

PROPOSAL FOR THE STUDY OF  
RARE AND ENDANGERED BIRDS  
IN HAWAII'S NATIONAL PARKS

Addressed to the  
National Park Service Western Regional Office  
San Francisco, California  
O. L. Wallis, Chief Scientist

by

Andrew J. Berger  
Professor of Zoology  
University of Hawaii  
Honolulu, Hawaii 96822

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Half of all the rare and endangered bird species listed in the Department of the Interior's Red Book of Rare and Endangered Species are Hawaiian birds. Some of these are still found within the boundaries of the parks and others were found there during the past 35 years. A base-line study for three of the most common species (Amakihi, Apapane, Iiwi) of honey-creepers exists as the result of the work of Paul H. Baldwin (1953. Univ. Calif. Publ. Zool., 52(4): 285-398) in Hawaii Volcanoes National Park during the 1940's, although his work was based almost exclusively on an examination of gonads in collected birds. A second, preliminary survey is found in IBP Technical Report No. 8 (Birds of Hawaii Volcanoes National Park, August 1972) by Berger and shows striking changes since Baldwin's work. However, there has never been conducted an intensive field study of the annual cycle of the endemic bird species within the Parks, and only one (on Kauai) has thus far been attempted on any of the Hawaiian Islands.

Although there has been much speculation as to the causes of the extinction and/or reduction in numbers of many of the species, we are still waiting for a thorough and reliable study of the external and internal parasites and diseases of birds in Hawaii, both endemic and introduced. We do not know the limiting factors in the annual cycle for any endemic bird species; we do not have detailed information on the frequency of destruction of eggs, young or adults by mongooses and rats; nor do we have precise information on the relationships between the introduced birds and the native species.

There can be little doubt that the future of virtually all of Hawaii's unique birds is in jeopardy. This is true, in part, because of the policy of the State Department of Land and Natural Resources to develop a timber industry by removing virgin, or near-virgin, ohia/tree-fern forests in order to plant exotic tree species. A map in a 1970 publication of the U.S. Forest Service (U.S.D.A. Forest Service Research Paper PSW-61/1970, Opportunities for Marketing Hawaii Timber Products) indicates that every one of the remaining ohia/tree-fern forests (outside of Volcanoes National Park) on the island of Hawaii is classified as suitable for commercial timber production. The destruction of endemic forests and ecosystems, of course, usually spells destruction of the endemic fauna as well (Carpenter and MacMillen, 1973, Interactions between Hawaiian Honeycreepers and Metrosideros collina on the Island of Hawaii, IBP Tech. Rep. No. 33; Berger, 1972, Birds of the Kilauea Forest Reserve, A Progress Report, IBP Tech. Rep. No. 11).

Moreover, I have found no evidence that the State Department of Land and Natural Resources has taken even the first step in following the provisions of Act 49 (relating to endangered birds and mammals) which was passed by the State Legislature in 1972 and signed by Governor John A. Burns on May 16 that year. The Department has, however, continued practices which are directly counter to that Act.

Consequently, it becomes in one sense a philosophical question: do we, or do we not, wish to make a concerted effort to save the unique Hawaiian birds and the ecosystems of which they are an integral part? If the answer is that we do, basic research into all aspects of the

annual cycles of the birds must be initiated as soon as possible.

This is a several faceted problem, all parts of which are interrelated.

In order to obtain meaningful information in a reasonable length of time, several people would have to be assigned to different aspects of the overall problem. It appears to be fairly evident that most of the "safe" land in the State is found in Hawaii's two largest National Parks, and that the National Park Service probably has the best appreciation of the value and the need for the proposed research--thus, this proposal.

The general title of the proposed research would be The Environmental Requirements of Rare and Endangered Bird Species in Hawaii. The major divisions of the problem into workable research projects would be as follows:

1. Annual cycle of the endangered species

The beginnings of research in this area have been carried out by Baldwin, Berger (both mentioned previously) and Conant (whose post-doctoral work in HVNP should be available by August 1974). Nevertheless, the breeding biology, ranges and other aspects of the annual cycle have not been worked out in detail for any endemic species. It may be advisable to begin field studies with a study of the less rare species, e.g., the apapane, then tackle the more rare ones.

The construction of aviaries should be an integral part of this annual cycle study. It is not sensible to raise rare and endangered Hawaiian species at Patuxent or elsewhere on the mainland U. S.; they must be raised in Hawaii. And since most rare and endangered birds are rainforest species, the aviaries should be in the rainforest rather

than at Pahakuloa where the nene are reared in HVNP. This would be a first-year undertaking, and may not even be funded by the NPS ultimately. Since the Bureau of Sports Fisheries and Wildlife via the Rare and Endangered Species Division is interested in this too, we will be working closely with them, and they may choose to carry out the construction of the aviaries when research reaches that level of accomplishment.

The nene, as well as the tree-nesting species, falls into this research category. We know these birds can be propagated in captivity in numbers limited only by space and personnel, but we know nothing about the wild population—not even whether it can sustain itself without the continued introduction of propagated captives. Some progress has been made in that enclosures have been built in an attempt to produce young imprinted on the wild habitat and other nene, and to see how a pair (and their offspring) behave in natural surroundings. Endemic plants have been grown in the enclosures to determine food preference, and it is interesting that the birds appear to choose to eat these endemics. Much more work is required, however, in monitoring the enclosures and in building more—especially in the lowlands where evidence indicates the earlier nene bred before migrating annually to higher elevations. And, of course, the entire problem of the wild population remains to be studied to corroborate any findings regarding the enclosures.

2. Parasites and Diseases

This research is critical to any understanding of the status and decline of endemic species. Only fragmentary information is available for the Parks, as well as for nearly all areas in Hawaii, despite Warner's 1968 paper (work which is suspect as to intellectual and scientific honesty) in the Condor. This problem requires intensive

a. External parasites: H. Eddie Smith, working under the direction of Dr. Frank Radovsky and myself, is making excellent progress on this problem on the Keauhou Ranch on Hawaii, but this is a long-term problem which probably should be extended to the parks themselves.

b. Internal parasites: There are at least three subprojects here:

1. blood parasites, with special reference to bird malaria,
2. other internal parasites--roundworms, tapeworms, etc., and
3. a thorough study of mosquitoes and other possible vectors in the Parks.

### 3. Relationships with Introduced Birds

No study has yet been conducted in Hawaii on the interrelationships of endemic with introduced species. Such a study is badly needed. The Parks are natural places for such an effort, in part because we have a better historical record of the birds there than nearly anywhere else in Hawaii. Moreover, I recently found on the island of Hawaii a new, established exotic species which is spreading in the direction of HVNP and which provides an excellent opportunity to monitor the advance of an exotic species into the ranges of endemics.

### 4. Mongoose, Rats, and Cats as Predators on Birds

Although no one yet apparently has actually seen a rat or mongoose destroy the eggs, young, or adults in tree-nesting endemic birds, there is considerable circumstantial evidence that they do so. Researchers on any project in the Parks should be alert for additional evidence.

The following estimates are for the first year of work in an estimated five-year study; in succeeding years, the supplies and equipment expenditures would probably be minimal. It is also possible that there will be varying numbers of researchers working at any one time, thus an alteration in the salaries category might be anticipated.

SALARIES

2 half-time research assistants @ \$4,062 = \$8,124 \$ 8,124

EQUIPMENT

Remote-controlled still camera with lenses and flash estimated at \$500; Toyota station wagon estimated at \$3900 4,400

SUPPLIES

Compasses, altimeters, ladders, nets, leg bands, flashlights, photographic supplies and processing, laboratory supplies and miscellaneous 1,000

TRAVEL

Approx. 6 Honolulu/Hilo or Honolulu/Maui round trips @ \$55 or \$41 by researchers = \$302  
 Approx. 2 Honolulu/Hilo round trips @ \$55 by advisor plus expenses = \$330 632

FRINGE BENEFITS

Approx. \$500 for each research assistant 1,000

INDIRECT COST

8% 1,212

TOTAL 16,368