

Aviculture and Conservation: The Peregrine Fund's Hawaiian Endangered Bird Conservation Program

by Cyndi Kuehler, Alan Lieberman
and Peter Harrity
The Peregrine Fund, Hawaii
Endangered Species Conservation
Program, P.O. Box 39, Volcano, HI
96785

Glossy photographs of jungle deforestation in the Amazon and giant pandas calmly chewing bamboo leaves in their misty mountain home, conjure up images of endangered species and conservation issues in exotic places far, far from home. But, in reality, one of the biggest environmental battles is being fought much closer to home—in our fiftieth state—Hawai'i. Aviculture is helping to provide the conservation tools necessary to preserve some of the rarest and most spectacular birds in the world.

There is indeed trouble in paradise. Many bird, plant and insect species in this tropical Eden are rapidly disappearing. Hawai'i has the highest percentage of endemic plant and animal species in the world, and is home to more than one-third of the endangered species currently listed by the U.S. Fish and Wildlife Service within the United States. Of the approximately 140 species of native birds that inhabited the Hawaiian Islands at the time of the first Polynesian settlers, at least 70 are now extinct and 30 more are endangered, including 12 that are dangerously close to extinction (Pyle, 1990, 1992). Perhaps more alarming is that even the most common species are declining. For example, the liwi, *Vestiaria coccinea*, once so abundant, may no longer survive on west Maui, Lanai or Oahu (Ellis et al., 1992). The factors limiting survival of these species in the wild are poorly understood, but are believed to include the lack of immunity to introduced diseases, habitat alteration, and predation and competition with introduced species. For nearly all of Hawai'i's forest birds, captive propagation and other hands-

on management techniques may be the only way to save the species, while factors causing decline are identified and controlled. Sufficient numbers need to be built up in captivity to enable researchers to gather basic information on the birds biology and to enable future reintroductions into the wild.

The 'Alala *Corvus hawaiiensis*, a frugivorous/insectivorous, forest dwelling corvid (family of crows, ravens and magpies), once inhabited large forested areas on the island of Hawai'i. But the species has been declining for many years, and prior to the 1993 breeding season, only a remnant population of approximately 11 birds remained (Giffin et al., 1987). Wild breeding pairs have not produced a chick which has survived to adulthood in recent years (Kuehler and Shannon, 1994).

In 1991, the U.S. Fish and Wildlife Service (Service) requested the National Academy of Sciences to assess the situation and recommend a course of action to conserve the 'Alala. This scientific panel reviewed the available data regarding the status of the species in the wild and the possible causes of decline. The committee recommended egg removal from wild birds for artificial incubation, hand-rearing and release (Duck-worth et al., 1992). Artificial incubation of eggs removed from the wild and hand-rearing of chicks are avicultural techniques which have been incorporated into the overall recovery strategy for endangered species such as the Mauritius Kestrel, *Falco punctatus*, Peregrine Falcon *Falco peregrinus*, the San Clemente Island Loggerhead Shrike, *Lanius ludovicianus mearnsi* and

the California Condor *Gymnogyps californianus*, (Sherrod et al., 1981; Cade et al., 1988; Jones et al., 1991; Kuehler et al., 1993; Kuehler and Witman, 1988). Successful techniques for hatching and rearing endangered bird species are essential elements of these recovery plans (Kuehler and Good, 1990).

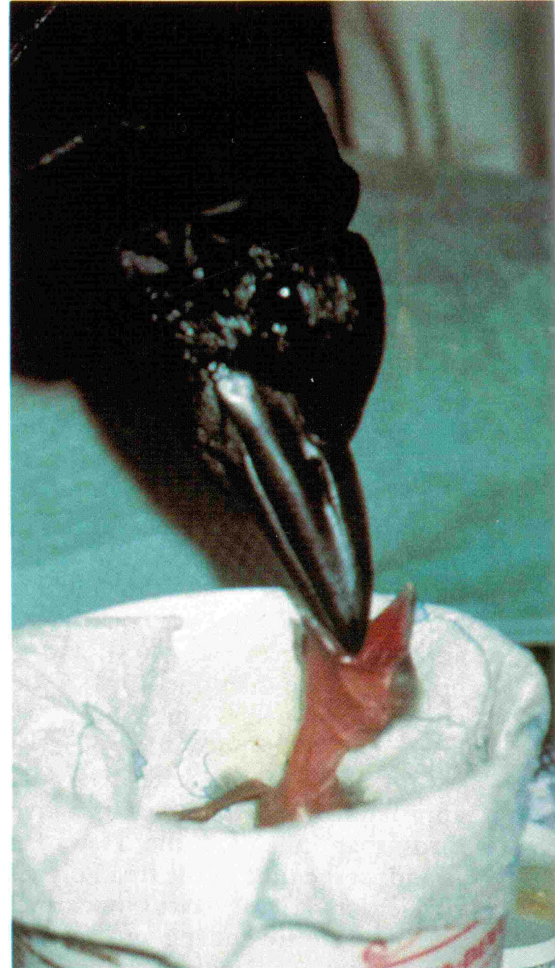
In 1993, the Service requested The Peregrine Fund (TPF) to initiate a prototype restoration program for the 'Alala *Corvus hawaiiensis*, in collaboration with private land-owners, National Biological Survey (NBS) biologists, Service biologists and the Zoological Society of San Diego (ZSSD), (Harrity, et al., 1993). Eggs were removed from wild nesting pairs for artificial rearing and reintroduction. To date, seventeen eggs have been removed from 'Alala nests in the wild. Three of these were infertile, one egg fertile but a malposition, thirteen chicks hatched and twelve 'Alala were successfully reared (Hatchability: 93%, Survivability: 92%). Four of these chicks have been sent to The Olinda Endangered Species Facility (OESPF) managed by the State of Hawai'i, for future captive breeding, and four 'Alala chicks reared at OESPF have been transferred to TPF's release facility. Five young 'Alala were released in 1993, and seven more chicks were released in 1994. This totals twelve 'Alala released—all as a result of captive management efforts in 1993 and 1994.

In 1994, the Service requested TPF to take a more active role in Hawaiian conservation by continuing work with the 'Alala while expanding their efforts to include designing,



The Hawaiian Crow, or Alala, release aviary covers over 1/2 acre of montane Hawaiian rainforest. At 4,500' elevation, the aviary receives afternoon showers on a daily basis. The aviary covers numerous native trees and shrubs, from which the young crows learn to forage on naturally occurring foods...experience that will be valuable once released into the surrounding forest.

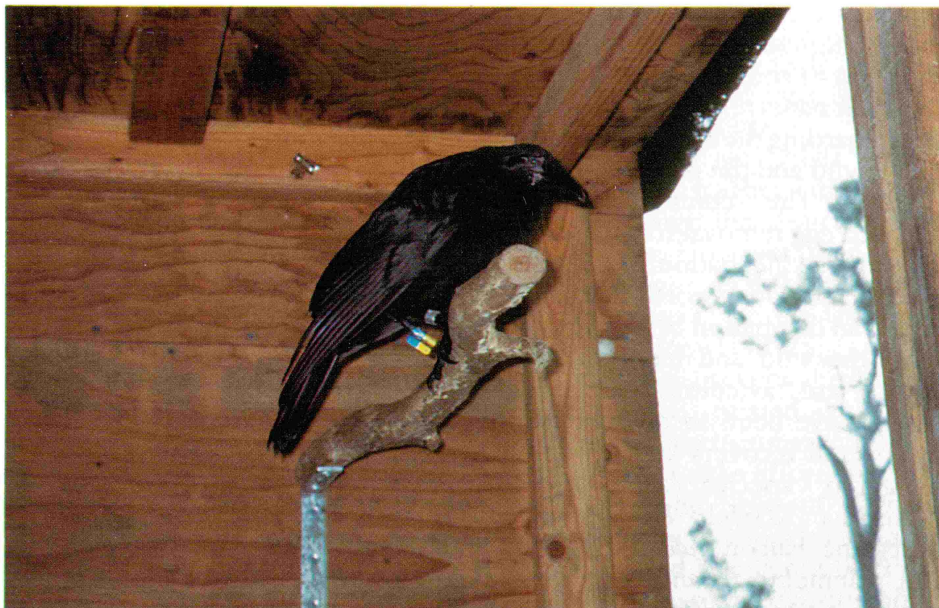
Photo by Cyndi Kuehler



The young crows are fed with a puppet parent as soon as their eyeslits open. This exposure to a "natural" parent reduces the possibility of the young bird imprinting on an unnatural object or a human as its parent.



Young Alala chicks are very altricial, but soon feathers unsheath and the nestlings begin to look like sassy crows.



A young Alala peeks out of his "hack" box at the highland Hawaiian rainforest that will soon be his home.

Young Common Amakihi soon learn to forage for small insects on their own.



Fledgling Common Amakihi soon learn to drink nectar mix from a drinker. They naturally feed on blossoms and insects.



building and operating a captive propagation facility. In 1994, funding became available through a Congressional Appropriation to carry out this directive. TPF, in collaboration and partnership with the Service, has designed, and will build and operate a captive propagation facility with the ultimate goal of assisting with the recovery and preservation of not only Hawaiian birds, but endemic Pacific Island avifauna as well.

The propagation facility site is being developed on the Keauhou Ranch of the Kamehameha Schools Bishop Estate on the Big Island of Hawai'i, and will be primarily dedicated to the reproduction of endangered island birds for reintroduction to their native habitat, as well as conservation education. The proposed captive propagation facility was designed to accomplish the following objectives: 1) Provide an environment to maximize captive production of Hawaiian forest species for reintroduction 2) Minimize health risks to wild and captive birds 3) Take advantage of climatic conditions 4) Minimize security risks (feral animals, people, fire and seismic activity) 5) Cost effectiveness. Initial construction will include a building with 20 forest bird aviaries, three "stand-alone" 'Alala aviaries built into the forest, an incubator and brooder building, and two residences for staff to live in close proximity to the bird facilities. When finished, the facility will have five bird buildings with 100 aviaries, five 'Alala aviaries, workshop, a quarantine building, and a clinic (U.S. Fish and Wildlife Service, 1994).

Educational areas will be incorporated into the brooder-incubator facilities that will allow school children and special interest groups to view the inner-workings of the facility from a close-up and personal advantage. A goal of this program is not only to propagate rare birds for restoration into native habitat, but to

Common Amakihi are reared in a brooder—always attempting to rear more than one bird in the same unit. This system of "creche" rearing helps to imprint the young bird on its own kind.



Photos by Alan Lieberman

educate the local community as to the cultural significance of the birds in Hawaiian history, and the importance of protecting and conserving the shrinking natural habitats of their island home.

Hawaiian Honeycreepers, a family of birds which have never been reproduced in captivity with much success, pose the first and most challenging avicultural hurdle. During the 1994 breeding season, in anticipation of the need for appropriate technology required to propagate Hawaiian Honeycreepers, a program of surrogate species artificial incubation and hand-rearing was initiated. This program resulted in the first successful hatching of Hawaiian Honey-Creeper (Sub-family = Drepanidinae) eggs in an incubator and subsequent hand-rearing of chicks from hatch. Common 'Amakihi *Hemignathus v. virens* eggs were collected, transported, artificially incubated and hand-reared through a collaborative effort involving personnel from TPF, NBS and National Wildlife Refuges. Two nestlings and nine eggs were collected: six viable, one infertile and two abandoned eggs (containing dead embryos prior to transport) were collected. Five chicks were successfully hand-reared. This exciting success has helped us establish preliminary artificial incubation parameters and handrearing techniques that will be used in the near future for the endangered species of Hawaiian Honeycreepers. All five Common 'Amakihi are now on exhibit at the Panaewa Rainforest Zoo outside of Hilo.

From these initial modest but ex-

citing successes with the 'Alala and the Common Amakihi, The Peregrine Fund is planning similar avicultural activities in 1995 with the Omao (Hawaiian Thrush), and the endangered Palila, as well as continuing the work with 'Alala and Common Amakihi. Aviculture is conservation... a familiar expression used for many years by private aviculturists, is truly becoming a reality in the effort to save endangered Hawaiian avifauna.

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