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KANAHĀ POND BIRD STUDY  
(excerpts from Final Report<sup>1</sup>)  
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First of Two Installments

## 1. Introduction

...The general purpose of the report is to provide a basis for determining the fate of Kanaha Pond, particularly with reference to the blueprints for "Kanaha Pond Improvements," Job. No. 37--MM-7, dated July 13, 1971 and the Kahului Airport Development Plan--1985, dated June 6, 1969.

I carried out field studies on Maui on the following dates during the summer of 1972: July 4-7, August 6-9, 20-22, August 31-September 4, September 13-15. I worked with an assistant on all trips beginning on August 20, 1972, that is, during the last 11 days of my field observations.

...Studies such as the present one should have been designed to continue for a period of at least one year in order to make it possible to analyze conditions during the several seasons of the year. This was impossible, presumably because of continuing bureaucratic inaction during the past decade. That significant conclusions can be drawn, in my opinion, after only a three-month study is due primarily to the existence of earlier careful studies by Mr. Eugene Kridler (see Doty 1969), who presented excellent data on the birds of Kanaha Pond for the winter and spring months. I also made observations at Kanaha Pond on several occasions prior to 1972, my first visit to that area being in 1964; the background thereby provided also was useful.

That a final decision on the fate of Kanaha Pond is long overdue is clearly evident from the history of proposals to improve the pond area as habitat for certain rare and endangered species of endemic Hawaiian birds. ...The following statement, for example, is from the so-called "Bush Report," which was published in March 1963: "This study has been undertaken pursuant to the authorization given under Act 195, SLH 1961, to prepare a development plan for Kanaha Pond at Kahului, Maui. In essence the report proposes what is believed to be a sound approach to the improvement of Kanaha Pond to create a better environment for the wildlife creatures that inhabit the area as well as laying out the groundwork for further investigation which should lead to determining more precisely to what extent improvements can be undertaken without destroying or having a detrimental effect on the wildlife habitat." Insofar as I have been able to determine, no meaningful action was taken on these recommendations made in 1963.

Actually, Kanaha Pond has had a written status as a wildlife refuge since 1952. On April 25 of that year, the Board of Commissioners of Agriculture and Forestry adopted resolution No. 8, declaring Kanaha Pond to be a wildlife refuge. In 1949, the Commissioners had requested the Hawaii Aeronautics Commission to turn Kanaha Pond and the surrounding land over to the Board of Commissioners of Agriculture and Forestry for management purposes, and this request was granted. The State Legislature reconfirmed the wish to improve Kanaha Pond for the waterbirds by Act 195 in 1961. Moreover, the

<sup>1</sup> dated September 20, 1972, under contract with the Department of Land and Natural Resources, State of Hawaii.

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sum of \$100,000 for this purpose was provided to the Department of Land and Natural Resources by Act 30 (1962) and Act 201 (1963) of the Legislature.

It is my understanding, however, that to this date the Board of Land and Natural Resources has only a "space permit" for police and patrol functions at Kanaha Pond and that this permit can be cancelled on 30-days notice. Hence, the Kanaha Pond Wildlife still is a refuge in name only.

It is presumed that no action was taken on the several development plans proposed in the past because jurisdiction for Kanaha Pond lies under the control of the State Department of Transportation, which in turn, is subject to certain stipulations regarding the Kahului Airport complex that are prescribed by the Federal Aviation Agency and the Secretary of the United States Navy. Efforts thus far to obtain the necessary permission from these agencies to develop Kanaha Pond as a bird sanctuary have been unsuccessful.

...It is pertinent to point out that the entire atmosphere toward the preservation of rare and endangered wildlife has changed considerably during the past decade. The Endangered Species Preservation Act (Public Law 89-669) was enacted by the United States Congress and signed into law by President Lyndon B. Johnson on October 15, 1966. The Bureau of Sport Fisheries and Wildlife issued the first edition of its "Rare and Endangered Fish and Wildlife of the United States" in 1966. This was revised and re-issued in 1968, and was further updated in the Federal Register, Volume 35, Number 199, Tuesday, October 13, 1970 (Title 50). (More than half of all the birds in the list are Hawaiian birds.) Another Act of Congress was passed in 1969 to protect endangered species in foreign countries by making their importation into the United States illegal.

By a Joint Resolution of Congress, that body recognized that "one of the most crucial situations to face this or any other civilization" is "the immediate or near potential of mankind to damage, possibly beyond repair, the earth's ecological system on which all life depends" (Public Law 91-438, 91st Congress, October 7, 1970).

There also has been a notable change in the laws of the State of Hawaii. The 1970 State Legislature passed Act 139, creating a Natural Areas Reserve Commission, and Act 195, "Relating to the Protection of Indigenous Fish, Bird, Animal, and Vegetable Life" of Hawaii.

On May 16, 1972, Governor John A. Burns signed Act 49, which stated, in part, that the Department of Land and Natural Resources "shall formulate programs for the conservation, management, and protection of indigenous birds and mammals. It shall, through the division of fish and game, conduct investigations of such species and their associated ecosystems in order to develop information relating to estimates of population, habitat, range and other biological data necessary to determine the status of indigenous birds and mammals. ...The department shall conduct research on indigenous birds and mammals and on endangered species and their associated ecosystems, and shall utilize land acquisition and other authority vested in the department to carry out such programs for the conservation, management, and protection of such species and their associated ecosystems. In addition, the department is hereby authorized to acquire by purchase, donation or otherwise, lands or interests therein needed to carry out the programs relating to the intent and purpose of this Act."

It does not seem to be an exaggeration to suggest that the improvement of Kanaha Pond is an essential step if Hawaii's indigenous and endemic waterbirds are to be saved from extinction. Nearly one-half of all of the Hawaiian Black-necked Stilts in the State were found on the island of Maui during an annual census held on August 3, 1972 (see Table 1).

Table 1  
Hawaiian Stilts Counted by Personnel of State  
Division of Fish and Game  
(Data supplied by Division of Fish and Game)

<u>Date</u>	<u>Total for State</u>	<u>Total for Maui</u>	<u>Total for Kanaha Pond</u>
January 4-8, 1960 .....	253 .....	232 .....	179 .....
January 10-13, 1961 .....	311 .....	155 .....	134 .....
January 15-17, 1962 .....	464 .....	282 .....	276 .....
January 14-18, 1963 .....	556 .....	170 .....	99 .....
January 15, 1964 .....	734 .....	164 .....	115 .....
January 14, 1965 .....	391 .....	162 .....	155 .....



<u>Date</u>	<u>Total for State</u>	<u>Total for Maui</u>	<u>Total for Kanaha Pond</u>
January 13-14, 1966.....	530.....	253.....	200
January 13-16, 1967.....	436.....	188.....	170
January 8-10, 1968.....	448.....	226.....	201
July 24, 1968.....	1,288.....	611.....	558
January 13-14, 1969.....	417.....	171.....	107
July 24, 1969.....	1,513.....	440.....	260
January 13-15, 1970.....	565.....	207.....	207
August 7, 1970.....	1,187.....	469.....	463
January 12, 1971.....	629.....	189.....	183
July 27, 1971.....	934.....	426.....	255
January 11-13, 1972.....	682.....	274.....	161
April 12, 1972.....	964.....	419.....	255
August 3, 1972.....	1,366.....	644.....	139

Based on my observations of Kanaha Pond from 1964 to 1972, it seems to me that the pond is continuing to deteriorate, and that, despite the population of stilts that still inhabits the pond, a single catastrophe (e.g., an epidemic of botulism) could decimate this important segment of the total population of this species, and that its loss could mark the beginning of the rapid decline and ultimate extinction of the species.

Such an opinion is based on a general knowledge of the behavior and fate of endangered populations on the Hawaiian Leeward Islands and in other parts of the world during the past. We do not know what the critical limiting factors are for Hawaii's endangered waterbirds, because neither State nor Federal biologists have ever conducted an intensive field study of the annual cycle of any endemic waterbird, and, therefore, the limiting factors to a better breeding success have not been identified with any degree of certainty. Even in his commendable study of the Koloa or Hawaiian Duck (*Anas wyvilliana*) on Kauai, Swedberg (1967) commented that "after nearly a year of often fruitless efforts expended in attempting to locate and study the Koloa, help was enlisted from all available sources. ...Readers will note that many questions remain unanswered, or only partially answered. ...After serious consideration, it was decided that because information on Koloa is scarce, it would be best to distribute this information as quickly as possible to conservationists and others concerned with the preservation of the species. This report will be enlarged or revised as significant progress is made in research or management." No revision has been published as of September 1972.

## 2. Kanaha Pond and the Kahului Airport as Bird Habitat

a. Kanaha Pond: The history of Kanaha Pond from the late 18th century to the 1960s was discussed in detail in the "Bush Report" (1963), and the gradual reduction in size of Kanaha Pond was depicted graphically by a series of maps of the area: 1881, 1905, 1910, 1938, and 1954. The total area of the 18th century "twin fish ponds of Kapi'ioho" has been decreased considerably, especially since 1938. Nevertheless, Kanaha Pond is still one of the best--if not the best--waterbird habitats in Hawaii, and it is of critical importance for certain endemic Hawaiian birds, as will be detailed in a later section of this report.

b. Kahului Airport: The areas covered by shrubs, trees, and even the grassy areas bordering the runways provide habitat for a number of introduced land birds plus at least one migratory shorebird. The most important of these are the Common Pigeon or Rock Dove (*Columba livia*), Lace-necked Dove (*Streptopelia chinensis*), Barred Dove (*Geopelia striata*), Common Iynah (*Acridotheres tristis*), Japanese White-eye (*Zosterops japonica*), Ricebird (*Lonchura punctulata*), House Sparrow (*Passer domesticus*), Cardinal (*Richmondia cardinalis*), and House Finch or Linnet (*Carpodacus mexicanus*).

The migratory shorebird is the Pacific Golden Plover (*Charadrius dominica pluvialis*); this species spends the nesting season in Alaska or Siberia but migrates to Hawaii for the nonbreeding season--August to May. An apparently uncommon visitor to the grassy areas bordering the runways is the European Skylark (*Alauda arvensis*). I have never seen the Pueo or Hawaiian Owl (*Asio flammeus sandwichensis*) in the vicinity of the airport, but it is possible that it occurs there, at least as bird of passage.

## 3. The Birds of Kanaha Pond

Three different groups of birds occur in the Hawaiian Islands: endemic, native (or indigenous), and introduced. Representative of all three groups are found at



# Kanaha Pond.

a. Endemic birds are those that are unique to Hawaii and, therefore, occur nowhere else in the world. Two species of endemic waterbirds now occur at Kanaha Pond: Hawaiian Coot (Fulica americana alai) and the Hawaiian Black-necked Stilt (Himantopus h. knudseni). Two other endemic species inhabited the pond historically: Koloa or Hawaiian Duck and the Hawaiian Gallinule (Gallinula chloropus sandvicensis). Both of these species were exterminated on Maui during this century; preliminary attempts by the State Division of Fish and Game to re-introduce the Gallinule were unsuccessful. Further efforts should be made if habitat improvements are made.

Kanaha Pond also provides excellent habitat for the Black-crowned Night Heron (Nycticorax n. hoactli), which taxonomists classify as a native species but not as endemic. The distinction is that the total geographical distribution of "native" (or indigenous) species includes areas outside of Hawaii, whereas an endemic species is found only in Hawaii. All of Hawaii's waterbirds except for the Black-crowned Night Heron are classified as rare or endangered by the U.S. Bureau of Sport Fisheries and Wildlife (see references). Because of the Night Heron is a permanent resident in Hawaii and because the population is not reinforced by migrations from North America, that species, is in fact an endangered species in Hawaii.

I have never seen the Hawaiian Owl in the vicinity of Kanaha Pond, but it is possible that it does pass through that area at times.

b. Native birds. In addition to the Black-crowned Night Heron (mentioned above), the Golden Plover and a number of other shorebirds and ducks (see 5a for the most common species) are found on Kanaha Pond during their nonbreeding season (in general, August to May).

c. Introduced birds. The following introduced species of land birds are found in the kiawe thickets that border Kanaha Pond: Lace-necked Dove, Barred Dove, Common Mynah, Japanese White-eye, Ricebird, House Sparrow, Cardinal, and House Finch.

A flock/approximately 40 Cattle Egrets (Bulbulcus ibis), an introduced species, roosted at night in the emergent vegetation in the pond during the summer months of 1972. The roosting habits of these birds can be demonstrated by observations made from August 6 to 9. The birds appeared as a rather close-knit flock from the northeast (from the direction of Waihee) at approximately 6:00 p.m. When I first saw the birds, they were flying about 100 feet above the ground, but, before reaching the pond, the birds descended suddenly and then flew less than 10 feet above the water. The birds flew toward the emergent vegetation in the pond, but, before reaching it, they veered off and flew to the kiawe trees, where they perched in the lower branches of one or two trees. They remained there for about a half hour. Shortly after 6:30 p.m., the birds flew in a flock, circling over the pond at heights between 10 and 20 feet above the water for several minutes before they settled in the vegetation for the night. During the period of August 6 to 9, the birds left their roost between 5:55 and 6:00 a.m., and the flock flew off to the northeast at tree-top height. At no time during my observations did I see a Cattle Egret at Kanaha Pond during the other daylight hours.

## 4. The Breeding Activities of Waterbirds at Kanaha Pond

No intensive studies of the breeding cycle have ever been conducted on any of the endemic or native Hawaiian waterbirds at Kanaha Pond, nor anywhere else in Hawaii. A minimum of one full year of intensive field work would be required to obtain meaningful information on the breeding activities of the pond and marsh birds of Hawaii. Such information is badly needed, particularly in view of the fact that these are endangered species.

a. Black-necked Stilt. My observations began during the last part of the nesting season of the stilt. On July 4, 1972, I found three young birds (estimated to be about 12 days old) with two adults in the small observation pond near the highway. On July 5, I accompanied Mr. Joseph S. Medeiros, Wildlife Biologist of the State Division of Fish and Game, to Kanaha Pond. He showed me two stilt nests that he had had under observation, but each nest then contained only two addled eggs each. A third, active nest held two pipped eggs (which hatched successfully later that day), and I found two young birds, hiding nearby, that had hatched during the preceding 24 hours.

Mr. Medeiros and I also visited Kealia Pond and Fishfarms Hawaii on July 5, and Mr. Medeiros found a new stilt nest with four eggs that he reported had not been there



the previous week. Based on the scanty published information available on the nesting season of the Black-necked Stilt in Hawaii (Berger 1972), a fresh clutch of eggs on July 5 would seem to represent a very late nesting attempt by this species. The first eggs of the season are laid as early as April, so that the young produced from such early successful nests are fully grown and independent by early July.

b. Hawaiian Coot. I saw several immature coots during the period from July 4 to 7 (and later), but no nests. Inasmuch as data on the breeding activities of the waterbirds was to be a by-product of the field work (and not one of the main objectives), I did not search for nests in the several extensive stands of emergent vegetation in the pond.

c. Black-crowned Night Heron. Immature herons were conspicuous at the pond and in the surrounding vegetation, but I did not see any nests, nor did I see any courtship behavior among the adult birds.

#### 5. Behavior of Waterbirds at Kanaha Pond

a. General habits of the birds: Two main groups of waterbirds inhabit Kanaha Pond: permanent residents and winter residents. The permanent residents (Black-necked Stilt, Coot, Black-crowned Night Heron) spend nearly all (Coot) or most (Black-necked Stilt, Black-crowned Night Heron) of their time at the Pond. The stilts and coots have the closest ties to the pond because they feed, rest, and nest there. The herons feed in the pond but spend much of their time perched in the kiawe trees and palm trees that border, or are near, the pond; they also nest in trees.

There apparently is a considerable amount of movement of stilts (especially during the nonbreeding season) between Kanaha Pond and Kealia Pond and undoubtedly other areas. The evidence for such movement is found in Tables 1 and 2. I saw a maximum of 71 stilts at Kanaha Pond between July 4 and 7, but saw 228 stilts there on August 21; on that same day, I counted 104 stilts at Kealia Pond. Table 1 shows considerable variation in the number of stilts at Kanaha Pond, not only from year to year but during different months of the same year (see data for 1970, 1971, and 1972).

Table 2

Birds Observed at Kanaha Pond, Maui, Summer 1972

Maximum Number of Individuals Seen during a Single Census Count

Species	Jul 4-7	Aug 6-9	Aug 20-22	Aug 21-Sep 4	Sep 13-15
Black-necked Stilt.....	71.....	84.....	228.....	168.....	293
Coot.....	109.....	134.....	137.....	136.....	166
Black-cr Night Heron...	20.....	21.....	13.....	11.....	22
Turnstone.....	--.....	200+.....	245.....	20.....	54
Sanderling.....	--.....	7.....	10.....	11.....	21
Golden Plover.....	--.....	2.....	30.....	19.....	137
Cattle Egret.....	--.....	37.....	37.....	37.....	2
Mallard.....	2.....	2.....	--.....	2.....	2
Shoveller.....	--.....	--.....	--.....	--.....	5
Duck, unidentified.....	--.....	--.....	--.....	--.....	2
Semipalmated Plover....	--.....	--.....	--.....	--.....	2
Sandpiper, unidentified	--.....	--.....	1.....	--.....	--

By contrast, the coots and herons are essentially permanent residents at the pond and the immediate vicinity; there appear to be no published data to document movements of these species to other areas but such movement--at least on a limited scale--would not be unexpected. Careful studies are needed on this subject.

The winter residents include several species of shorebirds, and ducks. These species rest and feed on the pond, or along its edges, and in the mudflats. The most common of these winter visitants are two species of ducks (Pintail, Anas acuta, and Shoveller, Spatula clypeata) and three species of shorebirds (Golden Plover, Ruddy Turnstone, Arenaria interpres, and Sanderling, Crocethia alba). (See tables 3 and 4). A comparison of data obtained by me with those obtained by Eugene Kridler and by personnel of the State Division of Fish and Game during January of each year demonstrates a considerable change in the numbers of the Golden Plovers, Ruddy Turnstones, and Sanderlings from year to year as well as from month to month during the period from July to May. These differences probably result, in part, because some of the shorebirds that first arrive at Kanaha Pond in July or August later move on to other areas to spend the winter months.



Table 3  
Ducks Counted During Annual January Inventory  
by State Division of Fish and Game  
(Data supplied by Division of Fish and Game)

Year	Statewide	Maui	Kanaha Pond	Year	Statewide	Maui	Kanaha Pond
1960	2,476 *	1,647	1,461	1967	1,689	881	316
1961	2,307	1,531	1,411	1968	1,493	938	647
1962	3,575	3,151	3,095	1969	607	373	359
1963	2,000	1,081	1,040	1970	1,998	936	900
1964	1,506	694	508	1971	2,083	1,529	1,444
1965	880	551	390	1972	2,820 **	1,915	657
1966	1,654	1,045	467	**No data available for Molokai			

\*No count was made on Oahu

Table 4  
Waterbird Populations at Kanaha Pond, Maui  
(Reproduced from Doty 1969, Exhibit D, by Eugene Kridler)  
Dates, 1964 - 1965

Species	12/14	1/12	2/5	3/5	4/28	7/21
Cattle Egret.....	.	.	.	1	1	.
Black-cr Night Heron.....	9	15	13	12	14	4
Black Brant.....	1	.	1	1	1	.
American Widgeon.....	.	.	3	3	1	.
Blue-winged/Cinnamon Teal	.	.	1	1	.	.
Shoveler.....	327	513	565	550	285	4
Pintail.....	.	.	37	2	.	.
Scaup.....	.	5	.	.	.	.
Coot.....	32	30	22	38	49	28
Golden Plover.....	50	35	30	55	160	2
Ruddy Turnstone.....	17	22	2	53	200	26
Wandering Tattler.....	3	.	.	5	5	.
Sanderling.....	11	12	7	7	30	2
Least Sandpiper.....	.	2	.	.	1	.
Black-necked Stilt.....	155	150	117	144	217	156
Glaucous-winged Gull *	.	.	.	1	1	.
TOTALS	605	784	798	853/873/	955/965/	222

\*Gulls are chance arrivals or accidental migrants to Hawaii; they do not remain long, and their fate is unknown.

b. Flight habits of the birds: All of the bird species that inhabit Kanaha Pond ignore automobile traffic on the highway as well as airplanes that fly over the Pond. I found that the birds were not particularly disturbed if I drove or walked on the road that leads to the observation booth on the south side of the pond. (Stilts nesting nearby during the breeding season, however, give continual alarm calls when disturbed, and they may fly near an intruder but no more than about 25 feet above the pond.)

Stilts and coots paid little attention when I drove on the interior roads--some stilts began to give alarm notes and coots generally swam toward the emergent vegetation, but the birds did not fly. The Black-crowned Night Herons, however, often flew from the pond up into one of the nearby kiawe trees, and, sometimes, to an adjacent part of the Pond. The fact is that the permanent resident waterbirds spend most of their time feeding and resting, or, during the breeding season, in incubating eggs and watching over young birds. Unless disturbed by humans or dogs, their flights from one part of the pond to another are made 50 feet or less above the water, and typically much closer than that.

Kridler (see Exhibit D in Doty 1969), however, wrote that "if a motor vehicle was driven along the interior roads or some human walked along them, the ducks generally quickly flushed in relatively large numbers and flew to the other end of the pond at higher than usual altitudes. Large flocks were always the result of birds being frightened by human intrusion. Not all flew off in large flocks when disturbed, however. There was slightly more activity in the afternoon than in the morning. Mating flights were at low levels and were infrequent. Although many planes passed over head during







## 6. Birds as Hazards to Aircraft

So far as I have been able to determine, the first bird-airplane collision that caused human death was in 1910, and there probably were few serious collisions during the following 30 years. Serious problems were encountered during World War II, however, and a number of studies have been conducted since that time.

It seems clear to me that there are distinct and significant differences between the potential problem of bird hazards to aircraft at the Kahului Airport and the problem in other regions: that is, Midway Atoll and large metropolitan areas, such as New York, Boston, and London.

### a. Midway Atoll

The chief birds involved at Midway Atoll are Laysan Albatrosses (Diomedea immutabilis), which are very large birds with a wing span of approximately six feet and a body weight between five and seven pounds. Birds of this size present a serious problem to aircraft in flight. ...

### b. Metropolitan airports

In this category are included airports at such large cities as Boston, New York, Washington, Chicago, Los Angeles, and London. ...None of these resulted in fatal air crashes. Approximately 68 percent of 138 strikes occurred at altitudes above 200 feet, and 56 percent, above 800 feet. ...

A relatively small percentage of the total species of world birds have been involved in bird-aircraft strikes. "On a world basis gulls are by far the most troublesome birds but a broad spectrum of species have been involved in strikes. In Britain about a dozen species constitute the major hazard and of these the black-headed, common and herring gulls, lapwing, wood-pigeon and rook are most frequently encountered" (Wright, in Murton and Wright 1968: 113). The European Starling (Sturnus vulgaris) is a serious problem at many airports in the United States and abroad, as is the feral pigeon (Columba livia). Gulls are not native to the Hawaiian Islands. One or two gulls have been recorded infrequently at various places in Hawaii during the past 50 years as "chance arrivals" or "accidental migrants," but the birds do not remain long, and whether they move on or die is unknown. ...

### c. Kahului airport

Kridler (in Doty 1969, Exhibit D, page 8) stated that "there have been no known strikes of waterbirds by aircraft at Kahului Airport". In 1952 there may have been one, but it was never documented and exists as a rumour. Such strikes as have occurred in the past involved land birds such as pigeons and mynah not associated with the pond, but these also were never documented; however, on February 17 of this year 1965, a Hawaiian Airlines DC-6C, Flight No. 818, landing on Runway 2 struck and killed 12 pigeons. No major damage to the plane was sustained, but the flight was delayed." Kridler's report was dated September 1965, and it presumably covered the period through July 21 of that year.

In his letter to me of September 12, 1972, Mr. Owen Miyamoto kindly provided information on bird strikes at Kahului Airport for the period from 1966 through August 1972. ...

The data provided...do not suggest any serious concern about bird-aircraft strikes in Hawaii, nor any rigid and specific policy for reporting strikes, either by the Airports Division of the State Department of Transportation nor by FAA personnel in Hawaii. Hence, of the possible eight actual bird-aircraft strikes occurring between 1966 and August 1972, three involved pigeons, four involved unidentified birds, and one allegedly involved two Hawaiian Stilts.

It would be very interesting to know if the two dead birds were, indeed, Hawaiian Stilts, or whether they were Golden Plovers. There is no indication in any of the reports that the birds were identified by a qualified observer, or whether the birds were saved or discarded. I have not been informed of any established State or FAA policy for the identification of birds that may be killed on the runways themselves.

The average number of daily landings and take-offs for each major aircraft group at Kahului Airport during 1972 is...216 landings and take-offs per day or 78,840 per year. Thus far during 1972, one bird strike has been reported: there was no damage, and "six pigeons" were removed from runway 2. ...

The key factor regarding the birds at Kanaha Pond, however, is that they rarely fly



more than 100 feet above the surface of the pond, and, therefore, they are below the glide path of aircraft landing on Runway 5-23. Mr. Miyamoto reports that "the minimum average altitude of the glide pattern for landing on Runway 5 is 525 feet."

Rather than the waterbirds of Kanaha Pond, it seems to me that a far greater potential hazard to aircraft using Kahului Airport are the birds that are found around the buildings at the airport and in the grassy strips and the kiawe trees that border the runways. These species include the feral pigeon, Lace-necked Dove, Barred Dove, Common Mynah, Linnet, Ricebird, House Sparrow, and the migratory Golden Plover. All of these species would still inhabit the aircraft complex even if Kanaha Pond did not exist. Moreover, these birds constitute a potential hazard both on take-off and landing. This is borne out by the meager bird-strike data for the long period of 1952 through August 1972. ...

Although the wintering Golden Plovers characteristically inhabit grassy areas (such as golf courses, residential lawns, and pastures), it is well known that they also find conditions suitable for feeding and resting at airports, both in the grassy borders and on the runways themselves. I have seen this species at Kahului Airport, Honolulu International Airport, Lyman Field at Hilo, and as far away as the airport on Christmas Island (Pacific Ocean). The Golden Plover, therefore, would inhabit suitable habitat adjacent to the runways even if Kanaha Pond were filled in. At 1:00 p.m. on September 3, I watched two Golden Plover fly from one side of Runway 2-20 to the other side, but the birds first engaged in a type of aerial display circling several times about 20 feet above the runway, before reaching the opposite side.

I saw only one European Skylark at the south end of Runway 2-20 during the summer (the nonbreeding season) of 1972, but his species prefers low grasses as habitat, and the males have a flight song which they give while soaring 100 or more feet above the ground. Fortunately, Skylarks are small birds (about 6.5 inches in total length).

It is my considered opinion that the waterbirds of Kanaha Pond do not, because of their general behavior and flight habits, constitute a hazard to aircraft approaching Runway 5-23 or Runway 2-20 at Kahului Airport, but that there may exist a considerable potential hazard from the presence at the airport of the wintering Golden Plover and of several species of resident introduced land birds, and that this potential hazard probably is greater during take-off of aircraft than during the landing approach.

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To be continued

Field Notes from Mae E. Mull, 9 July 1973

Stilts and Coots at Salt Lake: On July 9th I scanned Salt Lake from two vantage points with 10x binoculars. A total of eight Hawaiian Stilts were observed along the shoreline. Twenty-four Hawaiian Coots were on the shore or in the water. This is a partial count since the whole shoreline was not visible to look for both endangered species, and I did not have a telescope to cover the middle of the lake for coots. Steam shovels were scooping earth from the mauka slopes and trucks were dumping this material along the shore--part of the operation to fill in the lake for a golf course.

Keehi Lagoon: On July 9th while scanning Keehi Lagoon with 10x binoculars from Lagoon Drive east of the runways, I saw a single Wandering Tattler or 'Ulili (Heteroscelus incanum) fly offshore and land on a pontoon of pipes floating in the water about 100 yards away. For several minutes 'Ulili preened its feathers, rubbed its bill on the pipe and moved about before flying off over the lagoon. It did not make its distinctive call while in flight. The bird appeared to be in nonbreeding plumage, apparently not migrating this season to the nesting grounds in northern climes.

From the same location a short time later, I watched a flock of fourteen Ruddy Turnstones or 'Akekeke (Arenaria interpres) take off from the shore and fly along a strip of recently dredged-up material that curved out in Keehi Lagoon. The turnstones flew low over the water in a tight flock, banking and lifting in unison. The distinctive white-black patterning on the upper surfaces in flight made identification certain, with the flock creating in motion a natural harlequin effect. Some turnstones remain in Hawaii during the summer, but I had not seen previously a flock of this size in July.

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#### READERS NOTES:

Honolulu Star-Bulletin, 4 March 1970, page E-4: Many Island Fruits are Rich in Vitamin C by Marjorie Abel

...The need for Vitamin C is pretty exclusive. Of all the animals and birds known,



only four species have been proved to need Vitamin C. They don't have one specific enzyme needed to change glucose to ascorbic acid. Those four species are man, guinea pigs, the fruit eating bat and bulbul bird in India. ...

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Honolulu Star-Bulletin, 23 July 1973, page A-13: Silent-Winged Petrel Betrayed by Its Yap

Haleakala, Maui--Strange noises are being heard at night by residents along the upper levels of Haleakala. The sounds are similar to the high-pitched yapping of small dogs. However, since the noises are not emanating at ground level but come from above, they are being considered as something of a phenomenon and as a result have aroused the curiosity of quite a few persons.

David Dunatchik, Haleakala Park ranger, said that the dark-rumped petrels are responsible for the noises. He said the bird, a relative of the albatross, is among the rare fauna that inhabit the rocky crags of Haleakala crater. The petrel is an enigmatic bird. Little is known about its habits and it generally has remained unobserved because of its nocturnal habits. It sneaks in at night, moving about Haleakala on silent wings and betrays its presence by mimicking the barking of a small dog. It is guided to small burrows in the crater's rocky cliffs by some unknown vision and leaves for the open seas while it is still dark. From few studies that have been conducted on the birds, it has been found they are nomadic and spend most of their time on the open seas.

Presently, because it is their nesting season, the birds are highly active in the crater area where the females lay single eggs in thinly lined twiggy nests deep in their rocky burrows. The parents take turns warming the developing life and when hatched, the downy young is fed every few days. The young petrels remain in their nests for at least 115 days before they leave their burrows in the sheer cliffs to join their parents in their nomadic sea life.

Since only a single egg per pair is laid, not many petrels are produced, and according to Dunatchik, Haleakala is one of the few nesting areas of this rare, endangered species.

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Cornell University News, 24 September 1969

The frequently recommended practice of adding glycerine to water may keep your bird bath unfrozen this winter--but not the birds that use it.

...Mrs. Walter R. Spofford, research associate at Cornell University's Laboratory of Ornithology, explained that the glycerine in the water is harmless if the birds drink it, but if they bathe, their natural insulation against the cold is destroyed.

She said, "The feathers of birds are remarkably adapted for forming an insulating layer. The barbs of birds feathers interlock and in the winter the feathers are fluffed out, trapping warm air against the body. Anything added to the water--especially something oily like glycerine--makes it impossible for the feathers to function normally. As soon as the bird is exposed to extreme cold or heavy snow or rain, he will freeze. It's far better to add warm water several times a day or to use little electric water heaters commonly used to open water for chickens."

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#### Status of the Reef Runway Suit - Contributions Needed for the Appeal

On June 12, 1973 the U.S. Court of Appeals for the Ninth Circuit in San Francisco issued an injunction ordering that "further construction or offshore preparation for construction of the proposed Reef Runway Project adjoining the Honolulu International Airport" be suspended until the Court hearing on the appeal. The plaintiffs who are making the appeal include the Hawaii Audubon Society, Life of the Land, Sierra Club, Friends of the Earth and four residents of the Kalihi-Palama area.

We contend that the Environmental Impact Statement for the Reef Runway Project is inadequate and fails to comply with the National Environmental Policy Act of 1969. This federal law, NEPA, requires detailed assessment of the consequences of federal projects on the natural and human environment and calls for thorough consideration of alternative actions. The plaintiffs contend that the project will not decrease noise and increase safety as claimed, but will permit a staggering increase in tourism. What we face, in effect, is sacrifice of 186 acres of feeding and resting habitat for the endangered Hawaiian Stilt for the sake of objectives that may not be fulfilled.

National Audubon Society has given its support to the position of the Hawaii Audubon Society, saying in part that "the citizens of Hawaii deserve a vindication of their



environmental rights." National Audubon will enter the appeal suit at the hearing in San Francisco with its own argument in an amicus curiae capacity--as a "friend of the court." The hearing date set by the court is expected to be on or after August 6, 1973.

Despite the court order stopping offshore work on the Reef Runway Project, one of the sub-contractors, Hawaiian Dredging and Construction Company, was discovered on July 12 to be setting pipes on floating pontoons in Keehi Lagoon for use in dredging operations. Following a complaint by the plaintiffs' attorney that this work was in violation of the court order, the general contractor, Dillingham Corporation, agreed to have the pipes and pontoons removed from the water.

The Executive Board is asking members and friends to support the court appeal through contributions. The Society's share of the appeal costs will be at least \$2,500. For many of us this is our first opportunity to contribute to a local environmental law case. We can show our active concern for the natural environment and the quality of life in Hawaii by donations to this cause. Many Audubon members and friends will give \$5-\$25, but all contributions from \$1.00 to \$500 will be most gratefully received. Contributions are tax-deductible and should be made out to Hawaii Audubon Society, earmarked "Reef Runway Appeal." Please mail contributions to Treasurer, Hawaii Audubon Society, P.O. Box 5032, Honolulu, Hawaii 96814.

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#### ALOHA to new members:

Kent Alexander, 51 Kaikea Place, Kailua, Oahu 96734  
Sgt Donald R. Armstrong, PO 3585, 6908 Scty Sqd, APO San Francisco 96310  
Dr. Walter J. Bock, Dept of Biol Sci, Columbia Univ, New York, N.Y. 10027  
Conrad Craven, 2211 Hoonanea St, Honolulu, Hawaii 96822  
Inez K. Nilsson, 4241 Puu Panini Ave, Honolulu, Hawaii 96816  
Judith Reigel, 51 Kaikea Place, Kailua, Oahu 96734  
Mrs. Margaret F. Tompkin, 1434 Punahou St, Apt 611, Honolulu, Hawaii 96822  
Diane & Joseph C. Van Ryzin, 675 Ulumalu St, Kailua, Oahu 96734  
Mildred M. Winana, 219 Hanakapi'ai St, Honolulu, Hawaii 96825  
The Academy of Natural Sciences, 19th & the Parkway, Philadelphia, Pa 19103

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HAWAII'S BIRDS, a field guide, is available for \$2.50 postpaid, Airmail 50¢ extra. Send in your orders to: Book Order Committee, Hawaii Audubon Society, PO Box 5032, Honolulu, Hawaii 96814.

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#### SEPTEMBER ACTIVITIES:

- 9 September - Field trip to study shore birds--a look at fall migrants and residents on leeward Oahu. Bring lunch, water, and if possible your car. Transportation cost (\$1.00) to be paid to the drivers. Meet at the State Library on Punchbowl Street at 8:00 a.m.  
Leader: William P. Mull, telephone 988-6798.
- 17 September - General meeting at the Waikiki Aquarium Auditorium at 7:30 p.m.  
Speaker: William P. Mull  
Topic: Hawaii's Basic Nature--exploration of Hawaii's native ecosystems through close-up color slides of unique insects, snails and other endemic life forms that evolved here as part of the real Hawaii.

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#### HAWAII AUDUBON SOCIETY EXECUTIVE BOARD:

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