

**JOB PROGRESS REPORT
RESEARCH PROJECT SEGMENT**

STATE: Territory of Guam

PROJECT NO.: E-2-2

SUB-PROJECT: B

JOB NO.: 2

JOB TITLE: Mariana Crow Avicultural Support

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

SUMMARY

No Mariana crow (*Corvus kubaryi*) eggs were produced in the wild on Guam this year for artificial rearing at the Division of Aquatic and Wildlife Resources' (DAWR) facility. Two crow chicks (1 male, 1 female) were removed from nests on Rota and hand-reared on Guam. Both birds were released in the Munitions Storage Area (MSA) on Andersen Air Force Base (AAFB) on September 21, 1999.

BACKGROUND

Since the brown tree snake (*Boiga irregularis*) invaded Guam in the 1940s, the island's avifauna has rapidly declined (Savidge 1987, Conry 1988, Jaffe 1994). Despite of this impact, the Mariana crow continues to survive in the wild in very low numbers.

The federal recovery plan for native forest birds on Guam and Rota makes an interim recovery objective for the Mariana crow as the maintenance "... of at least 700 crows on Rota and to restore the Guam population to at least 700...." (Beck and Savidge 1990). A recent study of the status of the Mariana crow stressed the importance of having multiple populations and recommended that an additional crow population be established on another island (National Research Council 1997). Translocation of Mariana crows from Rota to Guam, as outlined in the recovery plan, is currently the best avenue to achieve the above objectives. Recently, the Mariana Crow Recovery Team, a committee organized to oversee the preservation and recovery of the species, endorsed the translocation of a limited number of crows from Rota to Guam.

Techniques required to successfully conduct a translocation project have been tried by the DAWR and proven satisfactory, including protection of nest trees from snakes and hand-rearing of crow chicks. The development of an effective electrical snake barrier to protect crow nests from snake predation resulted in five birds being fledging from wild nests between 1993 and 1995 (Aguon et al. 1998). In 1996, two crows were successfully hand-reared from eggs retrieved from protected nests and artificially incubated. These juveniles were hacked into the wild in 1997. Of these birds died 219 days after its release due to unknown causes, while the status of the second bird remains unknown.

Avicultural techniques were first applied to the species in 1996, when 9 crow eggs from 3 clutches were pulled from a single breeding pair in the MSA (DAWR 1996). After artificial incubation of the eggs, two chicks were successfully hatched, hand-reared, and released into the wild when they were 368 and 376 days old (DAWR 1997). Additionally, six adults crows captured on Rota in 1993 and sent to mainland zoos (National Zoo's Conservation and Research Center in Front Royal, Virginia and the Houston Zoo) were transferred to

back Guam and released in the wild in 1997. Two of the birds currently remain alive and are interacting with wild Guam crows, while the status of two others is unknown. A female and a male died 13 and 34 days, respectively, after their release. Causes of death are unknown, but necropsies found no evidence of snake predation. The decline of the population of crows on Guam will continue unabated without supplementation of birds from Rota.

OBJECTIVES

To develop and implement avicultural support program for the recovery of the Mariana crow as recommended in the Native Forest Bird Recovery Plan (Beck and Savidge 1990) and the National Research Council (1997) report.

PROCEDURES

1. Pull first and second clutches of eggs from nesting Guam Mariana crows after 7-10 days of incubation and artificially incubate. Handrear and release birds back into the wild after fledging in captivity, when they are at least 60 days old and are feeding independently.
2. Renew the endangered species subpermit from the U.S. Fish and Wildlife Service (USFWS) to take Mariana crows from Rota and hold them in captivity on Guam beyond 45 days. Renew the annual scientific collection permit from the Commonwealth of the Northern Marianas Islands (CNMI).
3. Collect up to 18 eggs and chicks from nesting crows and six adults on Rota. Coordinate between all agencies. Entire clutches of eggs, or broods of chicks will be collected.
4. Check each crow egg collected on Guam and Rota for gross cracks or breaks immediately upon collection. Weigh and candle eggs to determine the following: a) integrity, size, and location of air cell; b) integrity of yolk; c) presence or absence of hairline cracks or toenail punctures in the egg shell; and d) presence or absence of vascularization (indicating fertility and viability). Place eggs in an incubator and assess viability and weight loss every three days. Eggs showing no signs of embryonic development (i.e., progressive development of blood vessels) will be removed from the incubator. Brood and hand-rear chicks using The Peregrine Foundation guidelines developed for the alala (*Corvus hawaiiensis*), with appropriate modifications in diet and feeding regime to fit Mariana crow requirements.

RESULTS

No eggs were collected from Mariana crows on Guam. In November 1998, the DAWR received a USFWS endangered species permit and the CNMI scientific collecting permit to collect six adult crows and 18 chicks and/or eggs from Rota for translocation to Guam. However, because it was late in the breeding season, the DAWR was able to obtain only two chicks from Rota. In January 1999, a female chick about 27 days old and, in April 1999, a male chick about 17 days old were removed from their nests on Rota and hand-reared at the DAWR facility in Guam. The crows were instrumented with radio collars and released as juveniles in the MSA on 21 September 1999. The female died by asphyxiation (choked on native food items) on 23 September 1999, while the male was found dead of hepatitis two weeks after the release.

Based on weight comparisons among captive-reared Mariana crow chicks, males tended to be larger than females (Figure 1). Also, chicks that are captive parent-reared appear to be larger than hand-reared chicks. This suggests that cross fostering is preferred over handrearing. Unfortunately, with only a few breeding pairs left in the wild this is becoming less of an option. The two chicks hand-reared this season fledged at 45 days of age.

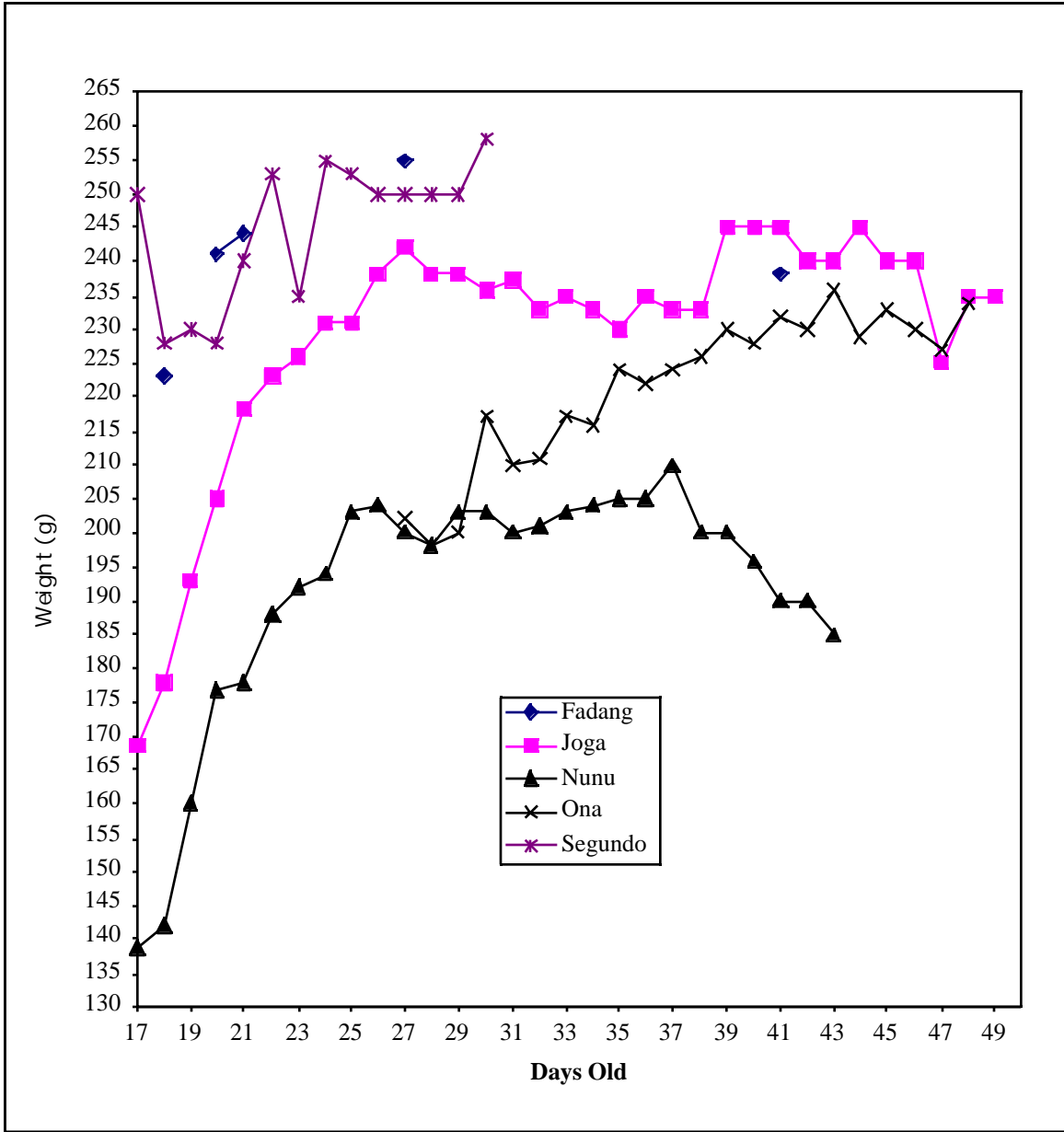


Figure 1. Growth curves for Mariana crow chicks hand-reared from artificially incubated eggs in 1996 (Joga and Nunu), wild hatched and translocated from Rota during the 1998-1999 breeding season (Una and Segundo), and a captive parent-reared chick from the Houston Zoo (Fadang). Males (Joga and Segundo) are larger than the females (Nunu and Una).

Behaviorally, raising chicks with a crow model appears to be important in reducing habituation to humans. Two birds hand-reared as solitaires, known as Una and Joga, were more habituated to humans than birds hand-reared with a brood-mate or with a model.

Birds reared with a live adult or broodmates were not easily approached. Future efforts should ensure that chicks are hand-reared with broodmates or raised with live adults when possible.

RECOMMENDATIONS

Continue avicultural intervention of Mariana crows and efforts to increase the production of crows in the wild through snake proofing of crow nest sites.

PROGRAM COSTS

The estimated cost of this project under E-2-2 is \$55, 000.

LITERATURE CITED

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