

**JOB PROGRESS REPORT
RESEARCH PROJECT SEGMENT**

STATE: Territory of Guam

PROJECT NO.: W-1R-5

SUB-PROJECT NO.: W-4

STUDY NO.: 1

JOB NO.: 2

JOB TITLE: Survey for Mariana crows and their nest sites (1460, 1470)

PERIOD COVERED: October 1, 1996 to September 30, 1997

SUMMARY

Based on Mariana crow, *Corvus kubaryi*, call surveys and locations of known individuals, the crow population on Guam was estimated at 16 birds. This number includes four Rota crows released on Guam that are still surviving. Only a single nest was found during the breeding season, but no eggs were produced.

BACKGROUND

The Mariana crow is found only on Guam and Rota and is the only species of crow in Micronesia. Though once found throughout Guam, surveys in 1981 estimated 380 crows (Engbring and Ramsey 1984) were present in northern Guam. This number was much lower than the estimate of 1,300 crows on Rota in 1982 (Engbring et al. 1986). By 1986, Michael (1987) reported that only 100 crows remained on Guam. By then, most of Guam's native forest birds had disappeared as a result of brown tree snake predation (Savidge 1987, Conry 1988, Engbring and Fritts 1988). In 1990, DAWR began annual crow surveys using tape-playback of crow calls to monitor their status. The initial survey found about 100 crows still present in northern Guam. Though crow numbers had decreased since 1981, distribution remained the same (DAWR 1990).

Efforts to reverse the decline of the Mariana crow began in 1986 with attempts to protect active nest sites from snake predation. Sheet metal sleeves and Tanglefoot®, an adhesive resin, were placed around trunks of active nest trees to act as a snake barrier and snake-trapping was begun. During the early 1990s, increased nest protection was achieved with the development of electrical barriers and effective snake trapping (DAWR 1991).

OBJECTIVES

To inventory Mariana crows and their nest sites in order to implement recovery efforts including predator control and other reproductive enhancement efforts (Beck and Savidge 1990).

PROCEDURES

1. Recorded-call playback surveys for Mariana crows were conducted in northern Guam during July (Figure 1). At each station, tape-recorded calls were played for 2.5 minutes. This was followed by a 2-minute silent period when the observer listened for crows. Numbers, distances, and plumage condition of the crows detected were recorded.
2. Areas in the northern Guam were searched during the breeding season (from October through May) for Mariana crows. Active nests were closely monitored and appropriate measures to protect them were taken. Locations of active nests were mapped.
3. Young, if found, were monitored.

RESULTS

Crow Surveys

Mariana crows were surveyed on 14 transects totaling 211 stations in eight regions of northern Guam in July (Figure 1). Birds were present on two transects, which is a slight increase from last year. A total of seven crows were recorded during the survey (Table 3), including six birds in the Conventional Weapons Storage Area (CWSA) and one bird in the C3 area of Northwest Field (Table 1).

The number of crows recorded during the FY97 survey is much lower than the actual number of birds still surviving. Transect 1 in the CWSA recorded six birds, but failed to detect three other birds known from the area. The nine known birds in the CWSA included one hand-reared Guam crow released in January 1997 and four Rota crows transferred from the National and Houston Zoos to Guam in February 1997, which were released in April and June. Unfortunately, the hand-reared Guam crow was found dead in August 1997, reducing the number of crows in the CWSA to 8 birds.

Table 1. Summary of results from playback of tape-recorded Mariana crow calls conducted in July 1997. Transect locations are shown in Figure 1.

<u>Transect</u>	<u>No. of stations</u>	<u>No. of crows</u>	<u>No. of stations with crows</u>	<u>Known no. of crows missed in survey</u>
1	50	6	4	3
2	36	0	0	1
3	12	0	0	0
4	10	0	0	0
5	8	0	0	0
6	11	0	0	0
7	10	0	0	3
8	23	0	0	0
9	8	0	0	1
10	9	0	0	0
11	7	0	0	0
12	8	0	0	0

13	8	1	1	0
14	9	0	0	2
Total	211	7	5	10

July 97 crow population estimate = 7 + 10 = 17 birds

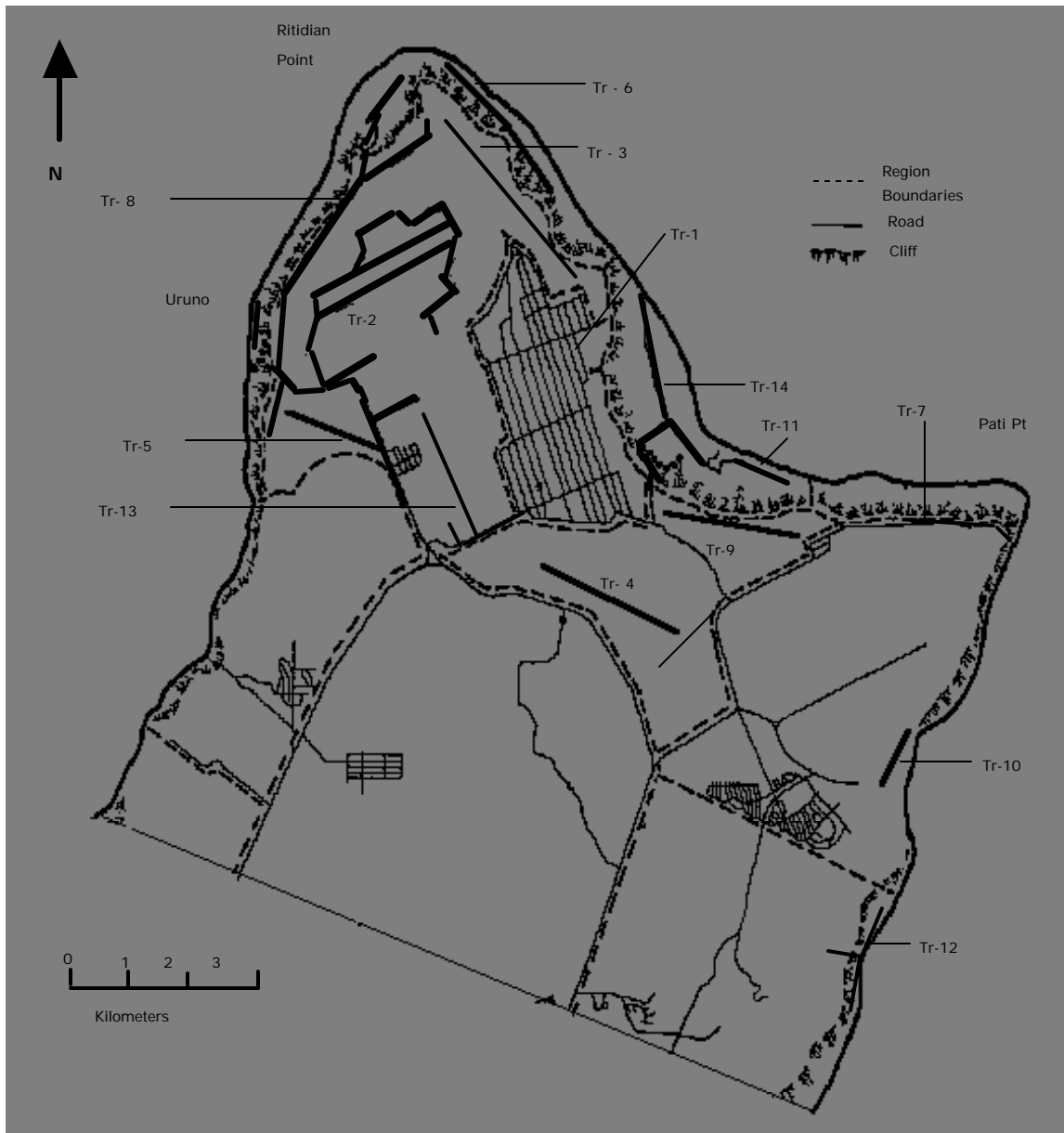


Figure 1. Locations of Mariana crow survey transects on Guam.

In the Pati Point area, the CWSA pair and two singletons (Pipeline and Pati Point singletons) were observed during the survey (Figure 2). No birds were recorded on Transect 7. The Tarague region still harbors the Tarague pair, which was not recorded during the survey. This pair is known to fly fairly long distances between the CWSA and Tarague areas (Figure 2).

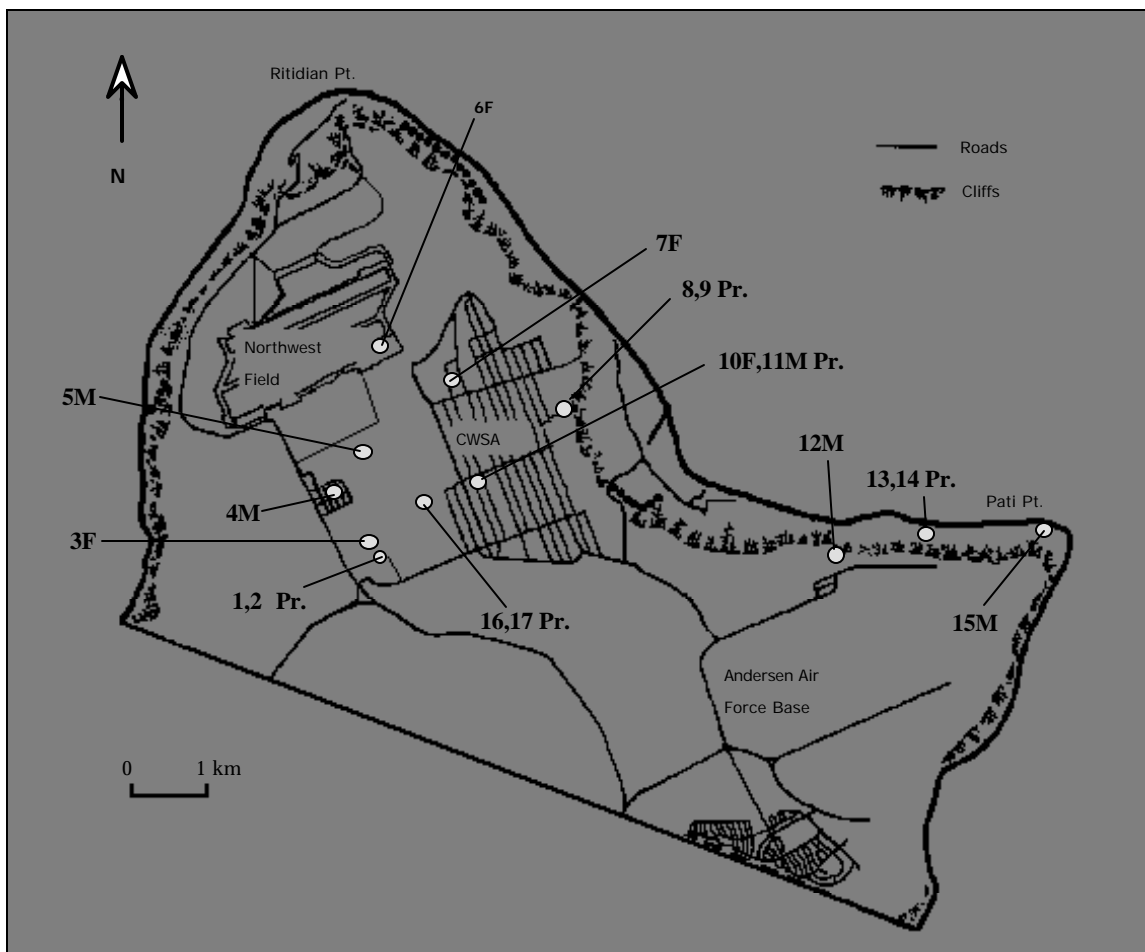


Figure 2. Locations of known crows (in circles) in the Northwest Field, Conventional Weapons Storage Area (CWSA), and Pati Point areas as of July 1997. Each location is noted as a male (M), female (F), or pair (Pr.). Pair 1, 2 was composed of a hand-reared Guam crow (“Joga”) and a female zoo bird. Joga was found dead in August 1997. The other released hand-reared Guam crow is 6F (“Nunu”), whose status is unknown. The four surviving released zoo crows include 2F (“Fadang”), 4M (“Ahgao”), 7F (“Pengua”), and 10F (“Faia”). Two other released zoo crows, a male and female, died prior to the survey.

Crows were not recorded in Northwest Field, but a hand-reared female Guam crow was released in the area in February 1997. Unfortunately, her radio transmitter failed making observations difficult and her status is unknown.

When the number of birds recorded during the survey is added to the number of missed birds (excluding repeats), minus the loss of the released hand-reared bird, an overall population estimate of 16 crows is obtained for Guam. This estimate is a 14% increase over last year's count (DAWR 1996), but includes the addition of released birds. The number of crows on Guam continues to be very low (Figure 3) because of lack of reproduction. The population will not survive much longer without the translocation of additional birds from Rota.

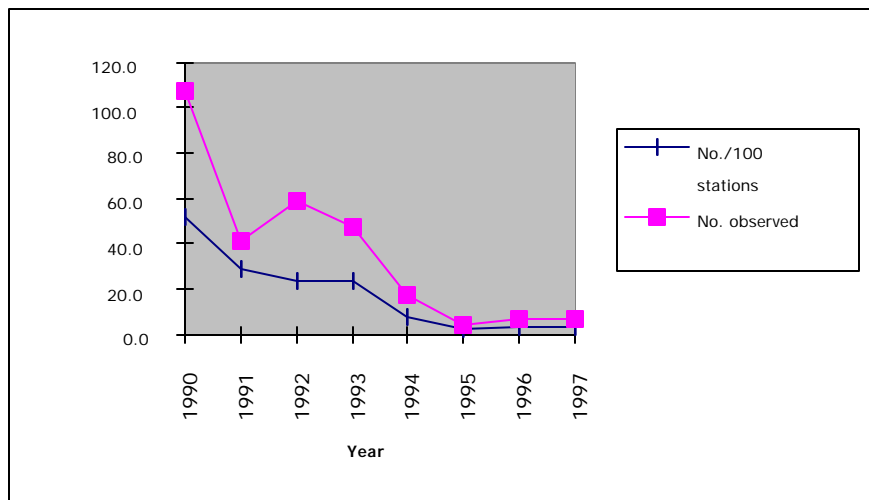


Figure 3. Yearly results of Mariana crow playback surveys conducted on Guam since 1990. The number of birds estimated in 1997 includes four Rota crows released in the wild this year.

Active nests

Nesting activity during the 1996-1997 breeding season was very poor, with only one nest found despite intensive searches in areas with crows (Figure 4). This single nest built by the Tarague Jeep Road pair and was found on January 21 in a *Ficus* tree in the CWSA. No eggs were laid after snake-proofing occurred, thus, a dummy egg was placed in the nest. Observations revealed nest attendance to be normal (95-100%) for 21 days, which is the normal length of the incubation period, before the nest was abandoned. This observation was significant in that this had been the only known pair to build nests in the past few breeding seasons. Potentially, crow pairs such as this one, which are believed to be unable to lay eggs, can be used in the future as surrogates for incubating eggs or raising chicks.

A second pair, the 11B6 pair, was observed on several occasions taking sticks to an *Elaeocarpus* tree, but this activity did not result in the construction of a nest. Their efforts

ended with the sticks falling to the ground or being blown off the branches, followed by the pair flying away. During the 1995-1996 breeding season, this pair nested and laid a single-egg clutch (DAWR 1996). Their behavior this season is probably indicative of their old age. The female was brought into captivity in 1989, rehabilitated, and released back into the wild in October 1994. She is now at least 10 years old and probably beyond reproductive age. This was the last known egg-laying pair left on Guam.

Of the six Rota crows and two Guam birds that were released in the wild on Guam in the early part of 1997, four Rota crows (three females and a male) are still alive and one Guam crow's status is unknown. Of the released birds, one had paired with a Guam bird by September 30, but the pair did not breed. A second Rota female lost its Guam mate in August, but did not remate with any of the remaining crows.

The very low reproductive success documented over the previous few breeding seasons was probably a result of senescence (DAWR 1995-1996). The lack of nesting activity this season is additional evidence supporting the senescence hypothesis. Though improved techniques (e.g., improved trapping and electrical barriers) have been developed to prevent snake predation at nests, low reproductive success related to the elderly age of the Guam birds can only be mitigated by releasing younger crows into the population.

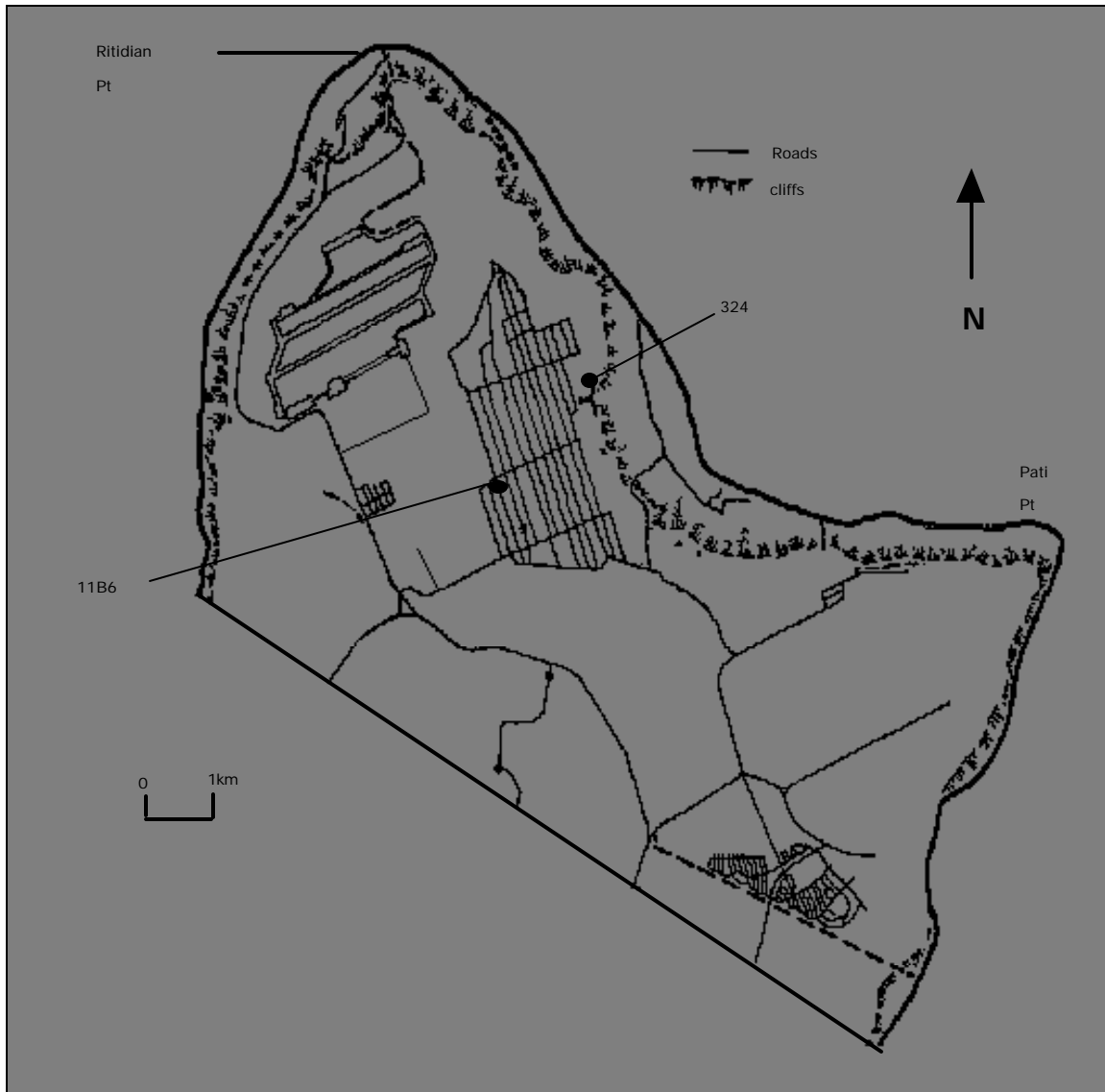


Figure 4. Location of the only nest (#324) produced during the 1996-1997 crow breeding season, which was made by the Tarague Jeep Road pair. The 11B6 pair made several feeble attempts to build a nest, but none were ever completed.

RECOMMENDATIONS

1. Continue crow surveys.
2. Continue searches for active crow nests and take appropriate measures to protect nests from snake predation.
3. Collect pertinent information where crow nests are found.

PROGRAM COST

The estimated cost of the Mariana crow project under W-1R-5 is \$80,000.

LITERATURE CITED

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