COOPERATIVE NATIONAL PARK RESOURCES STUDIES UNIT
DEPARTMENT OF BOTANY
UNIVERSITY OF HAWAI'I AT MANOA
HONOLULU, HAWAI'I 96822
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BIANNUAL REPORT #8
MARCH 1977

October 1, 1977 to March 31, 1977

NATIONAL PARK SERVICE

CONTRACT NUMBERS:

CX 8000 6 0031
CX 8000 7 0002
CX 8000 7 0003
CX 8000 7 0004
CX 8000 7 0005
CX 8000 7 0006
CX 8000 7 0007
CX 8000 7 0008
CX 8000 7 0009
PX 8000 6 0869
PX 8000 7 0026
PX 8000 7 0027

Clifford W. Smith, Unit Director
The National Park Service and the University of Hawaii signed the memorandum of agreement establishing this Cooperative National Park Resources Studies Unit (CPSU UH) on March 16, 1973. The CPSU UH provides a multidisciplinary approach to studies on the biological resources in the National Parks in Hawaii, that is, Hawaii Volcanoes National Park, Haleakala National Park, City of Refuge National Historical Park, and Puukohola Heiau National Historic Site. Through the Unit Director, projects are undertaken in areas identified by park management. These studies provide information for resource management programs. The involvement of University faculty and students in the resource management of the National Parks in Hawaii leads to a greater awareness of the problems and needs of the National Park Service. At the same time, research not directly or immediately applicable to management is also encouraged through the CPSU UH.

Contribution numbers are assigned as follows. CPSU UH identifies the Cooperative National Park Resources Studies Unit of the University of Hawaii. This is followed by a three-digit number assigned in sequence to each new project of this CPSU. The fourth digit indicates the report number for that particular project.
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CONTRIBUTION NUMBER CPSU/UH 019/2

NATIONAL PARK SERVICE, WESTERN REGION

COMPUTERIZED AVIAN BIBLIOGRAPHY

Project Leader: Dr. Kent W. Bridges
Assistant Professor of Botany
University of Hawaii at Manoa

Contract Number: PX 8000 6 0869
Started on September 7, 1976
Terminated on December 31, 1976

Objectives: To produce a computerized bibliography of the literature on Hawaiian birds which is indexed by:

1. Complete reference by senior author
2. All authors
3. Keywords
4. Sources

Progress: The first phase of the program using information contained in the references only has been completed and accepted.

The second phase has been proposed for implementation and funded. It will:

1. Update the bibliography with all references up to and including December 31, 1976.
2. Include annotated keywords identified by Mr. W. Banko.

The project will be completed by June 20, 1976.

Submitted by: K. W. Bridges
CITY OF REFUGE NATIONAL HISTORICAL PARK

HōNAUNAU BAY FISH SURVEY

Project Leader: Dr. Leighton Taylor
Director, Waikiki Aquarium
Associate Professor of Zoology
University of Hawaii at Manoa

Contract Number: CX 8000 7 0002
Started in June 1973
Anticipated Termination in June 1978

Objectives: To conduct a five-year survey of the fish population in Hōnaunau Bay.

Progress: Apart from the analysis of last year's data, no further progress has been made in this project. The next census will be taken during the summer of 1977. This census should provide the type of information for fish that was identified in the recent 10-237 and the Natural Resources Management Plan for the City of Refuge National Historical Park.

Submitted by: L. Taylor
HAWAII VOLCANOES AND HALEAKALA NATIONAL PARKS

BIRD SURVEY

Project Leader: Dr. Sheila Conant
Assistant Professor of General Science
University of Hawaii at Manoa

Contract Number: CX 8000 7 0007 and CX 8000 6 0031
Started on January 1, 1976
Termination on September 30, 1980

Objectives: 1. To provide an updated checklist of birds in Hawaii Volcanoes National Park and Haleakala National Park Crater District.
2. To provide population density figures for each species, in each park.
3. To provide provisional distribution maps for each species, in each park.

Progress: The original survey has been expanded to include Haleakala National Park Crater District.

Field work for the survey of the status of endangered and rare birds in the Kalapana Extension of Hawaii Volcanoes National Park was completed in January. An expedition to the Napau Crater region and surrounding areas provided an opportunity to assess seasonal variation in status and distribution of bird populations, hitherto censused only during summer months. A final report is now in preparation.

A five-day field trip to Haleakala in early January included an initial survey of the eastern side of Kaupo Gap between 5000 and 7000 feet elevation. In addition, most areas censused last June during the RBI expedition were visited briefly to note seasonal changes in distribution and abundance of bird species. A four-day visit to the Paliku and Kuiki areas is planned for the end of March to collect similar data.

Two days of field work were completed in the 'Ola'a Tract on Hawaii during February. The objective of this visit was to collect information on species presence and distribution during the winter. Further work in this area is planned for April (a one- to two-day visit) and for the summer months (an intensive survey).

Submitted by: S. Conant
HAWAII VOLCANOES AND HALEAKALA NATIONAL PARKS

RARE BIRD RESEARCH PROGRAM

Project Leader: Dr. C. H. Lamoureux
Professor of Botany
University of Hawaii at Manoa

Contract Number: PX 8000 7 0026
Started on October 1, 1976
Anticipated Termination on September 30, 1977

Objectives: To formulate a research program that will provide the basic information for a resource management program for the rare and endangered birds of Hawaii's National Parks.

Progress: No progress has yet been made toward the formulation of a master plan for research on the endemic birds in Hawaii's National Parks. However, discussions have been held with numerous ornithologists to obtain as much information and opinion as possible about such a research program.

The various people in the federal agencies are being contacted. Discussions with these people are focusing principally on the recovery team proposals for the rare and endangered Hawaiian birds.

Submitted by: C. H. Lamoureux
HAWAII VOLCANOES NATIONAL PARK

ROLE OF FIRE IN THE NATURAL ECOSYSTEM

Project Leader: Terry T. Parman
Researcher
Volcano, Hawaii

Contract Number: CX 8000 7 0008 and CX 8000 6 0031
Started in January 1976
Anticipated Termination on September 30, 1979

Objectives: 1. To evaluate the recovery of six ecosystems within Hawaii Volcanoes National Park after fire.
2. To measure the effect of fire on the survival, reproduction, and growth of plants.
3. To determine whether or not the damage by fire to a particular ecosystem would merit intervention by the National Park Service.

Progress: Since the initiation of this contract, a number of revisions have been made to the original proposal which modify the procedures but not the overall objectives.

A preliminary draft of the report by the fire consultants included a table of previous documented fires within Hawaii Volcanoes National Park. During the past six months, the location of a number of these fires have been pinpointed. Vegetation analyses within some of these areas have been carried out and compared with similar areas close by in an effort to evaluate the long-term impact of these fires on the vegetation. When these analyses are complete and integrated with results from the Hīliʻa Pali and Six Tanks studies, the impact of fires on the vegetation in most of the vegetation communities should be predictable.

All controlled fire burn studies have been delayed until the vegetation analyses of previously burned sites have been evaluated. Even if controlled burn studies are required, and there is a controversy as to whether they will be necessary or not, the necessary documentation for the environmental impact statement would not be available until the current studies have been completed and thoroughly reviewed.
HILINA PALI

Progress: In May 1975, a controlled fire burn was conducted as part of an exercise in fire control techniques at Hawaii Volcanoes National Park. At that time, Terry Parman and Kirk Wampler established vegetation analysis transects in the burned and unburned areas. The transects were sampled before and after the fire and at six-month intervals thereafter. During the fire, the rate of spread, intensity, and other characteristics of the fire were evaluated.

The monitoring of this site has since been incorporated into the CPSU activities for the general program on the role of fire in the natural ecosystem.

A technical report on the ecology of the plants in the area--both before the fire and at six-month intervals thereafter for 18 months--is in draft form. It has been reviewed once: there are a few changes to be made in the manuscript and the figures have yet to be drawn. As soon as these are completed, the manuscript will be distributed for a more thorough review. The next monitoring of the area is scheduled for May, after which the monitoring will be carried out on an annual basis rather than on a semi-annual basis.

SIX TANKS AREA

Progress: The analyses of information gathered in the last six months continue to substantiate the findings reported in previous progress reports. It is proposed to decrease the frequency of sampling of the area from every three months to at the most every six months, and perhaps on an annual basis only.

Compared with the Hilina Pali fire study site, the native species seem to be recovering much more rapidly. However, exotics still were seen to increase dramatically as a consequence of fire and generally dominate the area. The only exception is koa (Acacia koa). It should be noted that Andropogon does invade the area after fire, along the Mauna Loa Strip Road, but the cover of the species is minimal. It is not known at this time whether subsequent fires will have the same dramatic effect of increasing the ground cover of Andropogon in the Six Tanks area as it is presumed to have in the Hilina Pali area.

Submitted by: T. Parman
HAWAII VOLCANOES NATIONAL PARK

MAPPING OF VEGETATION IN HAWAII VOLCANOES NATIONAL PARK

Project Leader: Dr. Kent W. Bridges
Assistant Professor of Botany
University of Hawaii at Manoa

Contract Number: CX 8000 6 0031
Started on January 1, 1976
Continued through June 1977

2. Preparation of a computer-data base for the rare and endangered plant species in Hawaii Volcanoes National Park.

Progress: A paper entitled "The Application of a Geographic Information System to the National Parks" was presented at the National Parks Conference, New Orleans. At that time, color maps illustrating the distribution of 'āhi'a and koa in Hawaii Volcanoes National Park were shown. The maps located areas where the species were dominant, where they were present but not dominant, and where the species did not occur. Recently, a map of the distribution of Andropogon along similar lines was produced.

All these maps had no road or landmarks printed on them. However, the capability of including this information has been developed and the old maps will be updated.

No further progress has been made on a composite map of the rare and endangered plants in the Park because the localities of some species are incomplete. This information will be available by the end of April.

Submitted by: K. W. Bridges
HAWAII VOLCANOES NATIONAL PARK

VEGETATION RECOVERY FOLLOWING GOAT REMOVAL

Project Leader: Dr. Dieter Mueller-Dombois
Professor of Botany
University of Hawaii at Manoa

Contract Number: CX 8000 7 0006 and CX 8000 6 0031
Started on November 1, 1975
Anticipated Termination on September 30, 1978

Objectives: 1. To monitor the changes in vegetation in previously established sites.
2. To produce a new vegetation map for the coastal lowland.
3. To project the probable path of recovery and identify potential problems in the new ecosystems.

Progress: A paper was presented in New Orleans (November 1976) under the title, "Succession following goat removal in Hawaii Volcanoes National Park." The paper reports the vegetation recovery results obtained from monitoring three goat exclosures for the past five years (1971-76) in the coastal lowland ecosystem of the Park. A preprint was given to the Superintendent of Hawaii Volcanoes National Park. The paper will be published soon in the Proceedings of the New Orleans meeting.

A first complete survey of the coastal lowland was made by the writer in 1965. A resurvey of the entire area is anticipated for next summer which is expected to yield further results on the Park's goat and vegetation management program. Plans for the preparation of the vegetation map of the coastal lowland are well underway.

Submitted by: D. Mueller-Dombois
HAWAII VOLCANOES NATIONAL PARK

PLANT SURVEY OF THE KALAPANA EXTENSION

Project Leader:  Mr. Frederick R. Warshauer
               Graduate Assistant in Botany
               University of Hawaii at Manoa

Not under contract
Started in November 1974
Continued through June 1977

Objectives:  To locate and typify the distribution of rare and endangered plants within the authorized Kalapana Extension.

Progress:  The final report of this investigation is in a rough draft form.

A preliminary report on the work was presented at the First Conference in Natural Sciences in Hawaii. The title of the paper was "The Kala-pana Extension: its Variety, Vegetation, and Value."

Submitted by:  F. R. Warshauer
HAWAII VOLCANOES NATIONAL PARK

COLONIZATION OF INTERTIDAL ZONE AT KEAOUHOU

Project Leader: Dr. Daniel Cheney
Assistant Professor of Biology
University of Hawaii at Hilo

Not under contract
Started on May 1, 1976
Anticipated Termination in June 1979

Objectives: To study the colonization of the new intertidal zone at Keauhou.

Progress: Studies of the recovery of the marine fauna and flora at Keauhou have continued. These investigations are proceeding on a rather sporadic basis dependent on a variety of factors.

The various communities are still in a state of flux. The climax communities are not yet reestablished. In fact, the species composition of the various biotopes is still quite different from that of the climax communities which existed in this area previously.

The continued logistic support of Hawaii Volcanoes National Park is appreciated.

Submitted by: D. Cheney
HALEAKALA NATIONAL PARK
RESOURCES BASIC INVENTORY

Project Leader: Dr. Clifford W. Smith
Director, CPSU/UH
Associate Professor of Botany
University of Hawaii at Manoa

Contract Number: CX 8000 7 0003 and CX 8000 6 0031
Started in June 1975
Anticipated Termination in June 1978

Objectives: 1. To produce an annotated checklist of the insects, birds, flowering plants, conifers, ferns, mosses, liverworts, and lichens.
2. To produce distribution maps for all the above.
3. To provide a comprehensive collection of all specimens for Haleakala National Park.
4. To produce a monograph on the-organisms of the Crater District, with comments on their distribution.

Progress: The narrative report for the 1976 expedition has not yet been completed. Our primary priority was to establish the checklists for the individual groups before discussing the information garnered last summer. It is anticipated, however, that the narrative report will be completed by the end of May.

During the past six months some notes have been submitted for publication concerning our results obtained during the Resources Basic Inventory in Haleakala. A list including these publications can be found on pages 22-23.

Flowering Plants, Conifers, and Ferns
A provisional checklist for these organisms is in the final draft form and will be available for review within a few weeks. The checklist provides the scientific name, common name, distributional status, and where appropriate some comments--if the species has been identified as rare and endangered in any publication.

Mosses and Liverworts
A checklist of the species of mosses and liverworts is in draft form but still needs further work. Common names will not be provided because very few species have such names.
Lichens

A very preliminary list of lichens present in the Crater District is in preparation. However, there are numerous taxonomic problems which have not been resolved at present and are awaiting comments from experts in the field. The dominant species are known with some certainty, and a checklist of those species is in preliminary draft form. Common names will not be provided because such names are rarely applied to the lichens.

Birds

A checklist of the birds which are present in the Crater District is in preliminary draft form. It includes information on the scientific and common names, distributional status, and comments on rare and endangered species status, etc.

Insects

A checklist of the insects (exclusive of the majority of the Diptera) has been prepared and is currently being updated.

Submitted by: C. W. Smith
HALEAKALA NATIONAL PARK

KĪPAHULU VALLEY RESEARCH PROGRAM PROPOSAL

Project Leader: Dr. Clifford W. Smith
Director, CPSU/UH
Associate Professor of Botany
University of Hawaii at Manoā

Contract Number: PX 8000 7 0027
Started on January 1, 1976
Anticipated Termination in September 1977

Objectives: To propose a research program that will provide a detailed study plan. The purpose of this plan will be to provide a basis for NPS management to develop research guidelines for Kīpahulu Valley and to provide the justification and specifics necessary to support funding and implement the needed research programs.

Progress: Four alternatives for a research program in Kīpahulu Valley are being proposed:
1. to do no research in the valley at all;
2. to monitor the valley by means of aerial surveillance;
3. to conduct research only on specific resources management programs; and
4. a multi-phased comprehensive bioecological survey of the valley.

Each proposal is being evaluated on what it will and will not accomplish, and is followed by the budget that would be necessary if the CPSU/UH were contracted to do the work.

The third alternative has taken the Haleakala National Park 10-237, Resource Management Proposal (HALE-N-6), HALE Inc. #036, and evaluated the program outlined under "Description of the work to be undertaken." A detailed budget of this program is being constructed together with the work proposal.

The fourth alternative proposes that the valley be dealt with as three separate segments: (a) the lower segment from sea level to Palikea and the gauging station, but including the Kaumakani Ridge to the summit; (b) the central, relatively pristine segment of the valley up to approximately 6,000 feet; and (c) the upper segment from 6,000 feet up to Kuiki and Pōhaku Pālaha including Wai'ānapanapa, Wai 'Ele'ele and the park segment of the upper Hāna rainforest.

The preliminary descriptions of each of these proposals are completed, as are some budget statements. A completed draft of the plan should be available for review by Haleakala National Park in mid-April.

Submitted by: C. W. Smith
HALEAKALA NATIONAL PARK

KAUMAKANI RIDGE RESOURCES BASIC INVENTORY

Project Leader: John Kjargaard
Park Ranger (Resource Management)
Haleakala National Park

Not under contract
Started on January 1, 1976
Reactivated through June 1, 1977

Objectives: To conduct a preliminary Resources Basic Inventory of Kaumakani Ridge, Kipahulu Valley. The National Park management needs the information as soon as possible to determine whether or not this ridge should be included in the area with restricted entry in Haleakala National Park.

Progress: After an internal review of the initial draft of the report of this expedition, it has been recommended that some further information on the plant communities should be collected. Apart from that the project is complete. The area is to be revisited during the Easter vacation.

There are two significant results from this study:

1. There is very extensive damage to the ecosystem resulting from the activity of feral pigs.

2. There are a few plant species present that are proposed for rare and endangered status by the Federal Government. These include Labordia pedunculata (kāmakahala) and several varieties of other plants which are awaiting verification.

Submitted by: P. Higashino
J. Kjargaard
HALEAKALA NATIONAL PARK

STUDIES ON HAWAIIAN TARWEEDS

Project Leader: Dr. Gerald Carr
Assistant Professor of Botany
University of Hawaii at Manoa

Not under contract
Started in August 1975
Continued through December 1977

Objectives: To collect developing flower buds of Hawaiian tarweeds and their hybrids for chromosomal analysis. To collect cuttings of the various species of tarweeds and to establish them in the greenhouses at the University of Hawaii at Manoa. The ultimate objective of this and related studies is to establish the relationship between the genera and species of tarweeds.

Progress: Apart from work on the literature, no progress has been made on this project. No further work is expected until the flowering season for these plants this year, which is approximately late July and August. Cytogenetic analyses are normally carried out using flower buds prior to opening.

In the meantime, a literature survey is progressing on the differences between the Mauna Kea and Hāleakalā silverswords. The importance of this project is emphasized by the identification of the old name for the Hāleakalā silversword as a proposed rare and endangered species in the 1976 Federal Register list. The current taxonomy recognizes the Mauna Kea and Hāleakalā silverswords as the same species. This taxonomic problem must be solved as soon as possible.

Submitted by: G. Carr
HALEAKALA NATIONAL PARK

MAMMAL EXCLOSURE STUDIES:
COMPETITION BETWEEN NATIVE AND EXOTIC PLANT SPECIES

Project Leader: James D. Jacobi
Research Assistant in Botany
University of Hawaii at Manoa

Contract Number: CX 8000 7 0005
Started in August 1973
Anticipated Termination on September 30, 1979

Objectives: 1. To assess the competitive effects of *Holcus lanatus* (velvet grass or Yorkshire fog) in *Deschampsia* grassland and *Sophora* scrub.
2. To monitor the effect of excluding exotic mammals from the above communities.

Progress: Since the last progress report the sampling strategy for this study has been modified. It was decided that the vegetation in and around the Kalapawili Ridge exclosure would be sampled just once a year, in the month of March, rather than twice a year as had previously been the schedule. This change was made because the vegetation recovery here has now slowed down considerably since the beginning of the project, and sampling once a year will adequately show the relative changes in cover for each species.

A second trip will still be made to the study areas each October to continue monitoring the *mānane* forest around the Honokahua enclosure, and to establish other smaller vegetation recovery plots in the Kalapawili Ridge grassland.

During my most recent trip to Haleakala in February 1977, work was started on mapping the vegetation in and around the Honokahua enclosure, at a scale of 1:500. Seeds were also collected from the trees within the fenced area to conduct more detailed tests on their viability. Additionally, another small, unfenced plot was established and mapped at the lower edge of the Kalapawili Ridge grassland. This and other similar plots, still to be located, will be remapped each trip, in an attempt to better understand the dynamics of the vegetation in areas from which feral pigs have not been excluded.

Submitted by: J. Jacobi
HALEAKALA NATIONAL PARK

SURVEY OF THE LOWER KĪPAHULU VALLEY STREAMS

Project Leader: Dr. Robert Kinzie
Assistant Professor of Zoology
University of Hawaii at Manoa

Not under contract
Started on November 1, 1975
Terminated

Objectives: To conduct an inventory of stream biocoenoses and riparian vegetation of the lower and middle courses of Palikea and Pipiwai Streams and to monitor basic physico-chemical parameters.

Progress: The project has been completed. The final draft will be submitted for Park review when the figures have been redrawn.

Submitted by: C. W. Smith
HALEAKALA NATIONAL PARK
CRATER DISTRICT VEGETATION MAP

Project Leader: Mr. Louis D. Whiteaker
Research Assistant in Botany
University of Hawaii at Manoa

Contract Number: CX 8000 70004
Started on October 1, 1976
Termination on September 30, 1979

Objectives: 1. The production of a map of the ecosystems of Haleakala National Park Crater District, to include a large-scale master map which will be reproduced in such a manner that it will overlay the standard "quad" maps.
2. Quantitative descriptions of each vegetation unit.
3. Correlation analysis of recognized ecosystems with soil and environmental data.

Progress: During the summer of 1976, the project was begun by (1) carrying out a general reconnaissance of the area to become familiar with the species present and to note general community associations, (2) mapping of vegetation units on transparent overlays on 12 air photos of the area, and (3) doing ground-proofing reconnaissance to verify the composition and boundaries of the vegetation units as mapped, making adjustments where necessary. Thus, enough information was collected by the end of the initial field work to produce a preliminary vegetation map.

However, aerial photographs contain scale distortions due to changes in elevation in the topography called relief displacement. Since the topography of Haleakala has many large and rapid changes in elevation, the relief displacement is very significant in this set of photographs. Stereo pairs, photos with at least 60% overlapping coverage, were not available for the area, so that stereoscopic methods for correction of the relief displacement cannot be used. Also, there was a significant variation in flying altitude of the photographing aircraft. To deal with these problems, computer digitizing methods were chosen, and the help of Mr. Kurt Von Nieda was enlisted for the problems involved in programming the algorithm into the computer. Basically, this method involves the calculation of true ground coordinates from the altitude of the aircraft, the elevation of the points in question on the photo, the focal length of the camera, and coordinates assigned to the points on the photo by the digitizing table according to the following relationships:
\[
X_A = \frac{H - h_A}{f} x_a \quad \text{and} \quad Y_A = \frac{H - h_A}{f} y_a
\]

where \( X_A, Y_A \) = true ground coordinates
\( x_a, y_a \) = coordinates assigned to points on photo
\( H \) = altitude of the aircraft
\( h_A \) = elevation of point on photograph
\( f \) = focal length of camera

This is accomplished using digitizing equipment attached to the computer. This work is now in progress and should be completed shortly, with the result being a preliminary vegetation map that is planimetrically correct.

In preparation for the digitizing, the exact focal length and flying altitude for each photograph was requested and received from the Agricultural Stabilization and Conservation Service, from which the air photos were obtained; and a second overlay for each photograph was prepared on which the vegetation boundaries were traced and elevations were transferred from standard USGS topographical maps. Also, in preparing the second overlay sheets, the vegetation unit symbols used during the field mapping were translated into symbols corresponding to the structural-floristic symbols used in the vegetation map of Hawaii Volcanoes National Park for inclusion in the computer digitizing process.

Also at this time the strategy is being planned for collecting the quantitative floristic and environmental data to be used for the quantitative description of vegetation units and environmental correlation analysis. This field work, along with boundary adjustments as indicated by the planimetrically correct preliminary map, will be conducted in the summer of 1977.

Submitted by: L. Whiteaker
OTHER UNIT ACTIVITIES

Hawaii Regional Office 1. Conferred with Mr. Barrel on several occasions on various technical problems.

Puukohola Heiau N.H.S. . . .

City of Refuge N.H.P. 1. Review and comments on the Natural Resources Management Plan.

2. Comments on the proposal to enlarge the boat ramp in Hōnaunau Bay.


2. Revision of the program on recovery of vegetation after the goat fencing program.

3. Review of the Resource Management Planting Program update including a visit to the various facilities.

Haleakala National Park 1. Review and comments on the Natural Resources Management Plan.

2. Further support for the Kaumakani Ridge Study in Kipahulu Valley.

3. Survey of two streams in lower portion of Kipahulu Valley for rare and endangered fish.
MEETINGS ATTENDED


REPORTS AND PUBLICATIONS


CPSU/UH PAST REPORTS STATUS

Technical Reports

1. 01-Year First Progress Report  No longer available
2. Proposal for the Study of Rare and Endangered Birds in Hawaii's National Parks  No longer available
3. The Ohia Dieback Problem in Hawaii  No longer available
4. Vegetation Map, HAVO  Available
5. Revised Checklist of Vascular Plants, HAVO  Available
6. 01-Year Final Report  Available
7. 02-Year First Progress Report  No longer available
8. HAVO Fern Checklist  Available
9. HALE 1975 RBI Narrative  Available
10. Halapō Marine Survey  Available
12. Ohia Decline: The Role of Phytophthora cinnamomi  Available
13. PUHE Marine Fauna  No longer available
14. Hawaiian Bird Bibliography  No longer available
15. PUHE Plant Survey  Available
16. PUHE Marine Flora  Available

Other Reports

02-Year Final Report  Available
Ohio Rain Forest Study--First First Progress Report  No longer available
Proceedings, First Conference in Natural Sciences, HAVO  Available
Biannual Report #5, February 1976  Available
Biannual Report #6, June 1976  Available
Biannual Report #7, September 1976  Available