

# DEPARTMENT OF MARINE & WILDLIFE RESOURCES



AMERICAN SAMOA GOVERNMENT  
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20 August 1991

PETER T. COLEMAN  
Governor  
George Balaz

GALEA' P. POUMELE  
Lt. Governor

HENRY SESEPASARA  
Director

PHILIP LANGFORD  
Deputy Director

Dear George:

Here are the two slides you requested. It looks like that there is a scratch on the group shot. Sorry

We are scheduled to make a 6 week trip to Rose beginning 26 August, but our department boat is down and our director promised it to some whale watchers for 11 days starting on the 20th. So, we are trying to find a charter to keep on schedule. We'll keep you posted on all turtle activity whatever the date is we finally get there.

A dead turtle from the west side of Tutuila is now on the way to our office. Fill you in on details later.

Sincerely,

A handwritten signature in cursive script, appearing to read "Tom Morrell".

Tom Morrell

PP 4/15

Trip Report: Rose Atoll National Wildlife Refuge American Samoa, March 21-28, 1982  
Submitted by Gerald M. Ludwig, Asst. Ref. Man. (Remote Islands)

Personnel Participating: Gerald Ludwig, Assistant Refuge Manager (Remote Islands) USFWS  
Stewart Fefer, Wildlife Biologist, USFWS  
Dr. Richard Wass, Fisheries Biologist, Off. Mar. Resources, Am. Sam  
William Pedro, Staff Biologist, " " " "  
Richard Davis, Biology Curriculum Specialist, Dept. of Education,  
Am. Sam. Govt.

Itinerary: Mar. 21 Took South Pacific Airlines to Pago Pago, Am. Samoa.  
Mar. 22 Spoke with Henry Seseapasara, Office of Marine Resources Director.  
Boarded Sausauimoana for trip to Rose Atoll.  
Mar. 23 Arrived at Rose Atoll.  
Conducted studies on bird, turtle, tridacnid clam, fish and  
micromollusc populations.  
Mar. 26 Boarded Sausauimoana for return to Pago Pago.  
Mar. 27 Arrive Pago Pago.  
Unload boat and pack for return trip to Honolulu  
Mar. 28 Returned to Honolulu.

Highlights: The islands appeared to have been subjected to very heavy waves and wind recently. *Pisonia* trees were broken in some areas of Rose Island and *Messerschmidia* trees along the east side of Rose Island were uprooted. The storm had the effect of obliterating evidence of previous turtle nesting on both Rose and Sand Islands because of the churning up of the sand/gravel substrate by the waves on each of the islands.

A blue-gray noddy was repeatedly seen around the south side of Rose Island.

Several new-to-American Samoa fish species and several undescribed (perhaps) species were collected or observed during surveys along the outside of the atoll.

The corals along the outside of the reef on the east side of the atoll appeared to have been heavily damaged by the recent high waves.

Climatic conditions: Although temperatures were not recorded, they remained in the high eighties throughout the time we were in American Samoa. Winds were estimated to be between 0-10 kn. Skies were partly cloudy with occasional thunder showers while we were at Rose Atoll but in general the weather was nearly perfect with enough wind to maintain the camp ground comfortable yet not too much to prevent diving or other activities.

The only adverse weather that was encountered was on the ride back to Pago Pago. As we approached the Island of Tau large thunderheads were forming all about us. A nearly solid bank of rain, with almost constant lightening flashes was bearing down on us from the north. Fortunately the rain dissipated or moved ahead of us. Sitting on the ocean with a lot of lightening hitting was an exciting experience. The rest of the trip to Pago Pago from Tau was very rough with frequent thunderstorms hitting us.



Planning: Stewart and I met with Henry Sesespasara and Dr. Richard Wass briefly to talk about last minute trip details. Henry said that he may go along on the trip but he canceled later that day. I gave Henry a sample copy of the Rose Island "information for fishermen" leaflet that is translated into Korean, Japanese and Chinese and asked if he would also translate it into Samoan. He agreed to do so.

Henry also agreed to make arrangements for Stewart to meet with the fishery agents of the three nationalities in order that the leaflets get distributed to the participating fishermen. Henry also agreed to make arrangements for Stewart to appear on Television on the Monday following our return from Rose Atoll.

I let Henry know that we were having the Memorandum of Agreement looked over by our solicitors in Portland and that I would get back to him when we have finished with it on our end.

Henry and Richard asked us our feelings about having Richard Davis, a science curriculum development specialist, Dept. of Education, Am. Samoa Govt. accompany us on the trip to Rose Atoll. He would like to develop a curriculum unit on the Wildlife Refuge for presentation to Samoan 8th graders. I said that we highly favored this sort of "public use" of the refuge and felt that it was important that the objective of the refuge, information on the fauna and flora and work of the Service and of the Office of Marine Resources be known to the general Samoan public. Rick Davis has a background in biology and would provide help in both the terrestrial and marine surveys.

Objectives for the trip had been discussed with Dr. Wass during his stay in Honolulu during the week previous to our visit to American Samoa.

My objectives included: 1) obtain a collection of Tridacna clams to obtain data to determine age and size of sexual maturity. 2) Obtain measurements of previously tagged clams to determine size-specific growth rates and to tag additional clams for obtainment of additional growth data. The rates obtained this time will give us information on about a half year's growth. 3) Obtain measurements on clams to determine if the length-frequency changes during different times of the year in order to see if there is a fairly discrete settlement time. 4) Collect additional clam shells to determine age-growth relationships from cross sections of the shell. 5) Measure identifiable reef sections in order to utilize aerial photographs to draw maps. 6) To monitor utilization of the islands by green and or hawksbill turtles for nesting or other activities. 7) Assist in the assessment of the fish populations on the outside of the reef and to make a general survey of the outside of the atoll. 8) To determine the number of clams inhabiting several of the pinnacles within the lagoon. 9) To obtain additional photographs of the reef habitat. 10) To obtain data on the population levels of all sea and other birds inhabiting Rose and Sand Island. 11) To band brown and masked boobys 12) To determine the phenology of nesting for all avian species. 13) To do a general assessment of the condition of the atoll after possible damage caused by waves generated by a typhoon that hit Tonga on March 2, 1982.

Objectives 10, 11 and 12 will be covered by a report submitted by Stewart Fefer. A report on the results of the fish survey are included in this report as submitted by Dr. Richard Wass. Conclusions obtained from the data obtained on the clam populations will be covered in future reports but the summarized data is included here.

In addition to objectives directly related to ongoing FWS projects, a series of marine substrate samples were collected for Dr. Allison Kay, University of Hawaii, for an analysis of the micromollusc community of Rose Atoll. Dr. Kay will also be assisting in the sexing of the tridacnid clams.



#### Habitat Management:

1. General: High waves generated by a typhoon reached American Samoa (Tutuila I.) on February 25 and 26. The typhoon reached Tonga on March 2, 1982 and caused major damage.

Rose Island and Sand Island showed evidence of the effects of high waves and high winds. Although the general configuration of Sand Island was similar to what it was in November of 1981, the eastern end of the island was shortened by about 50 meters (at high tide). Photos taken shortly before the November 1981 trip to Rose Atoll showed that the eastern end of the island extended to a line of beach rock (cemented sand) that was now separated from the island by about 20 meters. In addition to the change in configuration of the island it was evident that waves had probably washed over the entire island with the possible exception of a narrow (to one meter wide) strip in the center. Evidence of this was the change in color of the gravel and sand that makes up this island. In November the substrate was a grayish color except in the areas where fresh turtle pits had been dug. The color of most of the substrate on this trip was light tan. All previous evidence of turtle nesting had been obliterated.

The effects of the storm on Rose were even more extreme than that on Sand Island. The east side of the island had been shifted an estimated 5-10 meter to the west. This estimate is based on the fact that many overturned *Messerschmidia* that had been back from the beach in November were now virtually at the water's edge at high tide. The northern point of Rose Island was extended about 15 m by a lobe of sand and gravel. The eastern third of the island that did not have humus (usually humus soil was restricted to the area of the island that have *Pisonia* trees) had been churned up by wave action. This was evident by the change in color of the sand and gravel substrate. The area had been very gray and sun-bleached during the previous November but now was a tanner color and fairly level except for occasional small berms. The remixing of the gravel had obliterated turtle pits and all other evidence of turtle nesting on the island.

The waves evidently washed completely over the island. This conclusion is based on the presence of flotsam in the middle of the *Pisonia* forest and the pattern of branches and twigs washed against the base of trees and shrubs.

The overwashing of the island evidently coupled with presumed high winds to defoliate or kill the leaves on many of the *Messerschmidia*. New leaves had returned in most places. The evidence for leaf replacement was that the old dead leaves were still in place on most of the trees. The winds caused damage to the *Pisonia* forest also. On a short walk through the forest I counted about 10 trees that had been blown over or broken off. Some of them had trunks of up to two feet in diameter.

#### G. Wildlife

2. Endangered and/or threatened species.

Surveys were done on Rose and Sand Islands and in the water for the presence of green and hawksbill turtles. These surveys consisted of notation of the presence of the turtles whenever they were spotted in the water, of a general overview of Sand Island on one day and of daily searches of Rose Island for evidence of turtles.

Three green sea turtles were observed in the lagoon and one was observed on the south side of the outside of the atoll. One sea turtle had come ashore on Sand Island and moved along the entire crest of the island before digging two (possibly three) pits in the area of the refuge sign on the west end of the island.



2. Endangered and/or threatened species (cont.)

Rose Island was surveyed by walking the beach each morning at sunrise and just before sunset. In addition the beach was walked at 9-12 each evening. During the walks the underbrush and beach was searched for tracks or for turtles. The timing of the walks at dawn and dusk fairly well coincided with high tide. No evidence of turtles having been on the island since the time of the storm was present.

Besides the one possible nesting on Sand Island the only evidence of turtles on the land at Rose Atoll was a single desiccated hatchling that was found on Sand Island. No other nests, tracks or even pits from old false nests were present.

5. Shorebirds, Gulls, Terns and Allied Species. The most noteworthy item in this category was the presence of a blue-gray noddy that was repeatedly observed around the south end of Rose during the time that we were on the island. The bird would often be roosting in a Pisonia tree adjacent to the beach, about 5 meters off the ground. Our presence usually caused it to fly off. A second fairly rare bird observed was the white-tailed tropicbird that was occasionally seen hovering above the island.

Notes and population levels of other birds in this category are covered in the portion of this report written by Stewart Fefer.

10. Other Resident Wildlife. The Polynesian Rat population appeared to be at a lower level than it had been during the November 1982 survey. Although subjective, my impression is based on the sighting of an average of about 9-12 rats maximum at a time while eating supper instead of the 12-17 that could often be counted at a time in November. The rats that were seen appeared to be in better condition than those observed in November also.

The Cassidix (red hermit crabs) that were observed to be breeding along the water's edge in November (not noted in that trip report however) were still breeding but to a lesser extent. Twenty to 30 could be observed at the water's edge or along the sloping beach along the northern half of the island during the 9:00 PM turtle surveys. This hermit crab spends its adult life on shore, generally in turban or tun shells.

A number of hermit crabs that were identified as juvenile coconut crabs were observed each evening at the campsite area. The population of these was subjectively judged to be lower than that seen in November. Usually one or two could be seen at any time after about 8:00 PM whereas 2-4 were commonly seen in November. One of these crabs was collected and returned to Honolulu for positive identification.

Several unidentified species of ghost and grapsid crabs were seen along the beach or on rocks, particularly at night.

11. Fisheries Resources. The principal objective other than seabird surveys for the field trip was to gather data that would be utilized in developing a management plan for the tridacnid clam population.



Sixty-one Tridacna maxima clams were collected over a 30 minute period from the mid-northwestern side of the lagoon side of the reef. The depth of water was about 0.5 - 2 meters. Wass, Pedro and Ludwig did the collecting. The purpose of the collection was to obtain information on the size at time of sexual maturity. Total length, total weight and weight of the shelled clams were taken before the shelled clams were preserved in 10% formalin. Data obtained in the field is given in Table 1. Some of the muscles were extracted from the clams before they were preserved. A number of the shells from the collected clams were brought back to headquarters and will be utilized to obtain data on the age of the clams. Dr. Allison Kay of the University of Hawaii has indicated that she would assist us in determining the degree of sexual maturity in the collected specimens.

Twenty clams that had been measured during the November 1982 field trip were remeasured in order to obtain data from which a growth curve could be developed. An additional 13 clams were measured and tagged. The yellow speggetti tags that had been utilized for the original tagging had become completely covered with coralline algae and other "fouling" organisms. In some cases the tags broke while the encrustation was being removed. The new tags that were used on this trip have a thicker plastic covering over the part of the tag that has the number written on it. This may help prevent tag destruction but since there is a thin space between the two plastic parts of the tag, fouling may occur internally and prevent future reading of the tag. Data that was obtained from the tagged clams is given in Table 2. This data may allow us to determine growth for the period between Nov. and March. Future data should allow a comparison of growth rates during different times of the year.

In order to obtain information about the time(s) of the year in which larva settle and about general size characteristics of the clam population and to corroborate growth information obtained by other means, length frequency data was obtained again on this trip. The data was obtained while a census of the total clam population was being taken on two pinnacles at the western corner of the lagoon. Wass, Pedro and Ludwig obtained the data that is presented in Table 3. The length of the reef was obtained and the density of clams on the pinnacles will be determined in the future. Clams that were measured had their highest concentrations in the relatively flat (horizontal) parts of the pinnacle. Depths of the data collection varied from the surface to the bottom at 10-13 m.

Photographs of clams that had been tagged were taken to document the method used for tagging and for future use in narrative and other reports. The area of the clam growth study is off the southwestern end of Rose Is. There are two beach rock formations that become exposed at all tides except extreme high tides in this area. These two rocks lie off the island about 30 meters and are at the point where the boat is usually kept overnight. The study area is a relatively rounded, flat-topped coralline algae formation that is essentially an extension of the southern end of the southern-most of the two rocks. The first isolated part of this rock harbors most of the yellow-tagged clams. The red-tagged clams are on the submerged extension of the rock and on an isolated small (ca. 1 m diameter) rock that is just to the lagoon side of the yellow-tagged clam site (see map)



In order to facilitate the accurate construction of a map of Rose Atoll from aerial photographs a number of measurements of parts of the atoll were taken. The site of these and the measurement are on the maps. Additional measurements will be added to these as transecting data is analysed.

A supplement to the list of fishes found in various habitats that Dr. Richard Wass developed from observations in Nov. 1981 was compiled after this field trip. The supplement covers observations that were made during three dives that were taken on the outside of the atoll to various depths. The locations of the dives are shown on the accompanying maps and also indicated in the Supplement. In addition to the individual dives, Dr. Wass was also towed behind the skiff as indicated in the Supplement.

Ludwig accompanied Dr. Wass on each of the dives as did William Pedro and Rick Davis. In addition Ludwig was towed behind the skiff along the same area that Dr. Wass was towed and also along approximately one half of the northeast side of the atoll and the shelf that extends from the eastern corner of the atoll.

The habitat along the outside the atoll has a generally similar look to it throughout the area of the tows except for the northeast side and about one half of the northeastern part of the shallow (20-40 ft deep) extension of the reef at the east corner. The exceptional parts of the reef appeared to have little coral cover to a depth of about 40 and sometimes more feet. In many areas there was extensive areas of what appeared to be freshly broken coral rubble. I suspect that the waves that caused damage to the two islands also caused much damage to the reef itself. There also were extensive areas which had a covering of what appeared to be filamentous algae.

Most of the rest of the outside reef can be generally described as follows. There is a series of surge channels dissecting the entire margin of the reef at the surface. The edge drops vertically for about 3-5 m with the surge channels extending out from the edge. At the bottom of the drop there is usually a ledge of various widths but usually about 30-40 m wide. The substrate in this area is usually dominated by coralline algae with little surface relief. At the ledge area there is a mixture of about 50/50 coralline algae/Pocillopora corals. Below this there is often up to 90% coralline algae with a mixture of soft corals (family Alcyoniidae). The percentages of algae and coral are highly variable in this zone.

With greater depths the percentage of coralline algae decreases until at about 50-80 feet there is very little present. The morphology of the coralline algae also changes from a smooth, encrusting configuration at the edge of the reef to a very fluted appearance as greater depths are reached.

In the 30-50 foot depths the bottom was dropping at about a 45 or greater degree angle. The percentages of bottom cover were estimated at about 30% coralline algae, 30% soft corals and 30% hard corals. The hard corals were mainly Acroporans, some vase-shaped Montiporans and a variety of Poritid appearing corals.

About 50 feet deep the bottom often dropped off at nearly a vertical angle. There were many overhanging coral outcrops. About 80-100 feet there appeared to be another shelf present in many areas. The shelf was of varying width but usually less than 100 meters wide and with a declination of about 30°. A second dropoff was often present at about 100 feet. This drop-off was often nearly vertical and descended to 150-200 feet before leveling off. Although visibility was over 100 feet in most cases I did not venture away from the proximity of the reef in order to see if the reef had another sharp drop. Abundant coral growth was apparently present at the 150-200 foot level although



sand patches and what appeared to be bare areas of rock were also present. There were no branching soft corals visible. In areas on Hawaii Island that I have dove on I have observed black corals in as shallow as 60 feet, particularly beneath ledges. In this area on Rose there were many overhangs that might be expected to provide habitat in the shallower areas and "bare" areas in the deeper parts of the reef that would provide attachment sites but no black or other branching soft corals were observed. Surprisingly, a single tridacnid clam could be seen in water estimated to be about 150 feet deep. The absence of black coral and the abundance of the shallow water corals in water over 100 feet deep may be indicative of the constant high light transmission in the water that passes Rose Atoll. Perhaps there are black corals at deeper depths.

One of the surprising aspects of the dives and the towing around on the outside of the reef was the near complete absence of sharks. Only one reef white-tip shark and no other sharks were seen during these dives. The number of black tipped reef sharks that were observed around Sand and Rose Islands were lower in abundance than they were in November 1981 (subjective judgement). Only one gray shark was observed and that was by Wass near the pinnacle that is closest to the entrance to the lagoon. He jumped into the water about 9:00PM to observe fish and nearly landed on the gray shark. The only other larger fish that were observed were a few large milkfish, many large red snappers (Lutjanus bohar), a dog-tooth tuna (over 40 lbs) and several schools of barracuda. The barracuda schools were estimated to have several hundred fish in them and they were packed to the point of nearly touching each other. This behavior may have been a defensive posturing brought on by the approach of the boat and towed divers (speculation).

The crew of the Sausauimoana concentrated on fishing for shallow water bottom fish during the time that we were on the island. They anchored off the western corner of the atoll for most of the time they were at the atoll and caught substantial amounts of jacks and a variety of other fish. The catch was limited by the lack of sufficient ice. Total catch ca. 800-1000 lbs.

14. Scientific Collections. Thirteen samples of sandy substrate were obtained for Dr. Allison Kay of the University of Hawaii for analysis of micromollusc presence and distribution.

16. Marking and Banding. See Pefer's report

15. Animal Control. Although a fair population of Polynesian rats were present and were causing damage to the eggs of nesting Sooty Terns, we have not made a decision on the necessity for control of the rats.

#### H. Public Use

3. Outdoor Classrooms-Teachers. Mr. Rick Davis of the American Samoan Department of Education accompanied us on the trip in order to observe the atoll and the work of the USFWS and the Am. Sam. Off. of Mar. Res. His observations and discussions with the other members of the field party will be incorporated into a science curriculum unit that will be utilized by 8th grade teachers to bring about awareness of the marine resources in American Samoa.



Table 1 Size and Weight of Tridacnid Clams collected  
 at Rose Atoll March 24, 1982 Page 1 of 2

| #  | Maximum Length(mm)* | Total Weight(gm) | Body weight(gm) |
|----|---------------------|------------------|-----------------|
| 1  | 64                  | 48               | 11              |
| 2  | 64                  | 58               | 15              |
| 3  | 73                  | 91               | 15.5            |
| 4  | 92                  | 145              | 27              |
| 5  | 104                 | 230              | 50              |
| 6  | 104                 | 246              | 40              |
| 7  | 120                 | 375              | 64              |
| 8  | 115                 | 380              | 63              |
| 9  | 122                 | 360              | 99              |
| 10 | 133                 | 500              | 89              |
| 11 | 134                 | 550              | 86              |
| 12 | 128                 | 400              | 71              |
| 13 | 133                 | 550              | 94              |
| 14 | 136                 | 545              | 72              |
| 15 | 156                 | 900              | 128             |
| 16 | 143                 | 800              | 118             |
| 17 | 150                 | 860              | 146             |
| 18 | 165                 | 1010             | 124             |
| 19 | 159                 | 850              | 98              |
| 20 | 180                 | 1150             | 130             |
| 21 | 178                 | 1000             | 134             |
| 22 | 182                 | 1150             | 118             |
| 23 | 188                 | 1600             | 156             |
| 24 | 167                 | 850              | 144             |
| 25 | 174                 | 1550             | 188             |
| 26 | 35                  | 8                | 2               |
| 27 | 42                  | 16               | 4               |
| 28 | 47                  | 24               | 5               |
| 29 | 52                  | 26               | 5               |
| 30 | 50                  | 18               | 4               |
| 31 | 54                  | 21               | 4               |
| 32 | 57                  | 25               | 6               |
| 33 | 68                  | 61               | 13              |
| 34 | 85                  | 104              | 21              |
| 35 | 101                 | 141              | 28              |
| 36 | 105                 | 172              | 40              |



Table 1 (cont.)

Tridacna Clam Data from Rose Afall  
March 24 1982 collection

page 2 of 2

| pl | Maximum<br>Length<br>(mm) | Total<br>Weight<br>(g) | Body<br>Weight<br>(g) |
|----|---------------------------|------------------------|-----------------------|
| 37 | 126 *                     | 400                    | 57                    |
| 38 | 117 *                     | 375                    | 52                    |
| 39 | 132 *                     | 625                    | 86                    |
| 40 | 128                       | 475                    | 72                    |
| 41 | 124                       | 350                    | 52                    |
| 42 | 126                       | 500                    | 64                    |
| 43 | 139                       | 375                    | 56                    |
| 44 | 143                       | 500                    | 68                    |
| 45 | 127                       | 425                    | 57                    |
| 46 | 129 *                     | 800                    | 96                    |
| 47 | 138                       | 750                    | 93                    |
| 48 | 135                       | 500                    | 57                    |
| 49 | 142                       | 530                    | 81                    |
| 50 | 151                       | 775                    | 101                   |
| 51 | 132                       | 600                    | 66                    |
| 52 | 150 *                     | 775                    | 112                   |
| 53 | 170 *                     | 725                    | 95                    |
| 54 | 170                       | 1100                   | 128                   |
| 55 | 165                       | 925                    | 137                   |
| 56 | 172                       | 1050                   | 119                   |
| 57 | 157                       | 1150                   | 131                   |
| 58 | 177 *                     | 1225                   | 176                   |
| 59 | 201                       | 1450                   | 136                   |
| 60 | 194                       | 2100                   | 215                   |
| 61 | 193 *                     | 2650                   | 235                   |

\* Shells collected for age determination



Table 3 Data Summary for *Tridacna clam* growth study

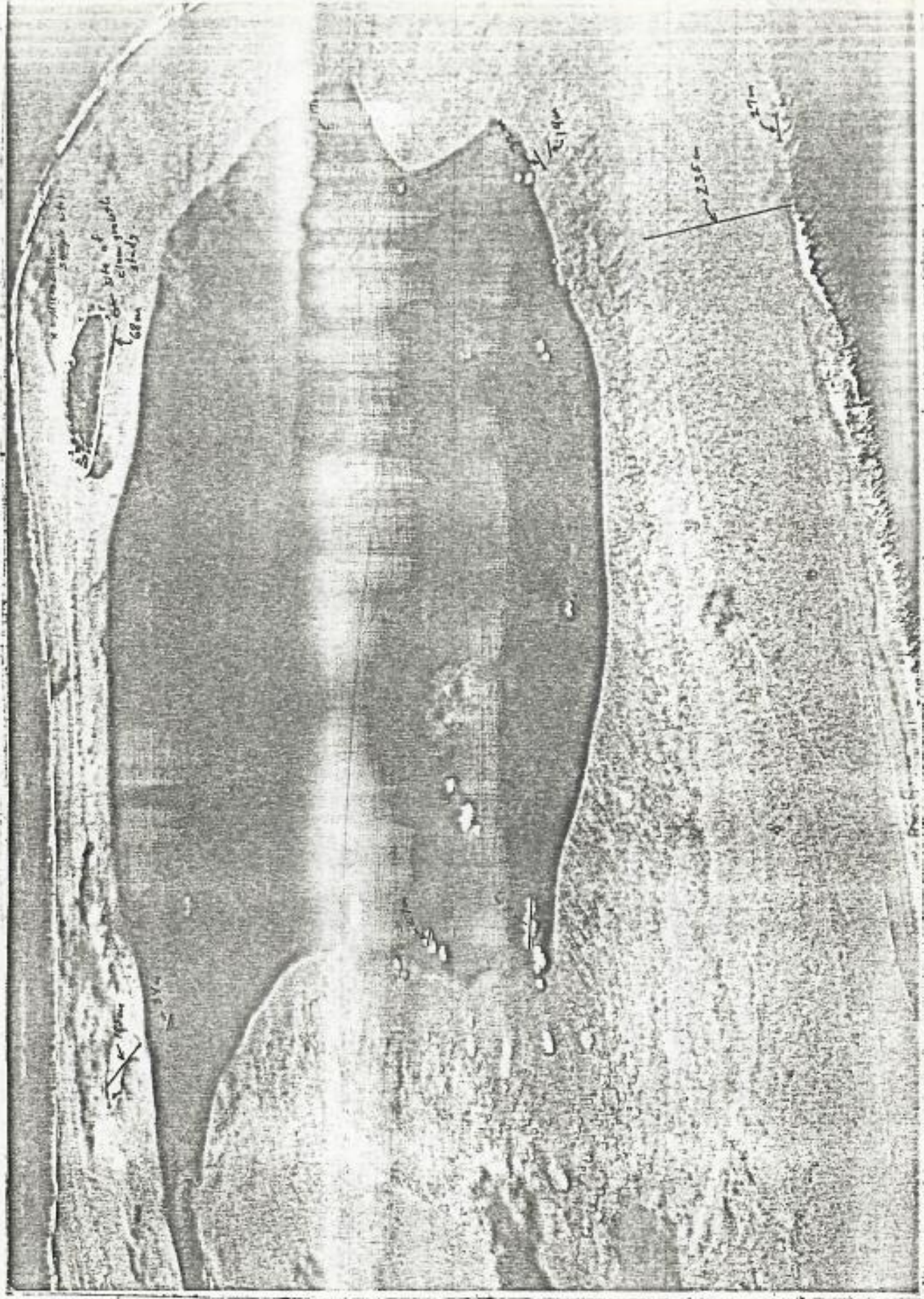
|             | #   | Tag #  | Total length (mm) |         | growth increment (mm) |
|-------------|-----|--------|-------------------|---------|-----------------------|
|             |     |        | 4/20/92           | 3/25/92 |                       |
| Yellow Tags | 1.  | T01696 | 170               | 170     | 0                     |
|             | 2.  | T01694 | 59                | 68      | 9                     |
|             | 3.  | T01692 | 167               | 172     | 5                     |
|             | 4.  | T01686 | 149               | 155     | 6                     |
|             | 5.  | T01684 | 161               | 177     | 16                    |
|             | 6.  | T01681 | 116               | 126     | 10                    |
|             | 7.  | T01675 | 111               | 117     | 6                     |
|             | 8.  | T01677 | 156               | 161     | 5                     |
|             | 9.  | T01699 | 123               | 137     | 14                    |
|             | 10. | T01671 | 171               | 172     | 1                     |
|             | 11. | T01695 | 66                | 73      | 7                     |
|             | 12. | T01679 | 146               | 148     | 2                     |
|             | 13. | T01693 | 165               | 167     | 2                     |
|             | 14. | T01689 | 147               | 149     | 2                     |
|             | 15. | T01678 | 165               | 174     | 9                     |
|             | 16. | T01690 | 34                | 45      | 11                    |
|             | 17. | T01683 | 138               | 149     | 11                    |
|             | 18. | T01676 | 94                | 92      | 8                     |
|             | 19. | T01675 | 154               | lost    | -                     |
|             | 20. | T01680 | 86                | 93      | 13                    |
| Red Tags    | 1   | 01847  |                   | 122     |                       |
|             | 2   | 01849  |                   | 169     |                       |
|             | 3   | 01846  |                   | 187     |                       |
|             | 4   | 01844  |                   | 145     |                       |
|             | 5   | 01845  |                   | 172     |                       |
|             | 6   | 01843  |                   | 102     |                       |
|             | 7   | 01841  |                   | 132     |                       |
|             | 8   | 01842  |                   | 137     |                       |
|             | 9   | 01840  |                   | 77      |                       |
|             | 10  | 01838  |                   | 169     |                       |
|             | 11  | 01839  |                   | 145     |                       |
|             | 12  | 01837  |                   | 62      |                       |
|             | 13  | 01836  |                   | 40      |                       |



Table 2 Length Frequency for *Tridacna clava* on pinnacles in Rose Atoll Lagoon on March 25, 1982.

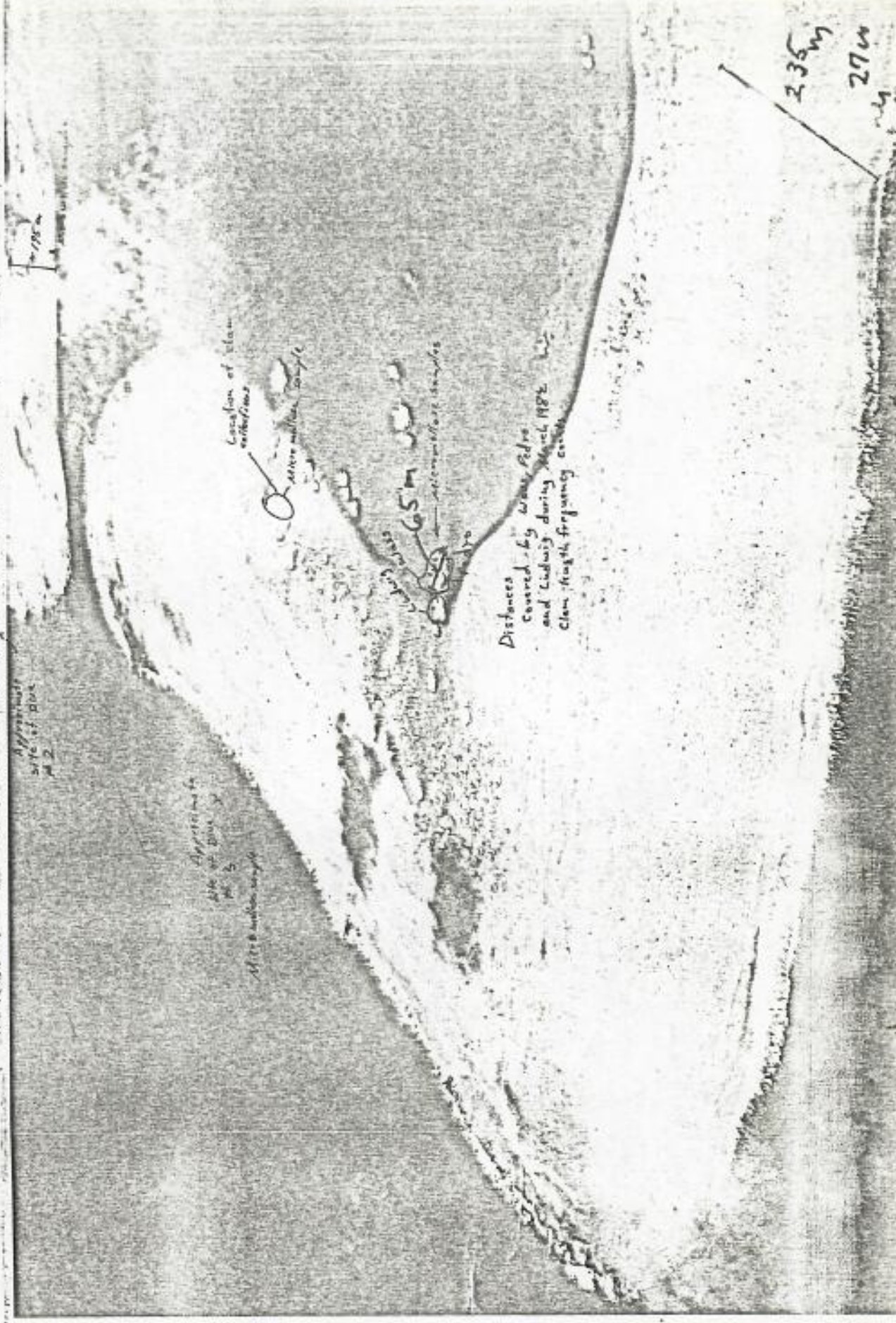
| Size Interval(mm) | Richard<br>Ward | William<br>Peters | mm along greatest shell length |
|-------------------|-----------------|-------------------|--------------------------------|
| 10 - 19.9         | 36              | 0                 | 54                             |
| 20 - 29.9         | 109             | 27                | 25                             |
| 30                | 219             | 39                | 37                             |
| 40                | 95              | 41                | 35                             |
| 50                | 35              | 27                | 23                             |
| 60                | 11              | 15                | 13                             |
| 70                | 7               | 6                 | 5                              |
| 80                | 4               | 3                 |                                |
| 90                | 6               | 3                 | 1                              |
| 100               | 11              | 2                 | 5                              |
| 110               | 20              | 6                 | 10                             |
| 120               | 20              | 9                 | 17                             |
| 130               | 31              | 7                 | 31                             |
| 140               | 24              | 14                | 31                             |
| 150               | 30              | 25                | 42                             |
| 160               | 26              | 30                | 43                             |
| 170               | 31              | 36                | 26                             |
| 180               | 22              | 47                | 16                             |
| 190               | 23              | 35                | 11                             |
| 200               | 5               | 30                | 2                              |
| 210               | 7               | 23                | 2                              |
| 220               | 2               | 11                |                                |
| 230               | 2               | 6                 |                                |
| 240               | 3               | 5                 |                                |





Rose Atoll from west Nov 1991, lot 4





Approximate site of base #2

Approximate site of base #3  
Miss B million sample

Location of clam shellfish

Active million sample

65m

accumulation samples

Distances Covered by wave ridge and tideway during March 1952  
Clam - North frequency count

235m

270m



## THE FISHES OF ROSE ATOLL - Supplement I

by Richard C. Wass

A previous paper titled THE FISHES OF ROSE ATOLL discusses the results of a fish survey conducted November 12-13, 1980 within the four lagoon habitats of Rose Atoll, American Samoa. The present paper supplements the original effort by listing and discussing the fishes observed within the Reef Front Habitat which is the major habitat outside the lagoon. Additional species occurring within the lagoon and species records unique to Rose Atoll are also listed.

The survey described herein was conducted March 23-25, 1982. Observations were made during three SCUBA dives and while being towed on the surface behind an outboard-powered skiff at the locations noted in Figure 1. As in the previous study, the observer simply listed every species seen. Again, the list is strongly biased in favor of larger and easily visible fishes. Each species was subjectively assigned to one of three categories reflecting numerical abundance and relative biomass.

### Results

The Reef Front Habitat is located on the seaward side of the reef. As defined in the present study, it begins at a depth of about 4 m. and consists of an irregular and often steep slope to a depth of about 50 m. The upper



portion may be bisected by ridges and surge channels. In some areas a narrow terrace with little slope occurs at 5-20 m. before the bottom plunges steeply to greater depths. The irregular substrate is calcareous and compacted with coralline algae predominating. Corals are profuse and species are diverse. The predominance of coralline algae and the complete lack of table and staghorn Acropora distinguish this substrate from that found in similar habitats around Tutuila and the Manu'a Islands.

The most visible fishes are those which occur well above the bottom in the midwater reaches. Dominant species include planktivorous surgeonfishes (Naso vlamingii, N. brevirostris, N. hexacanthus), butterflyfishes (Hemitaurichthys thompsoni), damselfishes (Chromis acares), anthiids (Anthias pascalus) and fusiliers (Pterocaesio tile) as well as carnivorous snappers (Aphareus furcatus, Lutjanus bohar), grouper (Gracila albomarginata), jacks (Caranx lugubris) and triggerfish (Melichthys niger). Dominant fishes associated closely with the bottom are groupers (Cephalopholis guttatus, C. urodelus and an undescribed Cephalopholis) and an angelfish (Centropyge loriculus).

A total of 105 fishes were observed within the habitat. They are listed in Table I along with a designation of relative abundance and comments on their distribution.



## Discussion

When compared to reef fronts around Tutuila, the fish community at Rose Atoll is lacking in diversity. The number of species observed during 31 surveys in reef front habitats around Tutuila averaged 106 even though considerably less time was spent listing species than during the present study. Also, the 31 surveys were each conducted at a single location.

Two families are noticeably less diverse at Rose. The lack of damselfish species that was noted during the earlier study of the lagoon habitats also appears to be true for the reef front. Only eight species were observed at Rose while 12-15 damsels were commonly observed on reef fronts around Tutuila. Likewise, 8-12 species of parrotfishes were usually observed on reef fronts around Tutuila while only three were seen at Rose. Large, carnivorous species of groupers, jacks and snappers, however, are more abundant at Rose than at Tutuila. The lack of fishing pressure probably accounts for their increased biomass. The factors which limit the number of damselfish and parrotfish species are unknown but may be related to substrate composition.

## Additional Notes

Six species can be added to the list of lagoon fishes at Rose Atoll. They were observed by the author during November, 1981 and/or March 1982. They are: Adioryx tiere.



Flammeo opercularis, Carangoides ferdau, Chaetodon flavivros-  
tris, C. lineolatus and Scarus atropectoralis (tentatively  
identified as Scarus caudofasciatus in the previous report).  
All are uncommon with the exception of Carangoides ferdau  
which is common in shallow sandy areas on the lagoon side  
of the reef.

Five fishes from Rose Atoll have not been observed or  
recorded elsewhere in Samoa. They are: Chaetodon flavivros-  
tris, Bodianus anthioides, Cirrhilabrus sp., Scarus atro-  
pectoralis and Zebrasoma rostratum.



Figure 1. SCUBA dive and tow locations from which fishes of the Reef Front Habitat were observed at Rose Atoll.

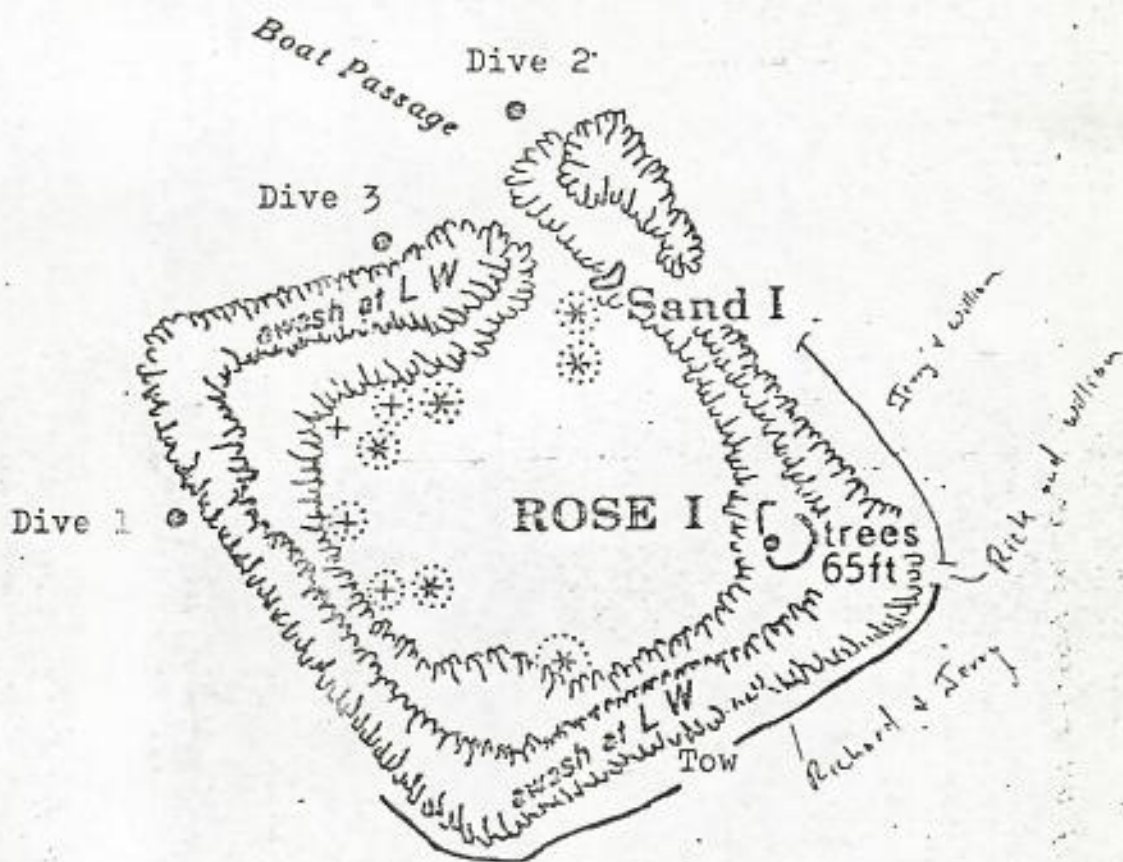




TABLE I. Fishes observed within the reef front habitat at Rose Atoll. The letters indicate a combination of numerical abundance and relative biomass. A = Abundant; C = Common; U = Uncommon.

| Species                           | Abundance | Comments                                    |
|-----------------------------------|-----------|---|
| <i>Carcharhinus amblyrhynchos</i> | U         | More abundant in previous years.            |
| <i>Carcharhinus melanopterus</i>  | C         | A shallow water species.                    |
| <i>Triaenodon obesus</i>          | C         |   |
| <i>Chanos chanos</i>              | U         | A group of 4 large individuals.             |
| <i>Adioryx spinifer</i>           | C         |   |
| <i>Adioryx tiere</i>              | C         |   |
| <i>Flammeo opercularis</i>        | U         |   |
| <i>Myripristis berndti</i>        | C         | More abundant than at Tutuila.              |
| <i>Myripristis vittatus</i>       | A         | Tends to occur deeper than <u>berndti</u> . |
| <i>Caracanthus maculatus</i>      | C         | Observed within <u>Pocillopora</u> heads.   |
| <i>Anthias lori</i>               | C         | Observed deeper than 40 m                   |
| <i>Anthias pascalus</i>           | A         | Schools well above the bottom.              |
| <i>Cephalopholis guttatus</i>     | A         | Argus is a synonym.                         |



| <u>Species</u>             | <u>Abundance</u> | <u>Comments</u>                               |
|----------------------------|------------------|---|
| Cephalopholis urodelus     | A                |   |
| Cephalopholis n. sp.       | A                | Reddish-brown with dark<br>or light blotches. |
| Gracila albomarginata      | A                |   |
| Belonoperca chabanaudi     | U                |   |
| Caranx ignobilis           | U                |   |
| Caranx lugubris            | A                |   |
| Caranx melampygus          | U                |   |
| Scomberoides lysan         | U                | Occurs near surface                           |
| Pterocaesio tile           | A                | Midwater schools                              |
| Aphareus furcatus          | A                |   |
| Aprion virescens           | C                |   |
| Lutjanus bohar             | A                |   |
| Lutjanus gibbus            | U                |   |
| Lutjanus monostigmus       | U                |   |
| Lutjanus kasmira           | U                | More abundant inside<br>lagoon                |
| Macolor niger              | C                |   |
| Gnathodentex aureolineatus | U                | More common inside<br>lagoon                  |
| Monotaxis grandoculis      | C                |   |
| Parupeneus bifasciatus     | C                |   |
| Parupeneus chryserydros    | U                |   |
| Parupeneus trifasciatus    | U                |   |
| Pempheris oualensis        | U                | Occurs within cracks and<br>caverns.          |



| Species                   | Abundance | Comments                              |
|---------------------------|-----------|---------------------------------------|
| Chaetodon auriga          | U         |                                       |
| Chaetodon bennetti        | U         |                                       |
| Chaetodon ephippium       | U         |                                       |
| C. <i>lineolatus</i>      | U         |                                       |
| Chaetodon lunula          | U         |                                       |
| Chaetodon ornatissimus    | U         |                                       |
| Chaetodon pelewensis      | A         | Always close to the substrate.        |
| Chaetodon quadrimaculatus | U         |                                       |
| Chaetodon reticulatus     | C         |                                       |
| Chaetodon unimaculatus    | U         |                                       |
| Hemitaurichthys polylepis | U         | Occurs deeper than <u>thompsoni</u> . |
| Hemitaurichthys thompsoni | A         | Schools well off the bottom.          |
| Heniochus monoceros       | U         |                                       |
| Forcipiger flavissimus    | U         |                                       |
| Forcipiger longirostris   | U         | Dark and yellow phases observed.      |
| Centropyge flavissimus    | C         | Occurs at shallower depths.           |
| Centropyge heraldi        | U         |                                       |
| Centropyge loriculis      | A         | Always close to the substrate.        |
| Pygoplites diacanthus     | U         |                                       |
| Amphiprion chrysopterus   | C         | Associated with large anemones.       |

| Species                                 | Abundance | Comments                                  |
|---|-----------|---|
| <i>Chromis acares</i>                   | A         | Most common damselfish.                   |
| <i>Chromis agilis</i>                   | C         |   |
| <i>Chromis iomelas</i>                  | C         |   |
| <i>Chromis margaritifer</i>             | C         |   |
| <i>Chromis xanthurus</i>                | U         |   |
| <i>Dascyllus trimaculatus</i>           | U         |   |
| <i>Plectroglyphidodon johnstonianus</i> | C         | Closely associated with substrate.        |
| <i>Neocirrhites armatus</i>             | U         | Lives within <u>Pocillopora</u> colonies. |
| <i>Paracirrhites arcatus</i>            | C         |   |
| <i>Paracirrhites forsteri</i>           | C         | Some with yellow caudal.                  |
| <i>Paracirrhites hemistictus</i>        | U         |   |
| <i>Sphyraena barracuda</i>              | U         |   |
| <i>Sphyraena</i> sp.                    | U         | Two large schools observed.               |
| <i>Bodianus anthioides</i>              | U         | One speared at 50 m.                      |
| <i>Cheilinus rhodochrous</i>            | C         |   |
| <i>Coris aygula</i>                     | C         | Large terminal males observed.            |
| <i>Gomphosus varius</i>                 | C         |   |
| <i>Halichoeres hortulanus</i>           | C         |   |
| <i>Halichoeres melasmapomus</i>         | C         | Common at depths greater than 50 m.       |



| Species                           | Abundance | Comments  |
|-----------------------------------|-----------|---|
| <i>Hemigymnus fasciatus</i>       | C         |   |
| <i>Labroides bicolor</i>          | U         |   |
| <i>Labroides dimidiatus</i>       | U         |   |
| <i>Labroides rubrolabiatus</i>    | C         |   |
| <i>Labropsis</i> sp.              | U         |   |
| <i>Pseudocheilinus evanidus</i>   | U         |   |
| <i>Pseudocheilinus hexataenia</i> | C         |   |
| <i>Thalassoma lutescens</i>       | C         |   |
| <i>Thalassoma quinquevittatum</i> | C         | Occurs at shallower depths.                         |
| <i>Scarus schlegeli</i>           | U         |   |
| <i>Scarus sordidus</i>            | C         | The most abundant parrotfish                        |
| <i>Scarus tricolor</i>            | U         |   |
| <i>Acanthurus achilles</i>        | A         |   |
| <i>Acanthurus glaucoparievus</i>  | A         |   |
| <i>Acanthurus nigroris</i>        | U         |   |
| <i>Acanthurus thompsoni</i>       | C         | Observed in midwater.                               |
| <i>Ctenochaetus strigosus</i>     | C         | Some with white caudal fins.                        |
| <i>Ctenochaetus striatus</i>      | C         |   |
| <i>Naso brevirostris</i>          | A         | Midwater schools.                                   |
| <i>Naso lituratus</i>             | C         | Occurs closer to substrate than other <u>Naso</u> . |
| <i>Naso hexacanthus</i>           | C         |   |
| <i>Naso vlamingii</i>             | A         | Midwater schools.                                   |
| <i>Zebрасoma rostratum</i>        | U         | Unobserved elsewhere in Same                        |

| <u>Species</u>                 | <u>Abundance</u> | <u>Comments</u>                              |
|--------------------------------|------------------|--|
| <i>Zebrasoma veliferum</i>     | U                |  |
| <i>Zanclus cornutus</i>        | C                |  |
| <i>Gymnosarda unicolor</i>     | U                | One very large individual.                   |
| <i>Balistapus undulatus</i>    | C                |  |
| <i>Balistoides viridescens</i> | C                |  |
| <i>Melichthys niger</i>        | A                | Schools in shallow water.                    |
| <i>Melichthys vidua</i>        | A                | Tends to occur deeper than<br><u>niger</u> . |
| <i>Canthidermis dumerili</i>   | U                |  |
| <i>Diodon hystrix</i>          | U                |  |



TRIP REPORT  
Rose Atoll National Wildlife Refuge  
March 28 - 30, 1978

Personnel:

Richard A. Coleman, Refuge Biologist, Honolulu, Hawaii

Pat Byran, Fishery Biologist, Office of Marine Resources,  
Government of American Samoa.

Itinerary:

Departed Pago Pago at 1100 hours on March 28 aboard a chartered fishing boat, J-ANN, skippered by Terry S. Hornidge and crewed by six fisherman/crew members. Arrived at Rose Island on March 29 at 0800 hours. By use of a skiff surveyed Sand Island and Rose Island. Conducted seabird counts and evidence of sea turtle activity. Inspected area for human trespass, left Rose Atoll at 1600 hours. March 30 arrived Pago Pago at 1130 hours.

General:

Rose Atoll Refuge was visited for the purposes of conducting wildlife surveys, enforcement patrols, and orientation for the refuge biologist. Data was collected on all aspects of the ecology. Weather was partly cloudy, no breeze, during the visit.

Vegetation:

The vegetative conditions throughout Rose Island were very lush and thriving. The Pisonia was very dense in the center portion of the island and new trees were 4-6 feet tall in the former "die-off area." Messerschmidia were also lush and in dense stands along the perimeter of the island except at the north end where they were healthy but scattered. The palms, Cocos Nucifera were in good condition except for one topped off tree. Numerous seedlings (30-40) were scattered in the center portion of the island and along the west side. Thick mats of Boerhavia covered most open spaces on the island except for the Northern end.

Wildlife:

Birds: No birds were found nesting on Sand Island.

Red-tailed tropicbirds: Three adults were seen nesting in the center portion of Rose Island under Pisonia trees. Two of the nests had small chicks (less than 1 month).

Blue-faced Booby: Six adults were seen on the east side of Rose. One was apparently guarding a white coral rock as if it was an egg. (Band # 757-3\_\_\_) No other nesting activity was seen.

Brown Booby: Estimated population of 500. Both fledging and nest building occurring. No eggs were seen, 2 newly constructed nests were found on the west side.

Red-footed booby: Estimated population 200 roosting in the Messerschmidia. No nesting activity noted.

Greater frigatebird: Approximately 200 were soaring over the island and roosting on the top of Pisonia trees.

Lesser frigatebirds: Approximately 200, same as greater frigates.

Reef heron: One white phase seen on reef.

Cattle Egret: One seen on reef.

Snowy Egret or Little Egret: One seen on west side of Rose.

Golden Plover: Ten were seen on Rose.

Ruddy Turnstone: Fifteen were seen on Rose.

Sooty Tern: Approximately 5,000 fledging at the north and east side of Rose.  
ca. 2,000 adults seen during the day.

Brown Noddy Tern: Approximately 200 adults seen on Sand Island and 5,000 adults at Rose. Ten chicks, less than 2 weeks old were seen.

Black Noddy Terns: 20 adults were seen at Sand Island. Approximately 5,000 were nesting in the Pisonia trees. No chicks were seen in the leaf nests.

White Tern: Approximately 200 adults, no nesting observed.



Mammals: Rats were extremely abundant in the center part of the island, under the Pisonia canopy. They appeared to the refuge biologist to be the black rat, Rattus rattus and not the Polynesian rat earlier reported on the island. 4 traps were set but none caught during the day.

Green Sea Turtles: Only one recent turtle track was seen on the east side of Rose Island, which lead to a small pit under a Messerchmidia 10 m. from the shore. Old pits were noted along the east side of Rose Island and the center of Sand Island. Some of these pits(4) appeared more recent perhaps a month old. Old ribs bones of a turtle were found on Sand Island and left there. A green turtle (30" carapace) was seen in the channel. No other turtle signs were noted.

Other Wildlife: Numerous black-tipped sharks (20-40cm) were seen around the edge of Rose Island. Large schools of mullet (100-200) were close to shore.

Other Notes:

Debris such as bottles, floats and wood was notably lacking on the islands. One glass float, two plastic floats and approximately 6 bottles were ashore. There was no indication of high waves on the islands as earlier reported by H. Sessapasara, on his Feb. aerial survey of Rose Atoll.

The Refuge sign on Rose Island was in excellent shape, some Messerchmidia had to be cleared from blocking the sign. The metal F&W signs were also in good shape on both islands. Future replacement of these signs will require Lag screws not bolts. No signs of human trespass were seen.

*Richard A. Coleman*

Richard A. Coleman  
Refuge Biologist

cc: H. Sessapasara

TRIP REPORT

ROSE ATOLL NATIONAL WILDLIFE REFUGE  
May 3-8, 1976

Prepared for

U.S. Department of Interior  
Fish and Wildlife Service  
Portland, Oregon

Prepared by

Environment Consultants, Inc.  
c/o Marine Resources, G.A.S.  
Pago Pago, American Samoa 96799  
14325 Proton Road, Dallas, Texas

D.O.I. Contract No. 11-16-0001-S782FA

August 27, 1976



## PREFACE

This report is not required by DOI contract, but was requested by the Refuge Manager, Rose Atoll National Wildlife Refuge. It must be emphasized that ALL MATERIALS AND STATEMENTS presented in this report ARE PRELIMINARY. Permission to use data from this report must be obtained from both the DOI Contract Officer and the ECI Project Administrator.

## INTRODUCTION

Rose Atoll National Wildlife Refuge was visited on May 5-7, 1976 by a field team of Environment Consultants, Inc., (ECI) as part of a two-year Inventory of the Wildlife and Wildlife Habitat of the Islands of American Samoa for the U. S. Department of Interior (Contract No. 11-16-0001-S782FA). ECI obtained Special Use Permit Rose-1-75 (and subsequent approved changes via ECI memos 758SM-135 and 758SM-145 and telephone conversation with Refuge Manager Palmer Sekora on April 30, 1976) from the Fish and Wildlife Service for visitation to Rose Atoll National Wildlife Refuge.

The visit was planned and conducted in cooperation with the Office of Marine Resources, Government of American Samoa, and the Fish and Wildlife Service, Department of Interior. The 50-ft. R/V Alofaga was chartered for this trip by the Fish and Wildlife Service.

The principal objectives of the two ECI visits to Rose Atoll, American Samoa have been:

- 1) To define the major habitats on the islands at Rose Atoll by:
  - a) Describing the ecological communities in terms of their physical attributes, such as soil types, amount of moisture and light present, amount of slope of the land, altitude and temperature;
  - b) Identifying the plant species present and their relative abundance in each of the ecological communities, including an indication of seasonal occupancy of the species and population densities for each species.
- 2) To inventory the wildlife of Rose Atoll by:
  - a) Determining the identity and status of the terrestrial wildlife, distribution of individual species, population densities and fluctuations and breeding phenology.
- 3) To prepare maps of the area showing distribution of each of the plant communities, as well as distribution and relative abundance of each of the wildlife species.
- 4) To describe the disturbance factors and the successional relationships in the ecological communities and how these factors influence animal and plant constituents of each.
- 5) To identify and record any plant or animal species threatened with extinction or extirpation from the islands with a description of the factors responsible.



Secondary objectives were:

- 1) To make casual observations of the effects of predation particularly by the Polynesian Rat on turtles and birds during their nesting season.
- 2) To recommend wildlife management procedures and alternatives and future areas of associated research.

#### SCIENTIFIC PERSONNEL

Scientific personnel on this trip were as follows:

A. Binion Amerson, Jr., Principal Investigator and Project Manager (Wildlife Ecologist), Environment Consultants, Inc., 14325 Proton Road, Dallas, Texas 75240.

Warren M. Pulich, Staff Scientist (Ornithologist), Environment Consultants, Inc., 14325 Proton Road, Dallas, Texas 75240.

Terry D. Schwaner, Staff Scientist (Herpetologist), Environment Consultants, Inc., 14325 Proton Road, Dallas, Texas 75240.

D. Ian Swan, Fishery Biologist, Office of Marine Resources, Government of American Samoa, Pago Pago, American Samoa 96799.

Dr. Stanley N. Swerdloff, Team Leader and Director of Office of Marine Resources, Government of American Samoa, Pago Pago, American Samoa 96799.

#### ITINERARY

May 3, 1976: Departed Pago Pago Harbor aboard GAS R/V Alofaga at 1815 hours with Shigeru Yano, GAS skipper, Wally Thompson, Chartering skipper, and five Samoan crew members.

May 4, 1976: Passed Ta'u Island at 0400 hours. Conducted continuous seabird transect from 0620 hours until 1702 hours. The boat sailed in an east direction, turned north to search for Rose at 1400 hours, turned east at 1500 hours, and headed south at 1552 hours. Rose Atoll was sighted at 1702 hours. The Alofaga anchored at 1830 hours. A Boston Whaler was placed in the water and loaded with scientific personnel and equipment by 1900 hours. An attempt at 1930 hours to go ashore via the atoll's channel proved futile. The tide was low causing the current in



the channel to be extremely swift (estimated by Swerdloff to be at least 10 knots). The boat was unable to traverse the swift current despite trying for approximately 30 minutes. The motor propellor ultimately hit a coral head causing the boat to float back out the channel. Fortunately the current carried the boat close to the Alofaga and by rowing all returned safely aboard by 2015 hours.

May 5, 1976: Landed all scientific personnel and equipment on Rose Island by 0900 hours. Personnel on the second boat trip stopped briefly at Sand Island. Base camp was established on the west-southwestern shore of Rose Island. Activities included setting up microclimate data station, conducting preliminary seabird censuses, setting up Sherman rat trap transects, inspection for skinks and geckos, inspecting flora, inspecting for signs of human trespass activity, counting fresh sea turtle tracks, and censusing sea turtle activity after dark.

May 6, 1976: Inspected for fresh sea turtle tracks, checked and reset Sherman rat trap lines, intensified bird censusing especially counting nests, inspected for geckos, inspected vegetation especially Pisonia trees, photographed wildlife and wildlife habitat, censused sea turtle activity after dark.

May 7, 1976: Inspected for fresh sea turtle tracks, checked and removed Sherman rat trap lines, continued bird censusing, mapped representative Pisonia 10 x 10 meter plots, inspected coconut trees, photographed wildlife habitat areas especially the dead Pisonia, broke camp, departed Rose Island at 1300 hours, stopped at Sand Island and censused birds. Departed Rose Atoll underway for Pago Pago Harbor at 1400 hours. Conducted continuous seabird transect observations from 1412 hours to 1738 hours.

May 8, 1976: Conducted continuous seabird transect observations from 0600 hours to 0735 hours. Alofaga docked in Pago Pago Harbor at 0745 hours. Removed equipment from Alofaga by 0830 hours.

## WILDLIFE HABITAT

### Soil

No soil samples were taken during this visit to Rose Island. Samples were, however, taken during the October 1975 visit. In general the black moist soil under the living Pisonia trees looked in excellent condition, while that in the Pisonia die-off area seemed to be dry and deteriorating.

### Microclimate

Maximum and minimum temperature recordings were taken each day at two sites while on Rose Island.



## Vegetation

Seven species of plants were observed on Rose Island by the ECI field team; none were found on Sand Island. The following species accounts summarize the status of each species.

Cocos Nucifera: The palm trees on Rose Island were considered in general to be in poor condition. Of the 19 numbered Cocos trees marked in October 1975, 2 were dead, 3 were in poor condition, 2 were in fair condition, and 12 were in good condition. Condition of fronds, numbers of nuts, and numbers of seedlings were recorded for each tree.

Pisonia grandis: The living Pisonia trees and the extensive Pisonia die-off area on Rose Island was examined by both ECI and GAS personnel. Healthy Pisonia trees remain along the south and east-central portions of the island while only a few live trees exist in the die-off area. At least two trees which had survived the initial die-off had fallen since the ECI visit in October 1975; their shallow root systems were exposed. New growth from fallen limbs occurred only on one of these dead trees. Decayed wood was observed at the base of several of the larger living trees while others had hollow bases. Representative study plots in the living Pisonia area were mapped. Photographs were taken of the die-off area as well as the study plots.

Messerschmidia (= Tournefortia) argentea: All of the Messerschmidia bushes appeared very healthy. Most were flowering; a few were fruiting. Most of the plants along the north edge of the Pisonia die-off area had grown to a height of 10 feet. A few seedlings were noted along the south and west upper-beach areas.

Boerhavia diffusa (?): Thick extensive mats of Boerhavia covered the open spaces on the southeast and west-central areas of Rose Island. Most plants were in flower; few fruit however, were observed.

Portulaca lutea: Sparse patches were found throughout the bare portions of Rose Island. A few flowers and fruits were observed.

Suriana maritima: The single Suriana plant found on the east-central side of Rose Island in October 1975, still is in a healthy condition. Its height was estimated to be 1.5 meters. Several yellow flowers were photographed; a few fruit were also present. No seedlings were found.

Ipomoea macrantha: The single Ipomoea vine found in the north-central portion of the Pisonia die-off area in October 1975, had multiplied and spread to an area approximately 15 x 30 feet. Several large white flowers were observed and voucher specimens were collected; no fruits were found. This vine is expected to spread rapidly over the surrounding area.



## WILDLIFE

### Birds

Seventeen species of birds were observed during the visit. One land bird species, the Long-tailed New Zealand Cuckoo, is a new range extension to the atoll. One seabird species, the Lesser Frigatebird, was found to be nesting which is a new breeding record for the atoll. Maximum populations occurred at night.

Species previously recorded but not seen during this visit include White-tailed Tropicbird and Bristle-thighed Curlew.

#### Phaethon rubricauda (Red-tailed Tropicbird)

Status: Resident breeding seabird on Rose Island. None present on Sand Island.

Population Estimate: Adults 40, young 6; active nests 16, 10 with eggs and 6 with hatchlings to almost fledged young.

Ecological Distribution: Nests Placed under Messerschmidia bushes and at bases (including hollowed out portions) of Pisonia trees. Individuals and courting pairs seen flying over Rose Island and lagoon.

#### Sula dactylatra (Blue-faced Booby)

Status: Resident breeding seabird on Rose Island. None present on Sand Island.

Population Estimate: Adults 30; active nests 2, 1 with 1 egg and 1 with 2 eggs.

Ecological Distribution: Most adults roosted in large club on Boerhavia covered open space on the southeast area of Rose Island. One nest placed in above area; another nest on similar portion of the west-central area of Rose Island.

#### Sula leucogaster (Brown Booby)

Status: Resident breeding seabird on Rose Island. None present on Sand Island.

Population Estimate: Adults 700; young 5; new nests 212; nests with chicks 5 (1 small and 1 large downy chick, 3 fledglings).



Ecological Distribution: Nests placed under Pisonia (73) and Messerschmidia (100), as well as on the open Boerhavia areas (39). Non-nesting adults roosted on the ground near the nesting sites as well as on the Messerschmidia bushes, Cocos trees, and Pisonia trees.

Sula sula (red-footed Booby)

Status: Resident breeding seabird on Rose Island. None present on Sand Island.

Population Estimated: Adults and subadults 1,000. Two inactive nests seen in Messerschmidia. Most adults were dark phase individuals.

Ecological Distribution: Adults and subadults roosted in Messerschmidia bushes and Pisonia trees.

Specimens: Two skeletons of already dead birds were collected.

Fregata minor (Great Frigatebird)

Status: Resident breeding seabird on Rose Island; none were recorded as breeding during this visit. None observed on Sand Island.

Population Estimate: Adults and subadults maximum of 50 at night, from 10 to 15 circling during day.

Ecological Distribution: Roosted at night in tallest Pisonia trees in center of island; commonly seen during day circling above Rose Island and the lagoon.

Fregata ariel (Lesser Frigatebird)

Status: Resident breeding seabird on Rose Island. Not seen on Sand Island. This is a new breeding range extension for this species.

Population Estimate: Adults 60 at night; 20 to 30 circling during day. Nests 10 (8 active nests and 2 inactive); broken eggs observed on ground under nests.

Ecological Distribution: Roosted day and night in tallest Pisonia trees; commonly observed during day circling above Rose Island and the lagoon. Nests placed in 85 to 100 foot high Pisonia trees in center of Rose Island. Courtship behavior observed; males with extended gular pouches displayed in nesting area.

Egretta sacra (Reef Heron)

Status: Resident breeding wading bird on Rose Island; no breeding observed during this visit.

Population Estimate: Adults 7 (white 3, black 3, mottled 1).

Ecological Distribution: Observed wading throughout the shallow areas of the reef and around Rose and Sand Islands. Roosted at night on high exposed coral heads of reef. Inactive nests present under hollowed out bases of largest Pisonia trees on Rose Island.

Pluvialis dominica (Golden Plover)

Status: Migrant visiting shore bird. Present on Rose and Sand Islands.

Population Estimate: Maximum 10 to 15 on Rose; 1 on Sand Island.

Ecological Distribution: Observed on beaches and inland areas of Rose; seen on the beach at Sand.

Arenaria interpres (Ruddy Turnstone)

Status: Migrant visiting shore bird. Present on Rose and Sand Islands.

Population Estimate: Maximum 10 to 15 on Rose; 2 on Sand.

Ecological Distribution: Present on beaches and exposed sand areas of Rose; seen on the beach at Sand.

Heteroscelus incanus (Wandering Tattler)

Status: Migrant visiting shore bird on both Rose and Sand Islands.

Population Estimate: Minimum 4, maximum 6 on Rose; count of 2 on Sand.

Ecological Distribution: Primarily observed on beaches of Rose and Sand Islands; occasionally observed inland.

Crocethia alba (Sanderling)

Status: Migrant visiting shorebird on Rose Island.

Population Estimate: Count of 2 on Rose; none seen on Sand.

Ecological Distribution: Seen only on beaches of Rose.

Sterna lunata (Gray-backed tern)

Status: Resident breeding seabird on Sand Island; none observed on Rose Island.



## Sooty Tern?

Population Estimate: Adults up to 10,000+; highest count after dark, lowest count (several 100) at dawn.

Ecological Distribution: Pre-breeding activity observed; all birds during this visit were in flight over the island. Swirling flock formed during late morning downwind of Rose. Flock gradually built up in number as day progressed with mass moving closer to Rose as night approached. Flock swirled low over Rose after dark until 0300 to 0400 hours when most left.

### Anous stolidus (Brown Noddy)

Status: Resident breeding seabird on Rose and Sand Islands. Not breeding during this visit.

Population Estimate: Adults 10 on Rose; none on Sand.

Ecological Distribution: Observed flying singly over island and occasionally roosting in Messerschmidia during day. Primarily seen about island at dusk and roosting in Messerschmidia at night.

### Anous tenuirostris (Black Noddy)

Status: Resident breeding seabird on Rose Island; none on Sand Island.

Population Estimate: Adults 10 on Rose; none on Sand.

Ecological Distribution: Observed flying singly about Rose during daytime. Primarily seen at dusk and at night roosting in Pisonia and Messerschmidia trees.

### Gygis alba (White Tern)

Status: Resident breeding seabird on Rose Island. Not breeding during this visit.

Population Estimate: Adults 40.

Ecological Distribution: Present during day flying about Rose. Roosting both day and night in Pisonia and Messerschmidia trees.

### Urodynamis taitensis (Long-tailed New Zealand Cuckoo)

Status: Migrant visiting land bird on Rose Island; none observed on Sand Island. This is a new range extension and new specimen record for Rose Atoll.

Population Estimate: Observed in the Pisonia forest area and adjacent dense Messerschmidia portions of Rose. Seen feeding on caterpillars; very vocal when approached or disturbed by humans.

Specimens: A single tail feather was found on the forest floor and was collected.

#### Mammals

One mammal species, the Polynesian Rat, was recorded during this visit. No porpoises were observed inside the lagoon or outside the atoll.

#### Rattus exulans (Polynesian Rat)

Status: Resident introduced breeding rat.

Population Estimate: Trap data has not been analyzed. Sherman traps totalling 30 were set in the Pisonia forest for 2 nights and were checked both afternoon and morning. Trapped animals were marked and released. Population appeared higher than during October 1975 visit.

Ecological Distribution: Primarily observed in vegetated areas, especially in Pisonia forest where they were commonly seen day and night. Several seen in Pisonia trees feeding on fruit.

Specimens: Eight Polynesian Rats were collected prior to leaving Rose Island.

#### Reptiles

Two lizard species were recorded from Rose Island during the visit. One species, Gehyra oceanica, is a new range extension. No Hawksbill Turtles were seen and only a few Green Sea Turtles were observed.

#### Gehyra oceanica (Polynesian Gecko)

Status: Resident breeding gecko on Rose Island. This is a new range extension.

Population Estimate: Common.

Ecological Distribution: Observed by day in rotted Pisonia tree stumps and at night on live Pisonia trees and on the concrete "Rose Island" marker.

Specimens: Ten were collected.

#### Lepidodactylus lugubris (Mourning Gecko)

Status: Resident breeding gecko on Rose Island.



Population Estimate: Uncommon.

Ecological Distribution: Observed in rotted Pisonia tree stumps and bases of Messerschmidia trees in litter and coral rubble.

Specimens: Seven were collected.

Chelonia mydas (Green Sea Turtle)

Status: Resident breeding sea turtle on Rose and Sand Islands; no breeding observed during this visit.

Population Estimate: Adults 3, yearlings 1, hatchlings 0.

Ecological Distribution: Swerdloff observed one adult while SCUBA diving in the lagoon; he and Swan from the skiff saw two additional adults near the reef inside the lagoon. One yearling seen by Amerson and Schwaner just off the south beach in shallow water. Old nests were present on both Rose and Sand Island.

TRIP REPORT  
ROSE ATOLL NATIONAL WILDLIFE REFUGE  
November 21-24, 1974

Personnel:

Dr. Stanley Swerdloff, Director of Marine Resources, Government of American Samoa

Dick Wass, Biologist, Government of American Samoa

Palmer C. Sekora, Refuge Manager

Itinerary:

November 21 Left Pago Pago, American Samoa at 0845 hours aboard the Government of American Samoa boat Alafanga.

November 22 Arrived Rose Atoll at 1030 hours, conducted wildlife surveys, erected refuge signs, conducted surveys throughout the night.

November 23 Conducted wildlife surveys in a.m. Left Rose Atoll at approximately 1600 hours.

November 24 Arrived Pago Pago, American Samoa, at 1100 hours.

General:

Rose Atoll was visited for the express purpose of wildlife surveys and the erection of refuge recognition signs. This was done in cooperation with the Government of American Samoa using their boats and equipment and personnel. We were able to spend approximately one and one-half days on the atoll which enabled us to make significant turtle observations.

Vegetation: Very significant die off of the pure stand of the buka trees, Pisonia grandis, has occurred for some unknown reason. The entire population of trees have no foliage whatsoever, the bark has fallen from the trees, and most of the trees have toppled onto the ground. There is no apparent reason for this, no insects or parasites could be found on or in the trees. Dr. Swerdloff stated that this has been a relatively dry year, they have experienced drought conditions on American Samoa to the extent that the tuna canneries had to be closed. So this might possibly be the reason. Pictures will be shown to dendrologists at the University of Hawaii to solicit their ideas.



Fairy tern: Very common during our period of stay. A total of 325 adults were observed, no nesting occurring.

Golden plover: Only one observed.

Ruddy turnstone: A flock of four noted throughout the visit.

Bristle-thighed curlew: One was seen on the western corner of the island.

Reef heron: Three noted during our stay.

#### REPTILES

Green sea turtle, Chelona Mydas: Was the most abundant turtle noted. Only two specimens of the hawksbill turtle, Eretmochelys Imbricata were observed. Rose Atoll is a very significant nesting population for the green sea turtle. Our survey found 135 recent dug pits on Sand Island, 173 recent dug pits on Rose Island, and 124 old pits on Rose Island. This compares with 301 pits of varying ages noted by Stan Swerdloff in 1970 on both Sand and Rose Atoll. As with that observation, no distinction was made between false and active pits. During the night ten large females and one large adult was noted coming onto the island. One female was observed in the act of laying eggs. This is the only known observation ever made of the actual egg laying process on Rose. Another significant observation was of six green sea turtle hatchlings emerging from the nest. This is the first record observation of hatchlings. Equally significant was the observation of rats attacking two of the hatchlings. We interrupted both of the attacks before the hatchlings were killed, one hatchling only had part of the shell chewed away and the other one had a large part of the head including both eyes missing. Because of the very large population of Polynesian rats, predation upon the hatchlings may be very significant. Hopefully the upcoming Federal Aid studies for American Samoa will indicate the importance of this rat predation.

Both islands consist primarily of coral debris, that is, large chunks of coral ranging anywhere from 1/4" to 2-1/2" in size with even larger pieces than that existing. There are no sand beaches as found in the Leeward Islands. It appears that any digging by the turtle would be very difficult because of the nature of the coral debris. No vegetation occurs on Sand Island, apparently frequently washed over by high storm waters. It should also be noted that no basking turtles were noted during our visit. According to Stan, none have been seen basking. Stan also reports



\* that in the latter part of August during a routine surveillance flight that he estimated approximately 200 turtles in the lagoon area.

Stan informs me that the hawksbill turtle nests here in the early part of the year (May, June, and July), where the green sea turtle nests in August, September, October, and now definitely in November. John Maciolek of the Hawaii Cooperative Fishery Research Unit reports that he saw green sea turtle hatchlings from the main Samoan group during April. The hawksbill turtle was noted to be nesting earlier on this island, however the nesting numbers are not known.

#### MAMMALS

The only mammal known to occur on Rose Atoll is the Polynesian rat, Rattus exelans, which is common throughout the rest of Polynesia. We noted several hundred rats during our stay. They tend to remain within the vegetated area during daylight hours, venturing out on the coral flats at night. Again predation was noted but only on the green sea turtles since no young birds were on the island. We noted no predation on bird eggs.

One small sperm whale observed on November 23, approximately fifteen miles west of Rose Atoll. Twenty-seven pilot whales were observed five miles southeast of Tutuilla.

#### Other Notes:

A meeting was held with George Wray regarding surveillance flights to Rose Atoll. Due to the intensity and significance of the turtle nesting at this time, I requested that George along with representatives of the Department of Marine Resources, make surveillance flights to Rose Atoll every two weeks through February 1975. These flights are scheduled for December 11 and 26, January 8 and 21, and February 5. At that time we should know whether this intensive surveillance should continue. George did ask if they had any indication of any foreign vessels or any trespass occurring on Rose Atoll, whether they should investigate or not. I informed George that they should have either Stan Swerdloff or Stan's designee accompany them if this was the case. However, they do have our permission to check it out and make appropriate observations on people, boat identification, etc., if the situation so dictates.

I discussed the need for a signed agreement per Portland's request. George did sign an agreement that they will provide flights to the area at the rate of \$300. However, after February 5, George would



## BIOLOGICAL ASCERTAINMENT - ROSE ATOLL, AMERICAN SAMOA

November 3-4, 1971

Eugene Kridler

### I. LOCATION

Rose Atoll is an uninhabited possession of American Samoa that lies about 78 miles ESE of Tau Island, in the Manua group, the most eastern of the inhabited islands, and about 150 miles ESE of Pago Pago on the island of Tutuila. It is about 872 miles south of the equator. The exact location is Lat.  $14^{\circ}32'52''S$  and Long.  $168^{\circ}08'34''W$ .

### II. HISTORY

Both Bryan (1939) and Sachet (1934) discuss the history of this atoll. The first European, Louis de Freycinet saw Rose Atoll on October 2, 1819 when his ships "l'Uranie" and "la Physicienne" sailed close by it (Bryan, 1939 and Sachet, 1934). He is reported to have named it after his wife who accompanied him. The next recorded observations were made by Otto van Kotzebue who passed the atoll on April 2, 1824 and named it Kordinkoff. On September 23, 1838, it was observed and briefly described from less than a mile away by D'Urville. Members of the U. S. Exploring Expedition under Commodore Charles Wilkes landed on the island on October 7, 1839 and spent the day studying its geology and natural history. About 25 years later Captain Rantzau visited the island several times while trying to establish a fishing

rats or have attained a balance of some type, if frigate birds prey upon rats (lacking the strong talons of a hawk or owl even though possessing a formidable beak, these birds might find a rat an entirely different customer from a tern chick), or whether rats take small turtles while the latter are making their way to the sea after hatching. Determining the relationship of rats with other forms of animal life on the island at various time of the year needs study.

### C. Reptiles

The green sea turtle, Chelonia mydas, probably of the subspecies japonica, has been reported as occurring here by a number of observers.

Rantzau (Sachet, 1970) related that this species comes to the sand island in great numbers to lay their eggs during August and September.

More seldom reported was the hawksbill turtle, Eretmochelys imbricata.

Large numbers of sharks preyed upon hatchlings as they entered the water. Swerdloff (1970) mentions seeing two adult turtles swimming in the water and of counting 301 pits of varying ages on Sand and Rose Island on August 21, 1970. No distinction was made between

false and active pits. During our 1971 visit, two large females were observed at night on the island. One spent almost two hours moving over much of the central part of the island, giving every appearance of searching for a nesting site, before making its way back down to the lagoon edge where it was eventually tagged before it entered the water. Another large female was resting high up on the beach about the same length of time. It, too, was tagged just before it decided to reenter the water (Nos. 1080 and 1082 - double tagged duplicate numbered tags). No nests were noted to have hatched that night. A

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total of 20 nest pits were also noted on Sand Island. No hawksbill turtles were observed during this visit.

Based on these observations and those by other visitors, it appears that Rose Atoll is an important nesting area for the green sea turtle, and possibly the hawksbill, in this part of the Pacific.

#### D. Fish

The lagoon and the surrounding waters of the atoll contain relatively undisturbed populations of fish. Swerdloff (1970) states that Schultz made extensive collections of fish in 1939. He published his findings in 1943. Some collecting of fish just outside the reef was done during our visit, but this was not done on a systematic basis. Species caught appeared to be those common in the Indo-Pacific area.

#### E. Molluscs

Swerdloff (1970) collected 36 species of molluscs in 1970, 12 of which belonged to the genus Cypraea. Large numbers of Tridacna ranging up to almost a foot in width occur in many places on the reef, but no large specimens of this giant clam were noted during the 1970 visit. This clam is highly relished by the Samoan people.

#### IV. Development

No development of this area is warranted. Conditions should be kept as natural as possible. Signs should be placed on both islands. A large refuge recognition sign should be erected on Rose Atoll. Smaller signs should contain information in Japanese, Chinese and Korean script which calls attention to the refuge status of the atoll and prohibits trespass.

No. 358155.

Reef Heron - Demigretta sacra: Two birds in the white plumage phase were seen on the reef about half way between Rose and Sand Islands. Reported by others in the past, this species appears to be a regular but sparse visitor to Rose Atoll.

#### B. Mammals

The only mammal known from Rose Atoll is the Polynesian rat, Rattus exelans, which is common throughout Polynesia. During our visit, we estimated that there were at least several thousand present on Rose Island. Most tended to remain under the cover of the Pisonia trees during the daylight hours, and at this time as many as 25 could be easily counted within a radius of 15 feet. They foraged over much of the island during the night. Although no actual predation was noted by these animals on sooty tern chicks, some eggs of this species of bird contained holes which appeared to have been inflicted by some predator. In a number of cases, rats were observed to pass within a foot from the chicks - with both mammal and bird apparently totally ignoring each other. Whether rats prey upon fresh eggs or very young chicks of these or other species of birds is unknown. They are accomplished climbers here. Opportunists, they may feed on whatever may be available at the time. Another enigma is the total lack of burrows of shearwaters or petrels and also the complete lack of any adults or young of these species. Wedge-tailed shearwaters were commonly observed at sea less than 25 miles from the atoll. Whether rats through the many years eliminated these types of birds as nesting entities is a moot question. Other questions needing answers are whether other seabird populations have been reduced in numbers by



11-3-4-1971

2. Ridley & Nass

rate or have attained a balance of some type, if frigate birds prey upon rats (lacking the strong talons of a hawk or owl even though possessing a formidable beak, these birds might find a rat an entirely different customer from a tern chick), or whether rats take small turtles while the latter are making their way to the sea after hatching. Determining the relationship of rats with other forms of animal life on the island at various time of the year needs study.

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The green sea turtle, Chelonia mydas, probably of the subspecies japonica, has been reported as occurring here by a number of observers. Rantzen (Sacher, 1970) related that this species comes to the sand island in great numbers to lay their eggs during August and September. More seldom reported was the hawksbill turtle, Eretmochelys imbricata. Large numbers of sharks preyed upon hatchlings as they entered the water. Swerdloff (1970) mentions seeing two adult turtles swimming in the water and of counting 301 pits of varying ages on Sand and Rose Island on August 21, 1970. No distinction was made between false and active pits. During our 1971 visit, two large females were observed at night on the island. One spent almost two hours moving over much of the central part of the island, giving every appearance of searching for a nesting site, before making its way back down to the lagoon edge where it was eventually tagged before it entered the water. Another large female was resting high up on the beach about the same length of time. It, too, was tagged just before it decided to reenter the water (Nos. 1080 and 1082 - double tagged duplicate colored tags). No nests were noted to have hatched that night. A

Personnel:

Dr. Stanley Swerdloff, Director of Marine Resources, Government of American Samoa

Dick Wass, Biologist, Government of American Samoa

Palmer C. Sekora, Refuge Manager

3

Fairy tern: Very common during our period of stay. A total of 325 adults were observed, no nesting occurring.

Golden plover: Only one observed.

Ruddy turnstone: A flock of four noted throughout the visit.

Bristle-thighed curlew: One was seen on the western corner of the island.

Reef heron: Three noted during our stay.

REPTILES

Green sea turtle, Chelona Mydas: Was the most abundant turtle noted. Only two specimens of the hawksbill turtle, Eretmochelys Imbricata were observed. Rose Atoll is a very significant nesting population for the green sea turtle. Our survey found 135 recent dug pits on Sand Island, 173 recent dug pits on Rose Island, and 124 old pits on Rose Island. This compares with 301 pits of varying ages noted by Stan Swerdloff in 1970 on both Sand and Rose Atoll. As with that observation, no distinction was made between false and active pits. During the night ten large females and one large adult was noted coming onto the island. One female was observed in the act of laying eggs. This is the only known observation ever made of the actual egg laying process on Rose. Another significant observation was of six green sea turtle hatchlings emerging from the nest. This is the first record observation of hatchlings. Equally significant was the observation of rats attacking two of the hatchlings. We interrupted both of the attacks before the hatchlings were killed, one hatchling only had part of the shell chewed away and the other one had a large part of the head including both eyes missing. Because of the very large population of Polynesian rats, predation upon the hatchlings may be very significant. Hopefully the upcoming Federal Aid studies for American Samoa will indicate the importance of this rat predation.

Both islands consist primarily of coral debris, that is, large chunks of coral ranging anywhere from 1/4" to 2-1/2" in size with even larger pieces than that existing. There are no sand beaches



TRIP REPORT  
ROSE ATOLL NATIONAL WILDLIFE REFUGE  
October 20-25, 1975

Personnel:

A. Dinion Amerson, Jr., Principal Investigator and Project Manager (Wildlife Ecologist), Environment Consultants, Inc., Pago Pago, American Samoa

John J. Kuruc, Chief Scientist (Botanist), Environment Consultants, Inc., Pago Pago, American Samoa

Dr. Richard C. Nass, Fishery Biologist, Office of Marine Resources, Government of American Samoa, Pago Pago, American Samoa

G. Fred Zeillemaker, Assistant Refuge Manager, Kilauea, Hawaii

Reptiles:

After landing on Rose Island, we found a gecko (Lepidodactylus sp.) in the bottom of a container of equipment. It was suspected that the animal was brought ashore in the gear, so it was immediately dispatched.

Green sea turtle (Chelonia mydas) tracks appearing recent counted upon our arrival totaled 52 (indicating about 26 animals). An estimation of the time span involved would be difficult to make. Turtle track counts during our visit (October 21-22: 3, October 22-23: 3, October 23-24: 1) indicated an average of two to three animals per night. A garden rake would have been handy to "erase" tracks each day. A huge adult was caught at low tide on the reef adjacent to the north shore of Rose Island the morning of October 23. When the rising tide buoyed her at 0700 hours, she walked off across the reef. A very small turtle believed to be no more than a few days old was found swimming outside the entrance to the lagoon on October 22.

Our survey indicated 247 pits on Rose Island (29 on west side, 210 on east side, 8 on southeast side), and 148 pits on Sand Island. The count of 395 is believed comparable to the 432 total pits counted in November, 1974.

GOVERNMENT OF AMERICAN SAMOA  
OFFICE OF THE GOVERNOR  
PAGO PAGO, AMERICAN SAMOA, 96799

10-20-12 Refer to

April 4, 1977

Serial: 532

To: Director, Marine Resources  
From: Government Ecologist  
Subject: Rose Island Report

On March 29, I visited Rose Atoll via South Pacific Island Airways with four other observers. Just before we got to the island, we experienced some heavy clouds on the way. However, when we arrived there, it was clear.

I noticed the following things:

- ✓ 1) About 50 turtle double tracks
- ✓ 2) I estimated 120-150 turtle single tracks
- 3) 4 turtles were seen in the lagoon
- 4) Birds were seen on both Sand Island and Rose Island
- 5) There was no boat seen close to the island.

Generally speaking, the island appeared to be in good condition and no major problem visualized.

  
RATI FALAI





GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

Serial: 308-7

ROSE ATOLL NATIONAL WILDLIFE REFUGE  
(Trip Report June 21, 1977)

Personnel:

Henry Sesepasara, Manager, Office of Marine Resources,  
Government of American Samoa; Robert L. Mehl, U.S. Coast  
Guard.

Itinerary:

Left Pago Pago International Airport - 0910  
Arrived Rose Atoll - 1020  
Left Rose Atoll - 1045  
Arrived Pago Pago International Airport - 1151

Weather Conditions:

Cloudy day; easterly wind at about 10 knots; sea rough,  
low tide.

Wildlife Observation:

- a. Turtle tracks:  
Rose Island - 14 tracks seen  
Sand Island - 14 tracks seen
- b. Birds:  
16 brown bobby nesting were seen on top  
of trees; a rough estimate of about 400  
friget birds were concentrated on Sand Island.
- c. Vegetation:  
Green and healthy - the big sign on  
Rose Island is covered with trees.
- d. Signs:  
All signs are in good shapes.
- e. There was no sign of human activity seen on the  
atoll, and no vessel was sighted within the  
vicinity.



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

Serial: 309-7  
DMN:hs:fm

ROSE ATOLL NATIONAL WILDLIFE REFUGE  
(Trip Report July 28, 1977)

Personnel:

Henry S. Seseapasara, Manager of Marine Resources,  
Government of American Samoa; B.J. McLaverty-YN-2,  
U.S. Coast Guard; Misa Malala, Biological Technician,  
Office of Marine Resources, Government of Amer. Samoa.

Itinerary:

Left Pago Pago International Airport - 0953  
Arrived Rose Atoll - 1045  
Left Rose Atoll - 1111  
Arrived Pago Pago International Airport - 1217

Weather Conditions:

Clear day - easterly wind at about 8 knots.  
Tide - low.

Wildlife Observations:

- a. turtle tracks:  
Rose Island - 14 tracks  
Sand Island - 8 tracks
  - b. birds  
18 nestings were observed on the tree tops.
  - c. vegetation  
green and healthy
  - d. signs  
all signs look alright.
3. No sign of human activity on the atoll, and no boat seen within the vicinity.





GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799

In reply refer to:

OFFICE OF MARINE RESOURCES

Serial: 310-7  
DMN:hs:fm

ROSE ATOLL NATIONAL WILDLIFE REFUGE  
(Trip Report August 23, 1977)

Personnel:

Henry S. Sesepasara, Manager, Office of Marine Resources,  
Government of American Samoa; Jim Clancy - E-4, U.S. Coast  
Guard.

(Rose Atoll Report Aug. 23, 1977)  
Page two.....

e. Lagoon survey:

Two turtles were seen in the lagoon (one in the center of the lagoon and the other near the channel entrance). Four sharks were seen along the lagoon shore-line. Few birds seen flying above the lagoon.

f. No sign of human activity seen on the atoll, and no vessel was sighted within the vicinity.

APR 19 1978

TRIP REPORT  
Rose Atoll National Wildlife Refuge  
March 28 - 30, 1978

Personnel:

Richard A. Coleman, Refuge Biologist, Honolulu, Hawaii

Pat Byran, Fishery Biologist, Office of Marine Resources,  
Government of American Samoa.

Mammals: Rats were extremely abundant in the center part of the island, under the Pisonia canopy. They appeared to the refuge biologist to be the black rat, Rattus rattus and not the Polynesian rat earlier reported on the island. 4 traps were set but none caught during the day.

✓ Green Sea Turtles: Only one recent turtle track was seen on the east side of Rose Island, which lead to a small pit under a Messerchmidia 10 m. from the shore. Old pits were noted along the east side of Rose Island and the center of Sand Island. Some of these pits(4) appeared more recent perhaps a month old. Old ribs bones of a turtle were found on Sand Island and left there. A green turtle (30" carapace) was seen in the channel. No other turtle signs were noted.

Other Wildlife: Numerous black-tipped sharks (20-40cm) were seen around the edge of Rose Island. Large schools of mullet (100-200) were close to shore.

Other Notes:

Debris such as bottles, floats and wood was notably lacking on the islands. One glass float, two plastic floats and approximately 6 bottles were ashore. There was no indication of high waves on the islands as earlier reported by H. Sessapasara, on his Feb. aerial survey of Rose Atoll.

The Refuge sign on Rose Island was in excellent shape, some Messerchmidia had to be cleared from blocking the sign. The metal F&W signs were also in good shape on both islands. Future replacement of these signs will require Lag screws not bolts. No signs of human trespass were seen.

*Richard A. Coleman*

Richard A. Coleman  
Refuge Biologist





GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

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In reply refer to:  
Serial:602  
DMN:DIS:vs

ROSE ATOLL NATIONAL WILDLIFE REFUGE  
(Trip Report Wed June 7, 1978)

Personnel:

David I. Swan, Fishery Biologist, Office of Marine Resources. Rick Stoher and Bert Morris, U.S. Coast Guard, Pago Pago.

Itinerary:

Arrived over Rose Atoll 1:05 p.m. and departed 1:25 P.M.

Weather Conditions:

Clear day - easterly wind 8 - 10 knots.  
Tide - low.

Wildlife Observations:

- a. Turtle tracks:  
Rose Island. one clear set of tracks on beach on east side of Is. Several older tracks and signs of nesting on the clear terrace on the east side.  
Sand Island: Several tracks, but could not tell if they were recent.
- b. Birds - many birds on Island.
- c. Vegetation - looked normal.
3. No sign of human - activity on the atoll, no boats seen near the atoll.



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

May 10, 1979

ROSE ISLAND TRIP REPORT

May 8, 1979

On May 8, 1979, I was accompanied by YN2 Joseph R. Stafford and MK2 Steven R. Peters on a charter flight to Rose Atoll. During the numerous passes we made over the atoll, we counted 4 turtles inside the lagoon and two in the water near outer reef edge. There were no sightings of recent nests or tracks on the beaches of the island and the sand bar, however, there were marks on the upper reaches of the north beach on the island which may have been older nesting tracks.

The bird population was notably less than experienced on a previous flight which I had participated in last year.

Flora on the island appeared normal and there was no visual evidence of damage from storms or of human encroachment.

Several longline floats were spotted on the reef north of the island and two others were seen floating in the S.E. corner of the lagoon, neither appeared to be connected to fishing gear and were most likely remnants which drifted over the reef from the open ocean.

ROGER PFLUM

RP/tmt



October 10, 1979

To: Richard C. Wass  
From: Jerome D. Laupapa  
Subject: Rose Island Aerial Survey

The survey was to determine a number of aspects regarding:

1. Invaders on or around island vicinity
2. Condition of island
3. Inhabitant life and activities

The first was negative. Other than the debris washed ashore, no human life or disturbance was noted. The second was quite hard, since that was my first trip to the island. However, at low tide, the exposed shelf was stripped by deep narrow valleys of eroding coral. Two such gaps forms channels wide enough for big fishes like sharks to enter the lagoon, although no such fishes were sighted. The third was quite interesting. As was observed, other than birds, the only other land inhabitants were turtles. Their tracks, like elongated centipedes, criss cross as they stretched from the water edge to a round patch of the only-green life on the island.

Because of the height and speed of the survey craft, it was hard to note if one track is the continuation of another, or a new set of tracks altogether, or whether they led inland or out. But we did spot some turtles (species unknown) and of the (17) I saw, only (5) were on dry grounds, all heading inland. All others were leisurely basking on the lagoon surface. Some were slightly submerged, seemingly struggling to go deeper. There were probably more than these. Though not spotted.

After several sweeps on the outskirts of the reef, we cut across the lagoon several more times for closer observation before we left. Nothing of importance was noted further.

On the first leg of the trip (Pago-Manu'a) we spotted freighter about fifteen minutes out. Returning, we spot a fishing vessel about five minutes off Manu'a.

Turtles

Observations concerning turtles at Rose Atoll were done with the following objectives in mind. Obtainment of the objective is as indicated. Development of the objectives was done through coordination with George Balazs of the National Marine Fisheries Service in Honolulu.

- A) Count the number of nesting pits on each island that appear to have been made during the past 3 months.

Sand Island: I counted recent pits on the morning of 11/19/81 at a time when the tide was low. There were 43 pits.

Rose Island: I did not have time to count the pits on this island.

- B) Count the number of sets of tracks on Rose Island visible at low tide in the intertidal zone to estimate the number of turtles coming ashore each night.

11/18/81. Two turtles came ashore during the previous night. One was observed but escaped before I could tag and measure it. No nests were dug that evening.

11/19/81. Two sets of tracks were found in the morning but no nests were made. Turtles had not been observed during the evening. No nests had been constructed.

11/20/81. Three turtles were tagged and measured during the evening. No additional sets of tracks were observed.

- C) Double tag as many turtles as possible.

The following turtles were caught, tagged, measured and released:

11/18/81 10:45 AM

A hawksbill turtle was caught at the lagoon end of the



entrance channel to the lagoon in 2 meters of water by Dr Dick Wass during a slack tide.

Old tag numbers: none

New tag numbers: 5801, 5802

Carapace length: 43.5 cm along the curve

Photos were taken and the turtle was released at the south end of Rose Island.

11/19/81-11/20/81 evening

1) Green sea turtle. 11:00 PM during low tide.

The turtle had reached the vegetation line on the sea side of the south end of Rose Island and had made a false nest and was returning to the water when William Pedro saw it and flipped it on its back. The beach in this area is sandy.

Old tag numbers: none

New tag numbers: 5304, 5805

Carapace length: 106 cm along the curve

After being flipped upright the turtle escaped into the water. We had been surprised that the turtle had come up in this area at this time because, with the exception of the beach itself, the bottom was composed of the coralline algae and rubble and was exposed.

2) Green sea turtle. 11:45 PM during low tide.

Tracks indicated that a turtle came out of the water, built a false nest, headed back to the water, came back to the vegetation line and built two more false nests. I observed the turtle at that time but Dick Wass said that he had seen the turtle when it was building the first nests. I flipped the turtle when it attempted to head for the water and then tagged and measured it.

Old tag numbers: none

New tag numbers: 5807, 5808

Carapace length: 94 cm along the curve.

The turtle returned to the water after the tagging operation in the same location that it had come out. That was on the lagoon side of the northwest side

of Rose Island in a sandy beach area.

3) Green sea turtle. 2:00 AM during a rising tide. I saw tracks in the sand that went up to the vegetation and then back to the water with a false (?) nest being built while the turtle was in the vegetation. At the point where the tracks were awash, either the same turtle or another had come out of the water and moved to the vegetation. These tracks were wet and led to a wet turtle which was under the vegetation. This turtle had not started to dig. I was able to tag and measure this turtle without flipping it.

Old tag numbers: none

New tag numbers: 5809, 5810

Carapace length: 106 cm along the curve.

The turtle escaped to the water after I finished the tagging operation. The turtle was at the north end of Rose Island in a sandy beach area.

D) Record existing tag numbers or remove old tags and apply new ones.

No turtles with old tags were observed.

E) Additional observations

- 1) A large male green turtle was observed over a sandy area at the south side of the lagoon
- 2) A small male was observed in the same area.
- 3) A large turtle that appeared to be sleeping was seen in a cave in the side of a coral pinnacle on the south-west side of the lagoon. Sex unknown.
- 4) A large male and a large female turtle were spotted in the entrance channel.



Rose Atoll Field Trip Nov. 11-22, 1981

Participants: Gerald M. Ludwig, Asst. Refuge. Manager  
(Remote Islands)  
Maura Naughton, Ecologist, USFWS  
Dr. Richard Wass, Fishery Biologist, Office  
of Marine Resources, American Samoa Govt.  
William Pedro, Fisheries Assist. Office of  
American Samoa Govt.

General Itinerary: Nov. 11-15 Honolulu, Pago Pago  
Nov. 16 Manua Islands  
Nov. 17-20 Rose Atoll  
Nov. 21-22 Pago Pago  
Nov. 23 Honolulu

Specific Daily Activities:

- Nov. 11 Finished packing in office and left Honolulu about 4:30PM. Arrived in Pago Pago, American Samoa at 11:30PM. The truck that was to carry equipment to the lab was not there. Dr. Richard Wass, Maura Naughton, myself and an assistant from Office of Marine Resources (OMR) loaded the equipment in taxis in the rain and got it to the office. Arrived at the Rainmaked Hotel about 1:00AM.
- Nov. 12. Maura and I met with Dr. Richard Wass and Henry Sesespasara, Director of the Office of Marine Resources, to talk over our objectives of the trip and other points of mutual interest. We made arrangements to talk over the Memorandum of Agreement (MOA) concerning the joint management of Rose for later that day. Richard, Maura and I planned what other supplies were needed. Richard and I looked over our plans for the Tridacna study and did a lot of modification of the plans. Maura and I spent most of the day purchasing and trying to locate supplies. Mr. Sesespasara was too busy to confer on the MOA that day.
- Nov. 13 After an hour wait we met with Mr. Sesespasara and Dr. Wass about the MOA. They agreed with the terms of the agreement except that they felt that the wording should read American Samoa



Government instead of the Government of American Samoa. In addition they wanted the Agreement to address who should be paying for the trips to Rose Atoll. I suggested that this could be done on a trip by trip basis because of changing priorities and purposes for the trips. They agreed.

We also discussed the idea of meeting with the Korean and Taiwanese Fishery Agents. Henry stated that they had been met with recently by Dr. Shallenberger and by personnel from the National Marine Fisheries Service. Implication was that the meeting with NMFS was quite recent but a few days later Henry said that it had been a few years ago, but by then it was too late to make an appointment to see the agents. I asked if our concerns were filtering down to the individual fishing boats and Henry felt that it might not be. I suggested that a notice be distributed to the individual captains and Henry agreed but stated that we should have the notice translated to Korean, Japanese and Taiwanese.

We made arrangements to appear on Television for that afternoon and then continued to shop for supplies. That afternoon Maura and I were filmed and interviewed for the news. They utilized two of the photographs of Rose Atoll that we had with us also.

- Nov. 14. Maura was ill with possible dysentery. I shopped for supplies and later did some sightseeing. That evening papers on Tridacna clam biology and files on previous trips to Rose Atoll were reviewed.
- Nov. 15. Maura and I did the final purchases for the trip. We then packed and loaded supplies on the boat, Sausaumoana, which is a new experimental fishing vessel that the American Samoa Govt. has purchased. It is a multipurpose fisher and plans are that it will be used to teach fishing methods to the Am. Samoan fishermen. The boat is 56 feet long and includes provisions for pole, trolling, bottom fishing and longlining types of fishing.

The vessel left the dock at 11:30PM with crew, scientific party, passengers for the Manua Islands and a man from the OMR who was to install fish attraction bouys in the Manua Islands. In addition we were towing a small boat to the Manua Islands for one of their legislators.



Seas were very rough and the wind was up as soon as we left Pago Pago Harbor. The boat in tow broke away about a mile out of the harbor so there quite a delay while a new tow line was rigged.

Sleeping was nearly impossible due to the rough seas and the heavy rain.

Nov. 16. The vessel arrived at Ofu, Osega and Tau Island of the Manua group about 6:00AM. Most of the morning was spent dropping the man and boat that had been towed off at Tau Island and then setting the fish attracting/mooring bouys on the tops of submerged volcanos between Tau and Olasega Island. One of the bouys did not set upright until the warning light and part of the superstructure was removed.

Tau Island has a profile somewhat similar to Hawaii Island when Tau is viewed from the east. Ofu and Osega Islands are remnants of a similar volcano that has become separated into two sections by wave erosion. A shallow reef separates the two islands. They are connected by a one lane bridge.

The fishing bouys were set in 40 and 70 fathoms. In what appeared to be a rather dangerous operation because of the lack of anything other than manpower to drop them over the side.

We arrived at a small harbor on the northwest side of Ofu Island about noon. There was a message that I was to call Henry Sesespasara and that I was to fly back to Pago Pago immediately but it turned out that the message was for the Marine Options Agent that was with us.

*Advisory*

We had dinner with the village chief. Dinner consisted of pie and cake for the first course, then whole fish, cooked and raw, breadfruit, turban shells, rice and a coconut sauce wrapped in taro leaf. Maura and I walked to the airport on the southwest side of the island and then I continued on to the bridge that separates the two islands. On the way two species of rails, fruit bats, reef herons, yellow waddled and crimson honey eaters, white tailed tropicbirds and a few unidentified birds were spotted. Scenery is spectacular here.

A hurricane during the previous spring had destroyed part of the harbor breakwater and a number of cement block houses near the airport.

We left the harbor at 6:00PM and headed for Rose Atoll. Again sleep was nearly impossible due to rough seas.



Nov. 17. 7:00AM Arrived at Rose Atoll and did a bit of trolling for tuna beneath a flock of boobies, terns and noddies for about a half hour.

Three trips by small boat were required to unload supplies. We then set up camp and took a hike around the beach at Rose Island. Along the way I marked turtle tracks that were on the beach so that any turtles that came up during our stay could be recorded. A number of black tipped sharks, and some jacks and mullet were the principal fish that could be seen in the shallow water that surrounded the island.

After a bite to eat Dr. Wass, Bill Pedro and I decided on the locations where we were going to start our transects of the Tridacna clams and then went about doing it. The transects on the first day consisted of each of us swimming for five minutes and counting all clams that we saw. We then measured all clams that we came across during an additional five minutes. Most of the clams measured during the second five minutes were those spotted on the first transect. Each individual transector did his work in a different direction from the boat.

The transects during this part of the study were in the shallow (1-3 meters) area between the inner edge of the coralline algae reef top and the steep drop off at the lagoon edge. The transects were located so that two were done along each of the four sides of the lagoon at points that divided each side into thirds.

We were able to complete the southeast and southwest sides of the lagoon.

In addition to the transects we measured the tops of a number of the coral pinnacles in order to obtain some estimation of the areas that are covered with different types of habitats at a later time.

While we were doing the measurements Dr. Wass speared one of a pair of butterflyfish that we did not recognize. I later located a description that indicated that the fish is Chaetodon flavirostris and that its presence in American Samoa was not previously varified.

The measurements of the clams were the greatest distance along the long axis of the shell. Measurement consisted in catagorizing the clams into less than 50 mm, 50-150 mm and greater than 150 mm. The rational for this catagorization was that during



the survey that Dr. Wass had done the previous November he had found that there appeared to be a mode in a length frequency graph that may have represented young of the year recruitment. This mode was distinctly separated from the majority of the remaining clams by a distinct gape in the graph at about 50 mm. The 150 mm starting measurement for the larger group was based on the recommendations that Dr. Wass had proposed for a lower size limit on clams that might be harvested from Rose Atoll. This limit was based on adding a margin of size to the minimum size that these clams are suspected to become sexually mature at on the basis of work that has been done on them in Tonga.

5:30PM Returned to camp to cook and eat supper and to discuss the day's results and plan work for the evening.

8:00-10:30 Banded birds with Maura Naughton. We did the brown and masked boobies. The birds were weighed, sexed and banded. Rat traps set.

Nov. 18 11:30-2:00 The island was circled several times to search for turtles. One was seen on land but escaped to the water before I could tag or measure it. The turtle was on the northeast end of the island.

4:30-5:00AM Circled the island to check for turtles but none were found. Including the one that had been seen earlier there were tracks of two turtles that had come ashore during the evening.

7:30AM Got up, had breakfast and circled island to check for turtle tracks but none in addition to those observed the night before were seen.

9:00AM Dr. Wass, Bill Pedro and I did a Tridacna transect in the channel that leads out of the lagoon. I observed a bright red female parrotfish that turned out to be a new record for Samoa. We speared two of the females and Dr. Wass identified it as Scarus caudofaciatus although there was a slight difference in the number of pre-dorsal fin scales than the description in Coastal fishes of Southern Japan 1975. Masuda, Araga and Yoshino.

In addition we saw a large male and female green sea turtle and Dick caught a small hawksbill turtle. The hawksbill was taken back to camp where it was photographed, tagged and measured. The turtle was released on the south side of Rose Island.

We drifted out of the channel while snorkeling on the surface. A large school of Caranx sp.



were apparently spawning in the outgoing tide. There were about fifty of them in pairs with one of each pair being a very dark gray color and the other one a silvery gray. The darker member of the pair was aligned immediately above the lighter member (I'm not positive of this part however i.e. which color was on top). There were also two species of barracuda that were in schools of paired fish and were very likely spawning. We did not see any sharks in this area although George Balazs and Dr. Wass had said that they were usually quite abundant here.

We drifted to the boat which was about 150 meters from the harbor entrance in order to find out why they weren't fishing. Turned out that their anchor could not be released from the bottom so they decided to just bottom fish at that spot.

On the way out to the boat a large anchor was spotted on the bottom in about 80 feet of water on the left side of the entrance as you face the sea.

Although not too much could be told from the surface, it appeared that the coralline algae changed in morphology as it was found deeper below the surface waters. It changed from a flattened appearance to a fluted, sort of mini-pinnacle looking.

During the rest of the afternoon we continued with the transecting on the northwest and northeast sides of the lagoon.

In addition to the above transects which were done while snorkeling we also did four sets of transects along the bottom of the lagoon. SCUBA was used for these transects. Each of them started at the midpoint of each side of the lagoon at the bottom of the dropoff. This was usually in 50 ft. of water. One of the transectors would swim directly away from the base of the dropoff and the other two would move to the left or right respectively along the base of the dropoff. Five minutes were spent counting as many clams as possible and another five minutes were spent in counting how many fit into each category.

5:30PM returned to camp for supper and discussion of transecting and with Maura concerning her work.

7:45-9:00 Dick Wass, Bill Pedro and I assisted Maura band, weigh and sex brown and masked boobies.

9:10-11:00 We assisted Maura set and bait rat traps

Nov. 19 1:00-1:45AM Maura Naughton, Bill Pedro and I circled the island in search of turtles but we did not find any, although tracks indicated that



a turtle had come ashore but there was no indication that it had attempted to build a nest. Tracks were on the northeast side.

3:30-4:15AM Circled island to check for turtles but only saw tracks from one that had crawled on to beach and back into sea without digging.

7:30 Breakfast and circled island to check for more turtle tracks but did not observe any more than were seen the night before.

Did SCUBA dive in the channel to 100 feet and on the outside of the reef. A wide variety of corals were observed although the coralline algae was dominant to depths of up to 60 feet in some areas. The channel is coral and algae dominated to about 40-50 feet and then it has gravel-rubble bottomed channels with coral dominated oblong "islands" that run parallel with the channel. The sides of the main reef drop off at a near vertical angle to about 60-80 feet and then flatten out to about a 30 degree angle with generally flat topography of corals and gravel or rock bottom channels.

A fish that was described as a new species in a previous report on Rose Atoll (by Valerie Taylor) was observed and was identified as a melanic morph of the long-nose butterflyfish Forcipiger longirostris. Forcipiger flavissimus was also observed in this area.

The anchor that had been observed from the surface previously was inspected and found to be about 5-6 feet long with a 4-6 inch diameter shaft and 5-8 in wide flukes. It gave me the impression that it was from a ship of the late 1800's although there was not very much growth on the anchor there was pitting of 1/2 to 1 inch deep in places. The anchor was firmly imbedded in the bottom at an angle that would have put the ship that dropped it on the edge of the reef. Perhaps this may be the explanation for the presence of igneous rock that is often observed on the surface of the atoll--it may be ballast rock from a ship that broke up.

Although sharks had been reported from this area before we only saw one reef white tip.

We picked ice up from the boat and then went to Sand Island and picked Maura up after I counted the fresh turtle pits that were on the island



After returning Maura to Rose Island and eating we did three transects at the mid points of the southeast, southwest and northwest sides of the lagoon. These transects were in a straight line perpendicular to the side of the lagoon. They started at the edge of the flat coralline algae reef top on the lagoon side and extended to 50 meters out along the bottom of the lagoon which in most areas was 50 feet deep. All clams were counted that were one spear length (2.15 m) or less from ~~the~~<sup>side of</sup> the transect line. The clams were categorized into less than 50 mm, 50 to 150 mm and greater than 150 mm in size (longest distance along the shell in a straight line). We also collected some of the clams for age studies.

6:00PM Finished transects and headed back to camp to have dinner and write up notes. We also dissected some of the clams in an attempt to identify the gonads. We were not sure what the gonads looked like but I did find a part of the vicera that secreted a milky fluid that appeared similar to milt in fish and may have been gonadal tissue.

Nov. 20 9:00PM - 2:30AM Did repeated circles around the island to search for turtles. We found three green sea turtles which I double tagged and measured the greatest length along the curve of the carapace. I also took photos of Maura and Bill tending the rat trap transect and prepared my underwater camera gear for the next day.

6:00AM Got up and had breakfast and dismantled camp and packed gear. Circled the island to see if any other turtles had come ashore during the night.

Did underwater photos of clams and habitat in an area about 50-100 m off the southwest side of Rose Island. Then I drilled holes in the reef rock next to a series of clams. I measured the clams and then stuck spegetti tags into the holes that I had drilled in order to identify the clams at a later date in order that growth could be determined. The tags are numbered.

11:00 AM After bringing the gear out to the boat we departed Rose Atoll for Pago Pago.

Nov. 21. 2:00 AM Arrived at Pago Pago harbor. Slept on board until about 6:00 AM and then unloaded the



boat. Checked into the Rainmaker Hotel and caught up on sleep. Checked back at the boat to take more supplies off and then checked the Office of Marine Resources to see if the authorization to take excess baggage had arrived from Honolulu. Found out that I had lost my return ticket so spent time trying to make arrangements for a substitute ticket. We could not locate the excess baggage authorization and the airline office was closed most of the day. I later got things settled at the airport and then went back to packing and making arrangements with Dr. Wass for finishing up the Tridacna report.

- Nov. 22. Finished up the packing and spent time writing up notes. Left Pago Pago about 11:30PM.
- Nov. 23. Arrived in Honolulu about 6:00AM and then brought supplies back to the office by about 8:00AM in time to learn that the Fed budget had not been signed and we may be laid off.

Additional reports on the results of the turtle, clam and bird and rat work are in separate papers.



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

December 8, 1980

George H. Balazs  
Assistant Marine Biologist  
University of Hawaii-Manoa  
Hawaii Institute of Marine Biology  
P. O. Box 1346  
Coconut Island  
Kaneohe, Hawaii 96744

Dear George:

I received your letter on December 1, the same day Wally arrived from Swains Island. I delivered your letter to him anyway, so hopefully he will write to you soon.

As you mentioned about our trip to Rose, it really was an interesting trip. I am very glad that I went and saw the island for myself.

The letter you sent with a copy of a Summary of Turtle observation, I tried to submit as many Rose Atoll trip reports on turtle observation for your record. I am also enclosing a copy of the trip report about the eleven (11) turtles. Hope this report will answer your questions.

Merry Christmas to you.

Tofa,

WILLIAM PEDRO



Geo. Balazs

Population Estimate: Uncommon.

Ecological Distribution: Observed in rotted Pisonia tree stumps and bases of Messerschmidia trees in litter and coral rubble.

Specimens: Seven were collected.

Chelonia mydas (Green Sea Turtle)

Status: Resident breeding sea turtle on Rose and Sand Islands; no breeding observed during this visit.

Population Estimate: Adults 3, yearlings 1, hatchlings 0.

Ecological Distribution: Swerdlow observed one adult while SCUBA diving in the lagoon; he and Swan from the skiff saw two additional adults near the reef inside the lagoon. One yearling seen by Amerson and Schwaner just off the south beach in shallow water. Old nests were present on both Rose and Sand Island.

May 3-8, 1976

From Rose Atoll Trip Report  
by Binion Amerson



RODENT SURVEY OF AMERICAN SAMOA'S  
TUTUILA ISLAND AND ROSE ISLAND

Roger D. Nass

Station Leader, Wildlife Damage Research Station  
Bureau of Sport Fisheries and Wildlife  
Denver Wildlife Research Center  
Hilo, Hawaii 96720

October 21 to November 5, 1971



6. Food and feed storage areas should be rat-proofed according to proven methods described in available pamphlets.
7. Proper methods of banding coconut trees should be encouraged to reduce damage.
8. Rodent surveys should be conducted to determine the distribution and abundance of rats. Rats undoubtedly influence the state of human and animal health by transmission of diseases such as Salmonella and leptospirosis.
9. An educational program is needed for the whole community. Everyone should be aware of the problems caused by rats and the benefits resulting from control programs. They should also be aware of proper safety procedures regarding their use.

#### Rose Island

This small atoll is a candidate for the National Wildlife Refuge System. Eugene Kridler, Wildlife Administrator, covers this aspect of Rose Island atoll in a separate report. Previous visitors to the atoll noted the large rat population and were concerned about possible predation on bird and green turtle eggs. Rose Island is inhabited by large numbers of terns, boobies, and frigate birds and is one of the few undisturbed breeding grounds of the green turtle.

Rats remain under cover of the Pisonia and Messerschmidia canopy during the day, but at night they completely traverse the island. Only Polynesian rats (there may be several thousand on the atoll) were trapped or observed during our 24-hour visit. These rats are accomplished climbers and were frequently observed in the crowns of the few coconut palms present and were feeding on the blossoms and immature nuts. Numerous mature nuts were found on the ground, but many of these were not rat damaged.

We did not observe any evidence of rat predation on bird eggs, chicks, or on green turtle eggs. Numerous posttern but unhatched tern eggs were found, but this could not be attributed to any specific factors. Rats frequented rookeries where tern chicks of all sizes were present, but no attacks by rats or dead chicks were observed. Turtle pits were distributed throughout the island but no rat burrows or signs of excavations were found. Hermit crabs of all sizes occurred on the island, but the rats ignored them even when only a few feet away. Captured rats did not appear undernourished and may be able to sustain themselves without predation.



Polynesian rats may have been present on Rose Island for thousands of years and are possibly compatible with other life forms. If this is the case, they possibly should be given the same protection a refuge provides for other animals. A long-term study during the peak turtle and bird breeding seasons is needed to determine if rats are responsible for predation.

There are several approaches that may be considered:

1. Leave the rat population as it exists.
2. Practice reductional control of the rat population short of extermination. (This approach probably would have little long-term value.)
3. Eliminate the rats from Rose Island. (This approach is feasible, but may not be desirable.) Acute toxicants could be used initially followed by anticoagulant and trapping mop-up programs. Ground baiting may be undesirable because of the large hermit crab population. Potential secondary hazards of birds eating dead rats must also be considered. *(Not likely considering sea bird feeding habits B.K.)*
4. Conduct studies, including food habits of rats, to determine the relationship of rats to other island wildlife. (This may prove difficult because of transportation difficulties to and from Rose Island.)

#### Summary

This report is based on personal observations and conversations with local inhabitants. While the rapid survey may not have revealed many underlying details, or completely separated fact from opinion, I believe actions outlined can effectively reduce agricultural damage by rodents in American Samoa.

The literature contains scattered reports of bird species and their distribution throughout Tutuila and other islands of American Samoa, but little or no information is available on life histories, current abundance and distribution, or the influences created by the expanding human population. A thorough study of Samoan wildlife is needed immediately. Concrete recommendations and prompt action will be necessary in the near future to prevent further loss of habitat due to encroachment by man.

Realistic recommendations can be formulated only after a comprehensive analysis of the current wildlife situation. Pamerika Tauiliili, Director of Agriculture, is concerned about loss of bird habitat associated with an expanding human population and would welcome any assistance. His Department does not have any biologists, nor are



there any training facilities available in American Samoa. An ecologist-environmentalist position was created and the position will soon be filled through the efforts of Governor John Baynes, but with numerous other problems, such as garbage, runoff and pollution, this position would devote little or no attention to wildlife problems.

The need is clear, but the vehicle for action doubtful. The Bureau's rare and endangered species program, assignment of other Bureau biologists, National Science Foundation grants or other approaches should be considered; however, the time is overdue for a complete survey coupled with the training of Samoans to continue the work. The Department of Interior, through the Bureau of Sport Fisheries and Wildlife, should initiate a program encompassing the aforementioned wildlife studies and to provide rodent control training to local inhabitants.



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:  
055-83

March 9, 1983

Mr. George Balazs  
Honolulu Laboratory  
National Marine Fisheries Service  
P. O. Box 3830  
Honolulu, Hawaii 96812

Dear George:

I have been appointed to the American Samoa Natural Resources Commission which was recently established by our Territorial Legislature. We are mandated to provide the following information to the Legislature by 1 July 1983; a list of endangered and threatened species within the Territory; a list of species whose taking should be regulated and suggested regulations; suggested programs for conservation and restoration of endangered and threatened species and suggested sources of funding for implementing that act. Appointments of the five-member commission have yet to be confirmed by the House but, because time is short and it looks like I may wind up as chairman, I am taking the liberty to ask you for some information.

Specifically, are you aware of any marine turtles besides the hawksbill and the green which have been sighted by reliable observers in Samoan waters? Do you think it possible that leatherbacks and loggerheads pass through occasionally? Does Samoa fall within the range of any other species? Would you care to suggest programs for the conservation, restoration, etc. of turtles within American Samoa?

I expect the Commission will be asking for your comments regarding our recommendations pertaining to turtles so I'll keep you informed. Thanks for your help.

Tofa,

RICHARD C. WASS,  
Fishery Biologist





**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

October 28, 1982

F/SWC2:GHB

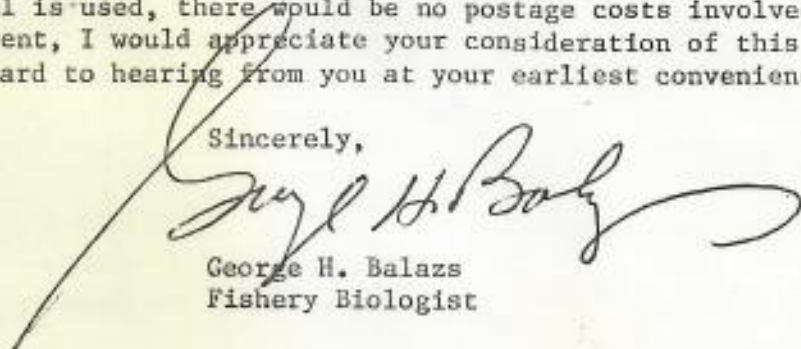
United Artists Television  
10202 Washington Blvd.  
Culver City, CA 90230

Dear Sir:

I have just recently returned from a wildlife research expedition to uninhabited Rose Atoll in American Samoa. Rose Atoll was designated as a National Wildlife in 1974 and is administered jointly by the U.S. Fish and Wildlife Service and the Government of American Samoa.

While I was in Samoa several people told me that portions of the 1953 movie, "Return to Paradise," were filmed at Rose Atoll. One man, who claimed to have been present for the filming, stated that footage was taken of the islands, sea birds, sea turtles, and sharks. If this is true, some important historical aspects of the atoll would have been recorded. Along with my colleagues at the U.S. Fish and Wildlife Service here in Honolulu, I would like to view this movie to see what sort of scientific information might be obtained. I am therefore writing to ask what arrangements might be possible with your company to borrow a videotape of the movie for a few days. If the enclosed franked label is used, there would be no postage costs involved on your part. In any event, I would appreciate your consideration of this request. I look forward to hearing from you at your earliest convenience.

Sincerely,

  
George H. Balazs  
Fishery Biologist

Enclosure



WILLIAM A. KUNKEL  
Division Manager  
Television Distribution

November 12, 1982

Mr. George H. Balazs  
National Marine Fisheries Service  
Southwest Fisheries Center  
Honolulu Laboratory  
P.O. Box 3830  
Honolulu, HI 96812

Dear George:

In reply to your letter dated October 28, 1982, I regret to inform you that "Return to Paradise" is not available on video tape. However, might I suggest that you contact one of your local television stations and ask if they would pursue the licensing of "Return to Paradise" through MGM/UA Television Syndication.

Thank you for your interest.

Best regards,

A handwritten signature in cursive script that reads "William A. Kunkel".

WILLIAM A. KUNKEL

WAK:ks





AMERICAN SAMOA GOVERNMENT  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to  
Serial: 66-82

August 11, 1982

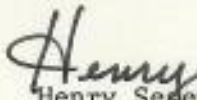
George H. Balazs  
Assistant Marine Biologist  
Honolulu Laboratory  
Nation Marine Fisheries Services  
P. O. Box 3830  
Honolulu, Hawaii 96815

Dear George:

I have review your proposal to the Sea Grant College Program for the assessment of marine turtle stocks and the nature usage in American Samoa and found it very interesting.

The Office of Marine Resources, American Samoa Government, fully support the proposed work and stand readily to assist you in any way we can.

Please keep us contact on your project.

  
Henry Sesepasara  
Director,  
Office of Marine Resources

HS/rpi

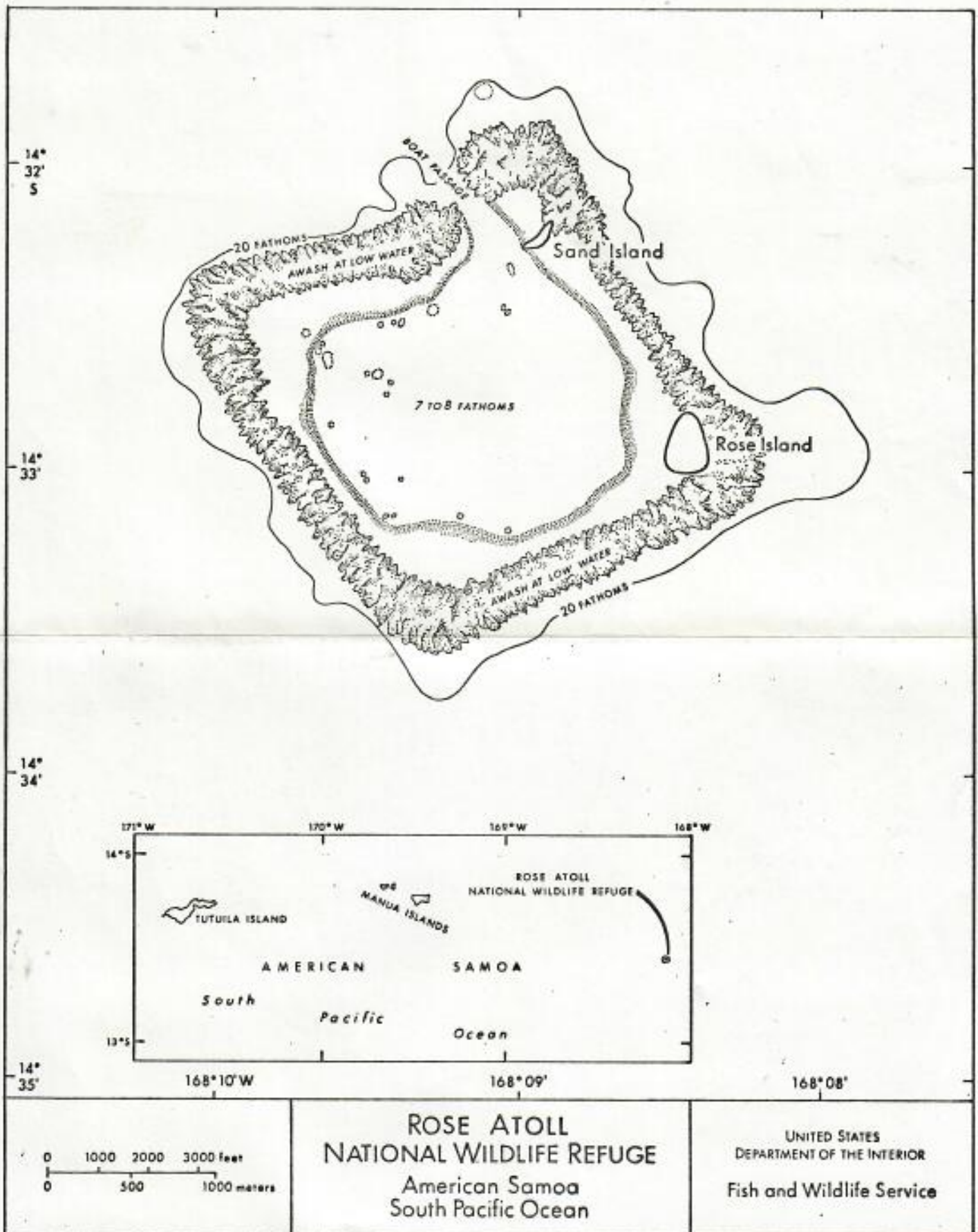
FOR ROSE ATOLL FILE

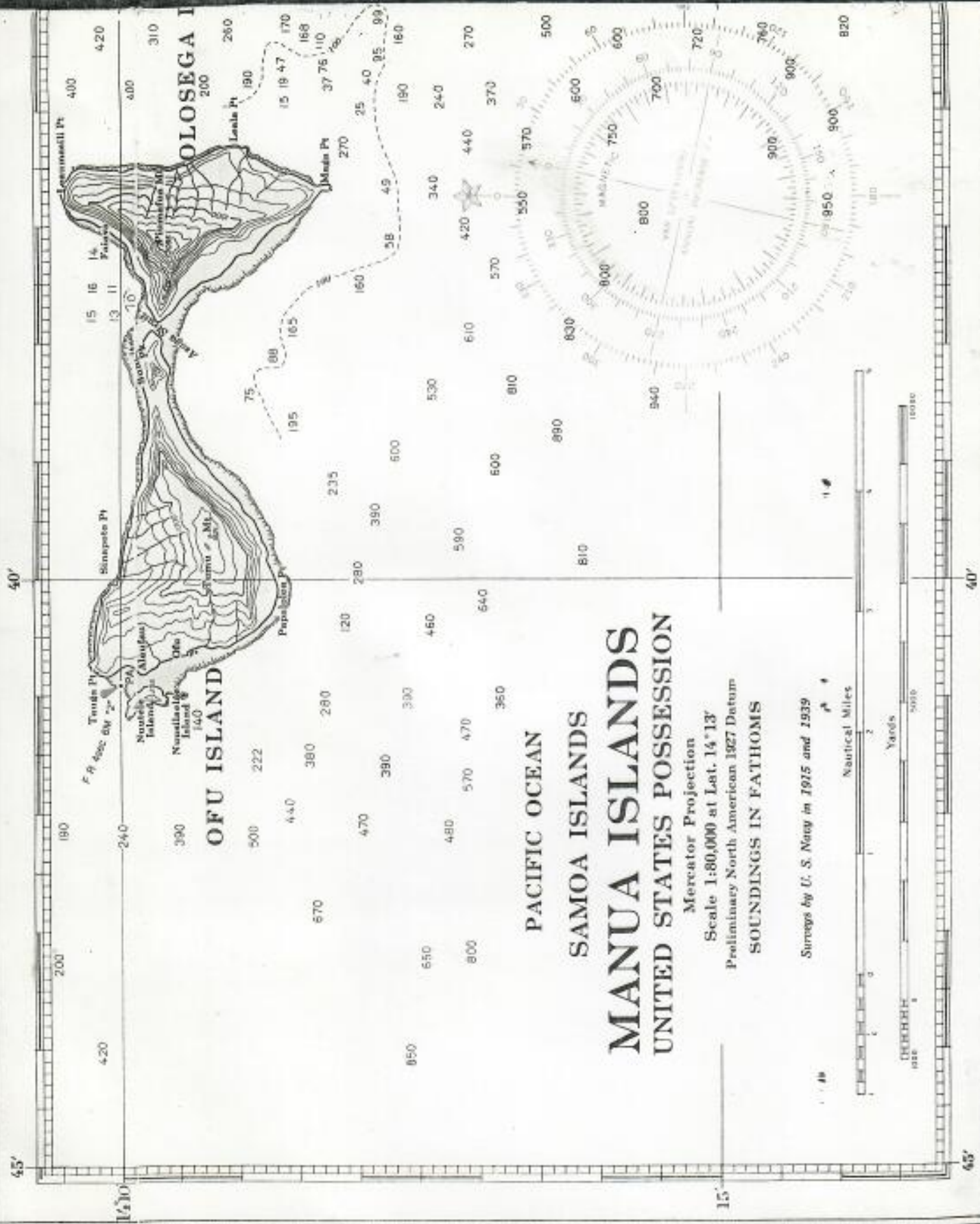
from pocket notebook:

Rose Atoll note <NOV 74  
" 75 adults in lagoon-  
tracks - mostly greens (?)

from Sekou











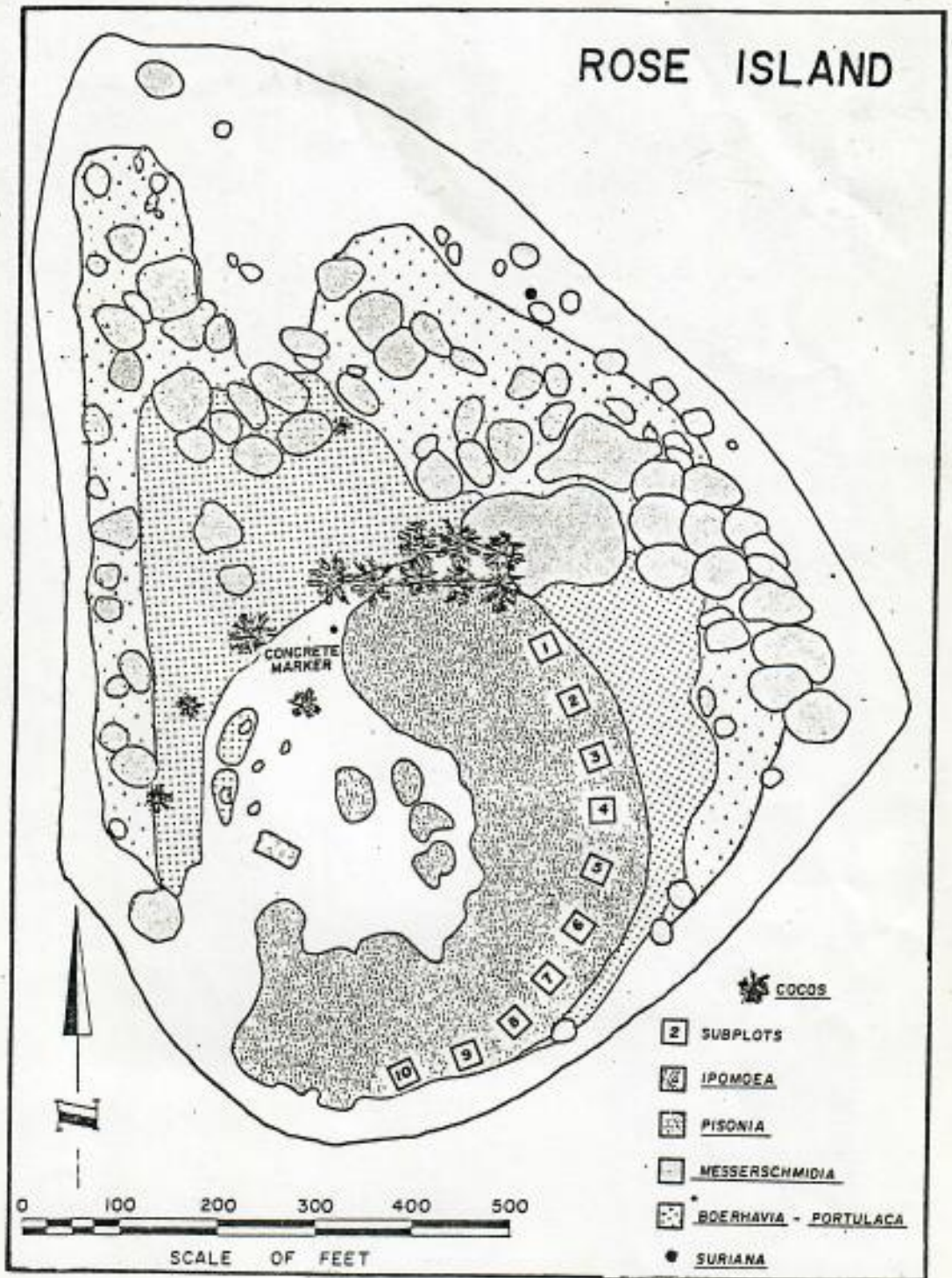
1-22-82 Telephone interview with Paul  
Bartlett - Soil Conservation Service  
546-3165

Visited Tau in August 1981 -  
Guide from Fitiuta Village named  
"TOFI", about 40 years old.  
Near Tau village, there is a  
 $\frac{3}{4}$  mile long white sand beach.  
Two <sup>fresh</sup> tracks seen, guide dug  
by both but only found eggs  
by one - only came up with  
12-20 eggs. [left rest so  
that Tau villagers wouldn't  
know he took some. Nest  
was at edge of vegetation - coconut  
trees and vines.

Another white sand beach exists  
on the east end - 1 mile long  
and 20 feet wide.



# ROSE ISLAND



2 SUBPLOTS

IPOMOEA

PISONIA

MESSERSCHMIDIA

BOERHAVIA - PORTULACA

• SURIANA

0 100 200 300 400 500  
SCALE OF FEET

9/20/82

Dear George:

It has been a while we didn't get together on our Maine Turtlle program -  
Anglad we are going to Rose on this year again.

Dick gave me your letter on Sept. 13. to ans- you asking for good communication with the San Sominiana She has a VHF standard LTD. 24-CH.

The most channel we use, is channel 16 -  
The Side Band Radio is under repair I don't think it will be ready, when we leave for Rose.

Looking forward for you on Rose trip.

Tofer Soifua.

*Tofer Soifua*

need Portable unit &  
② 2 battery packs



Turtles?  
w/utts?

George - Proposed work for Rose  
9/20/82

Jay

Rose Atoll NWR Field Trip Sept 30 - Oct. 17, 1982

### Objectives of Trip

1. To determine standing crop of harvestable size Tridacna maxima.
2. To determine relationship between methods of determining length frequency distributions of the clams and to ascertain <sup>the accuracy</sup> of the previous "rough" method of obtaining length frequencies.
3. To measure selected areas of the reef in order to determine areal measurements of the habitats being sampled for clams.
4. To continue growth study of marked clams.
5. To determine phenology of sea birds.
6. To estimate sea bird population numbers.
7. To instruct a Samoan student and his teacher in the natural history of Rose Atoll.
8. To obtain photographs of underwater habitats and organisms and to document vegetation condition on land.
9. To meet with the head of the Office of Marine Resources and fishery biologist Richard Wass to discuss the Tridacna studies.

The following methods will be utilized to obtain these objectives.

1. Standing crop. Previous observations indicate that there are four general habitats that have substantial clam populations: a) The submerged coralline algae flats on the lagoon side of the atoll; b) the gravel/rubble area between the algae flats and the lagoon floor; c) the lagoon bottom adjacent to the 30-50 foot drop off that surrounds the lagoon and d) coralline algae pinnacles that rise from the floor of the lagoon and reach the surface at times of lower low tide.

The first three areas will be sampled by use of a fifty meter transect line. All clams over 140 mm total length that are found within a spear's length of either side of the line will be counted (spears are about 2 meters long).

Placement of the transects will be determined by picking random sites within each of the three general habitats from aerial photographs. The random sites will be determined by picking random numbers along a graduated line drawn along the periphery of the lagoon.



The transects within each site will be independent of each other and perpendicular to the line drawn along each of the four sides of the lagoon. In cases where the habitat type is less than fifty meters wide the transect will be done along a randomly determined angle from the reef side of the habitat.

Based upon the desire to have confidence limits fall within 20% of the mean ~~and the desire to compare the clam density of the four sides of the lagoon~~ the following number of transects will be done in each habitat: Coralline algae ridge 16; rubble/sand flats and slope 70; lagoon bottom 12.

The second objective, to compare previous length frequency determination methods, will be done by the following method. Sites that have previously been surveyed by either the five minute "rough" method (three size classes: <50mm, 50-140mm, >140mm) or the more precise method (10mm intervals and no time limit) will be located. These will then be surveyed by both methods and the results will be compared. The precise method will be limited in this case to 15 minutes or to the time necessary to measure all clams at the site, whichever comes first. This comparison will be done for a minimum of five sites. An additional nine sites will then be surveyed by the rough method if it appears to do an adequate representation of the size frequencies. The location of the additional timed transects will be at the approximate location of previous rough length frequency determinations. Four of these sites were located at the center of each side of the lagoon at the lagoon floor. The others will be at locations one third and two thirds the distance along each side of the lagoon or in the north or west corner of the shallow part of the lagoon.

The third objective is to take sufficient measurements to determine the areas of the habitats that are being sampled for clams. This will be done by <sup>first</sup> marking places that are to be measured on aerial photographs ~~and then~~ <sup>the plots in situ for actual measurement</sup>. These measurements will be in positions that will enable us to scale the photographs to a degree that will <sup>allow</sup> planimetric or straight areal calculations to be completed.

Clam growth will be determined by measuring clams that have previously been marked and measured. Twenty clams were marked in November 1981 and thirteen were marked in 1982. Marks for these clams will also be changed from spaghetti tags to numbered plastic squares that are attached to the reef by galvanized nails. The previous tags have been broken in some cases while they were being cleaned for reading.

Sea bird phenology and population numbers will be determined by means indicated by sea bird biologist Stewart Fefer.

Records will be kept of all data collected and the data will be analyzed upon return from the field.



## Estimated time needed for data collection

### A. Transects (50 x 4.3 meters each)

|                       |                           |              |
|-----------------------|---------------------------|--------------|
| Coralline algae shelf | est. 20 minutes/transect, | 16 transects |
| Rubble/gravel area    | est. 30 minutes/transect, | 70 transects |
| Lagoon bottom         | est. 45 minutes/transect, | 12 transects |

The number of transects is based on estimates of how many would be necessary in order to reach a point where the confidence limits would be within 20% of the mean. The amount of time necessary to complete the transects is estimated at 50 hours or about 5 days of work.

B. Length frequency distributions. An estimated 1.5-2 days is necessary for the length-frequency distribution samples.

C. Reef measurements: Approximately 1-1.5 dayw will be needed for reef measurements.

D. Clam growth measurements and tagging will take about 2-3 hrs.

E. Bird phenology and population estimates may take .5-2 days.

F. Natural history instruction will be ongoing throughout the trip.

G. Underwater photographs will take about one half day.

G. Meetings with Henry Sesepasara and Dick Wass will probably take a few hours.

Other time involved in the trip will be preparation of field forms, gathering of field equipment, overhaul of regulators, preparation and testing of UW photo equipment, lights, repair of field equipment etc. Shopping in Pago Pago for supplies and packing the boat, etc, will also take place.

### Proposed Itinerary

9/30 travel to Pago Pago; meet with Sesepasara, Wass others  
9/30-10/3 Pack  
10/3-10/4 Travel to Rose  
10/4 Arrive Rose I. Prepare camp; clam growth and re-marking  
10/5-10/9 Transects  
10/9-10/11 Reef Measurements  
10/12 Bird Work  
10/13-10/12 Birds; UW photos  
10/14 Possibly needed for completion of studies  
10/15-10/16 Return to Pago Pago  
10/17 Return to Honolulu.



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

May 12, 1982

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

Dear George:

When I received your letter of April 23, Henry had just left for two weeks and then I went to Guam and Saipan for a week, hence the delay in my reply.

We are pleased to hear of your opportunity to give further study to Rose Atoll turtles and will do what we can to assist the effort. A two week charter of the SAUSAUIMOANA would cost \$1,200. If the refrigeration is not functional by then, the boat would have to return to Pago at the end of the first week (to unload fish). The return to Rose would probably be a two day trip at the end of your second week so there would be about a five day period with no vessel support at Rose. Again, the cost would be \$1,200 since the major expense is fuel.

I see no particular need for additional clam data at this time so would probably not accompany you. Henry and I would both like to see William go with you, however, if you so desire.

The vessel charter contract should be written to Office of Marine Resources, American Samoa Government. September 27 as a starting date is fine with us.

I expect to be in Honolulu June 10 and 11 for the next SSC meeting, perhaps I'll see you then.

Tofa,

*Dick*

RICHARD C. WASS  
Fishery Biologist

cc: Henry Sesepasara



November 30, 1981

F/SWC2:GHB

Mr. Henry Sesepasara  
Director, Marine Resources  
Government of American Samoa  
P. O. Box G  
Pago Pago, American Samoa 96799

Dear Henry,

I regret that William Pedro was unable to accompany me on the 10-day trip to Tokelau. I was able to gather a considerable amount of biological and ethnological information relating to sea turtles. I am sure that William would have benefitted, as a representative of your office.

I would like to obtain an estimation from you and your staff on the extent of subsistence fishing for green turtles that would occur in American Samoa if it were legalized in the manner that is now allowed in the Trust Territory. Could you give me a similar estimation for hawksbill turtles, and also, for Tutuila versus the native inhabitants of the Manua Group? For this purpose, I don't think it would be appropriate to include the Tongan nationals, who, I understand, are skilled turtle catchers.

From my shipboard discussions with Wally Thompson last November, I am inclined to believe that a subsistence exemption for green turtles should certainly be granted for the 50 or so residents at Swains Island. If my facts are correct and the people at Swains do indeed have a need and desire to eat green turtles, I would be willing to file an exemption petition on their behalf. Please let me know your thoughts on this important subject.

The chartered supply boat to Tokelau from Apia will probably be making up to 10 trips during 1982. The route taken will at times be within sighting distance of Swains Island. I suggested to John Larkindale, the official Secretary for the Tokelau Office, that it would be nice if stops could occasionally be made at Swains so that relatives and friends could visit. As it turned out, this idea was already under consideration and plans are underway to transmit a request to American Samoa through the proper channels. I hope that it will, in fact, be carried out.

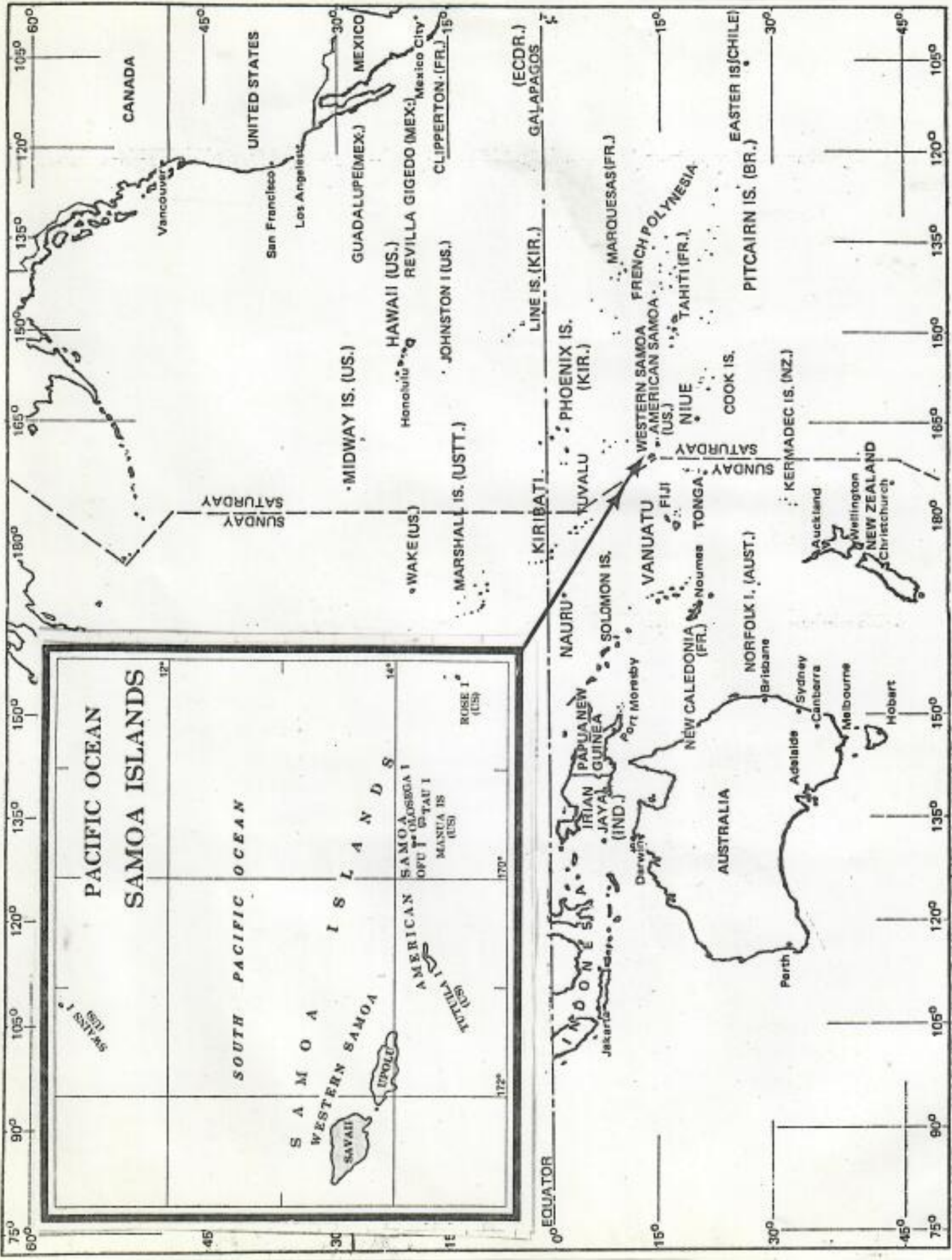
There is now a reasonably good chance that I will be in American Samoa for a few days in February using a U.S. Coast Guard flight. I would like to visit Anuu to learn more about the hawksbill nesting reported to take place at this location.

Sincerely,

George H. Balazs  
Fishery Biologist

GHB:vi  
bc: Balazs, HL

Balazs





Nov. 1981  
SAMOA

Dear George,

Sorry to be so long in reporting in. I'm about out of slips so send a few if you will. The "trades" have been quite strong this year and since I've bought a boat I've become spoiled and most of my diving is off shore, thus not so many ~~sighting~~ <sup>sightings</sup> caught a 12' tiger shark not long ago and I'm a bit hesitant about night diving. Caught it at about 11:00 P.M. where #3 turtle was ~~seen~~ sighted. Any way the ocean is calming down and I'll be seeing more turtles. I don't see many turtle products lately, not much of a problem as the

Samoan people get further away from the sea and work. A turtle would have to walk into a village to be in any trouble. A bit different than Western Samoa. So, the turtles are safe in Samoa for the most part. Again, sorry to be so late in writing.

Sincerely,

Terry Ferstle  
P.O. Box 3620  
Pago Pago, Samoa  
96799

SEASIDE TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

Thank you for your cooperation

Observation made by FERRY Date 9-11-81 Time 1:30 PM

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) 6

Observation made from: X shore;  
\_\_\_\_\_ boat; or while \_\_\_\_\_ skin  
\_\_\_\_\_ SCUBA diving.

MATU

Estimated size (shell length) 9"-12"

Turtle seen on: X surface; or at depth REEF  
of approx. \_\_\_\_\_ ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other comments: 1  
DON'T KNOW WHAT KIND IT WAS - VERY SMALL THOUGH AND  
BY THE TIME I GOT DOWN TO THE WATER AND OUT ON THE  
REEF I HAD LOST SIGHT OF IT. LOW TIDE - MAYBE 1 FOOT OF WATER



SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

*Thank you for your cooperation*

Observation made by

JERRY

Date

10-28-81

Time

8:00 PM

Address & Tel. No. (optional)

Location (indicate on chart)

7

Observation made from:      shore;

     boat; or while      skin

SCUBA diving.

Estimated size (shell length)

3'-4'

Turtle seen on:      surface; or at depth

of approx. 30 ft.

Distinguishing characteristics (species

I.D. if known, long tail, shell color,

tags, injuries, etc.): GREEN I

THINK SWIMMING AWAY  
FROM ME - QUITE LARGE

Other comments:

SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

Thank you for your cooperation

Observation made by FERRY FERSTLE Date 6-6-81 Time 2:00 P.M.

Address & Tel. No. (optional) P.O. Box 3620 Pago Pago, Samoa 96799

Location (indicate on chart) ①

Observation made from:      shore;

boat; or while      skin

SCUBA diving.

1/2 mile off shore

Estimated size (shell length) 2 1/2'

Turtle seen on:      surface; or at depth  
of approx. 80 ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): GREEN

BITE OUT OF REAR FLIPPER

Other comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



SEA TURTLE SIGHTING REPORT

*Thank you for your cooperation*

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

Observation made by FERRY Date 7-3-81 Time 10:00 AM

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) 2

Observation made from: \_\_\_\_\_ shore;  
\_\_\_\_\_ boat; or while \_\_\_\_\_ skin  
 SCUBA diving.

Estimated size (shell length) 1 1/2 - 2'

Turtle seen on:  surface; or at depth  
of approx. \_\_\_\_\_ ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): GREEN

Other comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

Thank you for your cooperation

Observation made by FERIZY Date 7-4-81 Time 12:00 PM

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) 3

Observation made from:    shore;  
 boat; or while    skin  
   SCUBA diving.

Estimated size (shell length) 1'

Turtle seen on:  surface; or at depth  
of approx.    ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): GREEN

Other comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

*Thank you for your cooperation*

Observation made by TERRY Date 7-20-81 Time 7:00 PM

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) 4

Observation made from: \_\_\_\_\_ shore;  
\_\_\_\_\_ boat; or while \_\_\_\_\_ skin  
 SCUBA diving.

MATUU

Estimated size (shell length) 3 1/2 - 4'

Turtle seen on: \_\_\_\_\_ surface; or at depth  
of approx. 10 ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): GREEN

Other comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

Thank you for your cooperation

Observation made by John Bluma Date 8-15-81 Time 2:00-4:00 PM

Address & Tel. No. (optional) TERRY

Location (indicate on chart) 5

Observation made from:      shore;  
     boat; or while      skin  
 SCUBA diving.

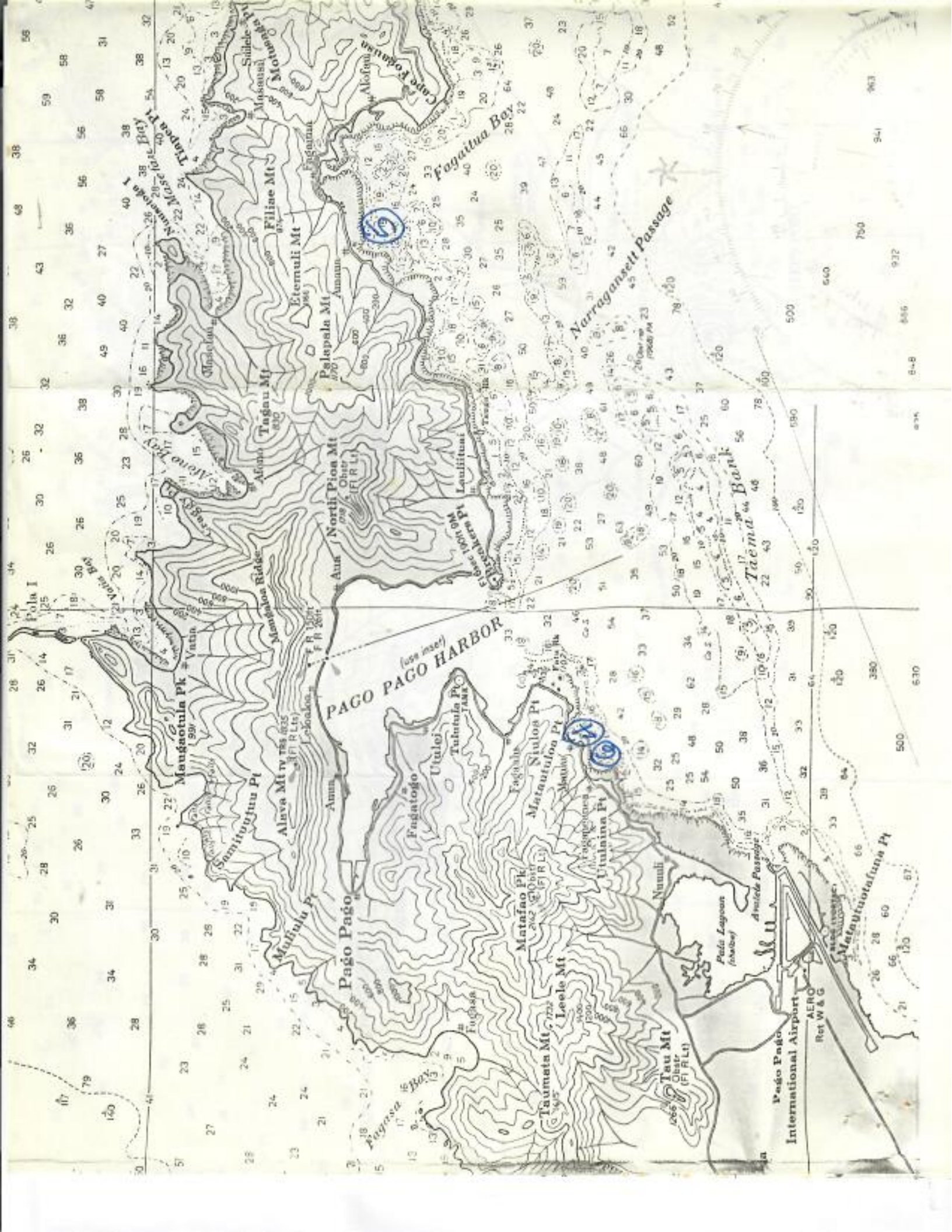
Estimated size (shell length) 3'

Turtle seen on:      surface; or at depth  
of approx. 40 ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): NOT SURE

Other comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

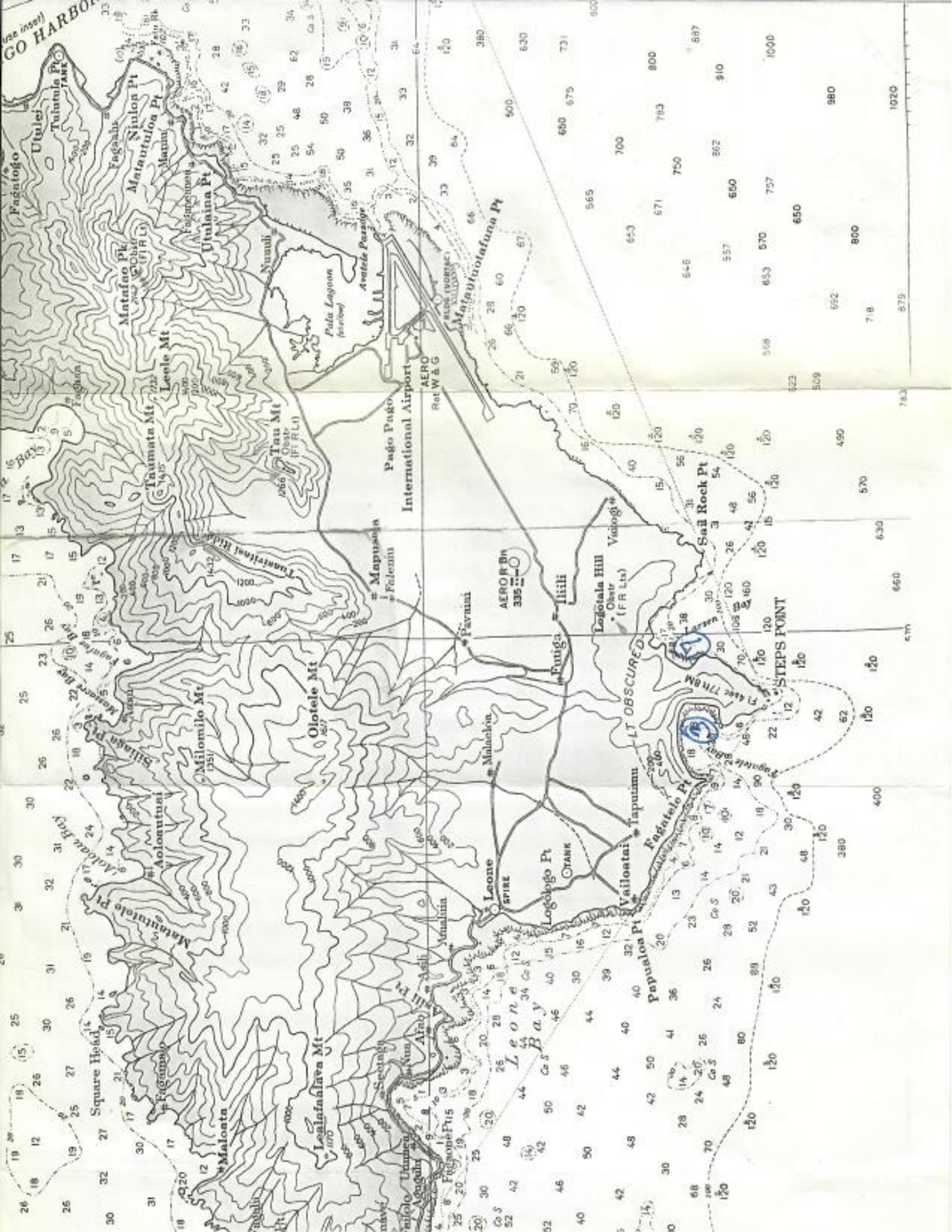


















UNIVERSITY OF HAWAII  
Hawaii Institute of Marine Biology  
Coconut Island • P. O. Box 1346 • Kaneohe, Hawaii 96744

December 26, 1979

Mr. Dale Coggeshall  
U. S. Fish and Wildlife Service  
P. O. Box 50167  
Honolulu, Hawaii 96850

Dear Dale:

As you are probably aware, discussions took place at both the Washington Conference and Noumea Workshop concerning the absence of baseline data on sea turtles at Rose Atoll. At the present time there is virtually no information on the numbers of each species that seasonally nest at this location. Furthermore, several authorities have suggested that predation on hatchlings by rats may be significant. There is clearly a pressing need to carry out a concise assessment of the sea turtles at Rose Atoll during the peak periods of both nesting and hatching. Based on the available literature, this would appear to be the time periods of August-September and October-November. During 1980 I would like to undertake these required investigations with some financial support from the Fish and Wildlife Service. At your earliest convenience, I believe it would be productive for us to meet and explore the options available for this research.

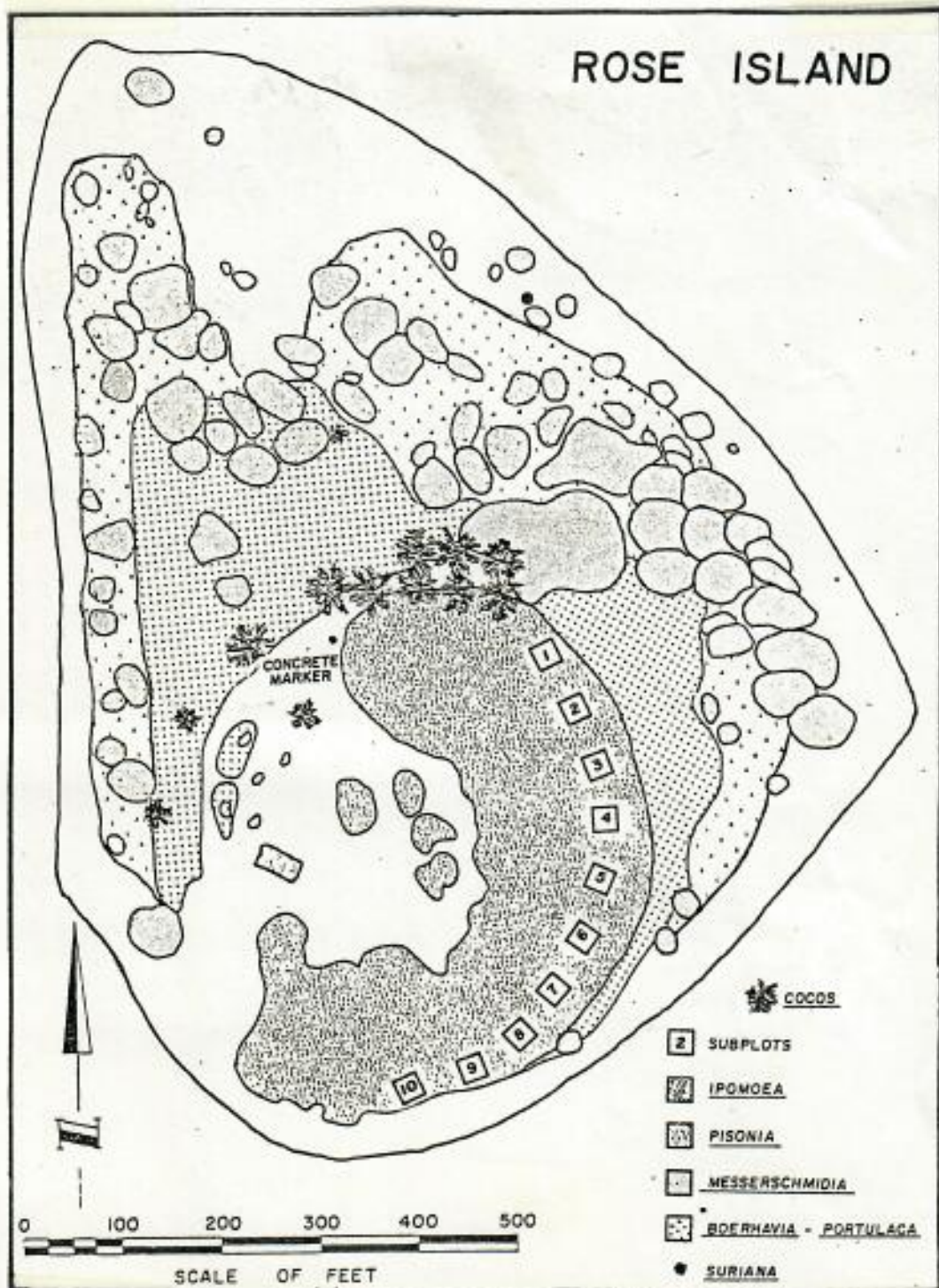
Hopefully you have now received a copy of my report on the Hawaiian green turtle which was prepared for the National Marine Fisheries Service.

Sincerely,

George H. Balazs  
Assistant Marine Biologist

GHB:md

# ROSE ISLAND







SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

*Thank you for your cooperation*

Observation made by TERRY FERSTLE Date 1-25-81 Time 8:00 P.M.

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) (2)

Observation made from: \_\_\_\_\_ shore;  
\_\_\_\_\_ boat; or while \_\_\_\_\_ skin  
 SCUBA diving.

Estimated size (shell length) 3'

Turtle seen on: \_\_\_\_\_ surface; or at depth  
of approx. 40 ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other comments: \_\_\_\_\_

HAWKSBILL



SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

*Thank you for your cooperation*

Observation made by TERRY FERSTLE Date 1-29-81 Time 3:00 P.M.

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) ③

Observation made from: \_\_\_\_\_ shore;  
\_\_\_\_\_ boat; or while \_\_\_\_\_ skin  
 SCUBA diving.

Estimated size (shell length) 2½'-3'

Turtle seen on: \_\_\_\_\_ surface; or at depth  
of approx. 60 ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): \_\_\_\_\_

GREEN

Other comments: \_\_\_\_\_

SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

Thank you for your cooperation

Observation made by TERRY FERSTLE Date 2-2-81 Time 2:00 PM

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) (4)

Observation made from: X shore;  
boat; or while      skin  
~~SCUBA~~ diving.

Estimated size (shell length) 6"-1'

Turtle seen on: X surface; or at depth  
of approx.      ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): \_\_\_\_\_

TERRY FERSTLE  
P.O. BOX 3620  
PAGO PAGO, AM. SAMOA  
96799

Other comments: WAS ON THE REEF (LOW TIDE) 1' OF WATER  
TRYING TO GET TO DEEP WATER. BY THE TIME I  
GOT DOWN THE HILL I LOST SIGHT OF IT SO WAS UNABLE  
TO INSPECT IT OR IDENTIFY. SEEN FROM A 100'



SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

*Thank you for your cooperation*

Observation made by TERRY FERSTLE Date 2-10-81 Time 4:00 PM

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) 5

Observation made from:      shore;  
     boat; or while      skin  
 SCUBA diving.

Estimated size (shell length) 2'

Turtle seen on:      surface; or at depth  
of approx. 60 ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

HAWKSBILL

SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs; Hawaii  
Institute of Marine Biology; P. O. Box 1346;  
Kaneohe, HI 96744; Tel. 247-6631)

*Thank you for your cooperation*

Observation made by TERRY FERSTLE Date 2-20-81 Time 9:00 P.M.

Address & Tel. No. (optional) \_\_\_\_\_

Location (indicate on chart) 6

Observation made from: \_\_\_\_\_ shore;  
\_\_\_\_\_ boat; or while \_\_\_\_\_ skin  
 SCUBA diving.

Estimated size (shell length) 1 1/2'

Turtle seen on: \_\_\_\_\_ surface; or at depth  
of approx. 70 ft.

Distinguishing characteristics (species  
I.D. if known, long tail, shell color,  
tags, injuries, etc.): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other comments: \_\_\_\_\_  
\_\_\_\_\_

HAWKSBILL







September 21, 81

Dick -

A quick question for you. At Rose Atoll there is an abundance of small encrusting growths that are dark red in color. They are present all over the fringing reef, as well as on the clam shells. I have tentatively ID'd these critters as Homotrypa, a forams. Is this correct?

Any information you can offer will be appreciated -

Best wishes,

George Balazs

over  
/

NATIONAL MARINE FISHERIES SERVICE  
HONOLULU LABORATORY  
P. O. BOX 3830  
HONOLULU, HAWAII 96812



25 September

George,

I've wondered about this organism, too. I've spent many hours trying to scrape it off specimen shells.

It retains its color even after soaking in chlorine

bleach. Sorry, I can't help you with the

I.D. I'm pleased to learn that it is a Foram.

I'll be at NMFS Honolulu for the SSC meeting Oct. 1+2.

Toha,  
Dick

HONOLULU, HAWAII 96812  
P.O. BOX 3820  
MARINE RESEARCH LABORATORY



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799

In reply refer to:

OFFICE OF MARINE RESOURCES

January 14, 1981

George H. Balazs  
Southwest Fisheries Center  
Honolulu Laboratory  
P. O. Box 3830  
Honolulu, HI 96812

Dear George:

Henry asked me to reply to your letter of 8 January addressed to him regarding William's participation in your study of the hawksbill hatchery at Aleipata.

William would very much like to accompany you and Henry and I both believe it would be worthwhile for him to do so. We also feel, however, that one week of William's time in Western Samoa would probably be sufficient for him to get a real feeling for the values and problems associated with the hatchery program. Please let us know your thoughts on this idea. Which week would you recommend that William spend with you?

We will purchase William's plane tickets and fund his expenses in Western Samoa.

We look forward to your visit in February. I will be in Honolulu to attend an SSC meeting 27 and 28 January and may see you then.

Tofa,

RICHARD C. WASS  
Fishery Biologist

cc: Henry Sesepasara  
William Pedro



February 27, 1981

Dear George;

Thanks for the letter, sorry You didn't have time to look me up while passing through. If you ever have the opportunity to visit Rose Atoll I would very much like to assist you if possible, as I've always wanted to observe the marine life there.

I've notified other divers about the tagging and notching of sea turtles, how ever I doubt if there will be many reports as it's impossible to get near a turtle during the day and I'm about the only diver that goes out at night. Also, most of the divers here are new to SCUBA diving and are not to aware of whats happening around them which is why most of the sightings are made by myself.

I never see turtles for sale in the markets here as any turtles taken are most likely grabbed up by village chiefs. I am quite sure if a turtle is able to be captured, it is, as the people have no knowledge of the law and if they did they would not abide by it. Also, there is no one to enforce the law. If there is a concentrated effort to capture turtles it probably is done by Western Samoans or Togans, who are of a considerable number in American Samoa. Also, the American Samoan has lost most of their ability to use the ocean for obtaining food as compared to the Togan or Western Samoan. the American Samoan now has a job and buys canned beef, fish, and beer. A couple of years ago I was aboard a boat for a night of diving and fishing with a group of Togans, and they captured two turtles alive by securing the legs with rope. They would continue skin diving while dragging the turtle with them until they had a full stringer of fish and lobster. I was very impressed with their skin diving ability, although not pleased with their indirection as they took berried lobsters, very small lobster and fish, in short if it's edible, kill it. I was able to get the one turtle which was quite small and release it the next morning. I find it difficult to find a lobster that is large enough to keep and wonder if this condition exist in other places in the South Pacific or is it just fished out here. I do not notice other skin divers out at night, in any consierable number, although, maybe later at night or in the early morning. I understand Tonga has a good lobster population, enough to export. Any information would be appreciated.

I would also appreciate any information you can provide me on Abalone. I've found many shells (dead) about an inch in length. I heard one rumor of bigger (edible) in the channel between Tutuila and Aunuu and will see if I can verify it in the near future. I thought abalone was a cold water animal and wonder if it is in deep water, dies, and then washes up into shallower depths. Can they be sexually mature at this size? Many questions come to mind as I am not familure with abalone in the South Pacific and would appreciate the information.

If I can be of any further assistance, such as tagging, sex, ect. I would enjoy the opportunity as I am very interested in the study of the ocean and marine conservation, although self taught I try to keep informed through different publications and library sorces, or think I do.

Sincerely,

*Jerry Ferstle*

P.S. Hear rumors of kids with turtles and also of kids getting them off reefs, ect. ect. but not observed by myself. also quite a few are supposed to be on Aunuu (next to Tutuila) I'll investigate and let you know.



March 2, 1981

Dear George;

I was doing some investigating on the sea turtles on the island of Aunuu and found out through a fella that works for me, who lives on Aunuu, that they take about three turtles a month. From what I could gather, the biggest reason they take them is to sell pieces of shell in the market here on Tutuila, or to any tourists that happen to visit Aunuu. Also, he asked me if I would like to have a baby turtle. According to him, turtles come ashore there to lay eggs, usually on rainy nights. If I were to buy baby turtles and transport them to a remote beach on the north shore of Tutuila would they return there to lay eggs? Or, do they return to where they were born? What happens if their set free from a boat in the open ocean? How long before eggs hatch after they are layed? Can you send me some lititure on sea turtles as I cannot find anything suitable here?

While diving off the N.W. coast of Aunuu this past week end, <sup>NOON</sup> looking for bigger Abalone I came across a Hawksbill in 80' of water with a length of 4'. It's right rear flipper? foot? was much shorter than the other. Looked rather straight to be caused from a shark, maybe the prop from a boat.

Sincerely,

*Terry Ferstle*  
Terry Ferstle

P.S. Has any organization looked into the possibility of buying baby turtles, especially in a place like this where there is ignorance of the law and no way of enforcing it? I imagine there is a high mortality rate as children can be cruel to animals, tire of the novility; ect. If I buy any babies should I do anything before I release them?

T. FERSTLE  
P.O. BOX 3620  
Pago Pago, SAMOA  
96799





GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

March 3, 1981

Dr. George Balazs  
NMFS, Honolulu Laboratory  
P.O. Box 3830  
Honolulu, Hawaii 96812

Dear George:

Thanks for your letter of 27 February and the enclosed copies of your letters to Henry and Alfonso. I hope Jack has the fish by now. I'm pleased to hear of your increasing interest in Samoan turtles and will let you know about our next trip to Rose when our plans firm up. The controlling factor is always money. If you can fund the boat charter, we could go any time after the first of July. We expect the new boat to arrive in Pago early in June.

I don't recall ever seeing anything on the geological formation of the Samoa Islands but I'm sure you are correct about Rose being the oldest. The American Samoa Coral Reef Inventory Part A lists the following references which may be of value: Daly, R.A. 1924. The geology of American Samoa. Carnegie Inst. Washington, D.C., Publ. 344, Pap. Dept. Mar. Biol., 19:93-143. Stearns, M.T. 1944. Geology of Samoan Islands. Bull. Geol. Soc. Amer., 55:1279-1332. A dissertation and a thesis by U.H. Geology students are also cited.

The SSC is scheduled to meet at the NMFS Lab March 25 but I'm not planning to attend. I'll probably be there for the June meeting, however, so may see you then.

Tofa,

RICHARD C. WASS  
Fishery Biologist



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

August 30, 1979

Dr. George Balasz  
Hawaii Institute of Marine  
Biology  
University of Hawaii  
Honolulu, Hawaii 96822

Dear George;

Henry Sesepasara, Director, Office of Marine Resources, American Samoa, was in Honolulu last week and talked with Dale Coggleshall regarding the possibility of your accompanying one of our next field parties to Rose Island. Henry and I would like you to have the opportunity to make some turtle observations and Dale also gave his consent.

I realize it is pretty short notice but there is a trip scheduled for October 1-4. I understand the primary purpose is to photograph seabirds. If you are interested in this trip (or in a future trip) contact Dale regarding the details. If you are unable to make the trip, I suggest that you briefly outline for our Office the useful turtle data that could be easily collected everytime we send a field party to Rose. I believe considerable data has been collected on some of the trips but on others, fresh turtle tracks on the beach have not even been counted.

I collected a Ptherichthys lineatus (remora) from an immature hawksbill that I caught last week. Upon examination of my limited reference collection, it appears that this species association is unrecorded.

Hope to see you in Samoa one of these days.

Tofa,

Richard C. Wass  
Fishery Biologist

cc: Henry Sesepasara





**GOVERNMENT OF AMERICAN SAMOA**  
**PAGO PAGO, AMERICAN SAMOA 96799**

In reply refer to:

OFFICE OF MARINE RESOURCES

August 5, 1980

Dr. George H. Balaze  
Hawaii Institute of Marine Biology  
P.O. Box 1346  
Kaneohe, Hawaii 96744

Dear George:

I returned Saturday from a trip to Honolulu and Hilo and found your letter of 18 July.

I agree that the breeding colony of turtles at Rose Atoll needs to be assessed and would like to see this accomplished during the coming breeding season through you, NMFS and our office. Regarding the mechanics of the survey, it would seem best to charter a small yacht here in Pago, sail to Rose and moor the vessel inside the lagoon for a month or so. I have no idea what the charter fee might be but expect it would not be too difficult to find a suitable vessel. The alternative would be for a couple of investigators to camp on the island and a couple of two-day charters to drop them off and pick them up. The first alternative would be best for reasons of safety and would prove less disruptive to the wildlife. The second alternative would probably be cheaper and you might even be able to take advantage of a charter funded by the Fish and Wildlife Service scheduled for October-November.

Your estimate of August and September as the peak months for turtles nesting at Rose may be a little early. We have very little pertinent quantitative data but by far the most nestings observed during any of our trips occurred on November 21.

I believe the Fish and Wildlife Service is planning a charter trip to Rose around October. I suggest that you contact the Refuge Manager at their Honolulu Office for details.

Let me know if I can be of further help. I'll probably be in Honolulu again around the middle of September.

Tofa,

RICHARD C. WASS  
Fishery Biologist







GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

August 5, 1980

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Hawaii Institute of Marine Biology  
P.O. Box 1346  
Kaneohe, Hawaii 96744

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Tofa,

RICHARD C. WASS  
Fishery Biologist



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

August 7, 1980

Dr. George H. Balaze  
Hawaii Institute of Marine Biology  
P.O. Box 1346  
Kaneohe, Hawaii 96744

Dear George:

Thank you for your letter of 24 July 1980. I believe with this set up you are willing to do, will be an answer to our Recommendation No.7 to our Noumea Workshop.


I am looking forward to assist such plan from our area and will try to provide as much information for the news bulletin as possible.

In the meantime, as you may know the only area that I have most informative report is Rose Atoll. To work on Rose Island, we need financial assistance. I am sure you are aware of that. To give you an idea to do a research on Rose Atoll, there is a local fishing vessel that can be arranged to charter at about \$650.00 and \$700.00 per day.

Also, if you maybe of interest, we may stop at other islands like Manu'a and Swains Island for turtle tagging during the breeding season, some time in November or December. We may have materialized information on this program in the Samoan waters soon.

Hopefully this plan works out good. Give my best regards to Mr. Shomura.

BEST REGARDS,

  
WILLIAM PEDRO  
Fishery Biology Tech.



Memorandum:

To: Dale Coggeshall, FWS, PIA  
Robert Shallenberger, FWS, RWR  
✓ George Balazs, NMFS  
Bill Gilmartin, NMFS

From: Ernie Kosaka, FWS, SE/ES

Subject: General Summary of Meeting with Henry Sesepasara Regarding  
Proposed Survey Trip to Rose Atoll, American Samoa

Henry met in the FWS Office, Honolulu, on August 5, 1980 to discuss the subject survey trip. NMFS personnel were not at this meeting, but had asked Ernie to include their participation in this survey, as was discussed in Richard Shomura's office last week. ) ?

Selection of the time for the survey was tentatively mid to late November. Henry indicated that this would probably be best in terms of weather/sea conditions. I also believe that Bill Pedro indicated at the NMFS and joint NMFS/SPC turtle conferences that this period would also be ideal for assessing the extent of nesting by turtles on Rose Atoll. <sup>NO</sup>

The nature of the surveys proposed require that we enter the lagoon and set up camp on shore. Henry indicated that it was possible, if somewhat hazardous, to get one of the larger vessels into the lagoon. However, he suggested that it would be better to anchor the vessel outside of the fringing reef and use Zodiacs or some other type of cargo boat to take the field personnel and their gear onto the island. Henry did not want to establish a precedent for permitting vessels to anchor within the lagoon, even for such purpose as ours.

Henry indicated that there was a charter skipper who was interested in taking us to Rose Atoll. He is Wally Thompson. Thompson's vessel is equipped to sleep only four (4) persons aboard. The duration of the trip from Tutuila to Rose Atoll would be between 12 to 16 hours. The charter skipper would probably fish offshore while waiting to pick us up if the trip were of three (3) day duration. ie. 1 day to Rose Atoll, overnight and 1 full day on the island, and 1 day return. <sup>Hurricane Season?</sup>

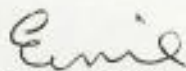
Ernie brought up the subject of participants. At least one of Henry's staff, either Bill Pedro or Dick Wass, would be involved in this survey and patrol. Ernie indicated that two (2) SE staff were budgeted for this survey, and that George Balazs would be a participant either before his assessment of turtle head-starting in Western Samoa or after he had completed his task. It was obvious that there would be insufficient space for all participants, unless some other arrangements could be made. The Government tugboat was suggested as an alternative charter vessel. However, its charter cost of \$1,200 is double the \$600 per day that Thompson is currently charging. <sup>too short</sup>

Henry also brought up the request their Government has had regarding commercial taking of giant clams from within the lagoon at Rose Atoll. The request had been denied since there was insufficient information to assess the impact of this taking on giant clam stocks in the lagoon. Henry did indicate that a cursory stock assessment made by Dick Wass indicated that there was an over-abundance of this resource within those waters.

Rob suggested an extensive survey of the lagoon waters, not only for assessing stocks of giant clams, but of all of the components of this ecosystem, similar to some surveys that the Corps of Engineers have conducted in American Samoa. This suggestion was met with enthusiasm by all present. A discussion of assignment of objectives/responsibilities followed, but was not carried to conclusion. The consensus was that it would be somewhat like the Tripartite studies of the NWHI, but focusing on the terrestrial and near shore environments.

Due to the expanded scope of this limited survey/patrol trip to Rose Atoll, it would be essential to spend at least a week gathering this information. Implementation of this comprehensive survey would require changes in the charter agreement whereby the vessel would take us to our destination and return to Tutuila, and make a separate pick-up run; a total of four (4) charter days would be required.

In view of the relatively short run to Rose Atoll, and our intention to set up camp on the island, Henry was requested to check with Thompson whether it would be possible to transport at least 6 people on his vessel for these proposed surveys. Henry's response was that he would be getting in touch with us sometime next week after he has discussed this charter proposal with Thompson.



Ernie Kosaka, SE/ES  
5 August 1980



3 November 1978

ROSE ATOLL

Rec'd  
11/28/78

J. Brent Giezentanner  
Refuge Manager  
300 Ala Moana Blvd.  
P.O.Box 50167  
Honolulu, Hawaii 96850

Dear Mr. Giezentanner,

On the evening of 28 October I had the good fortune to meet Doug Forsell in Pago-Pago. We had dinner together and were able to talk for some time. (He had heard) that this ship, the M. S. Lindblad EXPLORER, had recently received permission to visit Rose Atoll National Wildlife Refuge in American Samoa, and asked if we would conduct a bird survey of the island. This I was happy to do. He provided me with a list of bird species and estimations of numbers for each which had been compiled in October, 1975.

We arrived on Rose Atoll at approximately 0900, whereupon the staff naturalists led a walk around the perimeter of the island with the passengers, taking great care not to disturb the nesting populations of terns. After about 1½ - 2 hours, most of the passengers had left the island to go snorkelling and scuba-diving or back to the ship. It was at this time I conducted a survey, including much of the interior. Other staff naturalists, Ron and Valerie Taylor, and Jeremiah Sullivan, conducted a survey of fish species. Time and logistics limited them to one small area of reef on the seaward slope near the mouth of the channel. Low tide occurred at 1230, at which time we had to leave Rose Atoll.

#### Annotated List-Birds

White-tailed tropicbird (Phaethon lepturus): Twelve adults were seen flying; no nests found.

Masked booby (Sula dactylatra): Only one adult was seen-the list compiled in 1975 includes 540 individuals.

Brown booby (Sula leucogaster): Approximately 1000 adults were observed roosting in trees and at nest sites; nestlings were still downy, but nearly full-sized; no accurate estimation of the number of nests possible, perhaps 200-300.

Red-footed booby (Sula sula): Approximately 500 adults flying and roosting in trees; no nests seen-the 1975 list includes 3500 (?).



Continued...

Frigatebird (Fregata sp.): No more than 100 individuals were observed; all were flying (except one juvenile found on the ground); many were sub-adults; no nests seen. Both greater and lesser frigatebirds were present, but it was difficult to separate all to species level. Of those which were separated, the greater frigatebirds outnumbered the lesser frigatebirds 2:1.

Greater frigatebird (Fregata minor): See above.

Lesser frigatebird (Fregata ariel): See above.

Sooty tern (Sterna fuscata): 200,000 - 300,000 adults; many thousands of nests, in the egg stage (very few chicks); perhaps 1000 adults were congregated on the small sand island (no nests) located between the main island and the channel's mouth. I did not walk around in the area where these terns were nesting, but could easily observe the area from the perimeter.

Brown noddy (Anous stolidus): Approximately 3000 adults or sub-adults; nesting primarily in the same area as the sooty terns; most of the nests contained chicks already. There were about 100 brown noddies nesting on the small sand island.

Black noddy (Anous tenuirostris): Approximately 2500 - 3000 adults; virtually all nests seen contained chicks (one per nest).

White tern (Gygis alba): 1000 adults and sub-adults; most nests were still in the egg stage, although a few chicks were seen in the branches. Since no nesting material is used it was very difficult to find both eggs and chicks in the trees, so no accurate number of nests could be determined.

Whimbrel (Numenius phaeopus): 20 adults were observed in the shallows and inland under the trees.

Turnstone (Arenaria interpes): 8 adults were seen in the shallows.

Golden plover (Pluvialis dominica): 2 adults were seen in the shallows.



The results of this survey differ somewhat in both species and numbers of individuals from the survey conducted in October 1975, but it must be remembered that we were on the island for only one morning. Undoubtedly, many adult birds, particularly the boobies and frigatebirds, were out to sea feeding. This would perhaps explain the large discrepancy between the numbers of certain species reported in 1975 and those same species observed during our visit.

No gadfly petrels were seen, but numerous burrows were found around the bases of many of the large Poisonia trees, which may have belonged to various species of Pterodroma. Two people reported seeing (rat-like mammals (four in total).) From their descriptions of same, they did not seem to have been black rats or Norway rats. The animals ranged from light brown to golden in color, and both people thought they may have had a loose fold of skin between the forelimb and hindlimb on each side (not unlike that found on flying squirrels). The structure of their tails was not positively noted. They were described as being about the size of large mice. I would be very interested to find out what they are, and if they pose any threat to the nesting populations of terns.

Divers reported seeing three sea turtles (2 green sea turtles and one hawksbill) in the channel. The surrounding coral beach of the (main island) had numerous turtle nests along its length; and the small sand island was literally covered with turtle nests, perhaps 100 - 150.

#### Fish Species identified

Holocentridae  
Myripristis murdjan  
Holotrachys lima  
Myripristis vittatus  
Holocentrus violaceus

Serranidae  
Cephalopholis coatesi  
C. urodelis  
C. leopardus  
C. argus  
Epinephelus mema  
Plectropoma maculatum

Apogonidae  
Loramia novemfasciatus  
Apogon fasciatus  
Paramia quinquelineata

Muraenidae  
Enchelynassa canina  
Hemirhamphidae  
Hyporhamphus dussumieri

Lutjanidae  
Macolor niger  
Lutjanus carponotatus  
L. kasmira

Chaetodontidae  
Chaetodon lunula  
C. reticulatus  
C. trifasciatus  
C. ornatissimus  
C. ulietensis  
C. ephippium  
C. baronessa



Continued...

Chaetodontidae

C. klieni  
Heniochus varius  
H. monocerus  
Centropyge flavissimus  
C. ferrugatus (This is a possible  
 southern record)  
Zanclus canescens  
 \* Forcipiger sp.

Diodontidae

Diodon hystrix

Labridae

Thalassoma lunare  
T. lutescens  
Labroides dimidiatus  
L. pthirophagus  
Gomphosus varius

Nemipterinae

Monotaxis grandoculis  
Gnathodentex aurolineatus  
Scalopsis bilineatus

Pomacentridae

Dascyllus trimaculatus  
Chromis dimidiatus  
Abudefduf cyaneus  
A. flavopinnus  
A. glaucus  
Pomacentrus coelestis

Synodontidae

Synodus variegatus  
Saurida gracilis

Mullidae

Parupeneus bifasciatus  
P. luteus

Mugilidae

Liza vaigiensis

Gobidae

Paragobiodon echinocephala  
Gobiodon quinquestrigatus

Pempheridae

Pempheris ovalensis

Amphiprionidae

Amphiprion perideraion

Arothronidae

Arothron nigropunctatus  
A. citrinellus  
A. stellatus

Acanthuridae

Acanthurus achilles  
A. olivaceus  
A. oliala  
Ctenchaetus striatus  
Zebrasoma scopas  
Z. flavescens

Carangidae

Gnathanodon speciosus  
Caranx melampygus

Belonidae

Tylosurus indicus

Balistidae

Rhinecanthus vemucosus

Cirrhitidae

Paracirrhites fosteri  
Gymnocirrhites arcatus

Thunnidae

Thunnus alalunga

Aulostomidae

Aulostoma chinensis

Sphyraenidae

Sphyraena sp.

Lethrininae

Lethrinus haematropterus

Carcharinidae

Carcharhinus melanopterus

\*This may be a new species. It is closely related to Forcipiger flavissimus, but differs from F. flavissimus by having entire



body dark, almost black; much longer snout; orange patch behind pectoral fin. Valerie Taylor took numerous photographs of this single individual, so more positive identification or subsequent description can be made at a later date.

Jeremiah Sullivan described the reef as follows:

The dive took place about three hundred meters west of the main channel along a heavy lithothamnion ridge covered by a softer, brilliantly red-colored crustose algae (species unknown). No foliate corals were located within 30 meters of the algal ridge on the seaward side. Deep surge channels, devoid of corals, drop down approximately 6 meters to a lower level. This lower level extends approximately 20 meters seaward to another coral ridge of 3-4 meters wide. This lower ridge contains a few scattered stands of Acropora sp. Fire corals are dominant throughout, and cover a majority of the submerged reef area shallower than 10 meters. Large fish were lacking.

It must be emphasized that we were on Rose Atoll for only one morning, which precluded our making very indepth faunal studies. However, I feel that we were able to survey a significant portion, especially concerning the avifauna, of the animals present on this very extraordinary island, and I hope this information will prove useful to you.

Sincerely yours,

*Thomas Ritchie*

Thomas Ritchie  
Chief Naturalist  
M.S. Lindblad EXPLORER  
c/o Lindblad Travel, Inc.  
133 East 55th Street  
New York, N. Y. 10022



From Weins - ROSE Atoll

Sachet (1954, p 20) quotes from Groeffe (1873) the following account of turtles on Rose Atoll: "on the sand island, in the months of August and September, a great number of sea turtles came to lay their eggs. Most of them were the common sea turtle (Chelonia mydas L.). More seldom, came the caret (Chelonia imbricata L.). When the time came for the young to hatch, the surrounding sea was full of sharks who avidly snapped up the little turtles as fast as they arrived in deeper water."

Early Oct 79 - Eric Knudtson - H. Seseparsa  
made overflight in Otter -  
Maximum of 11 turtles  
seen in lagoon.



SWAINS  
(OLOSEGA)

from Bryan (Panala'au Memoirs)  
page 137-8. The Swains Adventure (1935)  
(no mention of turtles)

from Henry S. <sup>William Pedro?</sup> Marine Resources

He visited Swain's in 1963 -  
People gathered eggs.

Main Is. of SAMOA - Hawkbill common.  
Most beaches occupied: not many  
breeding sites.

168° 10'

PACIFIC OCEAN  
SAMOA ISLANDS

ROSE ISLAND

UNITED STATES POSSE

Mercator Projection

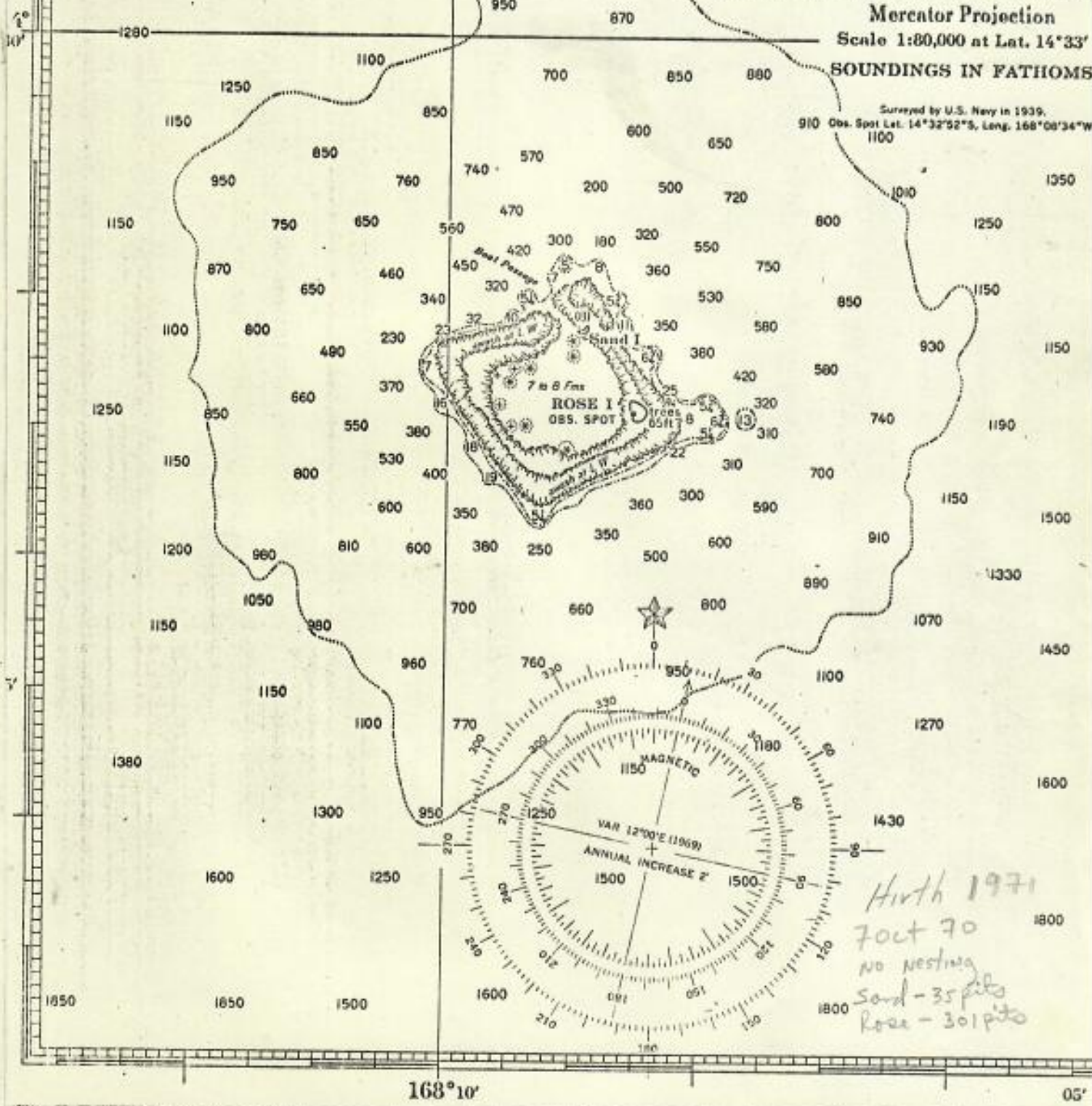
Scale 1:80,000 at Lat. 14° 33'

SOUNDINGS IN FATHOMS

Surveyed by U.S. Navy in 1939.  
Obs. Spot Lat. 14° 32' 52" S, Long. 168° 00' 34" W

*Sacket 1954 + Hirth 1971*

*goans nest in Aug and Sept*



*Hirth 1971*  
*7 Oct 70*  
*NO nesting*  
*Sand - 35 pits*  
*Rose - 30 pits*

168° 10'

05'

d., Feb. 28/70 (corr. thru N.M. 9/70)

CAUTION

This chart has been corrected only to the print date shown in the lower left-hand corner. Corrections subsequent to this date should be made from the weekly Notice to Mariners.

90

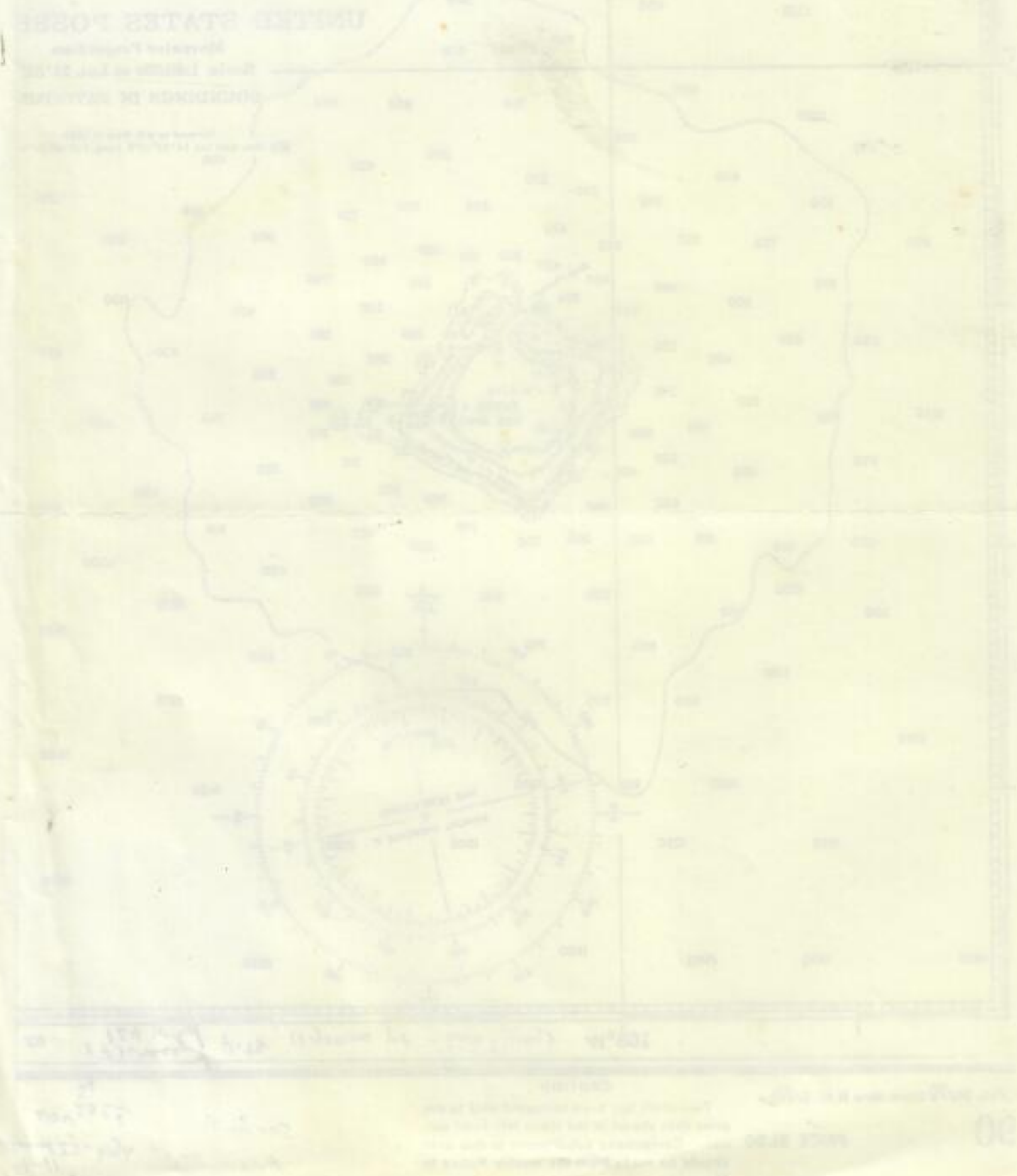
PRICE \$1.50

*Sacket*  
*Aug - sept*





7/30/76 Sekora transmitted information from Amerson  
about green sea turtle that has been "raised" for  
"1 year" in wild on north side of Tutuila, American Samoa





UNIVERSITY OF HAWAII  
Hawaii Institute of Marine Biology  
Coconut Island • P. O. Box 1346 • Kaneohe, Hawaii 96744

December 26, 1979

Mr. Dale Coggeshall  
U. S. Fish and Wildlife Service  
P. O. Box 50167  
Honolulu, Hawaii 96850

Dear Dale:

As you are probably aware, discussions took place at both the Washington Conference and Noumea Workshop concerning the absence of baseline data on sea turtles at Rose Atoll. At the present time there is virtually no information on the numbers of each species that seasonally nest at this location. Furthermore, several authorities have suggested that predation on hatchlings by rats may be significant. There is clearly a pressing need to carry out a concise assessment of the sea turtles at Rose Atoll during the peak periods of both nesting and hatching. Based on the available literature, this would appear to be the time periods of August-September and October-November. During 1980 I would like to undertake these required investigations with some financial support from the Fish and Wildlife Service. At your earliest convenience, I believe it would be productive for us to meet and explore the options available for this research.

Hopefully you have now received a copy of my report on the Hawaiian green turtle which was prepared for the National Marine Fisheries Service.

Sincerely,

George H. Balazs  
Assistant Marine Biologist

GHB:md

*George Balazs*



**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

November 6, 1979

CRUISE REPORT

**VESSEL:** Townsend Cromwell, cruise 79-04 (TC-85)

**CRUISE PERIOD:** August 18-October 25, 1979

**AREA OF OPERATION:** American Samoa, including the Manua Islands and seamount 35 mi south of Tutuila (Figure 1), and Western Samoa including Pasco Bank (Figure 2).

**TYPE OF OPERATION:** American Samoa. Personnel from the National Marine Fisheries Service (NMFS) and Office of Marine Resources (OMR), Government of American Samoa, participated in assessing the marine resources and anchoring 10 fish aggregating buoys in American Samoan waters.

Western Samoa. Personnel from NMFS and the Fisheries Department, Government of Western Samoa (FDWS), participated in assessing the marine resources and anchoring five fish aggregating buoys in Western Samoan waters.

- ITINERARY:**
- August 18 - Departed Kewalo Basin, Honolulu.
  - 30 - Arrived Pago Pago, American Samoa to embark OMR personnel and two NMFS personnel.
  - September 1 - Departed Pago Pago to fish with traps, handlines, midwater and bottom trawls, and plankton nets, and to make environmental observations.
  - 14 - Returned to Pago Pago to disembark OMR personnel and to embark a new team of OMR personnel.
  - 17 - Departed Pago Pago to continue resource assessment work around American Samoa.
  - 23 - Returned to Pago Pago to disembark OMR personnel.
  - 24 - Loaded fish aggregation buoys and departed Pago Pago.



- September 25 - Arrived Apia, Western Samoa to embark FDWS personnel and to load anchors for fish aggregation buoys.
- 26 - Departed Apia to anchor fish aggregation buoys around Upolu Island.
- 28 - Returned to Apia. Discussed fishing activities for remainder of cruise in Western Samoan waters with NMFS Honolulu Laboratory (HL) Director and Western Samoa Chief Fisheries Officer.
- October 1 - Departed Apia and headed for Pasco Bank 90 mi west of Savaii Island.
- 6 - Returned to Apia to disembark Western Samoa personnel, and to load brood stock of mollies for transport to American Samoa.
- 7 - Embarked American Samoa fishery biologist and departed for Pago Pago.
- 8 - Arrived Pago Pago to offload mollies and disembark American Samoa fishery biologist. Loaded fish aggregation buoys, anchors, and anchor rope, and departed Pago Pago.
- 12 - Returned to Pago Pago to disembark two NMFS personnel.
- 13 - Refueled vessel and departed Pago Pago.
- 25 - Returned to Honolulu. End of cruise.

**MISSIONS  
AND**

- RESULTS:** A. Deploy fish aggregation buoys around American and Western Samoa.
1. American Samoa. Ten fish aggregation buoys marked A through J were anchored in waters around Tutuila and Manua. Eight buoys were placed between 3 and 7.4 mi from land and the other two at 23 and 26 mi from land. One buoy was anchored in 25 fathoms; all others in depths ranging from 500 to 1,350 fathoms.

2. Western Samoa. Five fish aggregation buoys marked A through E, were anchored in waters around Upolu Island, 1.8 to 7.9 mi from shore. Three buoys were anchored in 40 to 50 fathoms and one each in 250 and 1,000 fathoms, respectively.

B. Assess marine resources around American and Western Samoa.

1. Sampling methods included fishing with lobster, fish and shrimp traps, crab nets, handline, bottom and midwater trawls, and plankton nets.
- a. Traps. Eight lobster trap stations were occupied in American Samoa and two in Western Samoa. Twenty-four traps (three strings of eight traps) were set at each station. In American Samoa, one station was fished in 1-5 fathoms along the coastline and six stations in 11-35 fathoms. A total of five spiny lobster, Panulirus penicillatus, were caught, one in 12-15 fathoms and four near the shoreline in American Samoa. No lobsters were caught in Western Samoan waters.

Thirteen fish trap stations were occupied, 11 in American Samoa, and 2 in Western Samoa. Twelve traps (three strings of four traps) were set at each station along with the lobster traps. A total of 215 fish were caught in American Samoa: 159 Lutjanus kasmira, 24 L. bohar, 9 L. rubiopercularis, 1 L. gibbus, 1 unidentified snapper, 1 Epinephelus microdon, 2 E. fasciatus, 4 unidentified grouper, 1 Parupeneus pleurostigma, 1 unidentified goatfish, 8 holocentrids, 3 Heniochus acuminatus, and 1 Dascyllus sp. In Western Samoa, traps were set at Pasco Bank. The catch included five L. bohar, two L. kasmira, two Holocentridae, one P. pleurostigma, 1 unidentified grouper, and one H. acuminatus.

Four shrimp trap stations were occupied, all in American Samoa, in depths of 150 to 300 fathoms. Twelve traps (three strings of four traps) were used at each station. The shrimp catch included 307 Heterocarpus laevigatus, 654 H. ensifer, 69 penaeids, and 8 unidentified shrimps. In addition, 11 congrid, 1 octopus, 1 Nautilus sp. and 98 assorted crabs were caught in the traps. Shrimps were caught at all stations fished.



- b. Crab net. Crab nets were used at three stations, all at the northern cove off Olosega Island, American Samoa. A total of 63 nets (six strings of 8 to 11 nets) were fished in depths of 10 to 25 fathoms. Five kona crab (Ranina ranina) were taken, one in 10 fathoms, one in 12 fathoms, and three in 25 fathoms.
- c. Handline. Sixteen handline fishing stations were occupied during the cruise, 11 at American Samoa and 5 at Western Samoa. Fishing was generally done during the day or early evening with four lines, four to six hooks to each line, at all stations. The lines were mounted on hydraulic powered gurdies. A total of 162 fish were caught at American and Western Samoa. The catch consisted of 116 snappers (36 Etelis carbunculus, 31 E. marshi, 24 Pristipomoides flavipinnis, 3 P. filamentosus, 1 P. auricilla, 13 P. zonatus, 2 Aphareus rutilans, 2 Lutjanus bohar, 2 L. kasmira, 1 L. argentimaculatus, and 1 unidentified species), 11 sea basses (5 Epinephelus cometae, 3 Cephalopholis sp., and 3 unidentified species), 6 breams (Lethrinidae), 15 jacks (9 Caranx lugubris, 5 C. sexfasciatus, and 1 C. ignobilis), and 14 miscellaneous species.
- d. Bottom trawl. One drag was made with the bottom trawl in 30-32 fathoms at the eastern shelf of Tutuila. The net snagged on the bottom and sustained major damages, forcing the cancellation of subsequent drags.
- e. Midwater trawl and plankton tows. Two midwater trawl tows and two bongo net tows were made in American Samoa. The catches in both nets were small due largely to bright moonlight.
2. Surface trolling for pelagic fishes was done during daylight runs and at selective areas around seamounts. On the runs between Honolulu and Samoa, seven fish (two skipjack tuna, one yellowfin tuna, three mahimahi, and one wahoo) were caught in 442 line-hours of trolling. In Samoan waters, 41 fish were taken in 321 line-hours of trolling. The catch included 14 yellowfin tuna, 7 dog-tooth tuna, 11 ono, 7 mahimahi, 1 kawakawa, and 1 barracuda. On the run between Samoa and Honolulu, four fish (three mahimahi and one wahoo) were caught in 204 line-hours of trolling.

3. Seven coral drags were made at American Samoa. One drag between Olosega and Tau islands yielded small pieces of black and red precious corals. A branch of black coral 36 in. long was brought up by a handline at a seamount 35 mi southeast of Tutuila Island.
4. Nine night-light stations were occupied during the cruise, six at American Samoa and three at Western Samoa. Activity around the light was poor throughout the cruise period. Small amounts (2-3 buckets) of baitfish and a like amount of mackerel scad appeared around the light at one station at Fagasa Bay. The baitfish consisted of sardines and juvenile goatfish.

Fishing with light tackle and handline around the light resulted in the capture of 44 Lutjanus, 2 Aprion, 1 Aphareus, 1 unidentified snapper, 2 Monotaxis, 1 unidentified sea bass, 9 Lethrinus, 5 Decapterus, 61 Myripristis, 1 Priacanthus, 4 Holocentrus, 1 Apogon, 9 Caranx, 7 Kuhlia, 1 barracuda, and 1 Hemiramphus.

#### C. Biological samples.

1. Sets of tissue samples for ciguatoxin study were collected from 217 fishes. A set of tissue sample consisted of material from (a) dorsal anterior musculature, (b) ventral anterior musculature, (c) gonad, and (d) postventral musculature. Samples were taken from 163 lutjanids, 10 lethrinids, 4 serranids, 25 carangids, 4 sparids, 2 holocentrids, 7 kuhlids, 1 barracuda, and 1 goatfish.
2. In addition, entire specimens of Lutjanus bohar and moray eels were frozen for ciguatoxin studies by the University of Hawaii.
3. Unidentified fish were frozen for later identification.

#### D. Oceanographic data.

1. A total of 177 XBT casts were made while traveling to and from Samoan waters. In addition, seven XBT casts were made in the survey area at trawl, plankton, and CTD stations.
2. Two CTD casts were made at American Samoa.



## E. Other observations.

1. All bird flocks and fish schools encountered on daylight runs were recorded. Twenty-three bird flocks, two with unidentified fish schools, were sighted en route to and from Samoa. Three of the flocks were large, 100 to 200 birds, and the rest were small, less than 100 birds. Fifty-two bird flocks, eight with fish schools, were sighted in Samoan waters. Eighteen flocks were large, 100 to more than 200 birds, and the rest were small. Of the eight fish schools sighted, one was identified as skipjack tuna, two as yellowfin tuna, and five were unidentified.
2. The Cromwell ran transects to determine the bottom contour at nearly all buoy sites to ensure the safe placement of buoy anchors. As time permitted, other transects were made around Tutuila to obtain depth readings, as requested by OMR.

## SCIENTIFIC

PERSONNEL: NMFS, Southwest Fisheries Center, Honolulu LaboratoryWalter M. Matsumoto, Chief Scientist, Fishery Biologist  
(August 30-October 12)Darryl T. Tagami, Acting Chief Scientist (August 18-29 and  
October 13-25), Research Assistant (August 30-October 12)

Paul M. Shiota, Research Assistant (August 30-October 12)

Bert S. Kikkawa, Research Assistant (August 18-October 25)

American Samoa, Office of Marine Resources

Frank W. McCoy, Fisherman (September 1-14 and October 8-12)

Pio Gaisoa, Fishery Biologist (September 1-14)

Richard C. Wass, Fishery Biologist (September 1-14)

William D. Pedro, Fishery Biologist (September 1-14)

Paul Pedro, Project Manager (September 17-23)

Nimo Laupapa, Fishery Biologist (September 17-23)

Western Samoa, Fisheries DepartmentAlphonso L. Philipp, Chief Fisheries Officer, Economic  
Development Department (September 26-October 6)

Submitted by:

*Walter M. Matsumoto*  
Walter M. Matsumoto  
Chief Scientist

Approved by:

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

Attachment





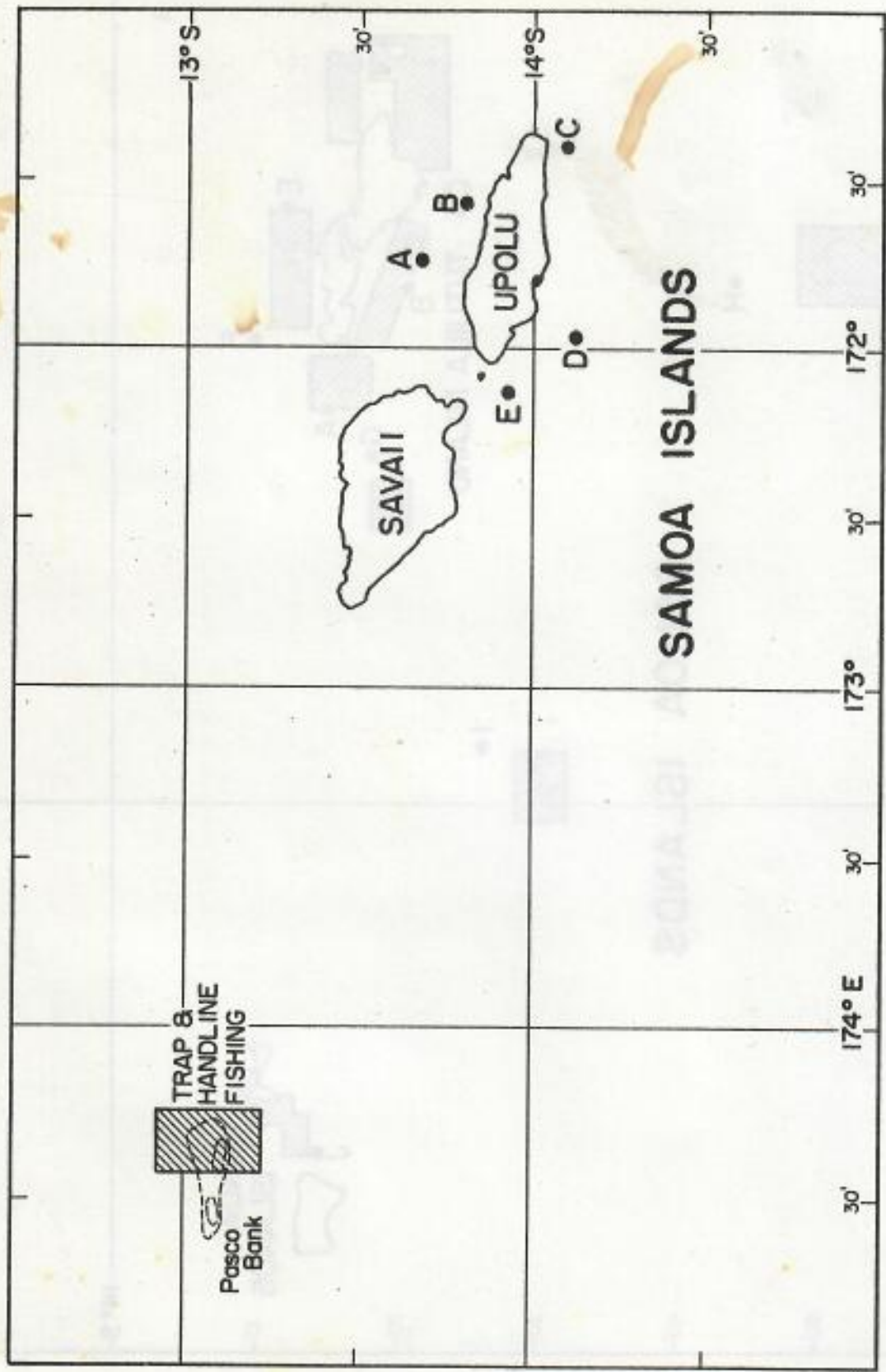


Figure 2.--Area of operation, Townsend Cromwell, cruise 79-04 (TC-85), around Western Samoa.





Principal Investigator(s) G. Balazs

Project Number \_\_\_\_\_

| DCAT CATEGORIES                            | Sea Grant NOAA | Matching |         | TOTALS   |
|--|----------------|----------|---------|----------|
|  |                | U H      | Others* |          |
| <b>PERMANENT EQUIPMENT</b>                 |                |          |         |          |
| <b>EXPENDABLE SUPPLIES &amp; EQUIPMENT</b> |                |          |         |          |
| misc. camping supplies for Rose Atoll      | 400.           |          |         | 400.     |
|  |                |          |         | (S/T C.) |
|  | 400.           |          |         | 400.     |
|  |                |          |         | (S/T D.) |
| <b>TRAVEL</b>                              |                |          |         |          |
| Domestic                                   | 2,700          |          |         | 2,700    |
| American Samoa, 120 days                   | 1,700          |          |         | 1,700    |
| " " 60 days                                | 1,150          |          |         | 1,150    |
| " " 30 days                                |                |          |         |          |
| International                              |                |          |         |          |
|  | 5,550.         |          |         | 5,550.   |
|  | 200            |          |         | 200      |
|  |                |          |         | (S/T E.) |

PUBLICATION COSTS

PROJECT Assessment of marine turtle stocks...American Samoa  
 Principal Investigator(s) G. Balazs  
 Project Area \_\_\_\_\_  
 Associate Investigator(s) \_\_\_\_\_  
 Project Number \_\_\_\_\_

| BUDGET CATEGORIES                            | Sea Grant NOAA | M a t c h i n g |         | TOTAL   |
|--|----------------|-----------------|---------|---------|
|  |                | U H             | Others* |         |
| <b>OTHER DIRECT COSTS</b>                    | 1,541.         |                 |         | 1,541.  |
| HIMB lab fees 05.00% of salaries, 30,810.    |                |                 |         |         |
| <b>TOTAL DIRECT COSTS (A THRU G)</b>         | 1,541.         |                 |         | 1,541.  |
| <b>INDIRECT COSTS</b>                        |                |                 |         |         |
| ON Campus - Research: % of DIRECT COSTS : of |                |                 |         |         |
| Training: % of                               |                |                 |         |         |
| OFF Campus - Research: 23.00 % of MDC        |                |                 |         |         |
| Training: % of                               |                |                 |         |         |
| Research Vessel: % of                        |                |                 |         |         |
| <b>TOTAL COSTS</b>                           | 10,792.        |                 |         | 10,792. |
|  | 57,715.        |                 |         | 57,715. |

\* Please insert in this column, Matching Funds from sources other than UH State Funds. Also, indicate Fund's source in parentheses under the figure, giving Institution's or Firm's name. Non-monetary contributions such as supplies, service, etc. should be supportable by evidence and subject to audit. For both monetary & non-monetary contributions, please detail in category column.



(UH MATCHING FRINGE CALCULATED AT % OF SALARIES & WAGES)

SOURCE OF FUNDS:

NOAA

| Name  | Balazs | RCUH   |                     |                         |  |        |
|---|--------|--------|---------------------|-------------------------|--|--------|
| Rank-Step                                     | R3     |        |                     |                         |  |        |
| Amount  | 29,029 | 1,781. |                     |                         |  |        |
| No. of Months                                 | 12     | 4      |                     |                         |  |        |
| Regular Employees                             |        |        |                     |                         |  |        |
| A. 26.29 of Wages*                            | 7,631. |        |                     |                         |  |        |
| B. 57/mo. or 684/12 mos.**                    | 684.   |        |                     |                         |  |        |
| C. APT Accum. Vac. 2.5% of Wages              |        |        |                     |                         |  |        |
| D. Overload (OL)*** 2.09% of Wages            |        |        |                     |                         |  |        |
| E. UH Match only % of Wages                   |        |        |                     |                         |  |        |
| Graduate Students                             |        |        |                     |                         |  |        |
| A. 2.09% of Wages***<br>RCUH 06.00%           |        | 107.   |                     |                         |  |        |
| B. /mo. or /12 mos.**                         |        |        |                     |                         |  |        |
| Undergraduates & Less than 1/2 time employees |        |        |                     |                         |  |        |
| A. 2.09% of Wages***                          |        |        |                     |                         |  |        |
| Totals  | 8,315. | 107.   |                     |                         |  |        |
| SUB-TOTAL Sea Grant Funded                    |        | 8,422. |                     |                         |  |        |
|   |        |        | SUB-TOTAL UH Funded |                         |  |        |
|   |        |        |                     | SUB-TOTAL Others Funded |  |        |
| OVERALL TOTAL                                 |        |        |                     |                         |  | 8,422. |

\* Retirement, Social Security, Workmen's Compensation, Unemployment Compensation Insurance  
 \*\* Health, Dental, Life Insurance  
 \*\*\* Workmen's Compensation, Unemployment Compensation Insurance

## SEA GRANT PROJECT SUMMARY

(See NOAA Form 90-2A for instructions before completing form. Limit all information to this page.)

|  |  |                     |                        |                                    |                               |                                  |                                      |
|--|--|---------------------|------------------------|------------------------------------|-------------------------------|----------------------------------|--------------------------------------|
| PROJECT NO.  | PROJECT STATUS: <input type="checkbox"/> NEW <input type="checkbox"/> CONTINUING |                     |                        |                                    | DATE INITIATED, IF CONTINUING |                                  |                                      |
| GRANT NO.<br>(Office)  | PROJECT TITLE  |                     |                        |                                    | DATE OF THIS FORM             |                                  |                                      |
| INSTITUTION  |  |                     |                        |                                    | OLD TITLE (if different)      |                                  |                                      |
| PRINCIPAL INVESTIGATOR AND COLLEGE OR DEPARTMENTAL AFFILIATION   |  |                     |                        | % TIME                             | ASSOCIATE INVESTIGATOR        |                                  | % TIME                               |
| FUNDING TO DATE  |  | LAST YEAR'S FUNDING |                        | PROPOSED FUNDING                   |                               | RELATED PROJECTS<br>(By numbers) |                                      |
| FED.-SEA GRANT   | MATCHING   | FED.-SEA GRANT      | MATCHING               | FED.-SEA GRANT                     | MATCHING                      |                                  |                                      |
| PART OF UNIVERSITY PROGRAM   |  |                     |                        | OFFICE OF SEA GRANT CLASSIFICATION |                               |                                  |                                      |
| PERCENT OF PROPOSED FUNDING FOR ANTICIPATED BENEFIT AREAS (Consider Prog. Mgt. & Support, if applicable) |  |                     |                        |                                    |                               |                                  | PROGRAM<br>MANAGEMENT<br>AND SUPPORT |
| RESOURCE UTILIZATION   |  |                     | RESOURCE<br>MANAGEMENT | EDUCATION                          |                               |                                  |                                      |
| ESTABLISHED IN-<br>DUSTRY  | EMERGING IN-<br>DUSTRY   | PUBLIC USE          |                        | MANPOWER DEVEL-<br>OPMENT          | PUBLIC EDUCA-<br>TION         |                                  |                                      |
| %  | %  | %                   | %                      | %                                  | %                             | %                                |                                      |
| OBJECTIVES:  |  |                     |                        |                                    |                               |                                  |                                      |
| ANTICIPATED BENEFITS:  |  |                     |                        |                                    |                               |                                  |                                      |
| IDENTIFIED BENEFITS TO DATE:   |  |                     |                        |                                    |                               |                                  |                                      |
| KEYWORDS:  |  |                     |                        |                                    |                               |                                  |                                      |



TRIP REPORT  
Rose Atoll National Wildlife Refuge  
November 10-13, 1980

Introduction:

Rose Atoll National WR was visited on 10-13 November, 1980 by a team of biologists representing the US Fish & Wildlife Service, National Marine Fisheries Service and the Office of Marine Resources (American Samoa Government). The purpose of the trip was to assess the condition of fish and wildlife resources in the refuge, including a preliminary evaluation of potentially harvestable clams in refuge waters. The most recent previous trip to Rose Atoll by a refuge biologist occurred in March 1978. A November 1979 trip was cancelled due to problems obtaining a charter vessel. This report also includes a discussion of activities relating to the management of Rose Atoll NWR which occurred in American Samoa prior to the chartered boat trip. This report focuses primarily on the activities of the Refuge representative (Shallenberger). Reports on surveys of turtles, plants and marine resources will be prepared by cooperating investigators.

Personnel:

- Dr. Robert Shallenberger, Supervisory Wildlife Biologist  
(RWR), US Fish & Wildlife Service
- Mr. Ernest Kosaka, Endangered Species Coordinator, US  
Fish & Wildlife Service
- Dr. Derral Herbst, Endangered Species Botanist, US Fish  
& Wildlife Service
- Mr. George Balazs, Research Biologist, National Marine  
Fisheries Service
- Dr. Richard Wass, Ichthyologist, Office of Marine Resources
- Mr. William Pedro, Biologist, Office of Marine Resources
- Skipper (Wally Thompson) and crew (3) of the vessel  
"Leilani"

Itinerary:

- 11/3/80: Kosaka and Herbst depart Honolulu for Pago Pago.  
11/5/80: Shallenberger and Balazs depart Honolulu for Pago Pago.
- 11/6/80: Shallenberger/Balazs meet with Henry Seseapasara (Director, Office of Marine Resources) and William Pedro. Inspection of vessel "Leilani." Discussion regarding cooperative management of Rose Atoll NWR, including potential for commercial clam harvest. Afternoon spent shopping for Rose Atoll trip.
- 11/7/80: Morning meeting at OMR with Korean Consul regarding illegal entry of Korean vessels to Rose Atoll NWR. Lunch meeting with Taiwan Fisheries Commissioner (Robert Hsiao) and Coast Guard Commanding Officer (Lt. Doug Perkins) regarding enforcement of regulations pertaining to Rose Atoll NWR. After lunch, Shallenberger/Balazs appeared on local television with Henry Seseapasara to discuss Rose Atoll NWR. Shopping and loading of "Leilani" in late afternoon.
- 11/8/80: Continued shopping for Rose Atoll trip in morning. Afternoon off for sightseeing.
- 11/9/80: Shopping and loading completed. Departure from Pago Pago in "Leilani" at 1440 hours. Seabird observations recorded until 1830 (sunset).
- 11/10/80: Sunrise at 0540. Intermittent seabird observations until arrival at Rose Atoll approximately 0930. Slack low tide (0800) was missed due to delay enroute so decision was made to offload equipment into a Zodiac to enter lagoon channel instead of taking "Leilani" through narrow, turbulent channel. First boat load with Shallenberger/Kosaka/Herbst/Balazs landed on Rose island at 1130. Remaining gear brought to island later in afternoon. Camp established south of Refuge sign on west side of island. All biological surveys begun. Shallenberger/Herbst laid initial E-W grid across island. Rats collected/weighed/pickled. Turtle/bird surveys conducted on land until 2300.



- 11/11/80: Bird survey/census initiated at 0530. E-W transects established/censused across Messerschmidia forest on north half of island. Strip transect laid in Pisonia forest. Census of Black noddies, White terns, Red-tailed tropic birds conducted in strip transects. Booby/frigate counts made. More rats collected for stomach analysis. Walked atoll reef during low tide. Banded boobies at night until 2300.
- 11/12/80: Up at 0530. 16 mm filming in morning. Bird observations noted on transects. Cleared Messerschmidia blocking view of refuge sign. Scraped/wire brushed refuge sign in preparation for varnish. Dived with Wass/Pedro/Kosaka on clam survey. Bird survey/census on Sand Island. Banded boobies with Kosaka/Herbst. Censused White terns on strip transect in Pisonia forest.
- 11/13/80: Up at 0500. Filmed sunrise at 0535. Continued frigate/booby counts and 16 mm filming. Applied Varathane to refuge sign. Kosaka finished clearing of vegetation near sign and repaired "blue goose" sign. Late morning dive on western reef and edge of lagoon. Packed gear for afternoon departure. Ran gear to "Leilani" in Zodiac. Weighed anchor outside atoll channel at 1600, headed west for Tutuila. Intermittent seabird observations noted until dark.
- 11/14/80: Up at 0530. Intermittent seabird observations noted until arrival at Pago Pago approximately 1100. Unloaded "Leilani" and took gear to hotel. Departed Pago Pago on Continental flight 600 at 2330.

#### Methods

This discussion includes reference only to bird observations. Methods used by other investigators are discussed in separate reports.

Birds: Census techniques varied by species, depending on nesting habits and stage of nesting. On Rose island, east-west transects were walked (by compass course) in an attempt to cover the entire Messerschmidia forest on the north half of the island. At 50' intervals, 10 E-W transects were

walked. The ends of the transects were marked with blue flagging tape on the east and west beaches. Vegetation characteristics made it impossible to stay on transect at all times but attempt was made to record bird and nest observations without duplication or missing segments. The transects are illustrated on the attached vegetation map, but the reader should be aware that the density of vegetation (particularly Messerschmidia) has increased considerably since the map was prepared and much of the area shown devoid of vegetation is now covered with Messerschmidia (in the north) and Pisonia (in the south).

Strip transects were established in the Pisonia forest using a compass course drawn E-W from the concrete marker (see map). An E-W and N-S line was flagged and edges of the strip transects were established at 10 meters. Total length of the E-W transect was 60 meters and the N-S transect was 110 meters. In order to reestablish the transect at a future date, metal botanical tags were nailed to the Pisonia trees along the transects.

For the purposes of future reference, botanical tags were placed as follows: (see Fig. 1)

Use of the transects in census or determination of phenology is discussed where relevant for each species. Census on Sand Island involved coverage of the entire island by walking repeated transects across the island, marking the start and finish of each transect.

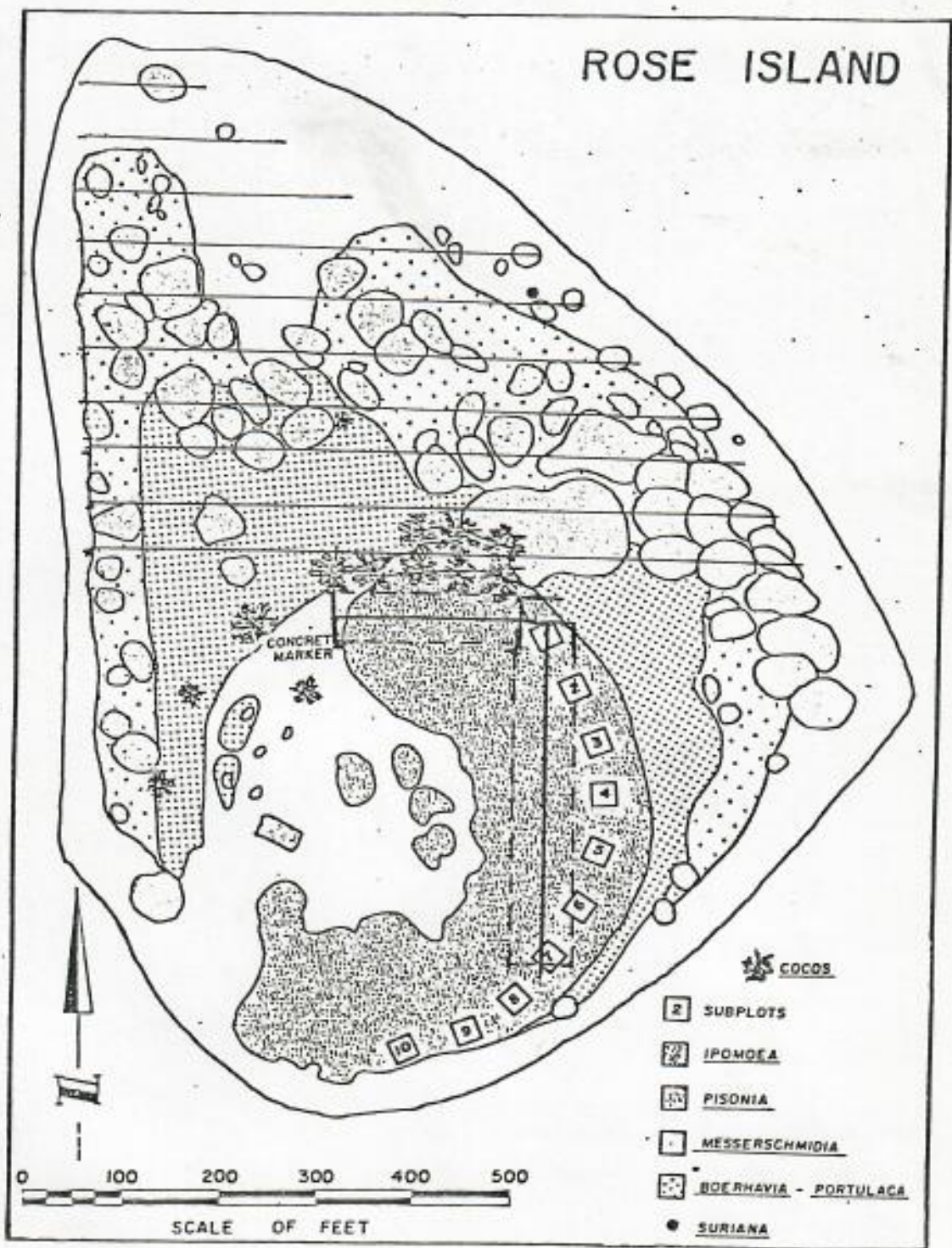
Masked and Brown boobies were banded at night (2000-2300) using Fish & Wildlife Service aluminum bands, size 7B. During this effort, only two previously banded birds were observed. Both were adult Masked boobies:

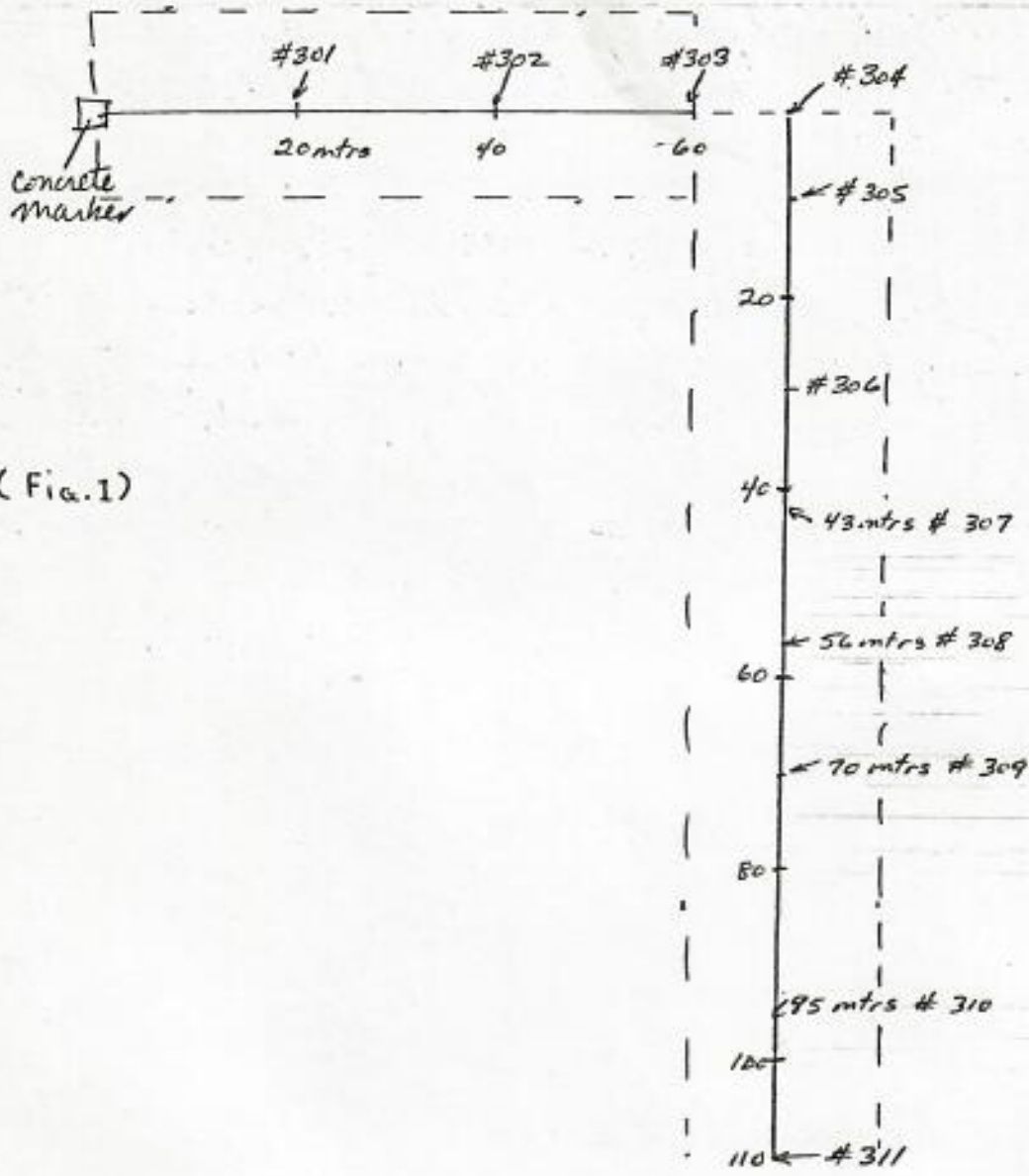
- 1) 757-66867 (sex unknown)
- 2) 757-63453 (female)

These band numbers will be submitted to the Banding Lab to determine when and where they were banded. Adult birds were weighed in a silk stocking using a 2 kilogram Pesola scale. Regurgitated food items were collected from 13 boobies (Masked and Brown) and preserved for later analysis in separate jars containing 10% Formalin solution with water.



# ROSE ISLAND





( Fig.1 )



Birds:

1) Red-tailed tropic bird (Phaethon rubricauda)

Observed both in flight over Rose island and on the ground. No aerial breeding display observed. One adult on an egg was observed in Messerschmidia. Six juvenile birds (all with black barring) seen near Pisonia roots, most within 30'-50' of forest edge. Parents still attending juvenile birds.

2) White-tailed tropic bird (Phaethon lepturus)

Maximum of two seen in flight over Rose island at any one time. Seen on all days at atoll. No evidence of nesting noted.

3) Masked booby (Sula dactylatra)

Observed juveniles in small (3-4 at a time) numbers behind boat as far as 15 miles west of Rose Atoll on approach. Common in air over Rose island and over water flying to and from island during visit. Most birds in air were juveniles (3-4:1). Most of nesting complete. Only two active nests with eggs on Rose island. One pair was also attending a 2-3 week old downy chick. Adults gathered with juveniles in Boerhavia "meadows," particularly in large open area NE of Pisonia forest. Banded 28 adults (14 males, 12 females, 2 unsexed) and 15 juveniles or downy chicks. Based on evening/morning counts and banding/resighting data, I estimate 50-75 adults and 25-40 chicks or juveniles were on island during our visit.

4) Brown booby (Sula leucogaster)

Brown boobies (adults and immatures) were seen in very small numbers following the boat at a distance of 10-15 miles from Rose. None were confirmed on transect between Tutuila and Rose. Adults, eggs, chicks and nest sites were noted on E-W transects within Messerschmidia (11/11 0700-1200). Count of 42 nest sites probably reflects 50% of actual total as many were partially deteriorated and inconspicuous. Only two nests contained eggs. Only 8 Stage 3 chicks were seen on Messerschmidia transects. 21 Stage 4-5 chicks were noted in Boerhavia meadow north of Pisonia forest. Some were roosting on Pisonia branches. These counts were not reflective of actual production as between 100-150 immature

birds were roosting on tops of Pisonia trees at the same time. Between 25-30 additional Brown booby nest sites were found under Pisonia canopy, within 50' of forest edge, around virtually the entire perimeter. Only two of these contained eggs, but 6 Stage 3-4 chicks were counted. A total of 72 Brown boobies were banded in the evenings of 11 and 12 November. Banded birds included 33 adults and 39 juveniles. It is apparent that a visit in late September or early October in this year would have been necessary to derive a more accurate estimate of breeding population, although the varied condition of old nest sites suggests that actual breeding may extend over several months. The total count (ground and tree top) of 150-200 young birds does indicate an adult population of over 400 birds, when immatures are included. Several earlier estimates within the last decade have been considerably higher than this.

#### 5) Red-footed booby (Sula sula)

Red-footed boobies were observed infrequently as single birds or in mixed species feeding flocks while on transect from Tutuila to Rose. First sightings were near Aunuu island. Adults and immatures followed the boat off and on from first light on 11/10. All adults seen at sea were dark phase birds. It was apparent upon arrival at Rose that accurate estimates of this species would be impossible due to the stage of nesting and locations of roosting birds. Most were found on the crowns of 20'-30' Messerschmidia trees and some were scattered across the entire Pisonia canopy. On transects in the Messerschmidia, adults were not counted (as they readily took flight). Very few nests were still intact. On 10 transects, 83 young were counted, all but one in Stages 3-5. Of more than 100 adults seen in these transects, only 6 light phase adults noted in the Messerschmidia forest are truly reflective of the Pisonia nesters as well. However, it was clear that Messerschmidia was a preferred nesting habitat, perhaps because of the roosting frigate birds in the Pisonia canopy. No Red-footed boobies were banded during our visit.

#### 6) Great frigate bird (Fregata minor)

Great frigate birds were soaring over and roosting on the Pisonia canopy throughout our visit. At times, a column



of frigates (both species), terns and some boobies could be seen over the reef edge. At no time were more than 80-100 frigates observed in the air, and often less than 20 were in flight above the forest. No evidence of breeding by Great frigate birds was noted, although it was impossible to clearly view the canopy roosting (nesting?) sites. In most counts of soaring birds, Great frigate birds outnumbered Lesser frigate birds by a ratio of 3:2-2:1.

7) Lesser frigate bird (Fregata ariel)

This species was observed soaring and roosting in company with Great frigate birds. At no time were more than 20 Lesser frigate birds observed in the air, although larger numbers may have been in soaring flocks seen off the reef edge at a distance where differentiation of species was impossible. No frigate nests were seen in the small portion of the Pisonia canopy that could be observed, but two 4-6 week old chicks were found on the Pisonia forest floor. One was in apparent good health, but the other had an injured wing, possibly sustained in a fall. They both moved around within about 100' of where they were first sighted, but no adults were seen below the canopy during more than 12-15 hours spent in the forest. It is unlikely that more meaningful data could be gathered on either frigate bird species without the aid of spikes to climb Pisonia trees and an observation platform near the canopy.

8) Reef heron (Egretta sacra)

Reef herons were observed on each day of survey. Virtually all were seen on reef flats adjacent to Rose island. Both dark and light color phases were seen. No more than six were observed during any one circuit of the island. Three inactive nest sites were located inside holds in the trunks of large Pisonia trees. Piles of sticks were gathered. No remains of egg shells or other evidence of recent nesting were noted. These nest sites were all in the south end of the island. Two of the nest site trees were marked with botanical tags numbering #312 and #313.

9) Snowy egret (Leucophoyx thula)

One large white heron was seen in the company of (within 50') of two reef herons during the first day of our visit. They were stalking prey on the reef flat south of Rose island. Although not close enough to positively identify the species, size comparison and leg color did lead me to

conclude it was a Snowy egret. Coleman (Mar. 1978) also reported a Snowy/little egret sighting at Rose.

10) Golden plover (Pluvialis dominica)

Golden plovers were recorded on all circuits of Rose island and on the exposed reef flats as well. A maximum of 12 birds were noted on any one circuit, all in winter plumage. Several were also seen at night, both on the beaches and moving across the Pisonia and Messerschmidia forest floor.

11) Ruddy turnstone (Arenaria interpres)

This species was observed both on Rose and Sand islands, individually or in flocks up to 8 birds. Most groups were seen on tidal flats, but a group of 5-6 birds entered a small Sooty tern colony for about 5 minutes after the terns had taken flight (when I approached). Surprisingly none of the turnstones pecked at any of several tern eggs in the area. Instead, they searched methodically for insects in the coral rubble.

12) Wandering tattler (Heteroscelus incanus)

As many as 6 tattlers were observed during daylight circuits of Rose island. Individual birds were also seen at night, both at the water's edge and inland. These birds seemed abnormally easy to approach with headlamps at night. Three were easily captured for examination this way. Although I had no bands along of the appropriate size, this does suggest the advisability of banding and more thorough examination on future trips.

13) Sanderling (Crocethia alba)

Only two birds seen on the first day at Rose. No subsequent observations.

14) Bristle-thighed curlew (Numenius tahitiensis)

Two curlews were observed during the visit, and both of these sightings were at night. One was roosting in a Messerschmidia tree on a branch 4' off the ground. This bird was easily captured by hand for examination in a bright headlamp. A second bird was seen the next night as it ran across the Pisonia forest floor.



15) Gray-backed tern (Sterna lunata)

No more than 20 birds of this species were observed on the morning of 11/10 as we circled the north and northwest edge of the atoll in the "Leilani." Surprisingly, no more adults were seen later in the visit, either at sea or on Rose or Sand islands. One juvenile Gray-backed tern flew over Sand island during my visit. This species has been reported to nest on Sand island in prior visits.

16) Sooty tern (Sterna fuscata)

Sooties were not observed on transect from Tutuila until 0705 on 11/10, approximately 20 miles from Rose Atoll. This was the most vocally conspicuous bird in flight once inside the atoll. Although 1000-2000 birds were circling and calling in flight over Rose upon our arrival, only one small colony of birds on eggs was located, under a Messerschmidia canopy bordering the Boerhavia meadow in the center of the island. Approximately 50-75 eggs were attended by birds that readily took flight when approached, but returned shortly when left undisturbed. However, on 11/11 the Sooty colony had regrouped more than 200' from the previous sight and approximately 200 eggs were on the ground in the new area. The previous colony was abandoned and many of the eggs were predated by rats. The new colony was almost entirely under the Messerschmidia canopy as well. This provides pleasant shade from the ruthless sun but it also makes entry and exit more difficult for the birds. By 2000 on 11/11, Sooties had already left their eggs in the second colony sight. Some eggs had already been predated. Even more had been predated by the next morning and no birds were on ground. Approximately 2000 Sooties were in noisy flight over the southeast portion of the Pisonia forest. Noise level in the forest was much higher than before, due in large part to the calling Sooties. Calling ceased completely on an intermittent basis as the Sooty flock flew in unison out over the water and then quickly regrouped over the forest again. No more laying of eggs was noted on Rose during the remainder of the visit. Calling of Sooties over the forest continued until we left, although it virtually ceased between 0200 and 0500 11/12 and 11/13. One additional observation relating to Sooties on Rose island is worthy of note. Although the laying/flocking behavior described above is not atypical of the initiation of breeding in this species, at least 6 nearly fledged or flying juvenile Sooties were seen on or around Rose during the visit. The juveniles on the ground were seen repeatedly in forest clearings west of the Pisonia forest, but none were attended by adults while being watched. This evidence of asynchrony in nesting is supported by historic data at Rose, but the inconsistency in recording of data makes it difficult to interpret breeding phenology. Sooties also appeared to



be at the initial phase of nesting on Sand island during our visit. Only 58 eggs were counted, virtually within the limits of the active Brown noddy colony on Sand. Sooties were confined to the northeastern part of the island. No chicks were seen.

17) Brown noddy (Anous stolidus)

Brown noddies were seen intermittently on at-sea transect between Tutuila and Rose and were particularly common in two dense feeding flocks observed over aku schools. They were also observed in the air in the vicinity of Rose Atoll and in very small numbers less frequently over Rose island itself. Only four Brown noddy nests were found on Rose island. Three nests were in a single Pisonia tree near the concrete marker, each within 20' of the ground. Two nests had 4-5 week chicks and one was empty. The fourth nest, with downy chick was in a Pisonia tree in the southeastern edge of the forest. The nests were built of twigs and small branches, in contrast to the Black noddy nests elsewhere in the tree, built almost exclusively of Pisonia leaves.

On Sand island, Brown noddies displayed considerable nesting asynchrony. In a total count of eggs and chicks on Sand, 68 eggs and 77 chicks were recorded. The age of chicks ranged from newly hatched (n=21) to flying juveniles (n=7) and was evenly distributed across age classes in between. The Sand island colony covered virtually all of the flatter portion of the island not subject to tidal action. Most noddy nests contained numerous feathers, bones, shells and other debris.

18) Black noddy (Anous tenuirostris)

Black noddies were also observed on transect from Tutuila to Rose Atoll, with virtually all sightings within 20 miles of Tutuila or Rose. None were nesting on Sand island. On Rose island, most were confined to the Pisonia forest. Survey of the Messerschmidia forest on II/II turned up only 4 active Black noddy nests. Census was difficult in the Pisonia forest because noddies were nesting between 10'-60' off the ground. Most were in the 20'-40' range. Their distribution was patchy as well, with groups of 4-5 nests separated by as much as 50' from other groups. Determination of nesting phenology was even more difficult because of inability to see into most nests. For this reason, no distinction is made between an egg and very young (closely brooded chick). Counts of Black noddies were made on E-W and N-S strip transects in the Pisonia forest. Total coverage in strip transects was 3400 sq. meters (170 x 20). In this area of forest, 76 Pisonia trees were counted. Within the transect, 64 nests were observed: 37 were closely brooded (eggs or small chicks) and 27 had erect young,



including 14 within 2-3 weeks of fledging. Accurate determination of the entire area of the Pisonia forest must await up-to-date aerial photography, but based on earlier mapping, the forest is tentatively estimated at 15,000 sq. meters of which about 12,500 sq. meters is used by Black noddies. Extrapolating the nests counted on strip transect (64/3400 sq. meters) to this latter figure indicates an estimated nest total of 235 and, therefore, a minimum adult breeding population of 470 birds at the time of our visit. The asynchrony in nesting suggest the actual colony size is considerably larger.

19) White tern (Gygis alba)

White terns were also observed intermittently along the at-sea transect from Tutuila to Rose. Greatest numbers were seen flying in a southerly direction (as individuals) from the south shore of Tutuila as we headed along this coast. They were also observed in mixed feeding flocks and as individuals until dark on 11/9 and at first light on 11/10.

Adult White terns were seen on E-W transects in Messerschmidia forest but few eggs or young were noted by comparison to the Pisonia forest. Adults were conspicuous by their flight reaction to intruders, but eggs or young were not detected easily in the dim light and tangled branches. Most eggs noted were firmly place into nodes on the tops of Pisonia branches, a factor possibly responsible for the atypical lack of reluctance of adults to leave their eggs to mob the intruder. Less than a dozen large chicks were seen on the entire visit. Most nesting birds were attending eggs or small chicks.

In view of the inability to accurately count eggs or chicks, adults were counted with a flashlight as they roosted in Pisonia trees at night. Birds were less likely to fly at night than by day, so the problem of attracting birds from "off transect" was reduced. Counts made on 11/12 from 2200-2330 on the E-W and N-S Pisonia strip transect revealed 22 (E-W) and 39 (N-S) birds respectively within a total coverage of 3400 sq. meters. As most of these birds appeared to be paired, an estimate of 35 nests is inferred. The White tern nesting distribution in the Pisonia forest is similar to, but somewhat smaller than that of the Black noddy. Extrapolation of White tern nesting density on transect to an estimated distribution of approximately 10,000 sq. meters indicates about 103 active nests in Pisonia. Including scattered nests in peripheral Messerschmidia and in the dense Messerschmidia in the north half of the island suggests a total nest count of about 120, or a minimum adult breeding population of 240 birds.

20) Long-tailed New Zealand cuckoo (Urodynamis taitensis)

This migrant land bird was reported on Rose island for the first time in May 1976 by A. B. Amerson and has not been noted on three visits since. Two cuckoo sightings were made on this trip (on 11/11 and 11/12). Both sightings were in dense cover, first in Messerschmidia and again in Pisonia near the concrete market. Sightings were brief but certain identification was possible.

21) Wattled honeyeater (Foulehaio carunculata)

A possible vocal record and brief sighting of this species was made at 0930 on 11/11 under the dense canopy of Messerschmidia while on E-W transect. A few notes of song were heard first and struck a familiar note after having spent three days in the previous week on Tutuila. This bird was sighted very briefly as it flew through the Messerschmidia branches. In contrast to the cuckoo seen only 20 minutes later, this bird lacked the obvious superciliary stripe and long tail. Certainly this questionable sighting needs confirmation, preferably through collection of a specimen.

Other bird observations:

Other birds sighted on at-sea transect include Blue-gray noddies (Procelsterna cerulea), Audubon shearwater (Puffinus lherminieri), Wedge-tailed shearwaters (Puffinus pacificus), Slender-billed shearwaters (Puffinus tenuirostris) and unidentified Pterodroma species. The Blue-gray noddies were confined to the south coast of Tutuila and near Anuu, where they have been recorded nesting on the east cliffs.



Mammals:1) Stenella species

Two porpoises of the genus Stenella were seen briefly as we circled the north side of Rose Atoll in the "Leilani."

2) Pilot whale (Globiocephala meleana)

Captain Wally Thompson reported seeing a school of 8-10 Pilot whales while at anchor off the southwest edge of the atoll during our visit.

3) Polynesian rat (Rattus exulans)

Rats were observed in greatest numbers within the Pisonia forest, particularly in the southern portions. Rats were seen using burrow entrances on frequent occasions, particularly within the Pisonia root complex. Less commonly rats were seen in the exposed forest floor, but seemed to prefer the cover of fallen branches and other debris. Fewer were seen in the Messerschmidia forest.

Although some rats were seen at all times of day and night, observations declined noticeably between 1000-1800 hours. No accurate estimates of abundance were made, although in frequent trips throughout the Pisonia forest it was not uncommon to see as many as 40-50 rats in a 30 minute period. Often sightings were made of 3-4 rats moving in and out of the same root complex and occasionally the same holes in the ground.

I was particularly interested in the rats' feeding habits and possible interactions with birds. Only one certain identification of an animal food item was made when a rat carrying a piece of fish was shot. Fish and squid are potentially important food sources in the Pisonia forest, where scraps from bird nests above the ground surely hit the forest floor with some frequency. I also observed rats rooting around in leaf litter but did not identify food items. Most coconuts on the ground are cleaned of all meat. Although rats must play some role in this, large hermit crabs are almost surely involved as well. A total of 22 rats were shot for later stomach analysis. Twelve of these were preserved intact in formalin and gastrointestinal tracts of the other ten were removed and pickled as well.

Rat predation was implicated in the Sooty colony observed on Rose island by the collection of several predated eggs, but only two observations of rats with their heads inside broken egg shells were made during the visit. Six Sooty eggs brought to our campsite at 2300 on 11/11 were predated by 0500 the next morning. At least three White tern eggs which fell from nest sites during my visit were predated egg shells overnight. No evidence of predation on chicks was noted, although rats were seen climbing lower branches of Pisonia trees where some White tern and Black noddy nests were found. Predation in these lower nests could easily have been missed in our brief visit. Perhaps, the apparent tendency of these rats to restrict their arboreal activity to lower branches accounts for the higher density of tern nests above 10'.

It is not clear whether the activity of rats was in any way responsible for the pattern of laying/desertion seen in Sooty tern during our trip. Unattended eggs were readily predated by rats and the typical reluctance of Sooties to hold tight on their eggs at the initiation of a breeding attempt probably predisposed them to heavy egg losses. We have no way of knowing how vulnerable young chicks may be just on the basis of these observations. However, no young tern (White or Black noddy) chicks were found on the Pisonia forest floor, dead or alive. It seems likely that rats scavenge or predate many of those that fall from nests above. The very few Sooty juveniles seen on the forest floor, including one with a broken wing, were presumably large enough to fend off a rat attack. Surely the same is true for numerous unattended boobies (Brown and Masked) and the Lesser frigate bird chicks seen on the ground. No turtle hatchings were seen during the entire visit, nor were any remains that might have implicated rats in turtle predation.



Reptiles:1) Polynesian gecko (Gehyra oceanica)

This gecko was seen in small numbers in Pisonia root systems. No attempt was made to determine abundance/distribution.

2) Mourning gecko (Lepidodactylus lugubris)

This species was noted in greatest numbers between the boards on the wooden refuge sign, particularly under the upper cross member.

3) Green sea turtle (Chelonia mydas)

Pits left by breeding turtles were widely distributed on both Sand and Rose islands. Many pits are in the open between Messerschmidia trees, yet the large number of pits under the forest canopy (Pisonia and Messerschmidia) casts serious doubt regarding the validity of aerial pit counts during overflights. Also the substrate is so coarse that old pits are likely to remain intact for several months. Adult females were observed and tagged while laying eggs on Rose during our visit, although the small number of observations (6) suggests that the peak of nesting had passed. Surprisingly, no turtle hatchlings (live or dead) were found on this visit. More extensive data on turtles at Rose Atoll will be provided in a report to be prepared by George Balazs.

### Terrestrial Invertebrates:

Dr. Derral Herbst collected various insects during his field work on Rose and Sand islands. This material will be worked up into a species list at a later date. The largest terrestrial invertebrates on Rose are hermit crabs (\_\_\_\_\_ species). Greatest numbers are found in the root and trunk systems of Messerschmidia by day. At night they leave this refuge in search of food across the sand and coral rubble of the island, and in lesser numbers, on the Pisonia forest floor. They appear to scavenge on whatever they can find including dead birds, fish, coconut meat, and possibly bird eggs.

### Plants:

Botanical observations will be provided in a report prepared by Dr. Derral Herbst.

### Marine Surveys:

Reports of fish and clam surveys will be prepared by Dr. Richard Wass. Samples of various marine algae were collected during the trip by George Balazs and will form the basis on an additional report at a later date.

### Other Observations:

We found no evidence of recent human presence on Rose or Sand islands, despite our concern regarding illegal entry by foreign fishing vessels and other boats. Debris of various types was scattered across the island, including the center of the Pisonia forest. However, most if not all of this debris appears to have been distributed by high surf, which at times must wash across the entire island. One piece of rusted military ordnance was found, but not of recent origin. Introduced coconut trees are thriving, with numerous seedlings taking root. This raises some concern for future management as it is the only introduced plant in this relatively undisturbed ecosystem.

### Recommendations:

The results of this survey suggest the need for additional management/research activities on site as well as actions on the part of the American Samoa Government and U.S. Fish and Wildlife Service which can be taken away from Rose Atoll. These are discussed briefly on the following pages.



- 1) Discussions with Taiwan and Korean consuls and fishery agents should be followed up with letters of encouragement and warning regarding enforcement of Rose Atoll regulations. Brief explanatory memos (in those languages) should be prepared and distributed through the agents to fishing boat captains to insure compliance with regulations.
- 2) As funds permit, law enforcement personnel should visit American Samoa and make their presence felt through meetings with the Governor, ASG officials, fishery agents and consuls and those retail outlets now illegally marketing turtle products. Law enforcement authority for OMR officials as specified in our cooperative agreement, should be reinstated.
- 3) Arrangements should be made for vertical aerial photography at Rose Atoll, to be used in reef and terrestrial habitat mapping. This should be pursued through the Coast Guard, or if funds permit, through South Pacific Island Airlines. Periodic overflights for survey/enforcement by SPIA aircraft, as specified in our current agreement with ASG, do not appear cost effective. As an alternative, periodic boat trips for field survey of fish and wildlife should be conducted. Use of the new ASG-OMR fishing vessel or other contracted vessels should be explored. Trips should be scheduled to cover months of the year other than Oct.-Nov., when most previous trips have occurred.
- 4) Serious consideration of clam harvest within the lagoon at Rose Atoll requires considerably more data on age/size at maturity as well as density and distribution in the lagoon. Trips should be scheduled to gather the data most pertinent to this analysis. All associated impacts of such harvest, including its effect on the marine and terrestrial ecosystems, should be carefully evaluated.
- 5) The potential designation of Rose Atoll as a Research Natural Area or a Unique Ecological Area should be investigated and the impacts of such designation on resource management should be evaluated.
- 6) Future field work at Rose Atoll should include periodic extended field camps to improve the data base on all species. Steps should be taken, however, to minimize the adverse effects of field activities. Particular care is necessary to prevent the unintentional introduction of pest plants. All cooperating agencies (NMFS, FWS, ASG) should participate

in the planning, funding and implementation field projects. In the immediate future, field work is needed in Feb.-Mar. (to evaluate clam breeding activities) and in Aug.-Sept. (intensive turtle study). This timing would be compatible with necessary future bird studies as well.

7) Although more intensive study would more clearly elucidate the extent of Polynesian rat impact on birds and turtles, there appears to be little if any justification to postpone an eradication program for this species at Rose. It can be effected with a combination of shooting, trapping and pesticides without impact on other species. Even if eradication proved unfeasible, significantly reduced populations subject to periodic future control would, in itself, be a worthwhile objective.

8) Navigational charts which include Rose Atoll should be modified to correct reference to the Fish & Wildlife Service and National Wildlife Refuge regulations.

9) Consideration should be given to preparation of a brief 16 mm film (using footage shot on this trip) for use on Samoan TV as an educational tool relating to the refuge. As an alternative, a short slide package can be produced and used with an appropriately translated soundtrack for Samoan TV and for future work with Taiwan and Korean fishing vessels.

10) The refuge brochure on Rose Atoll should be updated (and corrected) for a program of expanded distribution in Samoa.

11) All historic fish and wildlife data available for Rose Atoll should be compiled into a detailed overview by species (as in the format of Atoll Research Bulletins for Northwest Hawaiian Islands). In this way, some confusing data regarding phenology of individual species may be interpreted more meaningfully and obvious gaps in our data base will aid in planning for future trips. Methodology for future census and other studies should be established in advance to insure consistency and comparability of data.





AMERICAN SAMOA GOVERNMENT  
PAGO PAGO, AMERICAN SAMOA 96799  
DEPARTMENT OF EDUCATION  
Division of Instructional Development

In reply refer to:

October 22, 1982

Gerry Ludwig  
Assistant Refuge Manager  
U.S. Fish and Wildlife Service  
P. O. Box 50167  
Honolulu, HI 96850

Dear Jerry:

Thanks again for the invite out to Rose Island. It's nice playing field biologist. It's a good change from the class and office.

I have included a couple of news clips from the government bulletin. They wanted to break news that there had been harvesting of clams when they heard about fewer middle sized clams. I had only told them about it because I think it is scientifically odd that the population has the bimodal curve. They didn't find it as scientifically interesting as I did. I thought they did a fair job of the conflict in trying to protect the island.

You should be getting a check and a purchase order in a few weeks for slides. I would like to get about 50 from the ones that you took and twenty from the ones that George took. I made the order out so that I could get two duplicates of each slide. I estimated a cost of .60¢ a slide. If the cost is more let me know and I will make up the difference.

I have also included the Samoan translation (corrected) that you sent to me earlier. Instead of using the picture you used we stole a map off of a University of Hawaii map and put it on instead.

I would also like to get from you the following:

- a) the data on the clam growth studies
- b) the data on the longer frequency count (with tanks)
- c) a copy of xerox copy of the brochures that were done in Samoan and English about Rose Island giving the history and some other things. It is longer than the one I am returning to you now. The government bulletin lost mine.

Gerry Ludwig  
October 22, 1982

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I hope to be sending you my report and Ropeti's in the next couple of weeks.

Tell George, I have his medicine kit and am waiting for the labels. I would like to get about 20 slides from him with a couple of Ropeti if possible. Ropeti said he would like some prints and I can get those made if I have the slides. My finger still hurts and I am considering filing charges against him and William. (Not really, the swelling is almost gone but it still hurts a little. I am able to type though.)

I've started looking into taking a trip with students in April and May. I would like to take 10-12 students and 3-4 adults but Henry will only allow a maximum of 10 including adults. I have thought of maybe asking a purse seiner if they would be interested in a public relations trip to the island, just a thought. I will be writing more formally about what is happening as time goes on.

Again thanks for the invite it was a great time.

AR Lewis





# BULLETIN

*Larry Ludwig*

THURSDAY, OCTOBER 7, 1982

PUBLISHED BY THE OFFICE OF PUBLIC INFORMATION -- PAGE TWO, AMERICAN SAMOA

## PRICES UP SIX PERCENT

The Development Planning Office has released the local consumer price index figures for the period ending September 30, 1982. From September, 1981 to September, 1982 the overall index increased by 6%. Miscellaneous items increased by 17.3%, with the increase attributed to increases in the prices of drugs, recreational goods and tobacco products. Food prices were up 9.4% while housing, clothing and transportation were unchanged.

## OFFICIALS VISIT ROSE ATOLL

Monday afternoon the Marine Resources vessel Sausauimoana left Pago Pago for Rose Atoll for the semi-annual inspection of the National Wildlife Refuge. On board for the ten day trip are officials from the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Office of Marine Resources and Leone High School marine science student Ropeti Tofaeono. The atoll has only one island with vegetation, 18 acre Rose Island, and is located about 150 miles southeast of Pago Pago.

The purpose of the voyage is to collect data on the wildlife of the island and the surrounding reef. Rose Atoll is a nesting place for many birds and the hawksbill and green sea turtles. There are only seven species of plants found there. Coconut trees were first introduced on Rose by American Samoa's first governor, B.F. Tilley.

A spokesman for the Department of Education Marine Science Program said that Ropeti Tofaeono's participation in the trip is just the first of planned regular visits to the wildlife refuge by local marine science high school students.

The Sausauimoana is expected to return by the middle of next week.

## PUBLIC WORKS ROAD PROJECTS UPDATE

The Federal Highway Administration (FHWA) has approved the Public Works Department's design plans for the Afono guard rail, Vaipito bridge and the Tafuna housing and airport intersection improvement projects. Public Works Civil Division Manager Mark Nelson stated that these projects will be put out for bid before the end of the year, beginning with the Afono guard rail project on October 15. It involves the erection of 4,600 lineal feet of rail in potentially dangerous areas of the Afono road. The Vaipito Bridge project will replace the existing bridge in Pago Pago with a new and wider bridge. The one at Tafuna involves the improvement of traffic flow and drainage at the Tafuna housing and airport intersection. The three projects will be financed by \$345,000 from FHWA.

In other construction news, Nelson stated that Public Works crews are scheduled to resume paving work on the Asili-Amanave road Wednesday night, weather permitting. Works on the project has been held up for the past two weeks because hot asphalt plant equipment broke down. However, the equipment has been repaired and Nelson expects that, if the weather co-operates, the three miles of road from Asili-Amanave will be paved in three weeks.

There's no progress, however, on the Tafuna road project. Nelson explained that Public Works is still trying to secure the right of way for this project which involves the upgrading and paving of the Ottoville, Kanana Fou and airport roads. Initial work on these projects began six months ago but was halted shortly afterwards because of protests from landowners. The Samoan Affairs Office is assisting Public Works in securing the necessary rights of way.

## BILLS SENT TO THE GOVERNOR

Senate President Galea'i Poumele has transmitted SB-110 to Governor Peter Coleman for his consideration. This bill would amend current law to require that any medical fees established by the Department of Health be approved by the Legislature.

Speaker of the House Tuana'itsu Tuis has transmitted four bills to the governor for his consideration: HB-229, HB-249, HB-251, and HB-252. HB-229 would establish a limited term Natural Resources Commission to make recommendations to the Legislature for statutory

Dr. Neta Bilige wishes to remind parents that both medicine and medicine. Health Director and young children and medicine that the presence of Samoan medicine is dangerous to babies and



Commission, the regional development institution founded in 1977. The South Pacific Commission (SPC) is based in Noumea, New Caledonia although its annual conferences, are hosted from time to time by member governments. Outside of its home base of Noumea, the SPC has staged its annual meeting in Pago Pago more often than at any single location anywhere in the Pacific.

Governor Coleman was advised by the Western Samoa Head-of-State and the Fijian Prime Minister that they will honor his personal invitation to attend the Pago Pago conference. Full details on arrival and departure of the government leaders will be announced when they are available.

#### MORE TURTLES AND FEWER BIRDS ON ROSE ATOLL

The semi-annual inspection of the only U.S. National Wildlife Refuge in the South Pacific, 18 acre Rose Atoll, was completed last week. The ten member inspection team included officials from the National Marine Fisheries Service, U.S. Fish and Wildlife Service, the Office of Marine Resources, the Department of Education and Leone High School marine science student Ropeti Tofaeono. Travelling on the Marine Resources vessel Sausauimoana, the team spent ten days collecting data on the wildlife of the island and the surrounding reef.

Rick Davis, Marine Science Instructor for DOE, stated that the clam population of Rose is still plentiful but a length count of the popular delicacy revealed that there was a large number of fairly small and very large clams but very few medium sized clams. Davis would not speculate whether this indicated unauthorized harvesting of clams from the atoll. There has been interest shown in opening up the atoll for limited clam fishing. Local environmentalists have expressed concern that opening up the atoll for any type of fishing could be detrimental to the clam, bird and turtle population on Rose Atoll because there is no law enforcement agency there to ensure that the wildlife is preserved. The instructor stated that the number of turtles seen on this trip was greater than on previous expeditions. However, the bird population was much smaller and there was very little nesting compared to other visits. Davis said that a search for palolo was made on palolo night but there was no sign of the popular dish. Several black tip sharks were sighted and a plentiful supply of "large and hungry rats" roam the atoll.

The Leone High School student found the trip very educational and exciting, said Davis, because he was able to see the things he was taught in books and lectures. The Department of Education hopes to send 10 - 15 students to Rose Atoll on a similar scientific trip.

#### BUSH MEDICINE - IT CAN KILL CHILDREN

A ten month old baby died last week from what doctors believe to be the use of Samoan medicine. The baby died in hospital a few hours after it was admitted. The infant had a thrush in the mouth and was apparently treated with traditional herbs and medicine. Health Director Dr. Nofo Siliga wishes to remind parents that bush medicine can be dangerous to babies and young children and cautions that the practice of Samoan medicine is also against the law.

#### ASG SOFTBALL LEAGUE OPENS

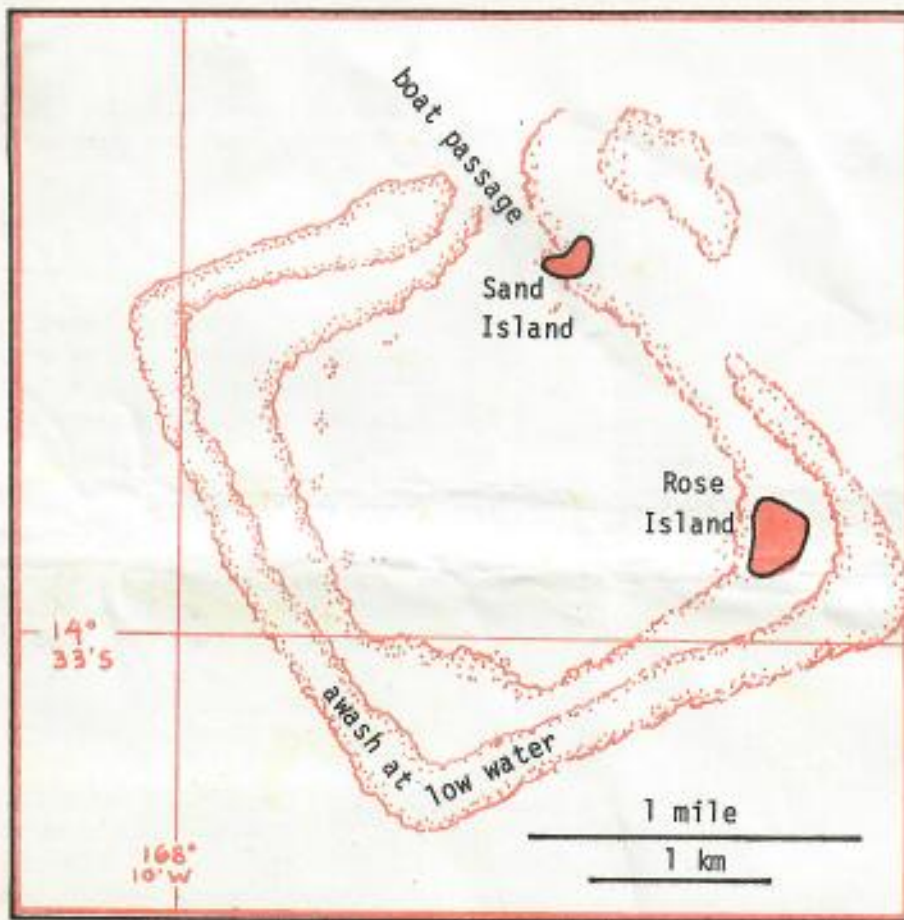
Governor Peter Coleman threw out the first ball to officially launch the 1982 ASG Mens Softball League during opening ceremonies at Pago Pago Park Saturday morning. Twenty teams are competing in this year's league, ten each in the American and National Divisions. Games will be played Monday - Saturday at the Utulei field and Pago Pago Park.

In opening games last Saturday, the 1981 softball champs CBT edged Seagram Seven 8-6 and the Rainbows downed Rainmaker A 15-9, in the National Division. In American Division play, UT defeated the A's 9-2 and ASCC zapped the Chargers 12-0.

In Monday's action Hawks 12 Hornets 6; Tuesday's action Young Mosi 36 Roosters 4.

League officials advise all teams that due to the opening of the South Pacific Conference all games this week are hereby transferred from Pago Pago Park to Utulei. The Saturday schedule is: 8:30 Seagram Seven vs Rainmaker; 11:30 CBT vs Rainbows; 2:30 Aeto vs Blues.





## ROSE ATOLL NATIONAL WILDLIFE REFUGE

'O le Motu o Manu, (Rose Atoll) 'o lo 'o i le itū i sasa'e 'o 'Amerika Sāmoa e tusa ma le 160 maila lona mamao. 'Ua 'avea ma nofoaga 'o i'a ma manu felelei. 'Ona 'o le tāua tele i soifuaga 'o manu ma i'a lenei laufanua, ua fa'atulāfonoina ai e le Mālō tele o le Unaiete Setete ma le Mālō 'o 'Amerika Sāmoa le Motu 'o Manu ma nofoaga fa'amoemoeina mo manu ma i'a. 'O manu felelei, 'o lo 'o 'avea lea laufanua ma o lātou nofoaga tu'ufua, e sili ona tāua i le 'aufaifaiva 'ona e faigōfie ai ona ta'ita'iina 'ilatou i 'ogāsami 'o lo 'o fai 'au i'a, e fai atu ma 'asi'asi ma isi fo'i i'a 'o lo 'o fafagaina i le gātaifale o motu 'o Samoa.

'O manu ma laumei 'o lo 'o lātou fa'amautū i lea nofoaga e fa'aeteete gatā o lātou soifuaga. 'E fa'alauiloa atu ai ma le fa'aaloalo lava e matuā fa'asāina lava 'ona uia e se tasi le 'au po'o le gātaifale o lenei motu, se'i vaganā ua 'aumai se fa'atagana mai le Mālō tele o le Unaiete Setete ma le Ofisa o le Kovana 'o 'Amerika Sāmoa. 'E tatau 'ona tātou utagia le tulāfono ua 'uma 'ona tu'uina mai e le Mālō tele e puipuia ai le Motu 'o Manu.





GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

May 29, 1981

George Balazs  
HIMB  
P. O. Box 1346  
Coconut Island  
Kaneohe, Hawaii 96744

Dear George:

Thank you for your letter 18th May. I am still looking forward on our plan.

I am very sorry if didn't provide much information on our new fishing boat. They kept changing the schedule who will be leaving to deliver the boat.

I will leave Pago on June 28th for Seattle, Washington and I'll be a seaman on the boat. There are two other people from our office, Paul Pedro and Palela Pule. I hope everything will go well.


We'll leave Seattle for Honolulu on the 8th of July and we probably arrive in Hawaii on the 21th or 23 July. Then we leave Honolulu for Pago on the 29th. I may give you a call when we arrive their, maybe we'll talk some more on our Rose Island trip.

The new fishing vessel will be operated and run by the Office of Marine Resources. Maybe it will be a good idea if you can talk to Henry about using the new boat for our trip. The new boat will be mostly on training and demonstration for the local fishermen, so we may have a chance to use the boat for our trip.

The green turtle at Rainmaker Hotel according to the Manager, Tony Brown, he said we wanted to have a sort of a pool in the front to the keep the turtle, but I believe he couldn't do it, unless he has a permit to do so.

So far, things are going well. Give my regards to your family,

Tofa,

  
WILLIAM PEDRO  
Fishery Biologist



NATIONAL MARINE FISHERIES SERVICE  
Southwest Fisheries Center  
Honolulu Laboratory

November 5, 1982

SEMINAR ANNOUNCEMENT

Title: Some biological and historical aspects of sea turtles at  
Rose Atoll and the Manu'a Group of American Samoa

Speaker: George H. Balazs, Fishery Biologist, Hawaii Institute of  
Marine Biology and National Marine Fisheries Service

Date: Friday, November 12, 1982, 10:30 a.m.

Place: Seminar Room 221  
Honolulu Laboratory  
2570 Dole Street

Mr. Balazs will discuss his preliminary findings from a recent trip  
to study sea turtles in American Samoa.



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

May 12, 1982

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

Dear George:

When I received your letter of April 23, Henry had just left for two weeks and then I went to Guam and Saipan for a week, hence the delay in my reply.

We are pleased to hear of your opportunity to give further study to Rose Atoll turtles and will do what we can to assist the effort. A two week charter of the SAUSAUIMOANA would cost \$1,200. If the refrigeration is not functional by then, the boat would have to return to Pago at the end of the first week (to unload fish). The return to Rose would probably be a two day trip at the end of your second week so there would be about a five day period with no vessel support at Rose. Again, the cost would be \$1,200 since the major expense is fuel.

I see no particular need for additional clam data at this time so would probably not accompany you. Henry and I would both like to see William go with you, however, if you so desire.

The vessel charter contract should be written to Office of Marine Resources, American Samoa Government. September 27 as a starting date is fine with us.

I expect to be in Honolulu June 10 and 11 for the next SSC meeting, perhaps I'll see you then.

Tofa,  
*Dick*  
RICHARD C. WASS  
Fishery Biologist

cc: ✓ Henry Seseapasara

May 27  
George,

*Here is another copy of the letter I wrote concerning the Sausauimoana charter. Your cost would be \$1,200 regardless of whether the boat makes 1 two-week trips or 1 one-week plus 1 two-day trips.*  
*Dick*



Intent to submit a research proposal to the Sea Grant College Program

May 1982

Title - An assessment of marine turtle stocks and their native usage in American Samoa

Principal Investigator - George H. Balazs  
Assistant Marine Biologist  
Hawaii Institute of Marine Biology  
(vitae attached)

Duration - Sea Grant Year 16 (1983-84)

Motivation - There is a need to investigate the marine turtle stocks of American Samoa from an interdisciplinary perspective that includes both a biological assessment and an ethnological appraisal. Very little information currently exists for the Pacific islands of Polynesia on either of these important aspects.

Both green turtles (*Chelonia mydas*) and hawksbills (*Eretmochelys imbricata*) are known to occur in American Samoa. Green turtles breed at the small outlier of Rose Atoll situated at the eastern-most end of the Samoan Islands (Figure 1). This uninhabited site has been considered a major breeding grounds for green turtles of the Central Pacific Ocean. Turtles hatched at Rose Atoll undoubtedly serve to populate coastal waters throughout American Samoa as well as the independent nation of Western Samoa, and possibly even as far away as Tonga. On the other hand, much of the breeding by hawksbill turtles in the Central Pacific is thought to occur on three islets off Upolu Island in Western Samoa. The distance from these islets to Tutuila Island in American Samoa is only about 40 miles. Marine turtles in the Samoa region are therefore an internationally shared resource.

Special attention to these stocks is warranted in order to establish the biological data base necessary to make sound management decisions.

At many of the islands throughout Polynesia (and elsewhere in the Pacific), the biological status of marine turtles is interwoven with the traditional subsistence life styles that are followed by the native inhabitants (see accompanying report on Tokelau - Balazs, 1982). The usage and cultural role of turtles in American Samoa should therefore be assessed concomitant with a biological investigation. The ethnological portion of this proposed study is expected to yield results applicable to a broad spectrum of Pacific communities, since American Samoa itself contains a gradient of Polynesian life styles. For instance, relatively modern life styles are led on Tutuila Island, while rural village communities occur in the Manus Islands, and isolated atoll living takes place at Swain's Island. The two main components of this proposed study are clearly complementary and, in some respects, actually dependent upon each other. For instance, the initial identification of key turtle foraging areas will result from interviews with native elders and knowledgeable fishermen who know best what has influenced the present state of these localized stocks and what traditional conservation systems are still in effect.

It is anticipated that the Government of American Samoa (Office of Marine Resources), the National Marine Fisheries Service, and the U. S. Fish and Wildlife Service will vigorously endorse this intended proposal. All three agencies have interests and responsibilities in the management of marine turtles in American Samoa. However,



limitations of funds and personnel are likely to prevent this work from being undertaken within the foreseeable future. Sea Grant appears to be an appropriate and logical avenue for accomplishing this task.

Goal - To assemble a treatise on the marine turtle stocks of American Samoa that includes essential biological data as well as ethnological information necessary for effective management.

Methods - The information that I propose to assemble would be obtained through a combination of on-site surveys of beaches and nearshore waters, extensive interviews with native inhabitants, and tagging at Rose Atoll. The most efficient and cost-effective manner of accomplishing this work would be to establish continuous residency in American Samoa for approximately eight months of the Sea Grant Year. Major budget items would therefore include round trip airfare between Honolulu and American Samoa, travel to the outer islands from my place of residence on Tutuila, salary or consultant fees for part-time assistants fluent in Samoan and English, and the Principal Investigator's salary at the R-3 level.

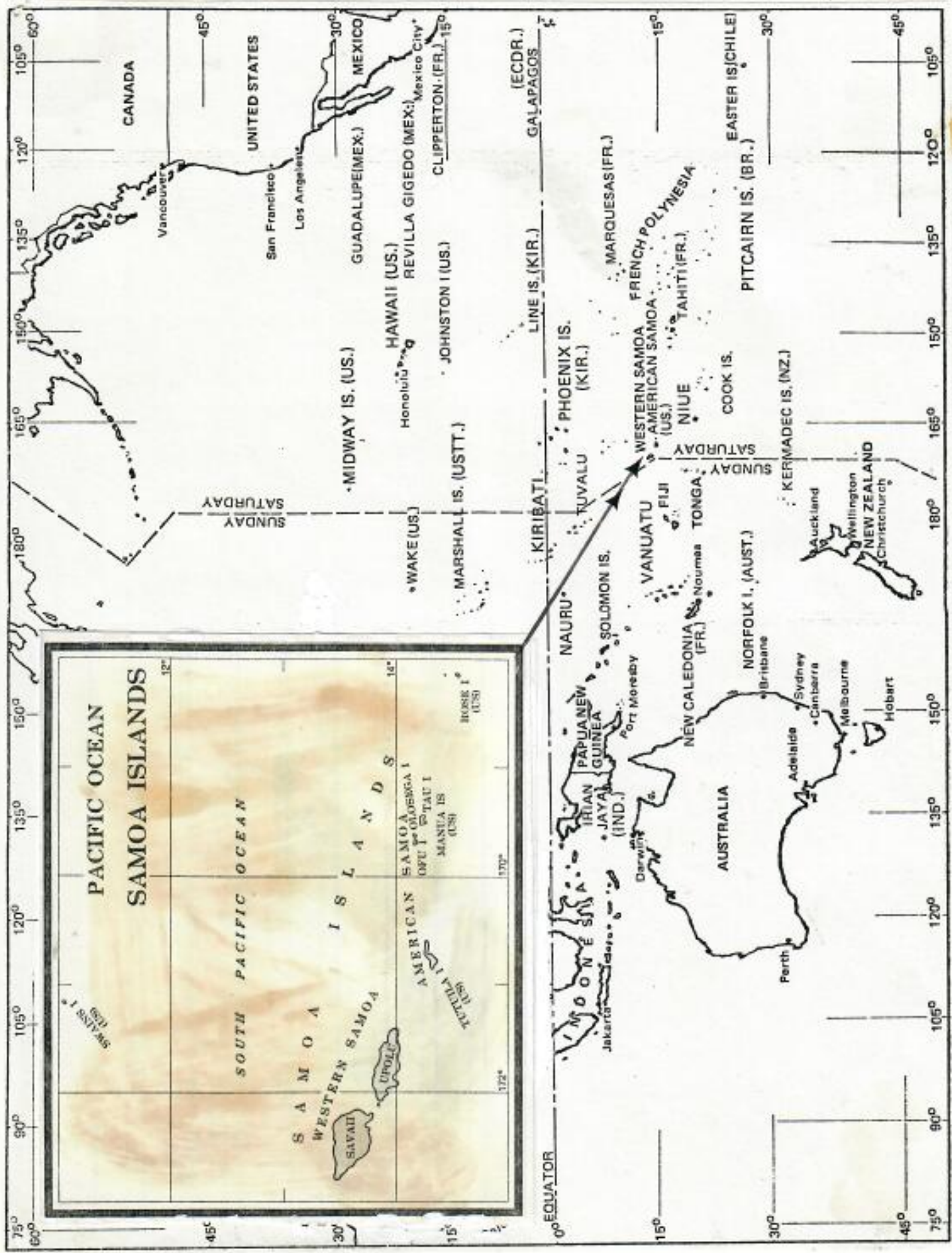


Figure 1.



Ebenfalls noch zur *Samoagruppe* gehörend, wenigstens in gleicher Flucht mit dieser liegend, ist die 70 Meilen von *Manua* nach Osten liegende Insel *Rosa*. Es ist dieselbe, aber nicht eine kleine, allein aus dem Meere emporragende Insel, sondern ein Lagun- oder ringförmiges Corallenriff, mit einer Passage und zwei auf dem Riffe befindlichen Inseln. Dieses ringförmige Corallenriff hat einen Durchmesser von 2 Meilen und zeigt die Passage am Nordwestende mit einer Tiefe von 6 und mehr Faden, am Eingange aber nur  $1\frac{1}{2}$ —1 Faden Tiefe, an der Seite gegen die innere Lagune. Capitain *Ranzau*, der wiederholte Male, im Dienste der deutschen Unternehmung, diese kleine Insel besuchte, und dessen freundschaftlicher Güte wir diese Notizen, wie die in der Karte befindliche Skizze über die *Rosa-Insel* verdanken, lief mit einem kleinen Schooner in diese Passage hinein, und ankerte in dem ruhigen Lagunenwasser. Doch ist dieses ein gewagtes Unternehmen, und bedarf schon bedeutender Uebung in der Riffbefahrung. Die Passage, anfangs breit, wird nämlich durch eine Reihe Corallenblöcke, die an der inneren Oeffnung liegen, verengt. Ist man in die Lagune eingefahren, so liegt die eine Insel, eine niedrige Sandbank, gerade zur Linken, an der Nordseite des Lagunriffes. Nach Süd-Osten liegt die zweite höhere Insel dem Riff auf, und stellt einen rundlichen Knollen Landes von ca. 500 Fuss Länge dar, der mit Bäumen bewachsen ist; dieses ist die eigentliche *Rosa-Insel*, von Capitain *Freycinet* zuerst entdeckt, und seiner Gemahlin zu Ehren so genannt. In der Südwestecke der Lagune finden sich zwei Corallenbänke. Die Brandung an der Ostseite während der Passatzeit ist beträchtlich, ebenso steht eine hohe Dünung in der Passage. Die Lagune ist überall ca. 7—8 Faden tief, und beherbergt, wie die umliegende See, eine grosse Menge Fische, was schon frühere Besucher der Insel erwähnt haben. Aus diesem Grunde versuchte der unternehmende Leiter der deutschen Factorie, Herr *Th. Weber*, eine deutsche Fischstation daselbst zu errichten, und kaufte zu diesem Zwecke die zu den Fischgründen *Manua's* gehörende Insel von den dortigen Hauptlingen. Ein Engländer ging mit einigen Eingeborenen dahin ab, um Fische einzufangen und in Fässer einzupökeln. Es zeigte sich aber, dass der Ertrag nicht so reich war als wie man vermuthet hatte, und dass die Fische nur mit der Angel zu fangen, viele Hände erforderten, um in kürzerer Zeit eine grosse Menge Fische zu erhalten. Die Fische selbst, meist Arten von Seebarschen (*Serranus*), Papageifischen (*Scarus*) und Chirurgfischen, waren nicht geeignet zur Conservation in Salz, die überhaupt in dem feuchten Tropenklima nicht anwendbar, oder nur mit grosser Sorgfalt und besonderer Methode zu leiten ist. Es wurde bei dieser Gelegenheit beobachtet, dass auf der Sandinsel sich im Monat August und September eine Menge See-Schildkröten einfanden, um ihre Eier abzulegen. Es waren dieses meist Arten der gemeinen, grünen See-Schildkröte (*Chelonia mydas L.*) Seltener kam die Carett-Schildkröte (*Chelonia imbricata L.*) Zur Zeit wenn die Jungen auskrochen, war die umliegende See voll von Haifischen, die begierig nach diesen kleinen Schildkröten schnappten, sowie dieselben in's tiefere Wasser kamen. Auf der mit Bäumen besetzten Insel, wo das Haus des Fischers aufgeschlagen war, nisteten eine Menge Seevögel, namentlich *Sterna*-Arten oder Seeschwalben. Es wurden damals auch auf der Insel Cocospalmen gepflanzt, die sehr gut gediehen, und gegenwärtig wohl schon Früchte tragen. Ein Eingeborener mit seiner Familie entschloss sich beim Abbruche der Fischerei allein dort zu bleiben, und ist falls er dort ausgeharrt hat, der Gouverneur dieser kleinen, einsamen Insel der Südsee.

# Samoa oder die Schifferinseln.

Von

Dr. Eduard Graeffe.

I. Abschnitt:

Topographie von Samoa.

*Nb. 5 Taf.*

*(Hamburg, Mus. Godeffroy, 1873)*

*In Mus. Godeffroy 181-32.*



# Technology

## Tahiti Star Observed By Argentine Aircraft

Known locally as "Tahiti Star"—the world's first man-made comet was born in December in a joint project involving West Germany, the U.S.A., France and Argentina. Observation in the southern hemisphere was organized by Argentina whose specially equipped observation jet arrived in Tahiti before Christmas.

## Turtle/Clam Count Up On Tiny Rose Atoll

A team of scientists from the United States Fish and Wildlife Service recently visited Rose atoll. They reported an increase in the numbers of turtles and new settlements of clams where previously there were none. A study is being made to find whether it would be feasible to harvest small numbers of the clams annually. However, the remoteness of the atoll might make it eco-

nomicly unsuitable. Rose atoll is 78 nautical miles east of the Manu'a group of islands and is awash except for a few 100 yards.

## Japan Pushes Satellite For Fiji And Tonga

Fiji, Tonga and Vanuatu are in the running to get television programs beamed through a \$200 million Japanese satellite. Japanese delegates to the annual Pacific Telecommunications meeting made a proposal for the launch of the satellite, intended to help 15 Asian and Pacific countries with inadequate broadcasting services.

## Newest Cable Ship Returns To Fiji Port

The world's newest cable ship has arrived back in Fiji after its first Pacific voyage. The Pacific Guardian was built in England to replace the Retriever, which is now bound for

Singapore. The 115-meter vessel, the latest addition to the Cable and Wireless fleet, will take care of Anzac cables in the Pacific. Its 50-man crew—made up of Fijians and Englishmen—took the vessel on a voyage to Australia, New Zealand and Papua New Guinea before returning to their Fiji base.

## Greenhouse Effect Could Flood Waikiki

A report was recently submitted to the Hawaii State Legislature summarizing the theories regarding the increase of CO<sub>2</sub> in the atmosphere, the "greenhouse effect," and its relation to the rise of sea level over the next century. It said sea level rises of 1.9 feet (56 cm) are used in the first scenario, then going up to 11.3 feet (345 cm) in the fourth and worst scenario. The potential impacts range from increasing shoreline erosion problems, including the loss of Waikiki Beach to submersion of many atolls.

*Reported by: Cathay Loadman, Julie Richardson, David Ross and Rick Scudder*

## How You Can Ventilate For Maximum Comfort

by Cliff Terry, AIA

To achieve maximum comfort in buildings in the tropics, it's important to apply the principles of ventilation carefully and correctly. One of the most basic of these principles is that hot air rises, and in an enclosed space the air temperatures at the top are going to be higher than at the bottom.

This implies that the best way to keep the space cool is to vent the higher, warmer air to the outside and replace it with cooler air brought in and up from lower areas inside and outside the building. There are a wide variety of ways to do this.

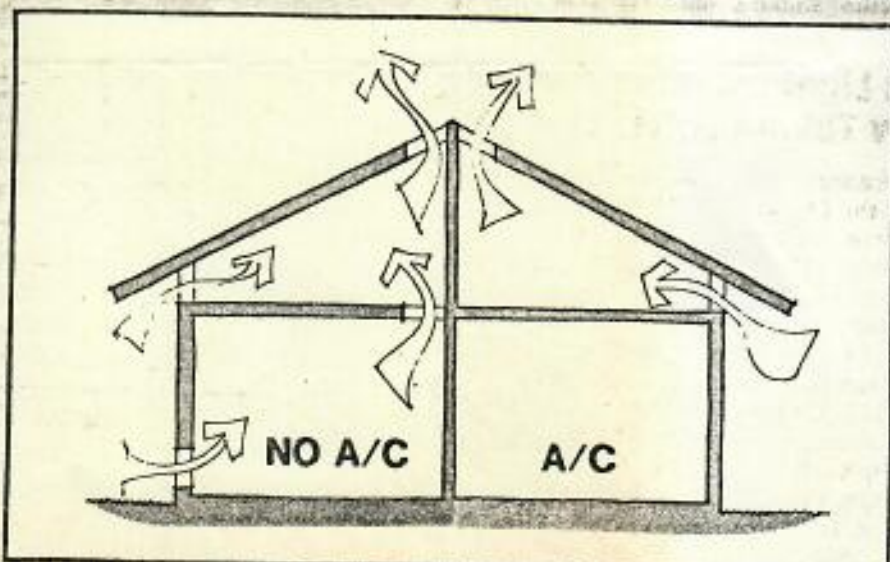
In a building with an attic space or a high, pitched roof, vents can be installed at the ridge or at the gable ends (if there are any). Other ventilators such as turbine vents (the round ball-shaped units with fins all around) can be installed in

the roofing. These units should be placed as high in the roof as possible, to vent the most air.

Any air being moved from a space must be replaced, and vents can be installed in a ceiling to let air enter the attic space. If the space below is air conditioned, and the cool air shouldn't be allowed to

escape, vents can be installed at the eaves or other low points on the roof, to bring outside air in and improve the air conditioning.

*Cliff Terry is a principal with the Honolulu firm of TRB/Hawaii, specializing in architectural energy consultation and design of buildings for the Pacific Basin.*



Venting: the higher warmer air into the outside while bringing in cooler air



September 29, 1980

F/SWC2:GHB

Mr. Henry Sesepasara  
Director  
Office of Marine Resources  
Government of American Samoa  
P. O. Box G  
Pago Pago, American Samoa 96799

Dear Mr. Sesepasara,

I am writing to tell you that as a representative of the Honolulu Laboratory, I will be participating in the study visit to Rose Atoll scheduled for November 8-12 in collaboration with the U.S. Fish and Wildlife Service. This will allow me to personally investigate the scope and character of sea turtle nesting occurring on the two islets. However, due to the limited time period available, this work will only constitute a preliminary assessment to serve as a foundation for more comprehensive research. As I have mentioned on several occasions to William Pedro and Dick Wass, it is the intention of our Laboratory to have this more exacting work carried out under contract to your Office of Marine Resources. If you are agreeable, this contract will almost certainly be finalized during early 1981, for the work to be conducted during the 1981 breeding season.

For the forthcoming trip, our Laboratory will be contributing 25% of the vessel's charter fees, as well as paying all of my other travel and salary expenses.

I am sorry that I did not have the opportunity to meet with you during the discussions on Rose Atoll held on August 5, here in Honolulu. I do, however, look forward to meeting you in Pago Pago during early November.

Best regards.

Sincerely,

George H. Balazs  
Fishery Biologist

cc: William Pedro, OMR, American Samoa  
Dick Wass, OMR, American Samoa

bc: Balazs  
HL

Balazs



January 8, 1981

F/SWC2:GHB

Mr. Henry Sesepasara, Director  
Office of Marine Resources  
Government of American Samoa  
P. O. Box G  
Pago Pago, American Samoa

Dear Henry,

I am writing to tell you that I will be in Pago Pago for a full day on Thursday, February 5, on my way to Western Samoa. I will be spending about 2 weeks at Aleipata studying the hawkswill hatchery. As you know, this conservation project has been operational for about 9 years now, but a detailed evaluation has never been carried out. I hope to be able to accomplish this task during my limited available time.

I had originally hoped to ask William Pedro to accompany me for at least a portion of this trip, and to be able to pay for all of his travel costs. Unfortunately, a lengthy advance application to Washington, D.C. is required for an "invitational" travel order, consequently, I am not in a position to fund such a trip. However, if your office is able to pay for William's visit to Western Samoa, I would certainly be pleased to have him involved. This is, of course, assuming that he would like to participate. I would appreciate hearing your thoughts on this matter at your earliest convenience.

Once again, I want to thank you for the hospitality which you extended during our visit in November.

Sincerely,

George H. Balazs  
Fishery Biologist

cc: William Pedro

GHB:vi

bc: Balazs  
HL

September 4, 1980

F/SWC2:GHB

Mr. Ernest Kosaka  
Endangered Species Coordinator  
U.S. Fish and Wildlife Service  
P. O. Box 50167  
Honolulu, HI 96850

Dear Ernie,

I greatly appreciated receiving your memo report of August 5th concerning a proposed research visit to Rose Atoll, but I was somewhat disappointed in not having the opportunity to be a participant of your planning meeting. I feel certain that some worthwhile contributions could have been made with respect to study plans for sea turtles.

I thought you would be interested in the enclosed letter which I sent to the Fish and Wildlife Service in late December of 1979, and again during February 1980. Unfortunately, no response was ever received to this inquiry. Nevertheless, I am pleased to see that some interest is now developing in the status of sea turtles at Rose Atoll.

Sincerely,

George H. Balazs  
Fishery Biologist  
1980-81 I.P.A., University of Hawaii

Enclosure

GHB:ey  
cc: Balazs ✓  
HL





**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  
20 January 1981

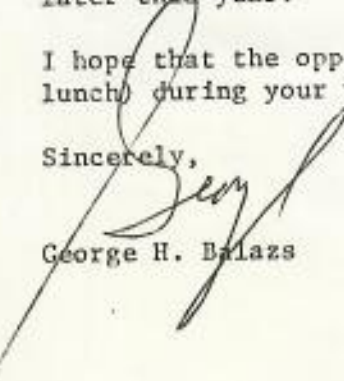
Dr. Richard C. Wass  
Fishery Biologist  
Office of Marine Resources  
Government of American Samoa  
Pago Pago, American Samoa 96799

Dear Dick:

Many thanks for your letter dated January 14th which arrived in this morning's mail. I was delighted to learn that William will be able to accompany me for the one-week period. I believe that it would be the most productive if he could go during my first week in Western Samoa. Ideally, he should travel with me on my departure from Pago, which will be on February 6th, 0945, flight 233. This is the reservation that I currently hold, however it could certainly be modified if need be. Before leaving Pago, I want to be sure to have the opportunity to lay some very firm groundwork with Henry for our tagging project at Rose later this year.

I hope that the opportunity will exist for some informal meetings (and lunch) during your visit to Honolulu on January 27th and 28th.

Sincerely,

  
George H. Balazs

NATIONAL MARINE FISHERIES SERVICE  
HONOLULU LABORATORY  
P. O. BOX 3830  
HONOLULU, HAWAII 96812

February 24, 1981

F/SWC2:GHB

Mr. Henry Seseapasara  
Office of Marine Resources  
Government of American Samoa  
Pago Pago, American Samoa 96799

Dear Henry,

I am sorry that I missed seeing you on February 18 on my return from Western Samoa; however, I did have the opportunity to speak at length with both Dick and William. As you are undoubtedly aware, our study visit to the Aleipata hawksbill hatchery proved to be highly informative and interesting. William's involvement in this trip was instrumental in making it a great success. Only a fraction of the work could have been accomplished if he had not been a participant.

The NMFS budget has received some cutbacks, but I am still hopeful that we will be able to undertake a 3-4 week green turtle tagging study at Rose Atoll between August and September of this year. Have any of your plans as yet been finalized for the operation of your new fishery vessel? I would hope that this would be our means of transportation to and from Rose.

Again, thank you for allowing William to accompany me on the trip to Western Samoa.

Sincerely,

George H. Balazs  
Fishery Biologist

cc: William Pedro

bc: Balazs  
HL



January 17, 1983

F/SWC2:GHB

Dr. M.-H. Sachet  
Atoll Research Bulletin  
Smithsonian Institution  
Washington, D.C. 20560

Dear Dr. Sachet:

I am writing to ask if you can provide me with copies of the following news articles relating to Rose Atoll.

Dunastrey, H. 1920. Official visit to the islands of the Manu'a district. O Le Fa'atouu 18(2):1-2.

Anon. (or A. G. Mayor?). 1920. Rose Island (Nuu O Manu) - Report to the Governor of Tutuila, printed both in Samoan and in English in - O Le Fa'atouu 18(7).

Anon. 1922-26. Flag Day at Manua. O Le Fa'atouu 20(6), 21(6), 22(6), 24(6).

Most of these articles were referenced in your excellent report on Rose Atoll that was published in Atoll Research Bulletin in 1954. Without success, I have tried to obtain copies from the Government of American Samoa, Brigham Young University, and the Hawaiian-Pacific library collection at the University of Hawaii. I am in the process of writing a report on sea turtles in American Samoa, so would appreciate your help in obtaining these obscure articles. Thank you for any help you are able to offer.

Sincerely,

George H. Balazs  
Fishery Biologist

bc: Balazs ✓  
HL

GHB:iht

October 21, 1982

F/SWC2:GHB

Mr. Henry Sesepasara  
Manager, Office of Marine  
Resources  
Government of American Samoa  
P. O. Box G  
Pago Pago, American Samoa 96799

Dear Henry,

I am writing this short letter to properly thank you and your staff for the excellent assistance and cooperation I received during my visit to Samoa. In my view, the short turtle study was a great success, but only because of the involvement of your staff. These words of praise are also meant for Captain Pedro and the crew of the Saussurimoana.

I will send you a copy of my report just as soon as it is completed in a month or so.

Best regards.

Sincerely,

George H. Balazs  
Fishery Biologist

bc: Balazs  
HL

GHB:iht



November 4, 1982

F/SWC2:GHB

Mr. Malaimua  
Tautai  
Fitiuta, Manua Islands  
American Samoa - 96799

Dear Mr. Malaimua:

I am writing to express my appreciation to you and your family for the information provided about sea turtles when I visited Fitiuta on October 14, 1982. Thank you very much for taking the time to talk to me.

As promised, I am sending you a copy of the photograph that I took of your family.

Sincerely,

George H. Balazs  
Fishery Biologist

GHB:vi

bc: Balazs  
HL

Balazs

October 27, 1982

F/SWC2:GHB

Reverend Tima Tima F.T.  
Olosega, Manua Island  
American Samoa 96799

Dear Reverend Tima:

I am writing to thank you very much for the information on sea turtles that you gave me during my visit to Olosega on October 12th. I am most appreciative of your assistance. Sometime in the future I hope to return to Olosega and stay for a longer period.

Best regards to you and your family.

Sincerely,

George H. Balazs  
Fishery Biologist

GHB:ey  
cc: Balazs ✓  
HL



October 28, 1982

F/SWC2:GHB

United Artists Television  
10202 Washington Blvd.  
Culver City, CA 90230

Dear Sir:

I have just recently returned from a wildlife research expedition to uninhabited Rose Atoll in American Samoa. Rose Atoll was designated as a National Wildlife in 1974 and is administered jointly by the U.S. Fish and Wildlife Service and the Government of American Samoa.

While I was in Samoa several people told me that portions of the 1953 movie, "Return to Paradise," were filmed at Rose Atoll. One man, who claimed to have been present for the filming, stated that footage was taken of the islands, sea birds, sea turtles, and sharks. If this is true, some important historical aspects of the atoll would have been recorded. Along with my colleagues at the U.S. Fish and Wildlife Service here in Honolulu, I would like to view this movie to see what sort of scientific information might be obtained. I am therefore writing to ask what arrangements might be possible with your company to borrow a videotape of the movie for a few days. If the enclosed franked label is used, there would be no postage costs involved on your part. In any event, I would appreciate your consideration of this request. I look forward to hearing from you at your earliest convenience.

Sincerely,

George H. Balazs  
Fishery Biologist

Enclosure

GHB:ey  
cc: Balazs ✓  
HL



GOVERNMENT OF AMERICAN SAMOA  
PAGO PAGO, AMERICAN SAMOA 96799  
OFFICE OF MARINE RESOURCES

In reply refer to:

May 12, 1982

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

Dear George:

When I received your letter of April 23, Henry had just left for two weeks and then I went to Guam and Saipan for a week, hence the delay in my reply.

We are pleased to hear of your opportunity to give further study to Rose Atoll turtles and will do what we can to assist the effort. A two week charter of the SAUSAUMOANA would cost \$1,200. If the refrigeration is not functional by then, the boat would have to return to Pago at the end of the first week (to unload fish). The return to Rose would probably be a two day trip at the end of your second week so there would be about a five day period with no vessel support at Rose. Again, the cost would be \$1,200 since the major expense is fuel.

I see no particular need for additional clam data at this time so would probably not accompany you. Henry and I would both like to see William go with you, however, if you so desire.

The vessel charter contract should be written to Office of Marine Resources, American Samoa Government. September 27 as a starting date is fine with us.

I expect to be in Honolulu June 10 and 11 for the next SSC meeting, perhaps I'll see you then.

Tofa,

RICHARD C. WASS  
Fishery Biologist

cc: Henry Sesepasara



Richard -  
Copy for  
your information  
GHB

Memorandum:

To: Dale Coggeshall, FWS, PIA  
Robert Shallenberger, FWS, RWR  
George Balazs, NMFS  
Bill Gilmartin, NMFS

From: Ernie Kosaka, FWS, SE/ES

Subject: General Summary of Meeting with Henry Sesepasara Regarding Proposed Survey Trip to Rose Atoll, American Samoa

Henry met in the FWS Office, Honolulu, on August 5, 1980 to discuss the subject survey trip. NMFS personnel were not at this meeting, but had asked Ernie to include their participation in this survey, as was discussed in Richard Shomura's office last week.

Selection of the time for the survey was tentatively (mid to late November.) Henry indicated that this would probably be best in terms of weather/sea conditions. I also believe that Bill Pedro indicated at the NMFS and joint NMFS/SPC turtle conferences that this period would also be ideal for assessing the extent of nesting by turtles on Rose Atoll.

The nature of the surveys proposed require that we enter the lagoon and set up camp on shore. Henry indicated that it was possible, if somewhat hazardous, to get one of the larger vessels into the lagoon. However, he suggested that it would be better to anchor the vessel outside of the fringing reef and use Zodiacs or some other type of cargo boat to take the field personnel and their gear onto the island. Henry did not want to establish a precedent for permitting vessels to anchor within the lagoon, even for such purpose as ours.

Henry indicated that there was a charter skipper who was interested in taking us to Rose Atoll. He is Wally Thompson. Thompson's vessel is equipped to sleep only four (4) persons aboard. The duration of the trip from Tutuila to Rose Atoll would be between 12 to 16 hours. The charter skipper would probably fish offshore while waiting to pick us up if the trip were of three (3) day duration. ie. 1 day to Rose Atoll, (overnight and 1 full day on the island,) and 1 day return.

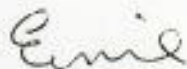
Ernie brought up the subject of participants. At least one of Henry's staff, either Bill Pedro or Dick Wass, would be involved in this survey and patrol. Ernie indicated that two (2) SE staff were budgeted for this survey, and that George Balazs would be a participant either before his assessment of turtle head-starting in Western Samoa or after he had completed his task. It was obvious that there would be insufficient space for all participants, unless some other arrangements could be made. The Government tugboat was suggested as an alternative charter vessel. However, its charter cost of \$1,200 is double the \$600 per day that Thompson is currently charging.

Henry also brought up the request their Government has had regarding commercial taking of giant clams from within the lagoon at Rose Atoll. The request had been denied since there was insufficient information to assess the impact of this taking on giant clam stocks in the lagoon. Henry did indicate that a cursory stock assessment made by Dick Wass indicated that there was an over-abundance of this resource within those waters.

Rob suggested an extensive survey of the lagoon waters, not only for assessing stocks of giant clams, but of all of the components of this ecosystem, similar to some surveys that the Corps of Engineers have conducted in American Samoa. This suggestion was met with enthusiasm by all present. A discussion of assignment of objectives/responsibilities followed, but was not carried to conclusion. The consensus was that it would be somewhat like the Tripartite studies of the NWHI, but focusing on the terrestrial and near shore environments.

Due to the expanded scope of this limited survey/patrol trip to Rose Atoll, it would be essential to spend at least a week gathering this information. Implementation of this comprehensive survey would require changes in the charter agreement whereby the vessel would take us to our destination and return to Tutuila, and make a separate pick-up run; a total of four (4) charter days would be required.

In view of the relatively short run to Rose Atoll, and our intention to set up camp on the island, Henry was requested to check with Thompson whether it would be possible to transport at least 6 people on his vessel for these proposed surveys. Henry's response was that he would be getting in touch with us sometime next week after he has discussed this charter proposal with Thompson.



Ernie Kosaka, SE/ES  
5 August 1980



Gardner (4°40'S, 174°32'W)- Turtle tracks have been observed on Gardner's southwestern shore (Balaza, 1975). Evidence of trespassing has also been found on this atoll.

McKean (3°36'S, 174°08'W)- No information on turtles exists for McKean. Several foreign fishing vessels have been wrecked on the island.

#### American Samoa (U.S.A.)

American Samoa consists of the mountainous volcanic islands of Tutuila and the Manua group (Ofu, Olosega, Tau), and Swains and Rose Atoll which are of coral origin. Approximately 94% of the 31,000 Polynesian inhabitants reside on Tutuila (port city - Pago Pago). Rose is the only uninhabited island in the group. Certain terrestrial areas, including Swains and Rose, are under review by the Fish and Wildlife Service for designation as Critical Habitat under the U. S. Endangered Species Act (Dodd, 1978).

Tutuila (14°18'S, 170°40'W) and Manua group (14°10'S, 169°35'W)- Green turtles and hawksbills occur in the waters surrounding these islands, but apparently only in small numbers. There is some indication that the hawksbill is the most abundant species. Occasional nesting on isolated beaches is thought to take place (Coffman, 1977; S. Swardloff, W. Pedro and R. Vass, pers. comm.).

Swains (11°03'S, 171°05'W)- Green turtles and hawksbills are known to nest at Swains (S. Swardloff, pers. comm.). Turtle eggs were observed being gathered by the native inhabitants during July and August of 1963 (W. Pedro, pers. comm.). The atoll is only 2 km in diameter and consists of a continuous ring of coral surrounding a lagoon with no surface connection to the ocean.

Rose Atoll (14°33'S, 168°09'W)- Green turtles, and probably some hawksbills, nest on the two islets (Rose and Sand) at Rose Atoll. An account in the 1800's stated that large numbers of turtles nest during August and September, and that when hatching takes place numerous sharks prey on the young as they pass through the surrounding waters (Graeffe, 1873, quoted by Sacket, 1954, Woless, 1962 and Hirth, 1971a). During a one day visit on 7 October 1970, Hirth (1971a) counted 35 and 301 nesting pits of varying age on Sand and Rose Islets, respectively, but no turtles nested that night. On Rose the beach was found to be composed of coral fragments, thereby suggesting to Hirth that nesting in such substrate must be a "formidable task." Fishermen in Pago Pago confirmed that the peak nesting season is August and September.

On a low-level overflight in October of 1974, 75 adult turtles were counted within the lagoon (P. Sekora, pers. comm.). During a five day visit in May of 1978, only three adults and one immature green turtle were observed, and no nesting took place (Coffman, 1977). During a daytime visit on 29 March 1978, Coleman (1978)

*from - Status of sea turtles in the  
Central Pacific Ocean  
by  
G.H. Balazs*

*IN PRESS - Proceeding of the World  
Conference on Sea Turtle Conservation*



recorded one recently excavated pit on Rose and four that be estimated to be one month old. Other older pits were noted, as well as a single adult green turtle in the lagoon and the rib bones of a turtle on Sand Islet. Numerous black-tipped sharks (*Carcharhinus melanopterus*) 20 to 40 cm long were present.

Direct observations of predation on hatchlings by rats have been made during recent years (S. Swerdloff, pers. comm.), but the extent and significance are unknown. Mayor (1921) was the first author to record rats at Rose, which he described as being small, gray-brown in color, tame and very abundant during a visit in 1920. Sachet (1954) assumed that they were Polynesian rats (*Rattus exulans*), however, specimens deposited at the Bernice P. Bishop Museum in Honolulu were never identified. Hirth (1971a) stated that Rose Islet "swarms with rats (possibly *Rattus exulans*)."  
 Coleman (1978) found that rats were "extremely abundant" in the center of the island under the *Pisonia* forest. Rather than Polynesian rats, this investigator thought that black rats (*Rattus rattus*) might be present.

Following the recommendations of Hirth (1971a), Rose Atoll was designated as a National Wildlife Refuge in 1974 (see also Rockefeller and Rockefeller, 1974).

#### Western Samoa

Western Samoa is an independent nation consisting of two large islands of volcanic origin (Savaii and Upolu) and several offshore islets. The islands are located between 130°-150°E and

168°-173°W. Approximately 72% of the 152,000 Polynesian inhabitants reside on Upolu Island. In 1923 the total population was reported to have been only 23,000 (Witzell, 1972a).

Green turtles and hawksbills occur in the surrounding waters of both Savaii and Upolu. The green turtle has been reported by fishermen to be the most abundant (Hirth, 1971), however, it is uncertain if this species actually nests in the area. Hawksbills are known to nest, but presently only on the offshore islets of Namua, Nuutele and Nuutua located at the western end of Upolu. The nesting season extends from October to June, with most activity occurring in January and February. Nesting tracks counted by Witzell (1972a) suggest that not more than 45 females use these beaches each season. The number of hawksbills is believed to have declined considerably within historical times, due mostly to human exploitation of eggs and nesting females (Witzell, 1972a, 1972b, 1974). The coasts of both Upolu and Savaii were reported to have abounded with turtles in the early 1800's (Williams, 1837).

In 1971 a hatchery project was initiated by the Fisheries Division and two U. S. Peace Corps volunteers in an attempt to replenish the hawksbill population. This effort has continued until the present time. During each nesting season as many freshly laid eggs as possible are transferred from the three islets and reburied at a protected facility on the adjacent mainland shore of the Aleipata district. Hatchlings are held for up to three months in concrete tanks before being released into offshore waters. Marginal scutes have been notched for identification purposes.

*from Savaii to Upolu*  
*In Peace Corps project*



G. Balago

A proposal submitted to:

National Biological Service  
State Partnership Program.  
Mail Stop 3070-MIB  
1849 C Street NW,  
Washington DC 20240

March 10, 1995

**1. TITLE: TRACKING MIGRATIONS OF SAMOAN SEA TURTLES  
USING SATELLITE TELEMETRY.**

**2. ABSTRACT:** This proposal addresses one of the most pressing conservation issues in the South Pacific -- the regional loss of sea turtles. Sea turtle populations are declining in American Samoa as they are throughout the South Pacific Ocean. The last remaining nesting area in Samoa for the threatened green turtle is at Rose Atoll, a small uninhabited atoll that is a National Wildlife Refuge. Only about 30 females nest there per year.

While sea turtles are legally protected in American Samoa, they are not protected when they migrate out of the Territory to distant feeding grounds, but the locations of these areas are not well known. Preliminary evidence indicates that Fiji, where it is legal to harvest turtles, may be a major feeding area for turtles that nest in American Samoa.

It is therefore important to identify the distant foraging areas for the Samoan turtles so that we can develop management plans that span their entire life cycle. Once the feeding grounds of Samoa's turtles are known, we can begin direct dialogues with the specific countries that share our turtle resources.

The proposed project will locate the distant feeding grounds of Samoan turtles by use of satellite transmitter tags. This interagency project seeks funding for the tags and logistical support.

A supplemental budget for preparation of a public information video about this project is also appended to this proposal (Appendix 1).

**3. NEED:** Sea turtle populations are rapidly declining throughout the South Pacific region (SPREP 1993), and they have been listed in the US as endangered or threatened species. To promote conservation awareness of this valuable but dwindling resource, South Pacific Regional Environmental Program (based in Western Samoa) has called for a reduction in the commercial and

subsistence kill of turtles throughout the South Pacific. The South Pacific Commission (New Caledonia) also declared 1995 to be the "Year of the Sea Turtle" in the Pacific region.

In American Samoa, turtle populations have seriously declined and now total only about 120 nesting females (species combined) per year throughout the Territory (Tuato'o-Bartley et al. 1993). The last remaining nesting area for green turtles in Samoa is at Rose Atoll, a small uninhabited island which has been designated a National Wildlife Refuge. Only about 30 green turtles nest there per year.

Green turtles generally undertake extensive migrations between their nesting and feeding areas, which may be separated by 1000's of miles (Balazs et al. 1993). In Samoa, we are just beginning to identify their migratory patterns, and limited tagging data indicate that Samoan turtle populations must be viewed in a broad regional context.

Nesting green turtles at Rose Atoll have been tagged opportunistically by USFWS, NMFS and DMWR in past years, but only 3 recaptures were made, 2 in Fiji (where they were eaten) and one near Vanuatu.

To increase recoveries, we recently initiated a satellite tagging program at Rose Atoll. In November 1993, we fitted 3 green turtles with satellite transmitters and followed their daily progress as they migrated directly to feeding grounds located in Fiji (Balazs 1993a). The following year, we satellite-tagged an additional green turtle at Rose Atoll (data from this on-going effort are not yet available).

This pattern of large-scale movements between a turtle's nesting area and feeding area means that turtle stocks in the South Pacific Ocean are intermixed, which greatly complicates conservation efforts. It means that region-wide cooperation among the island countries of the South Pacific is essential; otherwise, while we may try to protect turtles in Samoa, these same turtles may be killed later when they migrate to other islands.

The first step in addressing the need for regional conservation is to demonstrate how the islands are inter-related by turtle migrations, and more specifically to locate where Samoa's turtles go when they leave Rose Atoll. Once the feeding grounds of Samoa's turtles are identified, we can begin direct dialogues with specific countries about our shared resource.

**4. OBJECTIVES:** To locate the distant feeding grounds of Samoa's threatened green turtles so that we can initiate meaningful management measures with the specific island countries that share Samoa's turtle resources. Secondary objectives are to determine the duration of the turtle nesting season in American Samoa, their migration routes and timing between nesting and foraging areas, and their movement patterns while at nesting and foraging areas.



**5. METHODS:** Our overall strategy is to put satellite transmitter tags on 3 nesting green turtles at Rose Atoll each year for 5 years to build a composite picture of their migration patterns. There are several reasons for this approach. First, there are few nesting turtles present at any one time to tag (typically only 2-4 turtles nest per week during the nesting season). Second, different nesting turtles may have different feeding areas, so we wish to spread out the sampling effort to decrease the chance that all tagged turtles will go to the same site (for example, our Year-1 turtles went to Fiji, and the Year-2 turtle appears to be going in the opposite direction). Third, the cost of the satellite tags and subsequent processing requires a balance between field efforts, costs, and results. It should be noted here that satellite tags are highly competitive with the more traditional metal-clip tags which cost much less but yield few results.

Our satellite tag project began in 1993 when we successfully put satellite transmitters on 3 green turtles at Rose Atoll. In 1994, an additional turtle was tagged with a satellite transmitter (information from this effort is not yet complete -- the transmitter is relaying data but the migration is still underway).

We now propose to continue this effort and put an additional 3 tags on turtles at Rose Atoll in October 1995. A field crew of 2 biologists would camp on Rose Island, and conduct nightly turtle patrols at about 2-hr intervals until nesting turtle are located. Tagging procedures will follow the protocol developed by Balazs and others to minimize disturbance to the turtles (Balazs 1993b). After the turtle finished laying eggs, a large plywood box (with an open top and bottom) would be placed over it to confine it while the satellite transmitter is fixed to the turtle's shell. This effort requires only about 3 hours, so the turtle can be released that same day.

The transmitters will provide information about the length of the nesting season at Rose Atoll for the tagged turtles, as well as their daily progress as they migrate to unknown feeding areas. We will monitor the turtles until the transmitter batteries cease to function (estimated to be 6-8 months). However, we anticipate that the tagged turtles will reach their destinations (foraging areas) within 4 months after tagging.

State/federal permits needed to conduct this study are (1) a permit to work on the endangered green sea turtle (already possessed by G. Balazs), and (2) a USFWS permit to work at Rose Atoll National Wildlife Refuge.

**6. PROJECT OFFICER:**

Dr. Peter Craig, Chief Biologist  
Dept. Marine and Wildlife Resources  
Box 3730, Pago Pago  
American Samoa, 96799  
Phone: 684-633-4456, Fax: 684-633-5944



7. **STUDY AREA:** Rose Atoll National Wildlife Refuge, which is located in the US Territory of American Samoa. No access to private property is needed to conduct this project.

8. **INVESTIGATORS:** This project is a cooperative effort between the Department of Marine and Wildlife Resources in American Samoa and the National Marine Fisheries Service (Honolulu). It has also been strongly supported by interagency cooperation and in-kind contributions by local non-governmental groups. Previous satellite tags for this project were purchased by the American Samoa Environmental Protection Agency, US National Parks Service, Dept. Marine and Wildlife Resources, and American Samoa Coastal Management Program.

To promote public awareness about turtle conservation, DMWR also sponsored contests for the public to guess where the tagged turtles would go. This successful effort was assisted by the local newspaper (Samoa News) and environmental group (Le Vaomatua).

9. **EXPECTED PRODUCTS:** A final report will be prepared after the turtles reach their foraging areas. A video will be prepared if the the supplemental proposal in Apendix 1 is also funded.

10. **WORK AND REPORTING SCHEDULE:**

- 1) May 1995: Order satellite tags (2-month construction time required).
- 2) October: Field trip -- a vessel would be chartered for a 7-10 day field trip to Rose Atoll during the turtle nesting season in September-November 1995. Specific dates for the trip will depend on vessel availability and weather. In general, a field effort scheduled towards the end of the nesting season is preferred because the tagged turtles are more likely to migrate away from the island thereby reducing potential damage to the tags.
- 3) November-March: Monitor turtle migrations.
- 4) June 1996: Final report submitted.

11. **PROPOSAL BUDGET:** \$20,500. An itemized budget is provided in Table 1. The principal cost is for the satellite transmitters themselves, totalling \$10,500. These are ST-3 transmitters manufactured by Telonics Inc. of Mesa, Arizona for use in the Tiros-Argos satellite tracking system.

The second item is the cost of chartering a vessel to Rose Atoll from Pago Pago. We estimate this to be \$10,000 based on recent charters. Total in-kind costs would be approximately \$33,000 as outlined in Table 1.



TABLE 1. BUDGET AND IN-KIND COSTS.

|  | <u>Proposal</u> | <u>DMWR,<br/>NMFS<br/>in-kind</u> |
|--|-----------------|-----------------------------------|
| 1. Satellite tags (3 @ 3500)                             | 10,500          |                                   |
| 2. Vessel charter  | 10,000          |                                   |
| 3. Satellite usage (3 @ 8000)                            |                 | 24,000                            |
| 4. Manpower: field work, analysis,<br>report preparation |                 | 6,000                             |
| 5. Per Diem  |                 | 500                               |
| 6. Supplies  |                 | 500                               |
| TOTALS   | <u>20,500</u>   | <u>31,000</u>                     |

12. **QUALIFICATIONS OF PROJECT PERSONNEL:** This interagency project will be conducted by Dr. Peter Craig (Dept. Marine and Wildlife Resources) with cooperative assistance from George Balazs (National Marine Fisheries Service, Honolulu). Dr. Craig is the Chief Biologist at DMWR. George Balazs is a recognized authority on Pacific sea turtles and he has successfully conducted similar satellite-tag studies of green turtles in the Hawaiian Islands. Both Craig and Balazs are members of the USFWS/NMFS Pacific Sea Turtle Recovery Team, and both conducted the first phases of this project at Rose Atoll in 1993 and 1994.

13. **LITERATURE CITED:**

- Balazs, G. 1993a. Satellite telemetry of green turtles nesting at French Frigate Shoals, Hawaii, and Rose Atoll, American Samoa. Proc. 14th Symposium on Sea Turtle Biology and Conservation. 4p.
- Balazs, G. 1993b. Homeward bound: satellite tracking of Hawaiian green turtles from nesting beaches to foraging pastures. Proc. 13th Symp. Sea Turtle Conservation and Biology.
- Balazs, G., P. Siu, and J Landret. 1993. Ecological aspects of green turtles nesting at Scilly Atoll in French Polynesia. Proc. 1992 Sea Turtle Symposium. Jekyll Island, Georgia.
- SPREP (South Pacific Regional Environmental Program). 1993. Third Regional Marine Turtle Conservation Programme. June 1993. Apia, Western Samoa.
- Tuato'o-Bartley, N., T. Morrell, and P. Craig. 1993. Status of sea turtles in American Samoa in 1991. Pac. Sci. 47:215-221.

## APPENDIX 1. VIDEO SUPPLEMENTAL PROPOSAL

To maximize the conservation value of this project, we propose the following supplemental package to produce a public awareness video of the turtle project.

There are several reasons why a video would be advantageous. It would:

- help further the public's understanding of the serious survival problem faced by sea turtle resources in the South Pacific,
- increase public interest in letting the migrating turtles live in both nesting areas and feeding grounds,
- illustrate the need for regional management of the shared turtle resource,
- be usable as an educational tool in schools and communities as well as a television program for broadcast,
- help explain to funding agencies and organizations why satellite tagging is worth the cost and effort.

The video would be made in documentary style and be presented in plain language, understandable to most people. Narration would be in English. Short interview bits, dialogue, field sequences and informative segments would interchange in an interesting and informative way.

The video presentation must be captivating: we land on the island; we go along with the expedition to find the turtles without knowing what will happen; will there be any turtles at all? where will the tagged turtles go?

The enthusiasm and personal commitment of the team would be apparent. The viewers will have no doubt that the team is working to help save the turtles of the Pacific. The viewers will follow the work of the expedition as it progresses, while still learning more about satellite tagging and about the biology and behavior of sea turtles. The flora and fauna of remote Rose Atoll would be described. Graphics, drawings, and perhaps models would be used to explain the details of satellite transmitters and how the signals from the turtle reach the scientists. The turtle's progress would be plotted.

The video would be 24 min duration, shot and edited in broadcast quality so that it can be used as a public service television program.

The following is an outline for the proposed video production:



Going ashore on Rose Atoll.

We follow the team of scientists landing at Rose.

Preparing the tags.

Explain why we are here, what the tags are and how they will be used. Graphics could illustrate how and where signals are sent from the turtle's back to the satellite to France, then back to the US via Hawaii to American Samoa.

Rose Atoll.

Shots showing this remote atoll and the beaches where the turtles will lay their eggs. Impressions of isolation.

Looking for turtles at night.

Follow the team out at night, looking for turtle tracks. Find nesting turtle. Explain briefly the turtle's life cycle, and specifically about the turtles at Rose from previous tagging data.

Tagging a turtle.

Fixing the tag to the turtle shell. The tagged turtle returns to the sea and swims away.

Plotting the turtles as they migrate.

Migrations plotted on chart.

Conclusion.

What have we learned? What steps do we have to take to prevent these turtles from being eaten when they leave American Samoa?

The video would be produced by Hans Andersen, Producer, of Tradewind Communications Ltd., PO Box 5761 Wellesley Street, Auckland, New Zealand. Phone (64)9-520-4014, fax (64)9-522 2295. Tradewind Communications has recently prepared a video describing the plight of sea turtles in the South Pacific for SPREP (South Pacific Regional Environmental Program) and is currently preparing a wetlands video for the American Samoa Coastal Management Program.

**Video Budget: \$24,000**

|             |                |
|-------------|----------------|
| \$1900      | Pre-production |
| 3000        | Travel         |
| 7400        | Crew and gear  |
| 7700        | Editing        |
| 1600        | Duplication    |
| <u>2400</u> | Contingency    |
| 24,000      |                |



**APPLICATION FOR FEDERAL ASSISTANCE**

3. DATE SUBMITTED:  
3-10-95

Applicant Identifier

1. TYPE OF SUBMISSION:  
Application

3. DATE RECEIVED BY STATE

State Application Identifier

- Application
- Construction  Construction
- Non-Construction  Non-Construction

4. DATE RECEIVED BY FEDERAL AGENCY

Federal Identifier

5. APPLICANT INFORMATION

Legal Name: AMERICAN SAMOA GOVERNMENT

Organizational Unit: DEPT. OF MARINE & WILDLIFE RESOURCES

Address (give city, county, state, and zip code):

P.O. BOX 3730  
AMERICAN SAMOA GOVERNMENT  
PAGO PAGO, AM. SAMOA 96799

Name and telephone number of the person to be contacted on matters involving this application (give area code)

RAY TULAFONO, Director  
(684)633-4456

6. EMPLOYER IDENTIFICATION NUMBER (EIN):

97 - 0000676

7. TYPE OF APPLICANT: (enter appropriate letter in box)

A

- A. State  
B. County  
C. Municipal  
D. Township  
E. Interstate  
F. Intermunicipal  
G. Special District  
H. Independent School Dist.  
I. State Controlled Institution of Higher Learning  
J. Private University  
K. Indian Tribe  
L. Individual  
M. Profit Organization  
N. Other (Specify)

8. TYPE OF APPLICATION:

- New  Continuation  Revision

If Revision, enter appropriate letter(s) in box(es):

- A. Increase Award B. Decrease Award C. Increase Duration  
D. Decrease Duration Other (specify):

9. NAME OF FEDERAL AGENCY:

US FISH & WILDLIFE SERVICES

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER:

-

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:

TRACKING MIGRATIONS OF SAMOAN SEA TURTLES USING SATELLITE TELEMTRY

TITLE:

12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.):

TERRITORY OF AMERICAN SAMOA

13. PROPOSED PROJECT:

14. CONGRESSIONAL DISTRICTS OF:

Start Date: 5-1-95  
Ending Date: 6-30-96

a. Applicant

NA

b. Project

NA

15. ESTIMATED FUNDING:

|                   |    |        |     |
|-------------------|----|--------|-----|
| a. Federal        | \$ | 20,500 | .00 |
| b. Applicant      | \$ | 31,000 | .00 |
| c. State          | \$ |        | .00 |
| d. Local          | \$ |        | .00 |
| e. Other          | \$ |        | .00 |
| f. Program Income | \$ |        | .00 |
| g. TOTAL          | \$ | 51,500 | .00 |

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:

DATE \_\_\_\_\_

- b. NO.  PROGRAM IS NOT COVERED BY E.O. 12372  
 OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

- Yes  No If "Yes," attach an explanation.

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT. THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Type Name of Authorized Representative

Ray Tulafono

b. Title

Director

c. Telephone Number

(684)633-4456

d. Signature of Authorized Representative

*Ray Tulafono*

e. Date Signed

3-13-95



## LETTER FROM THE FIELD

### Pepper Trail

#### THE DEFLOWERING OF ROSE ATOLL

**M**Y FIRST TRIP TO ROSE ATOLL was a mythic journey. Less than six months earlier, I had left San Francisco and the Academy to take up the position of wildlife biologist for the government of American Samoa. Living on the populous island of Tutuila, I had gone through an immersion in the "real world" of conservation and politics in a developing Pacific state. Intense, rewarding, challenging...and yet, as I sat in my office tracking down purchase orders, I did not feel like Melville, or Maugham, or Mayr. Then came the opportunity to voyage out into the limitless ocean, headed for an uninhabited atoll of romantic purity.

Only one mile across, Rose Atoll is among the smallest atolls in the world, yet is one of the most important nesting areas for seabirds and sea turtles in Polynesia. It is the southernmost and one of the most isolated units in the U.S. National Wildlife Refuge system. As described in my earlier "Letter from the Field" (*Pacific Discovery*, Winter 1993), I was part of a team on a quest: to rid Rose Island of its only pest, introduced Polynesian rats.

On a tiny boat of dubious seaworthiness, we groped through staggering seas to arrive, at last, upon a lagoon of perfect beauty and tranquility. The atoll was then one of those sublime places where nature still holds dominion, where the very existence of humanity can be forgotten in the vitality of the living landscape. From the swirling clouds of seabirds above to the prismatic coral gardens below, Rose was indeed a beautiful flower, a remnant of the wild Pacific world that has almost passed away.

A year and a half later I returned, not on a scientific and spiritual quest, but on a bureaucratic assignment, the grimmest of all tasks for a naturalist: damage assessment. Over those 18 months, Rose had slipped from its paradisiacal plane and entered the modern age, battered, insulted, and infected by the world beyond its seemingly limitless horizons. The object of wonder had become the subject of lawsuits. How this came to pass is a sad tale, in which no one, including your correspondent, comes away with clean hands (or, as we shall see, boots).

The first bad news from Rose came in October 1992, only three months after my

*Just before dawn on October 14, 1993, Rose Atoll ceased to be a wilderness. The Taiwanese fishing boat Jin Shiang Fa, colliding with the western face of the atoll, ripped open its hull and released 100,000 gallons of diesel fuel.*

first visit. A cruising yacht, the *Rabba Abba*, was en route from French Polynesia to the Samoan islands with four young people aboard. Not long after sunset, in rain, they were all below, cooking dinner. The yacht was set on course, and its passengers thought they were sailing through one of those huge reaches of empty sea that comprise the South Pacific. As the rain drummed on deck, the crew didn't hear the roar of the breakers, and so were completely surprised when a particularly large roller picked up the *Rabba Abba* and slammed it firmly down on the rose-pink reef flat of Rose Atoll.

Aside from their original mistake, the crew did remarkably well. They managed to retrieve their radio and stagger through the dark across the reeftop to reach the safety of Rose Island. The following day they had the good fortune to raise a passing oil tanker bound for Pago Pago. I participated in their debriefing in the stateroom of the oil tanker. The "captain,"

GILBERT S. STRAUB

PEPPER TRAIL







PHOTOGRAPH BY

whose father owned the yacht, kept repeating how very disappointed he was with the quality of his charts. In a few days he was on a jet home to New York, where the maps do not require prudent allowance for error. Back on Rose, the broken hull of the yacht remains, a mound of fiberglass marring the sweep of pink reef and white breakers that has embraced the lagoon since long before the first voyaging canoe made landfall.

This episode was an insult to Rose; an esthetic affront, but not a profound injury. That injury came twelve months later. Again, it was night, and another ship bore down, all unawares, on Rose Atoll. This, unfortunately, was not a delicate yacht. It was a 350-ton Taiwanese fishing boat, the longliner *Jin Shiang Fa*. Just out of Pago Pago with full fuel tanks, the *Jin Shiang Fa* was headed for a long cruise. Shortly before dawn on October 14, that cruise came to an end. Under circumstances that are still in dispute, the boat rammed dead-end

ter into the western face of the atoll. The force of the collision drove the ship over the top of the reef front and ripped open a huge gash in the hull. As the breakers hammered the ship onto its side, the crew managed to abandon ship into lifeboats. The sea flowed into the torn hull, and the ship's toxic contents flowed out.

In a practice common among foreign-flag longliners, the captain of the *Jin Shiang Fa* had maximized his vessel's fuel capacity by filling not only the tanks but several of the empty fish holds with No. 2 diesel. A total of 100,000 gallons was aboard that night, and every drop of it was to bleed out in the coming weeks. An oil slick quickly spread far over the sea and along the front of the atoll. From that moment, Rose Atoll ceased to be a wilderness. As the oil was emulsified and spread through the water column by the pounding surf, it was joined by five hundred gallons of heavy lube oil and by 7,000 pounds of highly toxic antimonia, used in the ship's antifouling paint.

*Above left: Until recently, Rose Atoll, about 160 miles east-southeast of Samoa, was everything an atoll should be: beautiful, isolated, uninhabited, and mysterious.*

*Above: Remains of the fishing vessel Jin Shiang Fa sully the island's esthetic purity, but the accident's aftereffects are much deeper. Most of the giant clams in the area have died, there is widespread bleaching of the atoll's rose-colored coralline algae, an infestation of blue-green algae is choking coral elsewhere, and there are signs of eye damage to sea turtles in the area.*



A FEW DAYS LATER I WAS IN A FAST little prop-jet chartered by the Coast Guard. We streaked over the sea, the waves that had slapped me around on my first approach to Rose flattened to meaninglessness by our height. In an hour we were there, swooping around and around, taking pictures and video, documenting the oil slick, putting Rose on the map of damage. A few weeks passed, weeks full of conference calls between Hawaii and Samoa, the U.S. Fish and Wildlife Service and the Samoan Department of Marine and Wildlife Resources, the Coast Guard and the shipowners, the insurers and the lawyers.

And then I was on a ship bound again for the scene of disaster. This was not my department's funky little *Sausanimoana*, but a 110-foot-long charter, with room for a large damage assessment team in full battle gear. As the mountaintops of Tutuila sank beneath the waves and dusk fell over the Pacific, the 13 crew members and 12 passengers settled down to hamburgers and a

live broadcast of "Monday Night Football" on the cabin TV. This, clearly, was going to be nothing like my first trip.

We arrived at 10 A.M., and cruised back and forth in front of the wreck like a shark sizing up a possible meal. The skies, the sea, and the lagoon were gray that day. All of us—crewmen, scientists, and bureaucrats—mutely lined the rails, sharing a common sense of oppression at the scene.

Over the next five days, the marine biologists pored over the wreck site, mapping and cataloging preliminary injury to the reef and its life. I took thankful refuge on Rose Island, joining my colleagues Peter Craig, George Balacz, and Gil Grant in research on seabirds and sea turtles, for whom Rose Atoll is a critical sanctuary. We also continued the rat-trapping efforts that were the focus of my first trip to Rose. In the only bit of good fortune in the whole catastrophe, the *Jin* struck the atoll at the farthest possible point from Rose Island and its wildlife. We found no definite traces of the

wreck, or of oil, on the island, though the opposite side of the lagoon was a junkyard of fishing line, clothing, styrofoam, wood scraps, video cassettes, and all the other detritus of life on a fishing boat.

The damage assessment team, sadly, found plenty to assess. A partial list of the concerns they documented on this and subsequent trips includes:

- 75 percent mortality of giant clams in the affected area
- widespread bleaching of the atoll's rose-colored coralline algae
- extensive infilling of the reef's complex three-dimensional structure with sand produced by the wreck grinding on the reef
- a smothering infestation of blue-green algae that now covers at least two million square meters of the reef
- signs of eye injuries in sea turtles returning to nest at Rose a year after the wreck
- the breaching of a humpback whale in the midst of the oil slick in the days following the wreck.

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**B**ACK ON ROSE ISLAND, MEAN-while, we had made an awful—and profoundly embarrassing—discovery. At the site where we had camped the year before, we found a flourishing patch of *Cenchrus echinatus*...sandbur. This grass, infamous for its hard, spiny burs, is native to tropical America, but is now one of the most widespread and troublesome weeds in the Pacific islands.

On Laysan Island, the grass forms dense mats that render great areas of habitat unusable, both to seabirds, who cannot penetrate it to make nest scrapes or burrows, and to sea turtles, whose emerging young cannot clamber through it to reach the sea. The U.S. Fish and Wildlife Service spends \$175,000 a year trying to eradicate it on Laysan. Although we will never know exactly how sandbur reached Rose, it is probable that one of the grass's fiendishly adherent seeds hitched a ride on a boot or the clothes of a biologist, perhaps yours truly....

What is the status of Rose today? Small island systems are not very good at healing themselves. Biologically speaking, they have the fragility, and beauty, of bubbles in the sea. The effects of the wreck continue to devastate the western reefs of the atoll. Debris remains strewn across the lagoon. Efforts to eradicate sandbur have been unsuccessful, although so far the grass has not formed the dense mats that are so harmful on Laysan. On the bright side, the rat eradication efforts have apparently been successful, and the native vegetation of Rose Island is lusher than it has been in memory. Seabirds appear to be thriving.

Yet another damage assessment visit will take place this spring. Formal negotiations to resolve the legal and financial issues related to the wreck have yet to begin. And every night, as the sun sets into the Pacific, its rays glance off the twisted fragments of the *Jin Shiang Fa* and the *Robba Abba*...gifts of the twentieth century to a place that needed nothing. □

*PEPPER TRAIL, longtime research associate at the Academy, reported on his first trip to Rose Atoll in Pacific Discovery, Winter 1993. He returned to the United States in the summer of 1994, and now lives in Astland, Oregon, where he studies birds, raises children, works on Northwest forest issues, and writes.*

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