

NORTHWESTERN HAWAIIAN ISLANDS

3 of 5

G.H. BALAZS



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NARRATIVE REPORT

TOWNSEND CROMWELL, CRUISE 77-02-75 (PART III)

- I. CRUISE PERIOD: May 12-June 27, 1977
- II. AREA OF OPERATION: Northwestern Hawaiian Islands, and SE Hancock Seamount.
- III. MISSIONS AND RESULTS:
 - A. The primary objectives were to conduct trapping, bottom trawling, handlining, plankton tows, and oceanographic surveys.
 1. Trapping

Two trap designs were used, Hawaiian fish traps and California lobster pots. Both types were double-chambered. The Hawaiian-type fish traps had a frame of 1.27 cm reinforcement steel rod covered with 2.54 cm square galvanized wire mesh. They had two conical entrances, 16.51 cm diameter located one on each side. The California lobster pots were made of 5.08 x 10.16 cm heavy-gauge galvanized wire mesh with two conical entrances 16.51 cm diameter, one on each side.

With the exceptions of the strings in two experimental sets made at Maro Reef and the set made at Necker Island, all fish trap strings consisted of four traps attached to the mainline at intervals of 9.15 m (5 fathoms), and all lobster pot strings consisted of eight pots attached at the same interval. The experimental sets at Necker Island and Maro Reef were designed to test trap competition and will be described in another section. A "set" was a contiguous group of several strings of fish traps and lobster pots. With the exception of the three trap-competition sets, all sets consisted of a string of eight lobster pots alternated with a string of four fish traps. Either three strings of each or six strings of each were in a set. Thus a standard set consisted of either 12 fish traps and 24 lobster pots or 24 fish traps and 48 lobster pots. The mainline was 1.27 cm polypropylene to which the traps and pots were attached. Two inflatable floats and a flag pole were rigged to each string. Except for two sets, one to the north and one to the east of Laysan (Stn. 266-277), when the traps were baited with various handline and trawl caught fish, the

traps were always baited with mackerel, Scomberomorus maculatus and set between 1800 and 1930 h. After soaking overnight, retrieval commenced at 0800 the following morning and usually was completed by 1200. Initial sets in a given area usually paralleled the bottom gradient in depths ranging from about 18-65 m. Sets were also made on flat areas with little depth variation, or sometimes more or less paralleled a particular depth contour.

Immediately after a string was retrieved the catch was removed from the traps and the weight per trap of spiny and squat lobster was recorded. The carapace length of each lobster was measured--it was sexed, and for females the degree of egg maturation recorded. Additional morphometric data (carapace width, and tail length) was taken from 612 spiny lobsters over the carapace length range of 5.19-14.58 cm. Except on occasions when only a single lobster occurred in a trap, individual lobster weights were not taken. The combination of the limited accuracy of the spring scale used for weighing and the vessel's motion does not permit results accurate enough to be used to calculate length-weight relationship. In the original data, any individual weights which were recorded should be regarded as "approximate."

Forty-nine trap sets, consisting of 548 trap nights with fish traps and 1,112 trap nights with lobster pots, were made during the cruise. A total of 2,862 spiny lobster (2,445.2 kg) and 657 (353.3 kg) squat lobster were taken. Of the spiny lobster, 1,689 were males and 1,173 were females. The fish traps caught 1,331 (1,088.3 kg) spiny lobsters and 397 (165.5 kg) squat lobsters. The lobster pots caught 1,531 (1,356.9 kg) spiny lobsters and 260 (187.8 kg) squat lobsters. Thus the average catch per fish trap was: 2.42 (1.99 kg) spiny lobster and 0.72 (0.30 kg) squat. The average for lobster pots was 1.38 (1.22 kg) spiny lobster and 0.23 (0.17 kg) squat. For the fish traps the average weight of spiny lobster caught was 0.82 kg and of squat lobster 0.42 kg. For the lobster pots, it was 0.88 kg for spiny and 0.72 for squat lobster. There was, however, a wide range in the catch per unit effort for different areas, and catch rates in most of the areas were small. Sets made at Maro Reef, and Laysan and Midway Islands produced about 91% of the spiny lobster, with an average catch per fish trap of 3.74 and 2.17 per lobster pot. The average catch rates of spiny lobster for the other trapping areas, Necker, Raita, Lisianski, Salmon Bank, Pearl and Hermes Reef, and Kure was: 0.47 per fish trap and 0.37 per lobster pot. Maro Reef was by far the best trapping area with spiny lobster catch rates averaging 5.8 per fish trap and 3.0 per lobster pot. The highest catch rate of spiny lobster for a single set (24 pots and 12 traps) was 6.4 per trap made on the west bank of Maro Reef.

The highest catch per pot for a string of lobster pots was 6.25 (5.5 kg) per pot, made SW of Midway. The highest catch rate for a string of fish traps was 15.25 (9.4 kg) per trap made at west Maro. The best catch for a single lobster pot, 18 spiny lobsters weighing 8.6 kg, was also made at west Maro. The best catch for a fish trap, 22 lobsters (16.4 kg) was made NW of Laysan. The poorest catch for the cruise, 1 lobster (0.3 kg) was caught on six strings of traps and pots at Lisianski.

The catch rate for Hawaiian fish traps was consistently significantly higher than for California lobster pots. For all sets, the average catch ratio of fish traps to lobster pots was about 1.95:1. This will be discussed further in the section on trap competition experiments.

There was a considerable size range (carapace length) in the spiny lobster catch, 5.19-14.69 cm for males, and 4.48-13.00 cm for females. A total of 2,265 (79.4%) of the spiny lobster were of legal size; that is, the carapace length was 8.25 cm or over. Of these, 970 were taken in fish traps and 1,295 in lobster pots. Reflecting the smaller mesh size, only 73% of the lobsters taken in fish traps were greater than 8.25 cm whereas 85% of those caught in lobster pots were of legal size. About 30% of all spiny lobsters caught during the cruise had a carapace length of 10.0 cm or greater. The percentage of these large lobsters was greater in three areas: At Kure, of only 33 lobster caught, 61% were large. At Laysan, of 387 lobsters, 49% were large, and at Midway, of the total 587 lobsters taken 40% were 10.0 cm or greater.

Catch rates were usually higher in depths less than 35 m than were catches made in deeper water. In depths greater than 45 m fishing was consistently poor.

Maro Reef was an area of particular interest as all the sets made there seemed to indicate a consistent abundance of lobster. We were intrigued by the fact that the Simrad sonar indicated that the bottom topography was remarkably flat in all areas that we surveyed. On June 20, to satisfy our curiosity relative to the nature of the substrate, Gooding accompanied by John Persons, a ship's officer, made a scuba dive to about 35 m in the same area that we had set 12 strings of traps the evening before (Stn 313-324). The set had yielded a very good catch. To our surprise we found the bottom to consist of sand with no sign of cover for even the smallest lobster. On June 22 another dive was made (30 m) in the area in which we had, that morning retrieved 15 strings of traps (Stn. 342-356) and made a good lobster catch. The substrate consisted of nothing but sand and coral rubble with virtually no lobster habitat.

very good. The doors appeared to be digging in too much, rather than lifting over the ground. The center wing was towing very close to the ground and the lower wing was dragging hard on the bottom. When the situation was described to Karl Gustafson, the fisherman advisor who accompanied the first half of the cruise, he suggested that the problems could be corrected by positioning the towing warps further forward on the doors and adding more floats to the headrope. These modifications were made. In subsequent tows with this net, the webbing in the lower wings was frequently torn up, indicating they were still dragging hard on the ground. The general concensus was that this may have been due to the large mesh (20 cm) of this webbing which hooked up easily. Quite possibly a smaller mesh size would reduce this problem.

A good deal of time was spent searching for suitable trawl grounds during this cruise. On the basis of our interpretation of the sonar-gram, in depths beyond the upper bank, in most of the areas surveyed we found the bottom too rough and precipitous for trawling. In fact, during this cruise the lack of suitable trawling grounds was the limiting factor on the number of trawl stations, not lack of time. A new Simrad fishfinding sonar had been installed on the ship prior to this cruise and neither the ship's officers nor the scientific party had any previous experience with it. Thus, especially after losing the Noreastern trawl, we may have been over-cautious in our interpretation of the sonar-gram. If this was so, suitable trawl grounds may be more extensive in some areas. During subsequent cruises, three areas in particular should be surveyed: Northhampton Bank which was omitted in this cruise, and Salmon and Pioneer Banks which appeared to be very rough to us, on the basis of relatively cursory surveys. However, a closer look may indicate otherwise.

Two trawls were made at Raita Banks. One trawl, apparently did not reach the bottom, and nothing was caught. The other trawl, a shallow one (53 to 60 m), caught six species. The catch consisted primarily of filefish, Pseudomonacanthus gerratti, porcupinefish, Diodon histrix, and triggerfish, Xanichthys ringens.

Nine successful bottom trawls were made on the northwest banks of Maro Reef. Four trawls were in deep water (181 to 373 m); three trawls at middepth (110 to 117 m); and two tows in shallow water (31 to 33 m). Over 50 species were taken. Most common in the deeper ranges were filefish, Pseudomonacanthus gerratti. Sea robin, Peristedion hians, aweoweo, Priacanthus cruentatus, and Brotula sp. were caught at two or more of the deep stations in smaller numbers. At middepths, most frequent in the catch were: aweoweo, P. cruentatus, filefish, P. gerratti,

lizardfish, Trachinocephalus myops, and large numbers of puffer, Lagocephalus hypselogeneion. In the shallow trawls many filefish, Pervagor spilosoma, and porcupinefish, Diodon sp., were present. Also significant but in smaller numbers were: damselfish, Dascyllus albisella, goatfish, Parapeneus sp., and spiny lobster, Panulirus marginatus. In comparing day trawls to night trawls at Maro it was true of each depth level (deep, mid, and shallow) that a far greater variety of fish were caught during night trawls. Lobsters of both types (spiny and squat) were present only in night trawls.

At Laysan eight trawls were made, all on the northwest side of the island: four deep trawls (318 to 355 m), two middepth trawls (79 to 97 m), and two shallow tows (31 to 33 m). Over 60 species were netted providing the most varied fish fauna of the cruise. The deep trawls were characterized by relatively small numbers of individuals. The more common forms were sea robins, Peristedion sp., antigonids, Antigonia steindachneri, and emmelichthids. The Simrad sonar indicated signs of dense schools at about 9 m off the bottom during two of the deep trawls, but only on one trawl (Stn. 251) did we run through a large school of opelu, Decapterus russelli. Over 95 kg were netted. At Stn. 298 a sonar beeper tag, on loan from the Behavior and Physiology group, was put on the headrope of the net. CTFM sonar was used to detect the position of the trawl. This test indicated that there apparently was very little catenary in the warps and that this method though crude, could be used for determining net location.

Middepth trawls caught the greatest variety of species. Most frequently taken were: cornetfish, Fistularia petimba, filefish, Pseudomonacanthus gerratti, trunkfish, Lactoria sp., and squat lobster, Scyllarides sp. In shallow water, most frequently caught were: cornetfish, Fistularia petimba, goatfish, Parapeneus sp., trunkfish, Lactoria sp., and spiny and squat lobsters. It was here that the largest number of filefish Pseudomonacanthus gerratti, in one haul were taken, about 26 kg. Greater diversification of species occurred in night hauls. While a few of the spiny and squat lobsters were caught during the day, most were taken at night. The deepwater trawls, in excess of 300 m, had consistently few species and, with the exception of the opelu, had few numbers of individuals of these species.

One middepth trawl (62 m) made at Salmon Bank took six species. Simrad sonar indicated fish signs on the bottom and up to 7.5 m off the bottom but the catch proved poor. Only a serranid, Anthias thompsoni, and cornetfish, Fistularia petimba, were caught in moderate numbers. The other species were represented by one or two individuals.

Three shallow tows (31 m) were made on the northwest banks of Lisianski Island: One day trawl and two night tows. Seventeen species were netted. The most common species was filefish, Pervagor spilosoma. Night tows had the most variety. Squat lobster were present in both night tows and over 12 kg of unicorn surgeonfish, Naso unicornis, were caught in one haul.

Pearl and Hermes Reef was the site of five middepth tows (64 to 99 m). This was what might be termed the most successful area in terms of commercial fish. The catches here included 177 kg of jack, Caranx cheilio, 107 kg of kahala, Seriola dumerilii, 83 kg of opakapaka, Pristipomoides microlepis, 14 kg of grouper, Epinephelus quernus, and 8 kg of squat lobster. Also caught with some regularity were cornetfish, Fistularia petimba, trunkfish, Lactoria sp., and porcupinefish, Diodon histrix. At Pearl and Hermes Reef the most varied catches occurred during the day.

At Kure three tows were made. In two middepth tows (88 to 110 m), 10 species were caught. Common to these tows (one day and one night) were small jack, Caranx cheilio, and large numbers of puffers, Lagocephalus hypselogeneion. The day trawl netted over 2,500 individuals of this species. The night trawl provided the greatest variety. During a shallow day trawl (44 m) on the west bank, the Northeastern trawl hooked up and all of the gear aft of the doors was lost. The net was tentatively located with the Simrad sonar. Plans to definitely find the net and retrieve it by scuba divers were thwarted by large numbers of sharks.

At SE Hancock Seamount all tows were in relatively deep water (264-1,098 m). Two midwater hauls, the only ones of the cruise, were empty. One haul, although on the bottom, caught only a single gonostomatid. The last trawl set in 264-311 m caught 16 species including 20 kg of pelagic armorhead, Pentaceros richardsoni and 29 kg (134 individuals) of a nomeid fish, Areoma sp. An extensive sonar search of the seamount located only one target on the edge of the drop off, that may have been a large school of armorhead. This dearth of fish sightings on sonar was rather surprising, as on Townsend Cromwell 76-06, with the EDO sonar we saw, what we surmised were, dense schools of armorhead quite frequently.

3. Handlining

Seventeen formal handline stations (2 lines fishing with 4 hooks each) were made during the cruise. In addition, occasional recreational handlining was done in the evening when drifting

or at anchor. These latter were of little significance in terms of the nature or quantity of the catch. During the first half of the cruise the only two handline stations (Necker and Hancock Seamount) were set and retrieved by hand in the traditional manner. At Midway, two hydraulic fishing winches were installed by Don Aasted, happily marking the end of deep traditional handlining from the Cromwell. These winches facilitate the application a great deal and had they been available when we were at Hancock Seamount we would have made more stations there. As it was the handlining at Hancock in 256-659 m, brought up four fish species including six armorhead, Pentaceros richardsoni, and one alfonsin, Beryx splendens.

The species most frequently caught at most stations was hapuupuu, Epinephelus quernus, followed by ehu, Etelius marshi, and ulua, Caranx cheilio, and kahala, Seriola dumerilii. The largest single station catches were made at Pioneer Bank, 129 kg consisting mostly of hapuupuu, ehu, kahala, and ulua caught in 180-220 m; Pearl and Hermes Reef, 62 kg hapuupuu and ehu taken in 165-320 m, and Midway, 13 hapuupuu and one ehu (65 kg) taken in 156 m. Salmon Bank (3 h of fishing) yielded one of the poorest catches; two aweoweo, Priacanthus cruentatus and four small barracuda, Sphyraena sp. caught in 62-80 m.

4. Environmental Survey

A total of 47 (24 day and 23 night) oblique plankton hauls to estimated depths of either 100 or 200 m were made at prescribed environmental monitoring stations located off Nihoa and Necker Islands, French Frigate Shoals, Gardner Pinnacles, Laysan Island, Lisianski Island, Pearl and Hermes Reef, and Midway and Kure Islands. The stations were located east and west of the island or reef at the 183 m contour (inshore) and 25 nautical miles beyond the 183 m contour (offshore). A CTD cast was made at 20 of the 21 offshore (200 m) plankton stations. At station 382, 25 miles east of French Frigate Shoals, the CTD probe became inoperative so the cast was aborted. Ninety three XBT casts were made, including one at every trawl and plankton station.

At Salmon Bank, on the evening of June 10, following a trawl in about 62 m (Stn. 210), when the routine XBT was made the observer noted that the temperature on the bucket thermometer went off the scale which was calibrated to 26°C. The XBT surface trace had gone off scale at 35°C and read 31°C at about 60 m. Unfortunately, the thermosalinograph, which had been very reliable, was not giving a temperature trace at the time. The thermosalinograph was put back into commission, and,

with a good navigation reference point, from the trap bouys, we crossed the general area several times, and found a place where the thermosalinograph recorded a surface temperature of 26.7°C. Further attempts to locate the area again and make another XBT cast on it were unsuccessful. As temperatures elsewhere on the bank were about 25.8°C even 26.7° was high. The data are insufficient to say much, but what evidence there is seems to indicate an unusually hot spot was extant in a narrowly circumscribed area that evening. Subsequent monitoring the following morning did not indicate any temperature discontinuity in the same general area.

B. Miscellaneous observations and activities

1. Trolling

A total of 73 h of trolling at troll speed was conducted on 7 days. The catch included 15 skipjack tuna, Katsuwonus pelamis, weighing 31 kg, 27 yellowfin tuna, Thunnus albacares, 131 kg, 18 kawakawa, Euthynnus affinis, 75 kg, and 1 rainbow runner, Elegatis bipinnulatus, 2.5 kg. No incidental trolling at cruise speed was conducted.

2. Ghost fishing experiments

So called "ghost fishing" experiments were conducted at west Maro Reef. Their objective was twofold: first, to determine if trapped spiny lobsters tend to lure other lobsters into unbaited traps and second, if captured lobsters can leave the traps. Two experiments, each with four traps, were run. Experiment #1 used a string of Hawaiian fish traps and experiment #2 used a string of California lobster pots. On the morning of June 20, after the morning survey strings had been retrieved and the lobster catch placed in the live-bait well, healthy looking lobsters were selected for the experiments. Individuals missing few appendages covering a fairly good size range were carefully placed in the traps after being tagged, measured, and sexed. For experiment #1, trap number one was stocked with all males (7.87 to 11.06 mm)*, #2 contained all females (7.17 to 9.45 mm)*, #3 had three females (one berried) and three males (7.31 to 10.08 mm)*, and trap #4 had three females and three males (7.43 to 11.56 mm). In this experiment the traps were to be picked up, examined, and returned every morning for 3 days, with daily changes noted.

*Carapace length.

A second string (experiment #2) consisting of California lobster pots was set in the same general area. Again special care was taken in the selection and handling of these lobsters. In this string the first pot contained all males (9.25 to 12.03)*, the second had all females (6.66 to 9.35 mm)*, the third had three females and two males (7.43 and 10.70 mm)*, and the fourth was stocked with three females and three males (8.56 to 10.65 mm). This set was to remain undisturbed until the third day (June 23).

On June 21, the fish traps (experiment #1) were retrieved. No change was noted in any of the traps. The experiment was altered somewhat when trap #4 was baited with six mackerel. All lobsters seemed to be in good condition and all tags intact.

On June 22, inspection of the traps showed that trap #1 contained one new lobster, trap #2 had one new lobster, and one of the original lobsters had lost its tag, trap #3 remained unchanged, and trap #4 had one new lobster. New lobsters were measured, tagged, and replaced in the same traps. The lobsters that had lost its tag was retagged and the traps reset, all unbaited.

On the last day, June 23, the traps of ghost fishing experiment #1 were retrieved and examined. In trap #1 six live tagged lobsters and one dead untagged lobster were recovered. In trap #2 six live tagged lobsters and one dead untagged lobster were recovered. In trap #3 five live tagged lobsters and one dead untagged lobster was recovered. In trap #4 six live tagged lobsters and one dead tagged lobster were recovered. In all instances the carapace measurements of the dead untagged lobsters approximated the measurements associated with missing tag numbers.

The live lobsters seemed to be in poor condition and were listless. Of the dead lobsters most of the exoskeletons were hollow indicating possible octopus predation. In trap #2 one lobster had moulted with the tag remaining well embedded in the muscle. The carapace length of this individual had increased from 6.05 to 6.16 mm. In summary, this experiment showed no loss of the original experimental animals and a net increase of three lobsters. Tag retention was fairly good.

The string of lobster pots (experiment #2) was retrieved on June 23 after soaking continuously for 3 days. Pot #1 contained four live tagged lobsters and two dead untagged lobsters. Pot #2 had five live tagged lobsters and one dead untagged lobster. Pot #3 had four live tagged lobsters, one live untagged lobster, and one dead untagged lobster. Pot #4 contained two live tagged lobsters, two live untagged lobsters, and two dead untagged

lobsters. In all cases the carapace measurements of the untagged lobsters approximated the measurements associated with missing tag numbers.

In experiment #2 there evidently had been no movement in or out of the pots, and as in experiment #1, the lobsters were in poor condition. The high mortality rate was considered, poor condition. The high mortality rate was probably due in large part to octopus predation.

Summarizing both experiments, there was a net increase of three lobsters into the fish traps, indicating some attraction factor and there were no escapees. Generally, the lobsters were in rather poor condition after only 3 days. It would appear from these rather limited experiments that unbaited traps did not escape from these spiny lobsters and that spiny lobsters did not continue to fish and that spiny lobsters along with the apparent poor condition of the lobsters and what would seem to be a fairly high death rate, would indicate that lost trap could be a lethal factor of considerable significance.

3. Trap competition experiments

On the north bank of Necker Island, an experimental set was made to test the effect of varying trap intervals on the lobster catches. The set, in depths of 48-66 m, consisted of four strings of eight lobster pots each. The distance between pots on the mainlines of string nos. 1, 2, 3, and 4 was 9, 18, 37, and 46 m, respectively. The pots were baited with mackerel, and soaked overnight. Five pots were lost from string #1 and one pot from string #3. String #1 caught 9 spiny lobsters (3/pot), #2 caught 22 lobsters (2.8/pot), #3 caught 7 lobsters (1.0/pot), and #4 caught 8 lobsters (1.0/pot). The results, of course, have no significance.

Throughout the cruise the catch rate for fish traps was significantly higher than that for lobster pots. The catch ratio consistently averaging about 2:1 in most sets. The two trap designs are of course markedly different in construction material, and size. The distance between pots in pot strings and traps in trap strings were the same (9 m), however, pot strings consisted of eight pots, whereas there were only four traps on a trap string. We hypothesized that at the relatively close trap and pot interval of 9 m, the number of traps or pots on a string might be a significant factor. That is, a string of four of either lobster pots or fish traps would be more efficient in an area of low-medium lobster density than a string of eight. At Maro Reef, an initial attempt was made to test the hypothesis. Two 15 string sets were made to the west and east of the reef, both in depths of 27-35 m. Each set

consisted of three, 8-pot strings (24 pots) and six, 4-pot strings (24 pots) of California lobster pots, and six 4-trap strings (24 traps) of Hawaiian fish traps. All pots and traps were at 9-m intervals.

The results (Table 2) in summary were quite interesting: averaging both experiments, the catch per pot for the eight-pot strings was 3.2 spiny lobsters, whereas the catch per pot for the four-pot strings was 4.2 spiny lobsters, about 31% greater catch rate. However, the fish traps had a remarkably larger average catch rate of 6.8 spiny lobsters.

These limited experiments support the hypothesis that the number of pots in a string was a factor in the catch rate during this cruise, but apparently design must be the principal factor accounting for the consistently better catches harvested from the fish traps.

4. A total of 50 bird flocks was sighted. Six flocks were associated with skipjack tuna schools, one with a yellowfin tuna school, and nine were with unidentified schools.
 Nine schools of porpoise were seen, two of these were identified as bottlenose, Tursiops truncatus. Off Laysan Island single monk seals, Monachus schauinslandi were seen swimming near the ship twice, and monk seals were also observed on the beaches at Laysan Island and Pearl and Hermes Reef. No counts were made of animals on shore.
5. Fish and invertebrate samples were either preserved in Formalin or frozen for identification, stomach analysis, or otolith studies.
6. Salinity samples and surface temperature readings were taken with each XBT cast.
7. The surface thermosalinograph was run continuously.
8. Fathometer traces of the bottom were kept for the bottom trawl stations.
9. Standard weather observations were made at 0000, 0600, 1200, and 1800 G.m.t. by the ship's officers.
10. The Marine Operations Log, Deck Log, and Dead Reckoning Abstracts were kept and chart overlays of all stations were made by the ship's officers.

IV. ITINERARY:

- May 12 - Loaded vessel, departed Kewalo. Swing the magnetic compasses, and return to Kewalo to disembark the compass technician. Departed immediately for Waianae.
- May 13 - Made shakedown and diver check of the new Noreastern bottom trawl in about 37 m off the Dillingham Field area. Returned to Kewalo Basin.
- May 14 - Departed Kewalo Basin, and headed for Necker Island. Ran environmental stations en route.
- May 16-17 - Trapped, handlined, and ran environmental stations around Necker Island.
- May 18-19 - Trapped and trawled on Raita Bank.
- May 19-22 - Trapped and trawled around Maro Reef.
- May 22-23 - Trapped at Laysan Island. Brian and Patty Johnson came aboard for a visit.
- May 23-25 - En route to Hancock Seamount.
- May 25-26 - Trawled and handlined at SE Hancock Seamount.
- May 26-30 - Trapped, trawled, and ran environmental stations around Kure Island.
- May 30-31 - Ran environmental stations en route to Midway.
- May 31 - Arrived Midway Islands, disembarked Gustafson and Moffitt. Two University of Hawaii MOP students, Davies and Fitzgerald joined the scientific field party.
- June 2 - Departed Midway.
- June 2-6 - Trapped, trawled, handlined, and ran environmental stations around Midway.
- June 7-9 - Trapped, trawled, handlined, and ran environmental stations around Pearl and Hermes Reef.
- June 10-11 - Trapped, trawled and handlined on Salmon Bank.
- June 12-14 - Trapped, trawled, handlined, and ran environmental stations around Lisianski Island.
- June 14 - Handlined on Pioneer Bank.

- June 15-18 - Trapped, trawled, handlined, and ran environmental stations around Laysan Island. Brian and Patty Johnson visited ship.
- June 19-23 - Trapped (including trap competition experiment and ghost fishing experiments), trawled, and handlined around Maro Reef.
- June 23-27 - En route to Honolulu, ran environmental stations off Gardner Pinnacles, French Frigate Shoals, Necker, and Nihoa.
- June 27 - Arrived Kewalo Basin; end of Part III.

V. RECORDS:

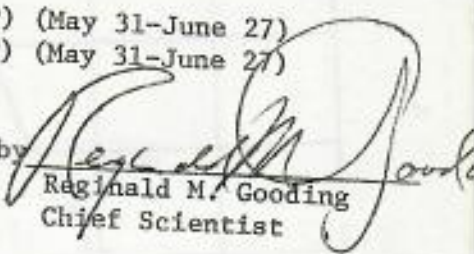
The following forms, logs, and other data sources were maintained. All of the records are filed at the Honolulu Laboratory (HL) unless otherwise indicated in parenthesis.

Barograph record (NWS)
 Bathythermograph and environment logs
 BT log, NODC (Fleet Numerical Weather Central, Monterey, CA)
 Crustacean tagging and morphometric form
 CTD log and record
 CTD charts
 CTD tapes
 Daily activity messages
 Dead reckoning abstract
 Deck log
 Demersal catch form
 Depth recorder (Simrad) bottom traces
 Handline station log
 Marine operations log
 Oceanographic log B
 Occurrence of birds, aquatic mammals, and fish schools log
 Plankton log
 Pollution log (NODC)
 Scientists log
 Size frequency log
 Ships weather observation log (NWS)
 Standard surface trolling log
 Station overlay charts
 Thermosalinograph chart
 Trap, pot, and net report
 XBT charts

VI. SCIENTIFIC PERSONNEL:

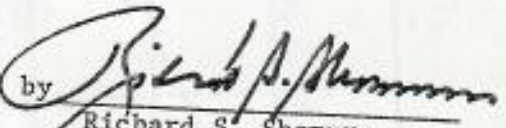
Reginald M. Gooding	- Chief Scientist
Glenn R. Higashi	- Research Assistant
Robert B. Moffitt	- Research Assistant (May 31-June 27)
John J. Naughton	- Fishery Biologist (May 12-13)
Martina K. K. Queenth	- Research Assistant
Paul M. Shiota	- Research Assistant
Darryl T. Tagami	- Research Assistant
Douglas Davies	- UH Collaborator (MOP) (May 31-June 27)
Jayne Fitzgerald	- UH Collaborator (MOP) (May 31-June 27)

Submitted by



Reginald M. Gooding
Chief Scientist

Approved by



Richard S. Shomura
Director, Honolulu Laboratory

Attachments

August 29, 1977

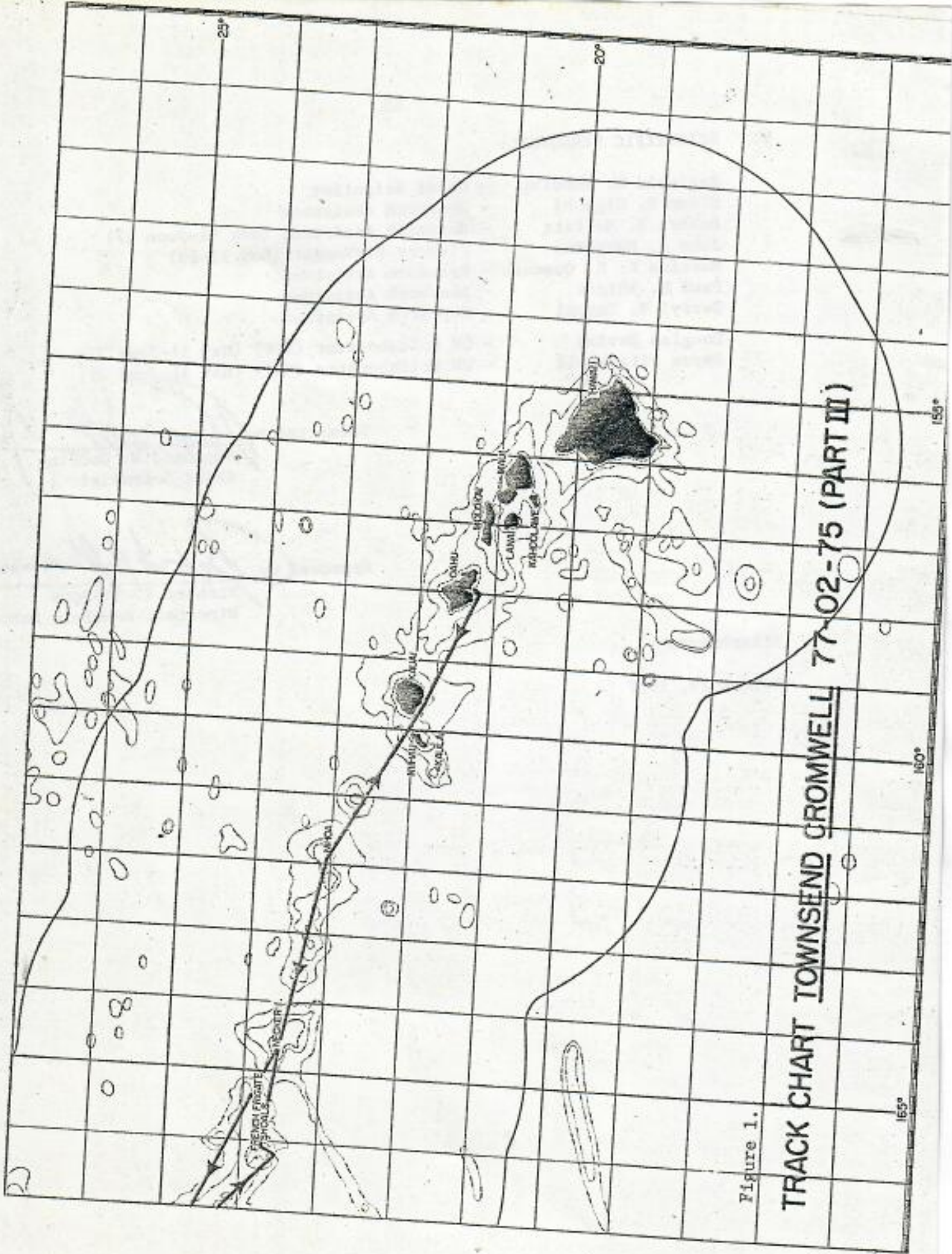


Figure 1.

TRACK CHART TOWNSEND CROMWELL 77-02-75 (PART III)

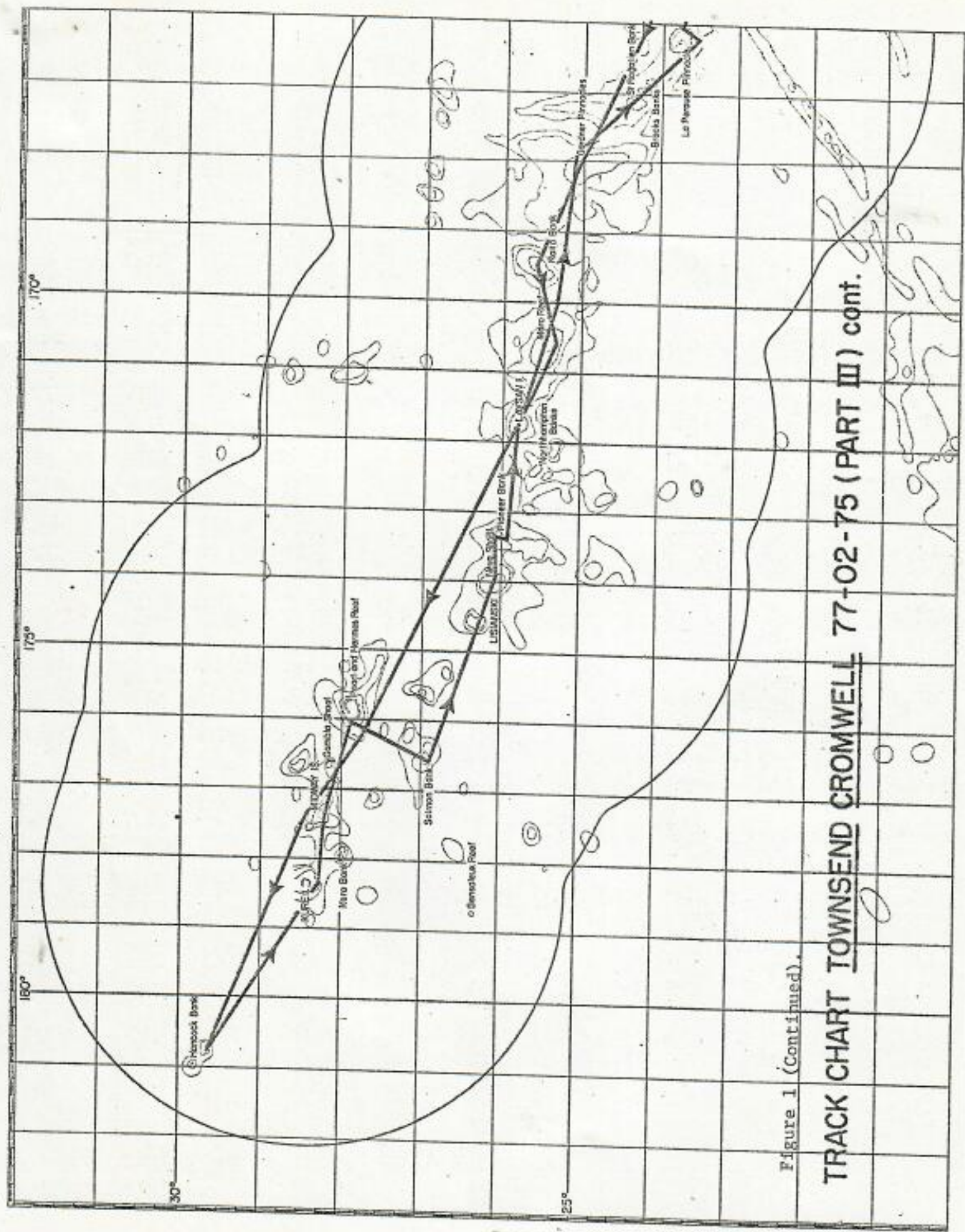


Figure 1 (Continued).

TRACK CHART TOWNSEND CROMWELL 77-02-75 (PART III) cont.

104° W

24° N

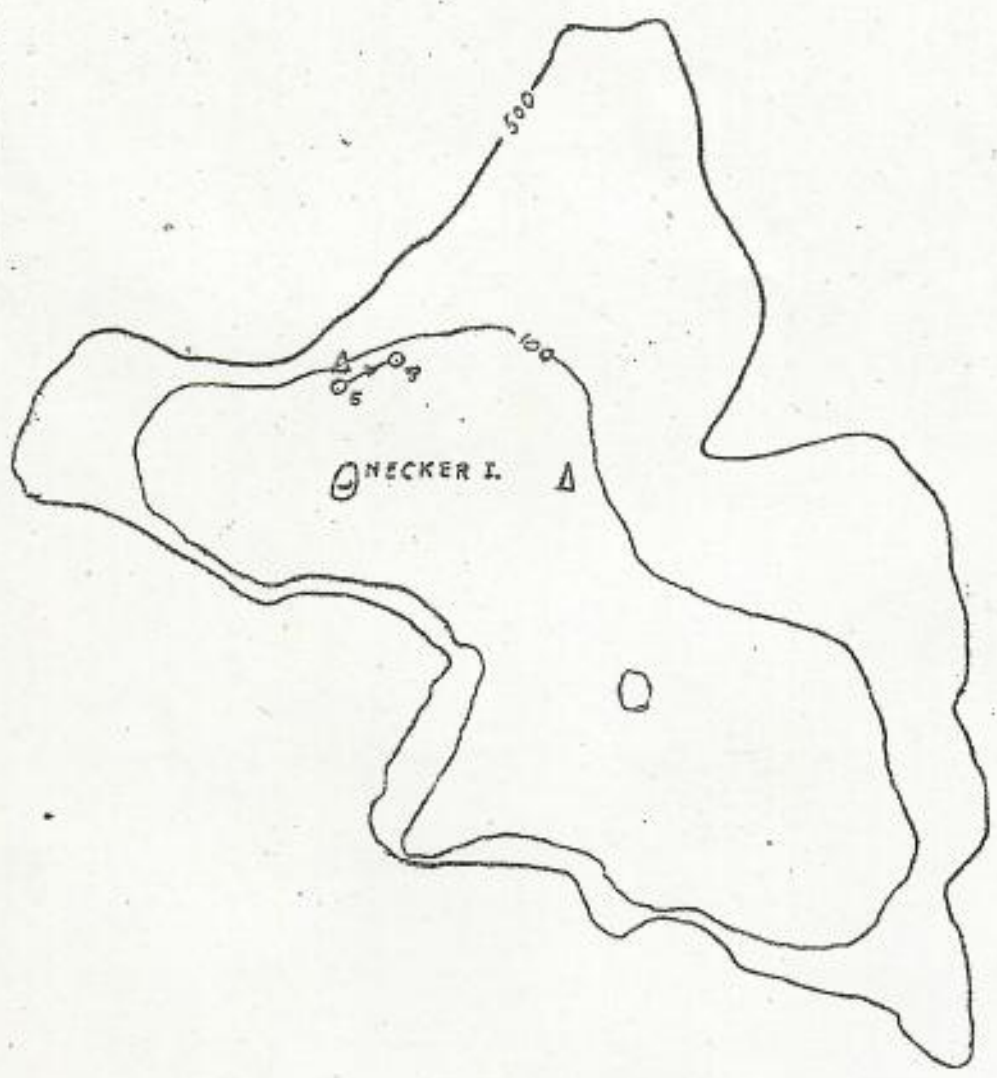


Figure 2.--Necker Island.

23° N

Δ = Handlining
○-○ = Traps (with Station number) INCLUSIVE

26°

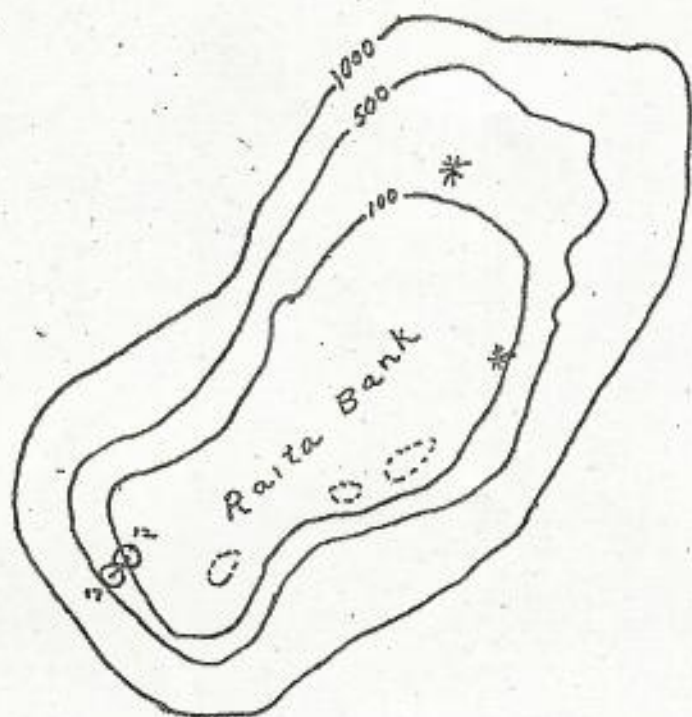


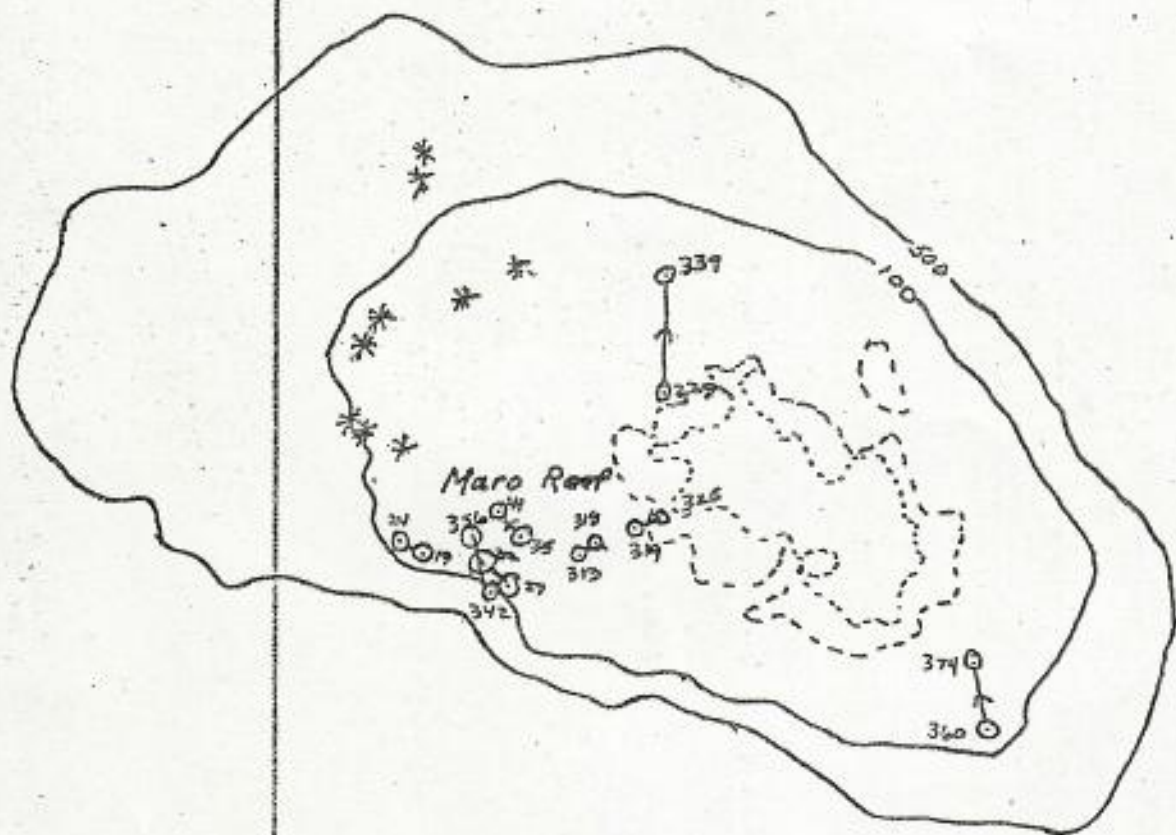
Figure 3.--Raita Bank.

25° N

170° W

* = Trawl (bottom)
⊗ = Trap set (with station number)
INCLUSIVE

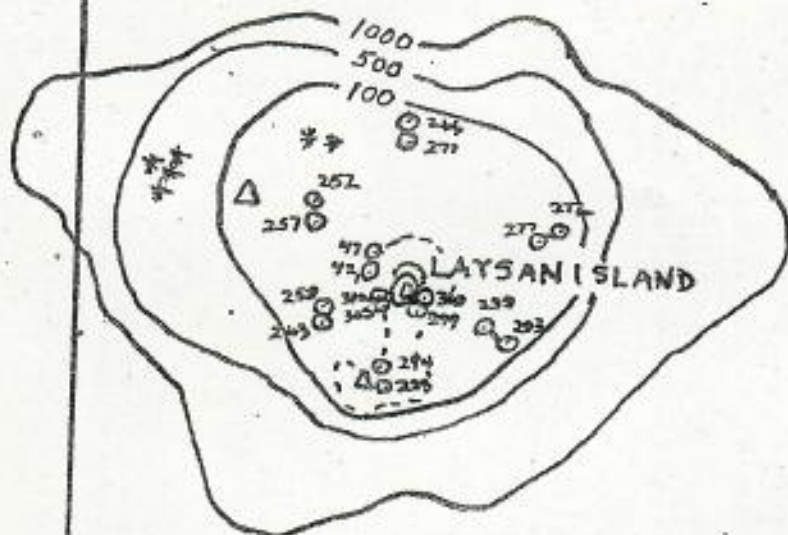
26° N



25° N

Figure 4.--Maro Reef.

* - BOTTOM TRAWL
⊙ - TRAP SET (WITH STATION
NUMBERS)
INCLUSIVE



Δ - HANDLING
 * - BOTTOM TRAWL
 ⊙ - TRAP SETS (STATION NUMBERS INCLUSIVE)

172° W

Figure 5.--Laysan Island.

25° N

174° W

26° N

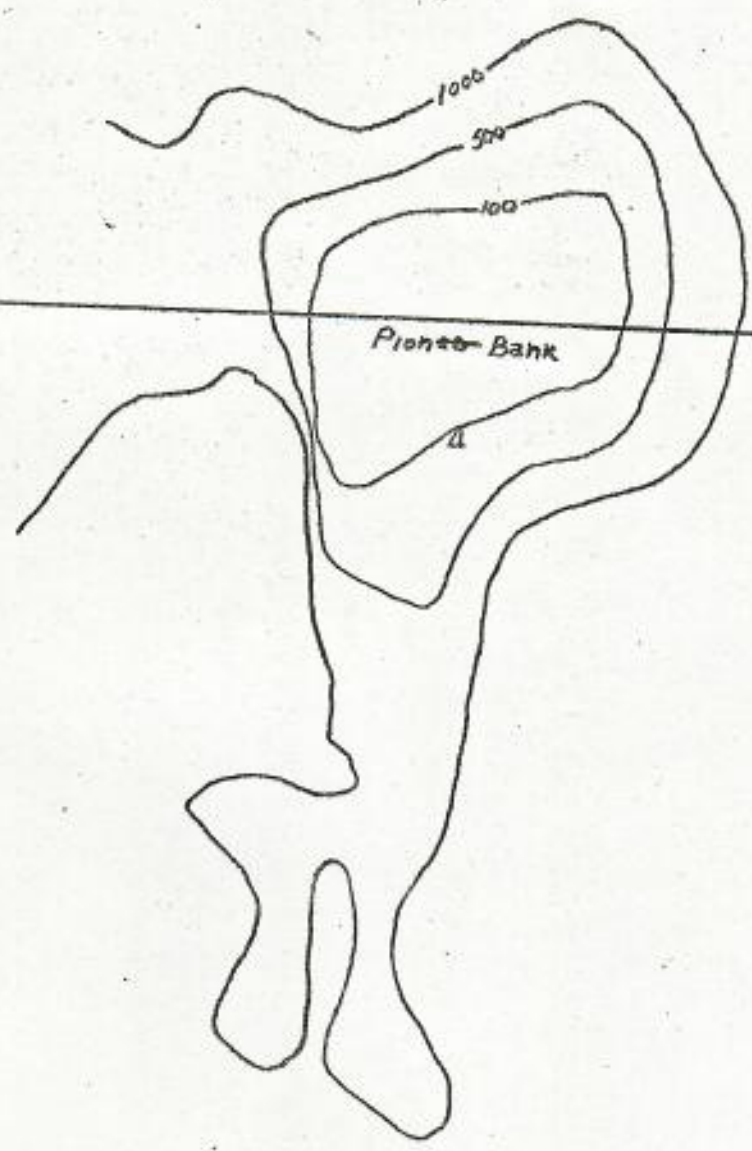


Figure 6.--Pioneer Bank.

Δ - Hand lining

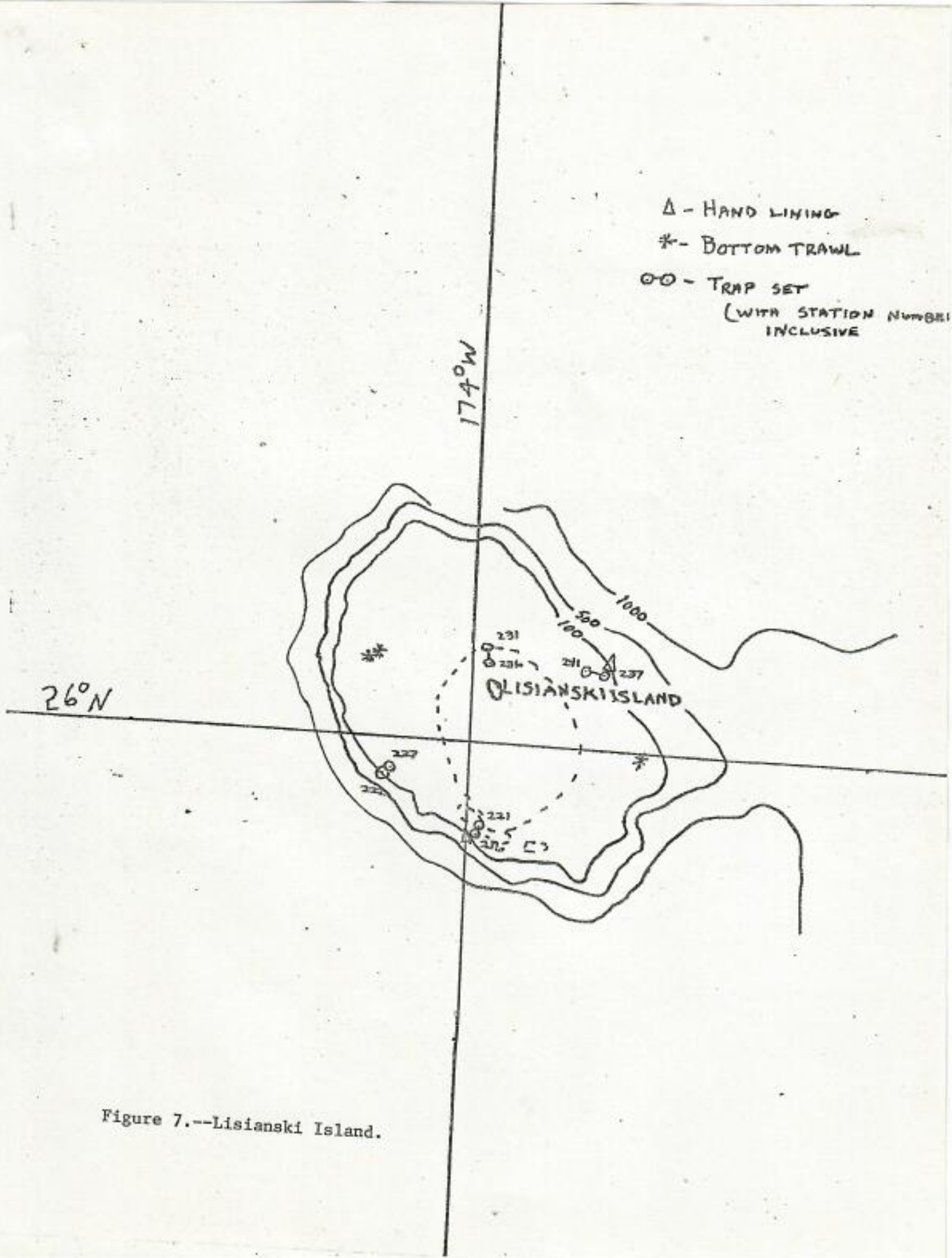


Figure 7.--Lisianski Island.

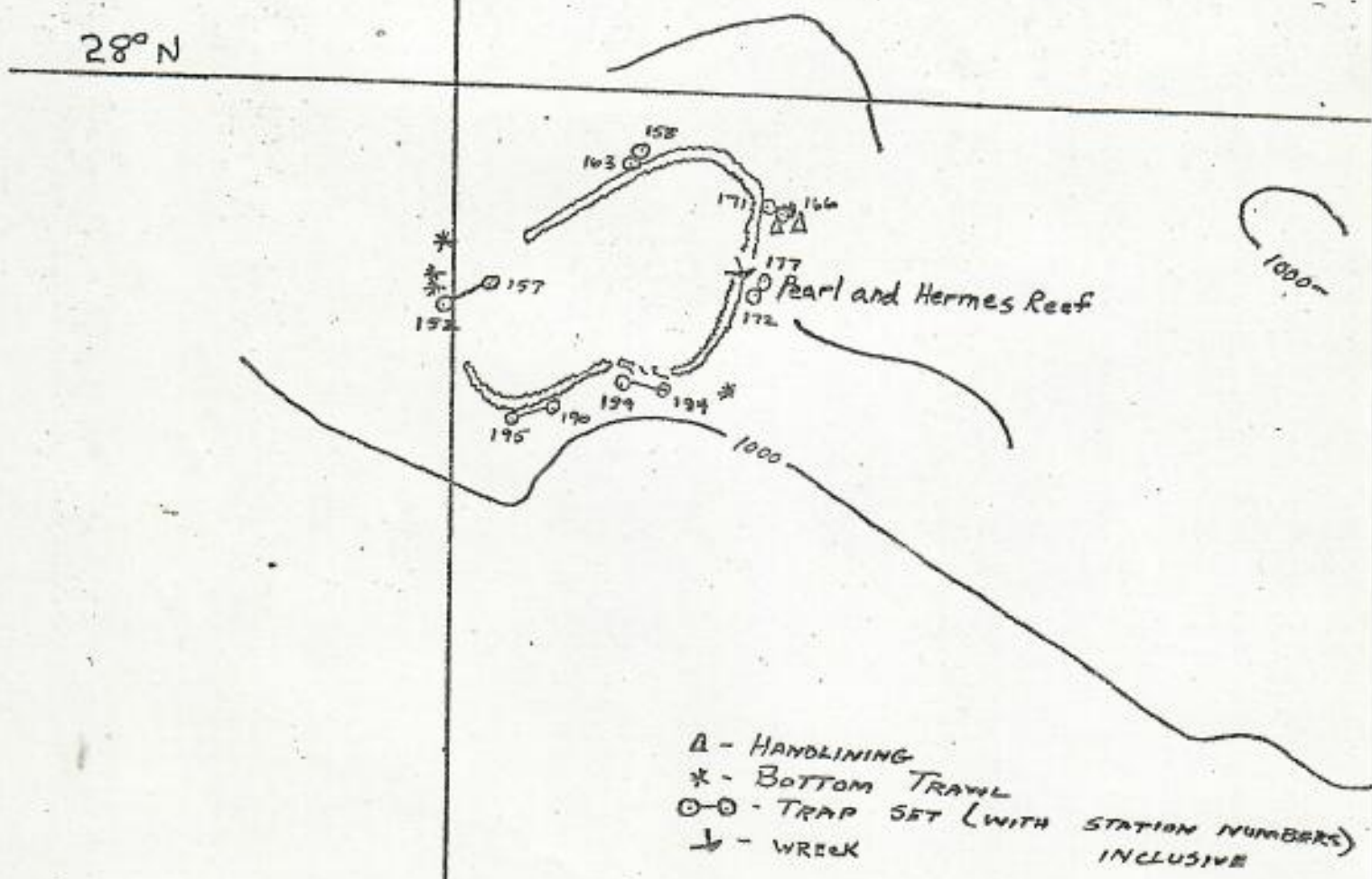


Figure 8.-- Pearl and Hermes Reef.

176° W

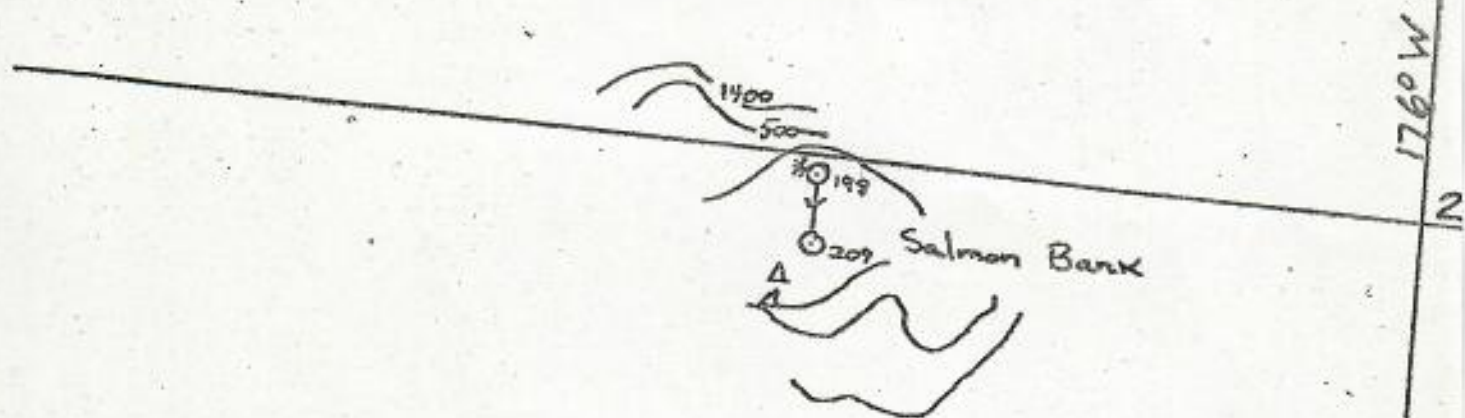


Figure 9.--Salmon Banks.

△-HANDLINING

*-BOTTOM TRAWL

⊙→⊙ TRAP SET (WITH STATION NUMBER
INCLUSIVE)

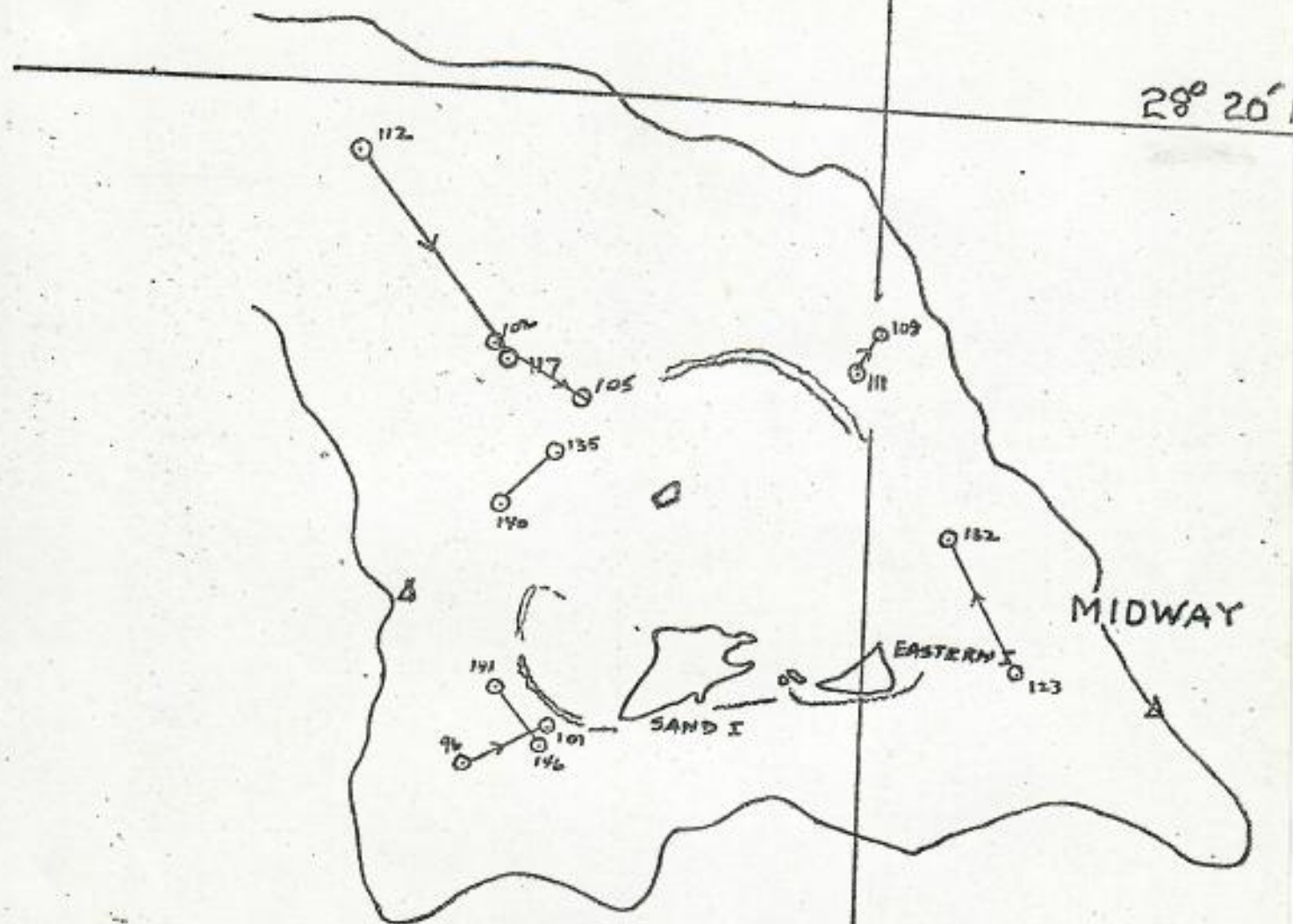
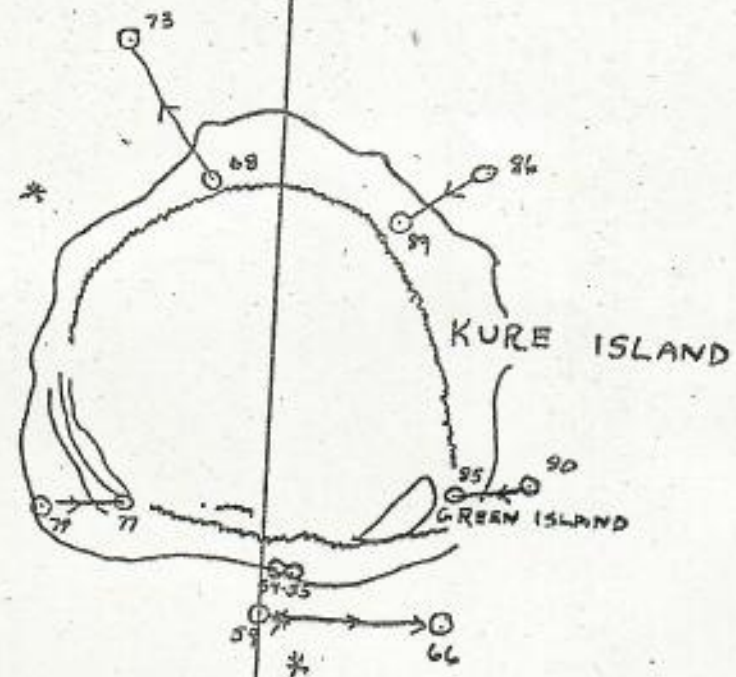


Figure 10.--Midway Island.

178° 20' W



28° 20' N

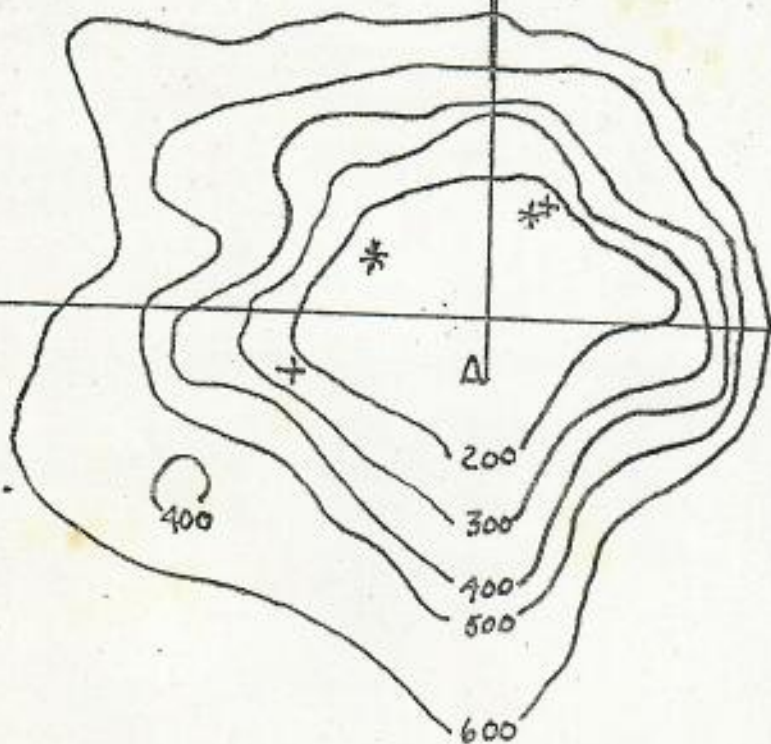
* - BOTTOM TRAWL
⊙-⊙ - TRAP SET (WITH STATION NUMBER INCLUSIVE)

Figure 11.--Kure Island.

HANCOCK
SEAMOUNT

179° 03' E

29° 45' N



- Δ - HAND LINING
- * - BOTTOM TRAWL
- + - MIDWATER TRAWL

Figure 12.-- SE Hancock Seamount.

1 nm.



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Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 77-04-77

CRUISE PERIOD: November 19-December 17, 1977

AREA OF OPERATION: Waters off Oahu and in North Equatorial Countercurrent (NECC) between long. 166° and 162°W.

ITINERARY: November 19 - Departed Kewalo Basin and monitored anchored fish aggregating devices in waters off Oahu.

November 20 - Departed local waters and headed for NECC northwest of Kingman Reef.

November 24 - Arrived designated area and released drift objects.

December 10 - Recovered drift objects and headed for Kona coast.

December 13 - Anchored off Kailua, Kona.

December 14 - Departed Kona and headed for anchored fish aggregation devices.

December 17 - Arrived Honolulu. Moored at Dillingham Shipyard.

MISSIONS AND RESULTS:

A. To monitor anchored fish aggregating objects in waters off Oahu en route to and from the equatorial area.

En route to equatorial area anchored objects A, E, C, and D were monitored and serviced. Three small bird flocks, 10 to 20 birds each, were seen at A and six mahimahi were caught on trolling lines at D.

Underwater observations were made at D by divers using scuba and the shark cage.

En route to Honolulu, anchored objects A, C, and D were monitored. Object E was missing. A bird flock of 100 birds was seen over a school of small yellowfin tuna at object D. Twenty-seven yellowfin tuna and 1 mahimahi were caught by pole-and-line fishing, and of these, 13 were kept alive in the ship's baitwell. Two other bird flocks (30 and 35 terns) were seen within 4 miles of D and one bird flock each at C and A.

- B. To set adrift, follow, and monitor a series of six fish aggregating objects in the North Equatorial Counter-current in the area northwest of the Line Islands.

Six objects were set adrift at lat 7°19'N, long. 166°46'W at 1530 on November 24, 1977. The objects were secured to each other with 1 mile of line between each object and were monitored each day as follows, sea conditions permitting:

- a. Trolling or fishing with live bait and underwater observation with fish finder were done at each object in the morning;
- b. A scouting run was made along a perimeter 3 miles from the string of objects in the afternoon; and
- c. A repetition of (a) before sunset.

A total of 62 fish were caught in 14 days of trolling along the objects. The catch rate was roughly 0.83 fish per line hour. The catch included 18 ono, 24 mahimahi, 18 yellowfin tuna (mostly juveniles 1-2 lb), 1 skipjack tuna, and 1 juvenile bigeye tuna. In addition, 3 skipjack tuna were caught trolling through fish schools and 18 fish (12 mahimahi, 5 yellowfin tuna, and 1 skipjack tuna) were caught on either pole and line or handline by chumming on fish school or at the objects.

On the scouting runs, 17 bird flocks, ranging in sizes from 10 birds to over 200 birds, were sighted in 9 days. Bird flocks appeared on the third day of drifting and persisted through the eleventh day. No bird flock was seen on the last 5 days due to poor visibility brought on by inclement weather. Of all the bird flocks sighted, all except one were at or within 3 miles of the drifting objects. The one exception was at 4 miles from the objects. Two of the bird flocks were pursued and the fish schools associated with them were verified. The first was a mixed school of 10- to 12-lb yellowfin and skipjack, the second was a school of 12-lb skipjack.

Due to rough seas and heavy swells, there was no opportunity to make underwater observations using divers and the shark cage, nor to use the night bait net.

C. Miscellaneous activities

Length measurements, gonad, and head samples were collected from 47 mahimahi for a study on age determination from otolith markings.

No porpoise was seen both en route to and from the drift area and within the drift area.

Thirteen juvenile yellowfin tuna was brought back alive for behavior and physiological studies. Of these three died either en route or during transfer to Kewalo Basin holding tanks.

XBT records were made at 6-h intervals on the run to the NECC and at 3-h intervals prior to and across the countercurrent.

SCIENTIFIC

PERSONNEL: Walter M. Matsumoto, Chief Scientist
Thomas K. Kazama, Research Assistant
Robert B. Moffitt, Research Assistant

Submitted by: Walter M. Matsumoto
Walter M. Matsumoto
Chief Scientist

Approved by: Tamio Otsu
Tamio Otsu
Acting Director
Honolulu Laboratory

Attachment

December 27, 1977

Due to rough seas and heavy swells, there was no opportunity to make underwater observations using divers and the shark cage, nor to use the night bait net.

C. Miscellaneous activities

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Submitted by: Walter M. Matsumoto
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Approved by: Tamio Otsu
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Acting Director
Honolulu Laboratory

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December 27, 1977

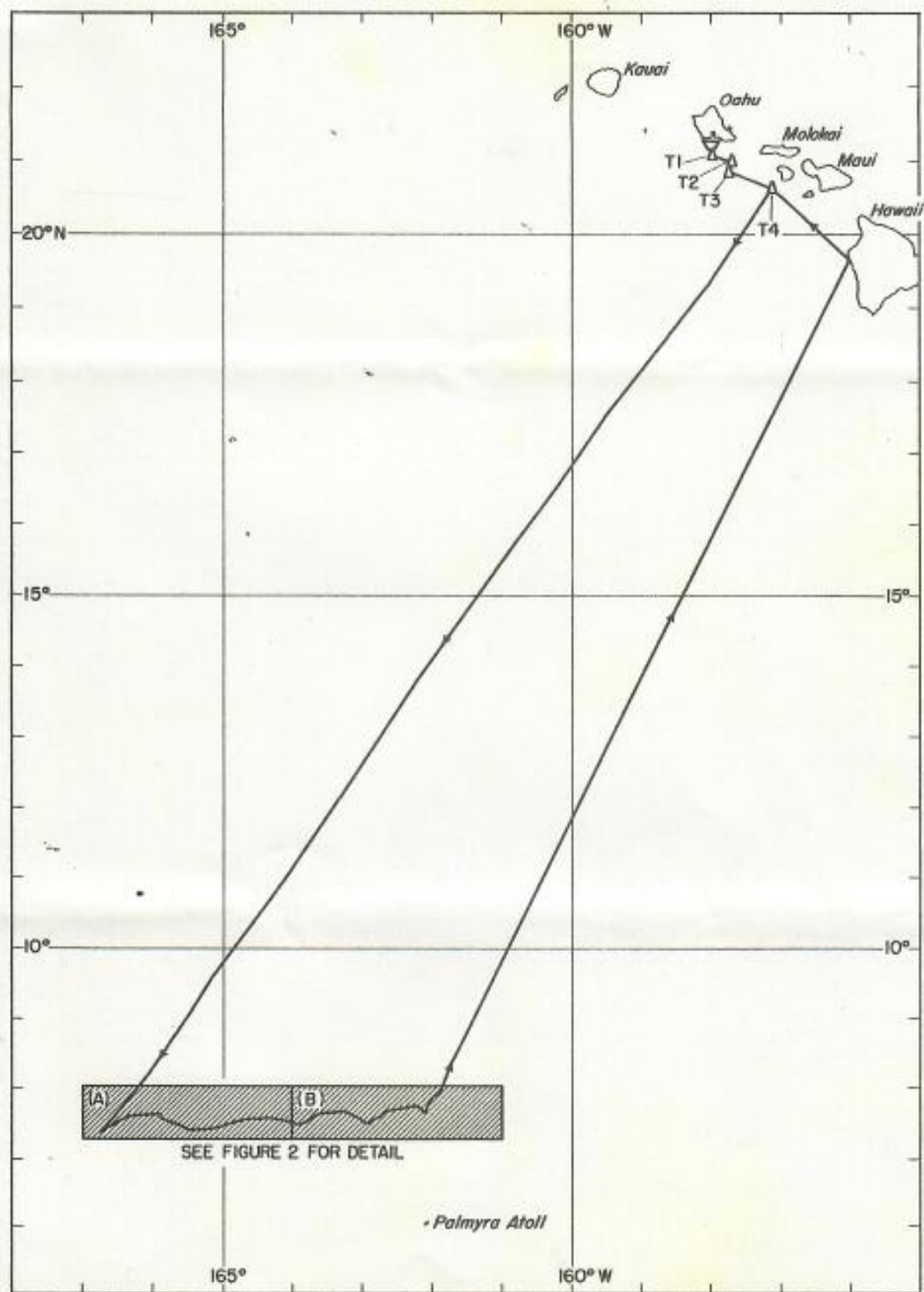


Figure 1.--Townsend Cromwell track chart, cruise 77-04-77.

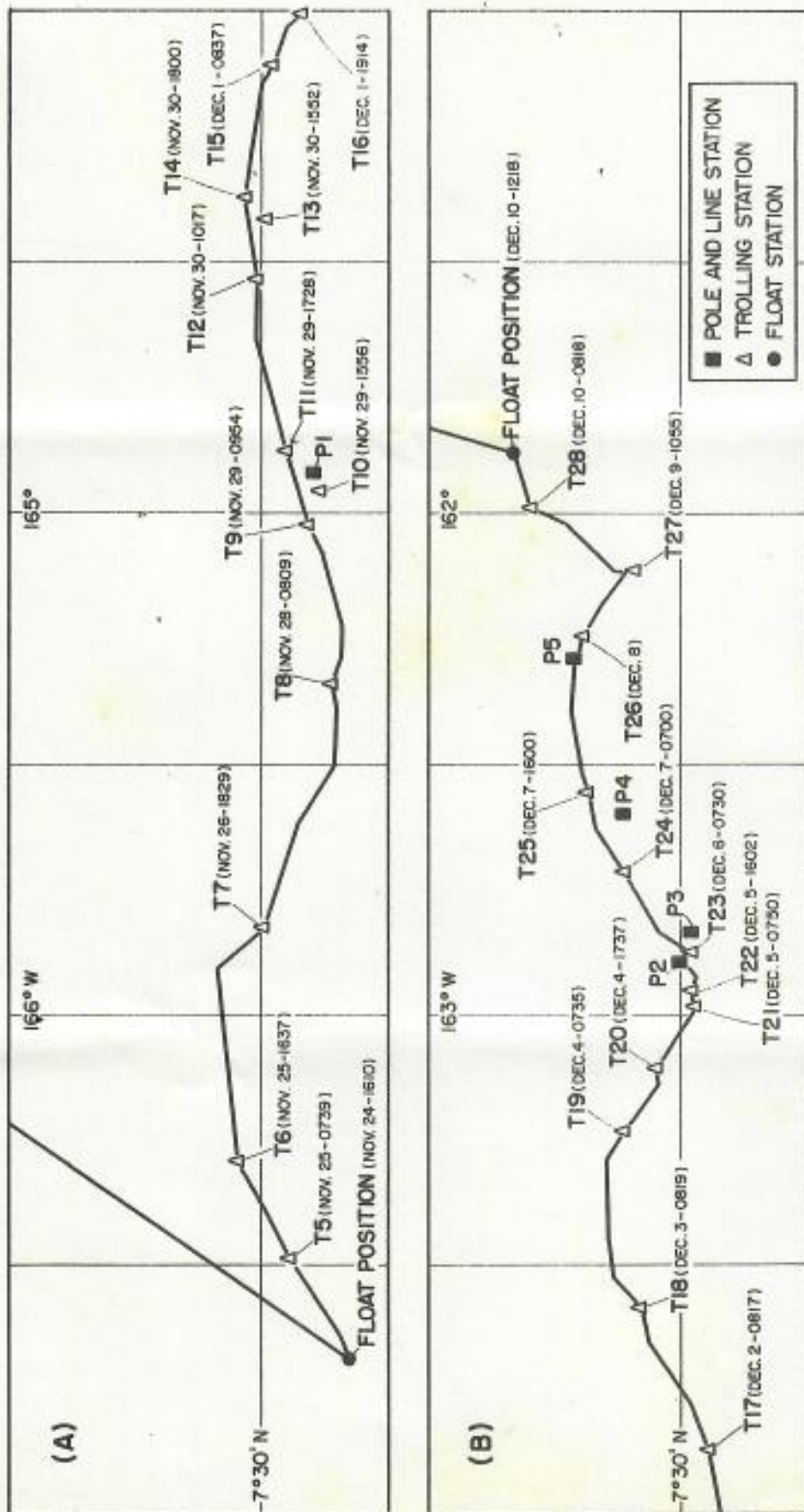


Figure 2.--Drift of objects and fishing operations around objects.



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CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 66

CRUISE
PERIOD: Phase I-A - August 19-24, 1975
Phase I-B - August 25-29, 1975
Phase I-C - September 2-5, 1975
Phase II - September 9-16, 1975

AREA OF
OPERATION: Hawaiian Islands.

ITINERARY:

Phase I-A

August 19	- Departed Kewalo Basin at 1100 and scouted south of Oahu.
20	- Scouted westward.
21	- Scouted northwestward.
22	- 0830-1330 stopped at French Frigate Shoal, then scouted northeastward for remainder of day.
23	- Scouted southeastward.
24	- Scouted southeastward and returned to Kewalo Basin at 1700.

Phase I-B

August 25	- Departed Kewalo Basin at 1700 and scouted for 2 hours south of Oahu.
26	- Scouted on windward side of Hawaiian Island chain.
27	- Delivered live threadfin shad to fishing vessel <u>Corsair</u> in Hilo. Resumed scouting.

- August 28 - Scouted south and west of island of Hawaii. Picked up live milkfish at Kawaihae.
- 29 - Arrived at Kewalo Basin and unloaded milkfish.

Phase I-C

- September 2 - Departed Kewalo Basin at 1600 and scouted south of Oahu.
- 3-4 - Scouted in area roughly 75 miles offshore west and southwest of southern portion of island of Hawaii. Tested thermosalinograph.
- 5 - Tested STD and CTFM sonar. Returned to Kewalo Basin at 1240.

Phase II

- September 9 - Departed Kewalo Basin at noon for fuel docks. Completed fueling and departed for Maui.
- 10-15 - Tested gear north of Maui in Pailolo Channel, and on Penguin Bank.
- 16 - Arrived at Kewalo Basin at noon.

MISSIONS
AND
RESULTS:

- A. Scout for concentrations of medium size skipjack tuna schools.

Phase I-A.--No concentrations of skipjack tuna schools were found. Only 14 schools were seen: four skipjack tuna, one yellowfin tuna, two porpoise, and seven unidentified.

Phase I-B.--Sighted during 34 hours of scouting were two yellowfin tuna schools of 40- to 60-pound individuals, one mahimahi school, and five unidentified schools.

Phase I-C.--Two skipjack tuna schools and four unidentified schools were sighted in 31 hours of scouting. Skipjack tuna in one school were 5 to 8 pounds in size and in the other 20 to 25 pounds.

- B. Test the capability of the live-bait wells aboard the Cromwell to sustain threadfin shad.

Phase I-A.--The 15 buckets of threadfin shad which were bucketed into the starboard baitwell on August 18 were in excellent condition throughout the cruise. Mortalities were negligible. It was estimated that 60 buckets could be held in the baitwell.

Phase I-B.--Twenty-five buckets of live threadfin shad were placed in the starboard baitwell upon departure. These were in addition to the approximately 10 buckets that were left from phase I-A. About two buckets of shad were lost and the rest exhibited signs of stress at the onset when the water intake was inadvertently set too low. With increased water flow through the baitwell the shad revived and were in excellent condition at the time of delivery in Hilo.

- C. Test the feasibility of conducting live-bait fishing from the Cromwell.

Phase I-A.--Only one skipjack tuna school offered the opportunity to conduct chumming. No positive response was observed. Feasibility tests should be made after the baitwell coaming has been corrected and the captain and crew have familiarized themselves with the fishing methods.

Phase I-B.--Live shad were chummed at the two yellowfin tuna schools. The schools were actively feeding during the approach of the ship and showed no response to the shad.

Phase I-C.--Five schools were approached. Live shad were chummed at three schools. The only sign of response was one 22-pound skipjack tuna caught on a trolling line during chumming.

- D. Transport live threadfin shad to Hilo.

Phase I-B.--Eighteen buckets of live shad were transferred to the skipjack tuna fishing boat Corsair in Hilo. That was the capacity of the Corsair.

- E. Transport live milkfish from Kawaihae, Hawaii to Honolulu.

Phase I-B.--Eighteen milkfish were trucked in two lots from ponds in Puako to the Cromwell docked at Kawaihae, a distance of 3 miles. The size of the milkfish ranged from 10 to 20 pounds. The milkfish were held en route in three tuna transport fiberglass tanks. They adapted quickly to the tanks and showed no sign of distress during the smooth crossing from Kawaihae to Kewalo Basin.

- F. Test the STD, thermosalinograph, and CTFM sonar.

Phase I-C.--The thermosalinograph was tested and found to be in working order except for malfunctioning of the recording pens. In the STD test the digital data logger was found to be nonfunctioning. The temperature sensor stopped working at 1,200-m depth. A subsequent deck function test showed it to be working again. The spare underwater unit was not tested because it lacked a salinity sensor. The horizontal scanning mechanism on the CTFM sonar was tested. It functioned up to a speed of 7 knots.

- G. Run operational tests on biological sampling gear.

Phase II.--Fourteen half-hour tows were made with the plankton sled. The shrimp trawl was towed 19 times for a total of 30 hours on the bottom. Four sets of bottom traps and two sets of the bottom longline were made. The total fishing times were 47 hours for the traps and 19-1/2 hours for the longline. Gear operations went smoothly.

- H. Miscellaneous observations and results.

XBT casts accompanied by surface temperature and salinity samples were made at 0800, 1400, and 2000 LCT daily when at sea during Phase I.

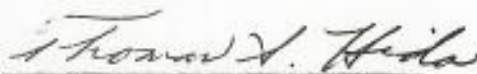
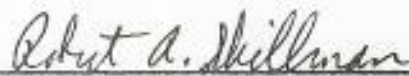
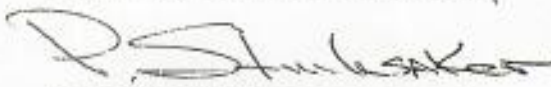
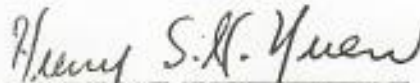
Surface trolling lines were fished for 330 line-hours in Phase I-A, 159 line-hours in Phase I-B, and 202 line-hours in Phase I-C. Three skipjack tuna and three mahimahi were caught in Phase I-A and two mahimahi were caught in Phase I-B.

SCIENTIFIC
PERSONNEL:

Thomas S. Hida - Field Party Chief (8/19-24)
 Heeny S. H. Yuen - " " " (8/25-29)
 Robert A. Skillman - " " " (9/2-5)
 Paul Struhsaker - " " " (9/9-16)
 Donald C. Aasted - Fishery Methods and Equipment
 Specialist (9/9-16)
 Jean M. Hatashima - Research Assistant (8/19-29, 9/9-16)
 Bernard M. Ito - " " (9/2-5)

Walter N. Ikehara - Graduate student, University of
 Hawaii (9/9-16)
 William Madden - Biologist, Oceanic Institute
 (8/28-29)
 Minato Yasui - Graduate student, Tokai University
 (9/9-16)

Submitted by:

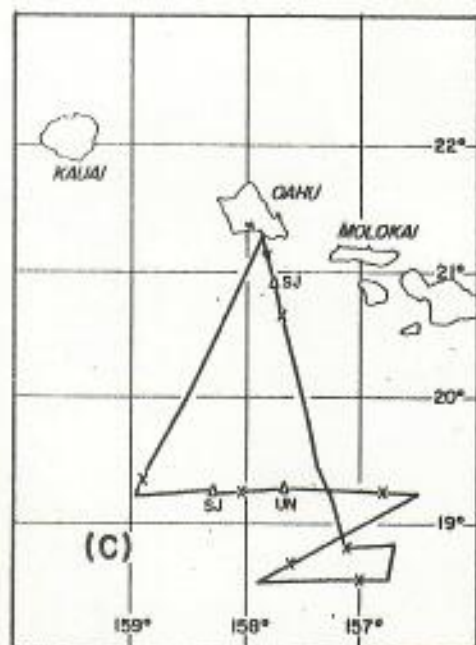
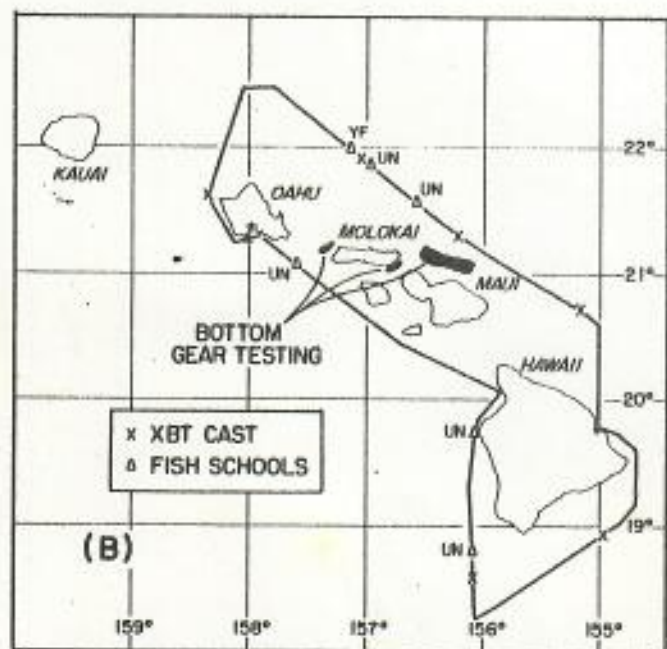
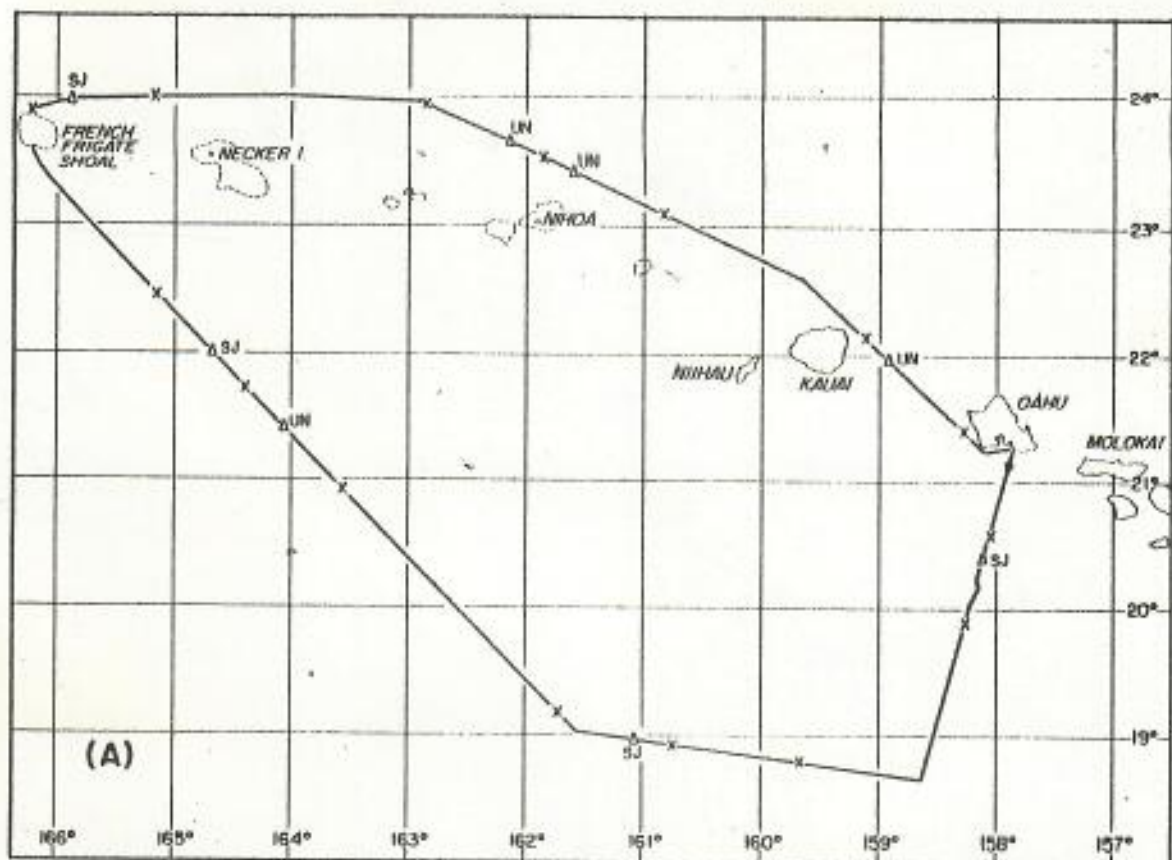
Thomas S. Hida
Field Party Chief, Phase I-ARobert A. Skillman
Field Party Chief, Phase I-CPaul Struhsaker
Field Party Chief, Phase IIHeeny S. H. Yuen
Field Party Chief, Phase I-B

Approved by:

Richard S. Shomura
Director, Honolulu Laboratory

Attachment

December 2, 1975



FRS Townsend Cromwell, cruise 66. Tuna scouting transects. (A), Phase I-A; (B), Phase I-B and Phase II, bottom gear test areas; and (C), Phase I-C.



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CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 67.

CRUISE

PERIOD: Leg I - 20 October-8 November 1975
Leg II - 9-11 November 1975
Leg III - 12-26 November 1975

AREA OF

OPERATION: Northwest Hawaiian Islands (Leeward Islands).

ITINERARY:

Leg I.

- 20 October - Departed Kewalo Basin to test STD, XBT, and thermosalinograph.
- 21 October - Returned to Kewalo Basin.
- 23 October - Departed Kewalo Basin. Conducted demersal resource surveys in the vicinity of Middle Bank, Nihoa Island, Necker Island, St. Rogatien Bank, Gardner Pinnacles, and Pearl and Hermes Reef.
- 6 November - Arrived Midway Islands. Gear repair and fabrication.

Leg II.

- 9 November - Departed Midway Islands for field trip to Pearl and Hermes Reef.
- 11 November - Returned to Midway Islands. Vessel openhouse.

Leg III.

12 November - Departed Midway Islands. Conducted demersal resource surveys in the vicinity of Kure Atoll, Lisianski Island, Laysan Island, Gardner Pinnacles, St. Rogatien Bank, and Nihoa Island.

26 November - Returned to Kewalo Basin.

MISSIONS
AND

RESULTS: A. Sample the demersal fish and shellfish populations of the Northwest Hawaiian Islands (Leeward Islands) in depths greater than 15 fathoms (fm).

- * Fish Trawling: Fish trawling was conducted with a high opening "Norwegian" trawl with a 63 ft. headrope, 83 ft. footrope, 4 in. diameter roller line, 4 in. mesh body and cod end, 1.5 in. mesh cod end cover, and fished with 750 lb steel V-doors.

A total of 26 fish trawl stations was made in the 16-215 fm depth range. The shallower stations were occupied at Middle Bank (34 fm), Nihoa Bank (26-30 fm), Necker Bank (16-26 fm), and St. Rogatien Bank (17-18 fm). Depths of 170-215 fm were sampled north of Necker Island. Persistent minor trawl damage due to occasional coral snags was experienced while sampling the bank tops. This was probably due to inadequate footrope protection. Towing periods varied from 10 to 60 min. All sets were made "blind" and represent the first trawl samples obtained from the banks of the Northwest Hawaiian Islands (Leeward Islands).

Four quantitative daylight trawl stations were effected on Middle Bank (lat. 22°44'N, long. 161°04'W). Individual catches ranged from 48 to 507 lb, which extrapolate to catch rates of 96-913 lb/h (\bar{x} = 534 lb/h). Assuming an effective trawl sampling width of 11.5 m, standing biomass estimates of 855-8,137 kg/km² (\bar{x} = 4,680 kg/km²) are indicated. Catches were dominated by three species of Acanthuridae (Naso brevirostris, N. hexacanthus, and N. lopezi), a small species of Serranidae (Caesioperca thompsoni) and the introduced lutjanid Lutjanus kasmira. Catches of Naso spp. ranged up to 243 lb/h, while catches of up to 285 lb/h of C. thompsoni were retained by the small mesh cod end cover. L. kasmira was taken at a

maximum indicated rate of 90 lb/h. Zooplanktivorous and herbivorous fishes made up 40%-91% of the catch weights at this locale.

Five quantitative stations were made north of Nihoa Island. Catches ranged from 61 to 116 lb/haul (184-349 lb/h; \bar{x} = 258 lb/h) with standing biomass estimates of 1,011-2,074 kg/km² indicated. These hauls were dominated by N. brevirostris, N. hexacanthus, and Acanthurus olivaceus. Zooplanktivorous and herbivorous species were again dominant, contributing 38%-84% to the catch.

Two daylight stations north of Necker Island in 26 fm yielded only small catches (8-17 lb/tow). A single night station in 16 fm, at which moderate gear damage occurred, resulted in a 376 lb catch (= 1,129 lb/h; 8,028 kg/km²). A variety of fish families were represented in this catch, but again the dominant species was N. hexacanthus. Two stations on St. Rogatien Bank yielded only small amounts of fishes.

Fish trawling in the deeper depth ranges north of Necker Island resulted in small catches (2-30 lb/h). Of interest, however, was the first Hawaiian capture (a single specimen from 210 fm) of Decapterus russellii (Carangidae), a commercially important species in southern Japan. Remains of this species recovered from dogfish (Squalus) stomachs from other stations is evidence that it is more abundant than indicated by the single capture.

Shrimp Trawling: Nine stations were made with 41-ft. headrope semiballoon shrimp trawls in depths of 16-20 fm and 218-430 fm. The three shallow water tows were made with a trawl rigged with a modified roller line on the footrope: catches were small and gear damage was experienced on two of the hauls. Gear damage occurred at two of the six deeper stations. Catches at these greater depths were small, with the caridean shrimps Heterocarpus ensifer and H. laevigatus being taken at rates of 1.5-2.0 lb/h.

Fish and Lobster Trapping: Ninety-six trap stations were occupied in the 16-65 fm depth range (double traps fished at 13 stations). Traps were of two general types. The large traps were 5 ft. square and 4 ft. high with two bottom entrances and one upper entrance. The smaller traps were 2 x 2 x 4 ft. and had either one or two

entrances. Bait was 1-5 lb of chopped fish in 0.5 in. wire mesh containers secured to the bottom of the traps. The gear was fished overnight for periods of 13-16 h.

Fish catches were quite variable and generally small. Fair catches of opakapaka (Pristipomoides microlepis) were made on four occasions with the large traps at the shelf edge north of Necker Island in depths of 24-31 fm. These catches ranged from 10-17 lb per set (\bar{x} = 11.9 lb). One trap near Kure Atoll (26 fm) produced 40.5 lb of Caranx cheilio. Two traps (of 12) in 15 fm near Lisianski Island produced 35 and 105 lb of Carangoides ajax.

Lobster (Panulirus marginatus Randall) catches were also variable. Best catches were made north of Necker Island. Here, 17 traps set in 16-31 fm produced 160 lobsters (estimated mean weight 1.4 lb). Best catches were made near the edge of the bank in 24-31 fm. Fair numbers of lobsters were taken in 24-26 fm NNW of Nihoa Island. Here, 11 traps yielded 41 lobsters with estimated mean weights of 2.0 lb. Sets near Pearl and Hermes Reef, Kure Atoll, Lisianski Island, Laysan Island, and Gardner Pinnacles produced only a few lobsters. Of interest was the occurrence of kona crabs (Ranina serrata) in traps set in 25-30 fm off Pearl and Hermes Reef and Kure Atoll: three traps at Kure produced 10-60 lb each (\bar{x} = 30.7 lb per trap).

A total of 14 handline stations in depths of 14-55 fm was occupied at various localities during the cruise. Catches were dominated by C. ajax, C. cheilio, P. microlepis, Seriola dummerilii, and Epinephalus quernus. Best catches were near Gardner Pinnacle where 11 C. ajax weighing 400 lb were taken and Laysan Island where 33 C. ajax weighing a total of 645 lb were captured during 3 h of fishing with five handlines.

Miscellaneous Activities: One-meter plankton net surface tows were made on 15 occasions.

Two benthic longline stations produced no catches.

Shrimp traps were set overnight in depths of 260 and 300 fm on two occasions. One set of six traps off Necker Island produced 36.5 lb of H. laevigatus (mean weight of 8-9 individuals per pound, heads on). A set of four traps off Nihoa Island yielded 24.2 lb of H. laevigatus and 4.3 lb of H. ensifer.

A total of 400 hook hours of trolling was obtained in the vicinity of the banks and between survey areas. A total of five yellowfin tuna (Thunnus albacares), three kawakawa (Euthynnus affinis), three mahimahi (Coryphaena hippurus), 1 skipjack tuna (Katsuwonus pelamis) and one wahoo (Acanthocybium solandri) was taken.

A search was made, with negative results for a shoal reported 80 miles SSW of Kure Atoll.

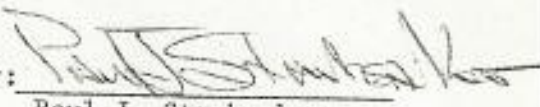
- B. Conduct a short field trip to Pearl and Hermes Atoll to acquaint State and federal officials with the Hawaiian Islands National Wildlife Refuge.

During the period 9-11 November, nine State and federal officials visited Pearl and Hermes Reef.

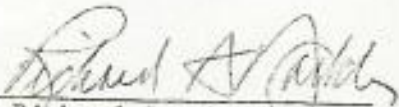
SCIENTIFIC

PERSONNEL: Richard A. Barkley - Chief Scientist (10/20-21)
 Richard S. Shomura - " " (11/9-11)
 Paul J. Struhsaker - " " (10/22-11/8; 11/12-26)
 Donald C. Aasted - Fishery Methods and Equipment Specialist (10/23)
 Lloyd Blaine - Research Assistant (10/23-11/9)
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 Thomas S. Hida - Fishery Biologist (10/23-11/26)
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 Robert M. Skillman - Fishery Biologist (10/23-11/26)
 Brian Lau - Student, Pacific University (10/23-11/26)
 Linda Paul - Graduate Student, University of Hawaii (11/12-26)

Submitted by:


 Paul J. Struhsaker
 Chief Scientist

Approved by:


 Richard S. Shomura
 Director, Honolulu Laboratory

Attachment

December 24, 1975



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu and La Jolla Laboratories
P. O. Box 3830
Honolulu, Hawaii 96812

CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 76-06-73 (Leg 2)

CRUISE
PERIOD: October 12-November 24, 1976

AREA OF
OPERATION: Northwestern Hawaiian Islands, Hancock Seamount, and waters
off Oahu and Niihau

ITINERARY: October 12 - Loaded vessel, departed Kewalo Basin and
headed for Waianae.

October 13 - Shakedown and diver check of bottom fish trawl
off Makaha, returned diver (Naughton) to
Kewalo Basin, and headed for Necker Island.

October 15-16 - Bottom trawled and handlined at Necker Island.

October 18 - Arrived Kewalo Basin; Skillman and Hughes
disembarked vessel.

October 19 - Departed Kewalo Basin and headed for Middle
Bank.

October 20 - Bottom trawled at Middle Bank and Nihoa and
headed for Necker Island.

October 21-25 - Worked bottom trawl, bottom grab, traps,
plankton net; trolled at Necker Island and
headed for Midway Islands.

October 28 - Arrived Midway Island, voted by absentee
ballot; Wilder disembarked vessel and Honda
came aboard; departed Midway Island and headed
for Hancock Seamount.

October 29-30 - Bottom trawled and handlined at Hancock
Seamount and bottom trawled at a 90-fathom
(165 m) bank north of Kure Atoll prior to
heading for Midway Islands.

- October 31 - Arrived Midway Island; disembarked Barcott.
- November 2 - Departed Midway Island and ran a STD leg to Pearl and Hermes Reef.
- November 3 - Trapped, trolled, and handlined at Pearl and Hermes Reef.
- November 4 - Departed Pearl and Hermes Reef and headed for Laysan Island.
- November 5 - Arrived Laysan Island and bottom trawled.
- November 6 - Ran a XBT leg and departed Laysan Island; headed for Kewalo Basin to repair ship's generator.
- November 10 - Arrived Kewalo Basin; generator being repaired.
- November 16 - Generator repaired; departed Kewalo Basin and headed for Necker Island.
- November 18-21 - Bottom trawled, trapped, and handlined at Necker Island and headed for Niihau.
- November 22-23 - Trapped, handlined, and trolled at Niihau and headed for Kewalo Basin.
- November 24 - Arrived Kewalo Basin (end of Leg 2).

MISSIONS
AND
RESULTS

- A. The primary objective was to conduct bottom fish trawling, trapping, handlining, and oceanographic surveys as well as to collect forage organisms at selected insular sites in order to assess the fishery resources of the Northwestern Hawaiian Islands.

1. Bottom fish trawling

A total of 29 trawl stations of 15 to 30 min actual fishing time on the bottom was attempted during the cruise. Twenty hauls were made at Necker, five at Laysan, and one each at Hancock Seamount, Nihoa, Middle Bank, and a 90-fathom (165-m) bank north of Kure. Of significance were catches of "red tail" opelu, Decapterus russelli (tentative identification), at depths of 178-210 fathoms (326-384 m) off Laysan and Necker with the largest catch weighing 379.5 lb (172.5 kg) made during a 30-min haul.

The filefish, Pseudomonacanthus garretti, was caught in fairly large quantities on two occasions, 1,000 lb (455 kg) in a 30-min haul in 48 fathoms (88 m) at Laysan and 363 lb (165 kg) in a 15-min haul in 39 fathoms (71 m) at Necker. Another filefish, Pervagor spilosoma, was caught in fair quantities in about 16-18 fathoms (29-33 m) at Necker Island. The squat lobster, Scyllarides squamosus, moano, Parupeneus multifasciatus, malu, P. pleurostigma, weke-ula, Mulloidichthys auriflamma, pipefish, Fistularia petimba, and aweoweo, Priacanthus cruentatus, were some of the species that were commonly caught in fair quantities. A few spiny dogfish, Squalus fernandinus, and a few large stingrays, Dasyatis hawaiiensis, and D. lata were caught in the deeper trawl hauls.

A bottom trawl haul taken at 145-160 fathoms (265-293 m) (bottom temperature 13.5°C) resulted in catching 34 pelagic armorhead, Pentaceros richardsoni, weighing 46 lb (20.9 kg) and 3 alfonsin, Beryx splendens. Another haul taken at 90-93 fathoms (165-170 m) a few miles north of Kure resulted in catching 73 lb (33.2 kg) of aweoweo, Priacanthus boops, and 41 lb (18.6 kg) of a yet to be identified red serranid. One hundred and eighty three pounds (83.2 kg) of a small red serranid, Anthias thompsoni were caught in 33-34 fathoms (60-62 m) at Middle Bank.

2. Trapping

Hawaiian-type fish traps and California lobster pots were fished eight times. A set consisted of six separate stations with each station consisting of two pairs of traps, each pair consisting of a fish trap and lobster pot. Six sets were made at Necker, of which five were soaked overnight and one during the day. The day set resulted in a zero catch of spiny lobsters and only a few fishes. The night sets resulted in catching 929 (including the two tagged lobster recoveries) spiny lobsters, Panulirus marginatus, of which, 481 were caught in the California lobster pots and 448 in the Hawaiian-type fish traps. Of the total, 596 spiny lobsters were tagged and released in the general area of their capture. A makeshift burlap bag release "cage" was used to return the tagged lobsters safely to the bottom. The best catch per set, consisting of 12 fish traps and 12 lobster pots, was 428 spiny lobsters. The best catch per station, four traps, was 106 spiny lobsters. The best spiny lobster catches in a single fish trap were 49 and 33, respectively, in a lobster pot. The

lobsters were not large, averaging slightly over a pound apiece. The best spiny lobster trapping grounds around Necker were at the periphery of the bank at the initial drop-off in about 16 to 30 fathoms (29-55 m) of water. Squat lobsters, moray eels, blue-lined snapper Lutjanus kasmira, opakapaka, Pristipomoides microlepis, moano, menpachi, Myripristis berndti, and malu were frequently caught in the fish traps. A few opakapaka (one was about 5.5 lb (2.5 kg)) and quite frequently, squat lobsters, were caught in the lobster pots.

Fifteen spiny lobsters were caught in a trap set at Pearl and Hermes. The traps were set to sample kona crabs, Ranina ranina, but none was taken apparently because the set was made on hard bottom.

No spiny lobsters were caught in a trap set at Niihau.

3. Handlining

Three handline stations at Necker in drop-off areas, 25-80 fathoms (46-146 m), resulted in hooking mostly opakapaka, ehu, Etelis marshi, kalikali, Pristipomoides sieboldii, hapuupuu, Epinephelus quernus, and butaguchi, Caranx cheilio.

Twenty eight Japanese mackerel, Scomber japonicus, weighing 96 lb (43.6 kg), 2 pelagic armorhead and a large "red tail" opelu were caught on the top of Hancock Seamount in 145-150 fathoms (265-274 m). Only one alfonsin was caught at the drop-off of the seamount in 160-165 fathoms (293-302 m)

A variety of fishes was caught at 70 fathoms (128 m) at Pearl and Hermes. The catch included opakapaka, ehu, kahala, Seriola dumerilii, rainbow runner, Elagatis bipinnulatus, butaguchi, and two bonito, Sarda orientalis, which weighed 10 and 11 lb (4.6 and 5.0 kg), respectively.

Five handline stations at Niihau were relatively unproductive. The best station was a night station in 8 fathoms (15 m) where a fair catch of menpachi was made. The other stations in 40-140 fathoms (73-256 m) were unproductive.

4. Oceanographic surveys

Two series of STD stations were occupied during the cruise. Four STD casts to 500 m were made between Midway and Pearl

Hermes and four casts were made between Necker Island and French Frigate Shoals. Two lines of XBT casts were made at stratified depths at Necker and Laysan Islands. A total of 59 XBT casts was made during the cruise.

5. Collecting of forage organisms

Only one 30-min tow to 100 m was made with a 10-ft (3-m) Isaac-Kidd trawl. The operation of the IK trawl was less than ideal with the present setup on the vessel.

Three 30-min surface tows were made with a 1-m plankton net. Several unidentified juvenile opelu regurgitated by shearwaters hitting the deck at night at Necker were preserved. Each shearwater regurgitated one or two opelu.

A 48-lb (21.8-kg) yellowfin tuna, Thunnus albacares, caught trolling at Necker had 43 Pervaga spilosoma in its stomach and 5 kawakawa, Euthynnus affinis, caught trolling at Necker had remains of P. spilosoma in their stomachs.

B. Miscellaneous observations and activities.

1. One Shipek grab sample was obtained before the grab was lost.
2. A total of 36 bird flocks was sighted. Of these, 2 flocks were associated with skipjack tuna schools, 1 with a yellowfin tuna school, 1 with a mahimahi, Coryphaena hippurus, school, and 32 were with unidentified schools.
3. No whales were observed by the whale watchers but bottlenose, rough tooth, and spinner porpoises were seen on nine occasions, about 15 false-killer whales once, and an unidentified turtle once.
4. A total of 43.75 h of trolling was conducted on 9 days. The catch included 5 skipjack tuna, Katsuwonus pelamis, 20 yellowfin tuna, 12 kawakawa, and 1 wahoo, Acanthocybium solandri.
5. Gorgonians, Callogorgia sp. and Villogorgia sp., black coral, Antipathes sp., and bamboo coral, Keratoisis sp., samples were preserved for Ms. K. Muzik of the Smithsonian Institution.
6. Fish and invertebrate samples were either preserved in Formalin or frozen for identification, stomach analysis, and/or otolith study.

7. Length frequencies for selected species were tabulated.
8. Salinity samples and surface temperature readings were taken with each of the 59 XBT casts.
9. Standard weather observations were made at 0000, 0600, 1200, and 1800 G.m.t. by the ship's officers whenever feasible.
10. The surface thermosalinograph was run continuously whenever the ship was at sea.
11. Fathometer traces of the bottom were kept for all of the bottom trawl stations.
12. The ship's officers mapped one of the seamounts in the Hancock Seamount complex.

**SCIENTIFIC
PERSONNEL:**

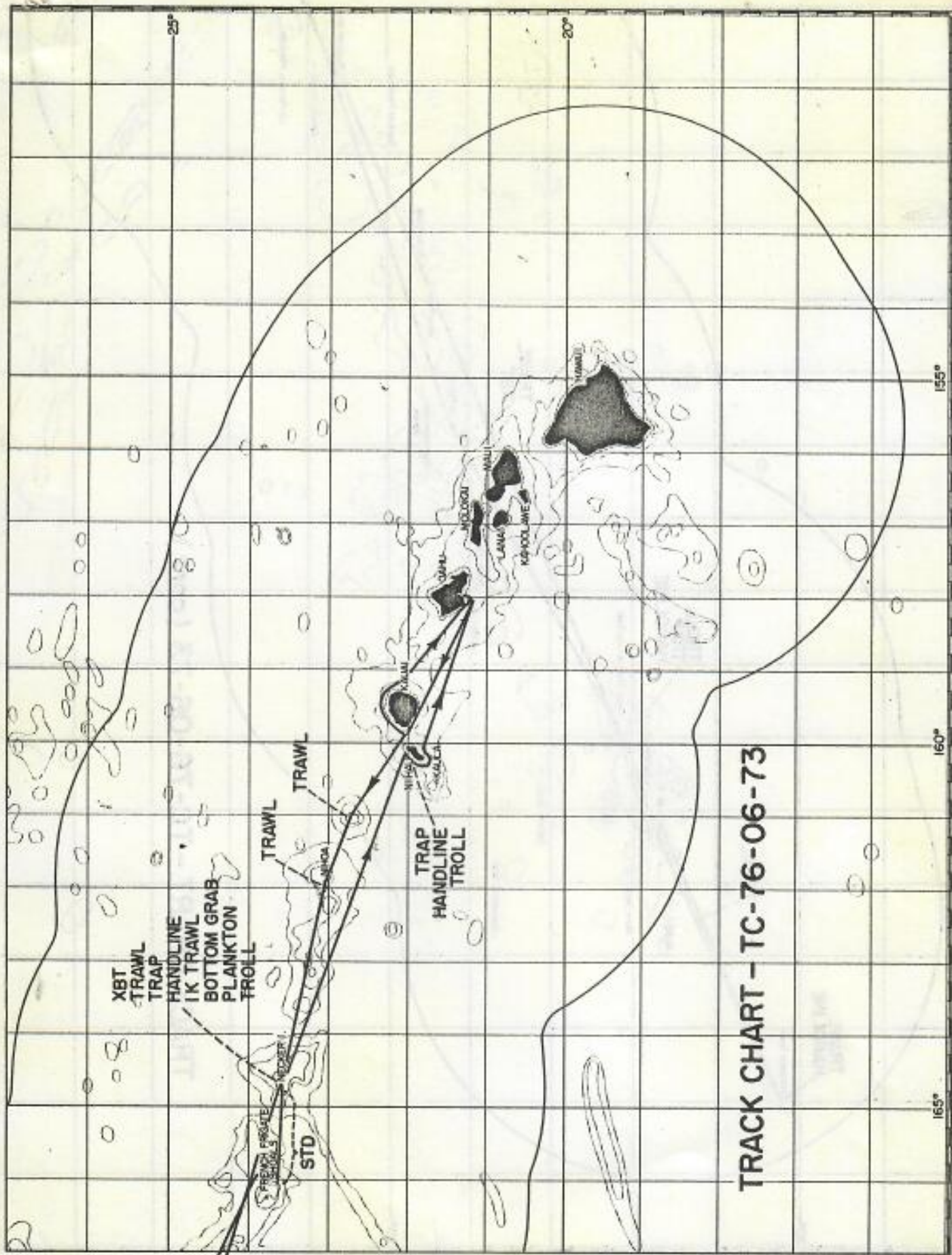
Thomas S. Hida, Chief Scientist
 Reginald M. Gooding, Fishery Biologist
 Victor A. Honda, Research Assistant (Oct. 28-Nov. 24)
 John J. Naughton, Fishery Biologist (Oct. 12-13)
 Paul M. Shiota, Research Assistant
 Robert A. Skillman, Fishery Biologist (Oct. 12-18)
 James H. Uchiyama, Research Assistant
 Michael J. Wilder, Research Assistant (Oct. 12-28)
 Augustine Barcott, Fishery Gear Maintenance Man, NMFS,
 Seattle Laboratory (Oct. 12-Nov. 2)
 Paul Forestall, University of Hawaii (Nov. 16-24)
 Mark Harrington, Graduate student, University of Hawaii
 Louis Herman, University of Hawaii (Nov. 2-10)
 Steven E. Hughes, Fishery Biologist, NMFS, Seattle
 Laboratory (Oct. 12-18)
 Steve Sipman, University of Hawaii (Nov. 2-24)

Submitted by: Thomas S. Hida
 Thomas S. Hida
 Chief Scientist, Leg 2

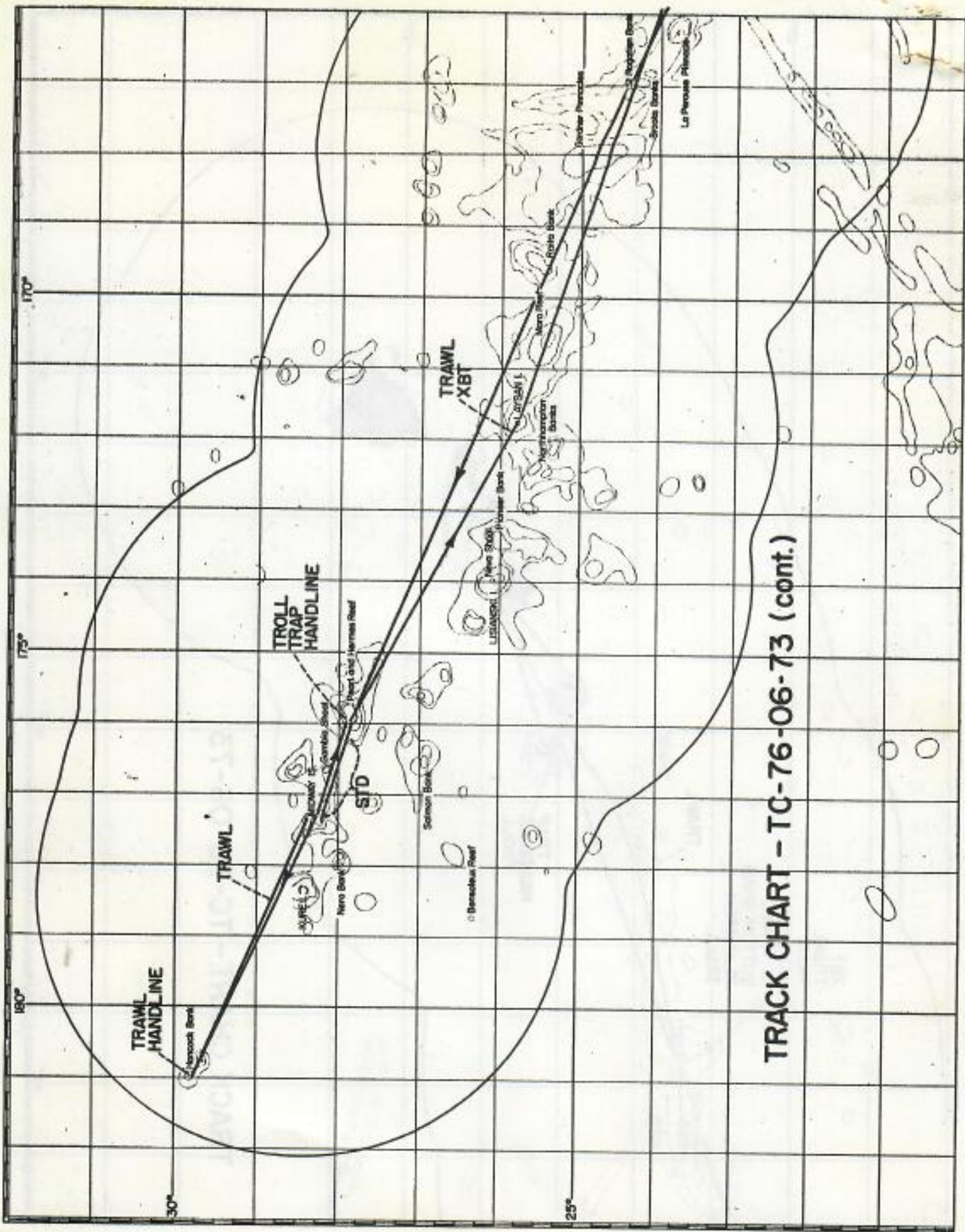
Approved: Richard S. Stomura
 Richard S. Stomura
 Director
 Honolulu Laboratory

Attachment

December 20, 1976



TRACK CHART - TC-76-06-73



TRACK CHART - TC-76-06-73 (cont.)



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
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NARRATIVE REPORT

TOWNSEND CROMWELL, CRUISE 76-06-73 (LEG 2)

- I. CRUISE PERIOD: October 12-November 21, 1976
- II. AREA OF OPERATION: Northwestern Hawaiian Islands, Hancock Seamount and waters off Oahu and Nihoa (Figure 1).
- III. MISSIONS AND RESULTS:
 - A. The primary objectives were to conduct bottom trawling, trapping, handlining, and oceanographic surveys as well as to collect forage organisms at selected insular sites in order to assess the fishery resources of the Northwestern Hawaiian Islands.

1. Bottom Fish Trawling

The 1.59-cm trawling cables were marked at 46-m intervals prior to the cruise. The newly acquired Norwegian fish trawl with roller gear was tested off Makaha in depths of 22-27 m on October 13. Divers (J. Naughton and R. Gooding) observed the performance of the trawl on the bottom. They reported that the trawl opened nicely, about 3 m high, and that the roller gear was working well. They observed that there was some constriction of the net at the attachment of the middle bridles which caused the trawl wings to billow both above and below the bridles but they believed that it was not affecting the effectiveness of the trawl. The bottom trawl station data are given in Table 1 and the trawling results in Table 2.

Nine successful bottom trawl stations were conducted at the northeast or windward side of Necker Island at stratified depths from 29 to 494 m (Figure 2). All of the tows were of 30-min duration except for a few that were of 15-min duration. The shorter tows were made either where the grounds were "rugged" or where there was a good chance that the troublesome filefishes, Pervagor spilosoma and/or Pseudomonacanthus garretti, would be caught in large quantities. These small filefishes get their spines embedded in the webbing and rope making their removal a most tedious job. The first two trawl hauls attempted were unsuccessful; one failed to fish on the bottom presumably because

the ship was going too fast and the other resulted in tangling because the wire was let out too fast. The largest catch of 343.5 kg was made at depths of 322-342 m and included 172.5 kg of the "red tail opelu," Decapterus russelli (tentative identification), and 170.5 kg of the stingray, Dasyatis hawaiiensis. The catches from lesser depths (29-119 m) consisted mostly of filefishes; the most caught in a single tow was 165 kg of P. garretti. Besides filefishes, the pipefish, Fistularia petimba; the aweoweo, Priacanthus cruentatus, the weke-ula, Mulloidichthys auriflamma and the squat lobster, Scyllarides squammosus, were caught in fair quantities. Hardly anything was caught in the deeper tows except the "red tail opelu" and stingrays.

Eight successful trawl hauls were made at the southwest or leeward side of Necker Island (Figure 2). The best catch made in this area was 63.3 kg which was mostly of squat lobster at a depth of 66-73 m. The filefish constituted a large part of the catches made at lesser depths. Caught in fair quantities were opakapaka, Pristipomoides microlepis, spiny lobster, Panulirus marginatus, weke-ula, and the pufferfish, Diodon hystrix. Very little was caught in the deeper tows, 357-384 m, except for the "red tail opelu."

Five successful bottom trawl hauls were made on the west side of Laysan Island (Figure 3) under less than favorable weather conditions. The largest catch made was 475.3 kg of mostly P. garretti (454.5 kg) at a depth of 88 m. Very little if any other species were caught at lesser depths. In the deeper areas only the "red tail opelu" and the stingray, Dasyatis lata, were caught in significant amounts.

Only one bottom trawl was made on Middle Bank at a depth of 60-62 m. The catch totaled 117 kg, of which, 83.2 kg were the serranid, Anthias thompsoni. The other species were caught in much smaller quantities with the triggerfish, Balistes capistratus, and squat lobster contributing a larger percentage of the catch than the others.

One bottom trawl haul was made in 48 m at Nihoa which resulted in a catch of 60 kg. A variety of fish was caught, but all in very small quantities, with the orange-spot tang, Acanthurus olivaceus, the butterflyfish, Henicocus acuminatus, and a unicornfish, Naso sp., being slightly more abundant than the others.

One bottom trawl haul was made in 165-170 m on a bank north of Kure Island. The total catch was 59.4 kg of which the aweoweo, Priacanthus boops, contributed 33.2 kg, and an

unidentified red serranid contributed 18.6 kg. This bank was located during a search for a 329-m bank. According to the captain, this shallower bank appeared to be very close if not on the position of the deeper bank. The trawl was badly torn at the belly indicating that the area trawled was hard and rugged. Some gorgonians and black coral were also brought up in the trawl.

Only one 19-min bottom trawl haul was made in the evening on the top of one of the pinnacles of the Hancock Seamount complex in 265-293 m. A total catch of 23.1 kg was made, of which, 20.9 kg (34 fish) were the pelagic armorhead, Pentaceros richardsoni. Both the "lean" and "fat" types of this species were caught. The trawl came up "clean" which indicated that the top of the seamount was hard and seemingly without rubble, corals, etc. Since a good chart of Hancock Seamount was not available, it was difficult to locate the guyot. The particular guyot fished rose very steeply from about 2,926 m and was found only after 6 h of searching using a cloverleaf search pattern. In the afternoon the depth recorder showed a rather dense patch of fish close to the top of the pinnacle at a depth of about 274-311 m which could very well have been pelagic armorhead. In the evening this patch seemed to adhere itself to the top of the pinnacle with its "tail" trailing downward to about 311 m. Further trawling was discontinued due to navigational problems and the possibility of losing the trawl if an attempt was made to skim the side of the pinnacle to sample the patch. Under the circumstances, the time was invested in carefully mapping this seamount.

2. Trapping

Two types of traps were used during the cruise, a Hawaiian-type fish trap and a California double-chambered lobster pot. The Hawaiian-type fish traps were constructed with a frame of 1.27 cm reinforcement steel rod covered with 2.54 x 2.54 cm heavy-gauge galvanized wire mesh with either two conical entrances, 13.97 cm in diameter, located one on each side or two pear-shaped entrances, 12.7 cm wide x 22.86 cm high, located at opposite ends. The California lobster pots were constructed of 5.08 x 10.16 cm heavy-gauge galvanized wire mesh with two conical entrances, 16.51 cm in diameter located one on each side.

A string of traps consisting of two fish traps and two lobster pots were set out in pairs as shown in Figure 4. Six strings of traps were set out in any single operation,

either night or day, which totaled 12 fish traps and 12 lobster pots. The mainline used was a 1.27-cm polypropylene rope to which the traps and pots were snapped on. Two plastic floats and a bamboo pole with a flag were rigged as shown on Figure 1 for marking and retrieving purposes. The traps were baited with either frozen fish or whatever fresh fish that was available from troll, trap, trawl, and handline catches. Therefore, the bait was a mixture of species which included skipjack tuna, Katsuwonus pelamis; kawakawa, Euthynnus affinis; yellowfin tuna, Thunnus albacares; wahoo, Acanthocybium solandri; malu, Parupeneus pleurostigma; moana, P. multifasciatus; the serranid, A. thompsoni; pipefish, F. petimba; orange-spot tang, and many other reef and deepwater fishes. The catches of spiny lobsters are tabulated by areas in Table 2. The species caught by fish traps and lobster pots are listed in Table 4.

The northeastern, western, and northern area around Necker Island were worked with traps (Figure 5). All except one of the trapping operations commenced at about 1600 when the strings of traps were set out. Setting took about 45 min. The traps were soaked overnight and retrieval commenced at about 0800. Depending upon the catch, the retrieval operation lasted for about 2-3.5 h. Only on one occasion were the traps set out commencing at 0800 and retrieved at about 1730. The daytime set on the west side of Necker Island failed to catch any spiny lobsters. The strings set out to fish at night at stratified depths caught 21 spiny lobsters while those set out close to the drop-off area caught 161 spiny lobsters. The lobster pots outfished the fish traps in this area; 125 for lobster pots and 57 for fish traps. The failure of the traps soaked during the day to catch any spiny lobsters substantiated our belief that spiny lobsters would not be caught during the day since they are known to forage during the night.

Only two night trapping operations were conducted on the northeast side of Necker Island. On one occasion, the strings were set at stratified depths which caught 158 spiny lobsters and on the other, the strings were set close to the drop-off area which caught 161 spiny lobsters. The fish traps caught 162 spiny lobsters and the lobster pots 157 spiny lobsters in this area.

Only one night trapping operation was conducted on the north side of Necker Island which caught a total of 428 spiny lobsters. Compared to the other areas trapped around Necker Island, the bottom in this area was very "rugged".

close to the drop-off. Of the 428 spiny lobsters caught, 229 (53.5%) were caught in fish traps and 199 (46.5%) in lobster pots. The total catch weighed 245 kg, of which, 226.4 kg were spiny lobsters, 10.4 kg were opakapaka, 6.7 kg were squat lobsters, 0.8 kg were moano, 0.4 kg were conger eel, and 0.2 kg were menpachi. The best catch per string of four traps was 106 spiny lobsters (53.2 kg) at a depth of 33 m. This gave a catch rate of 26.5 lobsters per trap (13.3 kg of spiny lobsters per trap). Sixty-one were caught in fish traps and 45 in lobster pots. The most spiny lobsters taken in a single fish trap was 49 (24.5 kg) and for a lobster pot it was 33 (20 kg).

Summarizing the spiny lobster catches round Necker Island, a total of 929 was caught, of which, 481 (51.8%) were caught in lobster pots and 448 (48.2%) in fish traps. The carapace lengths of 923 spiny lobsters were measured during the cruise. The minimum legal size for spiny lobster in Hawaii is 1 lb (0.45 kg, or 8.25 cm in carapace length as estimated from our data). Therefore, using this as the criteria, out of 691 (74.9%) male spiny lobsters caught, 465 (67.3%) were of legal size and of 232 (25.1%) females caught, 39 (16.8%) were of legal size. Of the 504 legal-size spiny lobsters caught, 236 (46.8%) were caught in fish traps and 268 (53.2%) in lobster pots. A total of 633 spiny lobsters was tagged with a Floy anchor tag between the carapace and first abdominal segment and released in the general area of capture. Two spiny lobsters died during tagging due to stab wounds and nine died after tagging while being held in a holding pen prior to being released. It was noticed during the tagging operation that some of the lobsters appeared rather weak but most recovered after being held in a holding pen for a few hours. The spiny lobsters were not large, the average being slightly over 0.5 kg. Noticeably absent in the catches, especially in what is believed to be virgin lobster grounds, were large spiny lobsters; those about 2 kg or larger.

Only one night trapping operation was conducted at Pearl and Hermes Reef utilizing six strings of traps in depths of 37 to 62 m. The traps were set with the intent of sampling kona crabs, Ranina serrata, since they were caught in this vicinity on an earlier cruise in 1975. However, the bottom must have been very hard since kona crabs were not taken and instead, 15 spiny lobsters were caught. A few squat lobsters, hermit crab, and butterflyfish were in the catch.

One night trapping operation was conducted along the western coast of Niihau at depths of 37-86 m to see if the method of lobster trapping at Necker Island would also be successful in the main Hawaiian Islands (Figure 6). Much to our disappointment, no spiny lobsters were taken. Only a few moray eels, blue-lined snapper, Lutjanus kasmira, butterflyfish, etc. were caught.

3. Handlining

Three handline stations at Necker Island in drop-off areas, 46-146 m in depth (Figure 2), resulted in catching mostly opakapaka, ehū, Etelis marshi, kalikali, Pristipomoides sieboldii, hapuupuu, and butaguchi, Caranx cheilio.

Two handline stations were conducted at Hancock Seamount. One station was occupied on the top of the seamount at a depth of 265-274 m. Twenty-eight Japanese mackerel, Scomber japonicus, weighing 43.6 kg, 2 pelagic armorhead, and a "red tail opelu" were caught. The other station occupied at the edge of the seamount in 293-302 m produced one alfonsin, Beryx splendens.

A variety of fishes was caught at 128 m at Pearl and Hermes Reef. The catch included opakapaka, ehū, kahala, Seriola dumerilii, rainbow runner, Elagatis bipinnulatus, butaguchi, and two bonito, Sarda orientalis, which weighed 4.5 and 5.0 kg, respectively.

Five handline stations conducted at Niihau were very unproductive. The best station was at night in 15 m of water where a fair catch of menpachi, Myripristis berndti was made. The other stations at depths of 73-256 m were unproductive.

Most of the handline stations were conducted with Hawaiian style snapper gear using three hooks and cut frozen squid as bait. There were anywhere from two to four men hooking on stations. Twenty-hook gear was used on Hancock Seamount, and because of the depth, extra weight was used to take the line down. Without winches, it took four to six men to retrieve the lines especially when the catch was good. About for hooks with artificial lures were used to fish menpachi at Niihau. These lures were either made of red and white thread or plastic strips.

4. Oceanographic Surveys

Two series of STD stations were occupied during the cruise. Four STD casts to 500 m were made between Midway Islands and Pearl and Hermes Reef and four casts were made between Necker Island and French Frigate Shoals. Two lines of XBT casts were made at Necker and Laysan Islands. A total of 59 XBT casts was made during the cruise.

5. Collecting of Forage Organisms

Only one 30-min tow to 100 m was made with a 3-m Isaac-Kidd trawl. The operation of the I-K trawl was less than ideal with the present setup on the vessel.

Three 30-min surface tows were made with a 1-m plankton net. While at Necker Island, several unidentified juvenile opelu, regurgitated by shearwaters landing on the deck at night, were preserved. Each shearwater regurgitated one or two opelu.

A 21.8 kg yellowfin tuna caught trolling at Necker Island had 43 P. spilosoma in its stomach, and 5 kawakawa caught trolling at Necker Island also had remains of P. spilosoma in their stomachs.

B. Miscellaneous Observations and Activities

1. One Shipek grab sample was obtained before the grab gear was lost. The winch failed as the cable was about to be hauled in from a depth of 430 m causing the grab or cable to snag the bottom.
2. A total of 36 bird flocks was sighted. Of these, 2 flocks were associated with skipjack tuna, 1 with yellowfin tuna, 1 with mahimahi, and 32 with unidentified schools.
3. No whales were observed by the whale watchers but bottlenose, rough tooth, and spinner porpoises were seen on nine occasions. About 15 false killer whales were seen on one occasion and an unidentified turtle was seen once.
4. A total of 43.75 h of trolling was expended in 9 days. The catch included 5 skipjack tuna, 20 yellowfin tuna, 12 kawakawa, and 1 wahoo.
5. Gorgonians (Callorgorgia sp. and Villorgorgia sp.), black (Antipathes sp.), and bamboo (Keratoisis sp.) corals were preserved for Ms. K. Muzik of the Smithsonian Institution.

6. Fish and invertebrate samples were either preserved in Formalin or frozen for identification, stomach analysis, and otolith study.
7. Length frequencies of selected species were tabulated.
8. Salinity samples and surface temperature readings were taken with each of the 59 XBT casts.
9. Standard weather observations were taken at 0000, 0600, 1200, and 1800 G.m.t. by the ship's officers whenever feasible.
10. The surface thermosalinograph was run continuously whenever the ship was at sea.
11. Fathometer traces of the bottom were kept for all of the bottom trawl stations.
12. The ship's officers mapped one of the seamounts in the Hancock Seamount complex.

IV. ITINERARY:

- | | |
|------------|--|
| October 12 | - Loaded vessel, departed Kewalo Basin and headed for Waianae. |
| 13 | - Shakedown and diver check of bottom fish trawl off Makaha; returned diver (J. Naughton) to Kewalo Basin, and headed for Necker Island. |
| 15-16 | - Bottom trawled and handlined at Necker Island. |
| 18 | - Arrived Kewalo Basin; R. Skillman and S. Hughes disembarked. |
| 19 | - Departed Kewalo Basin and headed for Middle Bank. |
| 20 | - Bottom trawled at Middle Bank and Nihoa Island and headed for Necker Island. |
| 21-25 | - Worked bottom trawl, bottom grab, traps, plankton net; trolled at Necker Island and headed for Midway Islands. |
| 28 | - Arrived Midway Islands; voted by absentee ballots; M. Wilder disembarked, V. Honda came aboard; headed for Hancock Seamount. |

- October 29-30 - Bottom trawled and handlined at Hancock Seamount and bottom trawled at a 90-fathom bank north of Kure Island prior to heading for Midway Islands.
- November 2 - A. Barcott disembarked; departed Midway Islands and ran an STD leg to Pearl and Hermes Reef.
- 3 - Trapped, trolled, and handlined at Pearl and Hermes Reef.
- 4 - Departed Pearl and Hermes Reef and headed for Laysan Island.
- 5 - Arrived Laysan Island and bottom trawled.
- 6 - Ran an XBT leg and departed Laysan Island; headed for Kewalo Basin to repair ship's generator.
- 10 - Arrived Kewalo Basin; generator under repair.
- 16 - Generator repaired; departed Kewalo Basin and headed for Necker Island.
- 18-21 - Bottom trawled, trapped, and handlined at Necker Island.
- 22-23 - Trapped, handlined, and trolled at Niihau and headed for Kewalo Basin.
- 24 - Arrived Kewalo Basin; end of Leg 2.

V. RECORDS:

The following forms, logs, and data sources were kept and turned in to the Laboratory upon termination of the cruise. All of the records are filed at the Honolulu Laboratory (HL) unless otherwise indicated in parentheses.

Barograph record (NWS)
 Bathythermograph (BT) and environment logs
 BT log, NODC (Fleet Numerical Weather Central, Monterey, Calif.)
 Daily activity messages
 Dead reckoning abstract
 Deck log
 Demersal catch form:
 Bottom grab
 Bottom trawl
 Handline
 Trap

Depth recorder bottom traces
 Isaacs-Kidd trawl log
 Marine mammal sighting log
 Marine operations log
 Oceanographic log B
 Occurrence of birds, aquatic mammals, and fish school log
 Plankton log
 Pollution log (NODC)
 Scientists' log
 Ship's weather observation log (NWS)
 Standard surface trolling log
 Station overlay charts
 STD log and record
 Supplementary bridge log for station data
 Thermosalinograph chart
 XBT traces

VI. SCIENTIFIC PERSONNEL

Thomas S. Hida	- Chief Scientist
Reginald M. Gooding	- Fishery Biologist
Victor A. Honda	- Research Assistant (Oct. 28-Nov. 24)
John J. Naughton	- Fishery Biologist (Oct. 12-13)
Paul M. Shiota	- Research Assistant
Robert A. Skillman	- Fishery Biologist (Oct. 12-18)
James H. Uchiyama	- Research Assistant
Michael J. Wilder	- Research Assistant (Oct. 12-28)
Augustine Barcott	- Fishery Gear Maintenance Man, NMFS, Seattle Laboratory (Oct. 12-Nov. 2)
Steven E. Hughes	- Fishery Biologist, NMFS, Seattle Laboratory (Oct. 12-18)
Paul Forestall	- University of Hawaii (Nov. 16-24)
Mark Harrington	- Graduate student, University of Hawaii
Louis Herman	- University of Hawaii (Nov. 2-10)
Steve Sipman	- University of Hawaii (Nov. 2-24)

Submitted by

Thomas S. Hida
 Thomas S. Hida
 Chief Scientist, Leg 2

Approved by

Richard S. Snocura
 Richard S. Snocura
 Director, Honolulu Laboratory

Attachments

February 11, 1977

Table 2.--The total catch (kg) and catch (kg) of major species made by bottom trawling on Townsend Cromwell, cruise 76-06-73 by area and station (+ = caught in small quantities).

Species	Windward (NE) Necker Island									
	Station number Depth range (m)	6 29-33	8 62-69	77 71	9 99-106	76 119	3 311-338	69 322-342	4 430-493	7 146-296
<i>Pervagor spilosoma</i>		13.2	19.1	5.4	+	+				
<i>Pseudomonacanthus garretti</i>			67	165	39	+				
<i>Decapterus russelli</i>										
<i>Fistularia petimba</i>										
<i>Priacanthus cruentatus</i>		+	8.4							172.5
<i>Malloidichthys auriflamma</i>				30.9	11.8					
<i>Dasystis hawaiiensis</i>				6.8	8.4					
<i>Scyllarides squamosus</i>						+				
Total catch		20.5	114.4	+	11.4	+	68.2	170.5	69.8	343.5
				231.6	93.6	10.5				1.0
										2.6

Species	Leeward (SW) Necker Island									
	Station number Depth range (m)	35 29-33	44 29-33	26 66-71	36 66-73	25 117-121	43 115-121	15 357-384	27 375-384	
<i>Pervagor spilosoma</i>		11.4	12.3							
<i>Pseudomonacanthus garretti</i>			+	+			26.8	13.2		
<i>Pristipomoides microlepis</i>				8.6						
<i>Malloidichthys auriflamma</i>			+	+	8.6					
<i>Diodon hystrix</i>					12.3					
<i>Priacanthus cruentatus</i>			+							
<i>Parupeneus chryserydros</i>										
<i>Parupeneus pleurostigma</i>		5								
<i>Decapterus russelli</i>			4.8							
<i>Squalus fernandinus</i>										
<i>Famulirus marginatus</i>			+							35.9
<i>Scyllarides squamosus</i>										+
Total catch		30.1	36.5	60	+	9.1	+	+	+	+
					20	63.3	41.1	13.8	42.1	2.4

Table 1.--Bottom trawl station data, Townsend Cromwell, cruise 76-06-73.

Station number	Date	Position				Time (ICT)	Duration of tow (min)	Depth (m)	
		Start		End				Start	End
		Lat. N	Long.	Lat. N	Long.				
3	10/15/76	23°41.5'	164°36.5'W	23°43'	164°36'W	1650	1720	311	338
4	10/15/76	23°31'	164°22'W	23°31'	164°24'W	2135	2205	430	494
6	10/16/76	23°29'	164°31'W	23°30'	164°32'W	0955	1010	29	33
7	10/16/76	23°39'	164°31'W	23°40'	164°31'W	1308	1338	146	296
8	10/16/76	23°36'	164°32'W	23°38'	164°33'W	1513	1543	62	69
9	10/16/76	23°37.5'	164°31.5'W	23°39'	164°32'W	1709	1739	99	106
11	10/20/76	22°43'	161°05'W	22°42'	161°03'W	1158	1228	60	60
13	10/20/76	23°07.5'	161°54'W	23°07'	161°55'W	1910	1940	48	48
15	10/21/76	23°37'	164°52'W	23°36'	164°52'W	1439	1509	357	384
25	10/22/76	23°33'	164°51'W	23°34'	164°51'W	1350	1420	117	121
26	10/22/76	23°33'	164°49.5'W	23°34.5'	164°49'W	1545	1615	66	71
27	10/22/76	23°38'	164°52'W	23°37'	164°52'W	2025	2055	375	384
35	10/23/76	23°32'	164°48'W	23°34'	164°48'W	1033	1103	33	33
36	10/23/76	23°34'	164°51'W	23°35'	164°50'W	2047	2117	66	73
43	10/24/76	23°34.5'	164°51'W	23°36'	164°50'W	1917	1947	115	121
44	10/24/76	23°36'	164°44'W	23°35.5'	164°43.5'W	2110	2125	29	33
49	10/29/76	29°45'	179°03'E	29°44'	179°03'E	2133	2152	265	293
50	10/30/76	28°52'	178°35'W	28°52'	178°36'W	2306	2336	165	170
63	11/5/76	25°48'	171°54'W	25°49'	171°54'W	1152	1222	320	320
64	11/5/76	25°47'	171°51'W	25°48'	171°52'W	1346	1401	90	104
65	11/5/76	25°50'	171°56'W	25°49'	171°52'W	1525	1555	351	357
66	11/5/76	25°50'	171°56'W	25°49'	171°54'W	1911	1941	338	338
67	11/5/76	25°48'	171°51'W	25°49'	171°52'W	2115	2145	88	88
69	11/18/76	23°43'	164°35'W	23°43'	164°34'W	0930	1000	326	342
76	11/18/76	23°37'	164°30'W	23°38'	164°30'W	2000	2015	119	119
77	11/18/76	23°36'	164°31'W	23°35'	164°31'W	2121	2136	71	71

Table 2.--Continued.

		West of Laysan Island					
Species	Station number Depth range (m)	64 90-104	67 88	63 320	66 338	65 351-357	
<u>Pseudomancanthus garretti</u>			454.5				
<u>Decapterus russelli</u>						28.6	
<u>Prisacanthus cruentatus</u>			5.9			68.2	
<u>Dasyatis lata</u>							103.8
Total catch	6.7		475.3	0.3	3.8		
Other areas							
		Middle Bank	Mihoo Island	Bank north of Kure Island	Hancock Seamount		
Species	Station number Depth range (m)	11 60-62	13 48	50 165-170	49 265-293		
<u>Anthias thompsoni</u>		83.2					
<u>Balistes capistratus</u>		7.4					
<u>Acanthurus olivaceus</u>			8.6				
<u>Henicopus acuminatus</u>			8.2				
<u>Prisacanthus boops</u>							
<u>Pentaceros richardsoni</u>				33.2			
<u>Unidentified serranid</u>							20.9
<u>Naso sp.</u>				18.6			
<u>Scyllarides squamosus</u>		5.9	7				
Total catch	117		60	59.4			23.1

Table 3.--The number of spiny lobster, *Panulirus marginatus*, caught per night or day set by fish traps and lobster pots on Townsend Cromwell, cruise 76-06-73 by major areas trapped.

Date caught Depth range (m)	Area								Total	
	West of Necker Island		Northeast of Necker Island		North of Necker		Pearl and Hermes Reef			West of Nihoa
	Oct. 22 26-73	Oct. 23 26-73	Oct. 25 37-55	Nov. 19 33-183	Nov. 20 29-48	Oct. 21 31-51	Nov. 4 37-62	Nov. 23 37-86		
Fish trap	8	0	49	82	80	229	5	0	453	
Lobster pot	13	0	112	76	81	199	10	0	491	
Total	21	0	161	158	161	428	15	0	944	

Table 4.--List of organisms caught with fish traps and lobster pots on Townsend Cromwell, cruise 76-06-73. (* = present, ** = common, *** = very common, and -- = not caught.)

Species	Fish trap			Lobster pot		
	Necker Island	Pearl and Hermes	Miihau	Necker Island	Pearl and Hermes	Miihau
<u>Myripristis berndti</u>	**	--	--	--	--	--
<u>Pristipomoides microlepis</u>	***	--	--	**	--	--
<u>Lutjanus kasmira</u>	**	--	*	--	--	--
<u>Epinephelus guernus</u>	*	--	--	--	--	--
<u>Pervagor spilosoma</u>	**	--	--	--	--	--
<u>Pseudomonacanthus garretti</u>	*	--	--	--	--	--
<u>Parupeneus chrysonemus</u>	*	--	--	--	--	--
<u>Parupeneus pleurostigma</u>	*	--	--	--	--	--
<u>Parupeneus multifasciatus</u>	**	--	--	--	--	--
<u>Mulloidichthys auriflamma</u>	*	--	--	--	--	--
<u>Holocentrus diadema</u>	--	--	*	--	--	--
<u>Holocentrus sp.</u>	*	--	--	--	--	--
<u>Chaetodon fremblii</u>	*	--	--	--	--	--
<u>Chaetodon miliaris</u>	*	*	*	--	--	--
<u>Aulostomus chinensis</u>	*	--	--	--	--	--
<u>Apogon menesemus</u>	--	--	*	--	--	--
<u>Sphoeroides cutaneous</u>	*	--	--	--	--	--
<u>Lactoria sp.</u>	*	--	--	--	--	--
<u>Gymnothorax sp.</u>	***	--	*	**	--	--
Conger eel	*	--	--	--	--	--
<u>Squalus fernandinus</u>	*	--	--	*	--	--
<u>Carcharhinus albimarginatus</u>	--	--	*	--	--	--
Octopus	*	*	--	--	--	--
<u>Panulirus marginatus</u>	***	*	--	***	*	--
<u>Scyllarides squamosus</u>	***	*	--	***	*	--
<u>Ranina ranina</u>	--	--	*	--	*	--
Hermit crab	*	--	--	**	*	*
Unidentified crab	*	--	*	*	--	--
Unidentified shrimp	--	--	--	*	--	--

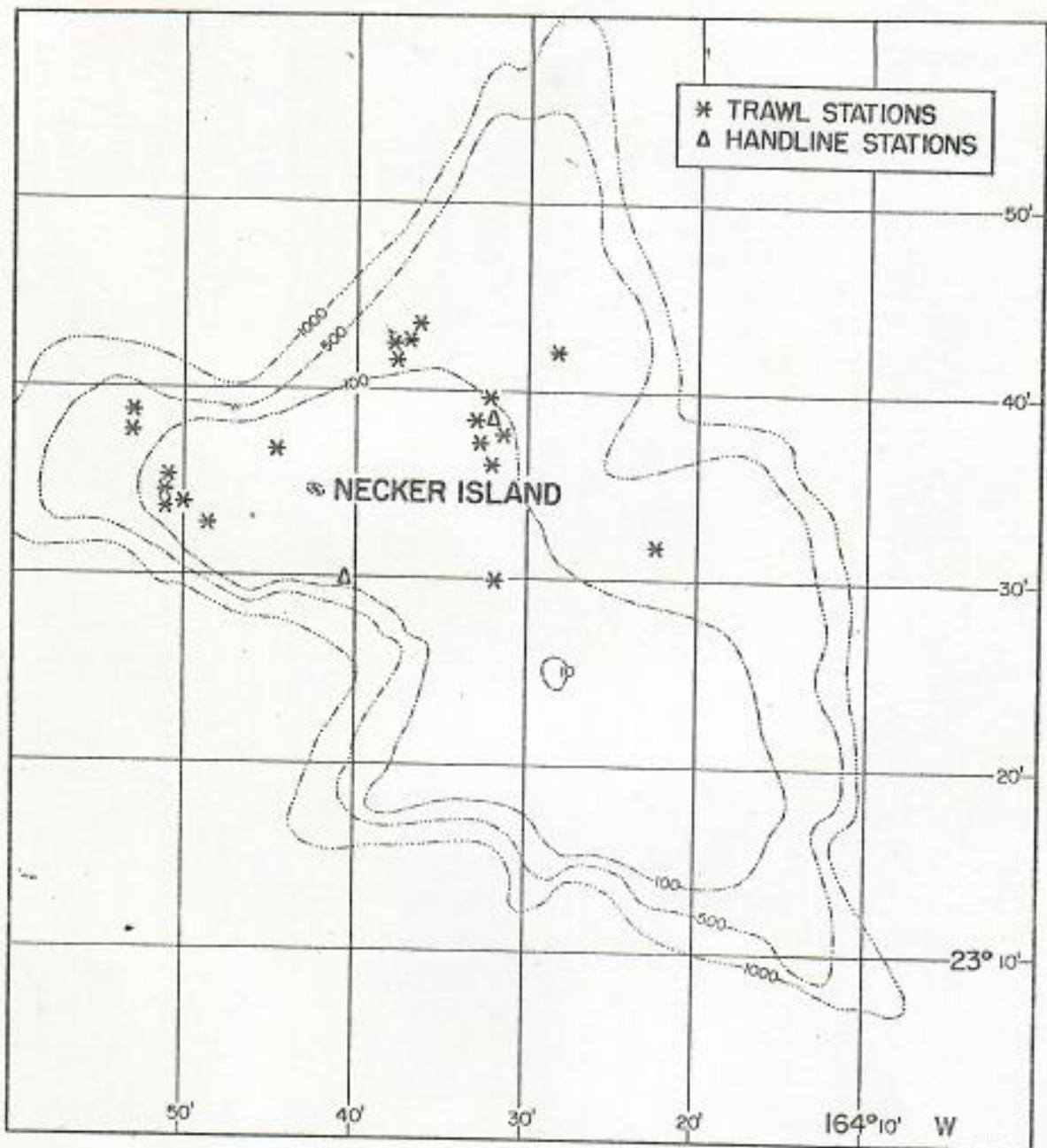


Figure 2.--Trawl (*) and handline (Δ) stations - Necker Island.

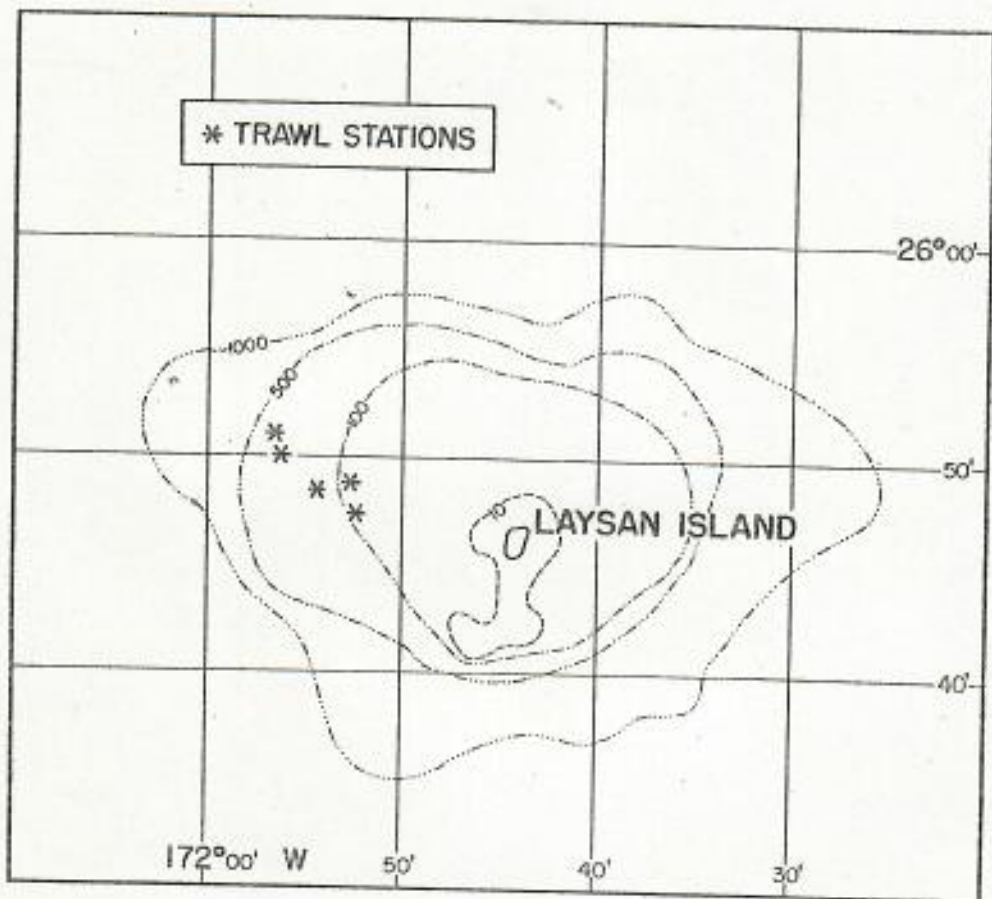


Figure 3.--Trawl (*) stations - Laysan Island.

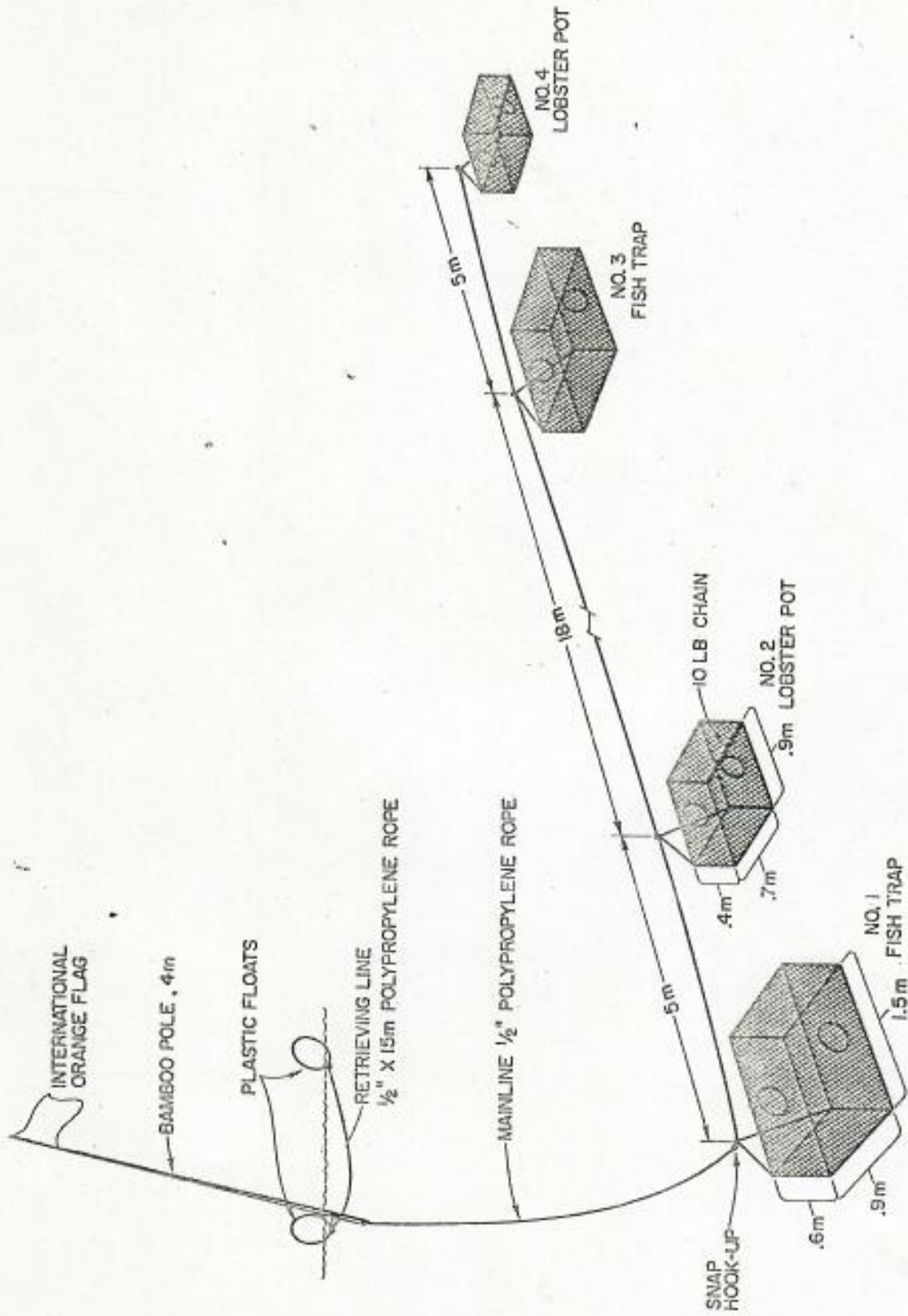


Figure 4.---Arrangement of traps on Townsend Cromwell, cruise 76-06-73.

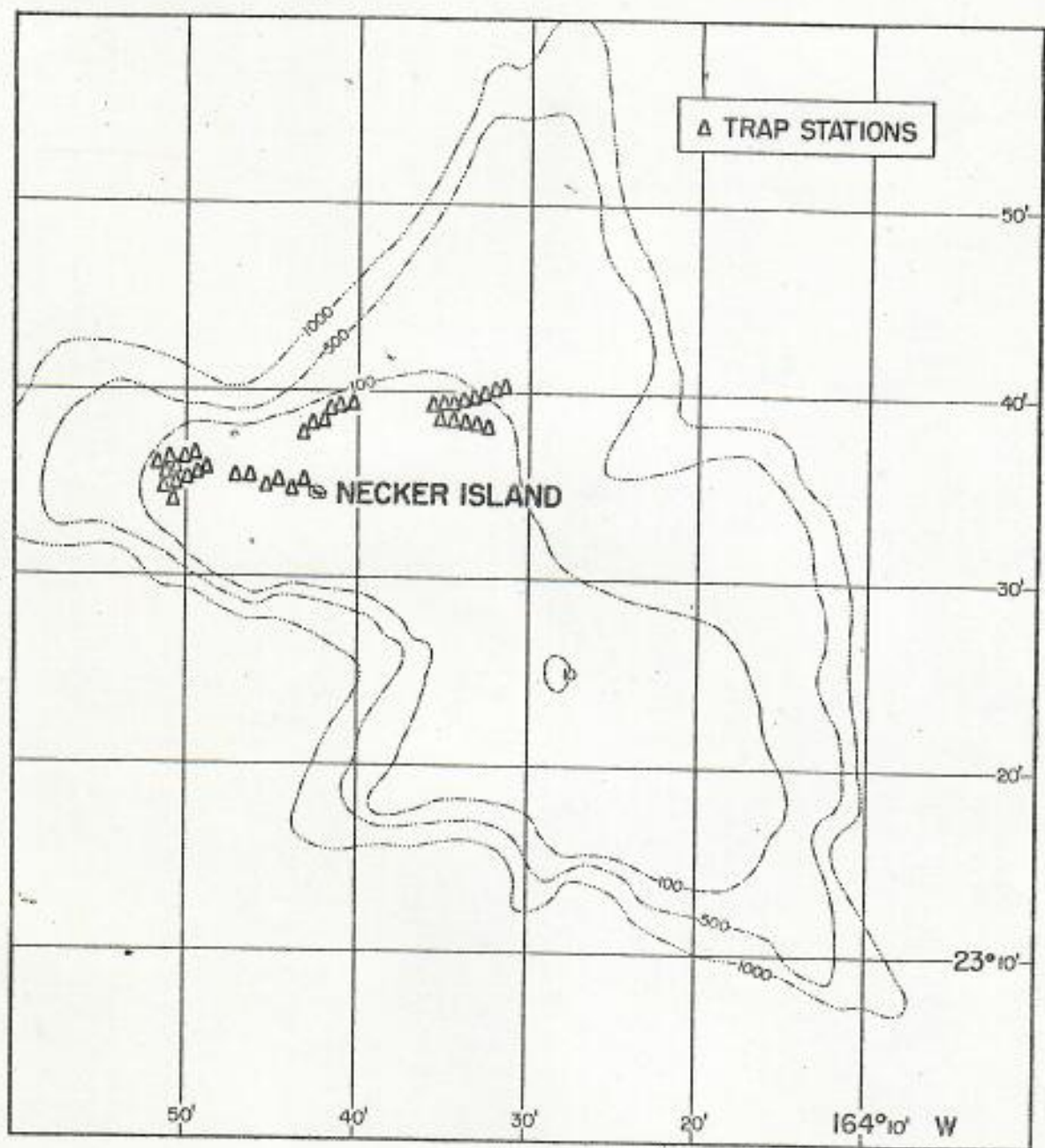


Figure 5.--Trap (Δ) stations - Necker Island.

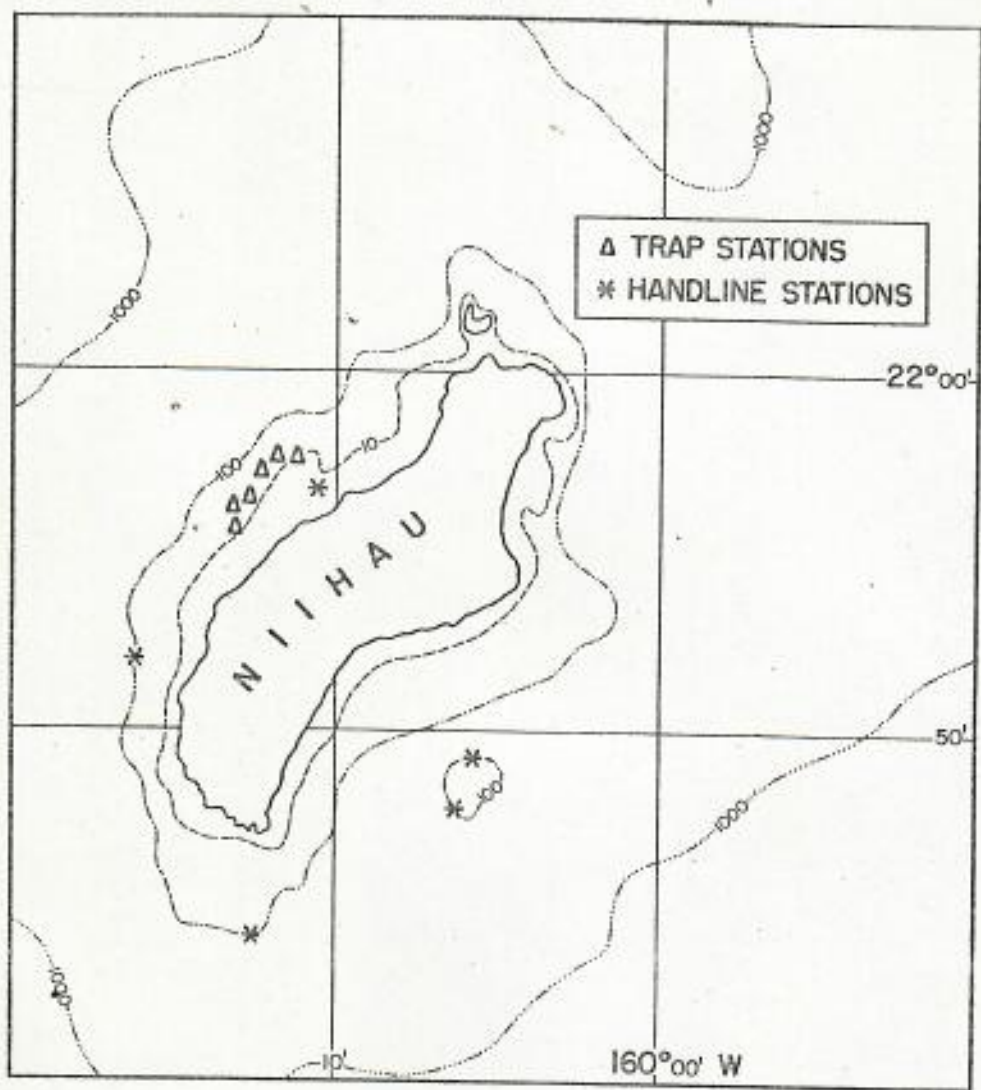


Figure 6.--Trap (Δ) and handline (*) stations - island of Niihau.



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 77-03-76 (Part I)

CRUISE
PERIOD: September 5-November 7, 1977

AREA OF
OPERATION: Northwestern Hawaiian Islands and waters off Molokai.

- ITINERARY: September 5 - Loaded vessel, departed Kewalo Basin. Surveyed, trapped, trawled, trolled, handlined, and occupied environmental stations in waters off Nihoa, Necker, Raita Bank, Laysan, Pioneer Bank, Lisianski, Pearl and Hermes Reef, and Kure Island.
- September 26 - Arrived Midway Islands. Refueled and replenished food and water supply. Loaded Zodiac and outboard motor belonging to the U.S. Fish and Wildlife Service.
- September 28 - Departed Midway; surveyed, trapped, trawled, trolled, handlined, and occupied environmental stations in waters off Midway, Maro Reef, Gardner Pinnacles, Necker, and Nihoa.
- October 9 - Arrived Niihau. Crew washed down vessel.
- October 10 - Departed Niihau.
- October 11 - Arrived Kewalo Basin. Unloaded fish traps, lobster pots, and crab pots.
- October 12-14 - Repaired traps and pots and assisted Laboratory staff in preparing for Open House.
- October 16 - Open House.

- October 17 - Loaded vessel.
- October 18 - Departed Kewalo Basin; surveyed, trapped, trawled, trolled, handlined, dragged for coral, and occupied environmental stations in waters off French Frigate Shoals, Necker, Nihoa, Middle Bank, and Penguin Bank. Calibrated flowmeter and checked anchored objects A, C, and E.
- November 5 - Anchored off Lahaina, Hawaii.
- November 6 - Vessel washed down.
- November 7 - Arrived Kewalo Basin. Unloaded all scientific and fishing gear. End of Part I.

**MISSIONS
AND**

RESULTS:

- A. The primary purpose of the cruise was to assess the demersal and pelagic resources over seamounts, banks, and offshore grounds of the Northwestern Hawaiian Islands from Middle Bank to Hancock Seamount. The sampling methods included lobster, fish, and crab trapping, handline fishing for snappers and groupers, bottom trawling for demersal fish and shellfish, and trolling for pelagic tuna and tunalike fishes.

1. Trapping

Three types of traps were used during trapping operations, as follows:

Fish trap, two-chambered, constructed of reinforcing steel rods and galvanized 2.5-cm square wire mesh, measuring 152.4 × 91.4 × 61.0 cm, conical entrance.

Lobster pot, two-chambered, constructed of galvanized 5.1 × 10.2 cm wire mesh, measuring 94.0 × 74.3 × 41.9 cm, conical entrance.

Crab pot, experimental, single chambered, constructed of galvanized 2.5-cm square wire mesh along top, bottom, and one side, 5.1-cm square wire mesh along two sides, ramp entrance.

Twenty-six trapping stations were occupied during the cruise. Each trapping station included a

minimum of 40 lobster pots (eight pots per string) and 20 fish traps (four traps per string). Crab pots were set only in those areas that indicated the presence of sand or sand-coral bottoms. Traps were usually set between 1730 and 1830 and retrieved the following morning between 0800 and 1130.

The traps caught a wide variety of crustaceans and fish species. The catch of commercially valuable species included 2,039 spiny lobster, Panulirus marginatus; 429 slipper lobster, Scyllarides squammosus and Paribaccus antarcticus; 876 blue-line snapper, Lutjanus kasmira; 155 goatfish, Parupeneus pleurostigma, P. chrysonemus, P. porphyreus, P. multifasciatus, and Mulloidichthys auriflamma; 16 pink snapper, Pristipomoides microlepis; and 11 squirrelfish, Myripristis berndti and M. argyromus.

Catch rates were high at Necker Island, Maro Reef, Laysan, and Raita Bank. The catch rate varied from 0.4 to 6.9 lobster per trap-night at four stations at Necker, 3.8 lobster per trap-night at Maro Reef, from 1.3 to 3.6 lobster per trap-night at two stations at Laysan, and 3.2 lobster per trap-night at Raita Bank. The experimental crab pots, designed primarily to capture kona crab, Ranina serrata, and white crab, Portunus sanguinolentus, were ineffective.

All undersized spiny and slipper lobsters were tagged and released at the capture station. These included 1,216 spiny and 190 slipper lobsters. Also tagged was one sea bass, Epinephelus quernus, caught in a lobster pot.

2. Handlining

Twenty-six handline stations were occupied during the cruise. Of these, 11 were day stations, usually occupied between 1200 and 1600 and 15 were night stations occupied from 1900 to about 2200. Usually, four lines were fished at each station (two hydraulically powered gurdies and two manually coiled) and each handline fished three to four hooks. Cut bait usually included squid, kawakawa (belly meat), Euthynnus affinis, and Japanese mackerel, Scomber japonicus.

Fishing was usually most productive between 70 and 120 fathoms. Good fishing was encountered at Pearl and Hermes Reef, Maro Reef, Necker, Nihoa, and French Frigate Shoals. Species frequently landed included pink snapper, Pristipomoides microlepis and P. sieboldii; red snapper, Etelis marshi; sea bass; thick-lip carangid, Caranx cheilio; snapper, Rooseveltia brighami; and kahala, Seriola dumerilii. Other species taken occasionally included gempylid, Promethichthys prometheus; balloonfish, Lagocephalus hypselogeneion and Spheroides cutaneus; and carangid, Caranx lugubris.

Catch rates, calculated in terms of the number of fish caught per line-hour, reached 2.7 fish per line-hour at Pearl and Hermes Reef, 1.9 fish per line-hour at Nihoa and French Frigate Shoals, 1.4 fish per line-hour at Necker, and 1.3 fish per line-hour at Maro Reef. Comparison between day and night handline stations showed that day stations were more productive. During daylight, catch rates reached 1.7 fish per line-hour whereas at night the catch rate averaged only 1.1 fish per line-hour.

3. Trolling

Eighty-three daylight hours were devoted to direct trolling with three lines for pelagic species such as tuna and tunalike fishes. The catch included 136 kawakawa, 26 yellowfin tuna, Thunnus albacares, 12 wahoo, Acanthocybium solandri, 5 mahimahi, Coryphaena hippurus, and 10 carangid, Caranx ignobilis.

The catch rate was highest at Laysan where it reached 2.6 fish per line-hour in 25 line-hours of trolling.

Ninety-three kawakawa, 8 yellowfin tuna, and 1 wahoo were tagged and released near the place of capture during the cruise. None of the tuna and tunalike fishes caught, tagged, and released during previous cruises were recovered.

Incidental trolling was conducted on a few occasions during daylight hours while en route to and from stations.

Anchored objects A, C, and E located off Oahu and Molokai were scouted for signs of bird flock and fish schools. At A, no bird flock was observed but one mahimahi was caught while trolling near the object. At C, there were neither bird activity nor fish signs. One bird flock was sighted at object E and four strikes on the trolling lines produced four mahimahi; however, three were lost during haul-in.

4. Bottom trawling

Twenty bottom trawl stations of 10- to 30-min duration were occupied during the cruise. Of these, 14 were day hauls and 6 were night hauls.

Trawl catches ranged from less than 1 kg to 24 kg. The largest catch occurred at Raita Bank in 91 m of water and consisted primarily of slipper lobster.

B. Miscellaneous observations and activities

1. Fourteen coral-drag stations were occupied in 329-452 m of water off French Frigate Shoals, Necker, and Nihoa. Among the species collected for Dr. Richard W. Grigg, Sea Grant, University of Hawaii, were Corallium secundum (live and dead), pink coral, Corallium sp., bamboo coral, Acanella sp., and gold coral, Parazoanthus sp. There were also three unidentified species of coral and a species of gorgonians in the drag samples.
2. Of 44 bird flocks sighted during the cruise, 2 were associated with kawakawa, 2 with small unidentified tuna, 4 with flyingfish, 2 with porpoise, and (1 with killer whale). The remaining bird flocks were associated with unidentified fish schools.
3. Fifteen pairs of eye lenses were collected during the cruise for Dr. Albert C. Smith, Oceanic Institute, for studies on nuclear lens proteins of fishes. These included 10 pairs of lenses from yellowfin tuna, 4 pairs from kawakawa, and 1 pair from a wahoo.
4. For studies on age and growth, otoliths were collected from ehu, mahimahi, kumu, and sea bass. Unusual fish and invertebrates were photographed and either frozen or preserved in Formalin for later identification.

5. Conducted reconnaissance hydrographic surveys over the top of the bank at Nihoa (west bank) and Necker (southern sector) with the Simrad EQ echo sounder. Echograms were also made while scouting for trawlable grounds and prior to bottom trawl operations at various localities throughout the Northwestern Hawaiian Islands.
6. The surface thermosalinograph was run continuously while at sea.
7. Length frequencies were collected from 651 Lutjanus kasmira, 28 Promethichthys prometheus, 46 Epinephelus quernus, 99 Etelis marshi, 44 Pristipomoides microlepis, 28 Seriola dumerilii, 23 P. sieboldii, 35 Caranx cheilio, 11 Rooseveltia brighami, 1 Etelis carbunculus, 5 C. lugubris, 8 Chromis olivaceus, 11 C. verator, 16 Sphyræna helleri, 10 Fistularia petimba, and 26 Acanthurus olivaceus.
8. Salinity samples and surface temperature measurements were collected routinely at each XBT cast.
9. Six environmental stations, which included a CTD cast to 1,000 m, plankton tow with a bongo net down to 100 m for inshore and 200 m for offshore areas, and XBT cast, were occupied during the cruise.
10. Morphometric measurements, including length of carapace, length from eye socket to posterior edge of carapace, length of tail, length of six tail segments, width of the carapace, weight, and sex, were collected from 42 Scyllarides squammosus. Seventeen Paribaccus antarcticus were frozen and brought back to the Laboratory for morphometric studies.
11. Seventy-five large spiny and slipper lobsters and a wide variety of fish, caught mainly by trapping, were kept alive in the ship's baitwells and brought back to Honolulu for the Open House (October 16).
12. Samples of flesh from Caranx ignobilis, S. dumerilii, Sphyræna barracuda, and S. helleri and whole specimens of several species of moray eels (Muraenidae) were collected and frozen during the cruise and brought back to the Laboratory for ciguatera tests.

13. Standard weather observations were made at 0000, 0600, 1200, and 1800 G.m.t. by the ship's officers whenever possible.

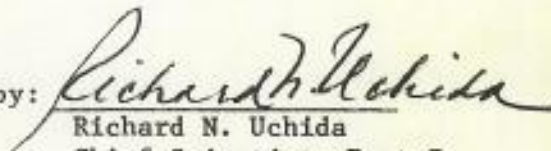
SCIENTIFIC
PERSONNEL:

Richard N. Uchida, Chief Scientist, Fishery Biologist
Glenn R. Higashi, Research Assistant
Robert L. Humphreys, Research Assistant (October 18-November 7)
Darryl T. Tagami, Research Assistant
James H. Uchiyama, Fishery Biologist

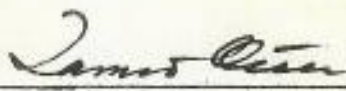
William S. Lovejoy, Cooperating Scientist (September 5-
October 11)

Michael T. Palmgren, Cooperating Scientist, Sea Grant,
University of Hawaii (October 18-November 7)

Submitted by:


Richard N. Uchida
Chief Scientist, Part I

Approved:


Tamio Otsu
Acting Director,
Honolulu Laboratory

November 22, 1977

MEMBER STATES

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PACIFIC MARINE FISHERIES COMMISSION

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EXECUTIVE DIRECTOR
JOHN P. HARVILLE
TREASURER
G. L. FISHER

May 10, 1976

TO: Invitees, Hawaii Meeting, Eastland Fisheries Survey
FROM: John P. Harville, EFS Coordinator
RE: Preliminary report on April 26-27 meeting and an invitation to
comment if you disagree with this summary

Our Hawaii Eastland Fishery Review meeting was held April 26-27 in Honolulu. We were delighted with the constructive and effective discussions and recommendations from our participants.

The attached summary reviews the major conclusions both of our initial general session and of the two separate workshops. Please advise us if in any way we failed to represent properly the conclusions of a group in which you participated, or if you have strong disagreements with any of the points made.

At the request of our participants, we are holding the record of this meeting open until Friday, May 28, for submission of completed worksheets and of written comments and suggestions. Many felt they wanted more time for thought and perhaps for discussion with their constituents.

If you were not able to attend and would like to submit recommendations for the record, please get your worksheet and/or comments to us prior to May 28. Note that your comments may be confined to those portions of the worksheet of importance to you--we do not expect any person to comment on every item or even every page. With respect to items on that worksheet, ask the question --is this an area to which the federal government should give high priority for action? If so, how could federal services be improved? Also identify those areas of low priority, or which you feel the federal government should stay out of. And please be sure to complete the next to last page headed Some Final Notes Please--.

Please mail to reach my office (cf. address on letterhead) not later than May 28, 1976.

Attachment: Hawaii EFS Meeting Summary

JPH;kjs

RECEIVED
MAY 19 1976

U.S. FISH AND WILDLIFE SERVICE
DIVISION OF LAW ENFORCEMENT
HONOLULU, HAWAII

EASTLAND FISHERIES SURVEY MEETING

April 26-27, 1976

This report summarizes input provided at the Hawaii Eastland Fisheries Survey April 26 and 27 at the Pagoda Hotel in Honolulu. It includes only input provided orally in the discussion sessions. Any written comments including worksheets, letters, and other written statements will be incorporated later. We want first to make sure we have correctly recorded the discussion, since it is this type of input that is subject to misinterpretation. If you feel that your views have not been adequately represented, please respond with your amendment or addition. We will make sure that the necessary changes are made.

GENERAL SESSION

General discussion of fisheries management section of worksheet:

Alika Cooper, a commercial fisherman, was concerned that establishment of the regional council would create another unneeded bureaucracy in addition to Sea Grant and NMFS, which he asserts are not helping the industry. He added that the national standards are not relevant to local fisheries and urged that management decisions be made with more industry input so that they meet the needs of the local people.

Cooper questioned the intent of the legislation (H.R. 200) and wondered why tunas were excluded. He felt that foreign nations should not be given the right to catch Hawaiian tuna and that Hawaii should have jurisdiction over its tuna resources.

Cooper felt strongly that the Leeward Islands were part of the native lands and that they should still belong to native Hawaiians. He stated that native fishing rights should exist for this area and that the federal government should not own these islands. He urged the federal government to investigate the native rights regarding this area.

Dr. John Craven, Marine Affairs Coordinator for Hawaii, mentioned some problems that may result from passage of H.R. 200. He stated that the bill opens the door to fishermen from the mainland to harvest species traditionally taken by Hawaiians. He pointed out that a potential State/Federal controversy exists regarding the boundary of archipelagoes: are waters in between islands State territory and is the terminus located at the land/sea interface or at the end of the reef? He also mentioned that jurisdiction over species that spawn in State waters and migrate to outside waters is not clearly defined.

Frank Goto, United Fishing Agency, Ltd., emphasized that all concerned individuals must make sure that Hawaii does not become a federal enclave and that the regional management council should be sympathetic to local problems.

Koichi Masaki, a market dealer, stressed the need for conservation of Hawaii's fish resources, since fishing areas are limited. He urged that conservation education programs be established to prevent collapse of the fisheries.

COMMERCIAL SESSION

Fisheries Management

It was re-emphasized that tunas should be included in the management bill so that foreign harvest of these stocks can be controlled and that Hawaiians should be permitted to establish their own management standards unique to that area. They assigned a low priority to compliance with the national standards and also to partial financing of management costs through the assessment of fees to user groups.

The group recognized the tremendous potential for development of inshore fisheries of the Leeward Islands. It was stated that while the nation has an obligation to protect the endangered fauna on these islands, it also has the obligation to allow harvest of inshore species of fish. Therefore, it was suggested that a major effort be initiated to assess the fish stocks of this area and determine if harvesting might affect the status of endangered island fauna. In addition, it was stressed that the boundary between the National Wildlife Refuge and State territory must be determined. Participants felt that Congress should be aware that Hawaii needs additional funding to research this problem adequately.

In this light, there was concern over the historical lack of management of inshore stocks in Hawaii and it was recommended that necessary preventive measures (quotas, bag limits, etc.) be taken to protect these resources. It was suggested that the old system of management (konohiki) be reinstated if necessary.

There was concern expressed over the diminishing harvest rights and access to fishing areas as a result of hotel development and the establishment of refuges, sanctuaries, bombing ranges, and national parks. It was suggested that the relative priorities for commercial fishing and tourism be established to determine what is best for Hawaii.

It was mentioned that the problem of jurisdiction over ocean resources has not been settled. The Congressional resolutions H.R. 1944 and SJR 155 regarding the Annexation Treaty of 1897 (Section 2) stated that Congress will enact special laws for Hawaii dealing with native rights, and these laws have not yet been passed. It was recommended that the resources be protected until these rights have been settled.

Vessel Financing and Insurance

Participants concurred that highest priority should be given to financial assistance in the form of long-term low-interest loans for building modern boats capable of engaging in distant-water fisheries. Existing vessels are not fast enough, nor are they capable of weathering big seas. It was mentioned that fishermen are not able to purchase vessels at existing prices and many do not qualify for loans through existing channels. Moreover, monthly payments are so high that during slow production periods, costs are greater than income. Participants added that without financial assistance,

domestic fishermen cannot compete with subsidized foreign fisheries. They also recommended some form of assistance in the insurance area, since existing rates are too high due to Workmen's Compensation and Unemployment Compensation. It was suggested that NOAA's financial programs be more sensitive to the needs of the industry and that NOAA should take a strong position against OMB in this regard. Participants felt that amendment of the Jones Act to allow purchase of foreign-built vessels would help reduce the high cost of vessels. It was suggested also that the fishing industry receive subsidies like the agriculture industry, since money is available for this purpose.

Some comments were made regarding federal agencies that provide general financial assistance. The Office of Minority Business Enterprise was criticized for giving assistance to the Japanese of Hawaii but not to native Hawaiians and Filipinos. The Small Business Administration was accused of lending money only to those who could not afford to pay back. A particular instance was cited where a company could not obtain money in an emergency situation caused by mercury contamination because they showed a profit.

Fisherman Training

Participants concurred that this should be given next highest priority in terms of federal government action. It was recommended that grants be given to help boat owners finance the training of their own crews for their specialized fishery. They added that general educational programs in institutions have been ineffective in the past and should not be supported. All recognized the need to attract young, well-trained, local people into the fishery to safeguard the future well-being of the industry. Alternatively, it was mentioned that training large numbers of new people to enter an unviable industry was not wise.

Harbor Facilities

The group agreed that present Hawaiian harbor facilities, including washing ramps, fueling stations, icing facilities, and mooring spaces were inadequate. They urged the federal government to assist in improving these facilities.

Informational Services

The group felt a need to be adequately informed and believed that existing informational systems were poorly operated. They requested better communication between industry and agencies and more adequate distribution of informational material.

Improved Fishing Effectiveness

Participants placed a high priority on the development of new baitfish, live-bait well design, and improvement of freezing capability of vessels. However, the group emphasized that any new innovations developed on an experimental basis must be proven on a commercial scale before industry will accept it. They added that industry input into experimental projects was essential.

Rescue

This activity was also given high priority; however, the participants stressed that radio communication between fishermen and the Coast Guard should be improved and that the Coast Guard should become familiar with local landmarks familiar to fishermen so that location of vessels would be simplified. To improve communication, the group felt that Coast Guard vessels should be equipped with Citizens' Band as well as VHF communication devices, since most fishermen utilize C.B. It was further recommended that an easy-to-understand but effective format be established for communication, so that Coast Guard aid can be obtained quickly and easily in emergency situations. The group added that if fishing vessels in Hawaii were more modern and safer, Coast Guard rescue services would not be so important.

Salvage

Commercial fishermen emphasized that they cannot afford salvage costs resulting from disasters or accidents and requested governmental financial assistance in this area.

Processing

Participants recognized the importance of new product development and utilization and expressed a need to utilize new species of fish that are not presently marketed.

There was concern expressed over the large number of standards placed on fishery products, causing increased prices to the consumer and increased costs to the fishermen and processors. It was suggested that the federal government give assistance to processors to help them comply with any new regulations. In addition, research on the extension of the shelf life of fresh fish was requested.

Marketing

The group felt that NMFS marketing, merchandizer education, and consumer education programs that exist on the mainland should be instigated in Hawaii. They considered consumer awareness of the nutritional qualities of fish to be highly important. They also recognized the need for better methods of analyzing contaminants of fish products such as mercury and Ciguatera.

Participants felt that government involvement in nomenclature and labeling of fish products should be substantially decreased. They added that too many agencies exist with authority in this area and believed that only one agency should control this activity. They also felt that government programs on merchandizing were not appropriate, since this was an industry function.

Aquaculture

While much emphasis was placed on baitfish culture, participants felt that food fish culture was impractical due to high costs of and lack of suitable sites and lack of expertise and technology. However, the group recognized the tremendous potential of aquaculture to fill consumer demands for fish. It was mentioned that pond culture was very important historically in Hawaii, but recently many ponds were filled by the federal government, military, and land developers.

Fishery Development

Participants concurred that exploitation of unutilized or underutilized fishery resources of Hawaii to fill the local demand for fish, and thereby decrease the need for imports, was essential.

Other

Some participants were concerned over the fact that the meeting was not open to the public. They felt representation of the various segments of the industry was not adequate and wished that this complaint be entered in the record. They also urged that a representative of each segment be appointed to attend any follow-up meetings.

RECREATIONAL SESSION

Fisheries Management

All participants concurred that most of the activities concerned with management should be given high priority. They felt that federal assistance for research projects on the inshore stocks was vital, noting that general baseline data was lacking. They thought that federal funding might be easiest to obtain for studies on the oceanic phase of reef fish life cycles. A need for more knowledge of bottom-dwelling species was indicated. The group agreed that archipelago-wide regulation and management was essential and that all shoreline areas in the state should be considered prime recreational areas. They supported the use of fees or licenses to users as a source of funding for recreational research and management.

Participants recognized the diversity of the Hawaiian fish fauna as a hindrance to proper conservation and management, stating that the amount of time and number of biologists required to obtain the needed data on about 500 species of fish were tremendous. They also pointed out that the overlap of recreational and commercial interests was a problem, in that the majority of trolling club members have commercial licenses; are they commercial or recreational fishermen or both? The group stressed that management problems

have increased in time due to increased pressure (as a result of more people with more leisure time), greater mobility of the fisherman, and better equipment. The recreational group also emphasized that harbor facilities were inadequate due to increases in the number of fishermen.

It was stated that for every boater or diver there are about 10 shoreline fishermen in Hawaii. The group felt that more data was needed on this large segment of the recreational fishery.

Participants requested that federal funds (Dingell-Johnson) be appropriated for the Kapuku model study. They recognized two alternative management procedures: area closures and species allocation.

The group emphasized that shelling and tropical aquarium fish collection were two important consumptive uses of the resource that should be recognized and controlled to protect endangered species.

Participants felt that Hawaii should receive federal assistance to the recreational fisheries of that State, since tourism and big-game fishing are in the national interest.

Nonextractive Uses

The group felt that a shift in attitude toward nonconsumptive use of the resources should be encouraged to aid conservation.

Recreational Fisheries Advisories

It was emphasized that federal support for marine education was necessary. Participants felt that education was of prime importance, specifically regarding handling, preserving and transporting the recreational (as well as commercial) catch to ensure its safety and quality.

Boating Operation and Safety

All agreed that education, regulation, rescue, and improved communication regarding boating safety and operation were extremely important and were assigned a high priority for federal government action.

Consuming the Catch

The group felt that educational programs were necessary to help promote acceptability of new or unutilized species such as taape, shark, and marlin.

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HAWAII EASTLAND FISHERIES SURVEY
April 26-27, 1976

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FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976

creates a 200-mile fisheries
zone off the coasts of the
United States, and establishes
several new mechanisms for
enforcement ...



University of Hawaii



Fishery Conservation and Management Act of 1976 Fact Sheet



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

June 1976

Reprinted as a public service by the Sea Grant College
Program, University of Hawaii.

July 1976

Reprinted from *Fishery Conservation and Management Act
of 1976: Fact Sheet*, U.S. Department of Commerce,
National Oceanic and Atmospheric Administration, June
1976.

The Fishery Conservation and Management Act of 1976 creates a 200-mile fisheries zone off the coasts of the United States, and establishes several new mechanisms for enforcement.

Many questions have arisen about the workings of the new law and what it will mean to fishermen, to processors, and to others involved in the Nation's fisheries. The National Oceanic and Atmospheric Administration has prepared the following answers to some of the most-asked questions, and the U.S. Coast Guard has provided the attached fact sheet to give further information on their plans under the law.

FISHERY MANAGEMENT AUTHORITY

Q. What is the "fishery conservation zone" that is established by the Act?

A. The U.S. fishery conservation zone adjoins the territorial sea (the 3-mile limit); its outer boundary is 200 nautical miles from the coast.

Q. What fisheries are affected?

A. The United States will exercise exclusive fishery management authority over:

1. All fish found within the fishery conservation zone;
2. All ~~transboundary~~ species that spawn in U.S. waters, throughout their migratory range beyond the zone, except during the time they are in another nation's territorial sea or fishery conservation zone that the U.S. recognizes;
3. All U.S. continental shelf fishery resources that extend beyond the zone, such as coral, crab and lobster, clams and abalone, and sponges.

Q. What fisheries are not affected?

A. Highly migratory species of fish, defined in the Act as tuna.

Q. When does the exclusive authority take effect?

A. March 1, 1977.

Q. Why so long?

A. To permit renegotiation of fisheries agreements with other nations and establishment of Regional Fishery Management Councils.

FOREIGN FISHING AND INTERNATIONAL FISHERY AGREEMENTS

Q. Once the law takes effect, will foreign fishing be permitted in the 200-mile zone?

A. Yes, but only under the following conditions:

1. If a treaty or international fishery agreement already exists, foreign fishing will be permitted until the treaty or agreement expires or is renegotiated, and each foreign vessel must have a registration permit issued by the Secretary of State;
2. Otherwise the foreign vessel must have a permit issued by the Secretary of Commerce through the Secretary of State.

Q. How does the Secretary of Commerce issue permits to foreign fishing vessels?

A. The Act gives a detailed account of this procedure. In brief, this is what must happen:

1. A foreign nation must first enter into what is called a Governing International Fishery Agreement (GIFA) with the United States;
2. Under such an agreement, the foreign nation must apply each year for permits for all of its fishing vessels that wish to fish for species covered by the Act within the zone;
3. When the Secretary of State is satisfied that the permit application complies with the requirements of the Act, he will send it to the Secretary of Commerce, the Secretary of Transportation, the appropriate Regional Fishery Management Council and designated committees of Congress;
4. The applicable Regional Fishery Management Council has 45 days to comment on the application;

5. After taking such views into consideration, and after payment of fees, the Secretary of Commerce may then approve the application.

Q. Will there be a fee for foreign fishing vessels?

A. A "reasonable" fee may be charged; such fees must apply without discrimination to all foreign nations, and their costs may take into account the cost of management, research, administration, enforcement, and other items.

Q. How much fish will foreign vessels be permitted to take?

A. Only that portion of the optimum yield of a fishery, if any, that will not be harvested by U.S. fishermen.

Q. What is "optimum yield"?

A. Optimum yield is defined as that part of a fishery that will provide "the greatest overall benefit to the Nation, with particular reference to food production and recreational opportunities..." In other words, a variety of economic, social, and ecological factors are taken into account as well as biological factors.

Q. Who determines optimum yield?

A. The optimum yield for each species will be specified in a fishery management plan drawn up by the Regional Fishery Management Council in whose area the species is found.

Q. How will enforcement officers of the National Marine Fisheries Service and the Coast Guard know whether a particular foreign vessel has a valid permit?

A. Every foreign fishing vessel must display the permit prominently in its wheelhouse; the permit will contain a statement of all the conditions and restrictions attached to it.

Q. What happens to violators?

A. Tough civil and criminal penalties are provided in the Act. In addition, if the fines are not paid, the permit for the vessel, or for all vessels of the nation, may be suspended.

REGIONAL FISHERY MANAGEMENT COUNCILS

Q. What are Regional Fishery Management Councils?

A. Regional Fishery Management Councils are the basic tool for management and conservation of America's fisheries within the 200-mile zone and otherwise as specified by the Act.

Q. What do they do?

A. Duties and responsibilities of each Council are:

1. To develop fishery management plans and amendments to them;
2. To submit periodic reports to the Secretary of Commerce;
3. To review and revise assessments of optimum yield and allowable foreign fishing.

- 4. To conduct public hearings on development of fishery management plans and on the administration of the Act;
- 5. To establish scientific and statistical committees and necessary advisory panels;
- 6. To undertake any other activities necessary to carry out the provisions of the Act.

Q. What Councils are called for in the Act?

A. There are eight, as follows:

- 1. New England Council, consisting of the States of Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut, with 17 voting members.
- 2. Mid-Atlantic Council, consisting of the States of New York, New Jersey, Delaware, Pennsylvania, Maryland, and Virginia; with 19 voting members.
- 3. South Atlantic Council, consisting of the States of North Carolina, South Carolina, Georgia, and Florida; with 13 voting members.
- 4. Caribbean Council, consisting of the Virgin Islands and Puerto Rico, with 7 voting members.
- 5. Gulf Council, consisting of the States of Texas, Louisiana, Mississippi, Alabama, and Florida; with 17 voting members.
- 6. Pacific Council, consisting of the States of California, Oregon, Washington, and Idaho; with 13 voting members. Idaho is included because Pacific salmon migrate up the Columbia River and its tributaries into Idaho, where major spawning areas are located.
- 7. North Pacific Council, consisting of the States of Alaska, Washington, and Oregon; with 11 voting members.
- 8. Western Pacific Council, consisting of the State of Hawaii, American Samoa, and Guam; with 11 voting members.

Three States—Florida, Washington, and Oregon—have voting members on more than one Regional Council.

Q. Who are voting members of the Councils?

A. Voting members are:

- 1. The principal State official with marine fishery management responsibility and expertise, as designated by the State Governor;
- 2. The regional director of the National Marine Fisheries Service for the area concerned;

- 3. At least one "qualified individual" from each State, selected by the Secretary of Commerce from nominations by the State Governors;
- 4. Additional "qualified individuals" who will be appointed at large; the number of these varies with the number of States in the Regions. They too will be appointed by the Secretary of Commerce from nominations by the State Governors.

Q. Who are "qualified individuals"?

A. Qualified individuals are those who are "knowledgeable or experienced with regard to the management, conservation or recreational or commercial harvest, of the fishery resources of the geographical area concerned."

Q. Who are non-voting members of the Councils?

A. Non-voting members are:

- 1. The regional or area director of the U.S. Fish and Wildlife Service;
- 2. The Commander of the Coast Guard district;
- 3. The executive director, if any, of the appropriate Marine Fisheries Commission;
- 4. One representative of the Department of State.

In addition, the Pacific Council has one non-voting member appointed by the Governor of Alaska.

Q. Where will the Councils be located?

A. Each Council will decide that for itself, in accordance with uniform standards provided by the Secretary of Commerce.

Q. How will the Councils operate?

A. Each Council will be free to operate as it sees fit, in accordance with uniform standards prescribed by the Secretary of Commerce. NOAA is now drafting such standards.

Q. Then, once established, the Councils are quite independent?

A. True. They are not arms of the Federal or of any State Government.

Q. How will Council members be paid?

A. Each non-government voting member will be paid on a per diem basis, that is, for the days actually worked on the Councils. The rate is approximately \$150/day. In addition, all voting and non-voting members will be reimbursed for actual expenses, such as travel, connected with Council operations.

FISHERY MANAGEMENT PLANS

Q. I have heard about "preliminary fishery management plans" and "fishery management plans". What's the difference?

A. A "fishery management plan" is a plan prepared by a Regional Council, designed to provide conservation and management of a particular species of fish found within the geographical area of the Council.

A "preliminary fishery management plan" is a plan prepared by the Secretary of Commerce. Such plans will be prepared only in cases where a foreign nation has applied for a fishing permit and the Regional Council cannot prepare its plan by the deadline (March 1, 1977).

Q. Will preliminary fishery management plans apply to U.S. fishermen?

A. No. Only to foreign fishermen.

Q. How long will a preliminary plan be in effect?

A. Only until a plan prepared by a Regional Council is implemented.

Q. What, if any, guidance will there be for the Councils in drawing up the plans?

A. The Act establishes seven "national standards" that every plan must be consistent with, as well as requirements for contents of every plan. The Secretary of Commerce will also provide guidelines based on the national standards.

Q. What are the national standards?

A. They are:

1. Conservation and management measures shall prevent overfishing but achieve optimum yield from each fishery;
2. These measures shall be based on the best scientific information available;
3. To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range;

4. Conservation and management measures shall not discriminate between residents of different States;

5. The measures shall, where practicable, promote efficiency in the use of fishery resources;

6. They shall take into account and allow for variations among fisheries, fishery resources, and catches;

7. And, where practicable, they shall minimize costs and avoid unnecessary duplication.

Q. What are fishery management plans required to contain?

A. Each such plan must contain:

1. Conservation and management measures applicable both to foreign and U.S. fishing;
2. A description of the fishery, including such information as the number of vessels involved, type and quantity of gear used, revenues, recreational interests, and other specified items;
3. An assessment of present and probable future condition of the fishery, including both maximum sustainable yield and optimum yield;
4. An assessment of the extent to which U.S. fishermen will harvest the optimum yield, and of the portion of the optimum yield that can be made available to foreign fishermen.

Q. Anything else?

A. In addition to the required items, there are a great many optional items, such as:

1. Requirements for permits and fees that the Secretary of Commerce should levy on U.S. fishermen;
2. Designation of zones and periods of time when fishing should be limited, or banned;
3. Establishment of limits on the catch, based on area, size, weight, or other factors;
4. Establishment of a system of limited access.

Q. Do the Councils have any regulatory authority with respect to the Fishery Management Plans?

A. The Councils may prepare and submit to the Secretary of Commerce any proposed regulations that they feel are necessary to carry out any fishery management plan.

- Q. How high can the domestic permit fees be?
- A. These fees are not to exceed the administrative costs of issuing permits.
- Q. What happens to a fishery management plan once it has been prepared by a Regional Council?
- A. The plan is submitted to the Secretary of Commerce. He has 60 days to review it and notify the Council of his approval, disapproval, or partial disapproval. If he disapproves in whole or in part, he has to give the reasons why, in detail, with suggestions for improvement.
- Q. If the Secretary approves, what happens?
- A. He publishes it in the Federal Register. After hearings, objections, and other administrative actions, the plan is put into effect.
- Q. Suppose the Secretary disapproves and tells the Council why?
- A. The ball is back in the Council's court, to come up with changes to meet his objections.
- Q. Suppose the Secretary and the Council can't come to agreement?
- A. The Secretary can then put into effect his own plan. However, he cannot establish any kind of limited entry system unless it is approved by a majority of voting members of the pertinent Council.

UNITED STATES COAST GUARD FACT SHEET

The new law creating a 200-mile fisheries zone means the Coast Guard and National Marine Fisheries Service will have—potentially, at least—about two million square miles of ocean to patrol starting next March.

Immediate plans call for reactivation of three old Coast Guard cutters and retention on active duty of a fourth, even though it had been scheduled to be decommissioned. To meet interim aircraft requirements, the Coast Guard is reactivating four retired Defense Department planes and is placing its last five spare short-range helicopters into service.

Coast Guard enforcement of the new law will involve two complementary concepts: Primary patrol operations in active fishing areas and less frequent random patrols to the limits of U.S. fisheries jurisdiction.

Much of this area already is patrolled by the Coast Guard to protect creatures of the continental shelf. Expansion of Coast Guard activities in this area could be influenced by the extent of cooperation of other nations.

Coast Guard cutters to be placed back into service are: Spencer, 327 feet long, built in 1937, World War II veteran credited with sinking two German U-boats, also used widely in Pacific landings; Unimsk, 311 feet long, built in 1942 as a Navy seaplane tender; Sorrel, 180-foot buoy tender, built in 1943. The Cutter Gentian, another 180-foot buoy tender, built in 1942, currently stationed at Galveston, Tex., is to be retained in commission.

CRUISE REPORT - LEG II

Rec'd FROM KENJI EOO,
FISHERIES BENCH CRUISE
HAW. DIV. FISH + GAME,
AT A.S.A.C. MTO.,
2 JULY 1976.

VESSEL: Townsend Cromwell, cruise 71

CRUISE
PERIOD: 5 - 19 May, 1976

AREA OF
OPERATION: Northwestern Hawaiian Islands

ITINERARY: Leg II (only)

5 May - Departed Kewalo Basin, Honolulu, Hawaii. Conducted near-shore and shoreline fishery and wildlife resource surveys at Nihoa Island (6-7 May), French Frigate Shoals (8-10 and 15-16 May), Laysan Island (12-14 May) and Necker Island (17 May)

19 May - Returned to Kewalo Basin.

MISSIONS
AND
RESULTS:

To assist in the conduct of a preliminary orientation survey of the near-shore and shoreline fishery resources as well as of the sea birds, terrestrial birds, green sea turtle and the Hawaiian Monk Seal of the Northwestern Hawaiian Islands by personnel of the State of Hawaii, Division of Fish and Game. The information collected will be used in the designing and planning of a resource assessment study of the area.

Fishery Resources

Various sampling and survey techniques were employed to inspect a total of 15 areas at: Nihoa Island (2); French Frigate Shoals (9); Laysan Island (2); and Necker Island (2). Six night surveys were conducted over areas surveyed during the day.

Data on the composition, distribution and densities of fishes, macro-invertebrates and algae, as well as bottom topography, were collected through shoreline, surface and underwater transects and observations. Specimens and samples were also collected using nets, hooks-and-lines and traps. General quantitative information on fish compositions and densities were also collected at selected sites.

Various species of fishes were collected and examined and/or preserved for further analysis throughout the cruise and included species of the following families of fishes:

Carangidae	Carcarhinidae	Sc mbridae
Polynemidae	Kyphosidae	Belonidae
Kuhliidae	Mullidae	Lutjanidae
Acanthuridae	Priacanthidae	Sphyraenidae
Mugilidae	Balistidae	
Labridae	Scaridae	

Samples of macro-invertebrates, algae and bottom substrates were also collected, examined, and/or preserved for further analysis.

Four fish counting transects were conducted at selected sites and the significant data are summarized in the following table for each location:

Location	No. of Fish Species	Estimated Densities (lbs./acre)	Major Fish Species Ranked in Terms of Greatest Densities
Nihoa Island	26	147.61	1. <i>Chromis ovalis</i> 2. <i>Ctenochaetus strigosus</i> 3. <i>Naso lituratus</i>
French Frigate Shoals East Island	29	1,979.89	1. <i>Scarus perspicillatus</i> 2. <i>Kyphosus cinerascens</i> 3. <i>Mulloidichthys samoensis</i>
Whale-Skate Island	32	4,232.31	1. <i>Mulloidichthys samoensis</i> 2. <i>Carangoides ajax</i> 3. <i>Scarus perspicillatus</i>
Laysan Island	34	756.95	1. <i>Scarus perspicillatus</i> 2. <i>Acanthurus triostegus</i> (=A. sandvicensis) 3. <i>Thalassoma purpureum</i> (=T. umbrostigma and T. fuscum)

The preliminary survey indicated that the ulua (Carangidae) and sharks (Carcarhinidae) are large in size and abundant in certain areas, while others of such families as Holocentridae, Apogonidae, Pomacentridae, Chaetodontidae, Acanthuridae and Muraenidae, commonly associated with similar habitats in the major Hawaiian Islands appeared to be noticeably absent. The low diversity of fish species present over the near-shore reef areas surveyed may be caused by the abundance of the larger sized predators.

Macro-invertebrates were also limited to a few species of gastropods, bi-valves and corals most of which were generally sparse in most areas.

Wildlife Resources

A total of seven areas, including sites at Nihoa Island, French Frigate Shoals (Tern, Whale-Skate, Little Gin and Disappearing Islands), Laysan Island and Necker Island were surveyed to gather information on the wildlife inhabitants. The numbers of Hawaiian monk seals and green sea turtles, and the number of sea bird and terrestrial bird species observed are listed in the following tables.

Location	Number of Hawaiian Monk Seals	Number of Green Sea Turtles
Nihoa Island	2	0
French Frigate Shoals		
Tern Island	0	0
Whale-Skate Island	21	9
Little Gin Island	6	1
Disappearing Island	38	0
Laysan Island	131	2
Necker Island	22	6
TOTAL	220	18

Location	No. of Different Sea Bird Species	No. of Different Terrestrial Bird Species
Nihoa Island	12	2
French Frigate Shoals		
Tern Island	8	0
Whale-Skate Island	12	0
Little Gin Island	3	0
Disappearing Island	Not determined	Not determined
Laysan Island	20	2
Necker Island	15	0

A Hawaiian monk seal was found dead on Little Gin Island at French Frigate Shoals on May 16. Due to its advanced stage of decomposition, only the head was recovered and retained for further examination.

SCIENTIFIC
PERSONNEL:

National Marine Fisheries Service, NOAA

Heeny S. H. Yuen, Chief Scientist (5/5-19/76)

State of Hawaii, Division of Fish and Game

Kenji Ego, Chief, Fisheries Branch (5/5-19/76)

Eric Onizuka, Aquatic Biologist (5/5-19/76)

Henry Okamoto, Aquatic Biologist (5/5-19/76)

Jon Giffin, Wildlife Biologist (5/5-19/76)

Dean Ohtani, Fishery Technician (5/5-19/76)

U.S. Fish and Wildlife Service

Palmer Sekora, Refuge Manager (5/10-15/76)

From - Preliminary report on April 26-27, 1976
Hawaii Eastland Fisheries Review meeting

COMMERCIAL SESSION

Fisheries Management

It was re-emphasized that tunas should be included in the management bill so that foreign harvest of these stocks can be controlled and that Hawaiians should be permitted to establish their own management standards unique to that area. They assigned a low priority to compliance with the national standards and also to partial financing of management costs through the assessment of fees to user groups.

The group recognized the tremendous potential for development of inshore fisheries of the Leeward Islands. It was stated that while the nation has an obligation to protect the endangered fauna on these islands, it also has the obligation to allow harvest of inshore species of fish. Therefore, it was suggested that a major effort be initiated to assess the fish stocks of this area and determine if harvesting might affect the status of endangered island fauna. In addition, it was stressed that the boundary between the National Wildlife Refuge and State territory must be determined. Participants felt that Congress should be aware that Hawaii needs additional funding to research this problem adequately.

In this light, there was concern over the historical lack of management of inshore stocks in Hawaii and it was recommended that necessary preventive measures (quotas, bag limits, etc.) be taken to protect these resources. It was suggested that the old system of management (konohiki) be reinstated if necessary.

There was concern expressed over the diminishing harvest rights and access to fishing areas as a result of hotel development and the establishment of refuges, sanctuaries, bombing ranges, and national parks. It was suggested that the relative priorities for commercial fishing and tourism be established to determine what is best for Hawaii.

It was mentioned that the problem of jurisdiction over ocean resources has not been settled. The Congressional resolutions H.R. 1944 and SJR 155 regarding the Annexation Treaty of 1897 (Section 2) stated that Congress will enact special laws for Hawaii dealing with native rights, and these laws have not yet been passed. It was recommended that the resources be protected until these rights have been settled.

Vessel Financing and Insurance

Participants concurred that highest priority should be given to financial assistance in the form of long-term low-interest loans for building modern boats capable of engaging in distant-water fisheries. Existing vessels are not fast enough, nor are they capable of weathering big seas. It was mentioned that fishermen are not able to purchase vessels at existing prices and many do not qualify for loans through existing channels. Moreover, monthly payments are so high that during slow production periods, costs are greater than income. Participants added that without financial assistance,

SENATE CONCURRENT RESOLUTION

adopted
S 58 day
H 62 day

introduced
S 32 day
H 59 day

RELATING TO FISHING IN THE NORTHWESTERN HAWAIIAN ISLANDS.

WHEREAS, the Hawaiian Island Reservation composed of certain islands, reefs, atolls and shoals in the Northwestern Hawaiian Islands, was established by Presidential Executive Order No. 1019 on February 3, 1909; and

WHEREAS, the set aside, subject to valid existing rights, was for the use of the U.S. Department of Agriculture as a preserve and breeding grounds for native birds; and

WHEREAS, the Hawaiian Island Reservation was redesignated as the Hawaiian Islands National Wildlife Refuge under the auspices of the U.S. Department of the Interior by Presidential Proclamation dated July 25, 1940; and

WHEREAS, the Board of Commissioners of Agriculture and Forestry, Territory of Hawaii and the U.S. Department of the Interior entered into an agreement for the management of the Hawaiian Islands National Wildlife Refuge; and

WHEREAS, the boundaries of the refuge have never been described, and as a consequence no one really knows where Federal jurisdiction ends and State's jurisdiction begins, or vice versa; and

WHEREAS, several meetings were held between representatives of the Department of the Interior and the State of Hawaii to resolve the boundary problem, which culminated in a proposed Memorandum of Agreement between the United States of America and the State of Hawaii for the description of the boundaries of the Hawaiian Islands National Wildlife Refuge premised upon the State of Hawaii reserving unto itself all rights, including but not limited to fishing and mineral rights in the submerged land and water areas; and

WHEREAS, the United States of America did not execute the agreement on the basis that the submerged land and water areas were deemed to be within the refuge on the presumption that the Presidential Proclamation included such areas in the refuge to enable the Department of the Interior to administer the area in the manner intended; and

WHEREAS, the submerged land and water areas are particularly valuable to the State of Hawaii because of the fishery resources contained therein; and

WHEREAS, among one of the latent fishery resources, the live bait resource of the Northwestern Hawaiian Islands offers great economic potential and is an essential ingredient for commercial harvest of skipjack tuna; and

WHEREAS, skipjack tuna is the most important commercial fish species in Hawaii and its fishery offers the greatest potential for multifold expansion; and

WHEREAS, through proper management and setting aside of representative marine reserve areas, the vast fishing potential of the Northwestern Hawaiian Islands could be developed without compromising the wilderness character of these Islands or the wildlife resources to be protected therein; and

WHEREAS, fishing activities within the submerged land and water areas are controllable through a permit system wherein the U.S. Fish and Wildlife Service and the Hawaii State Department of Land and Natural Resources could jointly issue commercial fishing permits; and

WHEREAS, such a permit system could provide the desired management flexibility in view of the lack of biological and resource data; now, therefore,

BE IT RESOLVED by the Senate of the Eighth Legislature of the State of Hawaii, Regular Session of 1976, the House concurring, that the Fish and Wildlife Service, U.S. Department of the Interior is respectfully requested to give serious consideration toward permitting the controlled harvest of the marine fishery resources of the Northwestern Hawaiian Islands; and

BE IT FURTHER RESOLVED that a certified copy of this resolution be transmitted to the U.S. Secretary of the Interior, the Director of the Fish and Wildlife Service, the Governor of the State of Hawaii and the Chairman of the Board of Land and Natural Resources.

OFFERED BY: *George W. Soyars*

George W. Soyars
Henry Sasaki
W. Kuroki
SMA 1046-528
Mell Ching

Robert S. Tam
Henry Takitani
Amory Crow
T.C. Yim
Mamoru Yamaguchi
Richard H. ...
Patsy K. Young
James C. ...
John E. ...
W. ...
Duke Kawano

THE PRESIDENT



REPORTS TO YOU

By Carl W. Buchheister, President of the National Audubon Society

Looking Back and Looking Ahead*

There are more reasons than its remarkable variety of wildlife why Florida is a good place to hold an Audubon convention. Some of our most honored traditions and firmest policies had their origins in that fabled peninsula.

The very first unit of the national wildlife refuge system was created there. It came into being March 14, 1903, when Theodore Roosevelt initiated a new concept of the powers of the Presidency by signing an order that set aside Pelican Island as a federal bird reservation.

The great T. R. was persuaded to sign that history-making, precedent-setting order by members of the National Committee of Audubon Societies—the same group that two years later expanded and incorporated in New York City to become the National Association of Audubon Societies (now the National Audubon Society).

In the next half-dozen years T. R. scratched his signature on executive orders bringing into being a number of new federal bird reservations, and the Audubon Societies had a hand in all of them. For many years the only wardens guarding some of them were Audubon wardens.

Thus was born our great chain of national wildlife refuges, a system now embracing 298 areas covering nearly 29 million acres in 45 states.

Not far from the site of the convention a stone marker stands over the grave of an Audubon warden named Guy Bradley. Bradley died a hero's death July 8, 1905, before the gun blasts of outlaw plume hunters as he stood guard over a rookery of egrets.

Yes, events took place and traditions were born in Florida that helped shape the unity of the Audubon movement. The martyr's death of Guy Bradley crystallized national determination to stamp out the feather trade. We fought for those early refuges. We are still fighting to enlarge and, when necessary, to defend our national wildlife refuges.

A Give-Away Planned in Hawaii

Some of the refuges are always threatened by some kind of land grab, encroachment or misuse. One of the

* From President Buchheister's address Nov. 9, 1963, at the 39th annual convention of the National Audubon Society in Miami, Fla.

early ones created by Theodore Roosevelt is at this moment in grave danger of being given away by the director of the Bureau of the Budget.

Giving away refuges is not normally one of the functions of the Budget Bureau. Through some curious accident of government procedure, however, the bureau's director, Mr. Kermit Gordon, was given the task, under provision of the Hawaii Statehood Act, of determining which federal lands in the former territory shall be transferred to the new state government.

The Hawaiian Islands National Wildlife Refuge is a mid-Pacific sanctuary of international as well as national significance. Made up of a chain of small islands northwest of the main Hawaii group, it is the only habitat, and the last hope for survival, of the Laysan duck, the millerbird, Laysan finch and the Hawaiian monk seal.

By the time we learned about the proposed transfer of the refuge to the state, the negotiations were so far advanced that it is now difficult for Director Gordon to change his mind without losing face. Quite aside from the conservation issue involved, we see illustrated here the hazards of government decision-making processes that operate in secrecy and without public knowledge and discussion.

The conservation danger now is that some face-saving compromise will be worked out that will leave the fate of the refuge and its wildlife in doubt, subject to the whim of some future session of the Hawaii legislature. We must insist that the refuge be kept under federal control. We must see to it that the Bureau of Sport Fisheries and Wildlife is given enough funds to patrol and protect it.

The Scoreboard in Congress

Last November in Corpus Christi, looking forward to 1963, I listed three major opportunities for conservationists:

First, I said the drive would be renewed for adequate safeguards for the nation's dwindling areas of wilderness.

Second, I saw new opportunities to add some areas of unspoiled seashore and scenic grandeur to our national park system.

Third, I said we had a chance, at last, to get something done about pesticides.

Let's look at the scoreboard. Although there have been no clear-cut victories, no major breakthroughs to date, this does not mean things have been standing still. There are good reasons for expecting some major accomplishments before the 88th Congress completes its second session in 1964:

• The Wilderness Bill should become law. There are signs that walls of resistance in the House are beginning to crumble before an insistent public call for action.

• A bill to create an Ozark National Rivers will, when passed, set an example that may lead to saving other unspoiled streams of exceptional scenic and recreational value.

• This Congress should act on bills to make new national seashores of Fire Island off the southern coast of Long Island, and of the Oregon Dunes. It is time for action also on some of the shoreline areas that can yet be saved for public use on the Great Lakes.

Audubon 1964
January-February
Formerly BIRD-LIFE
V66 N1

Honolulu, Hawaii

April 13, 1976

The Honorable John T. Ushijima
 President of the Senate
 Eighth State Legislature
 Regular Session of 1976
 State of Hawaii

Sir:

RE: S.C.R. No. 64

Your Committee on Economic Development to which was referred S.C.R. No. 64 entitled:

"SENATE CONCURRENT RESOLUTION RELATING TO FISHING IN THE
 NORTHWESTERN HAWAIIAN ISLANDS."

begs leave to report as follows:

The purpose of this Concurrent Resolution is to request the Fish and Wildlife Service, U.S. Department of the Interior, to give serious consideration toward permitting the controlled harvest of the marine fishery resources of the Northwestern Hawaiian Islands.

In a public hearing, your Committee learned that the Department of Land and Natural Resources, through discussions with commercial fishermen who have fished in the waters, acknowledges the vast fishery potential which exists in the area. The Department further recognizes that, due to the unique fauna and flora of the area, rational use must be made of the marine resources to protect and preserve the existing ecosystems. Consequently, the Department has been coordinating with the National Marine Fisheries Service and the Fish and Wildlife Service of the Federal Government, the Marine Affairs Coordinator, and the Hawaii Institute of Marine Biology in the planning of an assessment of the marine resources of the Northwestern Hawaiian Islands in order to formulate a comprehensive management scheme. A preliminary survey of the area is scheduled for May, 1976, to gather information needed to develop the assessment program.

Your Committee believes, with the concurrence of the Department of Land and Natural Resources, there is much merit in implementing a controlled commercial fishery under a permit system for the Northwestern Hawaiian Islands as proposed by this Resolution. Such a system will make possible the gathering of vitally needed information rapidly and in quantity at the lowest possible cost to the State.

DIVISION OF FISH & GAME	
DIRECTOR	<input checked="" type="checkbox"/> Referral Date
FISH. CHIEF	<input checked="" type="checkbox"/> Suspense Date
WILD. CHIEF	<input type="checkbox"/> Draft Reply
ENF. CHIEF	<input type="checkbox"/> Reply Direct
FISH. BR.	<input checked="" type="checkbox"/> Comments
WILD. BR.	<input type="checkbox"/> Information
ENF. BR.	<input type="checkbox"/> Comp. Act. & File
OFF. SERV.	<input type="checkbox"/> Return To
SECRETARY	<input type="checkbox"/> Remarks
FED. AID	<input type="checkbox"/>

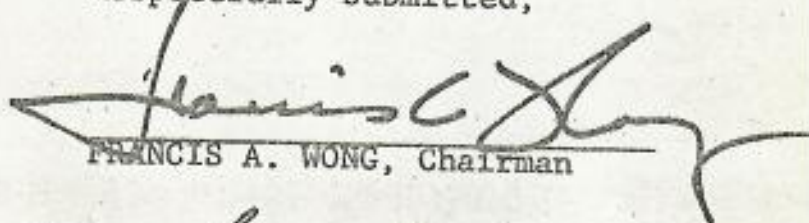
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APR 15 1976

Division of Fish & Game

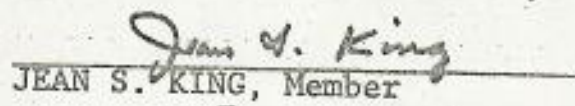
Your Committee on Economic Development concurs with the intent and purpose of S.C.R. No. 64 and recommends its adoption.

Respectfully submitted,


FRANCIS A. WONG, Chairman

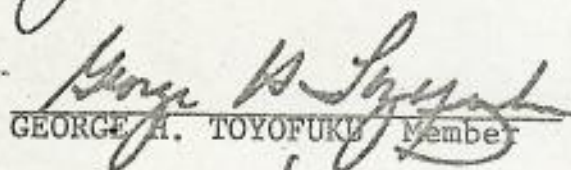

STANLEY I. HARA, Vice-Chairman

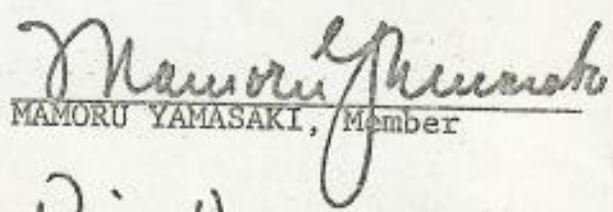

JOAN J. HOLTEN, Member

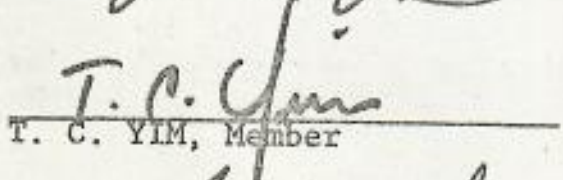

JEAN S. KING, Member


JOSEPH T. KURODA, Member

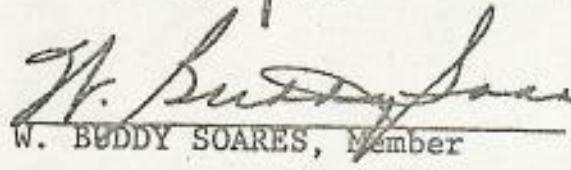

DONALD S. NISHIMURA, Member


GEORGE H. TOYOFUKU, Member


MAMORU YAMASAKI, Member


T. C. YIM, Member


RICHARD HENDERSON, Member


W. BUDDY SOARES, Member


PATRICIA SAKI, Member

Honolulu, Hawaii

APRIL 13, 1976

The Honorable John T. Ushijima
 President of the Senate
 Eighth State Legislature
 Regular Session of 1976
 State of Hawaii

Sir:

RE: S.R. No. 257

Your Committee on Economic Development to which was referred S.R. No. 257 entitled:

"SENATE RESOLUTION RELATING TO FISHING IN THE
 NORTHWESTERN HAWAIIAN ISLANDS."

begs leave to report as follows:

The purpose of this Resolution is to request the Fish and Wildlife Service, U.S. Department of the Interior, to give serious consideration toward permitting the controlled harvest of the marine fishery resources of the Northwestern Hawaiian Islands.

In a public hearing, your Committee learned that the Department of Land and Natural Resources, through discussions with commercial fishermen who have fished in the waters, acknowledges the vast fishery potential which exists in the area. The Department further recognizes that, due to the unique fauna and flora of the area, rational use must be made of the marine resources to protect and preserve the existing ecosystems. Consequently, the Department has been coordinating with the National Marine Fisheries Service and the Fish and Wildlife Service of the Federal Government, the Marine Affairs Coordinator, and the Hawaii Institute of Marine Biology in the planning of an assessment of the marine resources of the Northwestern Hawaiian Islands in order to formulate a comprehensive management scheme. A preliminary survey of the area is scheduled for May, 1976, to gather information needed to develop the assessment program.

Your Committee believes, with the concurrence of the Department of Land and Natural Resources, there is much merit in implementing a controlled commercial fishery under a permit system for the Northwestern Hawaiian Islands as proposed by this Resolution. Such a system will make possible the gathering of vitally needed information rapidly and in quantity at the lowest possible cost to the State.

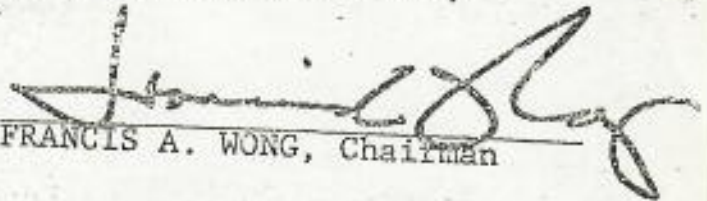
DIVISION OF FISH & GAME	
DIRECTOR	<input checked="" type="checkbox"/> Referral Date
FISH. CHIEF	<input checked="" type="checkbox"/> Response Date
WILD. CHIEF	<input type="checkbox"/> Draft Reply
ENF. CHIEF	<input type="checkbox"/> Reply Direct
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OFF. SERV.	<input type="checkbox"/> Return To
SECRETARY	<input type="checkbox"/> Remarks
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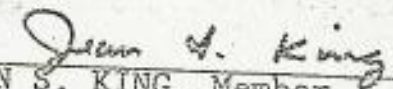
Your Committee on Economic Development concurs with the intent and purpose of S.R. No. 257 and recommends its adoption.

Respectfully submitted,


FRANCIS A. WONG, Chairman

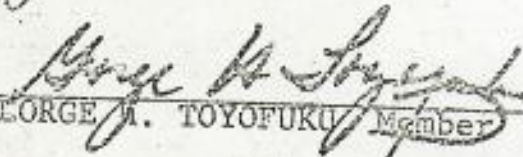

STANLEY I. HARA, Vice-Chairman

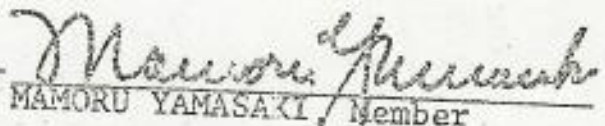

JOHN J. HULTEN, Member


JEAN S. KING, Member


JOSEPH T. KURODA, Member



DONALD S. NISHIMURA, Member

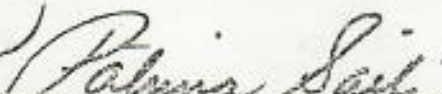

GEORGE A. TOYOFUKU, Member


MAMORU YAMASAKI, Member


T. C. YIM, Member


RICHARD HENDERSON, Member


W. BUDDY SOAKES, Member


PATRICIA SAIKI, Member



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

April 8, 1976

502 204 Bureau
548-6237
548-7853

CHRISTOPHER COBB, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

MEMORANDUM

TO: Honorable Francis A. Wong, Chairman
Senate Committee on Economic Development

FROM: Christopher Cobb, Chairman and Member
Board of Land and Natural Resources

SUBJECT: Senate Resolution No. 257 and Senate Concurrent Resolution
No. 64--Relating to Fishing in the Northwestern Hawaiian
Islands.

Senate Resolution No. 257 and Senate Concurrent Resolution No. 64 are companion resolutions whose purpose is to request the Fish and Wildlife Service, U.S. Department of the Interior to give serious consideration toward permitting the controlled harvest of the marine fishery resources of the Northwestern Hawaiian Islands.

Through discussions with commercial fishermen who have fished in the waters of the Northwestern Hawaiian Islands, the Department of Land and Natural Resources is aware of the vast fishery potential existing therein. Also, due to the unique fauna and flora of the area, we recognize the need to protect and preserve these features while rational use is made of the marine resources.

However, due to the remoteness and distance involved, there is a serious dearth of information upon which to formulate a comprehensive management scheme. Thus, the department has been coordinating with the National Marine Fisheries Service and the Fish and Wildlife Service of the Federal government, the Marine Affairs Coordinator, and the Hawaii Institute of Marine Biology in the planning of an assessment of the marine resources of the Northwestern Hawaiian Islands. A preliminary survey of the area is scheduled for May of 1976 to gather information needed to develop the assessment program.

Honorable Francis A. Wong
April 8, 1976
Page Two

S.R. 257
S.C.R. 64

To supplement data gathered through expeditionary type surveys, one of the best source of information for stock assessment of selected species consists of compiling and analyzing data derived from the catch composition of the commercial fishery. Thus, there is much merit in implementing a controlled commercial fishery under a permit system for the Northwestern Hawaiian Islands as proposed by the resolutions. Such a system will make possible the gathering of vitally needed information rapidly and in quantity at a minimum of cost. *About seabirds, sea turtles?*

In view of the foregoing, this department concurs with the purpose and intent of Senate Resolution No. 257 and Senate Concurrent Resolution No. 64 and recommends their adoption.



For the Protection of Hawaii's Native Wildlife

P. O. Box 5032
HONOLULU, HAWAII 96814

HAWAII AUDUBON SOCIETY

July 15, 1976

Mr. Lynn A. Greenwalt
Director
U. S. Fish and Wildlife Service
Washington, DC 20240

Mr. Palmer Sekora
Refuge Manager
Hawaiian Islands National Wildlife Refuge
U. S. Fish and Wildlife Service
Hawaiian Life Building
1311 Kapiolani Blvd, Rm 606
Honolulu, HI 96814

Mr. Eugene Kridler
Office of Endangered Species
U. S. Fish and Wildlife Service
Hawaiian Life Building
1311 Kapiolani Blvd, Rm 606
Honolulu, HI 96814

Gentlemen:

In April of 1976 the Hawaii State Legislature adopted two resolutions (SCR 64 and SR 257), which are attached. The resolutions seem to be directed to the U. S. Department of the Interior, and might be interpreted as a request to open the shallow waters and lagoons of Pearl and Hermes Reef, French Frigate Shoals, and Maro Reef to commercial fishing. This is not obvious when one first reads the resolutions because they seem to imply that none of the waters in Hawaii's northwest chain (i.e., the Hawaiian Islands National Wildlife Refuge) are open to commercial fishing, whereas the three areas specifically mentioned above are the only part of this area not open to such fishing.

It is our understanding that these three areas are also the subject of a boundary dispute between the State of Hawaii and the Department of the Interior, U. S. Fish and Wildlife Service, which currently has jurisdiction over the areas as they are considered part of the Refuge. Apparently the State feels that only the actual land areas (above low water mark) of the Refuge should be under federal jurisdiction.

The Hawaii Audubon Society and the National Audubon Society were very much involved in the 1963 controversy over the refuge. At that time a strong movement by conservationists helped to keep the Refuge under federal jurisdiction, rather than having it revert to the State of Hawaii. It appears now that another controversy has arisen, this time over the Refuge boundaries. Apparently the State of Hawaii feels that only the land area should be included in the Refuge and that surrounding waters, as well as lagoons should come under State jurisdiction. If this were to happen, of course, it might open the way for serious disturbance to the atoll ecosystems by commercial fishing activities.



HAWAII AUDUBON SOCIETY

July 15, 1976
page 2

The Hawaii Audubon Society feels that one of the most important reasons why boundaries should not be changed is that the present Refuge boundaries provide protection for the entire atoll ecosystems, rather than just their terrestrial portions. Animal life on the atolls is completely dependent on the surrounding reef ecosystems and nearshore waters, and protection of these areas is essential if we are to retain what now constitute truly spectacular and unique examples of undisturbed atoll ecosystems. Several species of endangered birds, as well as the endangered Hawaiian monk seal and the endangered green sea turtle have their entire (or a unique Hawaiian portion thereof in the case of the turtle) breeding grounds in parts of the Hawaiian Islands National Wildlife Refuge.

For the sea turtle, French Frigate Shoals, whose lagoon is a disputed area, is its only Hawaiian breeding ground. The Hawaiian monk seal breeds on several of the atolls in the Refuge. This animal has been said (Karl Kenyon, 1975, *Defenders of Wildlife*:497-499) to be unable to adapt to the presence of man. To consider allowing commercial fishing near breeding populations of these animals seems highly inappropriate. Serious, albeit unintentional, disturbance and damage to these animal populations could result from fishing activities.

Populations of endangered birds (i.e., Laysan Duck, Nihoa Millerbird, Nihoa Finch, Laysan Finch) occur at very low numbers, especially the Laysan Duck, in the Refuge. Although commercial fishing does not appear to pose a direct threat to these birds, one must consider the consequences of increased sea vessel traffic, and, especially the possibility of shipwrecks. Should rats or cats be accidentally introduced on any of the islands because of shipwreck or carelessness, it is quite likely to mean extinction of all these species and that serious damage to other avian populations could result.

The difficulty of enforcing what will have to be strict regulations on the activities of fisheries personnel should be considered. The areas in question are so isolated that significant harm to animal populations could take place before officials were alerted to problems. In other words, we would have to agree to take great risks, something the Hawaii Audubon Society is unwilling to sanction.

Very little has been said about the value of preserving the reef and lagoon ecosystems intact. At present Haunama Bay on Oahu is the only stringently protected reef area in Hawaii. Reefs in the Refuge present a unique scientific opportunity to study undisturbed systems. Unless the economic gain to be had from fishing these areas is great, it seems very shortsighted not to protect these last remnants of undisturbed Hawaiian coral reefs. We have not even had time to assess the damage being done to reefs in the main islands because of the aquarium fish trade.

Although we are reluctant to make predictions about what might happen, we would like to point out that past history of commercial fishing in the Refuge has not been good. First of all, it was probably a major cause of the endangerment of the Hawaiian population of the green sea turtle. According to George Balazs (1975, *Defenders of Wildlife*:521-523), in 1959 alone, the last year sea turtle harvesting was profitable, a commercial fishing company destroyed 25% of the



For the Protection of Hawaii's Native Wildlife

P. O. Box 5032
HONOLULU, HAWAII 96814

HAWAII AUDUBON SOCIETY

July 15, 1976
page 3

nesting females present for that year's breeding season. Of course, turtle harvesting on a commercial scale is no longer permitted, but this not to say that turtle populations would not suffer from illegal activities. Increasing the flow of human traffic in the Refuge certainly increases the chances that such activities could occur.

There is virtually no data to indicate what the effect of commercial fishing might be on the Refuge's magnificent populations of breeding sea birds. Studies are now underway to investigate this point, among other things. No decisions about opening commercial fisheries in the area should even be considered before this study is complete and available to the public.

In view of the foregoing, the Hawaii Audubon Society opposes both releasing boundary dispute areas from federal jurisdiction to the State of Hawaii, as well as opening these areas for commercial fishing. The Hawaiian Islands National Wildlife Refuge has been the site of many human errors, prompted by economic motives, in the realm of conservation (i.e., ecosystem and species preservation) in the past. Recently, under the protection of the U. S. Fish and Wildlife Service, it has enjoyed a respite from disturbance unequalled since man first landed on the atolls. The Hawaii Audubon Society strongly urges that this protection continue unchanged, or increased, if changed at all.

Thank you for your attention to this matter.

Sincerely,

Sheila Conant, Ph. D.
President
Hawaii Audubon Society

Assistant Professor
Department of General Science
University of Hawaii

cc: Mr. Paul Howard
Western Region Representative
National Audubon Society

NW
Fis. Res.
Coastal
Geography

Shoving - Greenwalt - Cobb
↑

Crucial
leg. acts
↓ available for
analysis studies

Oct 1 signoff by heads of respective agencies -

pers:

Aberson and Harry - Marine Mammals

Don't hold punches on viewpoints/comments

Bob Skillman - brief overview - coordinator of program study

Tripartite agreement - if one phase is stated unilaterally,
it no longer exists as a tripartite study.

They want to conduct a resource assessment, but want
others to find their own support if they are to partake.

charts →

Laysan IS - KURE

FFS - Laysan

Hawaii - FFS

- Definition of needs - spell out needs - what you expect
to get for your activity. Multiple use activity -
Minimize conflicts.

Possible
Support - Sea Grant - NAVY

Distribution and Density

Extended jurisdiction act - ^{NW Lab Fisher center} increased funding
seawant's quota's[?]

Experimental design - methodology

George Hardy

What is the status of population?
Recruitment of juveniles into population?

HIMB Telephone calls

3 years changed to
5 years

copies of letters
for Bob Iversen

Humpbacks 1966 ^{since} - completely protected IWC

spends
Summer - SE Alaska

scientific method - scientific approach

Russian
Fishing products book



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu and La Jolla Laboratories
P. O. Box 3830
Honolulu, Hawaii 96812

December 7, 1976

Mr. George H. Balazs
University of Hawaii
Hawaii Institute of Marine Biology
P. O. Box 1346
Kaneohe, Hawaii 96744

Dear George:

Please find enclosed a new draft of the prospectus (or as I would rather call it now, a tripartite cooperative agreement) for the Northwestern Hawaiian Islands study.

I have made reference in the main body of the agreement to the problems in funding your research, and I am sure it will be edited out whether or not an agreement is reached on who will fund your work. I put it in as a prod.

Appendix J. Research proposal--Hawaii Institute of Marine Biology, was written or rather taken from your Sea Grant application. Please review this section and edit as you see fit. Also, any comments you wish to make on any other section of the agreement will be most welcome.

When the funding of your project has been settled, I would like to include it in Appendix C, Manpower and funds commitments.

Sincerely yours,

Bob

Dr. Robert A. Skillman
Coordinator, Northwestern
Hawaiian Islands Study

Enclosure

Certificate of Appreciation

The Federal, State and Provincial Conservation Agencies join with thousands of professional and amateur ornithologists throughout North America in expressing their sincere appreciation for the interest and cooperation shown by reporting the bird band number and recovery data noted below. A report containing these data will be forwarded to the ornithologist who banded the bird and these data will be permanently retained in the cooperative North American Bird Banding files maintained at the Bird Banding Laboratory, Office of Migratory Bird Management, Laurel, Maryland 20810, U.S.A.

It is only through the continued cooperation of interested conservationists such as yourself that these important data can continue to be compiled and made available to the scientists who study our wild bird populations.

Awarded To

GEORGE H. BALAZS
BX 1346 COCONUT ISL
KANEHE HI 96744

BANDING DATA:

BAND NUMBER: 923-13346 KIND OF BIRD: NODDY TERN SEX: UNKNOWN

AGE OF BIRD: IT WAS AT LEAST ONE YEAR OLD WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 06/16/66

RECOVERY DATA:

FILE REF.: 09741

LOCATION: EAST ISLAND POC

DATE: 07/ /74



CANADIAN WILDLIFE SERVICE



BUREAU OF SPORT FISHERIES AND WILDLIFE

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Awarded To

GEORGE H BALAZS
BX 1346 COCONUT ISL
KANEHOE HI 96744

BANDING DATA:

BAND NUMBER: 863-20612 KIND OF BIRD: SOOTY TERN SEX: UNKNOWN

AGE OF BIRD: IT WAS AT LEAST ONE YEAR OLD WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 08/05/65

RECOVERY DATA:

FILE REF.: 09741

LOCATION: EAST ISLAND POC

DATE: 07/ /74



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Awarded To

GEORGE H. BALAZS
BX 1346 COCONUT ISL
KANEHOE HI 96744

BANDING DATA:

BAND NUMBER: 757-29332 KIND OF BIRD: BLACK FT ALBATROSS SEX: UNKNOWN

AGE OF BIRD: IT WAS TOO YOUNG TO FLY WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C. D. HACKMAN 3033 WOODSIDE PARKVILLE MO 64234

BANDING LOCATION: NEAR EAST IS FR PKG SHL HAWI DATE: 05/30/67

RECOVERY DATA:

FILE REF.: 09741

LOCATION: EAST ISLAND PCC

DATE: 07/ 1/74



CANADIAN WILDLIFE SERVICE



BUREAU OF SPORT FISHERIES AND WILDLIFE

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Awarded To

GEORGE H BALAZS
BX 1346 COCONUT ISL
KANEHUE HI 96744

BANDING DATA:

BAND NUMBER: 757-36994 KIND OF BIRD: BLACK FT ALBATROSS SEX: UNKNOWN

AGE OF BIRD: IT WAS TOO YOUNG TO FLY WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MO 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 06/09/68

RECOVERY DATA:

FILE REF.: 09741

LOCATION: EAST ISLAND POC

DATE: 06/ /74



CANADIAN WILDLIFE SERVICE



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It is only through the continued cooperation of interested conservationists such as yourself that these important data can continue to be compiled and made available to the scientists who study our wild bird populations.

Awarded To

GEORGE H. BALAZS
UNIV OF HAWAII (MANOA) MARINE BIO
BOX 1346
COCONUT ISL KAHOOHIE HAWAII 96744

BANDING DATA:

BAND NUMBER: 712-09948 KIND OF BIRD: HAWAIIAN NODDY SEX: UNKNOWN

AGE OF BIRD: IT WAS AT LEAST THREE YEARS OLD WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR WHALE - SKATE ISL FFS HAWI

DATE: 06/20/68

RECOVERY DATA:

FILE REF.: 20100

LOCATION: WHALE SKATE HI

DATE: 02/13/75



CANADIAN WILDLIFE SERVICE



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Awarded To

GEORGE H BALAZS
BX 1346 COCONUT ISL
KANEHE HI 96744

BANDING DATA:

BAND NUMBER: 757-38615 KIND OF BIRD: BLACK FT ALBATROSS SEX: UNKNOWN

AGE OF BIRD: IT WAS TOO YOUNG TO FLY WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 06/08/69

RECOVERY DATA:

FILE REF.: 09741

LOCATION: EAST ISLAND POC

DATE: 07/ /74



CANADIAN WILDLIFE SERVICE



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Awarded To

GEORGE H. BALAZS
BX 1346 COCONUT ISL
KANEHE HI 96744

BANDING DATA:

BAND NUMBER: 797-36861 KIND OF BIRD: LAYSAN ALBATROSS SEX: UNKNOWN

AGE OF BIRD: IT WAS TOO YOUNG TO FLY WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C. D. HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 06/09/68

RECOVERY DATA:

FILE REF.: 09741

LOCATION: EAST ISLAND POC

DATE: 07/ /74



CANADIAN WILDLIFE SERVICE



BUREAU OF SPORT FISHERIES AND WILDLIFE

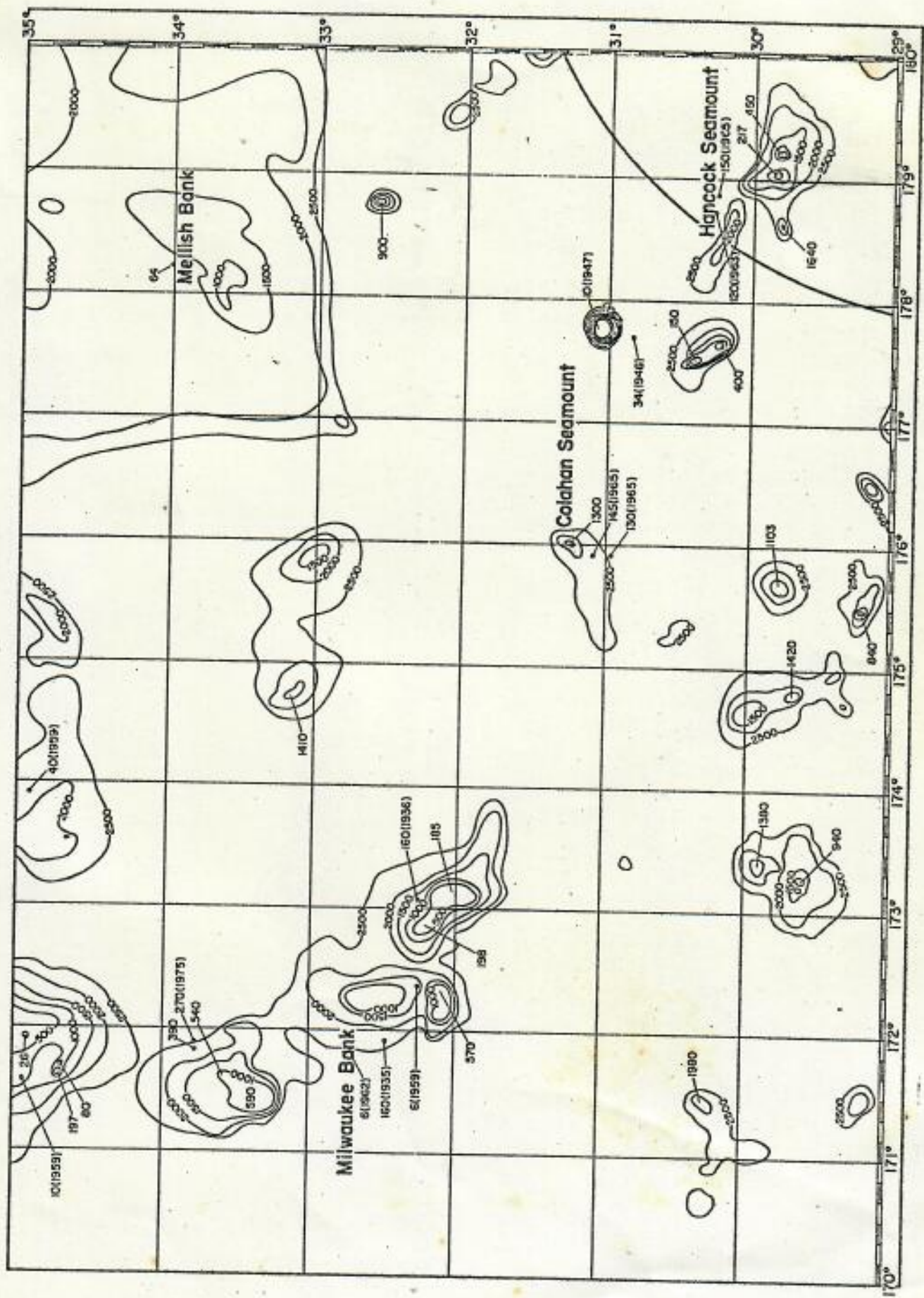


Figure 2.--Locations of seamounts and guyots northwest of the Northwestern Hawaiian Islands.



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Fisheries Center
Honolulu and La Jolla Laboratories
P. O. Box 3830
Honolulu, Hawaii 96812

Date: November 18, 1976

Reply to Attn. of: F142

To: Staff

From: Richard S. Shomura, Director, Honolulu Laboratory

Subject: Townsend Cromwell cruise schedule

Since there have been several changes to the FY 1977 cruise schedule, I have prepared a new updated cruise schedule. The schedule for FY 1978 has not been changed as yet. For your reference, cruise schedules for FY 1975 and FY 1976 are included.

A tentative listing of cruise personnel for the period 2 May 1977 to 30 September 1978 is provided below:

TC-77-03 (TC #76) (2 May--12 August 1977)

1. Robert A. Skillman (Chief Scientist)
Division of Fish and Game scientists to be named
(possibly some Laboratory personnel)
2. Richard N. Uchida (Chief Scientist)
Jerry A. Wetherall
Paul M. Shiota
(to be named)
(to be named)
(fisherman, net-man)

TC-77-04 (TC #77) (5 September--12 October 1977)

Reginald M. Gooding (Chief Scientist)
Howard O. Yoshida
James H. Uchiyama
(to be named)
(to be named)
(fisherman)

TC-78-02 (TC #81) (6 May--3 July 1978)

Robert A. Skillman (Chief Scientist)
Heeny S. H. Yuen
Roy Mendelsohn
Victor A. Honda
Thomas K. Kazama
(fisherman)

TC-78-03 (TC #82) (24 July--30 September 1978)

Howard O. Yoshida (Chief Scientist)

Walter M. Matsumoto

Paul M. Shiota

(to be named)

(to be named)

(fisherman)



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TOWNSEND CROMWELL

FY 1975

Cruise No.	Days		Days at sea	Shore time ¹	Area and type of operation
	Start	End			
TC-64	5/01/75	6/13/75	43	--	Gulf of Alaska, BLM environmental study
TC-65	6/23/75	6/30/75	7	--	Eastern Pacific albacore assessment
		Total	50		

FY 1976 and FY 1976T

TC-65 (cont.)	7/01/75	7/15/75	15	--	Eastern Pacific albacore assessment (continued)
TC-66	8/19/75	9/16/75	22	--	Hawaiian archipelago, scouting for skipjack tuna
TC-67	10/20/75	11/26/75	35	--	Northwestern Hawaiian Islands: survey and assessment
TC-76-01 (TC-68)	1/05/76	3/03/76	56	--	Eastern tropical Pacific, porpoise distribution survey
TC-76-02 (TC-69)	3/08/76	4/02/76	25	--	Eastern tropical Pacific, zooplankton and larval fish survey
TC-76-03 (TC-70)	4/02/76	4/12/76	11	--	San Diego to Hawaii, bait transport
TC-76-04 (TC-71)	5/03/76	6/09/76	~33	--	Northwestern Hawaiian Islands, survey and assessment; main islands, tracking skipjack tuna
TC-76-05 (TC-72)	6/21/76	9/16/76	83	--	Western Pacific, PTDF skipjack tuna survey
		Total	~280		

¹Days in port outside of Honolulu.

TOWNSEND CROMWELL

250 Sea Days Schedule

FY 1977

Cruise No.	Days Start	Days End	Days at sea	Shore time ¹	Area and type of operation
TC-76-06 (TC-73)	<u>10/05/76</u>	<u>12/03/76</u>	56	6	Northwestern Hawaiian Islands, survey and assessment
TC-77-01 (TC-74)	1/05/77	3/11/77	60	9	Eastern tropical Pacific, porpoise survey
TC-77-02 (TC-75)	3/16/77	3/30/77	14	--	San Diego to Honolulu run
HAUL OUT	April				(Honolulu)
TC-77-03 (TC-76)	<u>5/02/77</u>	<u>8/12/77</u>	99	10	Northwestern Hawaiian Islands, survey and assessment
TC-77-04 (TC-77)	<u>9/05/77</u>	<u>9/30/77</u>	23	3	Northwestern Hawaiian Islands, survey and assessment; main islands, tracking of skipjack tuna
Total			252		

FY 1978

TC-77-04 (TC-77) (cont.)	<u>10/01/77</u>	<u>11/12/77</u>	37	6	Northwestern Hawaiian Islands, survey and assessment; main islands, tracking of skipjack tuna (continued)
TC-77-05 (TC-78)	11/18/77	11/27/77	10	0	Run Honolulu-San Francisco
TC-77-06 (TC-79)	12/01/77	12/20/77	20	0	California coast: bottom trawl survey for rockfish
TC-78-01 (TC-80)	1/04/78	3/20/78	67	9	Eastern tropical Pacific, porpoise survey
TC-78-02 (TC-81)	<u>5/06/78</u>	<u>7/03/78</u>	53	6	Northwestern Hawaiian Islands, survey and assessment
TC-78-03 (TC-82)	<u>7/24/78</u>	<u>9/30/78</u>	63	6	Northwestern Hawaiian Islands, survey and assessment
Total			250		

¹Days in port outside of Honolulu.

Townsend Cromwell Cruise Schedule

FY 1977

Cruise No.	Date		Days at sea	Shore time ¹	Area and type of operation
	Start	End			
TC-76-06 (TC #73)	10/05/76	12/03/76	50 (6 lost)	6	NWHI-insular resources survey, tuna physiology
TC-77-01 (TC #74)	1/05/77	3/25/77	73	6	Equatorial central Pacific-porpoise survey
HAUL OUT	April				Honolulu
TC-77-02 (TC #75)	^{MAY} 5/02/77	^{August} 8/17/77	104	10	NWHI-insular resources survey and nearshore resources survey, live tunas for tuna ecology, aggregation
TC-77-03 (TC #76)	9/05/77	9/30/77	23	3	NWHI-insular resources survey; main islands-physiological ecology, aggregation, ikasibi
		Total	250		

FY 1978

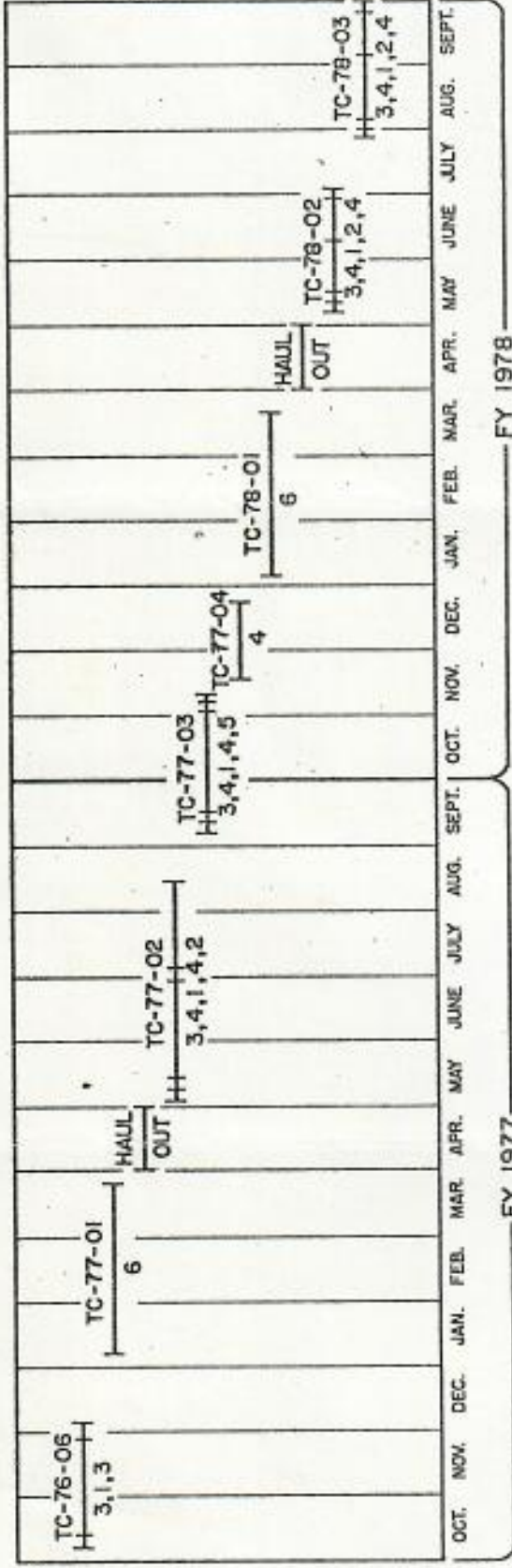
TC-77-03 (TC #76) (Contin.)	10/01/77	11/12/77	37	6	(Continuation)
TC-77-04 (TC #77)	11/17/77	12/21/77	30	2	Equatorial central Pacific-aggregation objects
TC-78-01 (TC #78)	1/04/78	3/20/78	67	9	Eastern tropical Pacific-porpoise survey
HAUL OUT	April				
TC-78-02 (TC #79)	5/06/78	7/03/78	53	6	NWHI-insular resources survey and nearshore resources survey; main islands-physiological ecology, aggregation
TC-78-03 (TC #80)	7/24/78	9/30/78	63	6	NWHI-insular resources survey; main islands-physiological ecology
		Total	250		

¹Days in port outside of Honolulu.

Townsend Cromwell Cruise Schedule
FY 1979

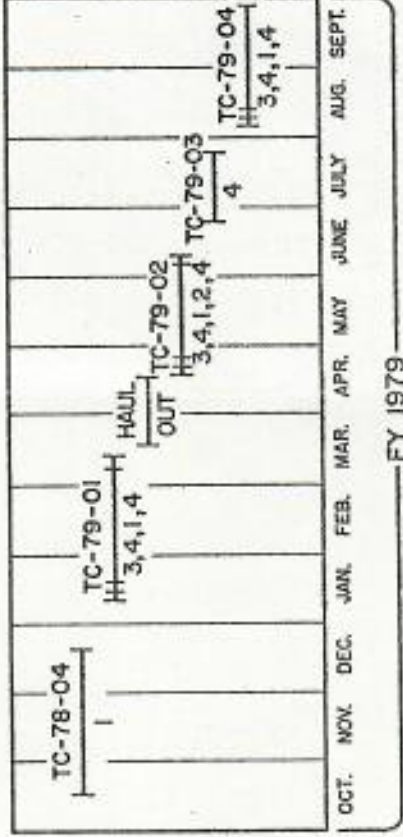
Cruise No.	Date		Days at sea	Shore time ¹	Area of operation
	Start	End			
TC-78-04 (TC #81)	10/16/78	12/20/78	60	6	N. Mariana Islands-insular resources survey and assessment
TC-79-01 (TC #82)	1/08/79	3/14/79	60	6	NWHI-insular resources survey; main islands-physiological ecology, aggregation
HAUL OUT	March-April				
TC-79-02 (TC #83)	4/16/79	6/10/79	50	6	NWHI-insular resources survey; main islands-physiological ecology; aggregation
TC-79-03 (TC #84)	6/25/79	7/26/79	30	2	Equatorial central Pacific-aggregation objects
TC-79-04 (TC #85)	8/06/79	9/30/79	50	6	NWHI-insular resources survey; main islands-physiological ecology, aggregation
Total			250		

¹Days in port outside of Honolulu.



TOWNSEND CROMWELL CRUISE SCHEDULE

- 1 INSULAR RESOURCES SURVEY, NMFS, H.L.
- 2 NEARSHORE RESOURCES SURVEY, HDFG
- 3 PHYSIOLOGICAL ECOLOGY
- 4 AGGREGATION
- 5 IKASIBI RESEARCH
- 6 PORPOISE, NMFS, L.J.





U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu and La Jolla Laboratories
P. O. Box 3830
Honolulu, Hawaii 96812

March 17, 1977

Mr. George H. Balazs
Marine Biologist
Hawaii Institute of Marine Biology
P. O. Box 1346
Kaneohe, Hawaii 96744

Dear George: .

For your information, I am enclosing our newest edition of the
FRS Townsend Cromwell cruise schedule for FY 1977, 1978, and 1979.

Sincerely yours,

Bob

Dr. Robert A. Skillman
Coordinator, Northwestern Hawaiian
Islands Study

Enclosure

Chapter I—United States Fish, Wildlife Serv.

§ 27.65

(c) The direction of a tow boat when circling will be counter clockwise.

(d) Skiers must wear U.S. Coast Guard approved ski belts, life jackets or buoyant vests.

(e) Water skiing is prohibited within 300 feet of harbors, swimming beaches, and mooring areas, and within 100 feet of any designated swimming area.

§ 27.34 Aircraft.

The unauthorized operation of aircraft, including sail planes, and hang gliders, at altitudes resulting in harassment of wildlife, or the unauthorized landing or take-off on a national wildlife refuge, except in an emergency, is prohibited. National wildlife refuge boundaries are designated on up-date FAA aeronautical charts.

Subpart B—Disturbing Violations: With Weapons

§ 27.41 General provisions.

Carrying, possessing, or discharging firearms, fireworks, or explosives on national wildlife refuges is prohibited unless specifically authorized under the provisions of this Subchapter C.

§ 27.42 Firearms.

Only the following persons may possess, use, or transport firearms on national wildlife refuges in accordance with this section and applicable Federal and State law:

(a) Persons authorized by permit or by provision of this Subchapter C.

(b) Persons carrying unloaded firearms, that are dismantled or cased, in vehicles and boats over routes of travel designated under the provision of Subchapter C.

(c) Persons authorized to use firearms for the taking of specimens of wildlife for scientific purposes.

(d) Persons authorized by special regulations or permits to possess or use firearms for the protection of property, for field trails, and other special purposes.

§ 27.43 Weapons other than firearms.

The use or possession of cross bows, bows and arrows, air guns, spears, gigs, or other weapons on national wildlife refuges is prohibited except as may be authorized under the provisions of this Subchapter C.

Subpart E—Disturbing Violations: Against Plants and Animals

§ 27.51 Disturbing, injuring, and damaging plants and animals.

(a) Disturbing, injuring, spearing, poisoning, destroying, collecting or attempting to disturb, injure, spear, poison, destroy or collect any plant or animal on any national wildlife refuge is prohibited except by special permit unless otherwise permitted under this Subchapter C.

§ 27.52 Introduction of plants and animals.

Plants and animals or their parts taken elsewhere shall not be introduced, liberated, or placed on any national wildlife refuge except as authorized.

Subpart F—Disturbing Violations: Against Nonwildlife Property

§ 27.61 Destruction or removal of property.

The destruction, injury, defacement, disturbance, or the unauthorized removal of any public property including natural objects or private property on or from any national wildlife refuge is prohibited.

§ 27.62 Search for and removal of objects of antiquity.

No person shall search for or remove from national wildlife refuges objects of antiquity except as may be authorized by 43 CFR 3

§ 27.63 Search for and removal of other valued objects.

No person shall search for buried treasure, fossils, bones, valuable semi-precious rocks, stones, or mineral specimens on national wildlife refuges unless authorized by permit or by provision of this Subchapter C.

(b) Permits are required for archeological studies on national wildlife refuges in accordance with the provisions of this Subchapter C.

§ 27.64 Prospecting and mining.

Prospecting, locating, or filing mining claims on national wildlife refuges is prohibited unless otherwise provided by law. See § 29.21 for provisions concerning mineral leasing.

§ 27.65 Tampering with vehicles and equipment.

Tampering with, entering, or starting any motor vehicle, boat, equipment or machinery or attempting to tamper with,

George Balazs



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National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 78-01 (TC-78) (Part I)
Drogue and animal distribution studies on Middle Bank

CRUISE PERIOD: January 6-14, 1978

AREA OF OPERATION: Middle Bank (22°42'N, 161°02'W).

ITINERARY: January 6 - Departed Kewalo Basin.
January 7 - Returned to Kewalo Basin for vessel repairs.
January 8 - Departed Kewalo Basin for Middle Bank.
January 9-13 - Placed drift drogues around Middle Bank and tracked them. Made coral mop drags for Katherine Muzik (Smithsonian Institution).
January 14 - Arrived Kewalo Basin (end of Part I).

MISSIONS AND RESULTS:

- A. The primary objectives of this part of the cruise were:
1. To measure currents around and over Middle Bank with drogues to determine whether a Taylor Column of relatively stationary water was present over the bank.

A drogue consisted of a 20-gal galvanized garbage can suspended from a small metal conical buoy (about 85 lb positive buoyancy) at a depth of about 27 meters. A standard longline rubber float with a lighted bamboo flagpole trailed downwind from the drogue buoy and below this, a buoyed radio beacon.

When this system was set, the drogue flag buoy and radio buoy trailed in line downwind.

Two drogue stations were made, each consisting of five drogues. On the first drogue station (Station 3), a drogue was set on the center of the bank in about 35 fathoms and the other four drogues were set about 5 mi south, west, north, and east of the central drogue, near the drop-off in 200-300 fathoms. Setting time was about 4 h. For the next 24 h, the ship visited each drogue about every 4 h taking a satellite-navigational fix verified with a loran C fix. The drogues were then retrieved. On the second drogue station (Station 10), the five drogues were set south to north in an approximate straight line: 5 mi south of the 300-fathom contour; at about 300 fathoms south of the center of the bank; at the center of the bank; at 300 fathoms north of the center; and 5 mi north of the 300-fathom contour.

The drogues were soaked for 30 h and navigational fixes were taken on each drogue every 3-4 h.

Figures 1 and 2 show the drift patterns for the two drogue stations.

The drift data apparently do not indicate the presence of a Taylor Column in the vicinity of Middle Bank at the time these stations were occupied.

2. To sample octocorals on Middle Bank by dragging a tangle mop on the bottom.

Thirteen half-hour coral drag stations were occupied in depths ranging from 37 to 300 fathoms. The mop entangled with gorgonians, *Corallium secundum*, on only one station (Station 6), located northeast of the center of the bank in about 200 fathoms.

The coral was preserved and sent to Katherine Muzik at the Smithsonian Institution in Washington, D.C.

B. Miscellaneous observations and activities

1. No large bird flocks or fish schools were sighted, only scattered birds were seen. Six small herds of

unidentified porpoise were sighted and a single unidentified whale.


2. A single kawakawa, Euthynnus affinis, was taken on the bank during 5.5 h of trolling.
3. Ten XBT casts were made. Salinity samples and surface temperature measurements were taken with each cast.
4. The surface thermosalinograph was run continuously while at sea.
5. Standard weather observations were made at 0000, 0600, 1200, and 1800 G.m.t. by the ship's officers.

SCIENTIFIC

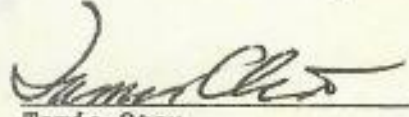
PERSONNEL:

Reginald M. Gooding, Chief Scientist, Fishery Biologist, NMFS, SWFC, HL
 Bernard M. Ito, Research Assistant, NMFS, SWFC, HL
 Katherine Muzik, Visiting Investigator, Smithsonian Institution, Washington, D.C.

Submitted by:


 Reginald M. Gooding
 Chief Scientist

Approved by:


 Tamio Otsu
 Acting Director
 Honolulu Laboratory

Attachments

April 13, 1978

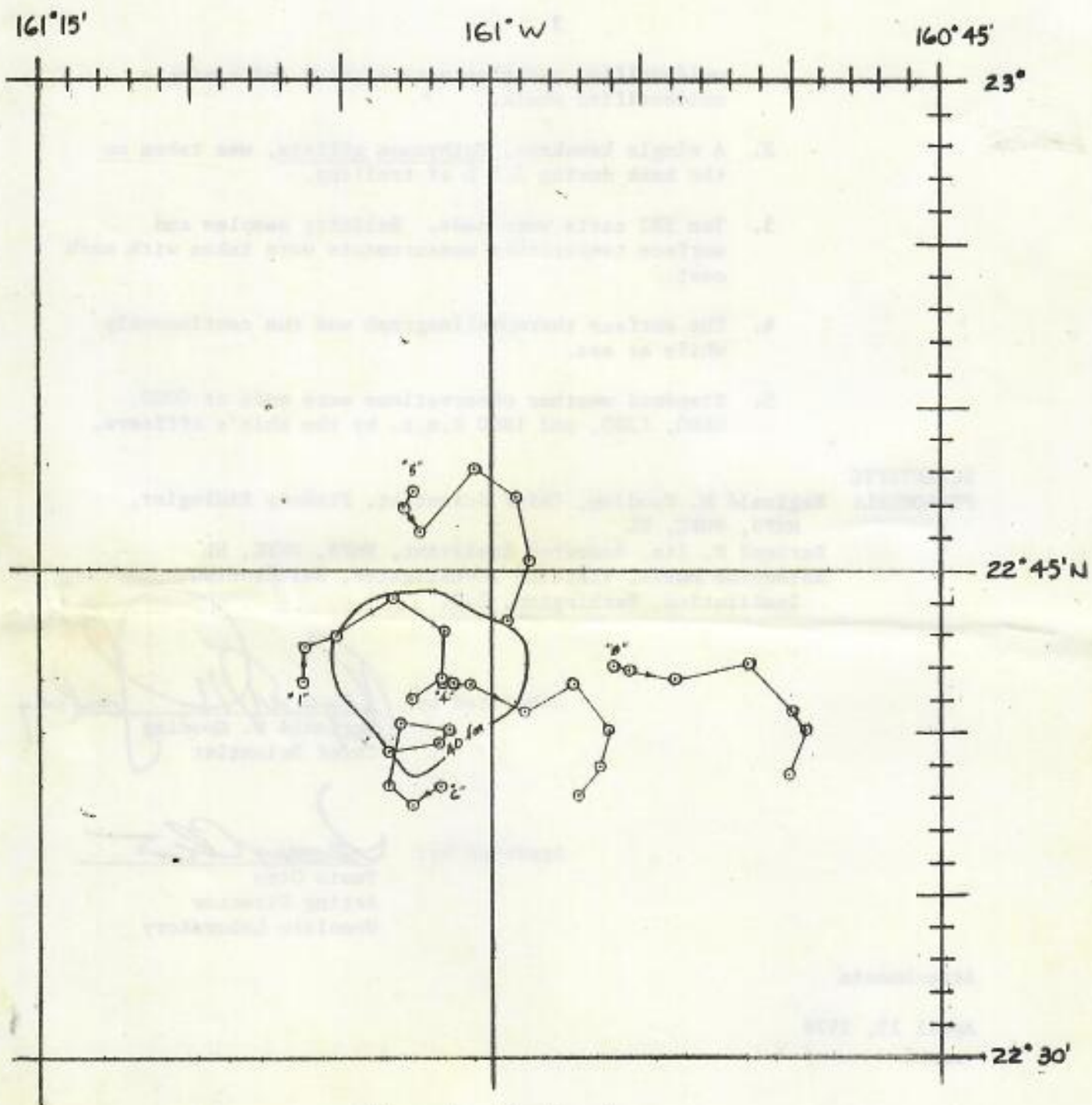


Figure 1.--Station 3.

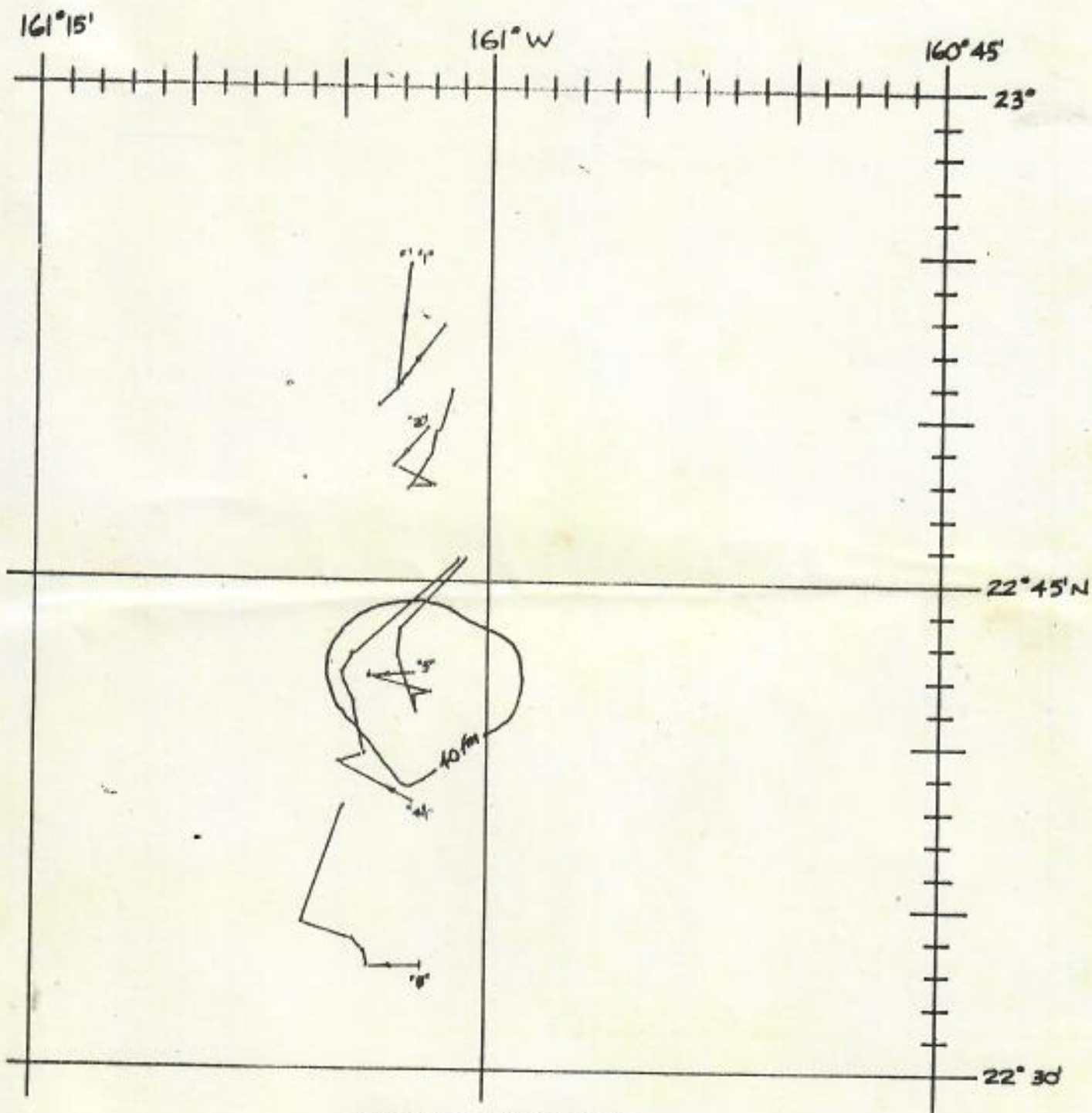


Figure 2.--Station 10.



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Southwest Fisheries Center
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CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 78-01 (TC-78) (Part II)

CRUISE PERIOD: January 16-March 9, 1978

AREA OF OPERATION: The Northwestern Hawaiian Islands and Hancock Seamount

ITINERARY: January 16 - Departed Kewalo Basin, Honolulu; tested the Furuno net sounder and returned to Kewalo Basin.

January 18 - Loaded vessel, departed Kewalo Basin and calibrated flowmeter. Occupied environmental stations, trapped, handlined, and dragged for precious corals at Nihoa Island and vicinity.

January 23 - Arrived Kewalo Basin to repair hole in ship's hull.

January 28 - Departed Kewalo Basin; occupied environmental stations, trapped, handlined, and dragged for precious corals in waters around French Frigate Shoals and Lisianski Island.

February 6 - Arrived Midway Islands. Replenished fuel, water, and provisions. Caught fish for ciguatera samples. A. Vala disembarked.

February 8 - Departed Midway Islands. Occupied environmental stations, handlined, trapped, dragged for precious corals, and trawled on Hancock Seamount and 274-m bank northwest of Kure Island, around Kure Island, Midway Islands, and Pearl and Hermes Reef.

- February 20 - Arrived Midway Islands. Refueled and picked up water and provisions. Caught fish for ciguatera samples. M. Palmgren disembarked. A. Kam and Brian and Pat Johnson boarded the vessel.
- February 22 - Departed Midway Islands. Occupied environmental stations, handlined, trapped, and fished for shark around Laysan Island, Gardner Pinnacles, and Necker Island. The Johnsons and supplies put ashore on Laysan Island.
- March 9 - Arrived Kewalo Basin. End of Part II. Unloaded some gear and samples.

MISSIONS
AND
RESULTS

- A. The primary objectives of the cruise were to conduct bottom and midwater trawling and to trap and handline for fish, crab, and lobsters to determine their distribution, availability, and relative abundance.

1. Bottom trawling

Only two hauls were made with a Norwegian trawl. For some reason, probably strong currents, the trawls did not fish on the bottom and resulted in "water hauls."

2. Midwater trawling

Only four hauls were attempted with the Noreastern trawl; one on Hancock Seamount and three on a 274-m bank northwest of Kure Island. All of the hauls were "water hauls" with the exception of one when a red bigeye (aweoweo), Priacanthus boops, was caught. It was not possible to determine whether the trawl was fishing at the desired depths since the net sounder traces could not be interpreted. After much troubleshooting, the radio operator concluded that the wrong (different than that used during the test cruise) circuit board was in the unit making it impossible to decipher. This precluded making further midwater trawl hauls.

3. Trapping

Ten trapping stations were occupied. Seven consisted of 40 lobster pots (8 on a string, each

37 m apart) and 20 fish traps (4 on a string, each spaced 37 m apart). One station consisted of 4 fish traps, 1 string, on Hancock Seamount and two others consisted of 40 lobster pots at Nihoa and Laysan Islands. Frozen mackerel was used almost exclusively as bait except for one station at Necker where mostly frozen smelt was used with some mackerel. Each trap was baited with about 0.9 kg of mackerel, usually two pieces. The traps were usually set between 1530 and 1630, "soaked" overnight and usually retrieved between 0800 and 1130.

A total of 879 spiny lobsters, Panulirus marginatus, were caught trapping, of which 260 undersized and/or berried females were tagged and released. Also caught were 140 slipper lobsters, Scyllarides squamosus, of which 40 undersized and/or berried ones were tagged and released. Blue-line snapper (taape), Lutjanus kasmira, the goatfishes, Parupeneus pleurostigma, P. chrysonemus, and P. multifasciatus, pink snapper (opakapaka), Pristipomoides microlepis, the kona crab, Ranina serrata, and a few other miscellaneous fishes were also caught in the traps.

The highest catch rate of 3.8 spiny lobsters per trap-night was obtained at Midway Islands. The catch rates of spiny lobsters at Necker Island was very low, about 0.25 per trap-night.

Four fish traps yielded 79 spiny dogfish, Squalus fernandinus, at Hancock Seamount.

4. Handlining

Eighteen handline stations were occupied during the cruise. Catches included mostly opakapaka, red snapper (ehu), Etelis marshi, jack (butaguchi), Caranx cheilio, amberjack (kahala), Seriola dumerilii, and the grouper (hapuupuu), Epinephelus quernus. A few other species such as the wrasse, Bodianus bilunulatus, red snapper (onaga), Etelis carbunculus, and pink snapper (kalekale), Pristipomoides sieboldi, were caught in small numbers.

Handlining was conducted while drifting along "drop-off" areas of the banks in depths from 110 to 220 m. Frozen squid was the primary bait used with three to six hooks per line. The best pink snapper fishing occurred at French Frigate Shoals where 71 were caught in about 2.5 h of fishing.

- B. Collect plankton and forage organisms with bongo net and Cobb pelagic trawl to determine the distribution and relative abundance of the organisms sampled.

1. Bongo net tows

A total of 71 bongo-net tows were taken at pre-determined stations. The inshore tows were oblique to 100 m and the offshore tows were oblique to 200 m. These stations were occupied night and day to examine diurnal differences. These tows were taken usually with the vessel going at 2 knots and trying to maintain a wire angle of 45°. All of the bongo tows except five off Gardner Pinnacles and two off Necker Island were completed.

2. Cobb trawl

Five oblique Cobb trawl hauls were taken with a maximum of 1,371 m of cable out. These hauls were taken off Nihoa Island, French Frigate Shoals, Lisianski Island, Kure Island, and Hancock Seamount. The desired depth of 1,000 m was probably not attained due to the length of trawl warp that was available.

- C. Collect oceanographic data with XBT and CTD casts for environmental studies.

1. XBT

Fifty-three XBT casts were made usually in conjunction with the environmental stations. T-4 type (450 m) XBT's were used exclusively during the cruise.

2. CTD

Nineteen CTD casts to 1,000 m taken at offshore stations were made during the cruise.

- D. Conduct direct and incidental trolling to determine the availability and relative abundance of tunas and other pelagic species.

Trolling results were very poor. Only six kawakawa, Euthynnus affinis, five mahimahi, Coryphaena hippurus, four yellowfin tuna, Thunnus albacares, one jack, Caranx ignobilis, and six Japanese barracuda (kawalea), Sphyrna helleri, were caught in 101 h of trolling.

- E. Conduct dredging for precious corals to determine their distribution and availability.

Thirteen coral drag stations were conducted during the cruise. The station consisted of dragging a concrete block to which a piece of gill net webbing was attached for a few minutes at designated areas. One potentially large precious coral bed was found off French Frigate Shoals. Samples collected by the drag gear included pink coral, Corallium secundum, solitary corals, Enalopsammia ampeloides, and unidentified ones, black coral, gorgonians, etc. All of the drags were at depths of 183-476 m and for 10- to 32-min duration.

- F. Conduct shark fishing at selected areas.

Only four shark fishing stations were attempted. Two sharks caught off Laysan Island were identified as tiger shark, Galeocerdo cuvieri, and a Galapagos shark, Carcharhinus galapagensis. The stomachs were empty except for the bait used. Unfavorable weather conditions precluded stations at Gardner Pinnacles and Morrow Reef.

- G. Transport the Johnsons and supplies to Laysan Island and help establish their camp.

The Johnsons and their supplies and equipment were landed on the east side of the island since the regular channel near the campsite on the west side was closed by large northwest swells. Landing of the supplies and gear plus the transporting of essential gear to set up the camp was very difficult and tedious but the camp was established prior to leaving the island.

- H. Miscellaneous observations and activities.

1. One skipjack tuna, 1 kawakawa, and 6 unidentified fish schools were observed. Also seen were 16 whales, 1 sea turtle, and several porpoises.
2. Otoliths (heads or whole samples) for age and growth studies were collected from mahimahi, ehu, kalekale, kahala, red tail opelu, Decapterus russelli, armorhead, Pentaceros richardsoni, and a few other fishes.
3. Samples for ciguatera analysis were collected from 258 fishes which included mostly hapuupuu, opakapaka, kahala, blue-line snapper, butaguchi, ehu, armorhead, surgeonfish (manini), Acanthurus sandvicensis, and mountain bass (aholehole), Kuhlia sandvicensis.

4. A few ovaries were collected for fecundity and maturity studies. These were mostly from butaguchi, opakapaka, hapuupuu, ehu, and kalekale.
5. The surface thermosalinograph was run continuously while at sea.
6. Length frequencies were recorded for almost all of the handline-caught fishes and some of the trap-caught fishes.
7. Salinity and surface bucket temperatures were taken with each XBT cast.
8. Carapace lengths and sex were recorded for all spiny and slipper lobsters caught.
9. Standard weather observations were taken by the ship's crew at 0000, 0600, 1200, and 1800 G.m.t. whenever possible.
10. Observation of birds and stomach contents from several birds were collected on Laysan Island. Nine Laysan finches were also captured and brought live to Hawaii for study.

SCIENTIFIC

PERSONNEL: Thomas S. Hida, Chief Scientist, Fishery Biologist, NMFS, SWFC, HL
 Glenn R. Higashi, Research Assistant, NMFS, SWFC, HL
 Robert L. Humphreys, Jr., Research Assistant, NMFS, SWFC, HL
 Martina K. K. Queenth, Research Assistant, NMFS, SWFC, HL
 Darryl T. Tagami, Research Assistant, NMFS, SWFC, HL
 Richard N. Uchida, Fishery Biologist, NMFS, SWFC, HL (Jan. 16)

Craig Harris, Cooperating Scientist, U.S. Fish and Wildlife Service, Honolulu (Feb. 22-Mar. 9)
 Brian and Pat Johnson, Cooperating Scientists (Feb. 22-28)
 Alan Kam, Cooperating Scientist, Hawaii Institute of Marine Biology, University of Hawaii (Feb. 22-Mar. 9)
 William Miller, Service Manager, Konel-Furuno, San Francisco (Jan. 16)
 Michael Palmgren, Cooperating Scientist, Hawaii Institute of Marine Biology, University of Hawaii (Jan. 18-Feb. 21)
 Araha Vala, Cooperating Scientist, Papua New Guinea (Jan. 18-Feb. 7)

Submitted by:

Thomas S. Hida
 Thomas S. Hida
 Chief Scientist,
 Part II

Approved by:

Richard S. Shomura
 Richard S. Shomura
 Director, Honolulu
 Laboratory

April 13, 1978



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National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
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Honolulu, Hawaii 96812

CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 78-01 (TC-78) (Part III)

CRUISE
PERIOD: March 13-19, 1978

AREA OF
OPERATION: Waters off Hawaii, Maui, and Molokai

ITINERARY: March 13 - Departed Kewalo Basin, headed for Kawaihae.

March 14- - Bottom trawled, trapped, handlined, and occu-
18 - pied University of Hawaii environmental stations
off Kawaihae, Hawaii, Lahaina, Maui, and Penguin
Bank.

March 19 - Arrived Kewalo Basin. End of Part III.

MISSIONS
AND

RESULTS: A. Conduct bottom trawling, trapping, and handlining for
fish and crustaceans to determine their distribution,
availability, and relative abundance.

1. Bottom trawling

Two bottom trawl hauls were made off Kawaihae, Hawaii. One large, unidentified, jellylike octopus weighing 21 kg was caught in one of the hauls while only one spiny dogfish, Squalus fernandinus, and an anglerfish were caught in the the other. Besides the known trawling grounds from previous surveys, the other areas off west Maui were very rugged. Adverse weather conditions precluded trawling at Penguin Bank.

2. Trapping

Four trap stations were occupied utilizing 40 lobster pots (8 on a string, each 37 m apart) and 20 fish traps (4 on a string, each 37 m apart). The stations were off Kawaihae, Hawaii; Olowalu and Ukumehame, Maui; and, at the southeast side of

Penguin Bank. No spiny lobsters were caught. A total of 26 slipper lobsters, Scyllarides squamosus, were caught, of which 4 were tagged and released. Numerous blue-line snapper, Lutjanus kasmira, and a few kona crab, Ranina serrata, were also caught.

3. Handlining

No fish was caught handlining off Kawaihae in about 128-183 m of water.

- B. Collect samples with a neuston net to determine the distribution and relative abundance of the organisms sampled.

Twenty-one neuston net tows were taken during the cruise. The tows were 5-10 min surface tows taken at night at inshore, intermediate, and offshore stations. The tows were repeated once or twice at the designated stations. The catches from the tows were split, processed, and preserved for later analyses.

- C. Conduct experiments with the suspended matter particle counter (Coulter counter).

Twenty surface water samples were collected during the cruise and analyzed. The amount of particulate carbon, nitrogen content, chlorophyll a, and the size distribution of particulate matter were obtained from the samples.

- D. Miscellaneous observations and activities.

1. No fish was caught in 9 h of trolling with three lines.
2. Carapace lengths and sex were recorded for all of the slipper lobsters caught.
3. Length frequencies for 50 blue-line snapper were recorded.
4. Samples from 39 blue-line snapper were collected for ciguatera analysis.
5. Eight XBT casts were made during the cruise.
6. Standard weather observations were made by the ship's crew at 0000, 0600, 1200, and 1800 G.m.t. whenever it was possible.

7. Five bird flocks were seen; one associated with skipjack tuna and the others were unidentified. Thirty-seven whales were also seen during the cruise as were several porpoise.
8. The surface thermosalinograph was run continuously while at sea.
9. Two secchi disc lowerings were made.

SCIENTIFIC

PERSONNEL:

Thomas S. Hida, Chief Scientist, Fishery Biologist, NMFS,
SWFC, HL

Glenn R. Higashi, Research Assistant, NMFS, SWFC, HL

Robert L. Humphreys, Jr., Research Assistant, NMFS, SWFC, HL

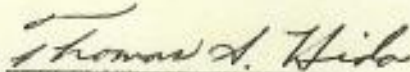
Martina K. K. Queenth, Research Assistant, NMFS, SWFC, HL

Darryl T. Tagami, Research Assistant, NMFS, SWFC, HL

Vernon Hu, Cooperating Scientist, Hawaii Institute of
Marine Biology, University of Hawaii

Susan Rasmussen, Cooperating Scientist, Hawaii Institute
of Marine Biology, University of Hawaii

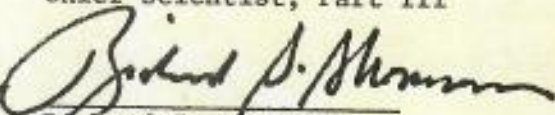
Submitted by



Thomas S. Hida

Chief Scientist, Part III

Approved by



Richard S. Shomura

Director, Honolulu Laboratory

April 17, 1978

...mit any other person to operate a boat in a reckless or negligent manner, or in a manner so as to endanger or be likely to endanger any person, property or wildlife.

(3) No person shall operate or be in actual physical control of a boat while under the influence of intoxicating beverages or controlled substances.

(4) No person shall operate a boat in a manner which will unreasonably interfere with other boats or with free and proper navigation of the waterways of the area. Anchoring in heavily traveled channels or main thoroughfares shall constitute such interference if unreasonable in the prevailing circumstances.

(5) No person shall operate a boat on refuge waters that has a marine head (toilet) unless it conforms to Environmental Protection Agency regulations regarding sewage discharge.

(6) Every sailboat when underway from sunset to sunrise shall carry and exhibit a bright white light visible all around the horizon for a distance of two miles.

(7) Leaving any boat unattended, outside of designated mooring or beaching areas, for a period in excess of 72 hours without written permission of the refuge manager is prohibited and any boat so left may be impounded by the refuge manager.

(8) Government-owned docks, piers, and floats are not to be used for loading and unloading of boats, except in emergencies or unless specifically authorized by the refuge manager.

§ 27.33 Water skiing.

When water skiing is permitted upon national wildlife refuge waters, the public will be notified under the provisions of this Subchapter C and the following requirements and limitations will apply:

(a) Water skiing is permitted only during daylight hours and during periods posted or otherwise designated under the provisions of this Subchapter C.

(b) When a skier is in "tow" there must be two persons in the boat at all times, with one person not operating the boat, acting as an observer of the skier in tow.

guard approved ski vests, life jackets or buoyant vests.

(c) Water skiing is prohibited within 300 feet of harbors, swimming beaches, and mooring areas, and within 100 feet of any designated swimming area.

§ 27.34 Aircraft.

The unauthorized operation of aircraft, including sail planes, and hang gliders, at altitudes resulting in harassment of wildlife, or the unauthorized landing or take-off on a national wildlife refuge, except in an emergency, is prohibited. National wildlife refuge boundaries are designated on up-date FAA aeronautical charts.

Subpart D—Disturbing Violations: With Weapons

§ 27.41 General provisions.

Carrying, possessing, or discharging firearms, fireworks, or explosives on national wildlife refuges is prohibited unless specifically authorized under the provisions of this Subchapter C.

§ 27.42 Firearms.

Only the following persons may possess, use, or transport firearms on national wildlife refuges in accordance with this section and applicable Federal and State law:

(a) Persons using firearms for public hunting under the provisions of 50 CFR 32.

(b) Persons carrying unloaded firearms, that are dismantled or cased, in vehicles and boats over routes of travel designated under the provision of Subchapter C.

(c) Persons authorized to use firearms for the taking of specimens of wildlife for scientific purposes.

(d) Persons authorized by special regulations or permits to possess or use firearms for the protection of property, for field trails, and other special purposes.

§ 27.43 Weapons other than firearms.

The use or possession of cross bows, bows and arrows, air guns, spears, gigs, or other weapons on national wildlife refuges is prohibited except as may be authorized under the provisions of this Subchapter C.

or other conditions beyond the control of the operator, or directed by an authorized person shall obey the lawful and controlling, or regulating the traffic.

weight and width limitation shall be necessary, shall be prescribed by the public advised under § 25.31. Such limitations implied with by the operators for vehicle involved in an accident to be moved until an official arrives at the scene of the accident, unless such vehicle constitute or safety hazard.

or vehicle shall not be operated without proper brakes, lights, or from sunset to sunrise, working headlights and tail-lights, comply with the regulations on the roads of the State and boundaries the refuge is subject to other requirements which under the provisions of chapter C.

use of boats in national wildlife refuge is prohibited except as may be authorized under and subject to the provisions set forth below.

(1) The use of boats is permitted on national wildlife refuge, the public shall be notified under the provisions of chapter C and the following requirements and limitations

in addition to the regulations in this part, the U.S. Constitution, Titles 33 and 46, Federal Regulations, are applicable waters of the United States

specifically covered by the special regulations set forth in the laws and regulations of the national wildlife refuge or other refuge is located shall govern the operation and use of the laws and regulations which

damaging plants and animals.

(a) Disturbing, injuring, spearing, poisoning, destroying, collecting or attempting to disturb, injure, spear, poison, destroy or collect any plant or animal on any national wildlife refuge is prohibited except by special permit unless otherwise permitted under this Subchapter C.

§ 27.52 Introduction of plants and animals.

Plants and animals or their parts taken elsewhere shall not be introduced, liberated, or placed on any national wildlife refuge except as authorized.

Subpart F—Disturbing Violations: Against Nonwildlife Property

§ 27.61 Destruction or removal of property.

The destruction, injury, defacement, disturbance, or the unauthorized removal of any public property including natural objects or private property on or from any national wildlife refuge is prohibited.

§ 27.62 Search for and removal of objects of antiquity.

No person shall search for or remove from national wildlife refuges objects of antiquity except as may be authorized by 43 CFR 3.

§ 27.63 Search for and removal of other valued objects.

(a) No person shall search for buried treasure, treasure trove, valuable semi-precious rocks, stones, or mineral specimens on national wildlife refuges unless authorized by permit or by provision of this Subchapter C.

(b) Permits are required for archeological studies on national wildlife refuges in accordance with the provisions of this Subchapter C.

§ 27.64 Prospecting and mining.

Prospecting, locating, or filing mining claims on national wildlife refuges is prohibited unless otherwise provided by law. See § 29.21 for provisions concerning mineral leasing.

§ 27.65 Tampering with vehicles and equipment.

Tampering with, entering, or starting any motor vehicle, boat, equipment or machinery or attempting to tamper with,

This is the party 173 we were unable to do for those refuges within the Hawaiian Islands which are VFR or for which FAA charts don't exist.

§ 27.74

Title 50—Wildlife and Fisheries

Chapter 1—United States Fish, Wildlife Serv.

enter, or start any motor vehicle, boat, equipment or machinery on any national wildlife refuge without proper authorization is prohibited.

Subpart G—Disturbing Violations: Light and Sound Equipment

§ 27.71 Motion or sound pictures.

The taking or filming of any motion or sound pictures on a national wildlife refuge for subsequent commercial use is prohibited except as may be authorized under the provisions of 43 CFR 5.

§ 27.72 Audio equipment.

The operation or use of audio devices including radios, recording and playback devices, loudspeakers, television sets, public address systems and musical instruments so as to cause unreasonable disturbance to others in the vicinity is prohibited.

§ 27.73 Artificial lights.

No unauthorized person shall use or direct the rays of a spotlight or other artificial light, or automotive headlights for the purpose of spotting, locating, or taking any animal within the boundaries of any national wildlife refuge or along rights-of-way for public or private roads within a national wildlife refuge.

Subpart H—Disturbing Violations: Personal Conduct

§ 27.81 Alcoholic beverages.

Entering or remaining in any national wildlife refuge when under the influence of alcohol, to a degree that may endanger oneself or other persons or property or unreasonably annoy persons in the vicinity, is prohibited.

§ 27.82 Possession and delivery of controlled substances.

(a) Definitions for the purpose of this section: (1) The term "controlled substance" means a drug or other substance, or immediate precursor, included in Schedules I, II, III, IV, or V of Part B of the Controlled Substance Act (21 U.S.C. 812) or any drug or substance added to these schedules pursuant to the terms of the Controlled Substance Act.

(2) The term "practitioner" means a physician, dentist, veterinarian, scientific investigator, pharmacist, or other person licensed, registered, or otherwise permitted by the United States or the

jurisdiction in which he practices to distribute or possess a controlled substance in the course of professional practice.

(3) The term "delivery" means the actual, attempted or constructive transfer and/or distribution of a controlled substance, whether or not there exists an agency relationship.

(b) Offenses.

(1) The delivery of any controlled substance on a national wildlife refuge is prohibited, except that distributed by a practitioner in accordance with applicable law.

(2) The possession of a controlled substance on a national wildlife refuge is prohibited unless such substance was obtained by the possessor directly, or pursuant to a valid prescription or order, from a practitioner acting in the course of his professional practice, or except as otherwise authorized by applicable law.

(3) Presence in a national wildlife refuge when under the influence of a controlled substance to a degree that may endanger oneself, or another person, or property, or may cause unreasonable interference with another person's enjoyment of a national wildlife refuge is prohibited.

§ 27.83 Indecency and disorderly conduct.

Any act of indecency or disorderly conduct as defined by State or local laws is prohibited on any national wildlife refuge.

§ 27.84 Interference with persons engaged in authorized activities.

Disturbing, molesting, or interfering with any employee of the United States or of any local or State government engaged in official business, or with any private person engaged in the pursuit of an authorized activity on any national wildlife refuge is prohibited.

§ 27.85 Gambling.

Gambling in any form, or the operation of gambling devices, for money or otherwise, on any national wildlife refuge is prohibited.

§ 27.86 Begging.

Begging on any national wildlife refuge is prohibited. Soliciting of funds for the support or assistance of any cause or organization is also prohibited unless properly authorized.

§ 27.91 Field trials.

The conducting or operation of field trials for dogs on national wildlife refuges is prohibited except as may be authorized by special permit.

§ 27.92 Private structures.

No person shall without proper authority construct, install, occupy, or maintain any building, log boom, pier, dock, fence, wall, pile, anchorage, or other structure or obstruction in any national wildlife refuge.

§ 27.93 Abandonment of property.

Abandoning, discarding, or otherwise leaving any personal property in any national wildlife refuge is prohibited.

§ 27.94 Disposal of waste.

(a) The littering, disposing, or dumping in any manner of garbage, refuse, sewage, sludge, earth, rocks, or other debris on any national wildlife refuge except at points or locations designated by the refuge manager, or the draining or dumping of oil, acids, pesticide wastes, poisons, or any other types of chemical wastes in, or otherwise polluting any waters, water holes, streams or other areas within any national wildlife refuge is prohibited.

(b) Persons using a national wildlife refuge shall comply with the sanitary requirements established under the provisions of this Subchapter C for each individual refuge; the sanitation provisions which may be included in leases, agreements, or use permits, and all applicable Federal and State laws.

§ 27.95 Fires.

On all national wildlife refuges persons are prohibited from the following:

(a) Setting on fire or causing to be set on fire any timber, brush, grass, or other inflammable material including camp or cooking fires, except as authorized by the refuge manager or at locations designated for that purpose or as provided for under § 26.33(c) of this Subchapter C.

(b) Leaving a fire unattended or not completely extinguished;

(c) Throwing a burning cigarette, match, or other lighted substance from any moving conveyance or throwing of same in any place where it may start a fire; and

(d) Smoking on any lands, roads, or in any buildings which been designated and/or posted smoking signs.

§ 27.96 Advertising.

Except as may be authorized by distributing, or otherwise disseminating, or otherwise disseminating private or public notices, advertisements, or displays of announcements, or displays of in any national wildlife refuge than business designations or vehicles or boats is prohibited.

§ 27.97 Private operations.

Soliciting business or conducting commercial enterprise on any wildlife refuge is prohibited except as may be authorized by special permit.

PART 28—ENFORCEMENT, AND PROCEDURAL REQUIREMENTS FOR VIOLATIONS OF PARTS AND 27

Subpart A—Introduction

Sec. 28.11 Purpose of regulations.

Subpart B—Enforcement Authority

Sec. 28.21 General provisions.

Subpart C—Penalty Provisions

Sec. 28.31 General penalty provisions

Sec. 28.32 Penalty provisions concerning timber.

Subpart D—Impoundment Procedure

Sec. 28.41 Impoundment of abandoned

Sec. 28.42 Impounding of domestic animals

Sec. 28.43 Destruction of dogs and cats

Authority: The provisions of title 50, U.S.C. are issued under Sec. 2, 33 Stat. amended (16 U.S.C. 685); Sec. 5, 4 (16 U.S.C. 725); Sec. 5, 45 Stat. 449 (680d); Sec. 10, 45 Stat. 1224 (16 U.S.C. 4, 49 Stat. 402, as amended 684); Sec. 2, 48 Stat. 1270 (43 U.S.C. 1604); Sec. 4, 76 Stat. 654 (16 U.S.C. 460); Sec. 80 Stat. 827 (16 U.S.C. 666dd) (5 U.S.C. 552a). Source: 41 FR 9171, Mar. 3, 1976, otherwise noted.

Subpart A—Introduction

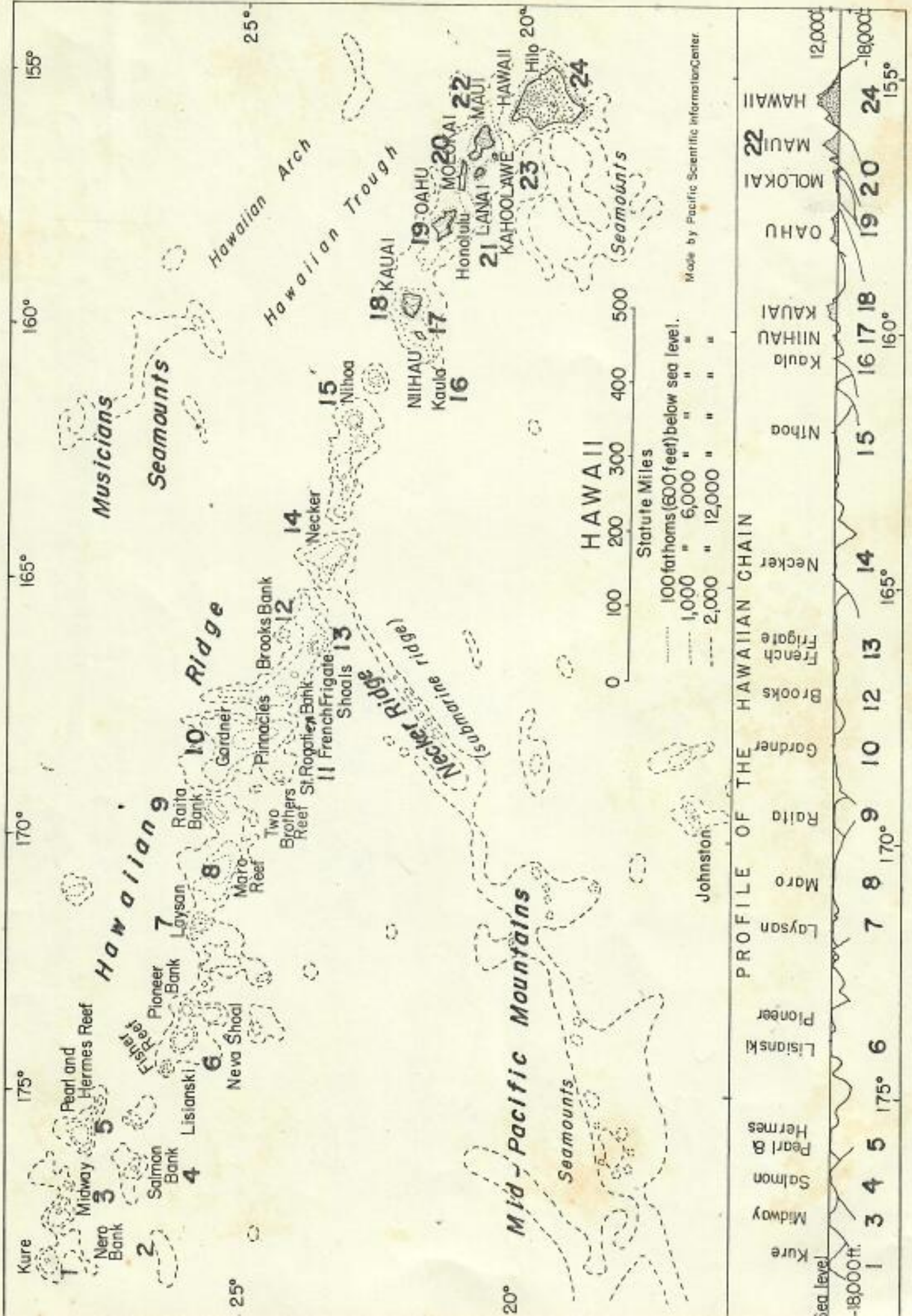
§ 28.11 Purpose of regulations

The regulations in this part are intended to enforce the provisions of the Act, and to provide for the enforcement, penalty and procedure for violations of parts 27 and 28.

Subpart B—Enforcement Authority

§ 28.21 General provisions. Refuge managers and other personnel are authorized to pursue

Thought you might be interested in these parts



Made by Pacific Scientific Information Center

GUIDE TO PLACE NAMES IN THE HAWAIIAN ISLANDS

(Preliminary additions)

Part I: Kauai County and the Northwestern Hawaiian Islands

(N.W. Hawaiian Islands, Kaula, Niihau & Kauai)
(incl. Midway Is. & Undersea Features on & near
the Hawaiian Ridge)

THE SYSTEMATIC GUIDE

NORTHWESTERN HAWAIIAN ISLANDS (Hi. 1-15)
(Leeward Islands)

Mellish Bank

Hi. 1 KURE Atoll (Kure Island; Buckles, Cure, Massachusetts, Moku Papapa,
Morrell, Ocean, Patrocinio, Staver [Stavers, Staves])

1. Green Island

North Point
North Roost
North Antenna Field
East Beach
South Antenna Field
Southeast Beach
Central Roost
South Beach

(1.) West Point

Southwest Beach
Northwest Beach

2. Sand Island

KURE Historical Names

Dunnottar Castle Ocean Pearl
Gledstones Saginaw

Hi. 2 POGY Bank, NERO Bank, BENSALÉUX Reef (Bensaleux: existence doubtful)

Hi. 3 MIDWAY Islands (atoll) (Laskar, Middlebrook)

1. Eastern Island

2. Sand Island

Picket Point
Halsey Drive
Decatur Avenue
Bauer Road
Roosevelt Avenue
Henderson Drive
Hazelwood Avenue
Kramer Drive
Commodore Drive
Radford Drive
Peters Avenue
Spruance Drive
Nimitz Avenue
Cannon Avenue
Tuttle Way
Mayday Street
Roberts Street
King Street
Rocky Point
Madole Street

(2.) Cable Road

Brannon Avenue
Waldron Boulevard
Frigate Point
Mehltretter Boulevard

Welles Harbor

3. Gooney Island

South Breakers

Seward Roads

The Hook

North Breakers

Middle Ground

MIDWAY Historical Names:

Spit Island

Hi. 4 LADD Bank, GAMBIA Shoal, SALMON Bank

Hi. 5 PEARL AND HERMES Atoll (Pearl and Hermes Reef)

- | | |
|--------------------------------------|-----------------------------|
| 1. North Island (Northernmost I.) | 5. Sand Island |
| 2. Little North Island (Humphrey I.) | 6. Grass Island (Center I.) |
| 3. Southeast Island | 7. Seal Island (Western I.) |
| 4. Bird Island | 8. Kittery Island |

Hi. 5 A. FISHER Reef B. MINOR Reef

Hi. 6 LISIANSKI Island (Cladius, Lassion, Lisiansky, Lysianski, Neva, Pell)
Neva Shoal

Hi. 6 A. PIONEER Bank (Springbank Reef) B. NORTHAMPTON Banks

Hi. 7 LAYSAN Island (Bunkers, Laysen, Layson, Moller, Mollers)

Hi. 8 MARO Reef (Allens, Dowsett [Dowsetts], Maros, Mary)

Dowsett Reef: former name for part of MARO Reef

Hi. 9 RAITA Bank

Hi. 10 GARDNER PINNACLES (Ballards Rock, Gardeners I., Gardiner I., Gardner I., Man-o'-War Rock, Pollard Rock)

Hi. 11 ST. ROGATIEN Bank

Hi. 12 BROOKS Banks (Brooks Shoal)

Hi. 13 FRENCH FRIGATE Shoals (French Frigates Shoal)

- | | |
|-------------------|-------------------------|
| 1. Shark Island | 8. Near Island |
| Northwest Channel | 9. Bare Island |
| 2. Tern Island | 10. East Island |
| 3. Trig Island | 11. Gin Island |
| 4. Skate Island | 12. Little Gin Island |
| 5. Whale Island | 13. Disappearing Island |
| 6. Round Island | 14. La Perouse Pinnacle |
| 7. Mullet Island | Southwest Channel |

Hi. 14 NECKER Island (Neckar, Pollards) *Moku-manamana (lit. branching island)*

Northwest Cape	Flagpole Hill	East Point
North Cape	Summit Hill	West Point
Rocky Point	Bowl Cave	West Cove
Shark Bay (East Cove)	Bowl Hill	
Annexation Hill (Peak)		

Hi. 15 NIHOA (Bird I., Moku Manu cModu Manu, Modumann, Modoo Mannoo, Mokoo Manoo)

Albatross Plateau	Middle Valley
Devils Slide (Devil Slide)	Miller Valley
Millers Peak (Miller Peak)	West Palm Valley
Tanager Peak	West Valley
Tunnel Cave	Dogs Snout (Dog Snout)
Adams Bay (Adam Bay)	Dogs Head (Dog Head)
East Valley	Needle Rock (Bent Rock)
East Palm Valley	Pinnacle Rock

NORTHWESTERN HAWAIIAN ISLANDS, HISTORICAL NAMES (features not located)

Frost Shoal (existence doubtful)	Montagu (bank between Nihoa-Niihau?)
Krusenstern Rock (" ")	Two Brothers Reef (exist. doubtful)

[This completes the Northwestern Hawaiian Is.]

UNDERSEA FEATURES on and near the Hawaiian Ridge (excluding banks, shoals and reefs named on nautical charts and rising closer to surface)

Hawaiian Ridge (name applied to entire length of submarine ridge forming Hawaii)

Jenkins Seamount (N.W. of Kure)	Musicians Seamounts (contd.)
O'Brian Seamount "	
Calahan Seamount "	Bach Ridge
Hancock Seamount "	Beethoven Ridge
	Chopin Seamount
Volador Seamount	Schumann Seamount
	Mendelssohn Seamount

Hawaiian Deep (Hawaiian Trough)

Mendocino Fracture Zone

Musicians Seamounts

Strauss Seamount
Bellini Seamount
Puccini Seamount
Verdi Seamount
Rossini Seamount
Bizet Seamount
Schubert Seamount
Wagner Seamount
Mussorgski Seamount
Liszt Seamount
Paganini Seamount
Mozart Seamount
Guonod Seamount
Grieg Seamount
Scarlatti Seamount
Ravel Seamount
Sibelius Seamount
Gluck Seamount
Haydn Seamount

Murray Fracture Zone

Waho Shelf (West of Oahu)

Tuscaloosa Seamount (Tuscarora)
(N.E. of Oahu)

Hawaiian Arch

Molokai Fracture Zone

Hilo Swale (submarine canyon)

(foll. seamounts E. & S.E. Hawaii I.)

Green Seamount
Wini Seamount (Bushnell)
Alexander Seamount
Hinds Seamount
Bryan Seamount
Crosley Seamount
Shepard Seamount (Sheperd)
Wilkes Seamount
Newell Seamount

(Seamounts E. & S.E. Hawaii I., contd.)

(Seamounts W. & S.W. Hawaii I., contd.)

Papau Seamount
Loihi Seamount
Apuupuu Seamount (Apuapu)

Jaggar Seamount (Jagger)
Indianapolis Seamount
Clark Seamount
Dutton Seamount
Powers Seamount
Brigham Seamount
Bishop Seamount

[coll. seamounts W. & S.W. Hawaii I.]

Dana Seamount
Wood Seamount
Thurston Seamount
Snowden Seamount Group

Chantaugua Seamount

Clarion Fracture Zone

Wisconsin Seamount

Day Seamount
Palmer Seamount
McCall Seamount
Pensacola Seamount
Daly Seamount
Finch Seamount
Swordfish Seamount
Cross Seamount
Washington Seamount
Ellis Seamount
Perret Seamount

Necker Ridge (S.W. to Mid-Pac. Mts.)

Mid-Pacific Mountains

Horizon Tablemount (Guyot)
Vityaz Seamount
Hess Guyot
Cape Johnson Guyot
Hohnhaus Seamount
Dixon Guyot
Darwin Guyot

[This completes the Undersea Features.]

MAIN GROUP, Hawaiian Islands (Hi. 16-24)

Hi. 16 KAULA Island (Tahoura, Tahoura, Tahura, Taura) - *MANOHUA (summit)*

Kahalauola (Shark Cave) Leinoai Waahila

POHAKU PLO

Hi. 17 NIIHAU (Nihau, Ohihiau, Oneehew, Oneehow, Onihow I.)

Kaluahonū; Pauahula; Pohueloa: [ahupuaa of Nihau; location & boundaries unknown]

Lehua Island (Egg I., Lenua, Oreehoua, Orihaua, Orihoua I.)
(considered an offshore island of Nihau)

[Place names of Nihau proper follow.]

Puukole Point (Puukole)
Kalanihale Point (Kalanihale)
Halekuamanao Heiau (Halekuamanao)
Nanina Bay
Nanina [beach?]
Kikepa Point (Kikepa)
Kaulakahi Channel (Kaulaka Passage)
Kona (Kona Coast, District)
Kaunuopou (Kaunopou, Kaunoupou,
Kaunuopou Pt., Oku, Oku Pt.)
Kif Landing (Ki, Kii)

Kii Bay
Nanaikoolau [hill]
Polehu [beach?]
Paniau (Paniau Pk., Puu Paniau)
Koolaukani Valley (Koolaukani,
Koolaukahi Valley)
Keanakaluahine Valley
Kailana Valley
Puulua Valley
Konoulii Valley
Pueo Point (PucO Pt., Pueo)

EAST ISLAND, FFS

HIROTA'S FISH SAMPLING, AUGUST 1980

- lee side of East Is. 200 yds offshore -
outside of the reef. 80' deep

net (30 feet deep x 500' long, monofilament
-sugi, lead-core lead line, float line
polypropylene, neutrally buoyant.

bottom: coral and sand

Problem: net collapsed due to (?) current
(?) not enough flotation, it got caught
on the coral, over 30 gal. of coral stuck in
net



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

Honorable Wadsworth Y. H. Yee
Hawaii Senate
Honolulu, Hawaii 96813

MAR 12 1982

Dear Mr. Yee:

Thank you for your December 23, 1981, letter which included the supporting information, mentioned in your letter of October 23, 1981, on the potential use of Tern Island, French Frigate Shoals by long range fishing vessels from Hawaii. I have referred the information to my staff and to our Solicitor's office for their review and recommendations.

Prior to receiving the information package from you, I had my staff do some preliminary research into the possibility of a fishery support station being established at Tern Island. From this preliminary examination some questions and alternatives have become apparent.

First, amendments to the National Wildlife Refuge System Act passed in 1976 provide that all areas in the National Wildlife Refuge System "shall be administered by the Secretary through the United States Fish and Wildlife Service" and that these areas cannot be transferred or disposed of except by Act of Congress, exchange, or pursuant to the terms of a cooperative agreement which established a given area as a wildlife refuge. This legislation thus restricts the authority of the Secretary of Interior on matters regarding the transfer of refuge lands. Since both Senate and House Reports on this legislation state that the transfer of total management responsibility of a refuge area is tantamount to actual transfer of land, the 1976 Amendments also preclude constructive transfer of total management authority by cooperative agreement made after February 27, 1976. However, beyond allocating the ultimate decision-making responsibility for National Wildlife Refuges to the Fish and Wildlife Service, the 1976 Amendments contain little guidance as to the degree to which the authority to carry out management functions may be delegated to others. Further, the legislative history clearly indicates that cooperation is even desirable to avoid costly and unnecessary duplication of expertise in management of refuge resources. In summary then, existing legislation limits the ability of the Secretary of Interior to dispose of or transfer refuge lands, but does not preclude cooperation in management of refuge resources.

Second, the Solicitor's Office has, over the past decade, developed a substantial file related to the legal questions surrounding Tern Island and the boundaries of the Hawaiian Islands National Wildlife Refuge. This file has been forwarded to us here in Washington for review in conjunction with the draft reports you have submitted on the legal claims of the State and Federal governments to Tern Island and to the internal waters and submerged lands of the Northwestern Hawaiian Islands.

Finally, it is apparent that means may already be available to provide for both State and Federal interests without litigation. I can certainly appreciate the desire you expressed for a resolution outside of the courtroom, since litigation could be extremely costly and time-consuming. Apparently, activities are already underway in Hawaii to help resolve conflicts over the use of Tern Island. Under the Tripartite Cooperative Agreement between the State of Hawaii, the Fish and Wildlife Service, and the National Marine Fisheries Service, research has been conducted to assess the resources of the Northwestern Hawaiian Islands. Most of the field research under this 5-year Agreement was completed by the end of FY 81. Although data analysis and reports may take at least another year, results and preliminary analyses are available for use by a multi-disciplinary, interagency team recently established to develop a plan for future use of Tern Island that considers both wildlife and economic interests. Perhaps your concern for fishery support at Tern Island can be satisfactorily handled in this recently initiated planning effort.

Another means of providing for fishery support at Tern Island without litigation might be a cooperative agreement between the Department and the State. I would be glad to consider such an agreement if you will provide a specific proposal of what the State wants to do at Tern Island and French Frigate Shoals. For a cooperative agreement, more detail will be needed than was included in the project proposal entitled "Tern Island Joint Fisheries Support/Research Station: A Trial Feasibility Study". submitted by the State for review under Section 7 of the Endangered Species Act. For example, the proposal for a cooperative agreement should provide such specific information as type of aircraft that will be using the runway; frequency of flights; restrictions that may be applicable to users of the flights; safeguards to be applied in transfer of fuel; schedule of any associated dredging that may be required for operation or maintenance of the support station or functions; and particularly the State's budget estimates for the support station and functions together with assurance that the State is prepared to provide full economic assistance to the endeavor throughout the term of the cooperative agreement. Most probably your staff could use the trial feasibility study already submitted as a base upon which the concrete proposal for a cooperative agreement could be prepared.

I will have my staff review your proposal for an Executive Order and will be back in touch with you when I have the results of their review. In the meantime, if you consider that either of the two options mentioned above - that is, the interagency planning effort or a cooperative agreement - has potential in resolving the Tern Island issues, we can pursue one or both of these alternatives. In any case, I will keep track of the status of the review of your proposals and I will let you know as soon as we have something definite to report.

Sincerely,


RONALD PAUL HODEL
UNDER SECRETARY

no

3/20 2015
[Signature]
of the Pacific Islands Administrator
Fish and Wildlife Service
RAS

3-29-82

Richa..

3/25 Telecon w/Wads indicated: Do

1. Quite happy w/DOI letter.
2. Tripartite study; planning approach not acceptable since State has differing view from NMFS and FWS.
3. Coop Agreement alternative encouraging.
- 4.. Will reply next week.

D. Coggeshall

~~TOP SECRET~~
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Red-tailed Tropic bird - Many red-tails were seen on the west side of the island and several were noted on the ground under the bushes. No eggs or young were seen.

Migratory birds - A flock of 100 or more turnstones and a few plover were seen circling the island but in general, shore birds were relatively scarce. Bristle-thighed Curlew were common in the interior grass land.

Pearl and Hermes Reef

On March 12, we arrived off Pearl and Hermes Reef at dawn. We were able to make an easy landing on Southeast Island and spent an hour and a half ashore. Two refuge signs were posted and photographic stations were established and several interesting observations were made.

Visitation and disturbance

Deep tracks on the beach landing point and over the length and breadth of the island were examined and it was established that some sort of amphibious tractor had been ashore within the last year or so. Near these tracks, in the center of the island, Foxtail grass (Setaria sp.) was found to have become established in small patches; usually not more than a foot or two across. It was assumed that the tractor must have come from Midway or some place where foxtail grows and seeds were brought in by it. In the time available, several plants were pulled up and the roots exposed to the sun. Establishment of such grasses on these small islands could have a drastic effect upon the ecology. Foxtail competes rather successfully with other strand zone plants in Hawaii and could conceivably crowd out such plants as Tribulus and Portulaca.

Other signs of visitation to the island were: a steel observation tower, about fifteen feet high; several 55 gallon drums, some apparently full of fuel; the shells of four or five turtles which were killed and some hollow tile blocks lying about. A later inquiry on Midway, revealed that an aircraft had indeed landed on Southeast island sometime last year on a project known as "LORAC." It is not known what this project involved.

No permit for this operation was issued by the Division of Fish and Game in Honolulu and the landing was apparently in violation of the regulations covering the refuge.

Biological Conditions

From the short character of the vegetation, it would appear that, during high seas, waves wash over a good portion of the island. Such waves probably prevent the scant Scaevola from reaching a height of more than six inches or a foot.

There are two small pools of brackish water near the center of the eastern part of the island. From the depth of these, it seems likely that they dry up during summer dry periods.

All of the elements of Laysan teal habitat are present on Southeast Island except, perhaps, protection in the form of bushes. However, the island is much too small to be considered for the introduction of teal.

A shoreline count of the monk seal was made and 12 animals were noted. No pups were seen.

Four large green turtles were seen. Two males were alternately copulating with a female in the shallow water immediately offshore. No signs of eggs was found.

Albatrosses - Both species were with young. The Black-footed being much more abundant than the Laysan.

Boobies - All three species present but not abundant. All were with eggs or small young. The red-footed booby is definitely restricted due to lack of elevated nesting sites. Some nests were but a few inches off the ground on the Scaevola.

Upon returning to Honolulu, a further check of the records revealed that there had been no permit issued by the Department of Fish and Game for the above mentioned party.

HIRAN Phase I

As mentioned earlier, U. S. Navy LST-758 (Duval County) was anchored at French Frigate Shoals when we arrived there on March 3. On her cargo deck was a navy helicopter. We met the Captain of this vessel, Lt. Francis L. Roach, on Tern Island. The ship was there to pick up some dynamite which was delivered by air while we were there.

We were informed that the ship was engaged in a project known as HIRAN phase I; and that they were visiting all of the islands of the Chain. The dynamite was to be used to blast a helicopter landing spot on Gardner Pinnacle. (See attached news clipping.) Before coming to French Frigate, the party had spent approximately five days each on Kaula, Nihoa, and Necker islands. HIRAN is apparently a surveying project, which is plotting the exact locations of the islands. Phase I, it seems, is using conventional instruments to plot them astronomically, while Phase II, which was scheduled for June, would employ electronic equipment. Accompanying the group was a fellow from the Coast and Geodetic Survey whose mission, he said, was to lay out survey markers and triangulation points.

When questioned as to whether a permit had been issued for this party to land on the islands of the refuge, we were assured that there was one on file with the Navy in Pearl Harbor. To our knowledge, no such permit was issued by our office; and it was assumed that, perhaps the permit had been issued directly from the Fish and Wildlife Service. Lt. Roach referred us to a Commander Wagner, COM Hawaiian Sea Frontier, Honolulu.

We were able to learn that during the course of the work on each island powder was used, and that "several or several hundred" birds on each island were killed. They also stated that they had de-dudded Necker Island and that birds were killed at that time. We were assured that such damage was not extensive or permanently irreparable.

Upon returning to Honolulu, a further check into the records revealed that there had been no permit issued by the Department of Agriculture and Conservation for the above activities, nor had the Navy informed the Department of the trip. Further checking with the 14th Naval District Office, revealed that a permit had been obtained from the State Department of Lands. Apparently, the Department of Lands erroneously assumed that they had jurisdiction over these islands. They have since been notified of their error and have subsequently withdrawn the permit.

The Navy and Land Department assured us that in the future all such requests for permits would be made to the Department of Agriculture and Conservation.

HIRAN Phase II

As mentioned before, this phase of the operation was scheduled for June of this year. It appeared to present an excellent opportunity for someone from our division to visit Nihoa and Necker as transportation also would have been available via LST and helicopter.

Photographic stations could be established; signs posted and general conditions noted. The personnel could disembark at French Frigate shoals and fly back to Honolulu via Navy or Coast Guard plane.

However, it appears that HIRAN Phase II started earlier than planned and is now at sea.

REPORT ON TRIP TO LAYSAN ISLAND

SEPTEMBER, 1961

By

D. H. WOODSIDE
Wildlife Biologist

State of Hawaii

Geophysical Measurements - Dr. Vitousek made numerous magnetic and gravitational measurements about the island from which he was able to draw some tentative conclusions which indicate that the mass of the sea mount on which Laysan is situated lies to the north of the present island.

Seal Studies - Dr. Udvardy recorded rectal temperatures of several seals at various times of the day. This was accomplished with the aid of a net to hold and restrain the animals on the beach. He also attempted to mark seals by using quick-drying spray paint to attempt to determine daily movements. The marking was not entirely satisfactory, however, as the paint did not adhere well to the hair.

HIRAN Station

At the usual camp site there were four enlisted service men camped with four tents, a small power plant and a 40-foot portable radio tower. They had been on the island for two months and expected to be there for another two, at which time the station would be moved to Nihoa Island. The camp was relatively well-contained and appeared to be causing little disturbance. No signs of molesting the wildlife of the island were found. The men remarked that they had been briefed as to the refuge status of the island and were confining their activities to the camp area and beaches.

A LST with helicopter arrived and visited the island on the day of our arrival. It services the HIRAN Station every two weeks. We were told that there are similar stations on Pearl and Hermes, Lisianski, and Gardner Pinnacles.

TERN ISLAND, FRENCH FRIGATES SHOAL

During the hour ashore on Tern Island, only a few plover and turnstones and a sanderling were noted.

There were several additional towers and equipment vans of the Pacific missile range on the island and a small Hiran installation was new. Otherwise, the island was little changed since March.

REPORT ON TRIP TO NIHOA ISLAND

DECEMBER, 1961

By

RAYMOND J. KRAMER
Wildlife Biologist

State of Hawaii

vegetative complex, as already described, is so randomized and in general, consistent, that there was no obvious zonation as is found on the atoll type islands farther north. The photographs taken would have to be enlarged to a greatly increased size if they are to show species composition variation over a period of years, and then they would be valid for only the small area between the stakes since it is impossible to distinguish between various types of Solanum, Sida, and Chenopodium at a distance on black and white photographs. Secondly, the terrain of the island is such that it is almost impossible to get camera angles on a three-stake layout that will work without sacrificing things of possible ecologic importance for good photographs.

OPERATION HIRAN

On landing on the island we found a military layout of four tents and one portable antenna on the plateau north of Miller's Peak. Two air force technicians and two army technicians had been living here for about two weeks. In general the camp was well organized and set up in a minimum of space. Only a few pairs of Masked Boobies were displaced by the camp but they moved a few yards and re-established territories. The personnel were relatively disinterested in the birds and made no attempt to molest them. Although these people had no weapons, a number of empty shotgun shells and what appeared to be small "line throwing" shells were found on the summit of Miller's Peak. These appeared to be less than a year old. One soldier's towel was found lying outside the tent with six Cenchrus sp seeds stuck to it. These were probably picked up accidentally on Midway. The seeds were burned, but this incident once again points out the necessity for a simple information brochure to be passed out to all people landing on the islands, telling them in layman's language of the importance of the islands and the effect that changes in the ecology could have upon the bird populations. To my knowledge this is the third introduction of exotics into the Refuge by the military in the last year.

Conclusions and Recommendations

From observations made, it can be concluded that:

Photographic Stations

Two stations were set up. Both are considered relatively useless due to relative lack of vegetative zonation, inability of the black and white photographs to be useful for distinguishing species, and awkward photo angles available.

HIRAN Activities

The physical presence of people and equipment is negligible in effect but accidental introduction of exotics could prove disastrous on such a small, relatively uniform area.

Recommendations

It is recommended that:

1. An entomologist familiar with plant host relationship studies be invited to participate in any future expedition.
2. A more intensive study of the Nihoa Miller bird be made in order to ensure its continuing survival.
3. Another expedition be made to Nihoa in the near future in order to utilize the facilities of the HIRAN ship and helicopter. If it were decided to transplant Miller birds to Laysan, the ship schedule could probably be worked out to go directly to Laysan from Nihoa, thus eliminating the hazards involved in taking the birds back to Honolulu for an unknown period before transfer back to Laysan.
4. A staff member of the U. S. Fish and Wildlife Service accompany Hawaii biologists on the next trip in order that they may more fully understand the myriad of problems inherent in these island populations.
5. A more specific type of permit be issued to all individuals or groups intending to land on any of these islands. Permits for military use should state (primarily for our information) when, exactly where, and

approximately how many people will be involved in operations on each of the islands. They should also include what type of facilities they will establish (how many tents, vans, antennas, etc.)

6. An information booklet or brochure be made telling in layman's language (with humour, perhaps, to hold interest) a little about each island, its birds and how to recognize them, the importance of specific types of plant life to these islands, and why it is a refuge. They could be issued not only to visitors to the islands but distributed throughout naval or coast guard vessels passing these islands for the interest of officers and crew. (We have continually noted an avid interest in what we are doing and why!)

INTRODUCTION

Purpose of the trip
Itinerary
Methods
Contributions
Recommendations

ACTIVITIES AND OBSERVATIONS

A REPORT ON A SURVEY TRIP
TO
THE HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE
JUNE, 1962
by
R. J. KRAMER
Wildlife Biologist
Hawaii State Division of Fish and Game

ENTOMOLOGICAL REPORT
by
JOHN W. BEARDSLEY
Senior Entomologist
Hawaii Sugar Planters' Association

APPENDICES

Photographs
Birds and Insects

tropic birds, Bulwers petrels; Wedge-tailed shearwaters were noted. Laysan Albatross Young (abandoned?) were abundant, while a few young of the Black-footed Albatross were seen.

Military Operations

It is entirely probable that here, also, the military shall abandon the tents, tent frame works, water barrels and C-ration cartons when the project is finished. This is also an extremely hazardous island to land on by helicopter and the dangers preclude making unnecessary trips. Here also is an unsightly garbage dump down the north face of the center of the island but which could not have been avoided. Unfortunately, one of the main camps was set, no doubt in complete ignorance, upon the site of one of the larger stone terraces of the pre-Hawaiian inhabitants, thus increasing the deterioration of this ruin. The Stone Marae (basaltic slivers of religious importance) on other parts of the island were left undisturbed and various small retaining walls remain intact. No sign of introduced weed seeds was found.

GARDNER PINNACLE

No landing was attempted on Gardner Pinnacle due to the restricted area on the summit of the island for helicopter approach. Ordinarily, it is only possible for a helicopter to touch its front two wheels to the island and personnel aboard must then jump a considerable distance down. One thing of interest was noted: The several hundred frigate birds seen hovering over this island. Where these birds come from or roost is unknown since there is apparently no vegetation on this island except Portulaca which certainly does not provide the favorite nesting materials of this species.

LAYSAN ISLAND

Monk Seals

On June 16, a circuit of the beaches of the island was made and a total of 261 seals were counted. An attempt was made to break the composition up into adults, i.e., those 7 feet long or longer; sub-adults, those having obtained the adult coloration but less than 7 feet long; and new-born pups, that is, those with the black pelage. Twenty-three pups were seen on the island having been born within the last 6 or 7 weeks. Of unusual note was the large number, 96, of sub-adults seen. The majority of these had left their parents and displayed absolutely no fear or caution towards man, whereas, almost all the 142 adults had at one time or another apparently encountered man and almost invariably rushed for the water when disturbed. Many of the "sub-adults" were covered with considerable algae, indicating a fair length of time spent at sea in the recent past. Of the black pups, all appear to be in excellent condition with some so fat they could not readily get into the water from the beach. Several pups were born while we were on the island. One large dead and decomposed adult was found in the Scaevola. Of interest was the apparent fearlessness and complete unconcern for sharks displayed by the seals. On several occasions, I watched three or four seals swim into a school of 30 to 50 sharks of up to 7 feet in

- Bonin Petrel: Only one pair of this species was noted. No eggs or young were found.
- Bulwer's Petrel: Only one pair of this species was noted. No sign of eggs or young was found.
- Red-tailed Tropic Bird: This bird was extremely abundant on the western shores of the island. Young were noted in all stages of growth and nuptial flights were occurring overhead daily.
- Masked Booby: Eggs were found on several occasions but most of the chicks were one-half to three-quarters grown.
- Brown Booby: More brown boobies were noted this year than in the past. Majority of the boobies had nested with the young being still naked.
- Red-footed Booby: Found in their usual abundance on the Scaevola. Eggs and downy young.
- Frigate Bird: Majority of these birds were with downy chicks.
- Sooty Tern: By far the most abundant bird on the island. Various colonies had been established periodically, with some colonies almost entirely on eggs and others almost entirely with downy chicks. In several colonies, no breeding activity at all was noticed.
- Common Noddy Tern: Abundant and with downy chicks.
- Hawaiian Noddy Tern: Common, with eggs and chicks.
- Fairy Tern: Common, with eggs, downy chicks, and fully feathered young.

Migratory Birds

- Golden Plover: Common throughout the island.
- Ruddy Turnstone: In large numbers this year.
- Bristle-thighed Curlew: Very common at this time of year, scattered randomly across the island.
- Wandering Tattler: Least common of the migrant birds but still numbering in the hundreds.

Military Operations

Two Air Force and two Army men landed with us on Laysan to re-establish their camp. The camp area has been expanded considerably in the past with four large tents set up and approximately 30 fuel and water barrels stacked neatly to the west. Just northeast of the ironwood tree a five-foot high concrete block has been permanently installed. It has been set up for engineering purposes of the project and should serve as a permanent photo station location. In general, the camp was quite clean and former garbage accumulations had been buried; however, the constant trade winds had blown away much of the loose sand over these garbage dumps and had re-exposed the upper portion of them. It is believed that when this station is dis-established, the military will leave the tents, cook shack frame, and the 55-gallon drums behind. If on the next trip, such is the case, efforts should probably be made to clean the island or have it cleaned by military personnel. Of interest was the fact that the common potato and garden variety onions were noted to be growing next to one of the larger garbage dumps. All plants that could be located were torn up and their roots exposed to the sun. Further efforts to assure complete destruction should be made on the next trip although it is doubtful that these plants would survive a season of drought.



A REPORT ON A SURVEY TRIP

TO

The Hawaiian Islands National Wildlife Refuge

February, 1963

by

Raymond J. Kramer

Golden Plover - Very common; scattered island-wide. 6 Banded by Smithsonian group.

Ruddy Turnstone - Abundant. Large numbers along lagoon edge, and singles scattered commonly throughout the openings in the vegetation. Collected by the Smithsonian group.

Bristle-thighed Curlew - Very common; scattered island wide.

Wandering Tattlers - Present in fair numbers. Several collected by Smithsonian group.

Sanderlings - Several were seen.

Gull - 1 large gull (believed to be an immature Heermann's gull) was collected by the Smithsonian group.

Military Operations

The HIRAN camp was again operating on Laysan. Several of the people had been there last June when Marshall and I were there, and were familiar with the purpose and extent of the refuge. The only detrimental factor noticed was the garbage dump. Winds had exposed last years dump, and little effort had been made to cover this years dump (see photo in appendix). Neither the potato or onions seen growing last June had survived the winter. The stack of about 30 empty 55 gallon drums were as noted on the last trip and will probably remain abandoned.

Lisianski Island

Monk Seal

No accurate count was made, since I started in the opposite direction from the Smithsonian people, and upon meeting them about 3/4 of the way around the island, found that the best estimate they could give me of seals was "about 50". I counted 101 on a 3/4 circuit, ^{of} which only one was a newborn pup. Some 30 seals were tagged by the Smithsonian group.

found on the eastern shore of the island.