HAWAII UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT MISSION NO. P5-460

MISSION STATUS

Location: Northwest side of Raita Bank, NWHI

Mission Date: 9/14/01

Maximum Depth: 389 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

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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 northwest 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 389 m and conducted an upslope transect to 113 m. Based on fish and habitat observations, the submersible descended from 113 m to 199 m and conducted a 30 minute bait station. After the bait station, two30 minute contour transects were conducted in opposite directions, with the transects ascending to 171 meters to investigate rock outcroppings that appeared to be bottomfish habitat. At the end of the second transect, a second 30 minute bait station was completed at 178 m. Following the second bait station, a third 30 minute transect was conducted along 178-185 m and a fourth transect was conducted in the return direction at 185-190 m. At the end of the planned activities for the dive, during the remaining 45 minutes, the upper slope was surveyed for specimens poorly represented in HURL records for videography and collection.

During each transect, the two observers audibly identified and counted all fish and invertebrate species visible through their windows while the pilot 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 to be identified during the transects, but during this dive an appropriate bait station was found immediately upon return to the depth of bottomfish habitat. The first bait station was therefore done prior to the transects and only the second was done after locating a second site during the transects. The submersible set out two 5 lb bait bags at each bait station. A bait station marker and size reference (i.e. "the pumpkin") had been secured to the submersible's basket, as was done during other dives in this project, but the pumpkin and one of the six bags of bait were lost during initial deployment of the submersible from the ship so the submersible's laser lights were used for size reference. After bait was deployed at the stations, the pilot established a position approximately 10-20 ft from the bait 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 next operation was begun. For general habitat characterization, close up images of animals were obtained with the digital camera each time the submersible came to a stop, if animals of interest were within range. 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

The presence of a lost fishing line and observations of onaga, ehu, gindai, hapu`u, and kale kale during the transects confirmed that the dive location was a bottomfishing site. Of these species, hapu`u groupers were the most abundant (30+ individuals observed). The first bait station attracted primarily hapu`u grouper which were very bold in the presence of the submersible and actually ripped open two of the bait bags, thereby establishing the position of the first bait station. Bottomfish species observed were 12 hapu`u, 2 kahala, 3 butiguchi (*Pseudocaranx dentex*), 1 *Gymnothorax nuttingi* moray eel, and 4 pigfish (*Bodianus vulpinus*). A male pigfish videotaped with the ambient-ligh CCD camera at this station is likely the first documentation of this life-stage of the species by the HURL bottomfish project. The second bait station, established by the submersible's occupants upon seeing a school of onaga swimming parallel to the submersible, attracted an extraordinary diversity of bottomfish, including 6 hapu`u grouper, 10 onaga, 2 ehu, at least 1 kale kale, 2 gindai, 2 kahala, 2 butaguchi, and 1 pigfish. With respect to other fish and invertebrate species, the most abundant were *Symphysanodon maunaloae* (1000's) and G*rammatonotus* spp., which are also common on main Hawaiian Island bottomfishing sites and are suspected prey species for onaga and ehu. Observations of four specimens of an undescribed *Prognathodes* butterflyfish constitute the northernmost record of that species. The substrate at 170-200 m was composed primarily of low relief carbonate outcrops with a light sediment cover. Of particular interest was an almost complete lack of cnidarians growing on these outcrops, an observation congruent with that from the previous dive. Aside from the single fishing line and a small piece of plastic, no other bottomfishing debris was observed. A number of animal species for which HURL lacked good images were successfully filmed at the end of the dive. The current throughout the day was negligible.

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

The loss of the station/size-reference marker ("the pumpkin") and one bait bag was the only problem encountered in the operation. Otherwise the operation was highly successful.

Recommendations for corrective action or improvement:

The marker and bait have been secured more firmly into the submersible's baskets in dives subsequent to this one. The problem has therefore been corrected.

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. 100 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 organisms and collect specimens of selected invertebrates

The four tasks were all completed with great success.

The efforts of the HURL crew aboard the K-O-K were essential to the success of this mission and in fact enabled us to obtain better results than initially anticipated. In particular, the efforts of Chris Taylor and Chuck Holloway to repair the focus on the University of Hawai`i CCD camera were highly successful. This enabled us to obtain clear, wide-angle video of fishes at our bait stations under natural light conditions, minimizing problems of disruption of the fishes' behavior by the submersible's lights. The extraordinary success of this new sampling technique would not have been possible without the skills and effort of the HURL crew. In addition, electrical grounding problems that had occurred during dives previous to this were solved and corrected by the HURL crew.

List specimens or samples collected on the mission.

None. Invertebrates of interest to the scientists that were suitable for collection were not encountered during the dive.

Dive P5-460

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