0.10	0.04	0.06	0.10
4-4								0.08	0.29	0.70	0.13	0.22	0.21	0.20	0.18	0.16		0.00
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		0.29
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	0.34	0.23
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	0.26	0.16
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		0.00
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		0.23
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		0.19
6-7	2.18							0.87	0.57	1.06	0.95	0.54	0.15	0.22	0.08	0.11		0.03
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	0.17	0.11

Slipper Lobster																		
Quad	1987	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006	2007	2009
2-3								0.31	0.15	0.25	0.08	0.18	0.18	0.09		0.16	0.09	0.30
2-4									0.04	0.25	0.50	0.20	0.19	0.14	0.02	0.44	0.29	0.31
3-2								0.20	0.10	0.56	0.49	0.32	0.10		0.22	0.12	0.19	0.41
3-4									0.05	0.06	0.08	0.08	0.09	0.05	0.05	0.01	0.00	0.01
3-5								0.16	0.07	0.29	0.37	0.30	0.22	0.19	0.05	0.16	0.12	0.09
4-4								0.11	0.15	0.30	0.08	0.29	0.11	0.22	0.22	0.18		0.05
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		0.07
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	0.18	0.21
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	0.13	0.44
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		0.10
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		1.24
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		0.59
6-7	1.37							0.30	0.42	0.50	0.62	0.21	0.40	0.61	0.31	0.80		0.50
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	0.14	0.33

Table 6.--Bottomfishing stations.

Station #	Date	Latitude	Longitude	Depth (fm)
15	2 June	23°15.354'N	164°26.232'W	35-140
32	3 June	23°15.064'N	164°23.791'W	30-100
50	4 June	23°29.060'N	164°38.576'W	57-110
147	9 June	23°29.613'N	164°41.901'W	65-105
167	10 June	23°29.660'N	164°43.436'W	60-100
189	11 June	23°28.905'N	164°46.602'W	48-65
226	13 June	23°30.315'N	164°48.192'W	63-140
247	17 June	25°16.282'N	170°34.509'W	41-119
263	17 June	25°15.982'N	170°34.712'W	47-106
288	18 June	25°15.990'N	170°34.696'W	50-98
405	23 June	25°15.840'N	170°334.004'W	56-100



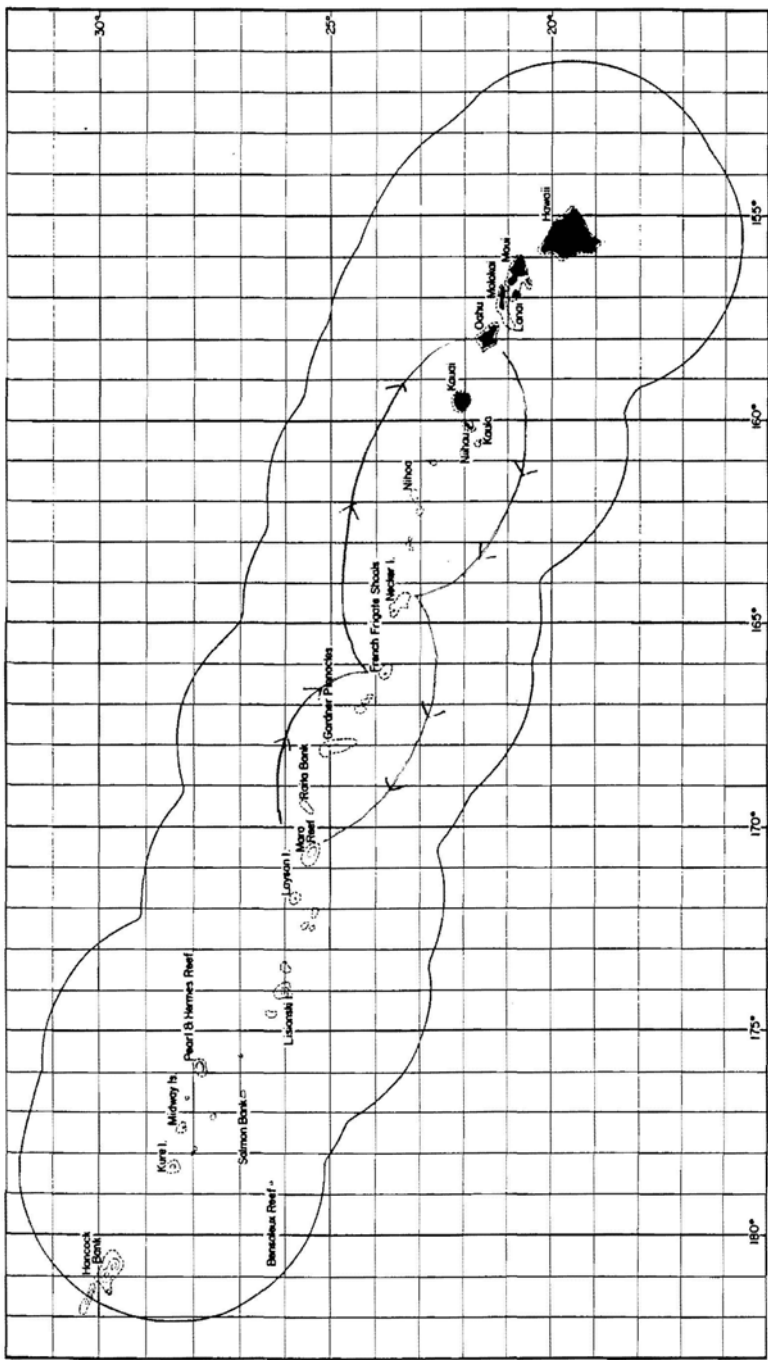


Figure 1.--Track of the NOAA Ship Oscar Elton Sette cruise SE-09-05 (SE-73), May 31 to June 27, 2009.