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CRUISE REPORT

VESSEL: *Townsend Cromwell*, Cruise TC-93-07 (TC-185)

CRUISE PERIOD: 4 October-3 November 1993

AREA OF OPERATION: Southeast (SE) Hancock Seamount and Nero Seamount (Fig. 1)

TYPE OF OPERATION: At SE Hancock, personnel from the Honolulu Laboratory (HL), Southwest Fisheries Science Center (SWFSC), National Marine Fisheries Service (NMFS), NOAA, used bottom longline gear equipped with hook-timers to assess the abundance of armorhead at this seamount. Upon completion of this work a 2-day port call was taken at Midway Islands. After port call, the *Townsend Cromwell* did not return to SE Hancock to participate in the planned cooperative U.S.-Japan trawl survey there due to logistical problems encountered by the Japanese vessel. Instead, after the Midway Islands port call a 4-day bottom longline survey of snapper/grouper and armorhead resources was conducted at Nero Seamount. Upon completion of this work, the ship returned to Honolulu.

ITINERARY:

- 04 October - Departed Snug Harbor, Honolulu, at 1300 and proceeded to SE Hancock Seamount. On board Alan R. Everson, Robert L. Humphreys Jr., Paul M. Shiota, and Happy A. Williams.
- 10 October - Arrived SE Hancock Seamount. Began 13 consecutive days of daylight bottom longline operations over the summit and upper slopes of the seamount.
- 22 October - Completed bottom longline operations at SE Hancock Seamount. In afternoon, began transit to Midway Islands.

- 23 October - Arrived Midway Islands. Port call.
- 25 October - Departed Midway Islands and proceeded to Nero Seamount. Began bathymetric survey over central and southern portion of seamount.
- 26 October - Completed bathymetric survey over central and southern portions of Nero Seamount. Began daylight bottom longline operations over summit and slopes of seamount.
- 29 October - Completed bottom longline operations at Nero Seamount. In afternoon, departed for Snug Harbor, Honolulu.
- 03 November - Arrived Snug Harbor, Honolulu at 1430; end of cruise. Disembarked Everson, Humphreys, Shiota, and Williams.

MISSIONS AND RESULTS:

- A. Stock assessment of armorhead, *Pseudopentaceros wheeleri*, at SE Hancock Seamount.

A total of 48 bottom longline sets were conducted during daylight hours over the summit and upper slopes of SE Hancock Seamount. Sets were deployed such that gear is aligned perpendicular to bottom contours. Effort was conducted within four depth strata: <265 m, 265-300 m, 301-400 m, and 401-500 m. A standard bottom longline set consisted of a 550-m groundline to which 30 2.9-m-long polyvinyl chloride (PVC) tube droppers were attached at 18-m intervals. Droppers were weighted on the bottom and buoyed with a small float on the other end to ensure that each dropper stood upright on the bottom while fishing. Each dropper consisted of five No. 20 Izuo circle hooks baited with cut squid. Hooks were linked to a magnetic plunger which in turn was linked to a resin-encased digital watch timer. Exertion of a pulling force >1 kg on the hook releases the magnetic plunger from the resin encased timer unit. Release of the magnet triggers the reed switch inside the resin encased timer unit and activates the timer. Depth recorders (maximum pressure gauges or electronic TDR units) were placed at both ends of the gear just before the groundline.

Malfunctioning of hook timer units was low (ca. 30); however, losses were high (ca. 280). Losses were primarily due to bottom entanglement, particularly during two of the sets

conducted. A total of 2,133 fish were caught on bottom longline gear during the armorhead stock assessment survey at SE Hancock Seamount; armorhead accounted for 89.3% of the total catch. Preliminary results indicate that highest and lowest catches occurred in the 265-300-m and 410-500-m depth strata, respectively.

- B. Conduct cooperative U.S.-Japan research trawl survey of armorhead population at the Hancock Seamounts for comparison with bottom longline-derived stock assessment data.

Cooperative plans between the NMFS, HL and the National Research Institute of Far Seas Fisheries in Shimizu, Japan called for 10-12 randomly directed bottom trawls of 10 minutes duration (bottom time) to be conducted at SE and again at Northwest Hancock Seamounts. These trawls were to be conducted by the vessel *Meishou Maru No. 128*, under research charter to the National Research Institute of Far Seas Fisheries. During bottom longline operations at SE Hancock, word was received that the *Meishou Maru No. 128* would be arriving at the Hancock Seamounts late, after the scheduled departure of the *Townsend Cromwell*. No alternatives were available, and the planned trawl work at the Hancock Seamounts was canceled. The *Meishou Maru No. 128* will conduct chartered research trawl survey work at seamounts outside the U.S. EEZ in international waters, and these data will be made available to the NMFS, HL after completion of the charter cruise.

- C. Conduct bottom longline survey for snapper/grouper species and possible armorhead resource at Nero Seamount.

In lieu of the canceled cooperative U.S.-Japan armorhead trawl survey work at the Hancock Seamounts, the available time was used to conduct a bottom longline survey of Nero Seamount. Depth coverage of the bottom longline sets included the primary summit (64-m depth), the secondary summit (approximately 130-m depth), and along the slopes beyond the secondary summit to a depth of some 550 m. Sets were conducted primarily along the outer portions of two finger-like extensions of the secondary summit. Operation and configuration of the bottom longline gear were the same as conducted at SE Hancock with two exceptions: 1) no hook timer units, and 2) larger hooks were used (No. 28 Izu). A total of 18 bottom longline sets were conducted at Nero Seamount which yielded a total catch of 188 fish representing some 22 different species. The catch consisted primarily of ehu, *Etelis carbunculus* (42%), and hapuupuu, *Epinephelus quernus* (20%). Two armorhead and several other specimens of deeper seamount species typically found at the Hancock Seamounts were collected at depths >365 m.

D. Miscellaneous observations and activities.

1. Occurrence of Birds, Aquatic Mammals, and Fish Log was maintained by ship's officers and crew during the cruise.
2. Standard weather observations were made every hour and synoptic weather at 0000, 0600, 1200, and 1800 (GMT) by the ship's officers and crew.
3. A total of 250 pairs of sagittal otoliths, 250 liver samples (for mtDNA analysis), and 50 pairs of eyes were collected from armorhead caught at SE Hancock Seamount. Additionally, whole frozen armorhead (n = 125) were collected for later analysis, including a sample of 60 armorhead requested by National Research Institute of Far Seas Fisheries of Japan.
4. From Nero Seamount, sagittal otoliths were collected from 76 *Etelis carbunculus*, 15 *Epinephelus quernus*, and 8 *Pristipomoides filamentosus*. Liver samples were taken from 50 *Etelis carbunculus*, 45 *Epinephelus quernus*, and 8 *Pristipomoides filamentosus*.
5. Fatness index (ratio of body depth at first anal spine to fork length) of armorhead catch at SE Hancock Seamount appeared lower than expected, ranging primarily between 0.21 and 0.23. Higher fatness index fish (>0.26), indicative of new recruits, were present but little represented in the catch.
6. The current regime of the water over SE Hancock and Nero Seamount, measured via the acoustic Doppler current profiler (ADCP), was continuously recorded and frequently monitored. While at SE Hancock, high southerly directed subsurface currents (50-100 cm/s) were encountered during the first 6 days. These currents declined to some 20 cm/s during the remaining 7 days at SE Hancock. Slack currents throughout the water column were encountered during our stay at Nero Seamount.
7. The newly installed SEAPLOT system was used extensively during the cruise and aided in displaying newly acquired bathymetric data and the deployment of bottom longline gear at both SE Hancock and Nero Seamounts.

**SCIENTIFIC
PERSONNEL:**

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Attachment

