

June 13, 2002

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CRUISE REPORT

VESSEL: *Townsend Cromwell*, Cruise 02-03, Leg II (TC-277)

CRUISE PERIOD: 24-30 May 2002

AREA OF OPERATION: Kona coast off the Island of Hawaii (Fig. 1)

TYPE OF OPERATION: Daylight operations consisted of larval billfish surface tows targeting coastal surface slicks with a 6-ft. Issacs-Kidd (IK) trawl towed from the ship and 1-m neuston tows and dip-netting conducted from the ship's safeboat. Night operations entailed deploying conductivity-temperature-depth (CTD) casts in conjunction with conducting midwater IK trawls for gelatinous zooplankton and surface 1-meter ring net tows targeting billfish eggs.

ITINERARY:

- 24 May Embarked Robert Humphreys, Eric Lynn, Kristina Mojica, Mike Musyl, Robert Nishimoto, Anita Sederstrom, and Happy Williams. Departed Snug Harbor at 1400 and proceeded to Kailua-Kona, Island of Hawaii.
- 25 May Arrived on site at 0800 and embarked Andrew West from Kailua-Kona pier. Commenced larval billfish collections using surface IK tows from the ship and small boat operations both targeting surface slicks off the Kona coast. At nightfall, commenced nightly operations that included midwater IK trawls for gelatinous zooplankton, CTD casts, and 1-meter ring net tows for billfish eggs.
- 26-28 May Continued daily schedule of daylight surface IK tows from ship and neuston tows and dip-netting from ship's small boat for billfish larvae and nighttime midwater IK trawls for gelatinous zooplankton and CTD casts; no further 1-meter ring net tows were conducted.

- 29 May Ended daylight surface tows at 1400 and disembarked West at Kailua-Kona pier; then proceeded back to Snug Harbor, Honolulu.
- 30 May Arrived Snug Harbor, Honolulu at 0815. Disembarked Humphreys, Lynn, Mojica, Musyl, Nishimoto, Sederstrom, and Williams; end of cruise.

MISSIONS AND RESULTS:

- A. Collect larval billfish specimens associated with surface slicks along the Kona coast of Hawaii.

A total of 45 daylight 1-hour surface IK trawls were conducted targeting coastal surface slicks (when available) between Keahole Point (19° 43'N latitude) to the north and Auau Point (19° 18'N latitude) to the south. Thirteen swordfish larvae and 64 istiophorid larvae were captured during daylight IK trawls. Two swordfish larvae and seven istiophorid larvae were captured during small boat operations yielding a total of 15 swordfish larvae and 71 istiophorid larvae captured during this cruise. A number of other species of fishes, primarily larval and juvenile stages of pelagic fish species, were incidentally captured. Surface IK tows were conducted primarily at a speed of 4.0 knots.

- B. Conduct at-sea trials of laboratory procedures for the genetic identification of billfish eggs and larvae.

This was the second cruise (beginning with TC 01-06) where trials of a molecular-based method to identify billfish larvae at sea in near-real time were conducted. The method is based on a PCR (polymerase chain reaction)-RFLP (restriction fragment length polymorphism) laboratory technique published by Seinen Chow in 1994 for identifying among all six Pacific billfish species. Eyeballs from 110 istiophorid larvae were removed for DNA extraction and purification; only 4 larvae were positively identified. The DNA product from the remaining 106 istiophorid larvae was either insufficient or of poor quality for PCR amplification, enzyme restriction, and subsequent electrophoretic identification to species.

- C. Conduct night 1-meter ring net tows for billfish eggs off the Kona coast.

Two 1-meter ring net tows conducted at night using a 0.505 mm mesh plankton net yielded no billfish or other fish eggs.

- D. Conduct nighttime 6-ft. Issacs-Kidd midwater tows for gelatinous zooplankton.

Eleven midwater tows targeting depths of 10 m (two 30-minute tows), 40 m (four 1-hour tows), and 100 m (five 1-hour tows) collected a variety of gelatinous zooplankton species.

- E. Conduct CTD casts off the Kona coast.

In conjunction with the aforementioned midwater tows for gelatinous zooplankton, six CTD casts using the SeaCat system were conducted to 500 m depth.

**SCIENTIFIC
PERSONNEL:**

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Attachment

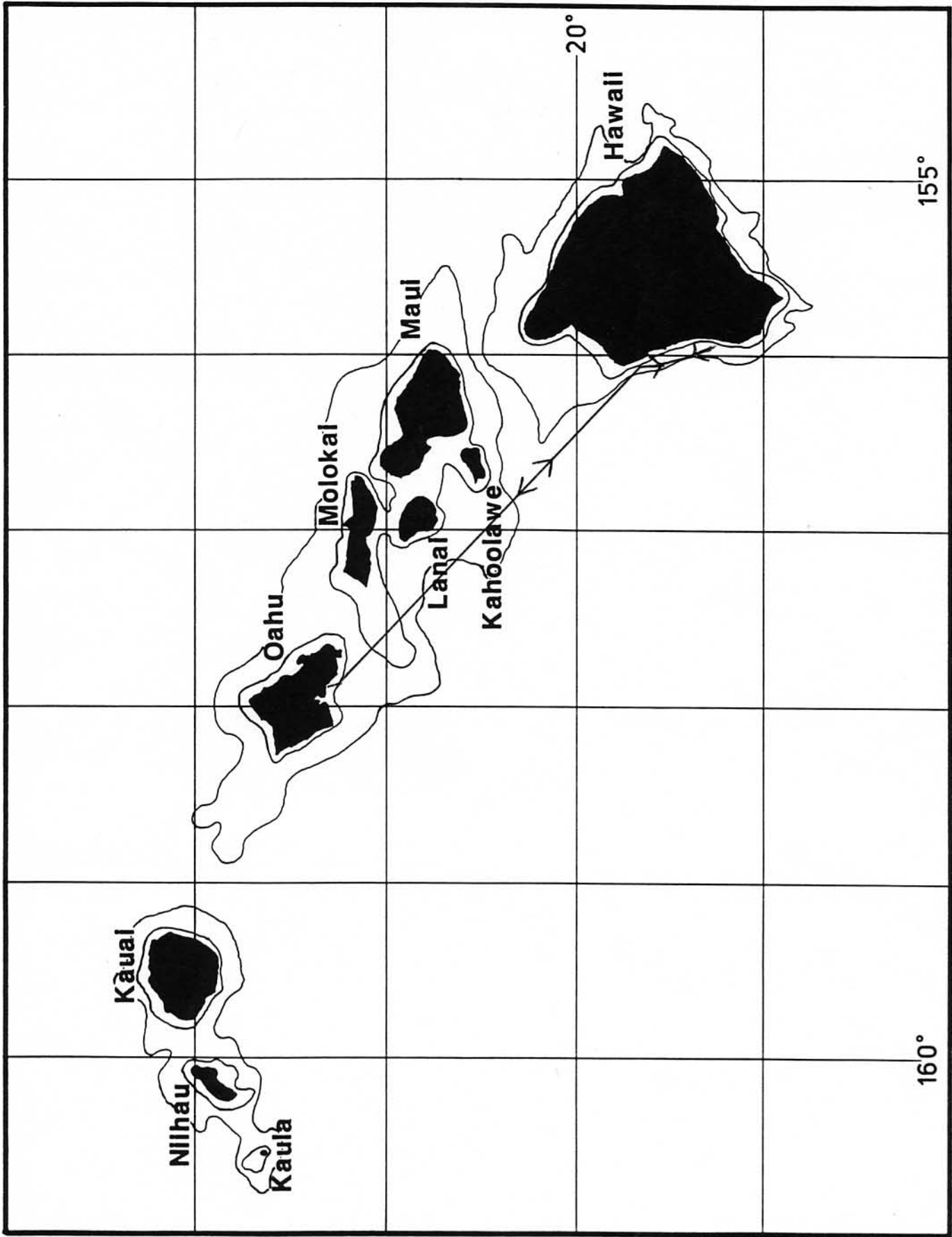


Figure 1.--Track of the NOAA ship Townsend Cromwell Cruise TC-02-03, Leg II (TC-277), May 24-30, 2002.