

COMMENTARIES

Release of Captive-reared or Translocated Endangered Birds: What Do We Need to Know?

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Attempts to evaluate the success of endangered-species reintroduction programs are frustrated by a lack of reliable information on releases of either endangered or nonendangered species. Although many programs have attempted to establish or augment wild populations with captive-reared or wild-caught birds (Williams 1977), there are few published accounts that allow quantitative statements on the success of releases and the role played by animals subjected to different rearing and release protocols (Berger 1978, Kear and Berger 1980). This makes it difficult to assess accurately the status of these species, or to evaluate the influence of various management actions.

The U.S. Fish and Wildlife Service (hereafter USFWS) lists 220 taxa of birds as threatened or endangered (USFWS 1986). Recovery plans exist for 45 of them. Captive rearing is cited frequently in recovery plans as a requirement to ensure the recovery of these species. Captive rearing of species with release to the wild is an important management technique used in attempts to save species from extinction (Martin 1975, Temple 1978, Carpenter and Derrickson 1981, Carpenter 1983). Reintroduction generally is initiated only after more conservative techniques (e.g. habitat protection, law enforcement, and public education) have been unsuccessful in restoring population levels. Captive propagation is viewed by many as the last possible action appropriate for only a few select species (Conway 1978, Scott et al. 1986a, Temple 1986). Potential benefits of reintroduction programs include (1) increasing the number of animals in a small population, (2) increasing genetic diversity in a small population, (3) reducing inbreeding depression in small populations, and (4) establishing new populations.

There are many examples of vigorous new populations of nonendangered bird species being established outside their historical ranges, and many undocumented failures (Long 1981). Earlier workers (Warland 1975, Fyfe 1978) were unable to document an endangered or threatened bird species that had been restored to a self-sustaining wild population as the result of releasing captive-reared birds. Even the claims of success for the Hawaiian Goose (*Nesochen*

sandvicensis; Ripley 1986) are premature (Stone et al. 1983, Scott et al. 1986b). A strong case, however, has been made for a successful reintroduction of the Peregrine Falcon (*Falco peregrinus*) in the eastern United States (Barclay and Cade 1983). Reintroduction efforts for the Whooping Crane (*Grus americana*), Mississippi Sandhill Crane (*Grus canadensis pulla*), Aleutian Canada Goose (*Branta canadensis leucopareia*), Bald Eagle (*Haliaeetus leucocephalus*), Masked Bobwhite (*Colinus virginianus ridgwayi*), and Puerto Rican Parrot (*Amazona vittata*) also show promise of success.

Captive- or wild-produced birds may be hand reared, parent reared, puppet reared, or reared by a surrogate parent. Captive or wild birds may be fostered or cross fostered as eggs or nestlings into the nest of wild birds. They may be released to the wild as juveniles or adults with a hard (birds are released to the wild upon arrival at the release site) or soft (birds are confined at the release site until they become acclimatized, possibly imprinted, to their new environment) release. Released birds may be first- or later-generation captive birds. All of these variations may influence the success of the release. Until recently, however, there has been little effort to document and evaluate these differences and their effects on the success of release programs. Even today many birds are released unmarked and with inadequate follow-up studies.

The ultimate measure of success for a release effort is the establishment of a self-sustaining wild population. A measure of the contribution of any group of managed birds to that objective would be the percentage of the birds released that survive to breed successfully in the wild.

If translocation and reintroduction of birds into the wild are to be viable management tools, an objective way to measure the success of the procedures must be developed. In most cases these data are not available. More data are necessary to evaluate critically the effectiveness of different rearing and release strategies. Therefore, we urge those who are rearing birds for release or conducting translocation programs of eggs, nestlings, juveniles, or adults to (1) band or mark (using USFWS and color bands, patagial tags, etc.) released birds to distinguish them from wild counterparts; (2) ensure that captive-produced birds, reared by hand, parents, puppets, or surrogate parents, can be distinguished from each other and from birds placed under wild parents as eggs or young; (3) document the conditions under which birds are prepared for different types of release programs, including capture

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techniques, handling methods, holding cages, and transportation procedures; (4) record the conditions of the release (e.g. Ellis et al. 1978); (5) document the condition of the release habitat and the environmental conditions at the time; (6) monitor, as much as possible, the movements and activities of released birds at least through first breeding; (7) determine the survival and breeding success by age and sex of birds reared and released under different conditions; and (8) document the use of medications administered to birds before or during release.

Because of the high costs associated with release programs and the endangered status of many of the animals, we cannot afford to introduce individuals to new environments without a high probability of their surviving and contributing genetically to a wild population. The techniques used to establish or augment endangered populations are experimental and unproved methods. Implementation of effective rearing and introduction methods should reduce the cost and time required for an endangered species to recover. We must rigorously test rearing and release methods, including the use of surrogate species, in numbers that will yield statistically and biologically meaningful conclusions. The case for better documentation of release and translocation efforts for endangered birds also applies to nonendangered birds and many other taxonomic groups.

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