RODENT SURVEY OF AMERICAN RABBIT'S
TUTUILLA ISLAND AND ROSE ISLAND

Roger D. Hess
Station Leader, Wildlife Damage Research Station
Bureau of Sport Fisheries and Wildlife
Denver Wildlife Research Center
1110, Hawaii 96720

October 21 to November 5, 1971
During a visit to American Samoa, Mr. John P. Findlay, Director, Region I, was advised of severe rat damage problems in agricultural crops by Governor John M. Haydon and his staff. Mr. Findlay suggested that the Bureau survey rodent problems in agriculture and recommend methods for alleviating these problems. Subsequently, arrangements were made for me to accompany Mr. Eugene Kridler, Wildlife Administrator, Kailua, Hawaii, to American Samoa from October 21 to November 5 to survey rodent problems and assist in surveying wildlife. We were also to assess Rose Island as a candidate for inclusion in the National Wildlife Refuge System and the deleterious effects that rats on Rose Island may have on bird and turtle eggs. Nine days were spent on Tutuila, four days at sea traveling to and from Rose Island, and one day on Rose Island.

This report describes the rodent damage survey and presents recommendations on rodent control. A report by Mr. Kridler appears elsewhere.

Introduction

American Samoa, consisting of 7 islands, is located south of the equator about 2,300 miles southwest of Hawaii and 1,600 miles northeast of New Zealand. Most of the 28,000 resident Samoans live on the main island of Tutuila. This island is 18 miles long and 1 to 6 miles wide with a rugged jungle-covered mountain range from one end to the other. Aunu'u is a small island near Tutuila; the Hanale group of Ta'u, Olosega, and Ofu lies 60 miles east of Tutuila; and Swains and Rose Islands are small coral atolls about 150 miles from Tutuila. The total land area of American Samoa is 76 square miles. Over 96% of the land is owned communally, according to local custom, and only a small amount is owned in fee simple by individuals.

Wildlife in American Samoa consists primarily of birds of which there are about 20 species of land birds. Other wildlife is represented by several kinds of lizards and the fruit bat. Domestic animals, mice, rats, and the fruit bat are the only mammals present. Rose Island is about 350 yards long and 250 yards wide with a maximum elevation of 11 feet. Trees (Zizania and Rhynchospora), which cover three-fourths of the island, make ideal nesting areas for some sea birds and provide cover for rats. Lizards and hermit crabs also are present.

This report is based on field observations and conversations with local inhabitants during our survey. The following persons were our primary contacts: John Haydon, Governor; Frank Hocksett, Lt. Governor; Pomerika Taulili, Director of Agriculture; Stanley...
Sverdloff, Director of Marine Resources; Tony Collina, Agricultural Extension Agent; Jeff Yee, Department of Education; Steve Reisman, Department of Marine Resources; Halack pineapple plantation; village chiefs; farmers; and villagers.

Tutuila Island

Taro, breadfruit, bananas, and coconut are grown throughout the island, while papaya, pineapple, and other fruits and vegetables are less extensively grown. Sun-dried crops valued at $33,750 were the only agricultural export in 1970, but large quantities of food were imported. Crops are frequently planted in small plots adjacent to forests or in rocky, debris-filled areas within the forest which enhances the potential for crop damage by rats.

The land ownership patterns and population distribution prevent separating urban from agricultural areas or classifying rodent problems as either communal or field pest situations. Other than the city of Pago Pago, rural and residential areas are intermixed. Rats are common in the port and market areas of Pago Pago and are a nuisance and health hazard in the city's residential areas. The common occurrence of uncovered, overflowing, and tipped garbage cans and generally poor sanitation practices provide sources of food and cover for rodents.

Polynesian rats (Rattus exulans), black rats (R. rattus) and Norway rats (R. norvegicus) are found on Tutuila, but their distribution and abundance are unknown. I trapped Polynesian and Norway rats in and around a taro patch in a forest near Tafuna and black and Norway rats were observed on a plantation near Pagoa. Due to the environmental conditions, I suspect that the three species of rats occur throughout all agricultural areas.

Pineapple production is limited to a few plantations. Extensive rat damage was observed on one weedy plantation, while no damage was found in another plantation that was clean cultivated and where anticoagulant baits were used occasionally.

Rat damage to coconuts was widespread whereas damage to taro, bananas, truck crops, and fruit tended to be localized. Rates reportedly damage other crops but we were not able to observe these losses due to the seasonal nature of these crops.

Responses to questions about rats and rat damage were often conflicting. Some people reported they had no rat problem around homes and plantations, while others related there were problems in villages, and some farmers expressed concern about crop losses. Food and feed storage
areas were frequently mentioned as problems. Individuals reporting no rodent problems generally practiced sound sanitation procedures by removal of harborage and food sources. Some farmers and villagers were reluctant to discuss rat problems.

Within the limited time available, I was not able to obtain an estimate on the economic impact of rats on agricultural crops. Rat damage appears to be localized in terms of areas involved, type of crops, and stages of the crop cycle. However, the problem is sufficiently serious to warrant initiation of corrective measures. Due to the numerous pest situations involved, there is no single rodenticide or rat control method that will solve the problem in American Samoa. Alleviation of the problems will involve a coordinated community effort and a variety of control methods.

Recommendations:

1. The Department of Agriculture and Health should coordinate their efforts in rat control. Frequently, village rat problems are also agricultural problems; therefore, control efforts should encompass both areas of activity.

2. A designated Department of Agriculture official should be responsible for activities dealing with rodents in agricultural situations:
   a. Damage complaints and related inquiries should be directed to this office.
   b. Inquiries should be answered by the official or an extension agent from the respective districts:
      (1) After analysis of the problem, specific advice could be given concerning the use of traps, anticoagulant and acute rodenticide baits, and sanitation or clean cultivation.
      (2) A follow-up visit should be made to determine if control programs were carried out and if satisfactory results were obtained.
      (3) A "do it yourself program" should be stressed. If there is enough stimulation to complain, the individual should have enough initiative to handle the problem once control methodology is made known to him.

4
c. Bait acceptance studies should be conducted with anticoagulants and acute toxic baits to determine those suitable for controlling rats. Most of the anticoagulants are generally considered about equally effective. The only acute toxicant recommended is zinc phosphide.

d. Weathering studies of various bait carriers and formulations should be conducted to establish longevity of baits and hazards in the field.

e. Emphasis should be placed on safety in handling or use of toxicants to avoid and minimize hazards to humans, domestic animals, and wildlife. Depending on the method of use, zinc phosphide may create primary hazards to birds. Bait stations with zinc phosphate are not generally recommended due to hazards to non-target species. Secondary hazards to cats and dogs may also be a problem. Anticoagulants are generally safer to use but may also present secondary poisoning hazards.

f. Close contact between the Denver Wildlife Research Center and the South Pacific Commission regarding new developments in rodent control should be maintained.

3. Trapping will provide relief from damage in many small plantations

a. The Department of Agriculture should have a central supply of traps for short-term loans. Traps could be used in places where toxic baits are hazardous to humans and other non-target animals, especially in and around residences.

b. If a loan system for traps is impractical, leaflets should be made available listing local sources of supply and current prices or describing simple methods of construction.

4. Agricultural extension agents should acquire about rat problems and provide advice for control when they visit plantations even if visits are not specifically rat-problem oriented. Extension agents and other government personnel were trained in the fundamentals of rodent control during a 2-week course given by Mr. R. J. Wilson of the South Pacific Commission. Extension agents made 3,607 farm visits during 1970. This close contact with farmers could well be used to emphasize sanitation practices, clean cultivation, and for training in rat damage control.

5. Health and agricultural officials should stress proper garbage disposal and sanitation around homes and villages.
6. Food and feed storage areas should be rat-proofed according to proven methods described in available pamphlets.

7. Proper methods of fending 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.

Roe 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. Roe 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 Massonchidia 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 nests but unhatched turtle eggs were found, but this could not be attributed to any specific factor. Rats frequented rookeries where tern chicks of all sizes were present, but no attacks by rats or dead chicks were observed. Turtle eggs 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 under-nourished and may be able to sustain themselves without predation.

6
Polynesian rats may have been present on Rose Island for hundreds 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 lengthier 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. (Note likely removing rat/bird feeding habitat OK)

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. Fameriks Taulituila, 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 Haydon, 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.