



The Distribution of the Brush-Tailed Rock Wallaby (*Petrogale penicillata*) on Oahu

by: Michael Lauret

INTRODUCTION

In 1916, the Brush-tailed Rock Wallaby, *Petrogale penicillata*, a marsupial of the family Macropodiadae, was accidentally introduced to the island of Oahu (Fig. 1). Tinker (1938) reported that the original population came from a single pair which were purchased from an Australian zoologist visiting in Honolulu. These wallabies subsequently escaped and established the present population.

The only confirmed colony of rock wallabies on Oahu was found in the cliffs above the Material Testing Laboratory of the State of Hawaii in Kalihi Valley (Kramer, 1971; Lazell, 1980). However, Kramer also suggested that another population may be present in Nuuanu Valley. Sightings of wallabies in Moanalua Valley in November 1980 by Army Privates MacDonald and Davis and Spec. 4 Lampman (pers. comm.) may indicate a resident population exists there as well. In July 1976, Dr. P.D. Dalton (pers. comm.) sighted a single wallaby on the Aiea Loop Trail. A sighting by Steve Gilbert (pers. comm.) of a single wallaby in Waimano Valley in March 1979 potentially extends their range to at least Manana Ridge. Therefore, in an attempt to clarify the present distribution of Brush-tailed Rock Wallabies on Oahu, an intensive survey of all reported sightings was begun in January 1981.

The common habitat of *P. penicillata* in Victoria, Australia, is steep, shrub-covered outcrops which face away from the prevailing winds (LeSouef, 1926; Wakefield, 1954; Troughton, 1966; Ride, 1970). Marlow (1962) adds that they also inhabit mountainous, dry-forested areas and sleep in caves and rock crevices.

Kramer (1971) found that the wallabies on Oahu also inhabit cliff areas and can be found sleeping and loafing along the ledges which face away from the moisture laden tradewinds. This species is also thought to avoid dense vegetation in order to escape dogs, which are known to occasionally prey on them (Tinker, 1938; Calaby, 1971).

The primary plants utilized by Hawaiian wallabies for food are the Ulei berry (*Osteomeles anthyllidifolia*), Christmas-berry (*Schinus terebinthifolius*) and several varieties of exotic fruits (Kramer, 1971; Lazell, 1980).

MATERIALS AND METHODS

Binoculars and topographical maps for locating cliff habitat were used in this survey. A hand lens and a small container with several sample wallaby scats were also utilized to examine and compare any fecal remains found.

After surveying the Kalihi colony to become more

familiar with wallaby habitat, surveys of other valleys where wallabies had been previously sighted were made. The area surveyed was between Nuuanu and Waimano Valley (Fig. 2). Specific sites which appeared to be ecologically similar to the Kalihi habitat were carefully examined by looking for "runs", scats, skeletal remains, tracks and live individuals. Cliffs were traversed or viewed with binoculars and the immediate area above and below such cliffs were inspected. All reported man-hours of fieldwork are those of the author and do not include time spent by research assistants.

RESULTS

Between 1 January, 1981 and 31 December, 1981, a total of 122 man-hours were spent surveying all the following valleys between Waimano and Nuuanu: Waimano (16 man-hours); Waimalu and Kalauao (8 man-hours); North Halawa (4 man-hours); South Halawa (5 man-hours); Moanalua (18 man-hours); Manaiki; and Kahauiki (9 man-hours); Kalihi (49 man-hours); Kamanaiiki and Kapalama (4 man-hours); and Nuuanu (9 man-hours). Vegetation



Fig. 1. *Petrogale penicillata* at Kalihi.

Photo by Michael Lauret.

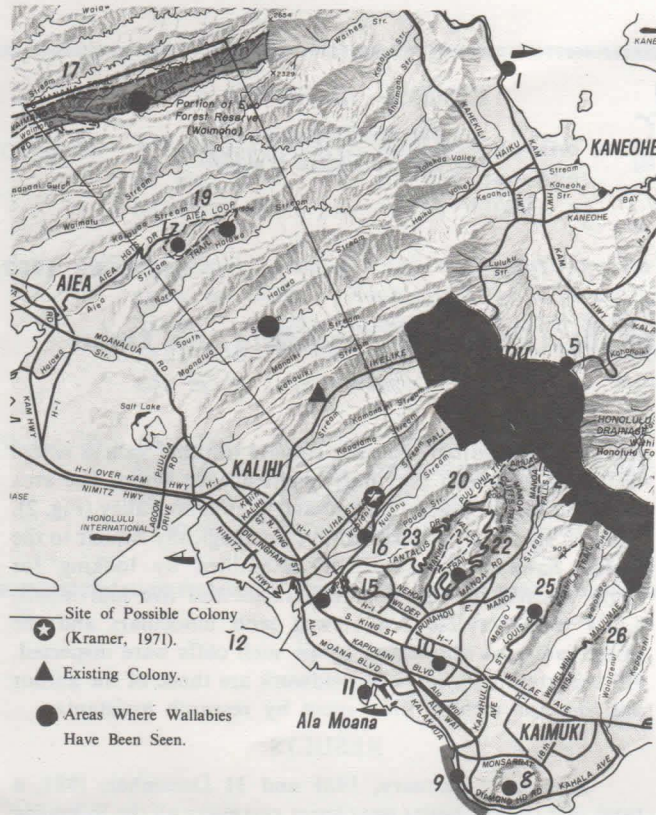


Fig. 2. Area Surveyed.

common to wallaby diets was found in all valleys surveyed. Caves and cliff types were also noted. Caves in Kalihi Valley are positioned up in the faces of the cliffs while in the other sites surveyed, few cliffs of this type were found. Instead, the majority had caves located at the base of low cliffs that formed terraces up the mountainside in a step-ladder fashion. Evidence of dogs, pigs, and cats was found in all surveyed locations and man's presence was obvious on all valley floors and ridges.

Of all the valleys surveyed, Kalihi was the only location where evidence of wallabies was found. With the exception of Moanalua and Nuuanu, none of the valleys contained extensive steep cliffs with dry caves facing away from the prevailing winds such as are found at the present colony site in Kalihi.

In Kalihi valley, wallabies were found in the same area described by Kramer (1971), with as many as 11 separate individuals seen in one day. The skeletal remains of wallabies were also noted in several places, including in dog scats. One female dog and four pups were found in a den immediately below these cliffs. Evidence that wallabies had foraged on Prickly Pear Cactus (*Opuntia megacantha*) and Moa (*Psilotum nudum*) was also noted. "Runs" or paths at the base of cliffs were common and showed evidence that they were extensively used by pigs as well as wallabies. One road-killed *Petrogale* (BYU-HC #1340) was found within 100 meters of this colony. The survey found no evidence of the marsupials beyond a radius of .4 Km from the known colony, except for one road-killed wallaby (BYU-HC #456) collected along the medial strip of Likeli Highway, 1.6 Km

east of the main colony site.

DISCUSSION AND CONCLUSION

Several questions are suggested by this study. For instance, if there are no new colonies of wallabies, what can account for the sighting of individuals in valleys up to 24 Km from the Kalihi site? One possibility is that the colony in Kalihi is crowded to the point that individuals are forced to disperse. Hence, the wandering of such individuals might explain these sightings. Another answer might possibly lie in the findings of Thomas and Delroy (1969). They observed that, in captivity, a colony of *Petrogale pearsoni* had only one dominant male and that the advent of any new, mature males resulted in displacement of the dominant male, a fight to the death, or if possible, dispersal. If this behavior is also typical of *P. penicillata*, then the wallabies recorded some distance away from Kalihi may be males that were driven out of the original colony. Another possible cause may be predators living near the Kalihi colony. As previously noted, dogs were found living in dens beneath the cliffs inhabited by wallabies. Wallaby bones were also found in several dog scats, so the probability of the dogs preying on wallabies appears likely. It is conceivable, then, that dogs may chase wallabies away from the safety of the cliffs. By the time they are able to elude the dogs, they may be disoriented and hence are subsequently seen later as stragglers, far removed from the colony. The possibility also exists that all previous sight records are the result of mistaken identity.

If wallabies are apparently able to leave their colony voluntarily or otherwise, and move some distance, why have they not established colonies outside of Kalihi? To attempt to answer this, one must first determine which direction the individuals may feasibly disperse. Kramer (1971) noted that the colony in Kalihi is bounded on three sides: to the south by Likeli Highway and residential housing, to the west by human habitation in lower Kalihi, and to the east by undesirable, wet habitat. Thus the likely direction for wallabies to disperse is to the north. This is further supported by the fact that all current sightings have occurred north of Kalihi. What is it then about these valleys to the north which inhibit the establishment of new wallaby colonies? In this survey, it was noted that all of these northern valleys had abundant vegetation common to wallaby diets. Lack of food does not seem to be a limiting factor. However, the northern valleys had very few cliffs of the type found in Kalihi, and in these valleys men and dogs were common. Most cliffs were of the terraced types and thus provided easy access to predators. Of the limited sites resembling the Kalihi terrain, many were in a very moist environment, which wallabies appear to avoid, and the few cliffs that were appropriate were far too small to support a colony. The limiting factors for further colonization of wallabies on Oahu, therefore, appear to result from the lack of suitable habitat which provides both protection from predators and dry dens; these are the same factors which also confront Australian individuals of *Petrogale* (Thomas & Delroy, 1969; Serventy, 1971; Kaufman, 1974).

Since only one confirmed colony has been established within the last 65 years and adjacent suitable habitat for further establishment is limited, it seems safe to predict that Brush-tailed Rock Wallabies will continue to be a small, albeit unique, part of the Oahu faunal community.

ACKNOWLEDGEMENTS

I would like to thank Phillip Bruner, for advice offered, and Greg Lundell who was an indispensable assistant throughout the fieldwork.

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Laie, Hawaii 96762*

REPORT CONSERVATION VIOLATIONS

HAS members are encouraged to call the Department of Land and Natural Resources Enforcement Division to report violations of Hawaii's conservation laws and rules. Oahu calls may be made to 548-5918; neighbor island calls may be made by calling Enterprise Operator 5469 toll free. Callers are asked to leave the name or description of individuals involved, license numbers of cars or boats, the place and time of the violation, and any other information that would be useful to the investigating officers.

MARGARET TITCOMB
1891-1982

The Hawaii Audubon Society lost one of its cherished honorary life members when Margaret Titcomb died on August 28, at the age of 91.

Miss Titcomb, "Makaleka" to many of her friends, left the American Museum of Natural History in 1931 to become librarian at the Bishop Museum in Honolulu. Subsequent events proved that Bishop Museum Director Dr. Herbert Gregory made an excellent choice when he persuaded Margaret to leave the bustle of New York for the calm of Honolulu. The "malihini" lost no time in adapting to life in Hawaii, which she came to love. Her forty career years at Bishop Museum were busy and happy ones, with many outside interests complementing her work.

Upon her retirement in 1970, the Museum designated her Senior Librarian, an emeritus position. During most of her remaining years she maintained a very active interest in the Museum and in writing, travel and research. She was particularly fond of Hawaiian and Pacific island culture, as evidenced by her book which include: "Native Use of Fish of Hawaii", "Native Use of Marine Invertebrates in Old Hawaii", "Dog and Man in the Ancient Pacific", and "Ancient Hawaiian Clothing". The "Voyage of the Flying Bird", published in 1963, won her the Dodd, Mead Librarian and Teacher Prize Competition. Her notes on food customs of ancient Hawaii are an important Bishop Museum resource.

Miss Titcomb also wrote numerous conservation articles for several journals. Of special interest to Audubon members was a list of Hawaiian bird names, co-authored with Wayne Gagné for 'Elepaio in 1976.

Margaret Titcomb was born in Colorado but spent a good part of her younger days in Maryland and New York. Perhaps her fondest memories were of summer family yachting trips along the east coast from New York to Maine.

In addition to being a past president of Hawaii Audubon, she had been editor of 'Elepaio, past president of the Hawaii Library Association, and active in numerous other organizations.

The members of the Hawaii Audubon Society extend their condolences to Margaret's family and the many friends who remember her lively spirit.

George Campbell

PROPOSED AMENDMENTS TO BYLAWS

The following proposed changes to the Hawaii Audubon Society's bylaws were strongly approved by members of the Board of Directors at their September meeting. Notice is hereby given that these proposed changes will be voted on by the membership at the upcoming 18 October general meeting.

The original bylaws were published in the October 1977 'Elepaio. The first amendments were published in the November 1981 issue.

The main purpose of these amendments is to establish a system of voting by mail for the annual election of officers and directors of the Society. Under the present arrangement, members must be present in person or by proxy at the annual meeting in December in order to vote. This makes voting very inconvenient for our many members on the other islands. With mail balloting, members on the other islands would receive a ballot by mail and would mail their votes to the Elections Committee. Voting would be kept secret, as it is now. Instructions on voting procedure would be sent with the ballots. The proposed system would encourage much wider participation in voting than has been the case under the present arrangement.

The following are proposed amendments to the bylaws, offered by the Bylaws Committee (Dr. Robert Pyle, George Campbell, Peter Donaldson, Susan Schenck):

	<u>PRESENT</u>	<u>PROPOSED</u>
ARTICLE II Section 5	Should renewal of membership dues not be paid within six months after due date, a member so in default shall be dropped forthwith from the rolls.	Change "six" to "two".
ARTICLE IV Section 3	The Directors shall be elected for the term of one year, or until the following annual meeting, whichever comes first, by a plurality of the voting members of the Society present in person or by proxy at the annual meeting of members.	The Directors shall be elected as provided in ARTICLE VII, and shall serve for one year terms, or until their successors are elected.
ARTICLE V Section 2	All officers shall serve for one (1) year terms, or until their successors are elected, and no individual may hold the same office for more than two (2) consecutive terms, except that the office of Treasurer is excluded from this two-year restriction.	The officers shall be elected as provided in ARTICLE VII, and shall serve for one year terms, or until their successors are elected. No individual may hold the same office for more than two(2) consecutive terms, except that the office of Treasurer is excluded from this two-year restriction.
ARTICLE V Section 3	The officers shall be elected for their respective terms by a plurality of the voting members of the SOCIETY present, in person or by proxy, at the annual meeting of members.	Delete entire Section. Re-number present Sections 4 through 10 as new Sections 3 through 9.
ARTICLE VII	NOMINATING COMMITTEE	NOMINATION AND ELECTION OF OFFICERS AND DIRECTORS

PRESENT (cont'd)PROPOSED (cont'd)

ARTICLE VII

Section 1 The Board of Directors shall annually appoint, not later than three (3) months prior to the next annual meeting of members, a Nominating Committee, to consist of not less than three members. The names of the members of the Nominating Committee shall be made known to the members through the *'Elepaio* or other publication, or by mail, or at a regular meeting of members, not later than one (1) month after the Nominating Committee has been constituted. Suggestions for nominations of Officers and Directors may be submitted to the Nominating Committee by any members of the SOCIETY.

Section 2 The Nominating Committee shall nominate candidates for Officers and Directors to succeed those whose terms expire at the next annual meeting. The Committee's report shall be published in an issue of the *'Elepaio* distributed to members prior to the annual meeting, and shall be presented to the membership at a regular meeting of members not later than one (1) month nor earlier than two (2) months prior to the annual meeting.

Section 3 Nothing contained herein shall be construed to prevent nomination of Officers and Directors from the floor at the annual meeting, with the prior consent of the nominee.

In the first sentence, change "three (3) months" to "four months (three months until December 31, 1982)".

Add the following sentence at the end of this Section: "To be nominated, a person must be a member of the SOCIETY or have an application for membership pending, and must have given his/her written consent."

In second sentence, between "members" and "prior", insert "not later than 45 days". Also in second sentence, delete phrase "nor earlier than two (2) months".

Delete entire Section.

TO ARTICLE VII, ADD THE FOLLOWING NEW SECTIONS 3, 4, 5 and 6

Section 3

Members of the SOCIETY may nominate additional candidates for Officers and Directors. Such nominations shall be submitted in writing, accompanied by the written consent of the nominee, to the Elections Committee on or before November 21.

PRESENT (cont'd)

Section 4

Section 5

Section 6

ARTICLE VIII OTHER COMMITTEES

TO ARTICLE VIII, ADD THE FOLLOWING NEW SECTION 4

Section 4

PROPOSED (cont'd)

A ballot containing the Nominating Committee's slate and any additional nominations made in accordance with Section 3 of this Article, shall be prepared by the Elections Committee and distributed to all members eligible to vote no later than 15 days prior to the annual meeting. Voting shall be by secret ballot returned by mail or in person to the Elections Committee prior to the start of the annual meeting.

Ballots will be counted during the annual meeting by the Elections Committee. The Elections Committee shall present its report before the conclusion of the annual meeting.

A plurality of the ballots cast and counted shall constitute election.

COMMITTEES

****IMPORTANT NOTE****

There are some members of the Hawaii Audubon Society residing outside Hawaii who are eligible to vote in the December 1982 election. In the interest of saving time, such members (not Subscribers or Institutions) who wish to vote in this election may request a ballot, pending the outcome of the membership vote of October 18 on the proposed bylaw amendments. Such requests should be addressed to: Elections Committee, Hawaii Audubon Society, P.O. Box 22832, Honolulu, Hawaii 96822.

The Bylaws Committee

NEWEST ENDANGERED HAWAIIAN PLANT

On 23 September, 1982, the 'Ewa Plains 'Akoko (*Euphorbia skottsbergii* var. *kalaeloana*) became an official endangered species. In the 24 August *Federal Register* the U.S. Fish and Wildlife Service announced this determination. This is the sixth Hawaiian plant species to be listed as endangered under the Federal Endangered Species Act.

This shrub is only known from the 'Ewa Plains area of Oahu. A primary reason for listing this plant was the need to provide protection and the the need to prevent habitat degradation of its localized known range.

For more background about this listing, see page 36846 of Vol. 47, No. 164 of the the Tuesday, 24 August, 1982 *Federal Register*.

THE FIRST 100 YEARS

The American Ornithologists' Union, oldest and largest of the ornithological societies in North America, is celebrating the hundredth anniversary of its founding in 1883. Its quarterly journal, *The Auk*, now includes about 1000 pages a year of papers on a wide variety of ornithological topics. The long-awaited sixth edition of the AOU Checklist of North American Birds will be published in time for the centennial meeting. If interested in knowing more about the AOU, please write to: Membership Chairman Dr. Gustav A. Swanson, Department of Fishery and Wildlife Biology, Colorado State University, Ft. Collins, Colorado 80523.

PALILA NEEDS YOUR \$\$\$\$\$ AGAIN

The Hawai'i Audubon Society (HAS), through our attorney Michael Sherwood, of the Legal Defense Fund of the Sierra Club, is again challenging the State Department of Land and Natural Resources (DLNR) to protect the Critical Habitat of the Palila. In this instance, we are now contending that mouflon sheep are destroying the Palila's Critical Habitat as evidenced, for example, by the DLNR's own document entitled "Ecology of the Mouflon Sheep on Mauna Kea" written by DLNR State Biologist Mr. Jon Giffin with the support of Federal-derived Pittman-Robertson funds. Sherwood will ask the court to "continue" our victorious and nationally significant *Palila versus Hawaii* DLNR suit and ask the court to rule that the mouflon is also incompatible with critical habitat of the Palila and find the DLNR in violation of the national Endangered Species Act in continuing to maintain these game animals there.

Earlier, the courts had ruled that feral sheep and goats were destroying Palila critical habitat. The courts ordered the State to remove sheep and goats and to continue to report on their progress in accomplishing this biannually. The reports from the State's own biologists were an indictment of maintaining feral sheep and goats on Mauna Kea. But, the State succeeded in prolonging the suit for over three years while trying to appease their hunting lobby, only to be assessed over \$100,000 in court costs when they eventually lost the suit to us.

The mouflon sheep report also appears to have been an embarrassment to the DLNR since it covers the 1975-1979 period, but was publically released only this May. HAS hopes that the DLNR has learned a lesson and will not again try to place political expediency before biological reality and also drag the mouflon issue through the courts. HAS asks its membership and other concerned individuals to consider a contribution to the costs of asking the court to rule in our favor by sending their tax-deductible checks to:

Sierra Club Legal Defense Fund, Inc.
2044 Fillmore Street
San Francisco
CA 94115

Earmark your checks for the Palila Suit.

HAS Board of Directors



250 S. Hotel St., Rm. 211 B
Honolulu, HI 96813
521-1300



HAWAII LEAGUE OF CONSERVATION VOTERS

Please help improve the conservation orientation of our County and State legislatures by contributing time and/or money to the Hawai'i League of Conservation Voters (HLCV). They are an organization of individuals who feel strongly that it is time for conservation activism to enter the political arena. Their activities are directed by a Steering Committee supported by an Advisory Board of environmental, conservation and community leaders. The organization supports (or opposes) selected candidates for public office on the basis of the candidates' positions on environmental issues. HLCV also provides voter education materials, workers and/or funds for selected campaigns. Forty of the 58 candidates supported by HLCV in the Primary election will go on to the General Election. They invite everyone who would like to see the "Green Vote" grow to join with them in working to elect those who are truly concerned about the environment. HLCV endorsed the following candidates for the 2nd Nov. 1982 General Election:

Senate Districts:

3rd (North Kona--Hamakua--Kula--Hana)
Malama Solomon (D)
7th (Waialae--Kahala--Upper Palolo)
Steve Cobb (D)
9th (Waikiki--Kapihulu--Kaimuki)*
Bert Kobayashi (D)
11th (Tantalus--Makiki--Downtown)*
Neil Abercrombie (D)
12th (Nuuanu--Liliha--Alewa Heights)
Tony Chang (D)
17th (Pearl City--Old Waipahu)
Joe Kuroda
20th (Pacific Palisades--Waipio--Mililani)
Ben Cayetano (D)
21st (Wahiawa--Waimea Bay)
Gerald T. Hagino (D)
22nd (Sunset Beach--Kahuku--Heeia)*
Charles Toguchi (D)

House Districts:

2nd (Puna--Ka'u--South Kona)
 Andrew Levin (D)
 3rd (Hoanaunau--North Kona) *
 Virginia Isbell (R)
 9th (West Maui--Lanai-Moloka'i)
 Clayton Hee (D)
 12th (Waialae Iki--Maunalani Heights)
 Barbara Marumoto (R)
 15th (Kapahulu-Kaimuki)
 Ken Kiyabu (D)
 16th (Waikiki)
 Joan Hayes (D)
 17th (McCully--Moiliili)
 Dave Hagino (D)
 18th (Upper Manoa)
 Brian Taniguchi (D)
 20th (McCully--Lower Makiki--Kapiolani)
 Mazie Hirono (D)
 21st (Tantalus--Makiki--Papakolea)
 Russell Blair (D)
 22nd (Kakaako--Downtown)
 Kathleen Stanley (D)
 24th (Alewa Heights--Liliha)
 Byron Baker (D)
 25th (Kalihi--Kamehameha Heights)
 Gimo M. Manuel (Ind D)
 31st (Halawa--Aiea)
 Tom Okamura (D)
 37th (Ewa--Ewa Beach--Makakilo)
 Mike Crozier (D)
 42nd (North Shore--Kahuku)⁺
 Joe Leong (D)
 Laura Lee Bolles (R)
 43rd (Laie--Kahalua--Ahuimanu)
 Bob Nakata (D)
 44th (He'eia--Haiku--Kaneohe)⁺
 Terrance Tom (D)
 Nancy Clingan (R)
 47th (Aiea--Kailua)
 Verlie Ann Malina-Wright (D)
 48th (Lanikai--Keolu Hills--Waimanalo)
 Norma Wong (D)
 50th (Kapa'a-Lihue)
 Alfred C. Lardizabal (D)

Honolulu City Council:

4th (Kaimuki--McCully)
 Leigh-Wai Doo (D)
 5th (Waikiki--Manoa--Makiki) *
 Marilyn Bornhorst (D)
 8th (Halawa--Pearl City)
 David A. Haak (D)
 9th (Waipahu--Waianae)
 Patsy T. Mink (D)

Maui City Council:

At Large: Abe Aiona (D)
 Central Maui: Wayne K. Nishiki (D)
 Velma McWayne Santos (D)
 East Maui: Ry Barbin (D)
 Molokai: Linda Lingle (D)

Kauai City Council:

William U. Asing (D)
 Jeremy Harris (D)
 Rodney B. Yadao (D)

 D=Democrat

R=Republican

Ind D=Independent Democrat

+ Both candidates selected by HLCV won their respective primaries, so HLCV will be re-examining these campaigns before the General Election and make specific endorsements

* Campaigns targeted for extra HLCV support

I want to help the HAWAII LEAGUE OF CONSERVATION VOTERS and would be willing to:

Serve as a volunteer:

() for HLCV () for a specific campaign
 () walking precincts () stuffing envelopes
 () telephoning

Contribute funds to HLCV to support its political action work (Make checks out to HAWAII LEAGUE OF CONSERVATION VOTERS)

*I am enclosing \$ _____ OR I pledge \$ _____
 by _____ (date)*

*Name: _____
 (Please print)*

*Telephone: _____
 (Home) (Work)*

Address: _____

Zip

Wayne Gagné

PASTE-UP

Volunteers are needed to help with the November 'Elepaio issue. Paste-up will be held October 16 beginning at 9:00 a.m. at Marie Morin's home. No experience necessary! Call 533-7530 after 5:30 p.m. for more info.

ALOHA TO NEW MEMBERS

The Society welcomes the following new members and hopes that they will join in our activities to further the protection of Hawaii's native wildlife:

Joint with National: Joel Bergsma, Saipan; Vada and Clark Bowen, Waimea; Christina M. Brodie, Honolulu; Linda Brooks, Agana, Guam; Jennifer M. Bushur, Ewa Beach; D. Cameli, Kamuela; Bruce A. Carlson, Honolulu; Barbara Cassiday, Honolulu; W. C. Ebersole, Keaau; Jesse Farnsworth, Honolulu; Richard Flint, Captain Cook; Robert T. Gaffney, Hana; Patty Grady, Lihue; Howard F. Hall, Mililani; Ralph L. Johnson, Honolulu; J. Kaaihue, Honolulu; Catherine Lowrey, Kurtistown; Ela Lulich, Hana; Beth Madinger, Honolulu; Juanita Mundon, Waimea; Robert M. Rasmussen, Hanalei; Victor J. Renahan, Kaneohe; J. Scoppetto, Honolulu; Peter Stonge, Kaneohe; Mr. and Mrs. Herb Sufrin, Captain Cook; J. Sunderland and R. Watkins, Kapaau; Frederick C. York, Honolulu.

Local: Carol Cho, Honolulu; Robert Clayton, Kailua; Finley Family, Volcano; Jim Henderson, Kapaa; Robert J. LeClair, Honolulu; Harold Martin, Kailua-Kona; Elizabeth Wittermans, Honolulu.

Subscriber: Richard Schaefer, San Antonio, Texas; Peter LaTourrette, Los Altos, California.

Junior: Jean Campbell, Kailua; Alexander Fanale, Honolulu.

*Susan Schenck
Kammy Wong*

NATIONAL AUDUBON SOCIETY

77TH ANNUAL DINNER

For the first time in 76 years, the 77th Annual Dinner of the National Audubon Society is being held outside of Manhattan.

The dinner will be held 4 November, 1982 in Los Angeles at the Biltmore Hotel. National Audubon President Dr. Russell W. Peterson will give an address. There will also be a presentation on Mono Lake by David Gaines.

Members of the Hawaii Audubon Chapter are invited to attend. Reservations must be made before 29 October, 1982. The dinner is \$30.00 per person. Reservations can be made by writing to: National Audubon Society, 1414 Fair Oaks Avenue, Suite 6, South Pasadena, California 91030. Phone is (213) 441-3466.

OCTOBER FIELD TRIP:
WAIPIO PENINSULA

The Sunday, 17 October field trip will be to the Waipio Peninsula near Pearl City on Oahu primarily to view waterbirds. The leader for this trip is Bob Pyle (phone: 262-4046).

Meet at 7:30 a.m. on Punchbowl St., Honolulu next to the Hawaii State Library, or call the Leader to arrange another rendezvous site. Bring binoculars and interested friends along! Call Bob Pyle for more information.

GLEANINGS FROM TECHNICAL LITERATURE

Fossil Birds from the Hawaiian Islands:
Evidence for Wholesale Extinction by Man
before Western Contact

by Storrs L. Olson & Helen F. James
Science, Vol. 217:633-635
13 August 1982

Over the past 11 years, discoveries of fossil bird bones on Molokai, Oahu, Kauai, Maui, and Hawaii have shed new light on the pre-human contact Hawaiian fauna. So far, at least 39 species of land birds that did not survive to the written historic period have been found. These include at least 7 species of geese (including flightless species), 2 species of flightless ibises, a sea eagle, a hawk, 7 species of flightless rails, 2 species of crows, a honey-eater and at least 15 species of Hawaiian drepanids.

Evidence from archeological sites indicates that at least some of these extinct birds were present when Polynesians colonized the Islands. The authors speculate that human predation, the introduction of dogs, pigs and rats, and widespread lowland habitat modification via fire and cultivation contributed to the extinction of these birds.

Besides the discovery of numerous extinct species, other fossils have shown that historically known species thought to have restricted ranges were originally more widely distributed. One of the implications from these preliminary findings is that some currently rare Hawaiian birds are possibly, of necessity, restricted to habitat which is really marginal or sub-optimal because their optimal habitat (e.g. dry, lowland forest) is no longer available.

Marie Morin

OCTOBER PROGRAM:

EVOLUTION OF AN ENVIRONMENTAL
EDUCATION CENTER

Faith Roelofs will be the guest speaker for the Monday 18 October general meeting. She will start with a multi-media slide show called *History of Forestry in Hawaii* produced by Marie Gill for the State Div. of Forestry and Wildlife. Faith will follow with discussion about the Makiki Environmental Education Center's efforts to inform our Hawaii school children and public about our unique Hawaiian environment. Faith will also bring her bird "treasures" along for identification.

The meeting will be held at McCully-Moiliili Library on S. King St. at 7:30 p.m.

Leilani Pyle

EDITORS'NOTE: Please attend this general meeting since HAS Bylaw amendments will be voted on and at least 25 HAS member must be present.

PUBLICATIONS OF THE SOCIETY

HAWAII'S BIRDS by the Society (1981). This is the best field guide to our birds, and includes colored illustrations of all native and well-established exotic species. \$3.95 plus postage: 70¢ (surface mail) or \$1.03 (air). Hawaii residents only: add 16¢ for tax.

FIELD CHECKLIST OF BIRDS OF HAWAII by R. L. Pyle (1976). A pocket-size field card listing 125 species found in Hawaii with space for notes of field trips. (Postpaid).....\$.25
(ten or more, 10¢ per copy)

GUIDE TO HAWAIIAN BIRDING by members of the Society and edited by C. J. Ralph (1977). Where to go and some idea of what you are likely to see. For the islands of Kauai, Oahu, Lanai, Molokai, Maui and Hawaii (Postpaid).....\$1.50

PRELIMINARY LIST OF THE BIRDS OF HAWAII by R. L. Pyle (1977). An authoritative compilation of all species naturally occurring in Hawaii as well as those introduced by man which are currently established as viable populations. Gives each species' status. (Postpaid).....\$1.50

ENDANGERED WATERBIRDS OF THE HAWAIIAN ISLANDS by R. J. Shallenberger (1978). Hawaiian Stilt, Coot, Gallinule and Duck, each described in 2 pages of photos and text. Covers description, ecology, status, and distribution. (Postpaid).....\$1.00

RETIRED MEMBERS -- AHoy!

This is a signal from the Hawaii Audubon Society to a member who would like to get into a significant and worthwhile phase of the Society's work. A retired person might be especially suited to these duties, which are modestly challenging but not burdensome. George Campbell needs a partner to share the mailing of 'Elepaio. The partner would alternate with George in handling the monthly mailings. This arrangement would vary as necessary to provide for each partner's absence on trips, etc.

George has prepared work guides which simplify the details and facilitate the learning of duties. He will be glad to discuss and explain these duties to anyone who might be interested (without obligation, as the ads say). In this work you can learn a lot about 'Elepaio, our members, and the mailing system which is used by most medium-size non-profit organizations. More than that, you'll be adding to the strength of the Society and deriving personal satisfaction from being part of the Audubon team!

Contact George Campbell at 941-1356 for further information.

NEW BOOK ON BIRDS OF SAMOA

The birds of Samoa and their place in local folklore are the subject of a recently released volume written by Corey and Shirley Muse of Blue Mountain Audubon Society, Washington. Entitled "The Birds and Birdlore of Samoa: O Manu Ma Tala'aga O Manu O Samoa", the book is written for diverse interests including serious ornithologists who wish to know more about the area's birdlife as well as for the Samoan people to aid in their understanding of their world.

The book includes descriptions, photographs or illustrations of all birds known to occur, or to have occurred in the Samoan Archipelago up to 1980, a total of 72 species. The book's fine illustrations were painted by noted wildlife artist Norman Adams.

Copies of the 156 page book are available for \$13.94 from the Blue Mountain Audubon Society, P.O. Box 1141, Walla Walla, Washington 99362.

Reprinted from Audubon
Conservation Topics-West

MEMBERS WELCOME AT BOARD MEETINGS

The Board encourages members to attend and participate in the monthly Board meetings. It is a good way to get more involved in conservation issues and in the workings of the Society.

NOTE TO CONTRIBUTORS TO THE 'ELEPAIO

All contributions concerning natural history and conservation are welcomed, especially those pertaining to the Pacific area. The Editorial Committee wishes to encourage especially material from the various Pacific Islands, such as the Trust Territories, Guam, Samoa, and other areas. Articles on all natural history subjects are solicited.

It would facilitate the processing and review of your contribution if it could be submitted typewritten and double-spaced, although this is not a requirement. All articles of a scientific nature are sent out for comments to at least two reviewers familiar with the subject.

To insure proper handling and rapid publication of your contribution, it should be mailed to the co-editors, and sent to Marie Morin, 1415 Victoria St., #1515, Honolulu, HI 96822.

REPRINTS OF ARTICLES

Reprints of articles in the 'Elepaio are available to authors and others at the following rate if ordered before publication date: for 100 copies, \$10 per page of the article. For each additional 100 copies, add \$3.00 per page.

IF NOT A MEMBER, PLEASE JOIN US

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Special rates for full-time students and Senior Citizens (65 years of age or older) are available. Please write for application form.

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New members who send in dues between January and September will receive, if they request them, all back issues of the 'Elepaio for that year. After September, the dues are counted for the following year.

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CALENDAR OF EVENTS

- Oct. 12 (Tuesday). Board meeting at the home of Bob Pyle, 741 N. Kalaheo Ave., Kailua, at 7 p.m. (262-4046)
- Oct. 17 (Sunday). Field trip to Waipio Peninsula on Oahu. Meet next to the State Library on Punchbowl St., 7:30 a.m. Call the leader, Bob Pyle, at 262-4046 for more information.
- Oct. 18 (Monday). Regular meeting, featuring *Evolution of an Environmental Center*. McCully-Moiliili Library at 2211 S. King St., Honolulu, at 7:30 p.m.

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