

Observations of a Green Anole "Colony" on Kaua'i

by John H. Michael, Jr.¹

Introduction

Prior to the arrival of man there were probably no lizards present in the Hawaiian Islands. The green anole lizard (*Anolis carolinensis*) became established on O'ahu about 1950 (McKeown 1978). McKeown speculated that because anoles were popular as pets Hawaii's residents would transport them to the other inhabited islands. Based on personal observations, the green anole arrived on southern Kaua'i sometime prior to 1989. Since arriving they have successfully reproduced and appear to be establishing permanent populations.

The anoles of the Caribbean basin have been studied extensively. Apparently, they spread throughout the area by means of oceanic transport; moving from island to island over distances as great as 640 km (Williams 1969). The lizards not only colonized the various islands but evolved into 78 endemic species demonstrating a great capacity to adapt and evolve in a variety of habitats. According to McKeown (1978), the anoles present in the Hawaiian Islands originated in Cuba.

The green anole is described as being diurnal and arboreal with males being territorial (Behler 1979). Carr (1940) refers to them as the most arboreal of Florida's lizards. According to Behler (1979), the green anole lays one egg every two weeks during the breeding season. Eggs are laid in trash piles and decaying wood on the ground.

The green anole is carnivorous with insects making up the bulk of the diet. Dietary water is procured by lapping droplets from leaves. (Smith 1946).

This paper summarizes observations of green anoles made on Kaua'i during June and July, 1989, and August of 1991 and 1994. On six visits prior to 1989 no anoles were observed on Kaua'i. Most of the observations were of one particular colony in southern Kaua'i. The observations also report the response of that particular colony to Hurricane

Table 1. Summary of Observations of Green Anole Colony at Kuhio Shores, Kaua'i.

Year	Days Observed	Anoles Seen	Average Seen/Day	Maximum Seen
1991	11	30	2.73	6
1994	11	25	2.36	4

'Iniki.

Methods

Observations centered on a colony of anoles living in the landscape vegetation surrounding the Kuhio Shores condominium complex, located in the vicinity of Prince Kuhio Park on southern Kaua'i. The complex is located on the shoreline within 20 m of the ocean. The landscape areas referred to here were on the inland side of condominium structure.

The building and surrounding vegetation suffered extreme damage from Hurricane 'Iniki in 1992. Reduced landscape maintenance, particularly irrigation, during the rebuilding process (not yet completed in 1994) gave qualitatively different vegetation between 1991 and 1994.

Prior to the hurricane the landscaping was maintained as lush vegetation made up of a mixture of coconut palms, plumeria, hibiscus, other shrubs, and an unidentified viny groundcover. The groundcover plants provided a mixture of stems and leaves elevated up to 10 cm above the soil surface. The shrubs and trees provided trunks, branches, and leaves up to 10 m above ground. Vegetation was spray irrigated on a daily basis.

Post-'Iniki vegetation consisted of the palms and some hibiscus. In two locations the shrubs and palms were surrounded by the viny groundcover. Irrigation appeared to be reduced to about once per week, at least in August 1994. One location, the west site, a triangle 2 m on a side, was vegetated with the groundcover plant plus a single 10 m palm (about 30 cm diameter). The other location (east site) consisted of about three times as much groundcover area, a number of hibiscus and other shrubs, and group of young palms (about 10cm diameter). The majority of the remaining groundcover between the two sites is a sparse, low-growing grass with dry soil exposed between plants.

In 1991 and 1994 systematic daily searches were made for lizards. Any anole observed was identified, enumerated, classified as to response to observer, and classified into one of three size groups. The smallest, characterized by very small size (about 20 mm snout-vent length (svl) and gaunt appearance, were called hatchlings. Juveniles were somewhat larger, especially in terms of bulk. They did not have the gaunt, visible rib, appearance and were about 50 mm svl. Anoles classified as adults were the largest, approximately twice the size of juveniles both in

Table 2. Summary of size classifications for anoles observed at Kuhio Shores, Kaua'i.

Year	Hatchlings		Juveniles		Adults	
	N	prop.	N	prop.	N	prop.
1991	20	.67	6	.20	4	.13
1994	10	.40	12	.48	3	.12

terms of length and bulk.

Anoles incidentally observed at other locations on Kaua'i were classified in the same manner as the Kuhio Shores animals. Other lizards observed were identified to species and apparent behavior noted.

Species identification was based on McKeown (1978). Since then there have been changes in both species classification and identification (Adler et al. 1995).

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Results

At Kuhio Shores green anoles were observed at only the west site in 1991 and 1994; in 1989 none were seen at all. No anoles were observed at the east site.

A total of 30 anoles were observed at Kuhio Shores in 1991 and 25 in 1994 (Table 1). Since the animals were not marked no actual census was done. It is likely that some animals were counted more than once in a

day. The maximum number seen at one time was six in 1991 and four in 1994. This represents a minimum population size.

The proportion of anoles classified as adults in 1991 was .13 and in 1994 it was .12 (Table 2). The relatively high proportions of hatchling and juvenile lizards is at least partially explainable because of their accessibility; adults 10 m up in the palm fronds would be more easily missed than a hatchling sitting on a groundcover leaf. The only lizard actually captured and measured was 20 mm svl. The mean svl for captive green anoles reported by Greenberg and Hake (1990) was 22.5 mm, suggesting this lizard had recently hatched.

The primary differences observed among the three size groups were habitat choice and escape response. The hatchlings were always observed on or in ground cover plants (Figure 1). They were always within the matrix of stems and leaves and their escape response was to run rapidly through the plants. In some cases the hatchlings jumped from stem to stem within the matrix. Juveniles appeared to divide their time between the ground cover plants and the lower (up to 1-2 m above ground) trunks of trees and shrubs. If they were on the ground cover plants they would be seen on the surface leaves. Their escape response was to run over the surface leaves of the groundcover. When on tree trunks they behaved similarly to adult anoles and remained still. The adults were always observed in the trees, at times as high as 10 m (Figure 2). Escape response for adults generally consisted of remaining still. If necessary, they would deliberately move to another side of the trunk.

Anoles were seen at a number of other locations on Kaua'i. Individuals were seen in the Poipu and Koloa areas; both of these locations are within a few miles of Kuhio Shores. One anole was also seen in low shrubbery at Kilauea, on the northeast corner of the island. In all cases the anoles were associated with a complex groundcover and small trees or shrubs. The anoles were found in close association with human-maintained landscaping.

Discussion

The green anole has successfully established breeding populations on Kaua'i. From only one animal observed during the 1989 visit, numbers had increased substantially by 1991 and were relatively similar in 1994. The lizards were all observed in lowland areas in association with humans.

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Fig. 1. Hatchling green anole in vine groundcover at Kuhio Shores, Kaua'i.

The manner in which the different size groups of anoles divided up the habitat at the west site agrees with experiments Greenberg and Hake (1990) conducted with anoles held in vivaria. They concluded that hatchlings occupied lower perch sites than did adults.

The differences in relative proportion of hatchlings and juveniles likely represents differences in time of hatching between 1991 and 1994. Green anoles reach sexual maturity in about one year (Michaud and Echternacht 1995). Consequently growth must be rapid and a difference of a few weeks in hatching date between years can explain the differences in size which is then reflected in the hatchling/juvenile proportions.

Based on observations in 1991 it appeared that anoles observed at Kuhio Shores were only found in areas that were regularly (daily?) spray irrigated. This was further supported by observations throughout the island where the lizards were always observed in well irrigated landscape plantings. In 1994 the colony at Kuhio Shores was still present and of similar size to that seen in 1991 despite the absence of intensive irrigation.

The lizards were able to meet their daily water need at Kuhio Shores without daily irrigation. Some anoles were observed to lap water off of the groundcover leaves. This water was either dew or water forced out of the leaves (guttation). Since the groundcover plant was observed only in areas that were irrigated (on approximately a weekly basis in 1994) it seems that the lizards still require

some assistance from humans in the form of landscape maintenance to meet their water needs.

Since anoles require water droplets on leaves for drinking (Smith 1946), their spread in the Hawaiian Islands will be closely tied to locations with water droplets on leaves. These locations may be either in gardens, with water supplied by irrigation, areas with regular rain-fall, or near streams and waterfalls.

A metallic skink (*Leiopisma metallicum*) was observed at the base of the west site palm tree and within 20-30 mm of an anole in 1991. McKeown (1978) suggests that this skink may have assisted, through direct competition, in the decrease in Hawaii of the moth skink (*Lipinia noctua*) and the azure-tailed skink (*Emoia cyanura*). Since hatchling anoles at the west site appear to be basically terrestrial they will spend at least part of their life, perhaps a few months, sharing the habitat with the skink. This may be a factor limiting anole population growth or expansion if the skink is in fact a competitor with hatchling anoles.

In 1994 a cavity in the base of the west site palm tree contained at least three house gecko (*Hemidactylus frenatus*) eggs. As the gecko is basically nocturnal it is doubtful that they would directly compete with the diurnal anoles but may compete for egg-laying locations. This competition may be limited in areas where soil moisture necessary for successful reproduction is limited.



Fig 2. Adult green anole on trunk of palm tree, Kuhio Shores, Kaua'i.

Consequently, the three most common lizards on southern Kaua'i share at least some parts of their habitat; the ground and lower trunks of trees. How they actually partition up the habitat and whether there is any significant competition is not known.

The anoles on Kaua'i appear to have certain critical requirements for maintenance of a reproducing population. They require trees of some sort, as the adults are primarily arboreal. For egg laying they require moist, easily worked soil (Propper et.al. 1991). The hatchlings appear to require a complex groundcover layer made up of leaves and stems with many openings. Anoles require some free water on leaves for drinking (Smith 1946).

On Kaua'i, the lizards observed on the southern part of the island-Koloa, Poipu, and Kuhio Shores-probably owe their continued existence to human activities. While the observations in 1994 demonstrated that daily irrigation is not required as the direct source of drinking water, irrigation seems necessary to provide sufficient soil moisture for egg incubation, allow plants to produce water droplets on the leaves necessary to meet the daily drinking water requirement, and to provide a sufficiently complex groundcover. Nullet et.al. (1995), in studies on the island of Hawai'i, documented that dew and cloud water provided significant amounts of water, particularly in windward, mountainous areas. Much of this water was found condensed onto plant leaves. If this water or rain water is available on a daily basis then lizards on the more windward parts of the island may be able to exist independent of humans. Further, lizards living in spray or splash zones along streams, particularly near waterfalls, may find sufficient available drinking water to meet their daily needs.

McKeown (1978) describes the anole as filling an empty niche in Hawaii; that being a diurnal, generally arboreal, insect eater. Schoener (1991) demonstrated that the presence or absence of the brown anole (*A. sagrei*) on specific islands in the Bahamas archipelago was correlated with the extinction rate for various spider species. The mechanisms of spider extinction were both competition for the same prey and predation by anoles on spiders. Consequently, the presence of green anoles in Hawaii could have impacts on invertebrate populations, particularly endemic species which evolved in the absence of reptilian predation.

The presence of the anole colony at Kuhio Shores following Hurricane 'Iniki is confirmation of the species' tenacity. Despite los-

ing much of the potential habitat and the regular water supply they were able to maintain a successfully breeding population.

Summary

The green anole is established on Kaua'i. Having demonstrated the ability to survive a severe hurricane, it would appear that the lizard will continue to colonize the available habitats island-wide. Available habitat appears to include a complex matrix of groundcover and some sort of tree or tall shrub. Moisture is a requirement; some free water on leaves for drinking and some level of soil moisture to provide for proper incubation of eggs.

It would be worthwhile to monitor the spread of these lizards on Kaua'i and other islands in the archipelago to study their impact on native and introduced arthropod fauna. Anoles, especially in insular situations, may not be as benign as once considered but may pose a threat to small endemic arthropods.

Literature Cited

- Adler, G. H., C. C. Austin, and R. Dudley. 1995. Dispersal and speciation of skinks among archipelagos in the tropical Pacific Ocean. *Evol. Ecol.* 9:529-541.
- Behler, J.L. 1979. The Audubon Society field guide to North American reptiles and amphibians. Knopf. New York, NY. 720 pp.
- Carr, A.F. 1940. A contribution to the herpetology of Florida. *Univ. Fla. Pub., Biol. Ser.*, 3:1-118.
- Greenberg, N. and L. Hake. 1990. Hatching and neonatal behavior of the lizard, (*Anolis carolinensis*). *J.Herp.* 24:402-405.
- McKeown, S. 1978. Hawaiian reptiles and amphibians. The Oriental Publishing Co. Honolulu, Hawaii. 80 pp.
- Michaud, E. J. and A. C. Echernacht. 1995. Geographic variation in the life history of the lizard (*Anolis carolinensis*) and support for the pelvic constraint model. *J. Herp.* 29:86-97.
- Nullet, D., J. O. Juvik, and A. Wall. 1995. A Hawaiian mountain climate cross-section. *Clim. Res.* 5:131-137.
- Propper, C.R., R.E. Jones, M. S. Rand, and H. Austin. 1991. Nesting behavior of the lizard (*Anolis carolinensis*). *J.Herp.* 25:484-486.
- Schoener, T.W. 1991. Extinction and the nature of the metapopulation—a case system. *Acta Oecologica* 12:53-75.
- Smith, H.M. 1946 Handbook of lizards of the United States and Canada. Cornell Univ. Press. Ithaca, NY. 556 pp.
- Williams, E.E. 1969. The ecology of colonization as seen in the zoogeography of anoline lizards on small islands. *Quart. Rev. Biol.* 44:345-389.

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Albatross Project Update

by Dr. Gail Grabowsky Kaaialii,
Project Coordinator

We are now one month into the Albatross Recolonization Project going on out at Kaohikaipu Islet (Black Rock—off of Sea Life Park). The Project aims to establish a new breeding colony of Laysan Albatross on the islet. Albatross are being "encouraged" to land, and nest, on Kaohikaipu with the roughly 50 adult and chick decoys accompanied by recordings of adult and chick Laysan Albatross calls. The Project is in its third of six years running, this year, from 1 December, 1995 to 1 May, 1996.

Some 50-odd volunteers have signed-up to help take data on albatross sitings and behavior. Observations and data are taken from our viewing station on the grounds of Sea Life Park. Many of the volunteers are Hawaii Audubon Society members so I and project directors Steve Kress and Richard Podolsky as well as Ken McDermond of the U.S. Department of Fish and Wildlife would like to thank all of you who have volunteered your time and bird watching expertise. Without you there would be no data, there would be no project.

So far we have had four sitings, roughly one each week since the project began. The last siting by Hawaii Audubon members John

and Vicki Wendel was particularly encouraging since two albatross were seen together! We do not know if they were a mated pair or two birds of the same sex because Laysan Albatross exhibit no external differences between the sexes (sexual dimorphism) but we are hoping they are indeed a mated pair that might set up a new nest site on Kaohikaipu, our first real albatross family on the island.

We expect to see more and more albatross as the observation period progresses. Research has shown that young adult albatross (six to eight year olds) come off the water to nest later in the year than older experienced birds. Since older experienced birds typically nest where they have in past years—which is obviously not on Kaohikaipu—our greatest hopes lie with the young adults. March is expected to be our best month. Last year a few birds stayed on Kaohikaipu for a few days. So this year may be the year of the rise of a new colony—a nesting pair. It would be a nifty thing to witness!

If you are interested in volunteering to help take data call Gail Grabowsky Kaaialii, 528-4241 (9 a.m. to 9 p.m.) I am always willing to train new observers.

Kaua'i Developer to Protect Native Cave Creatures

The Kukui'ula Development Company, Inc. can lay claim to being the first private developer in the Hawaiian Islands to enter into a cooperative agreement with the U.S. Fish and Wildlife Service (USFWS) to protect two of Hawaii's most unique cave creatures, the blind Kaua'i cave wolf spider and the blind Kaua'i cave amphipod. Both are considered candidates for federal listing as endangered species.

Only two populations of the Kaua'i cave spider (*Adelecosa anops*) and four populations of the Kaua'i cave amphipod (*Spelaeorchestia koloana*) are known to exist in the world, all within a four square mile area of the Koloa lava series on the southern coast of Kaua'i. All populations occur on privately owned land. According to USFWS biologists, the best two caves—those providing habitat for all of the spiders and two popula-

tions of the amphipod—are located on land owned by the Kukui'ula Development Company.

"These are truly extraordinary creatures," explained Dr. Adam Asquith, entomologist for the USFWS Pacific Islands Office. "While a few species of wolf spider have reduced eyes, including another cave-adapted species on the Big Island, only the Kaua'i cave wolf spider has evolved to the point where it has no eyes at all. Likewise, the Kaua'i cave amphipod has no eyes and has developed its own unusual features."

Kukui'ula Development Company is a subsidiary of A&B-Hawaii, Inc., whose parent company is Alexander & Baldwin, Inc. It is developing a 1,000-acre master-planned residential community on lands surrounding the protected site.

With technical assistance from the

USFWS, the corporation will be installing steel grates over the entrances of both caves to restrict human access, revegetating the surface over one of the caves to restore a root system to the cave ecosystem, and removing debris from one of the caves that was historically used as a civil defense shelter.

"We're also working with officials from Kukui'ula Development Company to develop a long-term conservation agreement to reduce threats to these species, stabilize their populations, and maintain their ecosystem," said Asquith. "These very specialized communities cannot be recreated elsewhere. Without the support and commitment of the private landowner, we could have lost these two species forever, so we are particularly grateful to Kukui'ula officials for their kokua."

While unique cave creatures have long been known from continental cave systems, until the 1970s none were known in tropical and island subterranean systems. Since that time, however, approximately 50 species of cave-adapted animals have been discovered in Hawaiian caves, many of which have evolved from native surface-dwelling ancestors.

Kaua'i is the oldest of the eight major Hawaiian Islands and has undergone significant erosion. Soil formation and siltation have filled in most of the island's subterranean spaces. However, a small area along the arid southern coast of Kaua'i within the younger Koloa series of lava flows still remains to provide habitat for subterranean animals. In 1971, Dr. Frank Howarth of the Bishop Museum first discovered both the Kaua'i cave wolf spider and the Kaua'i cave amphipod.

Because these animals are found only in dark, moist areas of caves, cracks, and crevices within the lava flow, they have no need for eyes. The cave wolf spider is a predator and can detect the presence of potential food items by sensing their movement. "Interestingly enough, its primary food source is probably the cave amphipod," said Asquith. The amphipod feeds primarily on the root systems of surface plants and on plant material washed into the caves.

Source: U.S. Fish and Wildlife Service

Publications Available

The Hawaii Audubon Society publishes books, checklists, and field cards relating to birds of Hawaii and the Pacific. For a complete price list send a self-addressed stamped envelope to Publications List, Hawaii

Paradise Pursuits Update

by Sylvianne Yee

Happy New Year! I'm happy to report that KITV Channel 4 will once again be airing the Paradise Pursuits semi-final and final competitions on Saturday, 20 April. More good news is that Paula Akana, popular and vivacious news anchorwoman, has consented to be the host of the three programs. We welcome someone of Paula's talents and stature! We're also very fortunate to have the services of KITV's production expert David McDonough, a game show whiz and a past winner on Wheel of Fortune. David has done much to produce a smoother running show with a more professional touch.

Dates and sites for the preliminary games are as follows: O'ahu—10 and 24 February (Olelo the Corporation for Community Television); Big Island—2 March (Department of Education Hawai'i District Office in Hilo); Maui—9 March (Hawaii Nature Center at 'Iao); and Kaua'i—16 March (National Tropical Botanical Garden at Lawai). Although seating at most sites is limited, you are cordially invited to attend any of the preliminary competitions.

I am still in need of volunteers to help at the games and to provide transportation to and from the airport for the outer island teams. Please contact me at 373-3062 should you still be in the holiday giving spirit!

Moloka'i resident Vicki Newberry, a Maui District Department of Education resource teacher, has consented to be the contact person for Moloka'i High School.

On the Big Island we are very fortunate to have the help of two longtime Department of Education employees. Nanette Hiraoka, educational specialist in charge of environmental education, has very graciously consented to coordinate the Big Island schools. Nan is known as a hands-on educator who doesn't just sit in the office.

Audubon Society, 1088 Bishop Street, Suite 808, Honolulu, HI 96813.

'Elepaio Seeks New Managing Editor

by Susan Elliott Miller

Since July 1991, the 'Elepaio has arrived in your mailbox because of the hard work of Lynne Matusow. She cajoled, demanded, and nagged when necessary to get all the information and then put it through the magic of "Pagemaker" and the Society's ancient MacIntosh and even more ancient (and crotchety) printer to create the journal you see.

The Society's luck has run out, however, and Lynne needs to spend more time elsewhere. Our deep appreciation goes with her.

Now comes the interesting part—who is out there, within or outside the Society, who would like to become the volunteer Managing Editor of what HAS Board member John Harrison points out is "the only peer-reviewed scientific journal he knows of that's put out by a conservation organization?"

Writing and editing experience is important; the Society is willing to pay for needed training in the use of "Pagemaker," and Lynne has agreed to help bring the new editor up to speed about the scheduling, working with the printer and mailer, and authors. Also about the proper language to use with our friendly MacIntosh!

If you're interested, please call President Linda Paul at 262-6859.

On the good news side: wildlife biologist and Society life member Ronald Walker has agreed to take the post of Scientific Editor for the 'Elepaio. He will be responsible for making the final decision as to whether a given scientific paper will be published by the journal.

Birding on O'ahu

A two-page guide listing areas on O'ahu where interesting birds may be found and where access is not a problem is now available. Written by Peter Donaldson, it offers important information for birders unfamiliar with Hawai'i. The guide is not designed to give detailed directions or information on bird identification. For a free copy, send a self-addressed stamped envelope to O'ahu Birding Guide, Hawaii Audubon Society, 1088 Bishop Street, Suite 808, Honolulu, HI 96813.

Office Corner

by Susan Elliott Miller

Mahalo, You Are Wonderful!

...Lynnea Overholt for volunteering to become the caretaker of the Society's membership and subscription files. She will be working with Christi Moore to learn the ins and outs of the HAS system.

...Jean Oshiro for calling to say "Yes, she'd be willing to look up 'phone numbers" in preparation for the phonathon.

...Dance & Diane Aoki, Wendy Johnson, Caroline Mee, Christi Moore, Lynnea Overholt, and Linda Paul for spending the better part of a Saturday labeling, stuffing, and sealing about 2,100 annual mailing packets—we got them to the Post Office just on time!

More Wonderful People Wanted!

I am still hoping to find volunteers who would be willing to put in an hour or so a week during lunch or after work to respond to membership information requests and to keep the filing monster at bay. Call me at the office (528-1432) if interested.

Going on a Trip?

The newsletters from other Audubon chapters and other birding organizations around the world are now filed geographically. They are a good resource for finding out what is happening and what is of interest in places you are planning to visit. To look at them, call ahead—there is generally someone in the HAS office in the afternoons.

Election Results

Results of the election for 1996 officers and directors were announced at the 11 December 1995 Annual Meeting: (for two year terms) Janis McCain, first vice president; Wendell Lee, treasurer; David Michael Hill, corresponding secretary; and Reginald E. David, John Harrison, Wendy Johnson, Adaline Kam, and Suzanne Marinelli, directors. Elected to vacant seats with terms expiring this December were Kimberly Welch, recording secretary and Mary Gaber, Director. Continuing in office with terms expiring this December are: Linda Paul, president and Emily Gardner, second vice president.

Mahalo Donors!

by Susan Elliott Miller

The following members responded to the annual fund appeal by 31 December 1995. The Society's Board sends its mahalo a nui loa to all of you!

Diane Amuro, Eleanore Aylett, Paul H. Baldwin, Paul C. Banko, Francis L. Benevides, Jr., Nancy B. Black, Mr. & Mrs. William Braden, Carol Hopper Brill, Phillip Bruner, Ron Buelow, William M. Bush, Thomas R. Chell, Dr. John E. Cushing, S. F. Cushman, James Dexter, Eugene V. Donaldson, Steven F. Donovan, Jim A. Fakas, Elaine Fessenden, Joel Fithian, Leonard Freed, Hubert & Mable Frings, J. Richard Gauthey, Harriet Gilbert, Julia T. Gordon, Richard W. Gordon, Norma W. Gorst, William T. Gruenbaum, Ann Guild, Donald G. Hasenyager, Robert B. Hill, and Darcy Hu.

Also, Jean T. Inouye, Kamal Islam, Betty L. Johnson, Harvey C. King, B. Kirby, G. Donald Kucera, Ardell Kuchenbecker, Ken Kupchak, Edwin F. Laak, Doug Lamerson, Ronald D. C. Lau, Linda Nash Leighton, Marianne Long, John S. Mahoney, David R. McFaul, Caroline Mee, John Mendoza, Scott E. Miller, Marata Miner, Mike Morton, and Peter Nimkoff.

Also, Jenni Parkes, Naomi Parnes, Linda Paul, John Payne, George G. Peabody, Blanche A. Pedley, Patricia Prukop, Hal & Elly Roberts, Sharon Rooney, Ronald J. Ryel, Jennifer Saville, Kevin Shaney, Dunlap C. Shannon, Leon M. S. Slawecki, Edwin Solheim, Margaret C. Stone, Nancy B. Thurston, Walter Y. Tokushige, Charles Vaile, David Ward, Jr., Dr. Leslie A. Weight, Mrs. Macy Wessel, Lyndon Wester, David Wilbur, Ernest H. Willers, Lorrin Wong, and Alan C. Ziegler.

The Society also wishes to acknowledge a contribution of \$100 in memory of Helene B. Davis from George-Ann Maxson and Gladys M. Maxson.

Moving?

Please allow four weeks for processing address changes. Because our records are kept in order by zip code, we need both old and new addresses.

Welcome Katherine Puana

by Susan Elliott Miller

At its January meeting, the HAS Board approved the selection of Katherine Puana to serve as the Society's eyes, ears, and voice in the 1996 State legislative session. This is the third year that HAS has hired a legislative analyst for the session.

A graduate of Chaminade University, she also holds a law degree from the William S. Richardson School of Law and an M.S. in Criminal Justice Administration, earned concurrently. She was a program budget analyst for the Senate Ways and Means Committee during the 1992 session.

Katherine will be responsible for culling from the 3,000+ legislative bills and resolutions those affecting matters of concern to the Society; in consultation with appropriate Society leaders, developing testimony and presenting it at hearings; following the bills and resolutions through the process; submitting verbal reports at monthly Society Board meetings and a written summary of activity within two weeks of session's end.

When she's not up to her ears in paper, she likes to take of her two dogs.

Your Bequest Can Help

A bequest to the Hawaii Audubon Society is an excellent way to help in our conservation efforts. George C. Munro, enthusiastic and tireless field ornithologist and naturalist, provided for a fund to be used exclusively for the protection of native dry forests. Today, the George C. Munro Fund provides money for research projects on such forests.

Although an attorney should be consulted in the drafting of your will, a model clause for bequests is set forth below.

"I hereby give, devise, and bequeath to the Hawaii Audubon Society, Honolulu, Hawai'i, the sum of _____ dollars (or set forth a description of property), to be used for the general purpose of said organization."

For more information and assistance, contact the Hawaii Audubon Society, 1088 Bishop Street, Suite 808, Honolulu, HI 96813, (808) 528-1432.

Books for Serious Birders

by Darlene Fiske

We all know—or should—that the world is shrinking. We all know—or should—that the health of the whole is dependent upon its parts and our knowledge of them. A sign of the times is the issuance of a series of *International Bird Guides*. The series originated in Britain with *Shorebirds*, *Waders of the World*, in 1951. Now Houghton Mifflin, long a leader in bird book publishing, thanks to its early backing of Roger Tory Peterson, has brought the series to America. *Shorebirds* was reprinted here in 1988 after the success of *Seabirds of The World* in 1983 and *Waterfowl* (Ducks, Geese and Swans of the World) also in 1988.

Now available are *Woodpeckers Of The World* and *Crows, Jays & Magpies*. These two volumes join *Warblers Of The Americas*, released early this year. A volume on *Buntings* is soon to come. Also in the same form Princeton University Press has published *Kingfishers, Bee-Eaters & Rollers* (worth it for the title alone!) and *Finches & Sparrows* (won't it be grand to have them all together?!).

In all cases it is the first time a comprehensive single volume treatment of these species has appeared. Each book treats every species, many races, and most sex and age variations and the color maps show breeding and wintering ranges for all species. There is nice general information followed by detailed facts about distribution, migratory movements, habitat, identification, geographical variation, voice, habits, food and breeding. The color plates—showing all plumages—are excellent and the written accounts are by top experts with many years of extensive study in the field and the literature.

The books are an invaluable reference for a comprehensive ornithological library. They run about \$40 each, which would be well worth it to a serious birder with a particular interest in the above listed families.

T-shirts for Sale

The Hawaii Audubon Society has a stock of T-shirts designed to spread the Audubon message. Not only are they attractive personal apparel, but they make excellent presents as well.

T-shirts bearing the Society's 'Elepaio logo are available in blue spruce and mountain rose with a black design. We also have a few in ash (gray). In addition, the "hot" Kolea (Pacific Golden Plover) T-shirts are also available. This T-shirt is white with a three-color design of the Kolea and native hibiscus. Proceeds from the Kolea T-shirt go to help HAS fund research on shorebirds in Hawai'i and elsewhere in the Pacific region.

T-shirts are \$12 each, plus \$2.00 per shirt for postage. They are available in medium, large, and extra large adult sizes only. When ordering T-shirts, be sure to list size and first, second, and third choice of color. To order T-shirts send your check, payable to the Hawaii Audubon Society, to Yvonne Izu, 1957 Alai Place, Wahiawa, HI 96786. Don't forget to add \$2.00 per shirt for postage. Insufficient postage will delay your order until the proper amount is remitted. T-shirts are not available at the HAS office.

Research Grants

The Hawaii Audubon Society makes grants for research in Hawaiian or Pacific natural history. Awards generally do not exceed \$500 and are oriented toward small-scale projects within Hawaii. Special consideration will be given to those applicants studying dryland forests and aeolian systems on Hawai'i.

The deadlines for receipt of grant applications are 1 April and 1 October. For an application form send a self-addressed stamped envelope to Grants, Hawaii Audubon Society, 1088 Bishop Street, Suite 808, Honolulu, HI 96813. For more information, call Phil Bruner, (808) 293-3820 (W).

November 1995 Field Trip Report: Manoa Cliffs Trail

by John & Donna de Haan

Eleven optimistic hikers gathered on Sunday morning, 12 November in weather that promised some light mauka showers which sure enough developed as we entered Manoa Cliffs Trail from the Connector Trail. Manoa Valley was filled with misty billows of soft rain which made for beautiful views reminiscent of Chinese paintings; clouds shrouding ridges with softened light splashing the verdant pali. The morning was pleasantly cool, and as we progressed, the mists lifted and the day grew sunny and warm. We were pleased to see so much trail improvement by the Department of Land and Natural Resources (DLNR) Forestry Division from damage by trail bikes.

We were rewarded with sightings of two endemic bird species ('Amakihi and 'Apapane) and native plants in bloom. The 'Amakihi were sighted on koki'o ke'oke'o taking nectar from the base of the fragrant white blossoms. 'The Apapane were sighted in ohia and koa beyond the junction of the Manoa Cliffs and Pu'u Ohia Trails before entering the bamboo section to the telephone road. In addition, we saw Red-billed Leiothrix several times and heard and/or sighted Shama Thrush, Red-vented Bulbul, Red-whiskered Bulbul, Mejiro (Japanese White-Eye), Nutmeg Mannikin, and Common Waxbill. Near some vigorous maile, we observed at length a brilliant Kamehameha butterfly (*Vanessa tamehameha*) on a green ti leaf beside the trail.

Manoa Cliffs Trail is remarkable for the diversity of native plants, and fortunately, there are labels on many of them. We were able to procure some copies of the DLNR-Forestry and Wildlife guide produced by Raymond Tabata and John Moriyama in 1982, so there was an interesting botany section along with the birding.

Calendar of Events

Thursday, February 8

Monthly meeting of the **Education Committee**, 7:00 p.m., Bale Sandwich Shop in Manoa Marketplace, near Safeway. All are welcome. For more information call chairperson Wendy Johnson, 261-5957 (W).

Monday, February 12

HAS Board meeting, 6:30 p.m., at the office.

Monday, February 19

Join your fellow HAS members and bring your friends to the next bimonthly program meeting, when John Culliney will take us on a visit, through slides and a 15-minute video, to the North Sulawesi Islands (formerly known as the Celebes). The biodiversity of these islands makes them one of the world's treasure spots. They contain five active volcanoes and a national park with an incredible amount of wildlife, including giant hornbills. Paki Hall conference room, Bishop Museum, 7:30 p.m. Refreshments will be served.

Sunday, February 25, 1996

Ewa Plains limestone sinkholes. Dr. Alan Ziegler will lead a short walk to the sinkholes at Barbers' Point where we will see the geology of the area and hunt for fossil bird bones. Bring water, hiking shoes, hat, and sunscreen. Meet at the Barbers' Point Deep Draft Harbor at 9:00 a.m. at the end of Malakole St. (See your yellow pages for a map.) For more information call Adaline Kam, 529-6268 (w). Suggested donation \$2.00.

Monday, March 4

Regular first Monday of the month meeting of the **Conservation Committee**, 6:00 p.m., at the U. H. Environmental Center (Crawford Hall, Room 317, 2550 Campus Road). All are welcome. For more information call chairperson Dan Sailer, 455-2311 (evenings).

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