

August 25, 2000

F/SWC2:RBM:DHY
CR9304-1.RBM

CRUISE REPORT

VESSEL: *Townsend Cromwell*, Cruise 93-04 (TC-182)

CRUISE PERIOD: June 4-July 5, 1993

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

TYPE OF OPERATION: Personnel from the Southwest Fisheries Center (SWFSC) Honolulu Laboratory (HL), National Marine Fisheries Service (NMFS), NOAA conducted trapping, trawling, snorkeling, shark tagging and video camera drop operations in the waters of the Northwestern Hawaiian Islands. Supplies and personnel were delivered to and retrieved from field camps on Tern Island, Lisianski Island, Laysan Island, and Pearl and Hermes Reef.

ITINERARY:

4 June Start of cruise. On board were Robert Dollar, Wayne Haight, Kelly Hastings, Victor Honda, Robert Moffitt, Frank Parrish, Michael Shulman, Roberta Swift, and Danial VanRavenswaay. Departed Snug Harbor at 1000 and proceeded to Necker Island.

6 June Arrived at Necker Island. Commenced lobster trapping, trawling, and tagging operations.

7-11 June Continued trapping, tagging, bottom fishing, and camera drop operations.

12 June Finished fishing operations. Departed Necker Island and proceeded to French Frigate Shoals.

13 June Arrived at Tern Island, French Frigate Shoals. Disembarked Hastings and Swift. Departed French Frigate Shoals and proceeded to Maro Reef.

14 June Arrived at Maro Reef. Commenced trapping, tagging, bottom fishing and camera drop operations.

15-23 June Continued trapping, tagging, bottom fishing, and camera drop operations.

24 June Departed Maro Reef. Proceeded to Laysan Island.

25 June Arrived at Laysan Island. Embarked Karen Lombard, John Klavitter, and Paul Armstrong. Departed Laysan Island and proceeded to Lisianski Island.

26 June Arrived at Lisianski Island. Embarked Babette Fahey and Heather Johnston. Departed Lisianski Island and proceeded to Pearl and Hermes Reef.

27 June Arrived at Pearl and Hermes Reef. Off-loaded supplies to the field camp and disembarked Armstrong, Fahey, Johnston, Klavitter, and Lombard. Commenced pearl oyster survey.

28 June Concluded pearl oyster survey. Departed Pearl and Hermes Reef and proceeded to Midway Island.

29 June Arrived at Midway Island at 1100. Disembarked Dollar, Haight, Honda, Moffitt, Parrish, Shulman, and VanRavenswaay. Departed Midway Island and proceeded to Pearl and Hermes Reef.

30 June Arrived at Pearl and Hermes Reef. Embarked Armstrong, Fahey, Johnston, Klavitter, and Lombard. Departed Pearl and Hermes Reef and proceeded to Tern Island, French Frigate Shoals.

3 July Arrived at Tern Island. Disembarked Johnston. Embarked Patrick Ching, Shawn Ferry, Lisa Hiruki, Susan Pultz, and Alyssa Ward. Departed French Frigate Shoals and proceeded to Snug Harbor, Oahu.

5 July Arrived at Snug Harbor, Honolulu, Oahu at 1330. End of cruise.

MISSIONS AND RESULTS:

- A. Conduct lobster trapping operations at selected sites in the NWHI using plastic lobster traps.
 1. Collect data on abundance and species composition of trap-captured lobster at two banks in the NWHI to compare with results of previous years.

A total of 148 lobster trapping stations were conducted 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 to 2 lb of cut mackerel and soaked overnight at depths of 10-80 fm.

Catch rates of legal spiny lobster were low at Maro Reef (0.21 per trap-night) with catch rates of sublegal spiny lobster catch rates also low (ca 0.16 per trap-night). Catch rates of legal slipper lobster were rather high at Maro Reef (1.33 per trap-night) with sublegal catch rates also high (ca 0.48 per trap-night). This year's catch rates of both species were higher than last year's, which was a very poor spiny lobster but good slipper lobster year for Maro Reef. The 1993 catch rate of sublegal spiny lobster is about 3-4 times that of 1992 but still low, indicating that a recovery of the stocks may be occurring, but at a slow pace.

Catch rates of legal and sublegal spiny lobster were almost identical to 1992 values for Necker Island (ca 0.41 per trap-night for legal lobsters and 2.66 per trap-night for sublegal lobsters). 1993 Slipper lobster catch rates at Necker Island were slightly higher than 1992 values (ca 0.39 per trap-night for legal and 0.10 for sublegal).

In general, 1993 catch rates for both locations and species were similar to 1990 catch rates and somewhat higher than 1992 catch rates.

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

Carapace length and tail width measurements were recorded for approximately 4,025 spiny and 2,025 slipper lobster. It was noted during data collection that this year smaller lobster appeared to be berried at Maro Reef than in previous years. Analysis of the data will be needed to confirm or reject this impression, however, a record small berried female (28 mm tail width (TW)) was taken this year. In the past females measuring 35-40 mm TW were uncommon and considered very small.

3. Conduct lobster trapping in shallow waters, on the barrier reef and inside Maro Reef lagoon.

A total of 4 stations were occupied in shallow water (0.5-3.5 m) on the barrier reef and inside the Maro Reef lagoon. Fifteen traps were set singly at each station. Traps were baited with mackerel and soaked for one night. Lobster were counted, sexed, and measured from each trap. A total of 244 *Panulirus marginatus*, 59 *P. penicillatus*, and 25 *Scyllarides squammosus* were caught for catch rates of 4.01, 0.98, and 0.42 lobster per trap-night for each species, respectively, and an overall catch rate of 5.47 lobster per trap-night. The majority of these lobsters were large, legal individuals. These catch rates are much higher than those obtained on the fishing grounds. Implications are that while the shallow waters are not utilized as a nursery area, they may represent a sizable breeding refuge.

4. Conduct lobster trapping at depths of 100-200-m.

This year some lobster traps were set in the 100-200 m depth range. These traps yielded few spiny lobster at most locations. Catches of the ridge-back slipper lobster, *Scyllarides haanii*, were much greater than at shallower depths (as much as 1.00 lobster per trap-night). These traps also caught an abundance of hermit crabs (many of the genus *Dardanus*).

B. Describe lobster habitats to compare habitat type with lobster abundance and habitat status of previous years.

A total of 33 video camera drops were conducted over lobster trapping sites.

C. Collect lobster larvae to add to information regarding phyllosome distribution within the Hawaiian Archipelago.

A single trawl was conducted using an OSU rope trawl. Trawls were scheduled to be conducted near the surface at night in the four compass directions about 25 nmi from the 100-fm contours of Maro Reef and Necker Island. During the first tow the bag blew out and was deemed irreparable.

D. Collect lobster for use in egg stripping and tank tagging studies.

Approximately 150 lobster were collected and transported back to Honolulu for tank tagging studies.

Berried female lobster were collected for use in egg stripping determination studies.

- E. Collect abundance data on pearl oysters in Pearl and Hermes lagoon.

A total of 30 living pearl oysters were collected from Pearl and Hermes lagoon and transported back to Oahu for various ageing and breeding studies. During snorkeling surveys, three sites in the lagoon were surveyed with reported densities of 0.12, 1.42, and 2.5 per diver-hour. In general, pearl oysters were found singly, associated with a sand-rock interface at depths of 1-4 m. Two sites located further to the north of the lagoon had turbid water and greater oyster abundances than a clear water site located nearer the center of the lagoon.

- F. Collect gonad samples from bottom fish.

Gonads were collected from several specimens of *Etelis carbunculus*, *E. coruscans*, *Pristipomoides sieboldii*, *Epinephelus quernus*, and *Psuedocaranx dentex*.

- G. Tag and observe sharks following the vessel during lobster trapping operations.

Sharks were observed daily during lobster trapping operations. They were easily baited in close to the vessel and tagged with streamer tags. Tagged sharks rarely were seen at new locations and then only in adjacent areas, suggesting that they do not follow the vessel around the bank, but rather new batches of resident sharks are attracted to the vessel each day.

SCIENTIFIC PERSONNEL:

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Attachments