

Counts of Pacific Golden-Plovers (*Pluvialis fulva*) Wintering on O'ahu Golf Courses, 1992

by Oscar W. Johnson¹ and
Patricia M. Johnson¹

Abstract--The plovers wintering on all 28 O'ahu golf courses were censused during the 1991-'92 season. We counted 1,902 plovers on 3,474 acres of golf course habitat, mean density = 0.55 plover/acre. It may take several years for new courses to develop attractive habitat and to be colonized by plovers. On mature courses 15 years or more in age, density ranged from 1.60 to 0.02 plover/acre. Explanations for this variation include the possibility that habitat exceeds population, and that food availability and other factors make some courses particularly attractive. Whether the chemicals applied to golf courses have undesirable effects on plovers is unknown. This raises basic questions concerning the overall suitability of these sites as wintering grounds.

Introduction

Among the various habitats used by wintering Pacific Golden-Plovers (*Pluvialis fulva*) in Hawai'i, golf courses are of major significance. Existing courses already host many birds, and a number of new courses are in various stages of planning and development. Although golf courses figure prominently in their life cycle, little is known about plovers on these sites. Previous studies have been relatively limited and restricted to O'ahu only (Morita and Walker 1964, Giffin and Medeiros 1968).

In an effort to update past findings and to accurately determine the numbers of plovers currently wintering on O'ahu's golf courses, we censused each course during the 1991-'92 season. These new data may be important as a basis against which future trends can be compared and evaluated.

Methods

The plovers wintering on all private, municipal, and military golf courses on O'ahu (28 sites, Fig. 1) were censused over the

period from 22 January through 26 March, 1992. Depending on course policies, access was granted through various levels of management: pro shop personnel, course superintendent, general manager. Sometimes we were given immediate clearance, more often the census had to be scheduled for a later date. At all but four courses, motorized carts were provided gratis. Where carts were unavailable, the courses were censused on foot. The census procedure was relatively simple: we followed the course hole by hole and systematically counted all plovers seen. The plovers occupying golf courses are generally territorial and well habituated to people. Such behavior leads to very accurate counts since the birds tend to remain sedentary and passive, even when approached closely. With a cart, censusing an 18 hole course usually required 45-60 minutes.

This project was done as an adjunct to other plover research. Time constraints limited us to a single census (with one exception) on each course. Several courses held very few plovers and one of them (the Honolulu Country Club) was visited a second time to recheck the first count. Most courses were censused in the morning. Course acreages and ages were provided by managers and groundskeepers. Acreage figures represent actual habitat suitable for plovers such as fairways, tees, and greens. Unusable space (parking lots, clubhouse, water hazards, etc.) were excluded. All counts were done under favorable weather conditions. There were no high winds and/or heavy rains which might have altered plover behavior.

Results

The findings are summarized in Table 1. We counted 1,902 plovers on 3,474 acres of golf course habitat. Mean density was 0.55 plover/acre. The highest density was 1.60 birds/acre (Hickam Air Force Base, 9 hole course) and the lowest was 0.02 bird/acre (Honolulu Country Club, Makalena Golf Course). A recheck of the Honolulu Country



Pacific Golden-Plover a few days before spring departure from Bellows Air Force Station, O'ahu. Intense black on face and underparts indicates a male. Photo by Oscar W. Johnson.

Club was consistent with the first census, and indicated that this area supports almost no plovers. Populations varied among mature, established golf courses—some courses held many plovers, others few. We found high densities on 30- and 86-year-old courses, and low densities on two 29-year-old courses and a 90-year-old course (Fig. 2, Table 1).

Discussion

O'ahu's newest courses are West Loch Golf Course (1.5 years) and Ko Olina Golf Club (2 years). The remaining 26 courses range in age from 15-90 years. It is reasonable to expect relatively low populations of plovers on new courses since colonization requires time to find vacant habitats. Also, with increasing age, plant growth may enhance microhabitats resulting in greater abundance of prey. Thus, on mature courses (in this case, 15 or more years old), it seemed plausible that plover density might trend upward more or less directly with age. But, in fact, our findings showed that course age was an unreliable predictor of plover numbers (Fig. 2).

Almost all of the plovers observed on mature courses appeared to be territorial resi-

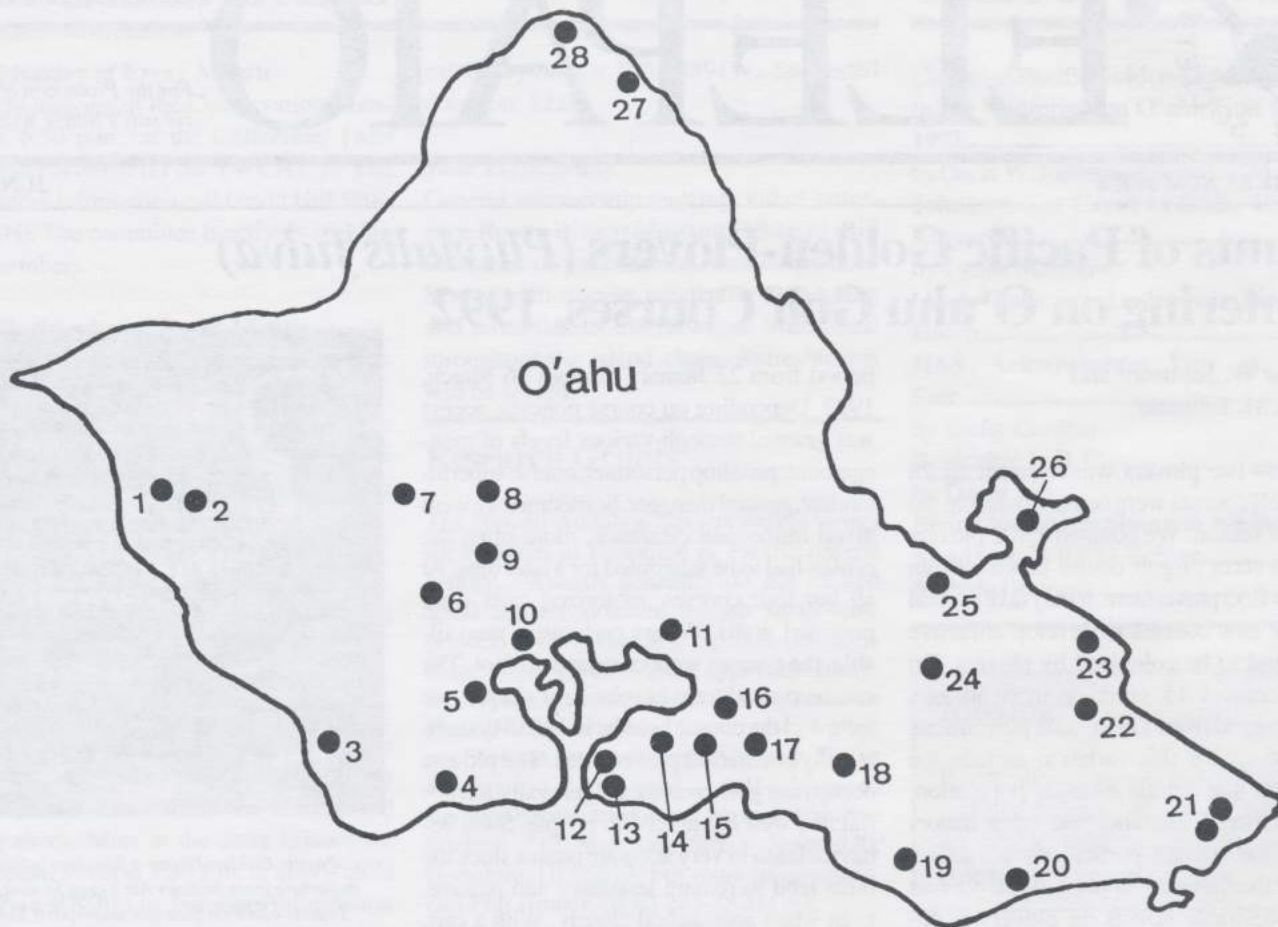


Fig. 1. Locations of golf courses where plovers were counted, spring 1992: 1. Sheraton Makaha Golf Course, 2. Makaha Valley Country Club, 3. Ko Olina Golf Club, 4. Barber's Point Naval Air Station, 5. West Loch Golf Course, 6. Hawai'i Country Club, 7. Kalakaua Golf Course, 8. Leilehua Golf Course, 9. Mililani Golf Club, 10. Makalena Golf Course, 11. Pearl Country Club, 12. Hickam Air Force Base (9 hole course), 13. Hickam Air Force Base (18 hole course), 14. Navy-Marine Golf Course, 15. Honolulu Country Club, 16. Moanalua Golf Club, 17. Ft. Shafter Golf Course, 18. O'ahu Country Club, 19. Ala Wai Golf Course, 20. Waiialae Country Club, 21. Hawai'i Kai Golf Courses (Championship and Executive), 22. Olomana Golf Links, 23. Mid-Pacific Country Club, 24. Pali Golf Course, 25. Bay View Golf Links, 26. Kane'ohe Marine Corps Air Station, 27. Kahuku Golf Course, 28. Turtle Bay Country Club.

dents. Such birds are very site-faithful and relatively sedentary through the daylight hours (Johnson et al. 1981, 1989). With this behavior, it is unlikely that variable density on older courses was the result of movements (i.e., populations shifting from site to site). Instead, there are other explanations, all of which involve speculation. From the broadest perspective, it seems possible that development of lawns and other habitats in Hawai'i has reached a point where there are not enough plovers to fill available space. This interpretation suggests that the overall plover population may be relatively stable and governed mostly by events elsewhere. Perhaps the major controlling factors are breeding success and the perils of migration—especially the first southward flight of inexperienced juveniles. Those golf courses which support numerous

plovers likely indicate the choicest wintering conditions. Why one course is more attractive than another is uncertain. Possible variables include the proximity of nighttime roosting sites and other desirable environments (the Ke'ehi Lagoon complex, for example), local predator populations (owls, cats), and the relative abundance of prey. Although it seems logical that plover density must be directly related to food availability, definitive evidence would require measurements of insect populations on representative courses. The underlying factors controlling insect abundance involve local climatic patterns and watering regimes which in turn affect soil moisture and plant growth, combined with the important variable of insecticide use. Questions concerning insecticides might be particularly complex since the types of chemi-

cals, quantities applied, and timing of applications probably differ from course to course.

Previous studies suggest that at least some plovers respond to tidal fluctuations by moving from upland areas to exposed tidal flats. The phenomenon occurred at some, but not all wintering sites (Morita and Walker 1964, Giffin and Medeiros 1968). Tide related movements appear to be a negligible source of variation among territorial plovers at Bellows Air Force Station on the east shore of O'ahu. These birds usually remain on their territories throughout the day unless subjected to disturbance exceeding normal levels of habituation (Johnson et al. 1981, plus ongoing research). Most of the plovers wintering on golf courses are remarkably habituated to human activities. Lacking repetitive counts, we were unable to assess the possible influ-

Table 1. Plover Census Counts on O'ahu Golf Courses, 1992.

<u>Course</u>	<u>Date & Time</u> [◇]	<u>No. Birds</u>	<u>Acreage</u>	<u>Density</u> (birds/acre)	<u>Age of Course</u> (years)
Hickam Air Force Base*+	12 Feb/09:55	33	21	1.60	30
O'ahu Country Club	22 Jan/18:00	124	100	1.24	86
Kane'ohē Marine Corps Air Station	26 Mar/08:50	135	120	1.13	40
Pearl Country Club	10 Feb/10:50	168	160	1.05	25
Ala Wai Golf Course	24 Jan/18:10	134	140	0.96	60
Mid-Pacific Country Club	23 Jan/08:00	129	150	0.86	*50
Hawai'i Kai Golf Course [△]	29 Jan/08:50	128	156	0.82	*26
Hickam Air Force Base	12 Feb/09:05	161	210	0.77	27
Olomana Golf Links	22 Jan/07:45	84	110	0.76	26
Waialae Country Club	27 Feb/08:30	106	148	0.72	65
Pali Golf Course	27 Jan/08:10	115	170	0.68	38
Mililani Golf Club	3 Feb/08:45	83	135	0.61	25
Ft. Shafter Golf Course*	27 Jan/14:40	42	75	0.56	73
Navy-Marine Golf Course	12 Feb/11:00	84	152	0.55	43
Leilehua Golf Course	3 Feb/10:00	77	146	0.53	43
Turtle Bay Country Club	28 Jan/16:10	53	130	0.41	21
Sheraton Makaha Golf Course	5 Feb/08:15	69	168	0.41	23
Hawai'i Country Club	3 Feb/12:25	33	108	0.31	50
Kalakaua Golf Course	3 Feb/11:05	37	125	0.30	74
Kahuku Golf Course*+	13 Feb/13:40	18	65	0.28	64
Ko Olina Golf Club	2 Feb/11:40	34	153	0.22	2
Makaha Valley Country Club	5 Feb/09:30	29	140	0.21	25
Moanalua Golf Club*+	27 Jan/17:40	10	54	0.18	90
Bay View Golf Links*+	25 Jan/10:00	3	40	0.08	29
West Loch Golf Course	5 Feb/13:10	5	123	0.04	1.5
Barber's Pt. Naval Air Station	12 Feb/12:35	4	120	0.03	29
Honolulu Country Club	27 Jan/16:30	2	125	0.02	15
Makalena Golf Course	10 Feb/08:20	2	130	0.02	22

◇ Time recorded at the completion of the census.

* Indicates 9 hole course.

+ Denotes census on foot.

• Course completed in two phases 10 or more years apart. Age shown is: age of phase one + age of phase two / 2.

△ Includes both the Championship (18 hole) and Executive (9 hole) courses.

ence of tides on golf course populations. If such effects occur, they might be particularly evident on courses situated near tidal mudflats (as in Ke'ehi Lagoon and the southeastern end of Kane'ohē Bay).

We censused plovers as scheduling permitted in both the morning and afternoon. Given the sedentary nature of territorial birds, the time of a census is probably of little significance. However, the morning schedule is preferable since it would be unusual for territorial plovers not to return to their territories (from overnight roosts) in the morning. Therefore, low counts early in the day almost certainly indicate areas with few resident birds (e.g., Bay View Golf Links, Makalena Golf Course, Table 1).

Although most of the plovers we ob-

served showed behaviors characteristic of territoriality (Johnson et al. 1981), there were a few instances in which behavior indicated non-territorial vagrants. Such birds were nervous and easily disturbed. They appear to represent a wandering population in which the birds (often in small flocks) feed opportunistically. On courses with very low densities, there was no basis for territoriality since individuals were usually widely separated. The exact behavioral status of these birds was uncertain.

Because of time limitations (other ongoing plover research) we were able to do a second count at only one course. However, this repeat was of particular significance given the circumstances described below. On the afternoon of 27 January, we censused the Ft.

Shafter Golf Course and then the nearby Honolulu Country Club. We were surprised at the difference between the two areas: an average population at Ft. Shafter Golf Course, an extremely low population at Honolulu Country Club (Table 1). We decided to recheck the low count and returned to the Honolulu Country Club course on the morning of 17 February from about 08:00 to 09:00. Again, we found the area almost devoid of plovers. The only birds seen consisted of a flock of nine non-territorial vagrants which alighted on a fairway along the southwest edge of the course at approximately 08:45. The birds foraged for 8-10 minutes and departed. Disturbance was not a factor (there were no golfers on that part of the course), and we interpreted their departure as a possible indi-

Fig. 2. Plover densities on mature golf courses of varying ages.



cation that insect prey was scarce.

Giffin and Medeiros (1968) estimated O'ahu's plover population through sample counts in major wintering habitats on the island. From their golf course counts on 5 of 23 courses then in existence, they extrapolated to a total of 421 plovers on 2,632 acres of golf course habitat, or 0.16 plover/acre. Giffin and Medeiros did not give precise counts for each course, but it is possible to calculate from their report that the five sites sampled held collectively 125 plovers. At that time, two of the courses (Brown Golf Course, now Pearl Country Club, and Mililani Golf Course) were only 1-2 years old, the other courses (Pali Golf Course, Ala Wai Golf Course, and Kahuku Golf Course) ranged from 13-39 years. As mentioned earlier, new golf courses are unlikely to support a full complement of plovers and this may have skewed their sample. It is notable that our counts for the same five courses totaled 518 birds. If the Giffin and Medeiros extrapolation was accurate, wintering plovers are more abundant on O'ahu's golf courses now than they were in 1968. Since the Giffin and Medeiros study, about 842 additional acres of

golf courses have been developed on O'ahu and the mean density of plovers has increased to 0.55/acre. The result is a population about 4.5 times larger: 1,902 birds compared to 421.

It is impossible to assess (given the sampling question) the overall significance of these changes. If the comparison is valid, our findings indicate either a shift of birds from other habitats to golf courses or a general increase in the population. In the 25 years since Giffin and Medeiros' comprehensive survey, dramatic habitat changes have occurred on O'ahu. A new island-wide investigation is needed to evaluate associated trends in plover populations.

The need for long-term data aside, there is a more immediate question: Are golf courses, as presently managed, really desirable wintering grounds for plovers? The possible impact of pesticides and other chemicals should be explored. Comparing the longevity of plovers on golf courses to birds wintering in other environments would be a useful approach. The annual cycle of spring pre-migratory fattening occurs over a relatively short period from early March to late April (Johnson et al. 1989). Pesticide use during that time

may be particularly hazardous with respect to the physiology of migration and reproduction. With appropriate study, it might be possible to devise cooperative management procedures whereby spring pesticide applications can be deferred or minimized until after the birds have departed.

Censusing plovers on golf courses is a simple procedure. It takes relatively little time once contacts for access have been made. From the long-range perspective, it would be desirable to continue monitoring the populations of plovers on O'ahu's golf courses and to initiate similar efforts on the other islands. Future management policies might focus on plovers as an asset to the golf course. Plovers are very effective insect predators and their economic benefits, though as yet unmeasured, must be substantial.

Acknowledgements

Without the kind cooperation of many individuals at O'ahu's golf courses, this investigation would have been impossible. We are most grateful to these people for their interest in the Pacific Golden-Plover. The project was supported through funding from

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Johnsons Get Grant to Study Plovers at Airports

by Lynne Matusow

Oscar and Patricia Johnson were awarded a research grant in April to study Pacific Golden-Plovers at airports and the possibility of associated hazards to aircraft. Of special interest is why the Pacific Golden-Plover has been involved in a number of birdstrike incidents at the Lihue Airport on Kaua'i yet the species appears to cause no problem at the Kahului Airport on Maui. Oscar Johnson says it is unclear why this difference exists. He will be looking into how many plovers are wintering on each facility, what the pattern of land use is in the immediate surrounding area and how this might affect the occurrence of plovers at the airport, how the runway/taxiway borders are maintained, what the compass orientation of the runways is and how this relates to sunrise/sunset light conditions which might render plovers unable to see approaching aircraft.

'Alala Recovery Underway: Six Chicks Hatch

Six 'Alala (Hawaiian Crow) chicks hatched in April at the new captive propagation incubation facility (nicknamed the Egg House) on the island of Hawai'i. The facility is being managed by San Diego Zoo personnel, under contract with the Peregrine Fund. The U. S. Fish and Wildlife Service (USFWS) signed a cooperative agreement with the Peregrine Fund in March to incubate, rear, and release at least some of the fledglings back to the wild. (See *'Elepaio* 1993:53:25.) Prior to the six hatchings, only 12 'Alala were known to exist in the wild, all on private land in the Kona District on Hawai'i, with an additional 11 birds in captivity at the State managed Olinda Endangered Species Propagation Facility on Maui. One additional wild bird may exist on the slopes of Hualalai, although it has not been seen since 1991.

To expand the number of young 'Alala produced during the breeding season, USFWS biologists are using a technique called double-clutching. The first clutch of eggs from each breeding pair is removed from the nests for artificial incubation and rearing. The wild 'Alala then build new nests and lay a second



Photo Courtesy U. S. Fish and Wildlife Service

clutch of eggs.

The first chick hatched on 19 April, with the next two on 21 and 23 April. The fourth egg from the first pair failed to hatch. Two chicks from the second pair hatched on 29 April, and the last hatched on 1 May. On 28 April, USFWS biologists removed one egg from a third nest. The egg was infertile.

The light bluish green, speckled eggs weigh approximately one half ounce each, and are a little smaller than a chicken egg. They usually hatch 19 to 21 days after they are laid. The chicks are fed every two hours. When their eyes open, keepers use a crow hand puppet from behind a curtain so the chicks won't imprint on humans.

Source: USFWS

HAS Acknowledges Two at Science Fair

by Emily Gardner

"Synthesis of A-3 Dehydrothoulene Biradical Precursors for Anticancer Applications." "The Correlation Between Size and Zonation of *Zittorina pintado* and *Nerita picca*." "Chemiluminescence and Sound Waves." Chemilumawhoositz? Seem a bit confused? You needn't be. These are just a few of the projects that made it into the final round of this year's Hawai'i State Science and Engineering Fair.

The 5 to 9 April event at the Blaisdell Exhibition Hall included 317 of the best science projects from Hawai'i public and private schools. Students first competed on school and district levels to qualify for the state finals. Projects were exhibited in 13 different categories of research ranging from behavioral and social sciences, to engineering, to zoology. Competitions were held at both the senior and junior high school level. The junior division also included poster competition.

The Hawaii Audubon Society presented awards to the senior and junior research projects determined the best in the natural history category. For the second year in a row, Dianella Howarth, a senior at Moanalua High School, won. Her botany project was "Evolution of *Scaevola* Species." Kauaia Fraiola, a student at King Intermediate, won for his project in environmental science entitled, "The Effects of Channelization on Streams." Both winners received a special plaque featuring art by local wildlife artist Patrick Ching, a copy of *Hawaii's Birds*, and a one year joint membership in the National and Hawaii Audubon Societies.

Judging on behalf of HAS were Emily Gardner, HAS Education Committee Chair; Lisa King, Director of the Hanauma Bay Education Program; Mary Joe Gellenbach of the Hawai'i Nature Center; Debbie Gochfeld from the Hawai'i Institute of Marine Biology; and Lance Tanino, HAS Board Member and

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Bootcamp in D. C.

by David Hill

This spring two Hawaii Audubon Society Board members went to Washington, D. C., on a working mission dubbed "Bootcamp," but officially known as the Audubon Washington Training Workshop. (Most of the cost was underwritten by the National Audubon Society (NAS). This allowed Emily Gardner, Education Committee chair, and me, Conservation Committee chair, to meet with Hawai'i's congressional delegation and staff and speak for our causes. To prepare for those visits, we met with NAS' key staff on various subjects, including wetlands, ancient forests, refuge reform, how to lobby effectively, and working with the media. However, we focused on two issues: the Endangered Species Act (ESA) and the Clinton Economic Package.

The ESA is up for reauthorization. Attempts are being made to strengthen it, to make it more workable and preventative. Meanwhile, industry is attempting to gut the law and/or bury it in red tape. As part of Bootcamp, the 18 participants attended a conference sponsored by the Endangered Species Coalition, a large coalition of environmental groups. Other Hawai'i environmentalists in attendance were Dr. Sheila Laffey of NAS and Dr. Steve Montgomery of the Conservation Council of Hawai'i. Also, Susan Miller of the Natural Resources Defense Council, who addressed the gathering concerning Hawai'i's extinction crisis. We learned many interesting facts which support a strong ESA bill:

- 40% of our medicines come from nature, yet one of every eight plant species in the U. S. is threatened with extinction.

(Science fair, continued from page 43)
a former winner.

While the Society was able to present awards only to the winners in the natural history category, the judges wish to recognize the high level of quality exhibited by all of this year's participants and admit that selecting the two winners was a difficult task. "All the participants are winners to have made it into the state competition," said Gardner. "I'm always amazed by how much I learn from the student's projects while judging. It is inspiring to know that there are so many bright young people interested in science. We can only hope that many will continue to pursue these interests in the future."

- 66% of Americans support a strong ESA, 14% oppose it.

- The question is not one of jobs versus animals: for example, of about 73,000 federal projects which came under scrutiny by way of ESA, only 19 were blocked. Many were modified to accommodate endangered species.

- All the money spent on endangered species programs in the U. S. in 1992 is equal to the cost of one mile of interstate highway, about \$50 million. Three times that is needed just to meet the requirements of the law.

What would a good ESA include? First, annual funding needs to be increased to \$150 million over four years. Second, Congress should require deadlines for recovery plans. (Forty three percent of the species listed as threatened or endangered do not have recovery plans.) Third, the Act should be more preventative by having mechanisms for early intervention via an ecosystem approach, in order to avoid "last resort" dilemmas.

At this writing, the ESA bills expected to be the strongest have not been introduced.

From an environmental viewpoint, the Clinton economic package was considered to be very good. However, it is being chipped away at from many sides. At Bootcamp we explored some of the most important environmental issues the Clinton administration has taken on.

Clinton's proposed energy tax addresses the hidden costs of continuing our dependence on oil and other polluting fuels. These costs include global warming, dependence on foreign sources and the military cost that goes with it, air quality, and oil spills. The tax would also make renewable energy such as solar more economically viable, as it would be exempted from the tax. This is one of the most positive environmental proposals ever.

However, as the heads of industry press their muscle on Congress the energy tax is facing an arduous uphill struggle. Sen. Daniel Inouye is opposed to the tax. He claims it is unfair to Hawai'i, since we are so dependent on oil. When we met with his staff, we countered that Hawai'i's addiction to oil should not stop this national attempt to break that addiction. We said we got where we are by ignoring the environmental consequences of our acts.

This is a problem we can deal with now, or bequeath to our grandchildren. We have great renewable, non-fossil fuel resources such as abundant wind and solar energy, which have not been fully tapped. At the same time, there have been several near disastrous

oil spills at Barber's Point. Several years ago a tanker with 10 million gallons of oil went on the reef there. Fortunately, the hull of the tanker was not ripped open. This tanker was the size of the Exxon Valdez. Had it ripped open, we would have had a disaster possibly worse than the one in Alaska.

The Clinton package also addresses three giveaways of our natural resources: below market timber sales, grazing fees, and the Mining Law of 1872.

Regarding timber sales, trees from federal lands are being sold for a fraction of the market price. This is objectionable for several reasons. First, it is a giveaway of our federal resources. If sold at market value, this income would help alleviate the national debt. Second, this subsidy artificially lowers the price of virgin wood pulp, making recycled paper relatively more expensive. Third, these are often old-growth, ancient forests which are irreplaceable.

The same is true regarding low grazing fees on federal lands. Often the land is overgrazed, causing environmental destruction. Also rivers (i.e. riparian habitat) are severely damaged as cattle tromp through. This even takes place on wildlife refuges. We learned that some Hawai'i ranchers have cattle on these lands on the Mainland and they are lobbying to protect their subsidy.

Under the Mining Law of 1872, federal lands are sold for as little as \$2.50 per acre to mining interests. There are no provisions for repairing the land after the minerals have been extracted. Companies can abandon strip mined areas, creating pollution which the public ends up paying for.

The administration has removed these three items from its package because of the opposition of Western senators. They will, however, be addressed in other legislation.

Being in Washington inspired both of us to become more involved. If you have questions about any of these issues, please feel free to contact either one of us.

Board Welcomes Shannon Atkinson

The HAS Board of Directors has appointed Shannon Atkinson to fill a vacant position. Atkinson, who has a Ph.D. in veterinary sciences, works as an associate researcher at the Hawai'i Institute of Marine Biology at the University of Hawai'i at Manoa.

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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.

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Maui Gets Wildlife Refuge

The U. S. Fish and Wildlife Service (USFWS) has established the Kealia Pond National Wildlife Refuge on Maui. The 700-acre refuge, located less than a mile north of Kihei on Ma'alaea Bay, was created primarily to protect habitat for endangered Hawaiian Stilts and Hawaiian Coots. The refuge also attracts large numbers of migrating waterfowl from North America and Siberia during the winter. A large number of Arctic shorebirds use the pond as they pass through the area on their way south to New Zealand and Australia.

"When the pond's water level is up, it is the largest natural shallow water wetland in Hawai'i," said Johnny Beall, O'ahu/Maui National Wildlife Refuge manager for the USFWS.

In the near future, efforts will concentrate on protecting endangered species habitat, posting the boundary, and installing entrance signs. Of immediate concern to the USFWS is disturbance to the Hawaiian Stilt nesting area by off-road vehicles and trash dumping in the mudflats area between the Kihei Highway and the ocean. Signs will be posted and individuals and groups contacted in an effort to eliminate these activities.

The dedication is scheduled for 2 June.

Source: USFWS

Mahalo Donors!

The Hawaii Audubon Society thanks the following members and friends for their generous contributions. This list reflects donations received from 1 March through 4 May:

Allen Allison, Donald Angus, Shirley Bennett, Michael and Nancy Davis, Rachelle Enos, William Fearn, Paul and Jane Field, Kahaulani Fitzsimmons, Gerard Fryer, Lorin Gill, Dr. Elizabeth Gladding, Dr. Samuel M. Gon III, Thelma Greig, Lawrence Hirai, Stephen Hyde, Mark and Choon James on behalf of Robbie and Mark James, Horace Kanno, and Candace Lutzow.

Also, Marylee Machado, James McCallum, Linda Mitchell, Valerie Monson, David Moxley, Nanea Parks, Elizabeth Porteus, Dr. Jean Purvis, Leon Slawewski, Phyllis Turnbull, Alvin Van Treese, and Jess Walters.

Calendar of Events

First Monday of Every Month

Monthly meeting of the Conservation Committee, 6:30 p.m., at the Coffeeline, 1820 University Avenue (in the YWCA). To join or for more information call David Hill, 988-7460 (H). The committee is actively seeking new members.

First Wednesday of Every Month

Monthly meeting of the Education Committee, 7:00 p.m., at the Coffeeline, 1820 University Avenue (in the YWCA). To join or for more information call Emily Gardner, 734-3921 (H), 254-2866 (W). The committee is actively seeking new members.

June 14, Monday

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

June 20, Sunday

Half day hike to Wa'ahila trail to see native plants and birds led by Casey Jarman. Bring water, snacks, binoculars, sun screen, and hiking shoes. Meet at the State Library on Punchbowl Street at 7:30 a.m. or at Wa'ahila State Park at 8:30 a.m. For more information

call Casey Jarman, 956-7489 (W). Suggested donation: \$2.00.

June 21, Monday

General membership meeting, Paki Conference Room, Bishop Museum, 7:30 p.m. Bill Gilmartin of the National Marine Fisheries Service will discuss population monitoring and protection of the Hawaiian Monk Seal throughout the island chain. Refreshments will be served.

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 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).

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Moving?

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