JOB PROGRESS REPORT
RESEARCH PROJECT SEGMENT

STATE: Territory of Guam

PROJECT NO.: E-1-12
STUDY NO.: 4
JOB NO.: 1

JOB TITLE: Captive Breeding Endangered Native Birds

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

SUMMARY

The number of Guam rails, *Gallirallus owstoni*, at the Division of Aquatic and Wildlife Resources' (DAWR) captive breeding facility on Guam increased from 71 birds on October 1, 1996 to 85 birds on September 30, 1997. Nine breeding pairs produced 171 eggs, 51 (30%) of which hatched. Forty-one chicks lived for at least 30 days of age and were banded and added to the captive flock by September 30, 1997. Nine adult rails died. One rail that escaped in FY96 was recaptured. Nineteen birds were transferred to Rota and released into the wild. No Mariana crow, *Corvus kubaryi*, eggs were produced in the wild for artificial rearing in the DAWR's wildlife lab. As of September 30, 1997, there were 50 Micronesian kingfishers, *Halcyon c. cinnamomina*, in captivity at mainland U.S. zoos, including two viable offspring hatched in FY97.

BACKGROUND

The Guam Native Forest Bird Captive Breeding Program began in 1983 as a cooperative effort between the DAWR, member zoos of the American Zoo and Aquarium Association, (AZA) and the U.S. Fish and Wildlife Service (USFWS) (DAWR 1983, Derrickson 1986, Shelton 1986). Predation by the brown tree snake, *Boiga irregularis*, now believed to be the single most important factor in the recent drastic decline of Guam's native forest birds (Savidge 1986, 1987; Conry 1988), precipitated the need for a captive breeding program when by 1982 at least five species of Guam endemic species or subspecies were nearing extinction in the wild. Unfortunately, by 1984, attempts at captive breeding three of these species, the bridled white-eye, *Zosterops c. conspicillata*, rufous fantail, *Rhipidura rufifrons uraniae*, and the Guam flycatcher, *Miagra freycineti*, were abandoned due to their disappearance from the wild (DAWR 1984).

The Guam rail and Guam subspecies of the Micronesian kingfisher were successfully brought into captivity (DAWR 1983-1986), with the capture of 19 and 31 wild birds, respectively. Rails first bred at the DAWR's facility on Guam and later at the Conservation and Research Center (CRC) of the National Zoological Park during 1984.

Kingfishers were first bred in 1985 at three mainland U.S. zoos (Bronx Zoo, Philadelphia Zoo and the CRC). During FY88, the first studbook for the Micronesian kingfisher was published by the Philadelphia Zoo (Bahner 1989). The kingfisher has been designated as a Species Survival Program species by the AZA. Beth Bahner of the Philadelphia Zoo was designated by the AZA as studbook keeper. The kingfisher program has been relatively successful, as 17 of 29 founders produced descendants (the last previously underrepresented living founder sired offspring in 1994), and the population reached a peak of 62 individuals in August 1990. However, problems such as high chick mortality, high young adult mortality, aggression, and infertility continue to limit population growth (Bahner 1993).

OBJECTIVES

1. Implement and manage captive breeding programs for the Guam rail and other endangered endemic birds by setting up facilities on Guam and at zoos on the mainland U.S. through the AZA.

2. Produce enough Guam rails for release and establishment of an experimental wild population on Rota, CNMI.

3. Enhance reproductive output of Mariana crows in the wild using avicultural support.

4. Become more administratively active in the management of captive Micronesian kingfishers.

PROCEDURES

1. Continue the routine maintenance and operation of a cooperative captive breeding program for the Guam rail and Micronesian kingfisher with the AZA and its member zoos.

2. Develop techniques for the successful release of captive-reared birds in the wild once the factors responsible for their decline have been controlled.

3. Continue to consult with recognized authorities regarding captive breeding methodology, facility designs, and captive population management techniques.

4. Consult and coordinate with USFWS, U.S. Department of Agriculture, and other government agencies with jurisdiction over the interstate movement and captive maintenance of wildlife. Acquire all necessary local and federal permits.

5. Breed rails in sufficient numbers to support the continuing introduction of the Guam rail to Rota, CNMI.

6. Maintain regular contact with the Micronesian kingfisher studbook keeper, and make recommendations to the SSP.

7. Coordinate efforts between field and laboratory for manipulating nests, eggs, and chicks of Mariana crows in the wild.

RESULTS

The number of Guam rails at the DAWR's captive breeding facility on Guam increased from 71 to 85 during FY97. Forty-one chicks were added to the captive flock, and 19 adults were transferred and released on Rota. Nine adult rails died at the DAWR captive breeding facility. One older rail died as a result of stress and handling after Typhoon Dale in November 1996. Two females died of aggression from cage mates. One rail died from apparent rat predation (a rat probably entered the cage through a hole in the wire mesh). One bird died of acute liver toxicity. Two young rails died of coccidiosis. Two young rails were euthanized after testing positive for coccidia. One adult rail that escaped from a breeding pen in FY96 was recaptured 7 months later after it was determined that the bird was living among the vegetation along the fence line of the rail yard.

Coccidia, a naturally occurring intestinal parasite, was first discovered in Guam rails in February 1997 after two chicks died. Screening of all rails failed to detect coccidia in any bird except those from one breeding pair. Two older chicks tested positive for coccidia and were euthanized to prevent the spread of the parasite to other rails in the captive population. The remaining birds in the family line (n=9) were treated for 3 weeks with a coccidiostat, then immediately transferred and released on Rota. It was the medical opinion of several consulting veterinarians, including Dr. Don Nichols, the Guam rail SSP pathologist, that coccidia is a naturally occurring parasite that poses no disease threat to adult rails, and that the high host specificity of the organism poses no threat to any other species of animals. Coccidiosis is only problematic for birds confined in small spaces, and young chicks (hatchlings) are most vulnerable to systemic infections. Adult rails build a natural immunity and the parasite poses no disease threat to birds in the wild.

The reasons for the low level of productivity (30% hatch rate) experienced in FY97 are undetermined. As many as eight eggs and one chick were lost due to Typhoon Isa in April 1997. Some breeding pairs that were productive in calendar year 1996 fell off in productivity in calendar year 1997. In an attempt to curb nest failure, 13 eggs were removed from nests for artificial incubation and four young rails were hand-reared.

Two staff members left the Guam rail program in December 1996 and May 1997. Five new staff members joined the program, resulting in a complete staff turnover for the rail breeding program in FY97. Suzanne Medina was hired as a Biologist II in July 1997. Ms. Medina has extensive experience in aviculture. Dante Buensuceso and Jeffrey Quitugua were hired as Technician I's and Chris Jones and Romano Santos were hired as Biological Aides. Dr. Scott Derrickson, Curator of Birds, CRC, continued as coordinator for AZA's Guam rail program. No rails were bred in captivity in mainland zoos during FY97.

Reproduction of Mariana crows in the wild diminished to zero in FY97. No eggs were produced by any crows in the wild or captivity.

Micronesian kingfishers continued to be bred at eight mainland U.S. zoos (reduced from 13 institutions as a result of the 1995 Action Plan). The Micronesian kingfisher population at mainland U.S. zoos declined from 53 by September 30, 1996, to 50 by September 30, 1997. Adult mortality continued to offset reproduction in FY97. Only two viable offspring were produced.

Dr. Ilse Silva-Krott and colleagues including Dr. Randy Junge, the Micronesian kingfisher SSP veterinarian, received a grant from Disney (via the AZA) to conduct a study of occurrence of *Mycobacterium avium*, the agent that causes avian tuberculosis, on Guam. Pooled samples from birds (primarily poultry) in each of 21 villages on Guam were analyzed, and two tested positive for *Mycobacterium avium*. This study quelled concerns regarding the risk of introducing a new disease to Guam (avian tuberculosis) if Micronesian kingfishers are repatriated. A manuscript was submitted for publication to *Pacific Conservation Biology*.

RECOMMENDATIONS

1. Continue the routine maintenance and operation of a cooperative captive breeding program for the Guam rail and Micronesian kingfisher with the AZA and its member zoos.

2. Continue to consult with recognized authorities regarding captive breeding methodology, facility design, and captive population management techniques.

3. Consult and coordinate with USFWS, U.S. Department of Agriculture, and other government agencies with jurisdiction over the interstate movement and captive maintenance of wildlife. Acquire all necessary local and federal permits for shipment of rails between Guam and mainland U.S. zoos.

4. Breed rails in sufficient numbers to support the continuing introduction of the Guam Rail to Rota, Commonwealth of the Northern Mariana Islands.

5. Coordinate with Dr. Scott Derrickson of the CRC the transfer of Guam rails produced in zoos to Guam for the purposes of captive breeding at the Guam facility or for release on Rota.

6. Continue avicultural intervention of Mariana crows and support efforts of DAWR to increase production of crows in the wild through efforts to snake-proof crow nest sites.

7. Initiate plans for the repatriation of Micronesian kingfishers to the captive breeding facility on Guam.

PROGRAM COST: The estimated cost of the project is $158,617.

LITERATURE CITED

Bahner, E.L. 1989. 1988 North American Regional Studbook for the Micronesian Kingfisher, *Halycon c. cinnamomina*. Zoological Society of Philadelphia, Philadelphia, Pennsylvania.

Bahner, E.L. 1993. SSP Master Plan (1993) & 1992 North American Regional Studbook for the Micronesian Kingfisher, *Halcyon c. cinnamomina*. Zoological Society of Philadelphia, Philadelphia, Pennsylvania.

Conry, P.J. 1988. High nest predation by the brown tree snake on Guam. Condor 90:478-482.

Derrickson, S.R. 1986. Captive propagation of the Guam Rail. The Philadelphia Zoo Review 2:19-23.

Division of Aquatic & Wildlife Resources (DAWR). 1961-1986. Job Progress Reports - Federal Aid to Fish and Wildlife Restoration. Department of Agriculture, Guam.

Kuehler, C., M. Kuhn, B. McIlraith, and G. Campbell. 1994. Artificial incubation and hand-rearing of 'Alala (*Corvus hawaiiensis*) eggs removed from the wild. Zoo Biology 13:257-266.

Savidge, J.A. 1986. The role of disease and predation in the decline of Guam's avifauna. Ph.D. Thesis. University of Illinois, Urbana-Champaign.

Savidge, J.A. 1987. Extinction of an island avifauna by an introduced snake. Ecology 68:660-688.

Shelton, L.C. 1986. Captive propagation of the Micronesian Kingfisher. Philadelphia Zoo Review 2: 28-31.

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