

**JOB PROGRESS REPORT  
RESEARCH PROJECT SEGMENT**

**STATE:** Territory of Guam

**PROJECT NO.:** W-1R-8  
**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, 1999 to September 30, 2000

**SUMMARY**

Guam's population of Mariana fruit bats (*Pteropus mariannus mariannus*) ranged in size from an estimated low of 173-179 animals in November 1999 and a high of 283-292 animals in February 2000. Numbers were low (< 200 bats) for most of FY00 at the island's only bat colony, which continued to roost at a single site on Pati Point for the sixth consecutive year.

**BACKGROUND**

Mariana fruit bats (MFB), have been studied by the Division of Aquatic and Wildlife Resources (DAWR) since 1962 (DAWR 1964-1998). Considered a local delicacy by Chamorro residents, MFB abundance's 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 population of MFB grew to approximately 850-1,000 individuals in the early 1980s, possibly due to immigration 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 treesnakes (BTS), *Boiga irregularis* (Wiles 1987a, 1987b, Wiles et al 1995). During FY98, Guam's MFB population ranged in size from an estimated high of 910-980 to a low of 210-245 individuals (DAWR 1998).

**OBJECTIVES**

- 1) To continue status surveys and natural history studies.
- 2) To provide for continued protection of habitat as recommended in the MFB Recovery Plan (Wiles 1990).

## PROCEDURES

- 1) Survey MFB 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 MFB colonies on Guam.
  - c. Assist the CNMI Division of Fish and Wildlife (DFW) with surveys of MFB on other islands as needed.
- 2) Record information on the behavior and reproduction of MFB in colonies.
- 3) Determine habitat use of MFB and visit abandoned roosts and record information about terrain and the size and abundance of vegetation present.
- 4) Monitor MFB imports to Guam from other Pacific islands.
- 5) Monitor illegal hunting of MFB on Guam and visit abandoned roosting sites of colonies to determine illegal hunting effort.

## RESULTS

### Locations of Mariana Fruit Bat Colonies on Guam

The island's only known MFB colony continued to occupy Roost 1 on Pati Point at Andersen Air Force Base (AAFB) throughout FY00 (Tables 1, 2). This site had been used since July 1994 and has been a preferred roosting location for many years (DAWR 1987-1999).

Table 1. Approximate dates of use of the roost used by the only known colony of MFB on Guam in FY00.

<b>Roost Number</b>	<b>Roost location</b>	<b>Approximate period of use by bats</b>
1	North Pati Point	2 July 1994 - present

Table 2. Counts of Mariana fruit bats at roosts on Andersen AFB, Guam in FY00.

Date	Roost Number									Total
	1	14	15	16	17	18	19	20	21	
5 Oct 1999	130	-	-	-	-	-	-	-	-	130
1 Nov	108	-	-	-	-	-	-	-	-	108
11 Nov	132	-	-	-	-	-	-	-	-	132
1 Jan 2000	149	-	-	-	-	-	-	-	-	149
1 Feb	179	-	-	-	-	-	-	-	-	179
3 March	156	-	-	-	-	-	-	-	-	156
30 March	151	-	-	-	-	-	-	-	-	151
12 May	131	-	-	-	-	-	-	-	-	131
27 June	119	-	-	-	-	-	-	-	-	119
18 July	127	-	-	-	-	-	-	-	-	127
22 Aug	129	-	-	-	-	-	-	-	-	129
18 Sept	135	-	-	-	-	-	-	-	-	135

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

### Surveys of Mariana Fruit Bats on Guam

Count results at Roost 1 followed the same seasonal pattern noted in most previous years (DAWR 1985-1999), with low counts (120-130 bats) obtained from early April 1999 to early December 1999 and somewhat higher counts from late December 1999 to February 2000 (Table 2). Colony numbers showed considerably less variation than in most previous years in FY00. The highest count totaled only 179 individuals in February 2000 (Table 2), which was a decrease from the unusually high tally of 247 bats in FY99.

Estimates of MFB numbers at the main colony on Pati Point can be made using the high and low roost counts for FY00. 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 188-197 adults and 9-10 juveniles or a total of 198-207 bats in late February 2000, and a low of 113-119 adults and 5 juveniles, or a total of 118-124 bats in early November 2000.

Incidental sightings of single MFB or pairs that were made elsewhere on the island during FY00 as follows:

- 1) Daytime - Ritidian Point (1); Munitions Storage Area (MSA), AAFB (10); Lafac Point (1); Tarague basin and cliffline (4); Northwest Field (5); Pagat cliffline (1); and 1 km south of Mt. Alifan on Naval Ordnance Annex (1).
- 2) Nighttime – MSA (1), Tarague basin (1), and Dandan in Malojloj (2).

Excluding bats residing in the colony at Pati Point, an estimated 40-60 MFB 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 173-179 animals in early November 1999 and a high of 283-292 animals in February 2000.

### **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, per. com., 1998). No reports of illegal hunting were again recorded on Guam this year. However, a man found a dead adult male MFB at his ranch between Latte Heights and Route 15 in Mangilao on 18 October 1999. Examination revealed that the animal was probably dead for about 2 days. The carcass was in good condition with no obvious signs of injuries. A necropsy revealed the absence of pellets, pellet holes, and broken bones. The intestine was full of food, indicating the bat had fed normally just before its death. Thus, it was unlikely that poaching took place. The cause of death was unknown.

Customs authorities on Guam confiscated no illegal shipments of bats during FY00.

### **Proposed Down-listing of the Mariana Fruit Bat Population on Guam**

In March 1998, the USFWS published a proposal to list the MFB as threatened throughout the Mariana Islands (USFWS 1998). This would result in down-listing Guam's MFB population, from endangered to threatened. No action on the proposal was taken during FY00 and a final decision on the ruling is still pending.

### **RECOMMENDATIONS**

- 1) Survey MFB numbers and distribution along Guam's entire northern cliffline once or twice per fiscal year. Searches for additional colonies may be productive because continued poaching at MFB roosts on Rota can cause large numbers of them to move to Guam (Wiles and Glass 1990).
- 2) Continue observations at Guam's MFB 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 BTS predation on MFB.
- 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 MFB colonies.
- 5) Known MFB 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 MFB population.
- 7) Continue to monitor illegal MFB imports entering Guam.
- 8) Coordinate and implement area wide BTS control around known roosting sites.

## **PROGRAM COST**

The estimated cost of the project is \$30,000.

This report was prepared by: Gary J. Wiles, Wildlife Biologist III (retired) and Dana T. Lujan, Wildlife Biologist II.

## **LITERATURE CITED**

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