# BIRDS OF THE KALAPANA EXTENSION

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## INTRODUCTION

In recent years the National Park Service has been working to develop a feasible and sound management program for lands included in the approximately 49,000 acres of the Kalapana Extension (Fig. 1), which was acquired by Hawaii Volcanoes National Park between 1938 and 1960 (National Park Service 1974). The first step in planning analysis has consisted largely of inventory-type research aimed at identifying and locating the resources of the Kalapana Extension. An up-to-date inventory of the avifauna was called for as part of this research.

Most of the information on birds presented in the Draft Planning Analysis (National Park Service 1974: Map D, henceforth Fig. 2 of this report) was based on data gathered by Baldwin (1953) more than 25 years ago. Surveys by Dunmire (1962) and Berger (1972), as well as verbal communications from other researchers, provided some additional data. It should be noted that the map shows only what were called "unimpaired" bird habitats. Presumably, some forest birds had and still have today more extensive distributions than is suggested by this map.

## MATERIALS AND METHODS

In 1976 I began field surveys under contract with the Cooperative National Park Resources Studies Unit (CPSU). This report summarizes data collected through December of 1977, including observations reported to me by other researchers.

Censuses of birds were conducted using either Emlen's (1971) transect count method or Reynolds et al. (in press) variable circular plot method. For the rarer species not often detected during censuses, such as the 'Io (*Buteo solitarius*), sighting locations were recorded. Although I was unable to exhaustively survey all parts of the Kalapana Extension, I attempted to inventory the avifauna of the major habitats, concentrating my field work in the closed *Metrosideros* rain forests near Napau Crater where Baldwin (1953) had reported several endangered species. I was interested to know if these species still occurred in the areas listed as "unimpaired habitats" as of 1974 (Fig. 2).

## RESULTS AND DISCUSSION

Fifteen exotic (63%), two indigenous (8%), and seven endemic (29%) bird species were observed during this study or by other researchers during the study period (Table 1).

Four native forest birds previously reported in or near the Kalapana Extension were not recorded there during this study. They are the 'O'u (Psittirostra psittacea), the 'Akiapola'au (Hemignathus wilsoni), the Hawai'i 'Akepa (Loxops coccineus coccineus), and the 'I'iwi (Vestiaria coccinea). The first three are endangered species, and all belong to the Hawaiian Honeycreeper Family (Drepanididae). It seems doubtful that the 'Akiapola'au or the Hawai'i 'Akepa may still occur there, but recent sightings of the 'O'u (W. E. Banko, pers. comm.) in the 'Ola'a Tract and near Park Headquarters and residences suggest that this species could still be found, very rarely, in the northernmost parts of the Kalapana Extension. In a brief, one-person survey such as mine, the species could easily be missed.

Because the native forest bird distribution plotted in Figure 2 included only "unimpaired habitats," it is impossible to determine whether or not the extent of native bird distribution has really changed. I suspect that present-day native forest bird distribution (Fig. 3), regardless of habitat quality, is essentially the same as it was in 1974. No doubt volcanic activity has reduced bird distribution since Baldwin's (1953) and Dunmire's (1962) studies due to habitat destruction. This change, as well as extensive alteration in forest habitats wrought by feral pig and goat activity and exotic plant invasion, may account, at least in part, for the disappearance of several forest bird species from the Kalapana Extension. There are virtually no "unimpaired" habitats remaining. It should be noted that the National Park Service (1974) report must have inadvertently omitted Hawai'i 'Oma'o (Phaeornis obscurus obscurus) from the forest birds listed in Map D.

Whether or not absolute densities of native birds have decreased or increased is not known because this information has not been available previously. If the indigenous Kolea (Pluvialis dominica) and Noio (Anous tenuirostris melanogenys) are included, native birds have been observed in virtually every type of habitat in the Kalapana Extension (Table 2).

Although rain forests of the Extension appear to be suitable habitats for most of the Hawai'i Island forest birds, these areas were unusually low in avian diversity, with 'Apapane (Himatione sanguinea sanguinea) and Hawai'i 'Oma'o dominating the avifauna, although Hawai'i 'Elepaio (Chasiempis sandwichensis sandwichensis) and 'Io also occurred there. In fact, the Kalapana Extension harbors the most extensive population of 'Oma'o to be found within Hawaii Volcanoes National Park. It is the only form of Phaeornis (Hawaiian thrushes) not yet considered endangered.

Notably and inexplicably absent from rain forests were the 'I'iwi and the Pueo (Asio flammeus sandwichensis). I feel these species may occur there, but because of their very low numbers, were not observed. Hawai'i 'Amakihi (Loxops virens virens) were present in mesic and dryland forests above 400 feet elevation, and Pueo and 'Io were recorded in lowland scrub. Kolea are likely to be found in any open grassy area between approximately September and April, and Noio can be seen regularly along the coastline.

The endemic passerines reached relatively low elevations, some of which were recorded by observers other than the author. Low elevation records for native passerines were: 'Elepaio 400 feet; 'Oma'o 1600 feet; 'Amakihi 50 feet; and 'Apapane 400 feet. East of Mauna Ulu flows, 'Amakihi were observed no higher than 1600 feet, nor lower than 400 feet, except occasionally (J. Jacobi & F. R. Warshauer, pers. comm.). However, west of Mauna Ulu flows they were consistently observed in suitable habitat, regardless of elevation. While the 'Amakihi does not regularly inhabit homogeneous closed rain forest in substantial numbers, it can usually be found in openings and edges. This was not the case in the forests east of Mauna Ulu flows. Perhaps the lack of understory diversity characteristic of much of this feral pig-disturbed area reduces available resources for birds, giving the much more abundant 'Apapane a competitive edge. This question is in need of further study.

No specific searches were made for the nocturnal 'Ua'u (Pterodroma phaeopygia sandwichensis), which was previously reported to nest in Makaopuhi Crater, on the northern border of the Extension (U. S. Fish & Wildlife Service 1974).

The Nene (Branta sandvicensis) was recorded in western portions of the Extension during this study and by P. Banko (pers. comm.) and J. and Z. Jacobi (pers. comm.). P. Banko (in prep.) is presently working with the National Park Service on a new recovery program aimed at reintroducing a breeding population of Nene to lowland habitats in Hawaii Volcanoes National Park.

The only widespread endangered species in the Extension was the 'Io, which has been observed in or over most habitats, except for the very dry scrub and grassland communities, east of Mauna Ulu flows either during this study or by other workers.

The Japanese White-eye (Zosterops japonicus) was by far the most abundant and widely distributed bird species (Table 3). Only the Cardinal (Cardinalis cardinalis) was as widely distributed as the Japanese White-eye, and it was much less abundant (Table 3). The House Finch (Carpodacus mexicanus) was the only other exotic bird that was either very common or widely distributed. Several species of game birds (Tables 1 & 3) were observed during this study and by J. and Z. Jacobi (pers. comm.). With the exception of the Ring-necked Pheasant (Phasianus colchicus), recorded from lowland scrub, game birds seem to have entered Kalapana Extension habitats from the 'Ainahou Ranch area. These species were probably introduced to the Ranch before it became part of the National Park.

One exotic bird not found but previously recorded in the Kalapana Extension was the Red-billed Leiothrix (Leiothrix lutea). This species has undergone a rapid decline, for unknown reasons, in its Hawaiian Islands range during the last decade (Hawaii Audubon Society 1978).

## CONCLUSION

Four species (including three endangered forms) of native birds apparently no longer occur in the Kalapana Extension where they were reported about 25 years ago (Baldwin 1953). However, all the habitat types in the Extension are still occupied by some native bird species, with closed Metrosideros rain forests, open Metrosideros forests, including scrub forests, harboring the greatest diversities of native birds. The closed Metrosideros rain forests provide the best and most extensive habitats available in Hawaii Volcanoes National Park for the Hawai'i 'Oma'o, the only unendangered form of Phaeornis (Hawaiian thrushes). Furthermore, should populations of endangered Hawai'i Island forest birds (e.g., 'O'u, 'Akiapola'au, 'Akepa, Hawai'i Creeper) stage a comeback in the Park, it would most likely occur in extensive tracts of rain forest, such as those found in the 'Ola'a Tract and the Kalapana Extension. For these reasons forest habitats should be managed to protect their integrity. Of extreme importance in this regard is the control of feral pigs and exotic plants.

When the natural features of the Kalapana Extension, especially those geological and botanical, but also ornithological and archaeological, are measured against its questionable value as homestead land (e.g., high volcanic risk, unsuitability for agriculture and ranching), it seems clear that management of these lands should have conservation of natural resources as its highest priority.

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TABLE 1. A list of the birds in the Kalapana Extension of Hawaii Volcanoes National Park (* = Endangered, E = Endemic, I = Indigenous, X = Exotic).

| Scientific Name | Vernacular Name | Hawaiian | Status |
|---|---|---|---|
| * *Branta sandvicensis* | Hawaiian Goose | Nene | E |
| * *Buteo solitarius* | Hawaiian Hawk | 'Io | E |
| *Lophortyx californicus* | California Quail | | X |
| *Francolinus erckelii* | Erckel Francolin | | X |
| *Francolinus adspersus* | Closebarred Francolin | | X |
| *Phasianus colchicus* | Ring-necked Pheasant | | X |
| *Phasianus versicolor* | Green Pheasant | | X |
| *Pluvialis dominica* | Golden Plover | Kolea | I |
| *Anous tenuirostris melanogenys* | Hawaiian Noddy | Noio | I |
| *Streptopelia chinensis* | Spotted Dove | | X |
| *Geopelia striata* | Barred Dove | | X |
| *Asio flammeus sandwichensis* | Hawaiian Owl | Pueo | E |
| *Alauda arvensis* | Skylark | | X |
| *Garrulax canorus* | Melodious Laughing-thrush | | X |
| *Phaeornis obscurus obscurus* | Hawai'i Thrush | 'Oma'o | E |

TABLE 1--Continued.

| Scientific Name | Vernacular Name | Hawaiian | Status |
|---|---|---|---|
| *Chasiempis sandwichensis sandwichensis* | Hawai'i 'Elepaio | 'Elepaio | E |
| *Zosterops japonicus* | Japanese White-eye | | X |
| *Acridotheres tristis* | Common Myna | | X |
| *Loxops virens virens* | Hawai'i 'Amakihi | 'Amakihi | E |
| *Himatione sanguinea sanguinea* | 'Apapane | 'Apapane | E |
| *Lonchura punctulata* | Spotted Munia | | X |
| *Passer domesticus* | House Sparrow | | X |
| *Cardinalis cardinalis* | Cardinal | | X |
| *Carpodacus mexicanus* | House Finch | | X |

TABLE 2. Densities (birds/40 ha) of native bird species in the different vegetation types of the Kalapana Extension (P = < 1 bird/40 ha; + = irregularly present). Vegetation types are based on Mueller-Dombois and Fosberg (1974).

| Species | cM | cM(ns) | oM | oM(C) | MD | olf | s | HEAn | r | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 'Io | P | P | P | P | P | P | P | P | | |
| Kolea | | | | | | | P | P | P | |
| Noio | | | | | | | | | P | (shoreline) |
| Pueo | | | | | | | P | P | | |
| 'Oma'o | 23 | 18 | 4 | 11 | P | | | | | above 1600 ft |
| 'Elepaio | 4 | 2 | 2 | + | 13 | | | | | above 400 ft |
| 'Amakihi | + | + | 5 | + | 47 | P | | | | 400-1600 ft E of Mauna Ulu flows |
| 'Apapane | 100 | 102 | 106 | 42 | 65 | | | | | above 400 ft |

cM = closed Metrosideros forests, various understory types

cM(ns) = closed Metrosideros forests with native shrub understory

oM = open Metrosideros forests, various understory types (includes scrub Metrosideros communities)

oM(C) = open Metrosideros-Cibotium forests

MD = Metrosideros-Diospyros forests, various understory types

olf = open mixed lowland forests

s = mixed lowland scrub communities

HEAn = lowland Heteropogon-Eragrostis-Andropogon grasslands, sometimes with mixed shrubs

r = rockland communities with scattered grasses and shrubs, includes salt spray communities

TABLE 3. Densities (birds/40 ha) of introduced bird species in different vegetation types of the Kalapana Extension (P = < 1 bird/40 ha; + = irregularly present). Vegetation types are based on Mueller-Dombois and Fosberg (1974).

| Species | cM | cM(ns) | oM | oM(C) | MD | olf | s | HEAn |
|---|---|---|---|---|---|---|---|---|
| California Quail[1] | | | P | | | | | |
| Erckel Francolin[1] | | | P | | | | | |
| Closebarred Francolin[1] | | | P | | | | | |
| Ring-necked Pheasant | | | | | | | P | |
| Green Pheasant[1] | | | P | | | | | |
| Spotted dove | | | | | P | 15 | P | P |
| Barred Dove | | | P | | | P | | |
| Skylark | | | | | | | P | P |
| Melodious Laughing-thrush | P | P | P | | P | | | |
| Japanese White-eye | 78 | 156 | 266 | 193 | 149 | 213 | 80 | 64 |
| Common Myna | | | | | | P | + | + |
| Spotted Munia | | | | | | P | P | P |
| Cardinal | P | 3 | P | 6 | 22 | 7 | P | 3 |
| House Finch | + | + | 2 | + | P | 15 | 27 | 14 |

[1] These species probably limited to plant communities in the northwestern corner of the Kalapana Extension, adjacent to upper portions of the 'Ainahou Ranch.

cM = closed Metrosideros forests, various understory types

cM(ns) = closed Metrosideros forests with native shrub understory

oM = open Metrosideros forests, various understory types (includes scrub Metrosideros communities)

oM(C) = open Metrosideros-Cibotium forests

MD = Metrosideros-Diospyros forests, various understory types

olf = open mixed lowland forests

s = mixed lowland scrub communities

HEAn = lowland Heteropogon-Eragrostis-Andropogon grasslands, sometimes with mixed shrubs

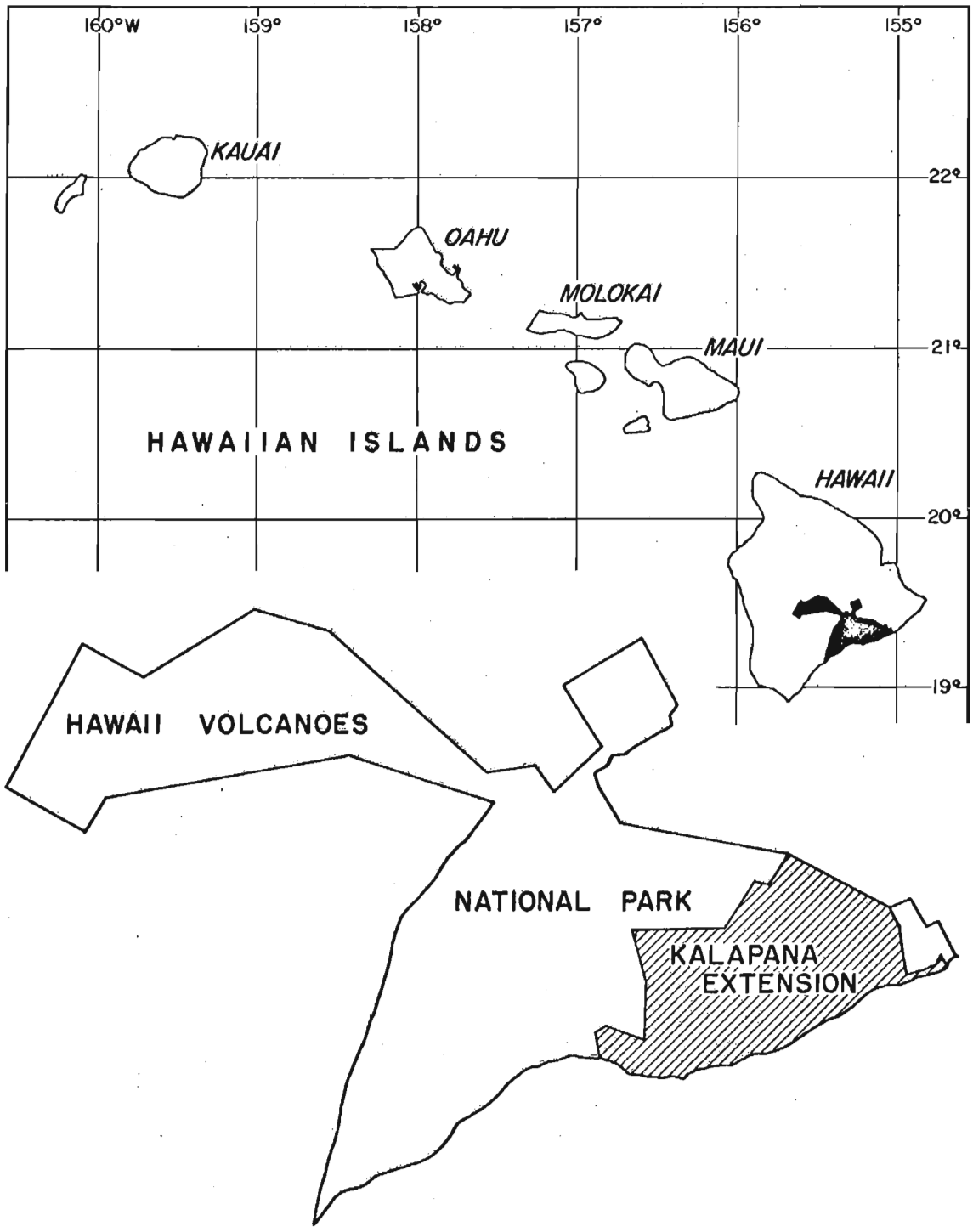


FIGURE 1. A map showing the locations of the main Hawaiian Islands, the Island of Hawai'i, Hawaii Volcanoes National Park, and the Kalapana Extension.

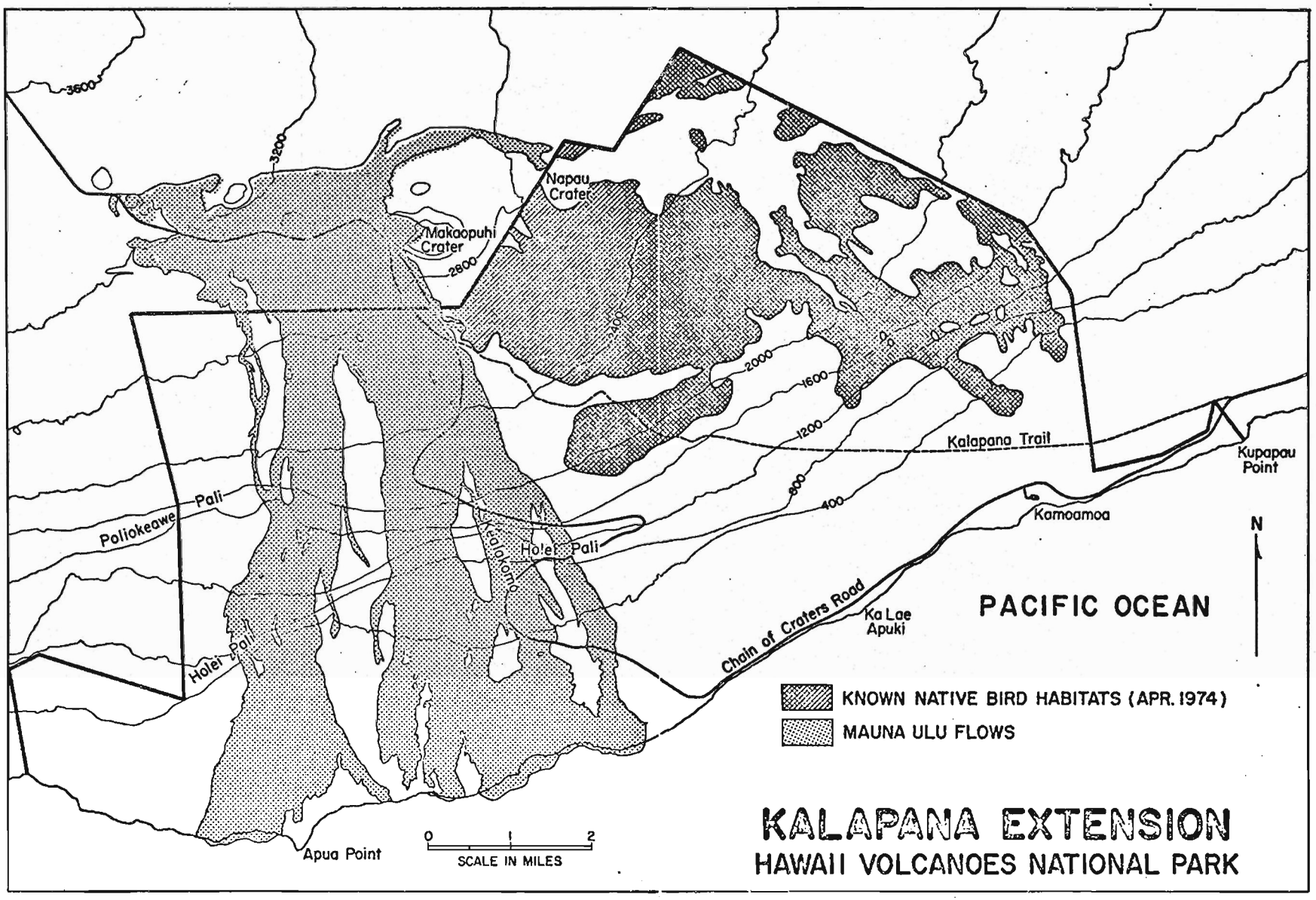


FIGURE 2. A map of the known (as of April 1974) "unimpaired habitats" of native forest birds in the Kalapana Extension, according to National Park Service (1974: Map D).

FIGURE 3. A map showing native forest bird distribution in the Kalapana Extension according to this study. Includes many habitats considered to be impaired by feral animals and exotic plants.