

JOB PROGRESS REPORT RESEARCH PROJECT SEGMENT

STATE: Territory of Guam

PROJECT NO.: W-1R-7
SUB-PROJECT NO.: W-5
STUDY NO.: 1
JOB NO.: 1

JOB TITLE: Current Status, Distribution, and Natural History of Mariana Fruit Bats

PERIOD COVERED: October 1, 1998 to September 30, 1999

SUMMARY

During FY99, Guam's population of Mariana fruit bats (*Pteropus mariannus mariannus*) ranged in size from an estimated low of 199-235 animals in October and a high of 327-371 animals in February. Numbers were low (< 200 animals) for most of the year at the island's only bat colony. The colony continued to roost at a single site on Pati Point for the fifth consecutive year. The Division of Aquatic and Wildlife Resources (DAWR) assisted in a survey of fruit bats on Sarigan in July. Data were gathered on population size, reproduction, food habits, and roosting behavior.

BACKGROUND

The Mariana fruit bat has been studied by the DAWR since 1962 (DAWR 1964-1998). Considered a delicacy by Chamorro residents, bat abundance declined during the 1960s and 1970s until only a few solitary animals remained (Perez 1972, Wheeler and Aguon 1978, Wiles 1987a). A second species, the little Mariana fruit bat (*P. tokudae*), also occurred on the island, but is now extinct (Wiles 1987a). Reasons for the declines were primarily overhunting and some loss of habitat (Wheeler 1979). Both *Pteropus* occur on the U.S. and Guam Endangered Species Lists. The island's population of Mariana fruit bats grew to an estimated 850-1,000 animals in the early 1980s, probably from immigration of bats from Rota (Wiles 1987a, Wiles and Glass 1990). However, numbers have gradually declined since 1983 because of continued illegal hunting and suspected predation by brown tree snakes (*Boiga irregularis*) (Wiles 1987a, 1987b, Wiles et al 1995). During FY98, Guam's fruit bat population ranged in size from an estimated high of 910-980 animals to a low of 210-245 animals (DAWR 1998).

OBJECTIVES

To continue status surveys and natural history studies and to provide for continued protection of habitat as recommended in the Mariana Fruit Bat Recovery Plan (Wiles 1990).

PROCEDURES

1. Survey fruit bat distribution and numbers in Guam and the Commonwealth of the Northern Mariana Islands (CNMI).

- a. Conduct annual surveys of fruit bats along Guam's northern cliffline with periodic surveys made elsewhere on the island. The emphasis of surveys should be to search for solitary bats and additional bat colonies.
 - b. Conduct monthly censuses at known bat colonies on Guam.
 - c. Assist the CNMI Division of Fish and Wildlife with surveys of fruit bats on other islands as needed.
2. Record information on the behavior and reproduction of fruit bats in colonies.
 3. Determine habitat use of fruit bats. Visit abandoned roosts and record information about terrain and the size and abundance of vegetation present.
 4. Monitor fruit bat imports to Guam from other Pacific islands.
 5. Investigate illegal hunting of fruit bats on Guam. Visit abandoned roosting sites of colonies to determine illegal hunting effort. Assist conservation officers with investigations of bat poaching.

RESULTS

Locations of Bat Colonies on Guam

The island's only known fruit bat colony continued to occupy Roost 1 on Pati Point at Andersen Air Force Base (AAFB) throughout FY99 (Tables 1, 2). This site has been used since July 1994 and has been a preferred roosting location for many years (DAWR 1987-1998).

Table 1. Approximate dates of use of the roost used by the only known colony of Mariana fruit bats on Guam in FY99.

| Roost Number | Roost location | Approximate period of use by bats |
|---------------------|-----------------------|--|
| 1 | North Pati Point | 2 July 1994 - present |

Table 2. Counts of Mariana fruit bats at roosts on Andersen AFB, Guam in FY99.

| Date | Roost Number | | | | | | | | | Total |
|-------------|---------------------|----|----|----|----|----|----|----|----|--------------|
| | 1 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 6 Oct 1998 | 204 | - | - | - | - | - | - | - | - | 204 |
| 28 Oct | 171 | - | - | - | - | - | - | - | - | 171 |
| 2 Dec | 190 | - | - | - | - | - | - | - | - | 190 |
| 31 Dec | 213 | - | - | - | - | - | - | - | - | 213 |
| 29 Jan 1999 | 214 | - | - | - | - | - | - | - | - | 214 |
| 26 Feb | 247 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 247 |
| 5 April | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 180 |
| 10 May | 163 | - | - | - | - | - | - | - | - | 163 |
| 27 May | 146 | - | - | - | - | - | - | - | - | 146 |
| 28 June | 163 | - | - | - | - | - | - | - | - | 163 |
| 2 Aug | 161 | - | - | - | - | - | - | - | - | 161 |
| 2 Sept | 141 | - | - | - | - | - | - | - | - | 141 |
| 5 Oct | 130 | - | - | - | - | - | - | - | - | 130 |

- = site was not checked for bats; * = colony was present, but complete count was not made.

Surveys of Fruit Bats on Guam

Count results at Roost 1 followed the same seasonal pattern noted in most previous years (DAWR 1985-1998), with low counts (130-190 bats) obtained from early April to early December and somewhat higher counts from late December to February (Table 2). Colony numbers in FY99 showed considerably less variation than in most previous years. The highest count totaled only 247 animals in February (Table 2), which was a sizable decrease from last year's unusually high tally of 760 bats.

Estimates of fruit bat numbers at the main colony on Pati Point can be made using the high and low roost counts for the year. Because some individuals were probably hidden by thick foliage during counts, the total number of adults in the roost was likely to be 5-10% higher than the actual number recorded. Assuming that about half the colony were harem females and that 10% of these had unweaned young (DAWR 1994), then the roost held an estimated high of 259-272 adults and 13-14 juveniles, or a total of 272-286 bats in late February, and a low of 137-143 adults and 7 juveniles, or a total of 144-150 bats in early October 1999.

Incidental sightings of single fruit bats or pairs of bats were made elsewhere on the island during the year, as follows: daytime sightings – Ritidian Point (4 sightings), Munitions Storage Area on AAFB (3), Mergagan Point (2), Tarague basin and cliffline (2), Tarague clifftop 1 km east of the cliffline road (1), Northwest Field (1), Urunao (1), Pagat cliffline (1), and 1 km south of Mt. Alifan on Ordnance Annex (1); nighttime sightings – Munitions Storage Area (1), west end of Naval Hospital in Anigua (1), and Dandan in Malojloj (1).

Excluding bats residing in the colony at Pati Point, an estimated 40-60 fruit bats are still believed to live solitarily or in small groups in northern Guam, primarily along the cliffline extending from Bijia Point to Iates Point. An additional 15-25 animals probably inhabit the Ordnance Annex and other forested areas in southern and central Guam. Based on these figures, Guam's islandwide population of fruit bats was small for much of the year, with an estimated low of 199-235 animals in early October 1999 and a high of 327-371 animals in February.

Surveys of Fruit Bats on Other Islands

The DAWR assisted the CNMI Division of Fish and Wildlife and U.S. Fish and Wildlife Service (USFWS) with a fruit bat survey on Sarigan in July. Results of the survey are presented in Appendix 1.

Illegal Hunting and Importations

Poaching has long been a major cause of mortality of *P. mariannus* in the southern Mariana Islands (Wiles 1987a, Wiles et al. 1989, Stinson et al. 1992). Poaching still occurs commonly on Rota and other islands in the Marianas (E. Taisacan, pers. comm., 1998). No reports of illegal hunting were again recorded on Guam this year.

No illegal shipments of bats were confiscated by customs authorities on Guam during the year (T. Eckhardt, USFWS, pers. comm.). However, two confiscations occurred on Saipan, as follows: 10 bats from Palau in one shipment and one bat from Yap.

Proposed Downlisting of the Mariana Fruit Bat Population on Guam

In March 1998, the USFWS published a proposal to list the Mariana fruit bat as threatened throughout the Mariana Islands (U.S. Fish and Wildlife Service 1998). This would result in the downlisting of Guam's bat population from endangered to threatened. No action on the proposal was taken during FY99 and a final decision on the ruling is still pending.

Insectivorous Bats

Wiles (1999) reported on two separate cases of insectivorous bats being accidentally transported to Guam in 1997 (see DAWR 1998). An additional incident was reported to the DAWR in July 1999, when contract workers opened a shipping container at a work site in the Munitions Storage Area on AAFB and found a dead insectivorous bat inside. The carcass was disposed of before it could be examined by biologists, thus no specimen was obtained for identification. The container originated from an undetermined location on the U.S. mainland.

RECOMMENDATIONS

1. Survey bat numbers and distribution along Guam's entire northern cliffline once or twice annually. Searches for additional colonies may be productive because continued poaching at bat roosts on Rota can cause large numbers of bats to move to Guam (Wiles and Glass 1990).
2. Continue observations at Guam's bat colonies. Information on reproductive biology, behavior, and social organization will be used to supplement data already gathered.
3. Summarize data previously collected and write reports on the diet, reproduction, and amount of snake predation on fruit bats.
4. Conduct a study of the vegetation, terrain, and proximity to development of known roosting sites to determine what site characteristics are important in the selection of roosting sites by fruit bat colonies.
5. Known bat roosting and foraging areas should be patrolled regularly by DAWR conservation officers.
6. Continue to assist the CNMI as needed with island censuses and other biological studies. Studies conducted on Rota would be most valuable for understanding the aspects of Guam's fruit bat population.
7. Continue to monitor illegal fruit bat imports entering Guam.

PROGRAM COST

The estimated cost of the fruit bat project under W-1R-7 is \$30,000.

LITERATURE CITED

Division of Aquatic and Wildlife Resources. 1964-1998. Job Progress Reports - Federal Aid to Fish and Wildlife Restoration, Guam. Guam Dept. Agric., Mangilao, Guam.

Perez, G.S.A. 1972. Observations on Guam bats. *Micronesica* 8:141-149.

- Stinson, D.W., P.O. Glass, and E.M. Taisacan. 1992. Declines and trade in fruit bats on Saipan, Tinian, Aguijan and Rota. pp. 61-67 in Wilson, D.E. and G.L. Graham (eds.). Pacific island flying foxes: proceedings of an international conservation conference. U.S. Fish Wildl. Serv. Biol. Rep. 90(23). 176 pp.
- U.S. Fish and Wildlife Service. 1998. Endangered and threatened wildlife and plants: proposed reclassification from endangered to threatened status for the Mariana fruit bat from Guam, and proposed threatened status for the Mariana fruit bat from the Commonwealth of the Northern Mariana Islands. Federal Register 63(58):14641-14650.
- Wheeler, M.E. 1979. The Marianas fruit bat: management history, current status and future plans. Calif.-Nev. Wildl. Trans. 10:149-165.
- Wheeler, M.E. and C.F. Aguon. 1978. The current status and distribution of the Marianas fruit bat on Guam. Aquatic Wildl. Resour. Div., Tech. Rep. No. 1. 29 pp.
- Wiles, G.J. 1987a. The status of fruit bats on Guam. Pac. Sci. 41:148-157.
- Wiles, G.J. 1987b. Current research and future management of Marianas fruit bats (Chiroptera, Pteropodidae) on Guam. Aust. Mammal. 10:93-95.
- Wiles, G.J. 1990. Guam Mariana fruit bat and little Mariana fruit bat recovery plan. U.S. Fish Wildl. Serv., Portland, Oregon. 57 pp.
- Wiles, G.J. 1999. Two additional records of bats accidentally transported to Guam. Bat Research News 40:10-11.
- Wiles, G.J. and P.O. Glass. 1990. Inter-island movements of fruit bats (*Pteropus mariannus*) in the Mariana Islands. Atoll Res. Bull. 343:1-6.
- Wiles, G.J., C.F. Aguon, G.W. Davis, and D.J. Grout. 1995. The status and distribution of endangered animals and plants in northern Guam. Micronesica 28:31-49.
- Wiles, G.J., T.O. Lemke, and N.H. Payne. 1989. Population estimates of fruit bats (*Pteropus mariannus*) in the Mariana Islands. Conserv. Biol. 3:66-76.

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