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The "10 Most-wanted" Management Actions for Terrestrial Hawaiian Ecosystems: a Survey

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On June 5-6, 1984, a Symposium on Protection and Management of Terrestrial Hawaiian Ecosystems was held at Hawaii Volcanoes National Park. There were 144 registrants at the meeting, all with some interest in Hawaiian ecosystems. During the course of the Symposium, attendees were challenged to submit a list of 10 "most-wanted" management actions to benefit terrestrial Hawaiian ecosystems. No recommendations were made as to whether lists should be for long-term or short-term actions, but respondents were asked to be specific and list practical topics. The point has often been made that such a list would be useful to legislators, administrators, and planners who do not have enough expertise to prioritize issues on biological bases, but who need to know where to start.

The initial responses to the challenge were few and were summarized by Frank Howarth and Carl Christensen of the B.P. Bishop Museum in a letter and short report to Ronald Walker, Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife, on June 17, within a few days of the Symposium. Howarth and Christensen noted that 5 conferees submitted formal lists and that additional input from others resulted in over 50 suggestions. These were condensed into a list of 10 items, that were not ranked. The emphasis was on what was considered specific achievable goals rather than general problem areas, and these were targeted for response by the Hawaii Department of Land and Natural Resources (DLNR) as the lead organization in protection and management of Hawaii's natural resources. The authors noted that the list was not a final product. The list was also presented in the Honolulu Advertiser July 11, in an article by Jan TenBruggencate. Ron Walker discussed the 10 items, their validity and approaches to addressing actions in a response to Howarth dated September 7, 1984. This letter is made public in order to increase understandings and dialog among DLNR and other concerned entities (see Appendix).

On June 30, we sent the preliminary list developed by Howarth and Christensen to all 144 Symposium participants. The participants were asked to rank the listed actions (1 = highest priority, 10 = lowest), but especially to suggest their own management actions and rank them along with the list provided; to consider target issues irrespective of landowner, manager or other responsible group; and to emphasize specific issues and achievable goals. Examples of additional desirable management actions were provided. A deadline of July 30 was set for responses. Results of the survey of the 144 Symposium participants are presented in this paper. A separate response by the Hawaii Chapter of the Sierra Club is also presented and discussed.

RESULTS

Sixty-nine (47.9%) of the 144 contacted people responded as of September 15, 1984. Most of the respondents rated only the 10 management actions provided or modifications thereof, but 28 (40.6%) ranked their own distinct ideas in the top 10 desired actions. Because these additional suggestions showed little overlap, they could not compete with the 10 management actions ranked by most respondents, and will be considered separately.

Overall ratings of the 10 management actions provided are presented in Table 1. The lowest mean value and therefore the highest rank (#1) was given to identifying and protecting pristine Hawaiian ecosystems with diverse assemblages of organisms. Establishing and managing Natural Area Reserves on Pu'u Wa'awa'a (#2), developing educational programs on Hawaiian natural history (#3), and improving plant and animal quarantine procedures (#4) were also considered important by participants. Note that more people voted for items 1, 3, 4, and 5.5 (keeping mouflon and other ungulates off Mauna Kea) than for item 2. Perhaps the reduced number of voters for item 2 is a reflection of less familiarity of some people with the proposed action; items 9 (establish formal review of alien species release proposals among islands) and 10 (remove axis deer on Maui) may have received fewer votes for the same reason; item 9 also overlaps somewhat with item 4 as far as interisland transport of alien species is concerned.

A breakdown of the voting used to obtain rankings is shown in Figures 1 and 2. Not only was the *average* rank for management action #1 (pristine ecosystems) the highest, but most people who voted for this saw it as the number 1 or 2 priority. Similarly, most people who voted for #10 (axis deer removal on Maui) saw it as number 9 or 10 priority on the list. In contrast, voting for the other management actions was more evenly spread. Of course, all 10 of the actions are considered important, but some must be considered more so than others, based on responses.

Tables 2 to 4 present priority management actions submitted as write-ins by respondents. Unfortunately, these cannot be integrated with the 10 actions discussed above as to importance, but they should also be considered as high priority management needs. Our own subjective impression is that many of the write-in actions ranked 1 to 3 are as important as those on the list developed by Howarth and Christensen and sent out by us. Setting priorities; managing what we do have set aside; improvement of communication, education, and training; and more involvement in funding and political processes are key general ideas. Many of the lower-ranked management actions suggested in Table 4 also have

Table 1. Ranking of management actions for terrestrial Hawaiian ecosystems by 69 participants in Symposium on Protection and Management of Terrestrial Hawaiian Ecosystems, held at Hawaii Volcanoes National Park, June 5-6, 1984.

Overall Rank	Management Action	Mean Rank	N
1.	Identify and protect pristine and near-pristine ecosystems with diverse assemblages of organisms.	4.22	67
2.	Establish and manage two proposed Natural Area Reserves on Pu'u Wa'awa'a Ranch.	5.03	61
3.	Develop educational programs on Hawaiian natural history for public schools, tourists and general public.	5.11	66
4.	Expand State quarantine list, improve quarantine procedures, discourage inter-island transport of noxious organisms.	5.35	66
5.5.*	Remove mouflon sheep from Mauna Kea immediately and keep feral sheep and goats and mouflon off mountain.	5.58	65
5.5.*	Strengthen and expand State endangered species program, especially with regard to plants and invertebrates.	5.58	62
7.	Intensify feral pig control, especially in Po'ouli range on Maui.	5.73	63
8.	Remove all restrictions on hunting alien animals on State-owned lands within Conservation District P-subzone.	5.86	63
9.	Establish formal review of all proposals to release alien species on islands within State on which they do not occur.	6.05	58
10.	Remove axis deer on Maui immediately.	6.76	58

*Indicates tie; average of 5 and 6 rating.

merit, are similarly worth serious consideration, and should be implemented.

Group Differences

As a contribution to understanding differences in the way people look at natural resource problems, we subdivided the 69 respondents according to their affiliations, and analyzed ratings of the 10 management actions developed by Howarth and Christensen accordingly (Table 5). Federal employees comprised the largest group of respondents (56.5%), so their opinions had the most influence on the total ratings. This group did rate feral pig damage control higher than the overall average (4 versus 7 overall). Other affiliation groups had lower numbers of respondents and can best be compared with federal employees to highlight differences.

University of Hawaii employees (14.5% of respondents) ranked identification and protection of pristine areas and development of educational materials lower than Federal employees (3 versus 1, and 5 versus 3). They also ranked feral pig control lower (8 versus 4), but ranked liberalization of hunting restrictions higher (2 versus 8).

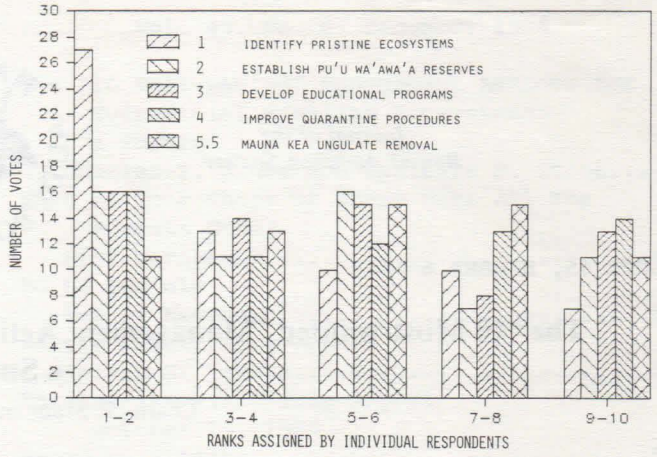

Figure 1. Voting patterns for most-wanted management actions with overall rankings of 1 through 5.5 (see Table 1).

Other State employees (7.2% of respondents) ranked development of education materials and improvement of quarantine facilities higher than Federal employees (1 versus 3 and 2 versus 5). They, like University employees, ranked control of feral pigs lower (9 versus 4), but liberalized hunting about the same as Federal workers. These State employees believed that formal review of inter-island transfer of alien organisms should be rated more highly than did Federal (or University) personnel (3 versus 10). They ranked creation of Natural Area Reserves on Pu'u Wa'awa'a Ranch low (7 versus 2 for Federal, and 1 for University personnel).

Other respondents (landowners, conservation organizations, Bishop Museum, private citizens, and other educators) as a group (21.7% of respondents) also ranked Pu'u Wa'awa'a low (7), development of educational materials low (8), and removal of ungulates from Mauna Kea low (9). They rated liberalized hunting regulations highly (2) as did the University workers, and formal review of interisland transfer of aliens highly (4), as did other State employees. The "other affiliations" group is admittedly a somewhat "catchall" group comprised of many sparsely represented or hard-to-categorize subgroups.

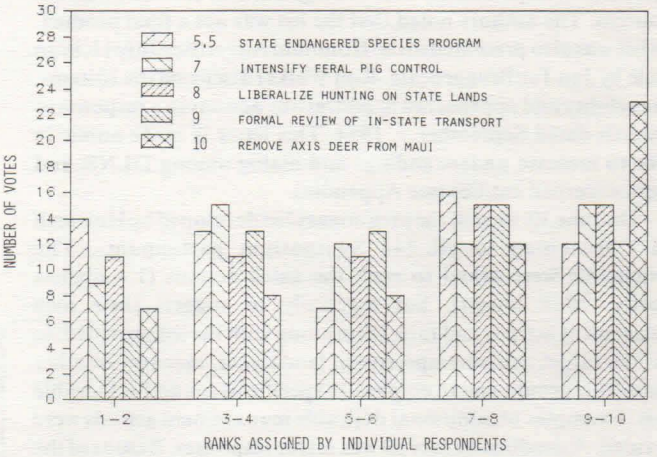

Figure 2. Voting patterns for most-wanted management actions with overall rankings of 5.5 through 10 (see Table 1).

Table 2. Management actions thought to be of primary (rated 1) importance by participants who wrote in top 10 priorities.

Maintain fences on forest reserves.
Eliminate feral goats.
Set up better information flow among Federal and State agencies and knowledgeable biologists, to achieve exemplary land management demonstrations.
Develop and implement practical pig control for remote sensitive areas.
Manage areas *already* identified as pristine on State lands.
Develop prioritized list of 10 most critical ecosystems needing preservation.
Set moratorium on further logging of upper elevation native-dominated koa forests.
Create better dialog with hunter groups.
Eradicate banana poka, lemiwoi, and *Myrica faya* from Hawaii Island.
Aggressively acquire and secure priority ecosystems.
Agree on the single most needed management action.

Rankings by respondents according to their roles in resource management was also revealing. No one group appeared strongly correlated with the overall response, so comparisons of each approach group can be made with the group as a whole (Table 6).

Administrators ranked creation of Natural Area Reserves on Pu'u Wa'awa'a, elimination of feral ungulates from Mauna Kea, and strengthening of the State endangered species program lower than the group as a whole (6 versus 2, 8 versus 5.5, and 9 versus 5.5). They rated removal of feral pigs and liberalizing hunting restrictions higher (4 versus 7 and 5 versus 8).

Resource managers (including natural and man-made resources) rated creation of Natural Area Reserves on Pu'u Wa'awa'a and liberalization of hunting restrictions lower (6 versus 2 and 10 versus 8) than the group as a whole.

Educators and interpreters ranked development of education programs much lower than the group as a whole (9 versus 3), perhaps because of their knowledge of existing programs. They rated strengthening of the State endangered species program, liberalization of hunting regulations, and formal review of interisland transport of aliens more highly than the group as a whole (2 versus 5.5, 4 versus 8, and 6 versus 9).

Research workers rated development of education materials, improvement in quarantine procedures, and strengthening of the State endangered species program lower than the group as a whole (5 versus 3, 7 versus 4, 9 versus 5.5). They rated removal of ungulates from Mauna Kea, liberalization of hunting restrictions, and removal of axis deer on Maui more highly than the group as a whole (3 versus 5.5, 4 versus 8, and 8 versus 10).

Sierra Club members who registered as such at the Symposium were few (n = 3), but they placed less emphasis on pristine areas (7 versus 1) and Pu'u Wa'awa'a (9.5 versus 2), and more on the State endangered species program (1 versus 5.5) and formal review of interisland transport of alien species (3 versus 9) than the group as a whole.

Table 3. Management actions thought to be of high importance (rated 2 or 3) by participants who wrote in top 10 priorities.

Hire a full-time conservation lobbyist.
Establish a University of Hawaii degree program for natural resource managers.
Create packages of material for community education.
Eliminate feral pigs and cats.
Focus on watershed values of forest reserves.
Complete fencing of Haleakala National Park crater and adjacent areas.
Fence Kipahulu Valley in Haleakala National Park to control feral pigs.
Intensify feral pig and goat control in National Park Service areas.
Establish funding bases (or release funds) such as tax incentives or checkoffs for conservation.
Develop films about introductions of alien organisms and show them on incoming planes.
Salvage mature, dead, and dying koa and emphasize reforestation on Hawaii.
Halt listing of endangered and threatened plants until a comprehensive statewide survey is conducted.
Implement comprehensive management for the 'Alala.
Legislate an audit of the Hawaii Forestry and Wildlife Department as per SR-165-84.
Provide a tax checkoff for supplemental funding for native ecosystem preservation and management.
Actively manage existing protected areas (will require funding, staffing, and cohesive objectives for agencies).
Set up a *routine* and mandatory coordination system to overcome bureaucratic "fragmentation of function" among State and Federal agencies.

Hawaii Sierra Club Response

The Conservation Committee of the Hawaii Chapter of the Sierra Club sent a group response on July 30. They ranked management actions according to whether they were "generic" or "specific," the first being considered more "widespread and useful" in nature. The generic actions were aimed at the State of Hawaii and were thought to require legislative mandates and considerable pressure to bring about. Both generic and specific responses were prioritized together and given considerable written amplification. The proposed actions and their priorities are condensed in Tables 7 (generic) and 8 (specific). Although suggested actions are not directly comparable with other lists, this group placed higher emphasis on the State Forest Reserve System as watersheds and native ecosystems, and public review of alien animal introduction proposals (including biological control), than did the Symposium registrants. They placed less emphasis on State native species programs and identifying and protecting pristine areas (other than those in Forest Reserves).

Table 4. Management actions thought to be of importance (rated 4 to 10) by participants who wrote in top 10 priorities.

Establish conservation education section and popular magazine in Hawaii Department of Land and Natural Resources (DLNR) and other agencies (suggested by 2).

Set up a Natural Area Reserve System with funding for management under DLNR (suggested by 3).

Establish a tax checkoff for protection and preservation of wildlife and land acquisition (suggested by 2).

Eliminate mongooses and rats (suggested by 2).

Reforest old grazing areas with native flora.

Find uses for nuisance plants.

Establish a volunteer program for eradicating alien plants (suggested by 2).

Establish a volunteer program for eradicating alien plants (suggested by 2).

Fence Haleakala National Park's north slope.

Carry out comprehensive land use planning including areas for native ecosystems, hunting, and both.

Keep pigs out of several areas in West Maui through fencing.

Fence leeward East Maui areas to preserve native ecosystems.

Discourage planting and retention of declared noxious weeds by private landowners.

Conduct a biological survey of terrestrial invertebrates.

Accelerate interagency effort to save the 'Alala (suggested by 2).

Rear and translocate native plants and animals.

Develop a popular picture book on Hawaii's native biota.

Obtain more and better enforcement of Federal and State environmental laws (suggested by 2).

Hire a State animal control expert to deal with problems before the "too late" stage.

Eliminate feral cattle from State conservation lands (suggested by 2).

Establish hunting areas in extremely altered ecosystems and fence same.

Do research on and begin biological control of strawberry guava.

Stop planting kikuyu grass in forest reserves.

Identify limiting factors for endangered forest birds.

Develop a tape for tourists on threats to native biota.

Expand, strengthen, and support Natural Area Reserves (suggested by 2).

Increase funding and authority for additional and existing DLNR personnel (suggested by 2).

Table 5. Rankings of 10 most-wanted management actions for Hawaii's natural resources by affiliation.

Action	Federal	University of Hawaii	Other State	Other Affiliations
Pristine Areas	1(3/90)	3(5.20)	4(4.50)	1(4.07)
Pu'u Wa'awa'a	2(4.97)	1(4.22)	7(5.50)	7(5.61)
Education	3(5.00)	5(5.60)	1(2.75)	8(5.71)
Quarantine	5(5.50)	6.5(5.80)	2(4.00)	3(5.13)
Mouflon—Mauna Kea	6(5.61)	4(5.22)	5(4.60)	9(6.07)
Endangered Species	7(5.70)	6.5(5.80)	6(5.20)	5(5.29)
Feral Pigs	4(5.21)	8(6.00)	9(9.20)	6(5.57)
Hunting Restrictions	8(6.32)	2(4.80)	8(7.20)	2(5.00)
Inter-Island Alien Review	10(6.44)	10(6.75)	3(4.33)	4(5.20)
Axis Deer—Maui	9(6.42)	9(6.63)	10(9.33)	10(7.07)
Number of Respondents	39	10	5	15

Table 6. Rankings of 10 most-wanted management actions for Hawaii's natural resources by approaches subgroups (as compared with overall rankings)

Action	Overall Rankings*	Rankings by Administrators	Rankings by Resources Managers	Rankings by Educators & Interpreters	Rankings by Researchers	Rankings by Sierra Club
Pristine Areas	1(4.22)	1(3.55)	1(3.61)	1(2.50)	2(5.17)	7(4.67)
Pu'u Wa'awa'a	2(5.03)	6(5.75)	6(5.71)	3(4.80)	1(4.39)	9.5(5.67)
Education	3(5.11)	3(5.10)	2(3.76)	9(6.67)	5(5.63)	5.5(4.33)
Quarantine	4(5.35)	2(4.78)	3(4.94)	4(5.33)	7(6.07)	2(2.33)
Mouflon—Mauna Kea	5.5(5.58)	8(6.77)	5(5.55)	7(6.50)	3(5/21)	4(3.67)
Endangered Species	5.5(5.58)	9(6.78)	4(5.00)	2(4.33)	9(6.30)	1(1.33)
Feral Pigs	7(5.73)	4(5.20)	7(5.87)	8(6.60)	6(5.83)	5.5(4.33)
Hunting Restrictions	8(5.86)	5(5.22)	10(7.33)	5(5.67)	4(5.22)	8(5.00)
Inter-Island Alien Review	9(6.05)	7(6.20)	8(6.06)	6(6.17)	10(6.35)	3(3.00)
Axis Deer—Maui	10(6.76)	10(7.33)	9(7.13)	10(8.40)	8(6.12)	9.5(5.67)
Number of Respondents	69	11	18	6	31	3

*1st figure is rank (1 = highest, 10 = lowest);
2nd, in parentheses, is average numerical rank by all who ranked that action in top 10

Table 7. Generic management actions proposed by the Conservation Committee of the Hawaii Chapter of the Sierra Club, July 30, 1984.

Priority	Management Action
1(8)*	State Forest Reserve System should protect water resources and native ecosystems as primary objective. Forest Reserves should include Natural Area Reserve System, native wildlife and plant sanctuaries, and portions of certain State Parks. These areas should be separate from Game Management Areas and tree farms by statute and management objectives. State should decontrol hunting in these areas and fence where feasible. Public should pay private landowner a fair return on lands dedicated to Forest Reserve System.
3(9)	Establish formal and open public review of proposals to import or release alien organisms within State or transport among islands where they do not now occur. Jurisdiction and authority to prohibit such proposals and including biocontrol agents shall be vested in an "Animal and Plant Species Advisory Commission," independent of any State Department and replacing similar bodies in the Department of Land and Natural Resources and the Department of Agriculture.
4(4)	Prepare and administer State list of noxious organisms, including those potentially harmful to Hawaii's natural, as opposed to agricultural environments, public health, and economy. A program to do this should include capacity to monitor, react quickly to emergencies, discourage inter-island transport of such species, and educate the public.
5(7)	Intensify work on feral pig control in native-dominated vegetation in State. Eliminate pigs from maageable areas such as portions of West Maui Mountains and other selected watersheds statewide.
10(5.5)	Strengthen and expand State native species programs, through adequate funding, enforcing existing statutes including HRS 195-D, and supplemental legislation, where needed.

*Numbers in parentheses refer to ranking by Symposium participants of similar proposals.

Table 8. Specific management actions proposed by the Conservation Committee of the Hawaii Chapter of the Sierra Club, July 30, 1984.

Priority	Management Action
2(2)	Immediately establish proposed 'Alala Sanctuary, incorporating all State lands identified in 'Alala Recovery Plan as "essential habitat." State should implement various economic incentives to encourage private landowners to set aside "essential habitat" defined, for supplementary 'Alala sanctuary.
6(5.5)	Remove mouflon sheep from Mauna Kea, and take steps to keep mouflon and feral sheep and feral goats off mountain.
7	Withdraw State lease at Pu'u Wa'awa'a Ranch and place land into other appropriate uses.
8(10)	Remove axis deer from Maui immediately.
9	Remove feral goats and sheep from Kaho'olawe immediately and employ native plants in revegetation once accomplished.

*Numbers in parentheses refer to ranking by Symposium participants of similar proposals.

DISCUSSION AND CONCLUSIONS

Although the response rate (47.9%) and the percentage of people who wrote in their own choices for management actions (40.6%) were disappointing to us, we realize that this may have resulted from minimizing the importance of this survey, from lack of time to think about the issues, and from a general feeling of inadequacy in judging such large questions. More knowledgeable representation from the private sector (especially landowners and hunters), and more responses from educators, environmentalists, and developers, might have changed the results and provided interesting contrasts in public opinion (we are currently working on a survey of 30 to 40 private landowners, with H. Peter L'Orange, to increase our sample size of this group). However, a large number of good suggestions has resulted from this study. In general, the actions judged most important may be restated as emphasis on: (1) protection and management of certain areas from alien species through legislation and active management; (2) education of various publics including legislators; and (3) better prioritization of our activities through communication and cooperative efforts. A stronger role by the State of Hawaii is obviously also desired and badly needed. Additional polls could be taken, but these general areas would remain very important; action programs by responsible groups for any of them would benefit Hawaii's native ecosystems, and, we think, future generations of Hawaii's citizens.

Because any change in the way people do things in Hawaii requires overcoming a great deal of bureaucratic and other inertia, and developing of definite priorities that can be defended (as well as more money and manpower), we believe that communication, cooperation, and prioritization must soon receive considerable organized emphasis. Public apathy is perhaps understandable if organized educational programs are not established to explain problems, and if responsible administrators will not work together, seek information, and use technical expertise. If we are to minimize confrontation and costly, time-consuming legal battles (which are sometimes necessary) and reduce development-preservation conflicts in nearly every situation where land use values are in question, all involved parties need to do a better job of sharing knowledge about, and finding solutions to, land use problems. The limited remaining near-native Hawaiian ecosystems are *known* to be deteriorating with time and with successive invasions and spread of alien organisms.

The large number of valid suggested management actions that are not being successfully addressed in Hawaii is discouraging. In the face of constraints in money, personnel, expertise, and time, we think that those affected by land management in Hawaii (who isn't?) need to take an especially hard look at what we all *are* doing in relation to what we *have* to do and what we *should* be doing. This

can scarcely be done from the perspective of one administrator, one agency, or one viewpoint in a land use vacuum. It requires knowledge of many viewpoints and needs, give and take, concensus, and then, concerted action. We need to include economists and developers in decision-making, as well as environmentalists, and to improve long range land use planning in Hawaii, as well as react to individual issues one by one as they occur.

We propose that a goal-oriented "blue ribbon" Advisory Committee be resurrected under the initial leadership of the Department of Land and Natural Resources (DLNR), to deal with recommending and publicizing land use priorities, approaches, and responsibilities. Membership should include people with decision-making authority, or easy access to such authority, as well as subject matter specialists for the agencies, plus important representatives of resource users that impact Hawaiian native ecosystems (e.g. timber harvesters, ranchers and other landowners, educators, conservation and tourist groups). There should be close ties with the state legislators, the media, and educators. The group should function to provide recommended actions and also to provide facts on issues to others in a timely manner through use of their own technical expertise and that available in their agencies or organizations.

The idea of such an Advisory Committee is not new, but it seems worth trying again with a new case of characters and definite agency and organizational support and commitment (a similar suggestion was made at a meeting of endangered species specialists in Hawaii Volcanoes National Park in 1983). There are a number of very capable people in Hawaii whose energies could be better directed toward problem prioritization and creative solutions to the task of preserving and managing near-native ecosystems. Although many of these individuals are bound to have divergent views, goals, and loyalties, we believe that people can work more closely for the benefit of Hawaii's natural heritage and future citizens, if they choose to do so. The time is now.

ACKNOWLEDGEMENTS

The authors would like to thank Mike Scott for the initial suggestion that a list of the top 10 environmental problems in Hawaii be developed. We would also like to thank Frank Howarth, Carl Christensen, Ron Walker, Mike Scott, and Cliff Smith for reading draft manuscripts and for their comments. Steve Anderson helped us generate Figures 1 and 2.

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APPENDIX

(Letter from Ronald L. Walker to Dr. Frank G. Howarth, dated 7 September 1984)

Dear Dr. Howarth:

Thank you for presenting us with the "Ten Most Wanted List" of conservation measures for terrestrial ecosystems in Hawaii. My response has been delayed in order to allow my office to review and evaluate the proposals in detail.

In general, we find the proposals to be reasonable to the extent that, if implemented, they would have direct benefit to the protection of Hawaiian ecosystems. However, from a practical standpoint, we have reservations about their feasibility in view of socio-economic realities. The following responds to each proposal:

1. *The state list of noxious plants and animals should be expanded to include all species recognized as potentially harmful to the state's economy, public health, and natural environment; quarantine procedures should be instituted to prevent their importation into the state, and measures should be taken to discourage inter-island transport of such species within the state.*

   These recommendations relate to responsibilities of the State Department of Agriculture (DOA) which has jurisdiction over importations and inter-island movement of alien animals. We agree that the system already in place for these purposes needs improvement. We have recognized these problems in the past and have met frequently over the years with representatives of the DOA to discuss them. We are particularly concerned with the proliferation of escaped birds which have become nuisance or crop damage problems and which may impact adversely on native biota. Representatives of the Division of Forestry and Wildlife (DOFAW) serve on advisory committees to the DOA, and through this medium, we urge a conservative approach to plant, bird, mammal, and invertebrate importations. As with most regulatory processes, the key to success is having the necessary manpower and funds to screen points of entry and transfer. A tightening up of controls would necessitate new funding in a time of tight fiscal constraints. In any event, we will initiate meetings with the DOA to voice our mutual concerns and will forward your recommendation to them for their consideration.

2. *As a first step toward deregulation of hunting of alien animal species in predominantly native habitats, all bag limits, closed seasons, and other restrictions should be removed on the hunting of alien animals on all state-owned lands within the Conservation District P-subzone.*

   On the surface of it, this proposal appears to be a logical solution to damage caused by game animals. However, in practice, it would not have the desired effect except in a few localized situations. Our present hunting seasons are, for the most part, very liberal in terms of seasons and bag limits. Hunters seldom achieve their limit in animals bagged and to a large extent, the harvest is self-limiting. When it becomes difficult to obtain game due to competition with other hunters or game seeking remote areas, hunters simply no longer go hunting. In effect, hunters cannot be *forced* to accelerate their hunting efforts. This proposal also would not be acceptable to the hunter community we have a legislative mandate to serve. However, where it can be demonstrated on specific areas within the "P" subzone that game animals are directly affecting the survival of ecosystem components, attempts to encourage more intensive hunting or other controls (fencing) could be instituted where practical and economically feasible. The key to this is having good scientific evidence to support the action, and for this we must depend on the academic community to provide the information.

3. *The state lease at Puu Waawaa Ranch should be renegotiated in order to establish the two long-proposed Natural Area Reserves there: one to include the lower elevation dry-mesophytic forest, and another located within the upper elevation mesic forest to serve as a reserve for the endangered Hawaiian Croa ('alala). A management program should be instituted immediately to control feral ungulates, fountain*

grass, and other alien species.

These are valid recommendations, but require resolving several technical and legal questions first. As the lease is for pasture purposes involving a large commercial ranching enterprise, the rights of the leasee have to be taken into consideration. A proposal to establish a sanctuary in the upper area of the leased lands is presently under consideration. Feral animals are being controlled to some extent by annual public hunting seasons on portions of the leased lands. Large scale alien plant control would be very expensive, and a new source of funding would have to be found. While the proposals are entirely logical purely from an ecosystem protection standpoint, the Department must consider existing obligations and constraints in considering actions.

4. *A formal review process, similar to the environmental impact study process now used in land use planning, should be established to better oversee all proposals to release alien plant and animal species on islands within the state on which they do not now occur.*

   This would probably require statutory amendments through the legislative process. The State agency involved would be the DOA, which already has a scientific advisory committee system for considering proposed alien introductions. Perhaps this system could be expanded, but again additional funding would probably be required. We will advise the DOA of your recommendation.

5. *The state's endangered species program should be strengthened and expanded; specifically, additional plant and invertebrate species recognized as biologically endangered and which inhabit biologically diverse habitats should be identified and listed.*

   There is already a process in place for this purpose which includes plants and invertebrates (Section 195-D, H.R.S., and Chapter 124, of the Department rules). The necessary field work and status studies to justify listing and additional actions is time consuming and expensive. The State simply does not have the resources to accelerate these activities in this time of fiscal austerity. To a large extent, we must depend on the scientific community to provide the necessary research and documentation. What can be done is to examine the existing program and re-order priorities for actions already funded.

6. *Axis deer now on Maui should be removed immediately.*

   There is recent evidence that Axis deer have expanded their range in the Ulupalakua, Kihei, Wailea, and Omaopio areas of Maui, but no indications that they entered native wet forest areas. For the most part, they are confined to kiawe forest on lands used for cattle ranching. Although there are native dryland plants in these areas, cattle are the primary herbivores affecting their survival. In general, since their introduction in 1959-60, Axis deer have not been implicated in damage to native ecosystems on Maui. Their numbers have been limited by hunting on the private ranch areas. The State has no authority to force landowners to eliminate Axis deer on their lands. The authority is limited to setting seasons and bag limits or closing hunting seasons and to date we have not exercised this authority for deer on Maui. In practice, the cost of eliminating deer now spread over vast areas of East Maui would be extremely high and hard to justify relative to any damage they are now doing. Where it can be demonstrated that specific elements of the axis deer population are threatening the survival of portions of the native ecosystem, concerted efforts to remove them (through organized hunts or fencing) could be considered.

7. *Mouflon sheep now on Mauna Kea should be removed immediately, and steps should be taken to ensure that Mouflon sheep, feral sheep, and feral goats do not return to that environmentally sensitive area.*

   Our present policy is to reduce the population of mouflon to 15 per square mile throughout the habitat (approximately half the present density) through liberal public hunting. Also, the intent is continue monitoring the impact of this sheep on the mamane-naio ecosystem and conduct a planting program to mitigate the impact of the sheep on the vegetation. We believe that this is a reasonable approach considering our obligation to the hunters, until it can be demonstrated that maintaining mouflon directly affects the survival of the ecosystem there. The Department is presently implementing a fencing project around the boundary of Mauna Kea to prevent future entry of feral animals. 2-1/2 miles of fence have been erected along the southern boundary.

8. *Work on feral pig control should be intensified; as a first step, feral pigs should be eliminated from the range of the Po'o uli on Maui.*

   Feral pig control (other than public hunting) is extremely difficult and expensive due to the remote forested areas they inhabit and their prolific nature. For specific localized areas where a particular threat to a component of the ecosystem is recognized, it might be practical to institute a concentrated control effort. But for widespread areas, such control is simply not practical or economically feasible. To even reach the habitat of the Po'ouli in the Koolau-Hana forest reserves, requires an extensive backpack trip through very difficult terrain. Control through fencing or herding would not be feasible in terms of costs and logistics. Even the prospect of accelerating public hunting as a mechanism of control is unlikely because of the extremely remote location. Again, hunters cannot be *forced* to increase their activities.

9. *Educational programs in Hawaiian natural history should be developed for use in the public schools as well as for tourists and the general public.*

   Such an effort has recently been initiated at the University of Hawaii, and the DOE curriculums have been slowly improving over the past several years. The Hawaii Wildlife Plan recommends that an element to serve this purpose be established in our department. Again, to implement this recommendation requires new funds, and this is difficult in hard economic times. We will continue to urge the DOE and Hawaii Visitors Bureau to implement this recommendation.

10. *Pristine and near-pristine habitats (i.e. ecosystems) that support diverse assemblages of native plants and animals should be identified, and a meaningful program of protective management should be instituted for such areas present on state-owned land.*

    The Natural Area Reserve System already serves this purpose. Management, however, has been limited to the

establishment of rules, posting of signs and law enforcement. Here, intensified management would require new resources presently not available. Where specific problems of a crisis or near-crisis nature occur, existing resources could be shifted to bring solutions to bear. What is needed is to identify precisely what and where they are and to shift priorities. The process of identifying specific, relatively pristine, native ecosystems requires detailed studies and, again, we must depend on the academic and scientific communities to provide this information.

In general, these proposals pre-suppose the availability of the necessary funds and manpower within the State structure to implement them. Many of them are too broad-brush in approach and some ignore practical realities of logistics and other, perhaps conflicting, priorities for the use of the land areas involved. While I do not question the value of these proposals to protect and restore native ecosystems, we must consider what *is possible,* not what is ideal. I look forward to working together with you and others who support these proposals to this end.

Sincerely yours,

RONALD L. WALKER
Wildlife Biology Program Manager

CASH IN YOUR CHIPS
- OR -
WHERE HAVE ALL THE FORESTS GONE?

THE BUSINESS OF "BIOMASS" ENERGY PRODUCTION IN PUNA.

When AMFAC closed its Puna sugar operations last month, a new and unexpected form of destruction threatened the native forests of the Big Island - woodchipping. In order to meet its contractual obligation to supply Hawaii Electric Light Company (HELCO) with biomass for electricity generation, AMFAC formed Puna Biomass Co. to purchase woodchips in place of bagasse. Initially, Bio Power Corp., a mainland-owned woodchipping firm, cut and chipped eucalyptus for AMFAC. However, after clearing a 240 acre tract of eucalyptus in Hilo, the chippers moved to Campbell Estate land above Kalapana Black Sand Beach and began chipping native ohia forest at nearly ten acres per day. According to State Foresters, the chippers were not interested in available eucalyptus stands, not even those planted by the State (at the expense of prime native forest) along Stainback Highway just a few miles from the Kea'au power plant. In addition, neither AMFAC nor Bio Power plan any operations to grow eucalyptus, leucana, or other fuel wood to power the plant after available stocks have been chipped.

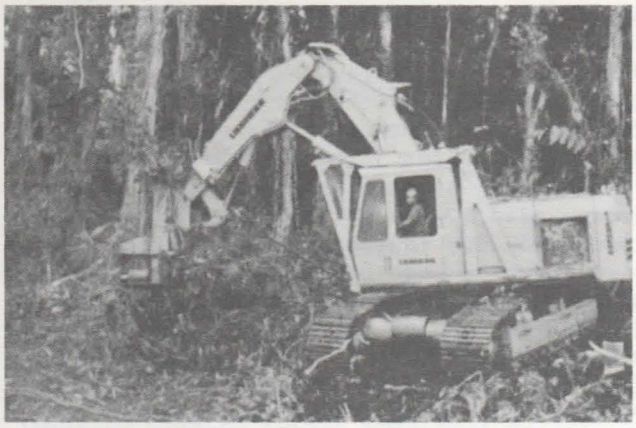
The Campbell Estate has over 20,000 acres of forested land in the Puna area, and the chippers have made arrangements to chip native forests in Ka'u and Kona as well. A ton of ohia woodchips costs AMFAC about $20. At 3,000-4,500 tons a week, this adds up to $60,000-$90,000 a week or about $3-5 million a year. Bio Power chief Warren Ramsey has not disclosed how much his firm pays Campbell Estate for the chipped ohia, but did say it was more than the $1.90 per ton price for the State eucalyptus stand near Kea'au and that he sells both species' chips for about the same amount.

SHORT-TERM ALTERNATIVES - A MATTER OF CHOICE

Is it too much to ask AMFAC to choose to stop burning ohia and to buy only eucalyptus chips? The answer should be "no", as both chips burn equally well and both cost half as much as fuel oil. Bio Power will chip only what they can sell; the choice belongs to AMFAC. The low cost of chips and the increased efficiency of their high-output boiler operation have motivated AMFAC to produce

This rich, native forest will probably have been chipped by the time you read this article.

Photo by Author



This "shear" is holding a shorn ohia tree and shaking it free from the 'ie'ie vines.

Photo by Author

50% more electricity than required by their HELCO contract. So they are making money. The choice for AMFAC, a conglomerate worth over two billion dollars, appears to be more a moral choice than a finanacial one.

Let's also hope the State tries to convince the chippers and buyers to purchase their eucalyptus stocks in order to stop the needless chipping of irreplaceable native forest. The added state revenue of $300,000 -$450,000 a year would be far greater than recent revenues derived from permitting extensive koa logging on state land, and it would be much less damaging. Also, cutting and regrowing eucalyptus and other species would convert present "biomass" operations from a "nonrenewable" to a "renewable" energy source, a Hawaii State goal.

Let's also hope that the Campbell Estate sees that choosing to chip the native forests of Puna is like choosing to burn the mansion's antique furniture in the pot-bellied stove in order to warm your hands during the first week of winter.

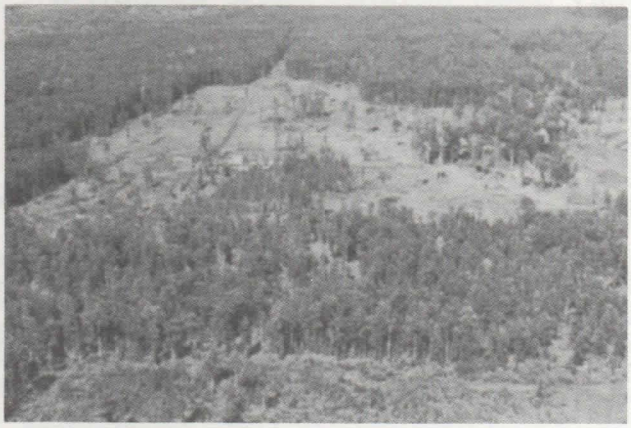
THE NATURE OF THE CAMPBELL ESTATE FOREST NOW BEING CHIPPED

Just what are the Campbell Estate antiques? This relatively pristine forest is dominated by numerous, closely-spaced ohia trees. Most of the trees rise about 100 feet to form a very dense canopy, occasionally broken by scattered kukui (*Aleurites moluccana*) and ohe mauka (*Tetraplasandra hawaiiensis*). The forest contains some tree ferns (*Cybotium* spp.), but most of the shade comes from the dense ohia canopy, the 'ie'ie (*Freycinetia arborea*) curtains, and the understory trees, including kopiko (*Psychotria* spp.), kolea (*Myrsine lessertiana*), mehame (*Antidesma platyphyllum*), lama (*Diospyros ferrea*), and mamake (*Pipturus* sp.). The shaded ground cover consists mainly of ha'i wale (*Cyrtandra* spp.), maile (*Alyxia olivaeformis*), 'ie'ie, ho'i'o (*Athyrium sandwichianum*), kanawao (*Broussaisia arguta*), and 'ala 'alawainui (*Peperomia leptostachya*). The 'a'a substrate and trees are liberally covered with bryophytes and epiphytic ferns, including a few very rare *Adenophorus periens*. The trees are heavily draped and intertwined with long strands of 'ie'ie vines, a condition rarely seen in present-day Hawaiian forests but commonly reported in early descriptions of many Hawaiian wet and moist forests. The forest shows little signs of serious invasions by alien plants and is the most intact rain forest area know in Puna.

However, the most important feature of this low-elevation (1,200-1,400') forest is the abundance and predominance of native birds. 'Amakihi (*Hemignathus virens virens*), 'Apapane (*Himatione sanguinea*), 'Oma'o (*Phaeornis obscurus obscurus*), 'Elepaio (*Chasiempis sandwichensis*), 'Io (*Buteo solitarius*), and possibly 'I'iwi (*Vestiaria coccinea*) made up over 90% of the birds heard or seen (in approximate order of relative abundance). Two to three 'Oma'o and nearly as many 'Elepaio could be heard from almost any given point. 'Io are known to nest in Puna's low-elevation forests. They were seen circling over the chipper and heard screaming in forest just disturbed by bulldozers. The only alien birds heard were occasional Japanese White-eyes (*Zosterops japonicus*), a Northern Cardinal (*Cardinalis*

The retreating edge of the forest.

Photo by Author



Aerial view.

Photo by Author

cardinalis), and a Melodious Laughing-thrush (*Garrulax canorus*).

This unusual bird richness at such low elevations could provide insight into several questions relating to bird distributions. The prominence of native birds in this large forest kipuka is an exception to several general conclusions and implications derived by analysts of the U.S. Fish and Wildlife Service Hawaii Forest Bird Survey data, and this area deserves more research attention.

The richness and integrity of this forest are due to its great age, its rough 'a'a substrate (providing good drainage and a deterrent to pig incursion), and most importantly, its lack of feral pig damage or other previous significant disturbance. This forest today is probably little different than it was when Puna's earliest Hawaiian inhabitants first passed through it.

ENTER THE DRAGON: THE "BOTTOM DOLLAR IS THE BOTTOM LINE" SYNDROME

Forty-nine percent of the Big Island was zoned Agriculture (Ag) following Hawaii's land use law, including much of the watershed forests of Kona and Puna. Bio Power Corp. is reported to have obtained options to chip 95,000 acres of these forests, or about 150 square miles - an area larger than the island of Lana'i. Apparently, the only legal requirement to chip Ag-land forests is a county grubbing permit. Bio Power has three times ignored this requirement, and Hawaii County government has shown no idication of either halting the operation until they comply or prosecuting the violation. (There is a potential fine of $500 for each day of violation.) No permit is required if the district Soil and Water Conservation group approves a plan of operations. This is being done for Bio Power's plans to clear 540 acres of state-owned Ka'u Forest Reserve leased to Ka'u Sugar Co. in 1969 for sugar cane production. This forest is "essential habitat" for several forest birds, including the 'Alala (*Corvus hawaiiensis*), and it has been recommended by the Natural Area Reserve (NAR) Commission for inclusion in the NAR system.

The high cost of forest clearing has protected the Puna forest and other Ag-zoned forests until now. But times have changed. Now, Bio Power offers a free or low-cost land-clearing service to owners of Ag-land "encumbered" by native forest, and the owners are queued up behind Campbell Estate. Once cleared of forest, a parcel's real estate value goes up. If a few cows are put on the land, it qualifies as low-grade pasture, and the land taxes go way down. Because of tax assessment practices, the assessed value of poor grazing Ag-land is usually much lower than that of "unused", forested Ag-land or of Conservation land. Thus, the combination of tax laws, real estate evaluations, sales potential, and Bio Power Corp. have made it much more economical for the landowner to clear the forest than to let it be. This has set the stage for the massive land-clearing episode just beginning on the Big Island. Can we stop it? Which islands are next?

Unless the tax laws, land use zoning, and other economic incentives are changed, it is inevitable that we will lose huge tracts of our islands' best forests. The local power-generating boilers and the Japanese market for woodchips are both insatiable. According to newspaper reports, Bio Power will apply some of their profits to buy more machinery for expanded operations, including the milling of koa and other native hardwoods.

THE FUTURE OF WATERSHEDS: A "HELLUVA" NOTE

Most of these doomed forests are valuable watershed, providing water to the lands and aquifers below. Most forest owners do not benefit directly from the most valuable product of their forest - water. Unless we can change the economic pressures favoring forest clearing, we all will continue to lose Hawaii's most rare biological treasures, and the already inadequate water supply on the island will diminish.

To tax an owner of forested land for maintaining it as forest makes no sense at all. Paradoxically, such policy almost forces the owner to exploit or destroy the forest to avoid losing money. The beneficiaries

of these forests pay the owner nothing - the people who tap and use the aquifer fed by the forest, the plants and animals of the forest, and the residents and visitors who appreciate the natural aesthetic and biological values of native forest.

The time has come for the public and private users of the most tangible product of Hawaii's forests - its water - to find a way to equitably repay the forest owner for the service rendered by preserving the forests of these islands. Without these forests, we all can expect more droughts, more barren, parched landscapes, and more floods from deforested areas. In the past, people, government and industry created forest reserves, because they recognized the links between forests and water. It appears that we have forgotten. Only considerable enlightenment, interest, and effort on behalf of Hawaii's residents and business interests can curtail the massive deforestation now underway. Will it take clear-cutting of Kapiolani Park before we wake up?

Rick Warshauer

NO NA LEO 'OLE

In the past months, wildlife on the Big Island has been in the news and on the minds of Hawaii Audubon Society (HAS) Board and Conservation Committee members. In a separate article in this issue, Rick Warshauer discusses the plight of native forest slated for woodchipping in Puna, Ka'u, and Kona. In the January issue, Carl Christensen plans to summarize HAS efforts to end lease violations in 'Alala habitat at Pu'u Wa'a wa'a. In addition, the HAS Board and Conservation Committee have been busy on a number of other issues as well:

PALILA VS. MOUFLON

On 13 November, the HAS Board voted unanimously to "reinstitute...the Palila law suit to require removal of Mouflon sheep from the birds' critical habitat". A Department of Land and Natural Resources (DLNR) study demonstrated that the browsing habits of Mouflon sheep were seriously damaging the remaining Palila critical habitat on Mauna Kea (see *'Elepaio* 44(2):15-17 for details), but action has been delayed. HAS' last effort was formal mediation through the Neighborhood Justice Center. For the past two months, HAS has been talking with state officials and Big Island hunters to try to negotiate a mutually acceptable solution. "HAS' bottom line is eradication of Mouflon from the entire area of Palila critical habitat on Mauna Kea. It's essential to the birds' survival," explained HAS President Dr. Sheila Conant. "But, we were willing to help the hunters get additional hunting areas elsewhere. Unfortunately, the hunters still want the challenge of hunting Mouflon on Mauna Kea, and cannot accept total removal."

The legal action is a continuation of conservationists' successful 1979 suit, which resulted in the landmark decision to require removal of feral goats and sheep from Palila habitat. Michael Sherwood of the Sierra Club Legal Defense Fund will be representing HAS and the other plaintiffs once again. Wayne Gagné will be the chief Hawaii contact.

PUNA GEOTHERMAL

The Puna Geothermal Committee on the Big Island is requesting a Board of Land and Natural Resources (BLNR) contested case hearing to oppose designation of several areas, including Kahauale'a, as geothermal resource subzones. HAS concerns over geothermal development so close to the native forests in Volcano National Park and Wao Kele o Puna Natural Area Reserve were summarized in an earlier issue (*'Elepaio* 43(8):63-65). The HAS Board voted to continue its participation and agreed to join as a party to the contested case hearing.

LOGGING KOKEE STATE PARK

HAS is working with other conservation groups to urge the State not to allow resumption of koa logging in Kokee State Park. The Head of the State Parks Division of DLNR regards the removal of "damaged" koa trees as routine maintenance. HAS regards it as an improper commercial activity in a State Park and Conservation District, and we contend that an Environmental Assessment and Conservation District Use Application are necessary before such activities can be permitted. These processes are designed to prevent the type of damage to native forest that has already taken place at Kokee.

NORTHWESTERN HAWAIIAN ISLANDS

The U.S. Fish and Wildlife Service's (USFWS) Draft Master Plan/Environmental Impact Statement (MP/EIS) for the Hawaiian Islands National Wildlife Refuge (HINWR) is meant to guide management activities in the refuge for the next 10-20 years. The document discussed

five management alternatives dealing with issues ranging from biological research to recreational access for fishermen. The following are excerpts from HAS' comments written by President Dr. Sheila Conant and Conservation Chair Carl Christensen:

> "HAS believes that the protective measures contemplated in the preferred alternative for future management actions in the HINWR will aid in providing necessary increased protection for the unique resources of the Northwest Hawaiian Islands. We believe, however, that proposals to facilitate fisheries development may pose unwarranted risks to the unique biota of these islands. Furthermore, we believe that designation of the HINWR under the World Heritage Site, Biosphere Reserve, and National Natural Landmark programs should proceed immediately, rather than being deferred pending further consideration, and that USFWS should proceed immediately with Wilderness designation for the HINWR and its included waters. In our opinion, the MP/EIS fails to give adequate consideration to the use of Midway Island as an alternative to Tern Island as a site for nature tours and fisheries support facilities. Most importantly, we believe that the MP/EIS, as circulated, is seriously deficient as a disclosure document because of the absence of necessary information regarding the nature and impacts of proposed fisheries activities; the absence of this information makes proper review of the document impossible at this time, and we believe a revised MP/EIS including this information should be circulated for public review and comment before a final MP/EIS is approved."

Other key points included:

> "...any plans for the HINWR that permit expanded use of Refuge resources for fisheries support and for other activities must be based on the attitude that any observed adverse impacts on wildlife will be assumed to be caused by those activities until proven otherwise; in other words, the burden of proof must be on advocates of increased resource utilization to show that their activities are safe, rather than upon the USFWS to show that these activities are hazardous.
>
> ...increased vessel traffic in the nearshore waters of the NWHI, as proposed, poses an unacceptably increased risk of pollution, groundings, and of the introduction of alien animals (particularly rats) to the islands of the NWHI. [Therefore], recreational activities on the island [Tern Island] should not be permitted for fisheries personnel.
>
> HAS strongly supports designation of critical habitat for all listed Endangered and Threatened Species inhabiting the NWHI.
>
> ...several invertebrate species inhabiting the NWHI [and identified] as catagory "2" candidates for listing as Endangered or Threatened Species...must be considered in future plans...and formal listing...should proceed where appropriate.
>
> ...monitoring should include alien invertebrates, particularly insects, as future introductions are likely...[and] may have a direct negative impact on native animals and plants in the NWHI.
>
> HAS supports the rights of Native Americans for access to cultural sites for religous purposes as proposed... USFWS supervision of these (and all other) visitors should include measures necessary to ensure that clothing and other articles taken ashore do not carry seeds or other materials that could lead to establishment."

Audrey Newman
Conservation Writer

ERRATUM

The lead article in the November 1984 issue (Vol. 45,No. 5) of *'Elepaio*, entitled "A second nest of the Small Kauai Thrush" by P.R. Ashman, P.Pyle, and J. Jeffrey, contained a printer's error.

H.D. Pratt's literature citation should correctly read "Relationships and speciation of the Hawaiian thrushes. Living Bird 19:73-90."

NATURE CONSERVANCY APPEAL

Dear Hawaii Audubon Society Members;

In the July 1984 issue of *Audubon* magazine, Steve Yates authored a fascinating report on Hawaii's rare and endangered species, entitled "The Cutting Edge of Extinction". Interestingly, his island-by-island account focused repeatedly on the work of The Nature Conservancy of Hawaii and its role in the preservation of important habitats for endangered forest birds and other creatures.

Yates noted that last year the Hawaii Chapter of the Audubon Society and its individual members provided strong support for the Waikamoi Save-An-Acre campaign that has now led to the creation of the largest Hawaiian preserve operating under The Nature Conservancy aegis. As the director of the Conservancy's Hawaii office, I can testify that the Audubon Society support was an important element in the final establishment of Waikamoi and an achievement of which every member of the Society can be proud. We are truly grateful for the collective and individual gifts that came in to help us reach our goal.

Yates' article went on to talk about the need for "more innovative responses by, and cooperation between, agencies than in the past." He quoted me as saying, "Being a private, nonprofit group, we can experiment in ways that agencies and corporations can't...The Conservancy hopes to become a framework within which the whole community of land managers can develop innovative solutions to our common problems." He described the work of The Conservancy in funneling "donations from environmental groups, foundations, corporations, and thousands of individuals to gain perpetual conservation easement, lease, or fee title to critical endangered bird habitats on Molokai, Maui, Kauai, and the Big Island" - preserves which he called "some of the few bright rays in the otherwise overcast future of Hawaiian forest birds."

The Nature Conservancy of Hawaii has indeed taken massive strides in recent years to preserve and protect valued parts of Hawaii's heritage. We have been able to capitalize on a sort of glamour surrounding the acquisition and establishment of new preserves. But as Yates also pointed out with a quote from Ed Misaki, the manager of our Kamakou Preserve on Molokai, "If you call it a preserve and leave it alone, you can kiss it goodbye." Hawaii's endangered lands require careful, continuing management - the not-so-glamourous day-to-day work that insures that these places continue to offer refuge to their rare inhabitants.

It is to the support of these vital management and operational costs that The Nature Conservancy of Hawaii is applying the donations it receives in 1984. Those gifts come principally from individuals who understand the necessity for the ongoing effort that continues long after the dedication parties are over. The members of the Hawaii Chapter of the Audubon Society are certainly foremost among people who appreciate this need. I hope that many of you will consider providing another gift to The Nature Conservancy this year to help us meet what we have termed "The Challenge of '84" - the operational funding for our conservation efforts in the Islands. We have already raised $100,000 of the $160,000 goal for 1984. You can help us meet the $60,000 remaining by mailing your check in the attached Nature Conservancy return envelope.

Many thanks.
Kelvin H. Taketa
Director, Hawaii Office
The Nature Conservancy
of Hawaii

WAIALAE IKI FIELD TRIP REPORT

- OCTOBER 14, 1984 -

Eleven people turned out for this hike along a ridge in the eastern Koolau Mountains. Waialae Iki is the ridge dividing Kalani and Aina Haina valleys on eastern Oahu. Weather conditions were good, with mostly sunny skies and no wind. It was a warm, hazy day and conditions were good for birding.

We began the hike at the top of the housing development and walked along the top of the ridge toward the summit. During the first mile of the hike we passed through exotic forest and encountered the usual introduced species of birds. We observed Japanese White-eyes, Shamas, Nutmeg Mannikins, Zebra and Spotted Doves, House Finches, Northern Cardinals, and Red-vented Bulbuls. In the same area we also observed two 'Amakihi, a Lesser Golden-Plover, and three Great Frigatebirds.

As we continued on, we passed two huge bunkers that were used as gun emplacements during the Second World War. We continued to hike higher along the ridge, and encountered more and more native vegetation. Eventually we reached our destination at the end of the wide trail about two miles from where we started. The vegetation in this area was pre-

dominantly native. We saw koa, 'ohia, 'ie'ie, mountain naupaka, tree ferns, and two species of lobelia that we were unable to identify. Four 'Elepaio were seen, and one was spotted near a nest made of lichens about ten feet off the ground in an introduced Java Plum tree. We also observed several 'Apapane and quite a few 'Amakihi. Since the birds were cooperating by foraging in branches just over our heads, everyone was treated to a good look at some of Oahu's last existing native forest bird species. Native Kamehameha Butterflies were also seen amongst the forest understory.

Satisfied with our good luck, we hiked the two miles downhill back to where we had parked our cars. We began the hike at 0800 and ended it around 1130. It was refreshing to find that a part of old "natural" Hawaii still exists so close to the city of Honolulu. What a nice way to spend a Sunday morning.

Bruce D. Eilerts

PAY YOUR 1985 DUES

1985 dues for those who are local Hawaii Audubon Society members should be paid this month, since all local memberships expire on 31 December, 1984.

Dues for 1985 are $6.00 for the regular memberships. Dues may be included, with or without the ballot, in the enclosed envelope. Make the check payable to "Hawaii Audubon Society".

Hawaii Audubon Society members who are "joint" with National Audubon (have paid the $30.00 membership) do not have to pay these $6.00 local dues, since part of the $30.00 is returned automatically to the Hawaii Audubon Chapter as local dues.

5-YEAR INDEX NOW AVAILABLE!

The 5-year *'Elepaio* index (for Volumes 36-40) is now available. It may be obtained by sending a $2.00 check or money order (made out to "Hawaii Audubon Society") to: Hawaii Audubon Society, P.O. Box 22832, Honolulu, Hawaii 96822. This small fee covers the cost of reproducing the index and also includes postage.

A big "Mahalo" to Sol Cushman, who compiled this 5-year index, and did such an expert job. Also our thanks to Susan Schenck, who compiles our yearly indices, without which there would be no 5-year idex!

VOTE THIS MONTH FOR HAWAII AUDUBON BOARD

December is the month not only for the Christmas Bird Counts but also for voting on Hawaii Audubon's new Board of Directors for 1985. Enclosed in this issue is a ballot which may be mailed in; however, it must be received before 17 December in order to be valid. If you choose to vote in person, the ballot must be cast no later than the beginning of the annual Hawaii Audubon meeting scheduled for Monday, 17 December. The meeting will be held at 7:30 p.m. at the McCully-Moiliili Library in Honolulu.

BIRDERS NEEDED FOR CHRISTMAS BIRD COUNTS

Every December the Society's field activities, nationwide, are concentrated on the annual Christmas Bird Counts. This year six (possibly seven) counts are scheduled in Hawaii: three on Kauai, two on Oahu, and one on the island of Hawaii. A Maui count will be conducted if there is enough interest. (Persons interested in helping on a Maui count should call Mary Evanson at 572-9724 for more information.)

The "Calendar of Events" on the last page of this issue lists the compilers, their phone numbers, and the dates for each island count. More birders, beginners as well as experienced, are needed to help with all the counts, especially the counts on Maui, Kauai, and Hawaii. If interested, call the appropriate compiler directly, and offer to participate. Novices are strongly encouraged to come along, since they can be paired with more experienced birders.

The areas for most of the counts extend from the mountains to the sea, and some urban areas are included. Aside from the regular counters, people who can count around their homes and/or bird feeders, or at sea while fishing or sailing on count day, are invited to participate.

There is a nominal participant's fee of $3.00, which goes to National Audubon Society to help (only partially!) defray the costs of publishing all of the nationwide counts in the July issue of *American Birds* magazine.

HELP WITH 'ELEPAIO

The January issue of the *'Elepaio* will be put together 15 Dec.(Sat.) at 1415 Victoria, beginning at noon. Call Marie (533-7530). Help is always needed and welcome!

DECEMBER PROGRAM:

ANNUAL MEETING AND FILM

Our 17 December (Monday) meeting will feature one, and possibly two, nature films. The Nature Conservancy film, "The Garden of Eden" will be shown; if there is sufficient time, the film "Guided by the Nene" will also be shown.

The December meeting is also the annual meeting, so members are strongly encouraged to attend, in order to vote on the new Hawaii Audubon Board of Directors. If you are not planning to mail in the ballot enclosed in this issue of *'Elepaio*, you may also turn your ballot in at the beginning of this annual meeting.

The meeting will begin at 7:30 p.m. at the McCully-Moiliili Library at 2211 S. King Street in Honolulu. Be there!

IF NOT A MEMBER, PLEASE JOIN US

JOINT MEMBERSHIP
(National and Hawaii Audubon Societies)

Individual	$ 30.00
Family	38.00
Sustaining	50.00
Supporting	100.00
Contributing	250.00
Donor	500.00
Life (single payment)	1500.00
Dual Life (single payment)	2000.00

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

LOCAL MEMBERSHIP
(Hawaii Audubon Society only)

Regular	$ 6.00
Junior (18 and under)	3.00
Subscriber (non-Hawaii residents)	6.00
Life (payable in three equal annual installments)	150.00

All Local Memberships and Subscriptions are for a calendar year January through December. New Local Members and late-renewing members who send in dues through September may obtain all previous issues of 'Elepaio in that calendar year, upon request and reimbursement to the Society for mailing costs. Dues received after September are applied to membership extended through the following calendar year, but do not include previous issues of 'Elepaio in the current year.

HAWAII AUDUBON SOCIETY

BOARD OF DIRECTORS

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1st V.P.	Suzan Harada	839-5334
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	Carl Christensen	847-3511
	Vacant	
	Ray Tabata	948-8191
	Rick Warshauer	967-7476
	Alan Ziegler	247-5318

COMMITTEES

Conservation	Carl Christensen	847-3511
	Wayne Gagné, Mike Hadfield, Ray Tabata, Rick Warshauer, Alan Ziegler	
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	Kammy Wong	
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'ELEPAIO

Editors.....Marie Morin, Peter Galloway
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ISLAND REPRESENTATIVES

Hawaii	Sheila Doyle	
Maui	Mary Evenson	572-9724
Lanai	Peter Connally	565-6242
Kauai	Dave Boynton	335-5008

CALENDAR OF EVENTS

Dec. (Mon.)Board meeting at 3663 Alani Dr. at 7p.m. Call S. Conant at 988-3960 or 948-8241 for info.
Dec. (Sat.)Lihue, Kauai Christmas Count. W. Sears, Compiler (822-3045)

Dec. 10 (Mon.)Board meeting at 3663 Alani Dr. at 7pm Call S. Conant at 988-3960 or 948-8241 for info.
Dec. 15 (Sat.)Lihue, Kauai Christmas Count. W. Sears, Compiler(822-3045)
Dec. 16 (Sun.)Honolulu Christmas Count. R. Pyle, Compiler(262-4046)
Dec. 17 (Mon.)Annual meeting at McCully-Moiliili Library at 7:30pm. Elections and film(s).
Dec. 22 (Sat.)Waipio, Oahu Christmas Count. D. Bremer, Compiler (623-7613)
Dec, 22 (Sat.)Waimea, Kauai Christmas Count. F. Hay, Compiler(335-3877)
Dec. 29 (Sat.)Volcano, Hawaii Christmas Count. L. Katahira, Compiler (967-7416 or 967-7367)
Dec. 30 (Sun.)Kapaa, Kauai Christmas Count. W. Villaneueva, Compiler 245-8913 during the day)

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