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Sight Record of Lesser Yellowlegs in French Polynesia

by James F. Clements[1]

On 4 October 1991, at 1330, I was surprised to encounter a Lesser Yellowlegs *(Tringa flavipes)* on an uninhabited motu in Rangiroa (43°18'S, 172°35'W) in southeastern French Polynesia. This North American breeder is an uncommon but regular winter visitor to the Hawaiian Islands and Johnston Atoll (Pratt *et al.* 1987). It is reported as a casual visitor to the Hawaiian Islands by the American Ornithologists' Union (AOU 1983).

The sighting of four individuals in 1984 at Takapoto Island in the Tuamoto Archipelago is the only prior record that I am aware of (Intes 1988). Takapoto lies slightly north and about 500 km east of Rangiroa.

Its congener, the Greater Yellowlegs (*Tringa melanoleuca*), is also listed as casual in the Hawaiian Islands (AOU 1983), and an unsubstantiated report exists from Wake Island (Pratt *et al.*). A yellowlegs, not positively identified, but probably *T. melanoleuca*, has also been seen on Rarotonga (Pratt *et al.*).

Rangiroa lies at the extreme northwest corner of the Tuamotu Archipelago, a vast coral chain spanning some 4,000 km slightly north of the Tropic of Capricorn. The atoll of Rangiroa is the largest coral atoll in the group, with a circumference of 230 km. The area in which the yellowlegs was observed is locally referred to as *Lagun Bleu* (Blue Lagoon), and is surrounded by a small group of uninhabited motus 40 km southwest of Kia Ora Vilage.

The Lagun Bleu is actually a lagoon within a lagoon. I estimated the distance across the lagoon at approximately two km, and was able to walk out some 100 meters from the exposed coral reef in knee-deep water.

The temperature of the Lagun Bleu was noticeably warmer than that of the major Rangiroa lagoon, but I was not able to record the difference in temperature. This might provide a richer habitat for waders than the surrounding motus, since it was the most prolific site I observed for waders in any of the numerous coral atolls I visited in French Polynesia.

The yellowlegs was in "loose" company with four other waders, the much larger Bristle-thighed Curlew *(Numenius tahitiensis)*, Pacific Golden-Plover *(Pluvialis fulva)*, Wandering Tattler *(Heteroscelus incanus)*, and a lone Tuamotu Sandpiper *(Prosobonia cancellata)*. While each of these waders explores a slightly different niche, the coral motus where they winter apparently offer enough variety for their rather catholic tastes.

Following are some quotations from my field observations at the time.

"Able to approach to within about 10 meters of the bird. Shows some light streaking on the upper breast. Upper parts pale brownish-gray, with some mottling on the scapulars. White rump prominent in flight. Legs much brighter yellow than nearby Wandering Tattler. Bill slightly smaller than nearby tattler and not as thick...much more delicate."

The yellowlegs was feeding among some coral rubble on the motu, at times close to the Tuamotu Sandpiper. Latter was quite tame, allowing approach to within three meters, but yellowlegs would only tolerate approach to within 10 meters. It did not call when disturbed, unlike the curlews and tattlers in the area. Bird appeared in excellent condition, and was in the same non-breeding plumage that I am most familiar with in Southern California.

Rarotonga (Cook Islands), where the prior record of a yellowlegs sp. occurred, lies approximately 2,000 km west of Rangiroa, and slightly south. A map of the tropical Pacific shows that a migrant wader overshooting the Hawaiian Islands would be most likely to wind up in some part of French Polynesia.

The distance from the Hawaiian Islands to the Tuamotu Archipelago is approximately 4,000 km, an overwater route regularly taken by three Arctic/North American breeding waders—Wandering Tattler, Pacific Golden-Plover, and Bristle-thighed Curlew.

Coupled with regular oceanic storms and tropical depressions, it is surprising more vagrant waders do not turn up in French Polynesia. I would suspect the lack of competent observers in these remote atolls is a contributing (if not the major) factor.

Literature Cited

American Ornithologists' Union. 1983. Checklist of North American Birds. 6th edition. American Ornithologists' Union, Washington, DC.

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Pratt, H.D., P. L. Bruner and D. G. Berrett. 1987. The Birds of Hawaii and the Tropical Pacific. Princeton University Press, Princeton, NJ.

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Scholarships

The Hawaii Audubon Society will be awarding an undergraduate tuition scholarship of $1,340 to a Hawai'i resident attending the University of Hawai'i for the 1993-94 school year. Named the Rose Schuster Taylor Scholarship, it is made available by the Yao Shen Trust, in honor of Rose Schuster Taylor. Terms of the trust require that recipients be Hawai'i residents, attending the University of Hawai'i, whose area of study is related to Hawaiian natural history, especially if it may lead to the better protection of native wildlife in Hawai'i. We will also be awarding the Clara Grenville Hatch undergraduate scholarship. This $1,000 stipend for the 1993-94 school year is for a student at any college or university in the state whose area of study is related to Hawaiian natural history.

Applicants should submit the following information: name, address, telephone number, class year, and explain how their academic major relates to Hawaiian natural history. They should also discuss how they plan to apply their academic degree to further study or work experience in Hawaiian natural history, how their course of study will enable them to contribute to the better protection of native Hawaiian wildlife, and if they have made contributions to the study of Hawaiian natural history. Applicants should attach a transcript of their college or high school records and three letters of recommendation.

Applications should be sent to Phil Bruner, Chair, Scholarships and Grants Committee, Box 1775, BYU-H, La'ie, HI 96762, telephone 293-3820 (W). The application deadline is 1 May, 1993.

HAS and SCLDF Comment on Boundary Review

Recently the Hawaii Audubon Society and the Sierra Club Legal Defense Fund jointly commented on the Office of State Planning's (OSP) State Land Use District Boundary Review. Our involvement in the boundary review is part of our efforts under a grant from the Pew Charitable Trusts in Philadelphia to the Conservation Council for Hawai'i to work with a consortium of organizations on protecting native species and their habitat. Several areas under OSP's consideration have been targeted for projects under the grant. The comments were prepared by Marjorie Ziegler and Mark Smaalders. Following are excerpts from our comments. For more information on OSP's Land Use District Boundary Review, call 587-2846 on O'ahu.

We agree with OSP's finding that the inclusion of important physical, biological, and cultural areas, as well as the identification of areas that are suitable for urban development, provide the opportunity to review land use proposals from a broad, comprehensive, and long-range viewpoint rather than incrementally on a case-by-case basis. It is within this context that we support the intent of the boundary review.

There is also an urgent need to review the State's land use law. Incorrect or inappropriate land use classifications can lead to or perpetuate inappropriate land uses. If we are to protect rare and endangered native ecosystems and habitats, watersheds, and important cultural and recreational areas, determinations of appropriate land uses and subsequent zoning must not be based on the economically driven "highest and best use" criterion.

It is critical at this point in Hawai'i's development that we establish a land use classification that protects important ecological and cultural resources *in perpetuity*. At present, Hawai'i's Conservation District Protective Subzone provides the highest (theoretical) level of protection. Yet, virtually any proposed land use may be permitted by the Board of Land and Natural Resources in the Subzone via the questionable "Conditional Use Permit." In addition, the State Land Use Commission routinely rezones Conservation District lands to accommodate urban development.

We urge the Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) to comply with Act 82, which requires the Department to initiate amendments to the Conservation District boundaries "in order to include high quality native forests and the habitat of rare native species of flora and fauna within the conservation district."

The inclusion of areas in the Conservation District should not result in unnecessary regulation and burden, particularly for those landowners who are furthering conservation goals. For example, the inclusion of streams and buffers should not adversely affect taro farmers. We encourage OSP to explore the possibility of a special subzone within the Conservation District in order to accommodate taro farmers and, at the same time, protect riparian resources.

We support the inclusion of all critical and essential habitats for threatened and endangered species (identified by the U.S. Fish and Wildlife Service [USFWS]), State plant and animal sanctuaries, all perennial streams (with adequate buffer zones), wetlands identified as ecologically significant by the USFWS, all remaining anchialine ponds, and all State Forest Reserves and key watersheds in the Conservation District.

Our experts believe that buffer zones of 100' for streams and 40' for wetlands and ponds are arbitrary and insufficient, and that buffers must be determined on a case-by-case basis. A variable Conservation District boundary should be determined for all coastlines based on coastal resource inventories, level and degree of environmental sensitivity, existing uses, and potential or future uses.

The potential for restoration of ecologically significant areas and the attendant benefits to rare and endangered species should be given greater consideration in OSP's identification of Priority 1 and Priority 2 recommendations for inclusion in the Conservation District.

The availability of water (potable and brackish) must be considered in recommendations for adding areas to the Urban and Agricultural Districts. Ground and surface water required to maintain streams, springs, wetlands, and estuaries should not be considered available for agricultural, urban, or municipal use.

Examples of specific areas that should be included in the Conservation District, or for which a need to protect should be looked at more closely, are listed below by island:

Kaua'i: Maha'ulepu coastline, Polihale Dunes, Hanapepe Salt Ponds, and Koloa Caves are in need of additional protection. If these areas are not included within the Conservation District, appropriate county zoning, easements, or other long-term management agreements should be pursued by OSP.

Embayment estuaries (including Hanalei, Hanapepe, Nawiliwili, Kalihiwai, Moloa'a, Anahola, and Hanamaulu), as well as significant coral reef ecosystems (including the reef from Pu'u Poa Point to Kalihiwai Bay on the north shore), are threatened by runoff of chemicals and sediments. These areas would benefit from the establishment of wider upland buffer zones than are currently established.

O'ahu: Kahuku wetlands and Kahuku coastal ecosystems (including the entire James Campbell National Wildlife region from the highway to the ocean), Ka'ena Coast Mauka Extension, Queen's Beach, and Sandy Beach are in need of additional protection. Also, Kauopu'u, Barber's Point Sink Holes, Barber's Point populations of *Achyrantes* and *Chamaesyce* species of plants, La'ie Point, and Pounders Bluff. Long-term management agreements, easements, the establishment of sanctuaries, county zoning, and other means of protecting this last group should be pursued.

The entire reaches of Kaluanui Stream, Maunawili Stream, and Halawa Stream should be included in the Conservation District. Maunawili and Halawa Streams are among the six streams on O'ahu that are identified for protection status by the *Hawai'i Stream Assessment*. Maunawili Stream is an essential part of the Maunawili-Kawai Nui ecosystem and is currently being degraded by stream modifications relating to construction of the Royal Hawaiian Golf Course. Halawa Stream is being radically altered by ongoing H-3 construction activities, to the point that the stream has virtually ceased to exist. Halawa Stream is also culturally significant. Both streams require immediate remedial actions by the State Commission on Water Resource Management simply to protect them from further damage. Inclusion in the Conservation District would make it possible to pursue restoration and long-term protection.

Moloka'i: We support OSP's recommendation that the entire Kalaupapa Peninsula be included in the Conservation District and encourage OSP to include the Mo'omomi Dunes on its list of Priority 1 recommendations as well.

Lana'i: We strongly disagree with OSP's draft recommendations for inclusion in the Conservation District on Lana'i, all of which

are identified as Priority 2 recommendations. Protection of cultural and natural resources is needed on this island as much, if not more, as anywhere in the state. We are perplexed by OSP's apparent casual treatment of Lana'i and are concerned that landownership has influenced OSP's prioritization of these areas. We recommend that all areas remaining on Lani'i for which significant cultural or natural resources have been identified be placed on the list of Priority 1 recommendations. In addition, we urge OSP to include the Manele-Hulupo'e Peninsula on its list of Priority 1 recommendations.

Maui: We concur with OSP's findings regarding the Kapa'ahu forest . Our experts state that the resource value of this area is high and that it should be included in the Conservation District. A proposal to log koa, even if restricted to dead trees, is inappropriate for this area, and we are not certain that the State is capable of enforcing forestry plans or other agreements that might be forged with the landowner. Additionally, biologists state that the ecological significance of dead and dying koa trees within native systems must be considered in management decisions concerning native forests.

We concur with the high priority placed on protecting the Waihe'e Dunes. We urge OSP to include, as part of the Conservation District, a wide enough buffer zone along the shoreline to protect nearshore waters from chemical runoff and sedimentation and to provide safe access along and to the beach. Boulders make access difficult and unsafe, and the landowner prohibits the public from walking along the grass and sandy shoreline above the boulders. We also encourage OSP to include the Waihe'e wetlands as a Priority 1 recommendation.

With regard to streams, we recommend that all streams between Ke'anae Point and Kaupo be included on the Priority 1 list, Kahakuloa Stream and Honokohau Stream on West Maui be upgraded to Priority 1, Makamaka'ole Stream remain as Priority 1, and the diversions of streams on East Maui under state land/water licenses be reevaluated in light of cultural and ecological values and needs. This evaluation could be done in conjunction with OSP's boundary review. We strongly feel that as long as these lands remain classified as Agricultural (as opposed to Conservation), land/water leases will be let at the expense of Hawaiian cultural practices and native stream ecosystems. Inclusion in the Conservation District could still accommodate taro farming through the creation of a special subzone, and should not adversely affect superior water rights.

As in the case of O'ahu, small isolated sites containing significant cultural or natural resources must be protected, even if OSP is not recommending their inclusion in the Conservation District. On Maui, such areas include, but are certainly not limited to, Kaunauhane Cave, Pu'u Makua, and Pu'u Mahoe. We encourage OSP to approach appropriate government agencies and private parties to initiate long-term protection of these natural areas.

We also note several areas that contain significant natural resources but are not included on the lists of Priority 1 or 2 recommendations. These areas include Hanaka'o'o (West Maui; rare *Acacia koaia*), Luako'i/Lihau (endangered *Gouania hillebrandii*, rare species of *Portulaca*, and trachyte domes), Pu'u Hona (*Hibiscus brackenridgei*, *Schiedea salicaria*, rare butterfly, possibly *Acacia koaia*), Kaupo Gap (native plants, endangered Hawaiian hoary bat, and endangered Nene), Pahihi-Kamole (only known population of *Lipochaeta kamolensis*, a state and federal listed endangered species), Manawainui Gulch (native rare dry forest), and Makawao (essential habitat for three endangered forest birds, rare native plants, and invertebrates). Most, if not all, of these areas are in the Agricultural District and are degraded by cattle grazing. Based on the resources described above, we believe that these areas should be placed in the Conservation District.

Hawai'i: All of our experts recommend that the Kilauea-Keauhou area be elevated to a Priority 1 for inclusion in the Conservation District. The area is identified as essential habitat for endangered Hawai'i island forest birds and contains rare and endangered plants. We anticipate that, in response to a petition by both our organizations, the Secretary of the Interior will include the Kilauea-Keauhou area when it designates critical habitat for these species.

Similarly, all of our experts recommend that the Kapapala area be included on the list of Priority 1 recommendations. Kapapala provides essential habitat for endangered forest birds on Hawai'i. DOFAW is proposing to log koa in this area, which we consider an entirely inappropriate action in an area that is essential habitat for critically endangered forest birds. DLNR's logging proposal is strongly opposed by professional biologists and environmental organizations.

We strongly urge OSP to arrange surveys (by qualified and impartial biologists) of native plants, birds, and invertebrates at Kapapala and to include the area on its list of Priority 1 recommendations. As in the case of Kapapala, we request information regarding the withdrawal of Kealakehe Mauka Extension from OSP's list of recommended boundary changes.

We strongly recommend that the portion of Kapapala Ranch located below the southern boundary of Hawai'i Volcanoes National Park be included on the list of Priority 1 recommendations. This portion of Kapapala is one of the few areas in the state where wild populations of the endangered Nene goose are recruiting in the wild. The area is extremely important habitat for the Nene and would benefit from the additional protection of Conservation status. Nene and their newborn are currently threatened by DOFAW's introduced game bird hunting program, which is conducted during the Nene's nesting/brooding season each year.

We recommend that all of Pu'u Wa'awa'a, including the portion betweeen OSP's proposed Priority 1 recommendations, be listed as a Priority 1. This is important to consolidate the larger adjacent proposed Conservation District areas (assuming they are reclassified). Leaving the middle section of the Pu'u Wa'awa'a region in agricultural use will complicate management in the long-term and further isolate native plant and animal populations.

Additional reasons for including the entire Pu'u Wa'awa'a region in the Conservation District are that the State has already committed significant resources at Pu'u Wa'awa'a for the 'Alala Sanctuary and plant sanctuaries at lower elevations and the fact that the current lessee and DLNR's Division of Land Management are unwilling to and/or incapable of managing the land and lease properly.

Eventually, the 'Alala Sanctuary should be expanded to include different elevational bands of native dry forest and woodland from the Sanctuary to below the highway (and, ideally, to the sea). Keeping the midsection of the Pu'u Wa'awa'a region in the Agricultural District is inconsistent with managing the region for native plants and animals.

It is also critical that buffers for important natural areas be included in the Conservation District. Areas on the Big Island where buffer zones would be especially appropriate include the Kaloko-Honokohau National Park, Hakalau National Wildlife Refuge, Hawai'i Volcanoes National Park, and Kahauale'a

Natural Area Reserve.

It is well recognized that the protection of isolated native communities and ecosystems is difficult and costly, and that it is vital to provide linkages or corridors between protected natural areas. The benefits of protecting such corridors are great, far outweighing their size, as they help to insure the long-term viability of larger adjacent native communities. We urge OSP to consider these benefits and strongly recommend that the following areas be recommended by OSP for inclusion in the Conservation District: Waipunalei, a narrow strip connecting the Hilo Forest Reserve and Laupahoehoe Natural Area Reserve; Keonepoko, an area connecting the Puna Forest Reserve and the coast; Kahuku Ranch, an important link between the Ka'u Forest Reserve and the Manuka Natural Area Reserve; Ka'apuna, an area between sections of the South Kona Forest Reserve; and lands below the lower boundary of the South Kona Forest Reserve, connecting the Reserve and the coast.

Native ecosystems in coastal areas have been particularly impacted by urban development. Those areas that are still relatively intact should be protected now. We recommend that the following coastal areas be included on the list of Priority 1 recommendations for inclusion in the Conservation District:

(1) a section of coastline from Palima Point to Punalu'u (including Pu'u 'Ulaula and archaeological sites). This area is one of the few nesting sites on the main Hawaiian islands for the endangered Hawksbill sea turtle and contains rare native plants, native strand vegetation, seabird nesting areas, and anchialine ponds. It is threatened by urbanization;

(2) a section of coastline from Leleiwi Point south to Kea'au, which is dominated by native strand vegetation and contains anchialine ponds;

(3) Kalapana and Pulama Lava Flows, from Kama'ili southwest to Pulama. Native plant communities still exist in some areas and endangered Hawksbill sea turtles were found offshore prior to recent lava flows;

(4) the coastline between Honu'apo and Manuka Natural Area Reserve, extending inland up to 1/2 mile. This area contains rare native plant communities, seabird habitat, anchialine ponds, and wetlands;

(5) Kapoho Point and the shoreline of Kapoho Bay. The water off of Kapoho Point and Bay provides resting and foraging habitat for threatened green sea turtles and contains a high diversity of coral species, anchialine ponds, and rare anchialine pond species; and

(6) Kohanaiki, an area with both high and low salinity anchialine ponds, which is threatened by adjacent development. Kohanaiki is an extremely important cultural and ecological area, located between coastline protected by the State and a National Historical Park. The current situation at Kohanaiki points to the dire need for long-term regional planning on the Big Island.

Volunteers Needed--Please Sign Up!

Hawaii Audubon Society desperately needs help in the following areas:

Phone Tree Coordinator. You will be responsible for maintaining the list of persons participating in the telephone tree and giving information to phone tree participants when calls need to be made. We need a self starter who is a good communicator and who can devote four to eight hours a month for a minimum of a year. This work can be done from home. Some knowledge of environmental issues and legislators is a plus. To volunteer call David Hill, 943-2784 (H).

Phone Tree Callers. We are growing a phone tree—a chain of people who can make calls to decision-makers on environmental issues. This allows the environmental community to respond very quickly with public pressure on important issues. To join our phone tree, call David Hill at 943-2784.

Testimony Presenters. Here we need self-starters who can tactfully and effectively present testimony at the legislature, county councils, and hearings of governmental boards and agencies, usually on weekdays during daytime hours. If you can't write the testimony, we will have someone else do it. A knowledge of Hawai'i, including issues, politicians, and who the players are is a big plus. A minimum of four hours a month is required. To volunteer call David Hill, 943-2784 (H).

Recordkeeper. This position, which requires you to spend one morning or afternoon a week at the office, entails integrating our membership records with our fundraising records and locating telephone numbers for all new members. The work is done manually. To volunteer call Lynne Matusow, 531-4260 (H).

Volunteer Coordinator. This hardworking, gregarious individual will match volunteers with available jobs, see that volunteers are trained, and maintain contact with volunteers to see if they are happy or have suggestions for improving things, and plan volunteer recognition events. This job will take two hours or more weekly. To volunteer call Lynne Matusow, 531-4260 (H).

Office Staff. We would like to have our office open five days a week. People are needed for morning or afternoon shifts Monday, Tuesday, Thursday, and Friday. Among the duties are answering the telephone, distributing the mail, referring problems to the appropriate officer or committee chair, filing, and responding to routine correspondence. To volunteer call Lynne Matusow, 531-4260 (H).

Writers and Editors for *'Elepaio*. A reporter is needed to write the monthly Volunteer Corner column. Also, if you can write stories, edit copy, and come up with story ideas call Lynne Matusow, 531-4260 (H).

The above is only a partial list. If you have a particular skill or interest, call Lynne Matusow, 531-4260 (H). Who knows, maybe we have the right opening but haven't publicized it yet.

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 Hawai'i. Special consideration will be given to those applicants studying the Northwest Hawaiian Islands, 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, 212 Merchant Street, Suite 320, Honolulu, HI 96813. For more information, call Phil Bruner, (808) 293-3820 (W).

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.

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Iniki's Wrath:

A Long Road to Recovery for Kaua'i's Refuges

by Suzanne Palmer

With relief efforts well underway for Hurricane Iniki victims on Kaua'i and the Waianae coast of O'ahu, agencies are beginning to restore Kaua'i's natural areas, including the federal wildlife refuges at Kilauea Point and Hanalei Valley.

The damage to the Kilauea Point and Hanalei National Wildlife Refuges from this September 11 storm is estimated at $6-10 million, according to Jerry Leinecke, deputy project leader for the Hawaiian and Pacific Islands National Wildlife Refuge Complex. Winds came down strongest at Kilauea Point near the historic lighthouse and surrounding areas which lighthouse is now only a structure of walls - the roof and everything inside is gone. The structure itself is still good, and efforts will be made to restore it.

Photo by Bruce Eilerts

Frigatebirds left Kaua'i before Iniki struck. Red-footed boobies, however, waited until the strong winds came up and were pushed back into trees or tossed around violently.

The park is closed to the public and Ray Rauch, project leader for the refuge complex, said there were no plans to reopen it any time in the near

lying plants.

"We need to get the habitat back up," Rauch said, but we lost the nursery (greenhouse) so we'll have to replant. We're really worried about the native plants..." and will have to make sure the "exotic plants don't out compete the natives."

Tom Telfer, State Wildlife Biologist on

there were probably few if any nestlings at the time of the storm.

Refuge manager Richard Voss, and a maintenance worker noted that as the strong winds came up, the boobies began to rise up from the colony. The strong winds pushed most of them back down into trees, or those who were flying got tossed around violently. The red-footed booby mortality rate is roughly estimated at 100 birds.

The greatest population of red-footed boobies is located on the north-facing portion of Crater Hill. The nesting and roosting trees in this area received extensive amounts of damage, however, less than 10 percent of the non-

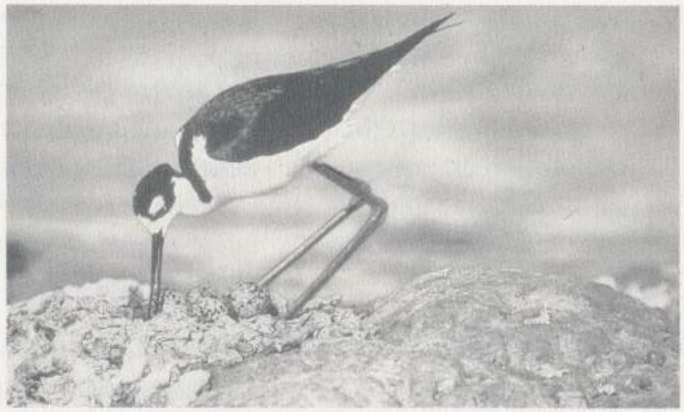
steadily increasing and in the April 1992 count, there were approximately 1700 nesting pairs. If hurricane-related losses are in fact limited to 100 birds, then this would be considered a minimal loss and will probably have little impact on the growth of the colony - unless nesting sites become limited.

Prior to assessing the damage, it was assumed

"We probably won't notice recovery (of the shearwater population) soon."

Ray Rauch
Fish &Wildlife Service

took the full brunt of the storm. Although the lighthouse itself merely lost a door, a window pane and some paint, damage assessments include complete destruction of eight out of 14 buildings located on the three Kaua'i refuges at Kilauea Point, Hanalei and Huleia.



File photo

The endangered Hawaiian stilt and other wetland birds returned one week later…virtually unaffected by the storm.

Clean-up efforts have already begun at Kilauea Point by the National Guard and the Kilauea Refuge staff. Roofing material from the mainland arrived and the National Guard helped people replace their roofs. (Roofing was completed before the flooding in mid-October.)

Both visitor centers were damaged, although the old center by the future. Federal disaster relief will bring $6 million in monetary relief to Kilauea Point and Hanalei. When the money is received, the refuge must be rebuilt to pre-hurricane conditions, and the dikes and ditches will be repaired.

Rauch said that earlier this year, great effort was taken to replant much of Kilauea Point with native plants. The devastating winds of Iniki ripped out much of what had been planted. Approximately 80% of the native vegetation was damaged, including a 25% loss of hala trees. Akoko plants, a low-lying native shrub, were torn from the ground or stripped of leaves, as were many other low-

Kaua'i, also noted the widespread destruction of uluhe fern slopes favored as nesting sites by the Newell's shearwater. He said they will become subject to erosion with the coming winter rains and the encroachment of weed plants.

"We probably won't notice recovery (of the shearwater population) soon," Rauch said. "The shearwaters are cycling right now. They go through food and disaster crashes periodically, and now we need to get their habitat back up."

The two seabird species that were most abundant before the hurricane, according to Wildlife Biologist K.J.F. Viernes, were the red-footed booby and the wedge-tailed shearwater.

In his report to the Fish & Wildlife Service, "Effects of Hurricane Iniki on Wildlife and Habitat of the Kaua'i National Wildlife Refuge Complex," Viernes said that most of the red-footed booby fledgings of this year had been flying since mid-August, so

native ironwood and Christmas berry trees fell in a way that no longer allows the boobies to perch on them. Twenty percent of the trees that fell or lost major limbs are still being used as perches by the boobies.

Whether the boobies will find these trees attractive as nesting sites will not be known until the next breeding season. The pattern of tree damage could possibly cause a shift in nest locations in the next breeding season (as happened in 1982 after Hurricane Iwa) but there appears to be adequate habitat available for nesting to support the current population.

Photo by Bruce Eilerts

Albatross Hill must be cleared of fallen ironwood trees before the Laysan Albatross return to nest in November.

Viernes said that the red-footed booby breeding population has been

that the wedge-tailed shearwater chicks could survive the hurricane in the safety of their burrows. Actual ground checks, however, showed unstable ground and collapsed or plugged burrows caused by landslides (from ripped out vegetation and wind-blown debris).

At Kilauea Point, an estimated 40 percent of the burrow area collapsed, but only half of the area contained chicks. Upon examining 25 collapsed burrows, 3 chicks were found…two were dead and one chick that was partially buried, later died. About ten artificial burrows (PVC pipe) were blown several feet from their original sites with live chicks still sitting inside, while other

See **Iniki,** p. 2

Iniki, From p. 1

artificial burrows were completely blown away.

During the traditional winter banding of wedge-tailed shearwater chicks at Kilauea Point in 1991, 700 fledglings were caught. The banding of 1992 chicks will occur in early November and will give a better indication of chick loss there. Preliminary estimates indicate that 200-300 chicks were lost in burrows throughout the refuge.

Voss and a refuge maintenance worker saw the great frigatebirds, which roost on the refuge, flying in a northwesterly direction apparently trying to escape before the hurricane arrived. A few days following the hurricane they began to return. In fact, just 13 days after the storm, 125 great frigatebirds were counted roosted and flying around the Crater Hill area.

Within a week of the hurricane, a few brown boobies were also flying around Crater Hill.

Neither the great frigatebird or the brown booby appear to have been may have had young in their cliff ledge nests at the time of the hurricane. However, while conducting post hurricane estimates, at least 3 chicks - believed to be white-tailed tropic birds - were seen along Crater Hill and the ocean-facing wall of seen on the refuge in apparent good health. The geese were released there almost a year ago and only visit the refuge occasionally. Since the hurricane, however, they have been seen several times on Crater Hill.

The Laysan Albatross was not present during the time of the hurricane, although the primary nesting site for the albatross, which nest in November, was severely affected. Viernes stated that Albatross Hill was covered with fallen ironwood trees as was the Mokolea Point nesting area.

Clean up of the nesting grounds would be high priority for the latter part of October, according to Rauch. If clean-up is completed before the albatross return in November, the nesting should proceed as normal.

Wetlands Spared

Rauch said wetland water birds at the Hanalei NWR suffered a 10% loss in population, and, although a dike was destroyed, officials are

James Campbell

Preliminary damage reports of the James Campbell Wildlife Refuge on O'ahu have been estimated at under $1 million.

Dikes were damaged due to heavy wave action, and water control structures were blown over.

Ditches are in need of cleaning from siltation and dead vegetation must be cleared.

Clean-up efforts will be underway shortly.

Alakai

Alakai Wilderness Preserve sustained only moderate

Paradise Pursuits Expands Statewide

Audubon's environmental quiz show for high school students welcomes neighbor island schools to the competitions this fall. Three Maui, four Big Island, and thirteen O'ahu schools have thrown their hats into the ring for competitions beginning in mid-November.

Final Rounds will be held on Dec. 14!

If your organization has any prizes to offer the teams please let us know by November 15th, or if you can help during the preliminary and final rounds as a scorer or timer please call Sheila Laffey at 522-5566.

Hawaiian stilt, coot, gallinule and nene may not have been as severely impacted, according to Telfer, as evidenced by many returning to wetlands a week after the storm.

Post-hurricane examination of the only waterbird nests known to be active two days before the hurricane seemed to be proceeding normally. He also stated that one nest with four eggs that began hatching prior to the storm, had one abandoned egg with a well-developed embryo inside. It is possible that the hurricane

The taro patches, which are important habitat for the endangered water birds at Hanalei NWR, remained rooted and bent down to the water with the heavy winds. In some fields, the large leaves were torn away by the strong winds, but new leaves emerged within days. This may affect crop growth rate and possibly harvest dates of some taro patches, but it has produced no known negative effects on the wildlife that use those fields.

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negatively impacted by the storm. The great frigatebirds continue to roost on the trees that fell, but as those trees deteriorate, roost site shifting may occur unless new trees and shrubs replace those which fell.

Small numbers of red-tailed and white-tailed tropicbirds nest on the refuge, and some of these

damages.

Kilauea Point. In light of the wind force that must have struck the Kilauea Point cliff wall, it was considered miraculous that the chicks survived.

The six nene geese which are a part of the captive release program at Kilauea Point NWR were

now able to pump water into the wetlands to help preserve that particular area. Hanalei NWR was the site of a joint venture project between Audubon, the Service, and Ducks Unlimited. Three nesting and fielding areas created by the joint effort escaped major damage from Iniki.

Lowland endangered waterbirds including the

caused the parents to move their young prior to the last egg hatching. Yet, this type of abandonment has occurred before, and at least two chicks and two adults were seen in the area after the hurricane.

Taro farmers located some dead coots and cattle egret, but overall the waterbird loss is estimated to be at less than 25.

Can you help?

Volunteer efforts to replant native vegetation are being organized. If you are interested in helping, call 522-5566. We will put you on a volunteer list for Iniki Relief at Kilauea Point and Hanalei and will inform you when work parties are formed.

Portions of this article were derived from K.J.F. Viernes' report, "Effects of Hurricane Iniki on Wildlife and Habitat of the Kauai'i National Wildlife Refuge Complex."

Natural Memories

Audubon Begins Membership Drive in Hawai'i

by Dana Kokubun

"Don't let your natural world become a memory." That is the message of two radio announcements produced by the National Audubon Society, as part of a membership recruitment drive. The spots feature two well-known environmental conservation "personalities": enthnobotanist Dr. Beatrice Krauss and artist Patrick Ching. They will be heard sharing their memories of wildlife in the Hawaiian environment that can no longer be experienced.

For Dr. Krauss, she has seen numerous changes in her 80-plus years and they have sometimes been dramatic. Among her treasure trove of memories is an ensemble of Hawaiian ladies dressed in white holoku picking limu (seaweed) floating in the waters off Waikiki. With the exception of the Moana hotel, the shoreline is free of buildings. No one is there to witness the moment save for a few children, including a very young Dr. Krauss.

On radio, Dr. Krauss will recollect that flocks of pueo (Hawaiian short-eared owl) flew down into Manoa Valley at dusk. Today, the owl is virtually extirpated from O'ahu, and would not find residential Manoa a hospitable foraging ground.

Although her junior by some 40 years, internationally renowned artist and environmentalist Patrick Ching also has fond memories of wild places. As he tells it, during those "crazy, mixed-up high school years" there was a special pool in Moanalua Valley on O'ahu where he could sit and reflect. Already a budding naturalist, Ching remembers seeing 'elepaio, 'apapane, and 'amakihi at the pool. While these native Hawaiian forest birds could be found easily then, less than 20 years later they are rarely seen at all.

Ching has translated onto canvas and paper these old memories and newer ones he gathered in his job with the U.S. Fish & Wildlife Service. He is the author of "Native Animals of Hawai'i", an educational coloring book which was Hawai'i's best-selling childrens' book in 1991. Since 1987, Ching has written a column for the newsletter of the Office of Hawaiian Affairs, "Ka Wai Ola o OHA". Some of Ching's sketches and wildlife articles are contained within his latest project, a 1993 wildlife calendar. (For more information on the work of Patrick Ching, call 522-5566.)

Audubon hopes that these very intimate recollections by two widely known kama'aina will not only inspire radio listeners to consider joining the National Audubon Society, but also to reflect upon the value of wildlife and wild places in their own lives. Hopefully, some will be motivated to do something for the Hawaiian environment or simply, get outside and enjoy nature. The radio spots will air on KHNR 65 AM starting November 9 during drive-time.

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The *'Elepaio* is printed on recycled paper.

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 ash (gray) with a black design. We also have a few in aqua, navy, white, and beige. 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, 2069 California Avenue, #20B, 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.

HAS Dues for 1993

All amounts are in U.S. dollars.
Includes delivery of *'Elepaio.*

Life Membership	**$300.00**
Payable in full or three equal installments. (The Board of Directors recently increased the amount of life dues. Those life members who are currently on the installment plan will be billed for their remaining payments at the old rate.)	
Delivery to U.S. zip code addresses	
Via bulk mail	**6.00**
(Not forwardable to new address)	
Via first class mail	**12.00**
(Hawai'i residents: there is no significant time difference between bulk and first class mail to addresses within the state of Hawai'i.)	
Junior Membership (18 and under)	**3.00**
Delivery to non-U.S. addresses:	
Mexico (airmail only)	**12.00**
Canada (airmail only)	**13.00**
All other countries (surface mail)	**14.00**
All other countries (airmail)	**24.00**
Introductory dues for National and Hawaii Societies:	**20.00**
(Includes delivery of *'Elepaio* and *Audubon Magazine* as bulk or 2nd class mail to U.S. zip codes. Renewal, $30 annually.)	

Help Needed for 28 November Mailing

We will be mailing ballots, dues renewal notices, and our annual fund appeal to over 2,500 members on Saturday, 28 November, from 10:00 a.m. to 2:00 p.m. We need help stuffing, addressing, and sealing envelopes. If you can give us an hour or more, please call Lynne Matusow, 531-4260 (H) after 3 November. The mailing party will be at the Hawaii Audubon office, 212 Merchant Street, Suite 320.

This is a great way to meet new people and have fun while helping Audubon get the work done. Refreshments will be served.

Notice to Authors

'Elepaio invites submission of original scientific articles of between 1,500 and 3,000 words on the natural history of Hawai'i and the Pacific. Such articles are subject to peer review.

Scientific articles should be typewritten and double-spaced. Four copies must be submitted. In addition, authors are asked to submit the article on a computer diskette, with a clear indication of the word processing program used. Because we have a Macintosh computer, we prefer you use Macintosh compatible software, although we can convert DOS.

We do all layouts directly on the computer. For that reason, authors are asked to adhere to the following guidelines: only one space after periods; no indentations, except for paragraphs and tables; no underlines, if on a diskette underlines should be shown as italics; no bold face type; use upper and lower case, nothing is to be in all capital letters; Hawaiian glottals should be used; capitalizaiton for all bird species should follow American Ornithologists' Union nomenclature; dates should be shown as date, month, year; and the address of all authors should be included.

Photographs/illustrations may be either color or black-and-white prints, 3.5 by 5 inches or larger. They should be clearly labelled as to subject and photographer/artist. Cropping lines (if needed) should be indicated. The originals of figures, maps, graphs, etc. should be clean and clear, with lettering large enough to remain legible after reduction to fit journal format. Submit two good-quality xerographic copies along with each original illustration.

Manuscripts should be sent to *'Elepaio*, Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, HI 96813.

Calendar of Events

First Monday of Every Month
Monthly meeting of the Conservation Committee, 6:00 p.m., HAS office. To join or for more information call David Hill, 943-2784 (H).

November 8, Sunday
Join Alan Ziegler as he takes us excavating for extinct bird fossils and bones at the sinkholes at Campbell Industrial Park (CIP). Long pants, shoes, and gloves are recommended attire. Be sure to bring water. The trip requies about 10 minutes of walking, mostly from the parking lot to the sinkholes. Meet at the State Library at Punchbowl and King Streets at 8:00 a.m. for carpooling or the entrance gate to CIP at 8:45 a.m. We will drive into CIP as a group. We should be pau by noon. Suggested donation: $2.00. For more information call Casey Jarman, 956-7489 (W).

November 9, Monday
Board meeting, 7:00 p.m., HAS office. Call Reggie David on Hawai'i, 329-9141 (W), for details.

November 28, Monday
Mailing party, 10:00 a.m. to 2:00 p.m., HAS office. See story on page 85 for details.

December, TBA
Christmas Bird Counts. For information or to sign up call Lance Tanino, 247-5965 (H), 247-7878 (W).

December 21, Monday
Annual meeting, 7:30 p.m., Paki Conference Room, Bishop Museum. Announcement of election returns. For more information see December *'Elepaio*. Refreshments will be served.

Publications Available

The Hawaii Audubon Society publishes books, checklists, and field cards relating to birds of Hawai'i and the Pacific. For a complete price list send a self-addressed stamped envelope to Publications List, Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, HI 96813.

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Kaua'i in Trouble

September's Hurricane Iniki ravaged Kaua'i. At press time we were awaiting damage assessments. But, the scarce news available is not good. Both forest and burrowing birds are in trouble. Food sources are gone. Hawaii Audubon will be participating in recovery operations, including financial help to restore Kauai'i's unique environment. Further details as soon as they are available.

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