HAWAII UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT MISSION NO. P5-461

MISSION STATUS

Location: Northeastern corner of Raita Bank, NWHI

Mission Date: 9/15/01

Maximum Depth: 407 meters

Project Title: The Impact of Bottomfishing on the Raita and West St. Rogatien RPAs in the NWHI Coral Reef Ecosystem Reserve: Initial Survey and Identification of Study Sites

Principal Investigator: Alexander Malahoff/Christopher Kelley

Address: Hawaii Undersea Research Laboratory

Phone: 956-6802/956-7437

Observer 1: Walter Ikehara **Observer 2:** Bruce Mundy

Address: Hawaii DLNR **Address:** NMFS SWFSC Honolulu

Scientific Data Acquired: Prepare an abstract outlining your objectives, techniques, findings, etc.

Objectives

The primary objective of this mission was to identify a long-term study site on the northeastern side of Raita Bank to assess the impacts of commercial bottomfishing on the bank's coral reef ecosystem. The secondary objectives were:

1) To obtain a baseline estimate of the number and types of bottomfish species present at the site.

2) To obtain a baseline estimate of other species of fish and invertebrate species present at the site that might be impacted by bottomfishing.

3) To obtain a baseline estimate of the amount of bottomfishing debris (i.e. fishing line, weights, anchors, anchor lines, miscellaneous trash, etc.) on the site.

Techniques

The GPS coordinates for the dive had been provided by a commercial fisherman prior to the mission. To locate the exact depth to establish a long- term study site, the Pisces V initially descended to 407 m on a deep sediment substrate and conducted an upslope transect diagonally along a northerly course to 157 m. Sediment samples were collected at the deep and shallow ends of this transect. At around 300 m, carbonate outcrops were encountered, with *Erythrocles scintillans* and *Plesionika martia*. We continued with the transect. Because no further suitable bottomfish habitat was found, a return exploratory transect was surveyed in the opposite direction diagonally from 157 m to 298 m, to find the carbonate structures where bottomfish were observed. Based on fish and habitat observations, the submersible conducted two 30 minute contour transects in opposing directions at ca. 301 m, first to the south and then to the north. Following these transects, two 30 minute bait stations were conducted at two sites where bottomfish had been observed in numbers, at 304 m and 299 m. By the end of the second bait station, only an hour remained for completion of the dive. This second station was at the edge of a large undersea canyon that was habitat for numbers of bottomfish. The remaining hour was spent exploring this canyon to document its extent and the numbers of bottomfish in the vicinity.

During each transect, the two observers and pilot audibly identified and counted all fish and invertebrate species visible through their windows and made audible observations on the substrate type and characteristics. The video camera was positioned on the slope to make a video record of both animals and substrate types as well. Potential bait station sites were identified during the transects. The submersible then returned to the sites and set out 5 lb bait bags and the bait station marker and size reference (i.e. "the pumpkin"). Two bait bags were deployed at the first bait station and four at the second. The pilot then established a position approximately 3-4 m from the pumpkin and turned out the lights. A CCD camera was used in addition to the digital and Panasonic cameras to record the fish and invertebrates attracted to the bait. After 30 minutes, the lights were turned on and the pumpkin was recovered. For general habitat characterization, close up images of animals were obtained with the digital camera each time the submersible came to a stop. Furthermore, the submersible's position was recorded at 10 minute intervals during each transect and radioed down to the sub where it was imprinted on the audio portion of the videotape.

Findings

Observations of onaga and ehu during the 30 minute, 297-301 m deep transects confirmed that the dive location was a bottomfishing site, although appropriate bottomfish habitat at this dive location was restricted to a few areas of limited extent within a narrow depth range. Most of the area surveyed during the first three hours of the dive consisted of soft-sediment substrate with few visible organisms. Submersible occupants described the sediment area as: "Stultifyingly barren, boring, lifeless expanses of sand. Like something out of "Beau Geste". It was truly the "Goby Desert," since not even gobies were seen." This result, although negative, is important for describing the extent of bottomfish habitat at this bank.

Bottomfish species were observed only in the carbonate canyon habitat in the 300 m level, where the transects and bait stations were conducted. This location was recommended by bottomfish fishermen and was the only suitable bottomfish habitat found on the entire dive. Of the species observed, most were onaga and ehu which were seen in almost equal abundance (30+ individuals observed). The first bait station attracted five ehu, one hapuupuu, two onaga, and one *Gymnothorax nuttingi*. The second bait station, at the edge of the large canyon, attracted onaga and ehu in abundance (16 and 17 individuals at maximum count, respectively). A couple of hapu`u groupers and a *Gymnothorax nuttingi* moray eel were the only other species seen at this station. With respect to other fish and invertebrate species, the most abundant were *Symphysanodon maunaloae* (1000's) and G*rammatonotus sp* 1 which are common in main Hawaiian Island bottomfishing areas, and *Plesionika martia* and other unidentified shrimp (100's). All of these are suspected prey species for onaga and ehu. *Erthyrocles scintillans* were also observed in the carbonate canyons. The substrate at most depths during this dive was composed primarily of soft sediment over low relief carbonate outcrops but at 270-320 m this soft-sediment was interspersed with a few high-relief canyons and ridges. As with other stations at Raita Bank, there was an almost complete lack of cnidarians growing on these outcrops. The only debris observed was a ca, 30 x 20 cm fragment of netting that appeared to be relatively new and a plastic bottle with encrusting growth that appeared to have been in the water for some time. The current throughout the day varied from strong at the northwest corner of the bank to moderate at other locations.

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

None

Recommendations for corrective action or improvement:

None

In your opinion, did the mission essentially achieve its purpose? Compare actual work accomplished with the work that was expected to be accomplished.

Yes. The purpose of the mission, to identify a long term study site to assess the impacts of bottomfishing on the north side of the bank, was achieved. The expected work was the following:

1) Conduct an upslope transect from the initial drop depth to ca. 150 meters to identify the target transect depth
2) Conduct four 30 minute transects at the target transect depth.
3) Conduct two 30 minute bait stations at sites identified during the transects
4) If time permitted, photograph selected species of interest and collect specimens of selected invertebrates

The four tasks were all completed. Only two 30 minute transects were completed but two other diagonal transects were done to locate habitat suitable for bottomfish. The determination that much of the habitat in this location was unsuitable for bottomfish is as important for this project as the identification of the few isolated areas of appropriate habitat. Selected specimens were videotaped in the early portion of the dive. No collectable specimens of interest to the scientists were encountered during this dive. Use of the CCD low-light camera to record animals at the bait stations was highly successful, as it had been in the previous day's dive thanks to extra efforts of the HURL crew to repair it, giving success to this mission beyond that which was initially anticipated.

List specimens or samples collected on the mission.

Two sediment samples (405 m and 156 m) were collected for Frank Parrish (NMFS SWFSC Honolulu Laboratory).

DATA RELEASE

Data may be retained by the project leader for up to 2 years after the mission date with the following exception. NOAA may request to use photos for publication or publicity purposes at any time.

Fill in the appropriate statement below and sign this form.

I hereby release the data archived by HURL for public consumption following

mission_____(project title)

held on_____(date) in the following way:

a. CTD data by _____(date)

b. voice transcripts, video, and still camera film by_____(date)

c. other_____(date)

d. I will give my written consent to individuals wishing to use these data prior to the above dates depending on the nature of the request(s)

_____Principal Investigator