



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL MARINE FISHERIES SERVICE**  
Pacific Islands Fisheries Science Center  
2570 Dole St. • Honolulu, Hawaii 96822-2396  
(808) 983-5300 • Fax: (808) 983-2902

## CRUISE REPORT<sup>1</sup>

**VESSEL:** *Oscar Elton Sette*, Cruise OES-07-05 (OES-53)

**CRUISE PERIOD:** June 13–July 12, 2007

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

### ITINERARY:

13 June	Start of cruise. On board Michael Burns, Meaghan Darcy, Caleb Elrod, Margaret Flanagan, Matthew Iachhei, Garrett McNulty, Robert Moffitt, Christopher Monsour, Ryan Nichols, Christine Palmeri, and Justin Reinicke. Departed Pearl Harbor at 1600; started transit to Tern Island, French Frigate Shoals.
15 June	Arrived at Tern Island and off-loaded supplies. Continued transit to Maro Reef.
16 June	Arrived at Maro Reef; commenced lobster trapping operations in quad 4-7 at 1800.
17-22 June	Continued lobster trapping and commenced bottomfishing operations.



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<sup>1</sup>PIFSC Cruise Report CR-07-014  
Issued 13 August 2007

23 June	Hauled lobster traps and departed Maro Reef; started transit to Necker Island.
25 June	Arrived at Necker Island and commenced lobster trapping and bottomfishing operations.
26-27 June	Continued lobster trapping and bottomfishing operations.
28 June	Hauled lobster traps and departed Necker Island; started transit to Lisianski Island in response to a request for a medical evacuation of Protected Species Division camper Jon Sprague.
30 June	Arrived at Lisianski Island. Embarked Jon Sprague and Angie Kaufman. Started transit to Midway Island.
1 July	Arrived at Midway Island at 1600. Disembarked Angie Kaufman. She will finish her field season at Midway. Jon Sprague on board until medivac flight arrives.
2 July	Disembarked Jon Sprague at 2330.
3 July	Departed Midway at 0800. Started return to Necker Island.
6 July	Arrived Necker Island. Commenced lobster trapping and bottomfishing operations.
7-9 July	Continued lobster trapping and bottomfishing operations.
10 July	Hauled lobster gear and headed towards Pearl Harbor, Oahu.
12 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 1,158 spiny lobster, *Panulirus marginatus*; 2,624 slipper lobster, *Scyllarides squammosus*; 18 ridgeback slipper lobster, *S. haanii*; and 24 Chinese slipper lobster, *Parribacus antarcticus*, were caught in 196 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 1,118 trap-nights yielding a total of 955 spiny lobster, 2,458 slipper lobster, 7 ridgeback slipper lobster, and 8 Chinese slipper lobster. Catch rates of spiny lobster were moderate at Maro Reef, approximately 0.85 spiny lobster per trap-night for all depths and locations. This is up from the 2005 value of 0.68 and nearly identical to the 2006 value of 0.88. Catch rates of slipper lobster were high at approximately 2.20 slipper lobster per trap-night (down from 2002, 2003, 2004, 2005, and 2006 catch rates of 3.29, 3.22, 3.27, 2.38, and 2.26, 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 1,111 trap-nights yielding 203 spiny lobster, 166 slipper lobster, 11 ridgeback slipper lobster, and 16 Chinese slipper lobster. Catch rates of spiny lobster were very low at 0.18 lobster per trap-night (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 0.15 lobster per trap night was considerably lower than the 2004, 2005, and 2006 catch rates of 0.26, 0.27, and 0.30, respectively. It should be noted that due to a medical evacuation, several of our study sites were not visited. Since different study sites have varying historical lobster abundances, the 2007 catch rates may not be comparable to previous 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 7 tagged spiny and 5 tagged slipper lobster were caught and released at Necker and 34 tagged spiny and 114 tagged slipper lobster were caught and released at Maro Reef.

D. Conduct bottomfishing and collect biological data.

A total of 11 bottomfishing operations (Table 6) were conducted. A total of 68 ehu, *Etelis carbunculus*; 6 hapuupuu, *Epinephelus quernus*; 14 gindai, *Pristipomoides zonatus*; 7 kalekale, *Pristipomoides seiboldii*; 1 yellowtail kalekale, *Pristipomoides auricilla*; 10 kahala, *Seriola dumerili*; 1 nohu, *Pontinus macrocephalus*; 6 uku, *Aprion virescens*; 4 opakapaka, *Pristipomoides filamentosus*; and 2 Butaguchi, *Pseudocaranx dentex* were caught. An additional 31 uku, *Aprion virescens*, were caught using surface trolling gear. Length measurements were taken on all fish. Genetic samples, otolith, dorsal spine, and gonad samples were collected from selected fishes.

E. Collect spiny and slipper lobster for shore based morphometric and biological studies.

A total of 50 spiny and 50 slipper lobster were collected at Maro Reef, frozen, and returned to the Science Center for additional morphometric and biological studies. An additional 18 spiny and 17 slipper lobster were collected at Necker Island, frozen, and returned to the Science Center for these studies.

F. Collect genetic material from select crustacean and fish species (including from those bottomfish listed above).

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

Species	# Necker	# Maro Reef
<i>Panulirus marginatus</i>	18	33
<i>Panulirus penicillatus</i>	0	1
<i>Scyllarides squammosus</i>	2	18
<i>Scyllarides haanii</i>	11	6
<i>Calcinus laurentae</i>	2	0
<i>Dardanus sanguinocarpus</i>	1	0
<i>Unidentified pagurid</i>	1	0
<i>Gymnothorax steindachneri</i>	0	11
<i>Gymnothorax flavimarginatus</i>	0	10
<i>Gymnothorax meleagris</i>	2	0
<i>Gymnothorax eurostus</i>	0	1
<i>Gymnothorax albimarginatus</i>	0	6
<i>Gymnothorax berndti</i>	1	0
<i>Lutjanus kasmira</i>	27	2
<i>Aprion virescens</i>	26	11
<i>Epinephelus quernus</i>	0	3
<i>Etelis carbunculatus</i>	3	2

Species	# Necker	# Maro Reef
<i>Pristipomoides auricilla</i>	1	0
<i>Pristipomoides seiboldii</i>	4	3
<i>Pristipomoides filamentosus</i>	1	3
<i>Pristipomoides zonatus</i>	2	11
<i>Pseudocaranx dentex</i>	1	1
<i>Pontinus macrocephalus</i>	1	0
<i>Synodus doaki</i>	1	0
<i>Melichthys vidua</i>	1	0

**SCIENTIFIC  
PERSONNEL:**

Robert B. Moffitt, Chief Scientist, Pacific Islands Fisheries Science Center (PIFSC),  
National Marine Fisheries Service (NMFS)  
Michael S. Burns, Research Technician, Joint Institute for Marine and Atmospheric Research  
(JIMAR)  
Meaghan Darcy, Research Technician, JIMAR  
Caleb Elrod, Research Technician, JIMAR  
Matthew Iacchei, Research Technician, JIMAR  
Garrett McNulty, Research Technician, JIMAR  
Christopher Monsour, Teacher-at-Sea  
Ryan Nichols, Fishery Biologist, PIFSC, NMFS  
Christine Palmeri, Research Technician, JIMAR  
Justin Reinicke, Research Technician, JIMAR  
Margaret Flanagan, Teacher-at-Sea

(/s/Robert B. Moffitt)

Submitted by: \_\_\_\_\_  
Robert B. Moffitt  
Chief Scientist

(/s/Samuel G. Pooley)

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

Attachments

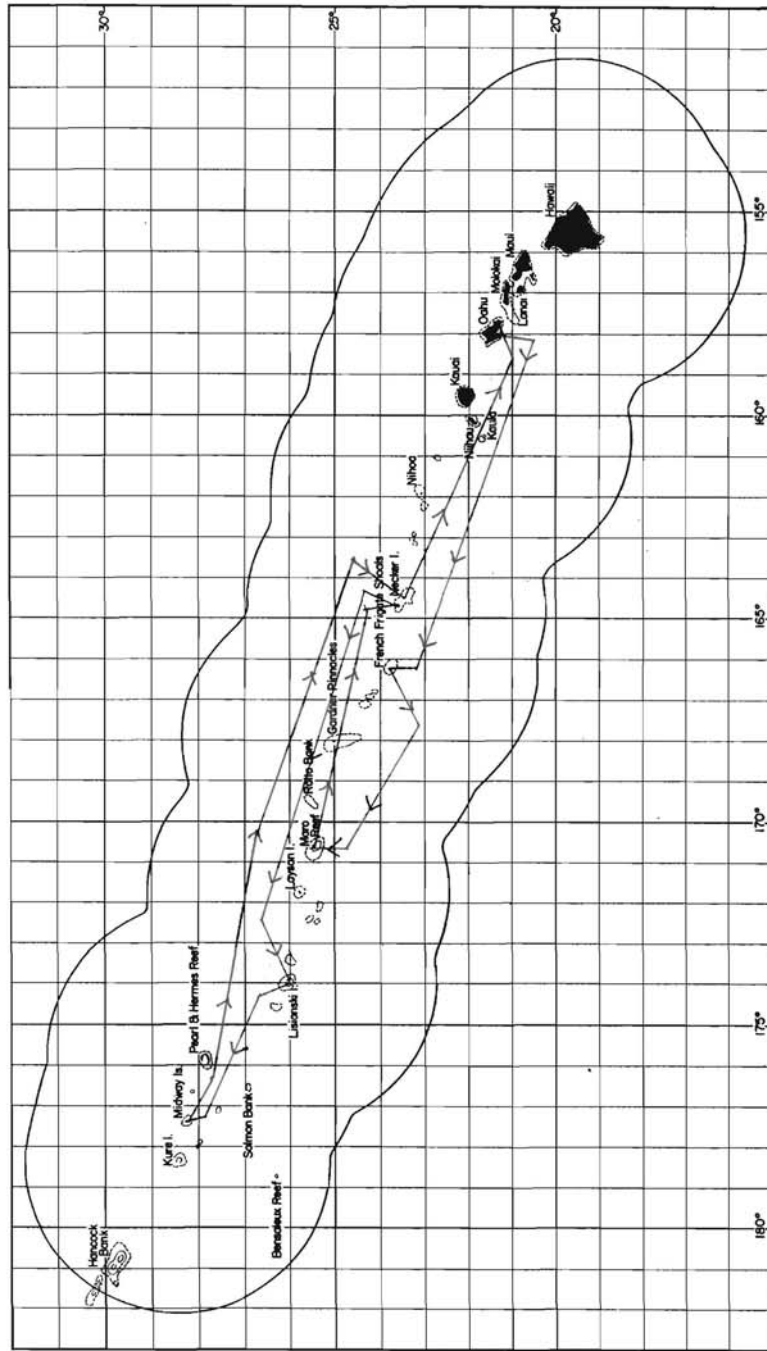


Figure 1.--Track of the NOAA ship Oscar Elton Sette cruise OES-07-05 (OES-53), June 13 to July 12, 2007.

Table 1.--List of Lobster Trapping Stations

Station #	Date	Latitude	Longitude	Depth (fm)
1	16 June	25°28.719'N	170°43.233'W	15
2		25°28.499'N	170°43.540'W	15
3		25°28.287'N	170°43.823'W	15
4		25°28.096'N	170°44.100'W	17
5		25°27.916'N	170°44.362'W	17
6		25°27.595'N	170°44.823'W	18
7		25°27.425'N	170°45.060'W	18
8		25°27.246'N	170°45.310'W	14
9		25°27.086'N	170°45.546'W	17
10		25°26.894'N	170°45.828'W	17
11		25°26.595'N	170°45.518'W	18-18
12		25°26.944'N	170°44.962'W	17-18
13		25°27.317'N	170°44.384'W	14-16
14		25°27.693'N	170°43.780'W	15-16
22	17 June	25°37.795'N	170°45.693'W	16
23		25°37.661'N	170°46.015'W	16
24		25°37.529'N	170°46.306'W	16
25		25°37.397'N	170°46.618'W	15
26		25°37.274'N	170°46.909'W	15
27		25°37.143'N	170°47.219'W	16
28		25°37.022'N	170°47.504'W	16
29		25°36.900'N	170°47.801'W	16
30		25°36.771'N	170°48.111'W	16
31		25°36.636'N	170°48.433'W	16
32		25°38.233'N	170°46.348'W	27-29
33		25°38.244'N	170°45.623'W	24-25
34		25°38.269'N	170°44.868'W	25-25
35		25°38.289'N	170°44.212'W	24-28
47	18 June	25°34.682'N	170°39.152'W	14
48		25°34.522'N	170°39.445'W	13
49		25°34.377'N	170°39.717'W	13
50		25°34.236'N	170°39.983'W	13
51		25°34.098'N	170°40.248'W	13
52		25°33.953'N	170°40.531'W	14
53		25°33.811'N	170°40.802'W	15
54		25°33.660'N	170°41.082'W	14
55		25°33.509'N	170°41.362'W	11
56		25°33.365'N	170°41.630'W	16
57		25°33.449'N	170°38.812'W	13-14
58		25°33.708'N	170°38.245'W	14-14

Station #	Date	Latitude	Longitude	Depth (fm)
59		25°33.974'N	170°37.672'W	14-14
60		25°34.250'N	170°37.106'W	14-15
78	19 June	25°32.298'N	170°29.419'W	20-25
79		25°31.954'N	170°28.887'W	19-19
80		25°31.637'N	170°28.351'W	20-24
81		25°31.312'N	170°27.849'W	23-24
82	19 June	25°27.740'N	170°27.828'W	13
83		25°27.945'N	170°28.034'W	13
84		25°28.177'N	170°28.242'W	13
85		25°28.392'N	170°28.438'W	13
86		25°28.618'N	170°28.646'W	14
87		25°28.847'N	170°28.858'W	12
88		25°29.074'N	170°29.059'W	12
89		25°29.297'N	170°29.264'W	12
90		25°29.538'N	170°29.473'W	11
91		25°29.767'N	170°29.650'W	11
108	20 June	25°25.487'N	170°24.032'W	15
109		25°25.492'N	170°24.343'W	15
110		25°25.502'N	170°24.609'W	15
111		25°25.511'N	170°24.868'W	15
112		25°25.519'N	170°25.139'W	15
113		25°25.530'N	170°25.463'W	14
114		25°25.541'N	170°25.776'W	14
115		25°25.553'N	170°26.016'W	12
116		25°25.565'N	170°26.271'W	14
117		25°25.576'N	170°26.556'W	15
118		25°25.338'N	170°22.599'W	22-24
119		25°24.898'N	170°22.251'W	22-25
120		25°24.403'N	170°21.928'W	27-28
121		25°23.876'N	170°21.665'W	28-28
138	21 June	25°15.469'N	170°26.424'W	13-14
139		25°15.396'N	170°27.085'W	14-14
140		25°15.325'N	170°27.730'W	14-19
141		25°15.261'N	170°28.356'W	20-23
142		25°16.048'N	170°28.063'W	15
143		25°16.047'N	170°28.375'W	14
144		25°16.040'N	170°28.699'W	15
145		25°16.046'N	170°29.010'W	15
146		25°16.047'N	170°29.324'W	15
147		25°16.040'N	170°29.645'W	15
148		25°16.056'N	170°29.991'W	15
149		25°16.065'N	170°30.307'W	14
150		25°16.077'N	170°30.639'W	14



Station #	Date	Latitude	Longitude	Depth (fm)
151		25°16.089'N	170°30.948'W	14
169	22 June	25°17.506'N	170°37.274'W	14
170		25°17.609'N	170°37.550'W	13
171		25°17.693'N	170°37.792'W	14
172		25°17.816'N	170°38.127'W	14
173		25°17.896'N	170°38.359'W	15
174		25°17.988'N	170°38.621'W	14
175		25°18.081'N	170°38.885'W	15
176		25°18.174'N	170°39.145'W	14
177		25°18.271'N	170°39.412'W	15
178		25°18.365'N	170°39.674'W	15
179		25°17.621'N	170°39.230'W	27-30
180		25°17.425'N	170°38.632'W	27-28
181		25°17.232'N	170°38.046'W	27-28
182	22 June	25°17.043'N	170°37.424'W	28-33
196	25 June	23°21.439'N	164°35.220'W	17
197		23°21.355'N	164°35.567'W	17
198		23°21.265'N	164°35.896'W	16
199		23°21.175'N	164°36.214'W	16
200		23°21.091'N	164°36.524'W	15
201		23°21.008'N	164°36.818'W	15
202		23°20.909'N	164°37.140'W	19
203		23°20.814'N	164°37.437'W	35
204		23°21.815'N	164°34.479'W	18
205		23°21.714'N	164°34.774'W	17
206		23°22.288'N	164°35.537'W	16-16
207		23°21.998'N	164°36.138'W	18-29
208		23°22.443'N	164°35.383'W	17-17
209		23°22.710'N	164°34.773'W	17-17
217	26 June	23°30.372'N	164°39.792'W	14
218		23°30.325'N	164°40.119'W	14
219		23°30.294'N	164°40.431'W	13
220		23°30.273'N	164°40.724'W	13
221		23°30.247'N	164°41.042'W	13
222		23°30.217'N	164°41.380'W	14
223		23°30.185'N	164°41.693'W	13
224		23°30.153'N	164°41.996'W	14
225		23°30.118'N	164°42.299'W	13
226		23°30.079'N	164°42.633'W	14
227		23°29.864'N	164°42.614'W	29-30
228		23°29.806'N	164°42.022'W	29-30
229		23°29.770'N	164°41.464'W	21-30
230		23°29.612'N	164°40.887'W	24-64

Station #	Date	Latitude	Longitude	Depth (fm)
237	27 June	23°30.112'N	164°43.613'W	14
238		23°30.099'N	164°43.891'W	14
239		23°30.067'N	164°44.200'W	13
240		23°30.043'N	164°44.519'W	13
241		23°30.016'N	164°44.826'W	13
242		23°29.984'N	164°45.139'W	13
243		23°29.957'N	164°45.448'W	13
244		23°29.938'N	164°45.777'W	14
245		23°29.919'N	164°46.096'W	14
246		23°29.896'N	164°46.402'W	15
247		23°29.442'N	164°46.502'W	26-27
248		23°29.088'N	164°46.057'W	29-36
249		23°29.244'N	164°45.497'W	30-36
250		23°29.515'N	164°45.014'W	22-28
256	6 July	23°23.105'N	164°23.626'W	15-16
257		23°23.051'N	164°24.252'W	15-15
258		23°23.019'N	164°24.866'W	14-15
259		23°23.001'N	164°25.502'W	14-15
260		23°22.995'N	164°26.892'W	12
261		23°23.001'N	164°27.168'W	13
262		23°23.008'N	164°27.435'W	13
263		23°23.016'N	164°27.725'W	13
264	6 July	23°23.020'N	164°28.021'W	13
265		23°23.029'N	164°28.329'W	13
266		23°23.032'N	164°28.650'W	14
267		23°23.043'N	164°28.963'W	14
268		23°23.056'N	164°29.251'W	14
269		23°23.068'N	164°29.565'W	14
276	7 July	23°22.589'N	164°16.658'W	19-21
277		23°22.017'N	164°16.452'W	20-30
278		23°21.509'N	164°16.252'W	30-30
279		23°20.973'N	164°16.053'W	30-32
280		23°19.921'N	164°16.348'W	17
281		23°19.861'N	164°16.671'W	17
282		23°19.806'N	164°16.997'W	17
283		23°19.753'N	164°17.288'W	18
284		23°19.695'N	164°17.602'W	19
285		23°19.636'N	164°17.918'W	18
286		23°19.579'N	164°18.237'W	19
287		23°19.519'N	164°18.551'W	19
288		23°19.464'N	164°18.871'W	19
289		23°19.413'N	164°19.185'W	19
297	8 July	23°15.731'N	164°18.650'W	18

Station #	Date	Latitude	Longitude	Depth (fm)
298		23°15.640'N	164°18.950'W	19
299		23°15.547'N	164°19.260'W	18
300		23°15.454'N	164°19.581'W	18
301		23°15.358'N	164°19.902'W	19
302		23°15.261'N	164°20.217'W	19
303		23°15.168'N	164°20.546'W	18
304		23°15.073'N	164°20.868'W	18
305		23°14.982'N	164°21.176'W	17
306		23°14.887'N	164°21.505'W	17
307		23°14.256'N	164°21.728'W	22-27
308		23°14.180'N	164°21.184'W	18-26
309		23°14.117'N	164°20.537'W	17-18
310		23°14.040'N	164°19.984'W	20-24
315	9 July	23°16.541'N	164°24.428'W	17
316		23°16.679'N	164°24.702'W	17
317		23°16.823'N	164°24.992'W	17
318		23°16.960'N	164°25.277'W	17
319		23°17.095'N	164°25.554'W	17
320		23°17.230'N	164°25.826'W	17
321		23°17.368'N	164°26.105'W	17
322		23°17.509'N	164°26.382'W	17
323		23°17.649'N	164°26.653'W	17
324		23°17.796'N	164°26.943'W	18
325		23°15.972'N	164°27.581'W	18-18
326		23°15.853'N	164°26.987'W	19-20
327		23°15.745'N	164°26.429'W	24-27
328		23°15.641'N	164°25.788'W	23-27

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
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
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
4-4												0.04	0.14	0.38		0.11	0.40	0.40	0.99	1.46	0.96
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
5-4														0.48		0.30	0.49		0.73	2.96	2.04
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
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
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

Slipper Lobster																					
Quad	1977	1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
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
2-6			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
4-4												4.28	3.86	1.69		4.96	4.62	5.44	3.25	2.54	4.30
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
5-4														2.74		3.20	5.19		0.57	3.16	3.84
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
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
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

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
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
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
4-4												0.00	0.05	0.35		0.04	0.02	0.16	0.22	0.45	0.23
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
5-4														0.15		0.12	0.08		1.46	0.81	0.58
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
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
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

Slipper Lobster																					
Quad	1977	1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
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
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
4-4												1.50	2.02	1.62		3.05	1.82	2.39	2.29	2.13	1.99
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
5-4														1.20		6.09	0.70		4.18	1.15	0.79
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
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
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

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
2-3									1.19	0.16	0.38	0.32	0.25	0.10	0.18		0.08	0.06
2-4										0.52	0.23	0.26	0.21	0.46	0.59	0.09	0.14	0.16
3-2									1.12	0.77	0.32	0.41	0.50	0.26		0.09	0.42	0.22
3-4										0.38	0.30	0.23	0.49	0.19	0.29	0.06	0.23	0.14
3-5									1.35	0.82	0.46	0.65	0.52	0.32	1.08	0.34	0.35	0.21
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	0.22
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
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	0.19

Slipper Lobster																		
Quad	1985	1987	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006	2007
2-3									0.30	0.38	0.44	0.52	0.32	0.40	0.26		0.28	0.13
2-4										0.22	0.34	0.21	0.20	0.46	0.11	0.16	0.08	0.03
3-2									0.55	1.01	0.66	0.71	0.35	0.59		0.28	0.40	0.21
3-4										0.16	0.05	0.11	0.16	0.11	0.08	0.08	0.07	0.01
3-5									0.44	0.71	0.31	0.41	0.23	0.19	0.05	0.28	0.16	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	0.23
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
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	0.16

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
2-3								0.48	0.11	0.30	0.08	0.41	0.11	0.12		0.05	0.10
2-4									0.22	0.36	0.70	0.28	0.06	0.20	0.08	0.02	0.23
3-2								0.20	0.11	0.36	0.54	0.38	0.18		0.06	0.06	0.13
3-4									0.42	0.19	0.27	0.20	0.59	0.49	0.22	0.16	0.08
3-5								0.86	0.23	0.68	0.68	0.38	0.18	0.34	0.10	0.04	0.06
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	0.34
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
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	0.17

Slipper Lobster																	
Quad	1987	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006	2007
2-3								0.31	0.15	0.25	0.08	0.18	0.18	0.09		0.16	0.09
2-4									0.04	0.25	0.50	0.20	0.19	0.14	0.02	0.44	0.29
3-2								0.20	0.10	0.56	0.49	0.32	0.10		0.22	0.12	0.19
3-4									0.05	0.06	0.08	0.08	0.09	0.05	0.05	0.01	0.00
3-5								0.16	0.07	0.29	0.37	0.30	0.22	0.19	0.05	0.16	0.12
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	0.18
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
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	0.14

Table 6.--Bottomfishing Stations

Station #	Date	Latitude	Longitude	Depth (fm)
123	20 June	25°14.808'N	170°32.513'W	109-114
153	21 June	25°17.252'N	170°39.543'W	100-114
184	22 June	25°18.269'N	170°43.751'W	57-62
211	25 June	23°18.846'N	164°38.921'W	60-130
212	25 June	23°17.640'N	164°37.980'W	62-100
232	26 June	23°29.237'N	164°45.242'W	40-130
233	26 June	23°29.471'N	164°46.807'W	124-127
252	27 June	23°31.064'N	164°48.784'W	80-139
271	6 July	23°18.651'N	164°39.037'W	60-184
272	6 July	23°17.439'N	164°38.275'W	130-155
273	6 July	23°17.859'N	164°38.200'W	36-75