Psittacine Research Project

Stimulating Reproduction in Orange-winged Amazons

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[Editor's Note: The Watchbird *staff has received permission to publish material from the research done at the Psittacine Research Project at the Department of Avian Sciences, University of California at Davis, California. Since the research at the Department of Avian Sciences is on the leading edge of aviculture, this material will be of great benefit to our readers. The first series of articles in the Watchbird will be on a colony of Orange-winged Amazons,* Amazona amazonica.

The Psittacine Research Project received 50 sexed (25.25) Orange-winged Amazons in October, 1983. These birds were held in quarantine facilities until April, 1984. This group of Amazons were the basis of a breeding colony to be used for study of both nutrition and reproduction. We appreciate the generosity of the Psittacine Research Project for allowing us to print this material. D.R.T.]

Studying the breeding biology of Amazon parrots in captivity presents special resource problems. The birds are expensive to acquire—if available at all. They require considerable space to house and must be rigorously quarantined prior to introduction to a general flock. Further, wild-caught Orange-winged Amazons (*Amazona amazonica*), the species that the Psittacine Research Project (PRP) is studying, are considered difficult to breed, often requiring several years in captivity before egg-laying begins; and standard protocols for breeding these birds are not established, although some aviculturists have had excellent success and contributed invaluable advice to our project.

Given these constraints, and aware that scientific data needs to be gathered as rapidly as possible due to the growing number of endangered parrot species, we adopted experimental protocols that attempted to maximize information yield from a small population of non-breeding Amazons. We employed a multi-faceted management plan as an environmental probe to detect manipulations that might stimulate reproduction. Our results reflect the compromises that small numbers and lack of light and temperature-controlled facilities impose, but the initial results are extremely encouraging.

Background

In the 1990 breeding season a group of eight self-selected pairs of wild-caught Orange-winged Amazon Parrots housed in wire cages (0.9 by 0.9 by 1.8 m [3 x 3 x 6 feet]) were provided with nestboxes in mid-February to encourage breeding. Detailed behavioral observations were made by video-taping and direct observation to compare the incidence of several behaviors before and after nest-box presentation. The results of this experiment, conducted by Lisa Jochim, a graduate student now beginning veterinary school at UC Davis, will be reported on at a later date. We here treat this group as a control for comparison with the "enriched" group described below.

Seven other pairs in an environmentally enriched group were provided with four additional environmental manipulations:

1) Enriched pairs were first separated into two same-sex flocks (flight dimensions, 12 m by 8 m by 7 m [39.36 x 26.24 x 22.96 feet]) for three months, then reunited (with their original selfselected mates) and placed in wire cages with nest-boxes as above in mid-March.

2) Pairs were also provided with nest-boxes that had wooden inserts that reduced the diameter of the nest-hole (from 4.5 cm to 3.5 cm [1.75-1.37 inches]) and permitted pairs to "chew" into the nest-box.

3) Enriched pairs were also, at the time of reuniting and nest-box presentation, offered two items of fruit (1/4 apple and 1/4 orange) five days per week.

4) They were exposed to a spray of water from ceiling misters on alternate days for a period of about 15 minutes twice a day.

Behavioral observations of these birds, recorded by Tracy Brownback, a graduate student also beginning veterinary school at UC Davis, will likewise be reported at a later date.

Both the control and enriched groups were housed in cages in a semi-enclosed facility which exposed them to natural direct and indirect lighting and daylength. Cages were aligned on either side of a central aisle. Feed hoppers, with a 20% protein pelleted diet, and automatic waterers were affixed to the front of each cage. Nest-boxes were attached to the right-rear side, and visual barriers occluded

the back half of each cage (on the nestbox end) from adjacent cages.

Results

One out of eight pairs produced eggs in the control group, with four eggs hatching. Six of seven pairs in the enriched group laid eggs (mean clutch size 3.66 plus or minus .21 S.E). Two laid infertile clutches of four eggs. The other four pairs produced from one to four nestlings each.

Discussion

Despite the impressive percentage difference (86% of enriched pairs vs 12.5% of control pairs; $P<0.05$, chi-square), the small number of pairs provides only a weak statistical basis to conclude that pairs in the enriched group were more likely than controls to lay eggs. Nonetheless, this view is supported by behavioral differences between the groups: irrespective of breeding activity, pairs in the control group showed more intercage aggression in the form of tail fanning displays and high-intensity vocalizations.

Comparison of these treatments as a single experiment must be done with caution: nest-boxes were presented at slightly different times and the simultaneous imposition of four additional manipulations confound whether any single manipulation is necessary. It cannot be concluded that any of these "enrichments" is essential. Further, none of the manipulations were replicated at different "doses." A better design would provide for replication such that nest-hole inserts of different diameters and materials could be tested. Nonetheless, the success of the enriched group, assuming these results are repeatable, now provides us with an invaluable tool: a positive control. We can, in principal, now determine which of the four manipulations are not essential—a far simpler task than searching for a method to stimulate breeding in the absence of any success.

Significance

Captive studies such as this contribute to our understanding of basic reproductive biology and behavior of psittacines. If importation of parrots is curtailed—and many parrot biologists and aviculturalists support at least a partial moratorium on trade—methods of predictable, intensified production could contribute significantly to reducing the number of illegally imported birds by reducing the economic incentive to capture birds from the wild [This report was begun prior to the Wild Bird Conservation Act of 1992 — S.L.D.].

Finally, although habitat protection and control of the illegal traffic in the bird trade are the most critical factors, the improved understanding of captive propagation techniques may also contribute to the stabilization of populations of critically endangered species.

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