



'ELEPAIO

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Hawaii Audubon Society

For the Protection of
Hawaii's Native Wildlife

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SCALY-LEG MANGE FOUND IN HAWAII 'AMAKIHI ON THE BIG ISLAND: A NEW THREAT TO HAWAIIAN HONEYCREEPERS?

JACQUELINE M. GAUDIOSO¹, DAVID L. LEONARD, JR.², DENNIS A. LAPOINTE³, JENNIFER A. RANDALL⁴, AND LISA J. HADWAY⁴

Scaly-leg mange was recently found on Hawaii 'Amakihi (*Hemignathus virens*) in Manuka Natural Area Reserve (NAR) in the Ka'u district (first documentation: June 2007) and in the Keauohana Forest Reserve in the Puna district (October 2008) on the Big Island. Skin scrapings of the mange revealed an ectoparasitic mite, which was identified as *Knemidokoptes jamaicensis* (Gaudioso et al. in press). This mite is responsible for epizootic podoknemidoktiasis or knemidokoptic mange in wild birds and has been increasingly reported from wild passerines worldwide suggesting the occurrence of recent host shifts, increased movement of host species, or synergistic effects with environmental stressors. The lesions caused by the burrowing mites can lead to deformity of the feet and severe mite infestations may affect survivorship of the host (Latta 2003) due to reduced ability to perch and preen. Therefore, *K.*

jamaicensis poses an additional threat to Hawaii 'Amakihi and potentially other Hawaiian honeycreepers.

Although scaly-leg mange has been seen in domesticated canaries (*Serinus canaria*) in the Kona area, there has been no confirmed identification of *K. jamaicensis* in these cases (S. F. Nakaya, pers. comm.). No other wild species, native or non-native have been captured with knemidokoptic mange on the Big Island. Currently, mist-netting efforts continue at three sites along an elevational gradient in the Manuka NAR to determine the range of *K. jamaicensis* in the Manuka area, and opportunistic mist-netting continues in the Keauohana Forest Reserve to determine infestation rates there. Future efforts will focus on surveying additional sites of Hawaii 'Amakihi habitat in the western and southern regions of the Big

continued on page 72

Audubon's 109th Annual Christmas Bird Count December 14, 2008 – January 5, 2009

This winter, tens of thousands of volunteers throughout the Americas will take part in an adventure that has become a family tradition among generations. Families and students, birders and scientists, armed with binoculars, bird guides and checklists will head out on an annual mission. For over one hundred years, the desire to both make a difference and to experience the beauty of nature has inspired dedicated people to participate in the Audubon's annual Christmas Bird Count. Each of these citizen scientists makes an enormous contribution to conservation as Audubon and other organizations use data collected in this longest-running wildlife census to assess the health of bird populations - and to help guide conservation action.

Join the Hawaii Audubon Society for this year's event, the 65th annual count for Hawaii! People of all levels of birding experience are welcome to participate. Participants are asked to donate \$5 each to support the cost of compiling and publishing the data; there is no fee for children under 18. Check www.hawaii.audubon.com for up-to-date count information for Hawaii. Visit www.audubon.org/bird/cbc for more information.

This one-day annual event is a great opportunity to meet other local volunteers, hone your birding skills, collect valuable data for Hawaii, and take part in a seasonal tradition. Sign up today!

Contact your local CBC Coordinator to sign up

KAUAI

Kapa'a

Date TBA

Contact: Shayna Carney
shayna_carney@fws.gov

Koke'e

Date TBA

Contact: Michelle Ho'okano
Koke'e Natural History Association
(808) 335-9975
www.kokee.org

O'AHU

Honolulu

December 20, Saturday
Contact: Arlene Buchholz
(808) 779-5200
abvetlab@yahoo.com

Waipi'o

January 3, Saturday
Contact: David Bremer
(808) 623-7613
bremerd001@hawaii.rr.com

MOLOKA'I

December 15, Monday
Contact: Arleone Dibben-Young
(808) 553-5992
nene@aloha.net

MAUI

Pu'u o Kaka'e (East)

Date TBA
Contact: Jennifer Higashino
jenn@maui.net

'Iao Valley (West)

Date TBA
Contact: Jennifer Higashino
jenn@maui.net

HAWAII

Kulana (Volcano)

December 20, Saturday
Contact: Eldridge Naboa
enaboa@tnc.org

North Kona

December 17, Wednesday
(date is weather dependent)
Contact: Maile Melrose
(808) 323-3378

Island to determine the geographical extent of *K. jamaicensis*, establishing a captive flock of infested and non-infested birds to identify mode(s) of transmission and effective methods of treatment, and blood sampling and diagnostics to determine the relationship, if any, between avian malaria or avipoxvirus and mite infestations.

We ask the public to be aware of the symptoms of knemidokoptic mange (see Figure 1) and to report any sightings or captured birds (live or deceased) exhibiting knemidokoptic mange to David Leonard of the Division of Forestry and Wildlife (email: david.l.leonard@hawaii.gov). Live birds exhibiting mange should be placed in a cloth bag or box and carcasses exhibiting mange should be placed in a plastic bag and refrigerated.

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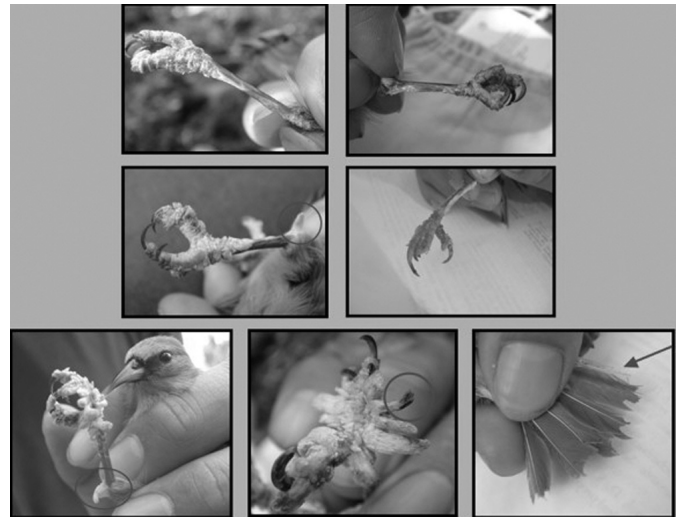


Figure 1. These photographs were taken of infested Hawai'i 'Amakihi at Manuka NAR. During the early stage, scales begin to lift upright on the feet and hallux. During the middle stage, the lesions begin to encrust digits and a spur may begin to form at the tibiotarsal joint, as circled in the middle left image. During the advanced stage, lesions completely encase digits, and the spurred lesion at the tibiotarsal joint is fully extended, as circled on the lower left image. One individual with advanced mange exhibited a green, algal-like growth on the extremity of the lesions, as circled in the lower middle image. Feather degradation on both the flight feathers and tail feathers was common in birds with advanced mite infestations, as denoted by the arrow in the lower right image.

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The Red-vented Bulbul – “Superbird”?

By Ron Walker

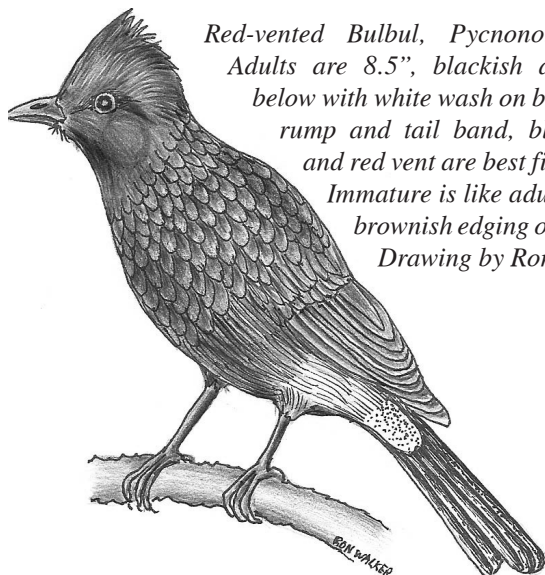
The Red-vented Bulbul (*Pycnonotus cafer*) should be familiar to anyone who lives in or about an urban, residential, rural, agricultural, or lowland forest setting on O‘ahu. Although an attractive bird with interesting vocal abilities, it is best known for its ubiquity, pestiferous habits, and illegal arrival.

A native of Southeast Asia, the Red-vented Bulbul first appeared on O‘ahu in October 1966 near Waipahu; I saw my first ones in 1967 at Fort Shafter. It has been postulated that their arrival was due to an accidental release from a cage at the Honolulu International Airport or from Fijian birds deliberately brought in cages from which they inadvertently escaped. Since then, this species has proliferated on O‘ahu. Reported sightings on other islands include Kailua-Kona, 1982; West Moloka‘i, 1983; Kaua‘i, 1985 and 1987; Hilo, 1987; Maui, 1988, and Kaho‘olawe, 1989. To date, none of these reports has been followed by known establishment of bulbuls on these islands.

In terms of its aggressiveness, adaptability, reproductive capacity and food habits, the Red-vented Bulbul can be considered a “superbird”. It is highly competitive with its own kind and will chase and intimidate other species of its size or smaller. It has adapted to a large variety of habitats and sometimes chooses very unique nesting sites, including hanging and potted plants, and vines crawling up porches. In Asia, nests were recorded in the top of a stump, in a chandelier in a drawing room, and a luggage rack of a bus. For the most part in Hawai‘i, it nests at relatively low heights in trees and shrubs. (I’ve noted a nest in a Ti plant about 4 feet above ground.) In Nepal, nesting has been noted in “open deciduous forest, secondary growth and trees around habitation.”

As to reproduction, it lays 2 to 4 pinkish-white, purplish-brown or partially red eggs and may have 2 to 3 broods a year from April to October (peaking in June-July). It may live as long as 11 years. Few factors limit its life other than its forceful elimination by those permitted to do so for nuisance, crop damage, or human health hazard reasons. Rats, cats, and mongooses may prey upon the eggs and young.

But it is in its food habits that this species rises to dominance in the bird world. As an omnivore, the list of plants and animals the Red-vented Bulbul (and its cousin, the Red-whiskered Bulbul) eats is remarkable. It feeds on the nectar, buds, seeds, and flower petals of plants and in the bark of trees. Any invertebrate or reptile it can fit down its gullet is fair game.



Red-vented Bulbul, Pycnonotus cafer.
Adults are 8.5”, blackish above and below with white wash on belly. White rump and tail band, black crest, and red vent are best field marks. Immature is like adult but with brownish edging on feathers.
Drawing by Ron Walker.

Red-vented Bulbul Diet

PLANTS:

Fruits: oranges, tangerines, lemons, limes, peaches, mangoes, bananas, lichees, guavas, mountain apples, Surinam cherries, papayas, mulberries, strawberries

Vegetables: string beans, pole beans, lettuce, spinach, chili peppers, peas, eggplant, tomatoes, cucumbers, zucchini, bell peppers, avocados

Flowers: ginger, carnations, anthuriums, mock orange, orchids (including dendrobiums and vandas)

Other plants: strawberry guava, banyan, fig, autograph tree, octopus tree, clidemia, naio, Java plum, mulberry, bottlebrush, coral tree

ANIMALS (including larvae):

Ants, beetles, cockroaches, bees, wasps, aphids, caterpillars, praying mantis, geckos, skinks, moths, butterflies

The government, of necessity, is dealing with this species. The State Department of Agriculture (DOA) prohibits the importation of this bird (Chapter 4-71, Administrative Rules), and the State Department of Land and Natural Resources (DLNR) lists bulbuls as “injurious wildlife” (Chapter 124, Administrative Rules). Therefore, bulbuls may not be imported into Hawai‘i, and they may be removed from the wild if they are determined to be harmful to agriculture, aquaculture, indigenous wildlife or plants, or constitute a nuisance or health hazard.

An irony is that bulbuls are otherwise protected by the “Wild Bird Law” (Chapter 124) which states that “No person shall attempt to, or catch, possess, injure, kill, destroy, sell or offer for sale, transport, or export any indigenous wildlife or introduced wild bird except by an authorized employee of the department or persons authorized by the board or its authorized representative....” This also allows DLNR to issue permits to export injurious wildlife, including bulbuls. DLNR may also issue permits to maintain wild birds, including bulbuls, in captivity for “... the protection, treatment for injury or disease, propagation, and other purposes consistent with the preservation, protection, and conservation of the animals.” Such permits are regularly issued by DLNR for “hospital” purposes.

In response to concerns over economic losses caused by bulbuls, the Hawai‘i state Legislature passed House Concurrent Resolution “Requesting a Control Program for the Red-vented and Red-whiskered Bulbuls to protect Hawaii’s Agriculture” (H.C.R. No. 152, H.D. 1, April 25, 1988).

To some extent, bulbuls have a positive impact by consuming weed seeds and noxious plants as well as gracing our yards with sight and sounds. But they also spread weed seeds in their droppings and can have devastating impacts on family and commercial crops. The Red-vented Bulbul on O‘ahu is here to stay; the only hope is that the species will not spread to the neighbor islands by natural means or by man. It is the ultimate invasive species of the animal world.

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Birds in My Indian Garden. Malcolm MacDonald. Alfred A. Knopf. 1961. 192 pgs.

Bulbul Introductions to O‘ahu. Richard N. Williams. ‘Elepaio, Vol. 43 (12), pgs. 89-90. May, 1983.

Bulbul Pest Alert Poster Information Packet. U. S. Department of Agriculture, Animal Damage Control. December, 1988. 6 pgs.

continued on page 74

HILTON HAWAIIAN VILLAGE FLORA and FAUNA

With Wildlife Staff Member Lisa Goya-Nishikawa

By Alice P. S. Roberts

If you've never been to the Hilton Hawaiian Village, there are 10 ponds, lots of birds, many wondrous plants, and gorgeously maintained grounds. On Saturday, June 14 at 9 a.m., seven of us met Lisa, who has been doing this tour annually for Hawaii Audubon Society for years, at the Penguin Enclosure. The South African Black Footed Penguins still seem content to be in Hawai'i (they're not polar); a couple were in various molting phases. Lisa brought Icarus over and we were able to feel the feathers - outer waterproof, inner downy (you can feed them at the "Penguin Encounter" (8 a.m. daily). They live with some turtles including a softshell, a new smaller black Pacu (vegetarian piranha), grass carp, and some Tilapia.

As we toured several ponds, some with waterfalls, we saw several "resident" (uninvited) Black-Crowned-Night Herons, Flamingos, Sacred Ibises to which we fed mealworms (you can feed them at the "Ibis Encounter" M-F 8:30 a.m.), one Black-Necked Swan "Ānuenue" (he was born here many years ago, I remember when he was an egg!), and many ducks. The White Faced Tree Ducks (like the Eyton Tree or Whistling Duck) sounded like squeaky toys; there were several hybrids (White Faced Tree Duck X Whistling) who also squeak! The Mandarin Ducks (Asia) were in plain everyday plumage, while the male North American Wood Ducks "Woodies" were partly in courtship feathers with green hoods. Many ducks still parade around the grounds from pond to pond, pool to pool - especially loving the Super Pool!

The Parrots, as usual, were "off on Saturdays" (to get bathed and clipped), but we got to see several of them in the holding area up in a corner of the garage - male and female Eclectus, a couple small parrots. We saw several macaws: Red, Scarlet, Military, and a handsome orange-rainbow of colors hybrid; a couple of us got to hold a Blue and Gold Macaw.

In the ponds were many gorgeous koi (including 1 or 2 butterfly koi - hard to keep pretty with cichlids nibbling fins), really big blackish grass carp (wonderful filter feeders who help keep the water clear), Liberty Mollies, electric blue (male) and yellow (female) Cichlids, and Tilapia (another cichlid) of many sizes (wild gray and orange).

Along the pathways, many beautiful bromeliads were blooming amongst all kinds of well kept plants. There are many

restaurants and stores at the Hilton Hawaiian Village, take a trip to Waikīkī, walk the grounds, have a great meal and get your parking ticket validated.

Try to join us next June. Aloha, Alice



Hilton Hawaiian Village Wildlife Staff Member Lisa Goya-Nishikawa led the HAS group on a tour of the wonderful flora and fauna at HHV. Several lucky participants also got to hold this beautiful blue and gold macaw.

continued from page 73

Bulbuls in Auckland. E. G. Turbott. Auckland Museum. Undated, unattributed. University of Hawaii Library. Division of Forestry and Wildlife Library, File 5-C. pgs. 185-193.

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Birds of Nepal. Richard Grimmett, Carol Inskipp, Tim Inskipp. Princeton Field Guide. Princeton University Press. 2000. 288 pgs.

Handbook of the Birds of the World. Vol. 10. Cuckoo-shrikes to Thrushes. Bird Life International, Pgs. 148, 184. 2005.

Indigenous Wildlife, Endangered and Threatened Wildlife and Introduced Wild Birds. State Department of Land and Natural Resources. Title 13, Subtitle Forestry and Wildlife, Part 2 Wildlife, Chapter 124. September 1, 1994.

List of Prohibited Animals. State Department of Agriculture. Hawaii Administrative Rules, Chapter 4-71, Section 6. November, 2006.

Red-vented Bulbul on the Island of Hawai'i, The. Richard N. Williams. 'Elepaio, Vol. 44(12), pgs. 101-103. June, 1983.

Spread of Bulbuls to Hawai'i and Implications to Agriculture, The. F. R. Warshauer. Animal Damage Control. APHIS, U. S. Department of Agriculture, August, 1987. 21 pgs.

Green Your Holidays at the Green Market Gift Fair Saturday, December 6

The annual Green Market Gift Fair will take place on Saturday, December 6 from 9am to 2pm at Church of the Crossroads, 1212 University Ave. There will be food, recycle art crafts, keiki activities, and green gifts to buy in support of local non-profits! Green your holidays at the Green Market Gift Fair!

Extinct Hawaiian Birds

By Ron Walker, with Eric Vanderwerf

Twenty two bird species have gone extinct in Hawai'i since 1825; the last one, the Kama'o, officially in 1989. No bird has made the list for the last 19 years, although the Hawaiian crow (Alalā) is now found only in captivity and what is believed to be the last Po'ouli died in captivity in 2004. The greatest period of loss was during the 1890s when 6 bird species disappeared. As of matter of interest, globally, the first recorded bird extinction was in the 16th century when the Saint Helena rail disappeared in 1502.

In 2007, Birdlife International published the "Rare Birds Yearbook 2008: The World's 189 Most Threatened Birds" which discussed birds threatened with extinction, but also provided a list of extinct species (see book review in the 'Elepaio, Volume 68:3, April 2008). The list is provided here.

1825	'Amaui	<i>Myadestes oahuensis</i>
1837	O'ahu 'O'o	<i>Moho apicalis</i>
1859	Kioea	<i>Chaetoptila angustipluma</i>
1884	Hawaiian Crake	<i>Porzana sandwichensis</i>
1891	Lesser Koa Finch	<i>Rhodacanthis flaviceps</i>
1892	Maui Nui 'Akialoa	<i>Akialoa lanaiensis</i> *
1892	Ula-'ai-hawane	<i>Ciridops anna</i>
1894	Kona Grosbeak	<i>Chloridops kona</i>
1896	Greater Koa Finch	<i>Rhodacanthis palmeri</i>
1898	Hawai'i Mamo	<i>Drepanis pacifica</i>
1901	Greater 'Amakihi	<i>Hemignathus sagittirostris</i>
1907	Black Mamo	<i>Drepanis funereal</i>
1918	Lana'i Hookbill	<i>Dysmorodrepanis munroi</i>
1934	Hawai'i 'O'o	<i>Moho nobilis</i>
1940	O'ahu 'Akialoa	<i>Akialoa ellisiana</i>
1940	'Akialoa	<i>Hemignathus obscurus</i>
1944	Laysan Crake	<i>Porzana palmeri</i>
1963	Kakawahie	<i>Paroreomyza flammea</i>
1969	Kaua'i 'Akialoa	<i>Akialoa stejnegeri</i>
1981	Bishop's 'O'o	<i>Moho bishopi</i>
1987	Kaua'i 'O'o	<i>Moho braccatus</i>
1989	Kama'o	<i>Myadestes myadestinus</i>
1990-1999		none confirmed
2000-2007		none confirmed

**Hemignathus ellisianus lanaiensis* (Checklist of the Birds of Hawai'i 2002. R.L. Pyle)

HAS Field Trips

Contact the HAS Office at:
(808) 528-1432, hiaudsoc@pixi.com

Saturday, December 6

Wetland Walking Tour, with Ron Walker

HAS Second Vice President and expert birder, Ron Walker, will lead you on a wetland birding tour. Contact the HAS office for more information and to reserve a space; be sure to leave your contact information.

Saturday, December 13, 1:00 p.m.

Energy Efficient Solar House, with John Harrison

HAS President John Harrison will give a tour of his energy efficient home which is run on solar power. Contact the HAS office for more information and to reserve a space; be sure to leave your contact information.

December 14 – January 5

Christmas Bird Count

Count dates and times for all islands are listed on page 71, and online at www.hawaii.audubon.com. Join us in collecting important data for Hawaii's birds!

HAS Research Grant Awarded

Each year, Hawaii Audubon Society awards two grants for research in Hawaiian or Pacific natural history. We are pleased to announce that Richard Pender of the UH Mānoa Botany Department has been awarded an HAS research grant of \$500. His research is entitled: Are Honeycreepers still pollinating species of Clermontia (Campanulaceae), a genus of Hawaiian lobelaid? Congratulations to Richard Pender and we look forward to a report on his conclusions!

HAS Annual Membership Meeting Bird ID Slideshow, Christmas Gifts, and More

December 15, Monday

6:30 - 8:30 p.m.

HAS Second Vice President Ron Walker will present his fabulous lecture and slideshow on bird identification. Rumor has it that HAS Board Member Phil Bruner will also be in attendance, along with his collection of bird skins! Come and brush up on your bird ID skills with the experts in time for this year's Christmas Bird Count. Meet fellow members and shop for Christmas gifts that support the Society!

The meeting will be held at UH Mānoa's St. John lab building (Botany Building) in room 011 (ground floor auditorium). The address is 3190 Maile Way. Attendance is free and open to the public. Refreshments will be served.

Christmas Gifts That Support The Society

To Order: Visit our online store at www.hawaiiadubon.com (view color photos of products there as well).
Or fill out this form and mail it with your check, payable to Hawaii Audubon Society, to
850 Richards St. #505, Honolulu, HI 96813. Be sure to include your mailing address; products
will be shipped upon receipt of payment.

Give the Gift of Membership

Memberships are valid for one year from January 1 to December 31 and include a subscription to the *'Elepaio*.

_____ Regular Membership \$25	Name and Address of New Member:
_____ Student Membership \$15	_____
_____ Supporting Membership \$100	_____
_____ Foreign Membership (Airmail) \$33	_____

Products and Publications

Prices include postage. Please indicate quantity:

_____ ***Hawaii's Birds*** field guide by the Hawaii Audubon Society, 6th edition, 2005. Over 150 color photographs and illustrations. \$15.80

_____ ***Voices of Hawaii's Birds*** by Douglas Pratt and the Hawaii Audubon Society, 1995. Two 60 minute tapes of songs of more than 100 species of birds found in Hawai'i. \$10.00
_____ Separate 10-page supplement also available for \$1.00.

_____ **Greeting Cards, set of 8 plus envelopes.** A beautiful collection of prints of rare and endangered Hawaiian birds by Patrick Ching. \$9.50

_____ **Hidden Treasures of O'ahu Map** A fun and informative self-guided tour of O'ahu including hiking, birding, and ancient cultural sites. \$4.95

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Please circle your color and size choices:

Men's style:	S	M	L	XL	XXL	White	Natural	Jade
Women's style:	S	M	L	XL		White	Aqua	

_____ **Ruddy Turnstone ('Akekeke) T-Shirts** A full color picture of the Ruddy Turnstone with both its Hawaiian and Inuit names. Part of the proceeds benefit our Shorebird Research Fund. \$26.00
Choose a size: S M L XL

_____ **Kolea Research Fund T-Shirts** A lovely Kolea (Pacific Golden Plover) among yellow hibiscus blossoms. Part of the proceeds benefit our Shorebird Research Fund. \$26.00
Choose a size: S M L XL

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Chestnut hill Performance Plus Pique Polo, 100% combed cotton pique. See colors at www.hawaiiadubon.com.
S-XL \$40.00, XXL \$42.00

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Women's style:	S	M	L	XL	Stone	Azalea

_____ **TOTAL ENCLOSED** Be sure to send us your mailing address.

Thank you for supporting the Hawaii Audubon Society!

Freeman Seabird Preserve Update and Volunteer Opportunity

In the fall of 2007, the Hawaii Audubon Society received a gift of a one-acre oceanfront property at Black Point on the south shore of O'ahu. The site supports a thriving colony of wedge-tailed shearwaters (*Puffinus pacificus*) and was deeded to the Society for the purpose of establishing the Freeman Seabird Preserve (FSP) for the protection of native birds, plants and habitat. A vacant residential lot for several years, the Preserve is in need of clean-up and alien plant removal, as well as predator control and nesting habitat enhancement. Wedge-tailed shearwaters have been nesting under shrubs, in shallow burrows and rock crevices on the FSP and on the properties of several surrounding neighbors for decades, but anecdotal observations are inconsistent and unreliable for estimating population fluctuations.

From mid-December 2007 through March 2008 when the birds were at sea, HAS volunteers met at FSP on a regular basis to remove trash and invasive grasses, vines and shrubs. A program for predator control in 2008 was confined to targeting rats by the placement of six bait (Diphacinone) stations on the property. Initially bait was heavily consumed and needed replenishment weekly, but by May 2008, bi-weekly bait checks were adequate. No evidence of mammal predation has been noted in the wedge-tailed shearwater population at FSP in 2008. Several un-hatched eggs were found during a population survey conducted in the afternoon of September 6, 2008. Forty-seven downy chicks were counted in active nesting sites and



Wedge-tailed Shearwater; one of this year's happily raised inhabitants at the Freeman Seabird Preserve.

about 200 past or potential nesting sites (containing guano and/or feathers) were identified on the one-acre Preserve. Plans for 2009 include continuing predator control, further cleanup, and landscaping and planting of native shrubs and grasses to provide additional breeding and nesting habitat.

Hawaii Audubon Society members who are interested in participating in these activities on weekend days from December through March should contact the HAS office by phone or e-mail to request notification about specific dates and volunteer opportunities as they are scheduled.

Membership in Hawaii Audubon Society 2008

Regular Member: \$ 25.00
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Supporting Member: \$100.00

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Mexico..... \$ 26.00
Canada..... \$ 28.00
All other countries \$ 33.00

*These are annual membership dues, valid January 1 through December 31.
Donations are tax deductible and gratefully accepted.*

Name _____

Address _____

City, State, Country, Zip _____

Phone _____

Email _____

Membership \$ _____ + Donation \$ _____ = Total \$ _____

New Membership ☐ Renewal ☐

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PLEASE LET US KNOW IF YOUR ADDRESS CHANGES.



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Calendar of Events

Saturday, December 6

HAS Field Trip

Wetland Walking Tour with Ron Walker

See page 75

Saturday, December 6

Green Market Gift Fair

Church of the Crossroads, 9am to 2pm

See page 74

Saturday, December 13

HAS Field Trip

Energy Efficient Solar House, with John Harrison

See page 75

Monday, December 15

HAS Annual Membership Meeting

Bird ID Lecture, Christmas Gifts, and More!

See page 75

December 14 – January 5

Annual Christmas Bird Count

See page 71

Table of Contents

**SCALY-LEG MANGE FOUND IN HAWAII 'AMAKIHI
ON THE BIG ISLAND: A NEW THREAT TO
HAWAIIAN HONEYCREEPERS? 71**

Audubon's 109th Annual Christmas Bird Count..... 71

The Red-vented Bulbul – “Superbird”? 73

Hilton Hawaiian Village Flora and Fauna74

Green Your Holidays at the Green Market Gift Fair74

Extinct Hawaiian Birds 75

HAS Field Trips 75

HAS Research Grant Awarded 75

HAS Annual Membership Meeting..... 75

Christmas Gifts That Support The Society 76

**Freeman Seabird Preserve Update and Volunteer
Opportunity 77**

Membershp Application 77