

State of Hawai`i
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Forestry and Wildlife
Honolulu, Hawai`i 96813

October 11, 2013

Chairperson and Members
Board of Land and Natural Resources
State of Hawai`i
Honolulu, Hawai`i

Aloha Land Board Members:

SUBJECT: PROGRESS BRIEFING FOR RESEARCH PROJECTS, EDUCATIONAL TOURS AND ADMINISTRATIVE CHALLENGES OF THE HAWAI`I EXPERIMENTAL TROPICAL FOREST, HAWAI`I (TMK'S (3) 3-7-001:002; (3) 3-7-001:012; (3) 7-1-001:001; (3) 7-1-001:004; (3) 7-1-001:006; (3) 7-1-001:007; (3) 7-1-002:001; (3) 7-1-002:013; (3) 7-1-002:002; (3) 7-1-002:008)

Background

On January 25, 2007 the Board of Land and Natural Resources granted the U.S. Department of Agriculture, Forest Service (USFS), Pacific Southwest Research Station a non-exclusive permit to use State lands (Appendix A) situated at Laupāhoehoe and Pu`u Wa`awa`a, Hawai`i for use as the Hawai`i Experimental Tropical Forest (HETF).

The HETF includes two Units: the Laupāhoehoe Wet Forest, totaling 12,343 acres, and the Pu`u Wa`awa`a Dry Forest, totaling 38,885 acres. Unit maps are provided in Appendix A. The HETF overlays existing State of Hawai`i, Department of Land and Natural Resources (DLNR) managed lands and include the following land designations: Forest Reserve and Natural Area Reserve (NAR) in Laupāhoehoe and Wildlife Sanctuary (*Forest Bird Sanctuary*), Forest Reserve and State Parks in Pu`u Wa`awa`a.

The USFS works with the DLNR – Division of Forestry and Wildlife (DOFAW) and State Parks to manage research and education activities within the HETF. Further information regarding HETF management is outlined in the December 6, 2006 Cooperative Agreement (Appendix B) between the USFS and the State of Hawai`i Board of Land and Natural Resources (referenced throughout this document as “HETF Cooperative Agreement”).

In granting the Permit to Use State Lands, the USFS agreed to “consult regularly with the State including:

- a. Providing a copy of the annual report submitted to Congress as required by section 607 of the International Forestry Cooperative Act of 1990, as amended by the Hawai`i Tropical Forest Recovery Act;
- b. Providing an annual report on the status of approved new and ongoing research (including the primary investigator, the research topic, the location for the research, dates

- of field research, date of anticipated results, and contact information for the primary investigator);
- c. Providing an annual report on the number of educational tours and total number of participants, and
 - d. Annually reporting on the challenges faced in the administration of the Experimental Forest.”

This submittal provides an overview of HETF administration, a summary of the research and education activities that have occurred within the HETF from 2008-2012, current plans for facilities and the challenges associated with HETF administration. More detailed information can be found within three annual reports available online (<http://www.hetf.us/page/home/>) or hardcopy by request.

Administration

Per the HETF Cooperative Agreement, "owing to the many values and benefits that arise from research, education and demonstration on the HETF and elsewhere, the Parties (*the USFS and the State of Hawai`i*) further agree they will consult and reach agreements with each other to coordinate research, management, and education activities". The HETF Planning Group was established to fulfill this objective and includes the USFS-HETF Line Officer, the USFS-HETF Science Lead, the USFS-HETF Facilities Manager, the Hawai`i Island DOFAW Branch Manager, the Hawai`i Island Natural Area Reserves Program Manager, the Hawai`i Island Forestry Program Manager, East and West Hawai`i Island Wildlife Biologists, the Pu`u Wa`awa`a coordinator, and two to three external partners. The HETF Planning Group is facilitated by the HETF Coordinator (USFS employee) and meets bi-monthly.

Permitting

Permit applications for research and education activities are reviewed by a subset of the HETF Planning Group, the Research Technical Committee (RTC), which includes the USFS-HETF Line Officer, the Hawai`i Island Branch Manager, the USFS-HETF Science Lead, the NARS Hawai`i Island Manager, the Forestry Section Hawai`i Island Manager, East and West Hawai`i Island Wildlife Biologists, and the Pu`u Wa`awa`a Coordinator. Permit processing and tracking is administered by the HETF Coordinator. Signing authority for all permits lies with the Hawai`i Island Branch Manager. All research permits are valid for one year and require an annual report.

Community Advisory Councils

Per the HETF Cooperative Agreement, "the Parties will consult with scientists, managers, general citizens, and local community members concerning ongoing research activities. Existing State sanctioned advisory councils may be utilized for this purpose." The Pu`u Wa`awa`a Advisory Council has been in existence since 2002. The Laupāhoehoe Advisory Council was formed in December 2010. Both Councils participate in research permit application review and their comments and/or recommendations are provided to the RTC during the review process.

Planning

In 2012, planning began to outline overall and site specific goals and priorities for research, education, and demonstration within the HETF boundaries. In the Laupāhoehoe Unit, progress

was made on drafting the Laupāhoehoe Forest Management Plan. To date, the DOFAW and the USFS have solicited feedback on focal areas such as research, education, public access, and infrastructure from the Laupāhoehoe Advisory Council. A working draft of the management plan was completed in July 2013.

Research Projects

The HETF is utilized for research by universities, government agencies including the USFS, and private organizations, as well as others including non-profits, non-government organizations and societies (Figure 1). In 2012, the HETF supported 19 research projects. Nine of these projects have been or are expected to be long term (5 or more years). Table 1 provides a breakdown of project locations within the HETF Units and yearly project totals. Research project locations may be specific to an HETF Unit or take place within both Units. From 2008 – 2012, fifty publications have been produced from research projects within the HETF in over 26 different journals, newsletters and technical reports.

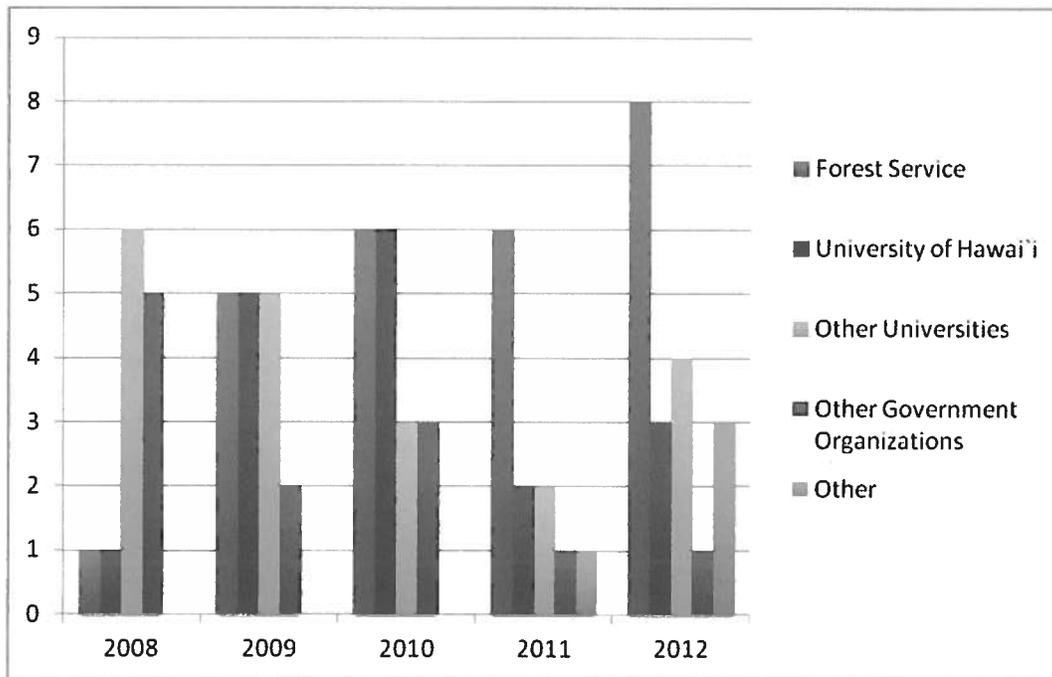


Figure 1: Affiliation for research projects initiated within the HETF from 2008-2012

A selected number of research projects from 2012 are briefly described below. Additional detailed information about all research projects including publication citations, are contained within the HETF annual reports available online (<http://www.hetf.us/page/home/>).

- *Acacia koa* genetic improvement program - Dr. Charles Michler, director of the Tropical Hardwood Tree Improvement and Regeneration Center, in partnership with the University of Hawai'i and the IPIF, began an improvement program for koa, emphasizing stem form, wood quality and frost resistance as the main improvement objectives for the species. They found natural stands of good quality koa trees within the HETF Laupāhoehoe Unit and collected seeds in August 2012. These seeds were

processed and are currently growing in a local nursery. In spring 2013, seedlings will be transplanted and a seed orchard established at a site on Department of Hawaiian Homelands Lands (DHHL) at an elevation of 5000 feet (1524 m). The orchard seedlings will be measured every year to determine their growth rate, straightness, and potential as crop trees.

- *Conservation genetics and taxonomy* - Dr. Danica T. Harbaugh-Reynaud, Founder and Executive Director of the International Sandalwood Foundation, and researcher at the University of California, Berkeley, began a project studying Hawaiian mountain sandalwood, *Santalum paniculatum*. No island-wide population surveys or genetic or taxonomic analyses have been performed on Big Island sandalwood despite the continued human impacts on this species. Her study will assess *S. paniculatum* across Hawai'i Island through population surveys (including numbers of mature trees and seedlings) and a genetic and taxonomic study, which will in turn help identify seed sources for a germplasm repository and for use in reintroduction programs throughout the island.
- *Invasive species impacts on Hawaiian Forests* - The degradation of water quality or reductions to the flow of freshwater to streams and wetlands are serious threats to native Hawaiian ecosystems and have been identified by the Natural Area Reserve system as priorities for research. On Hawai'i Island invasive strawberry guava (*Psidium cattleianum*) is expanding into the forest understory, outcompeting native species and altering habitat availability and ecosystem function. Additionally, invasive ungulates, notably feral pigs (*Sus scrofa*), disrupt the soil structure, consume native vegetation, and create wallows that mosquitoes use to breed. Both strawberry guava and feral pigs are believed to affect watershed hydrology by altering plants and soils. Rich Mackenzie (USFS) and Ayrton Strauch (UH Manoa) have established long-term study sites (8 to 10 years) in the HETF Laupāhoehoe Unit to measure soil erosion and runoff in strawberry guava-dominated forest and native ōhi`a-dominated forests.
- *Impacts of rising temperature on carbon* - Carbon storage on earth exceeds that in the atmosphere by a factor of four, and represents a dynamic balance among carbon input, allocation, and loss. This balance is being altered by climate change, with important implications for terrestrial carbon storage and, hence, atmospheric CO₂ levels and global climate. However, the response of terrestrial carbon cycling to warming remains poorly quantified, especially in the tropics. This is particularly important because tropical forests account for a ~40% of global terrestrial carbon storage and ~35% of global terrestrial productivity and, as such, tropical forests play a very important role in regulating global climate. Dr. Creighton Litton (UH Manoa) and Dr. Christian Giardina (USFS) are examining how rising mean annual temperature will impact the carbon balance of the world's most productive forests (i.e., tropical wet forests). This research has assisted in creating a model global change research platform that has attracted multiple national and international collaborators.
- *Grass/Fire cycle in Dryland ecosystems* - The Strategic Environmental Research and Development Program (SERDP) aims to improve our understanding of altered fire regimes and devise methods to break the grass/wildfire cycle, Dr. Susan Cordell (USFS) and colleagues are using both remote sensing and field-based experiments. At the landscape scale, they have developed the use of high temporal frequency satellite imagery to monitor near real-time fire fuel conditions. This product is available as a web

tool and was introduced to Department of Defense (DoD) and other Hawai'i based land managers. Visit the site at <http://hawaiiifire.stanford.edu>.

Table 1: Total number of research projects initiated in the HETF per year and grouped by Unit from 2008-2012.

Year	Laupāhoehoe Unit only	Pu`u Wa`awa`a Unit only	Both HETF Units	Total # of projects initiated
2012	8 (44%)	9 (44%)	2 (12%)	19
2011	5 (42%)	5 (42%)	2 (16%)	12
2010	8 (44%)	9 (50%)	1 (6%)	18
2009	10 (59%)	6 (35%)	1 (6%)	17
2008	6 (46%)	5 (39%)	2 (15%)	13
Totals:	37	34	8	79

Research Infrastructure/Databases

Long term climate monitoring equipment has been installed in both Units and the Laupāhoehoe Unit also includes hydrology monitoring equipment. The HETF climate stations are part of the EPSCoR-ENDER (Experimental Program to Stimulate Competitive Research - Environmental Dynamics and Ecosystem Responses) Climate Network, an island-wide network of climate stations at locations across the island of Hawai'i.

Laupāhoehoe Unit equipment includes a stream gauge in Manowai`ōpae Stream (outside the forest boundary and managed by the USFS) and a free standing aluminum weather station located within the Forest Reserve. The purpose of the stream gauge is to measure natural stream flows, water quality and sediment in a non-destructive manner. The weather station, installed in 2009, extends 10 feet (3 m) above the forest canopy and collects daily rainfall, temperature, relative humidity, wind-speed, solar radiation (sunlight), soil moisture, soil temperature, and wind direction.

The Pu`u Wa`awa`a Unit hosts multiple weather stations including two in the Forest Reserve, installed in 2003 (RAWS station) and 2011, and one in the Forest Bird Sanctuary, installed in 2012. The Pu`u Wa`awa`a Unit is also a potential location for a National Ecological Observatory Network (NEON) Satellite site.

Long term vegetation plots are available in both Units including:

- The Hawai'i Permanent Plot Network (HIPNET), <http://www.hippnet.hawaii.edu/>
- Forest Inventory and Analysis (FIA), <http://www.fia.fs.fed.us/>

Additionally, State management infrastructure (fencing) to protect plants is found within both Units. Detailed information regarding this infrastructure is found within the management plans for each unit.

- Pu`u Wa`awa`a - <http://www.puuwaawaa.org/index.html>

- Laupāhoehoe – a draft management plan is currently in progress and a working draft was completed in July 2013.

Education

Both HETF Units are utilized for education and outreach activities. In 2012, three participants on 1 trip visited the Laupāhoehoe Unit and 481 participants on 26 trips visited the Pu`u Wa`awa`a Unit. Table 2 contains annual data for the number of educational trips and participants within the HETF Units from 200-2012. Activities are categorized as education, service, education/service (this is when an education trip also includes a service portion) and other (which includes trainings, surveys (engineer, archaeological, plot or private) as well as site visits, tours, media visits and Hawaiian cultural practices such as Ho`olaule`a).

Table 2: Total number of education projects initiated in the HETF per year and grouped by Unit from 2008-2012.

Year	Laupāhoehoe Unit		Pu`u Wa`awa`a Unit	
	# of participants	# of trips	# of participants	# of trips
2012	3	1	481	26
2011	117	6	309	16
2010	120	6	59	7
2009	87	7	698	34
2008	76	11	854	31
Totals:	403	31	2,401	114

Some examples of educational activities from 2012 are highlighted below. More detailed information on all education activities can be found within the HETF annual reports available online (<http://www.hetf.us/page/home/>).

- *Christopher Havran Ph.D. of Campbell University's Biology Department* led a Hawaiian Natural History class, introducing the students to the biotic diversity of Hawaiian forest ecosystems as well as threats and conservation practices within Hawaiian dry forests.
- *Scott Rowland of the University of Hawai`i at Manoa* took a group of 22 participants into kīpuka Oweowe to conduct invasive weed control and dryland forest restoration. This visit to the HETF was a part of the American Geophysical Union's Chapman Conference, celebrating 100 years of the Hawaiian Volcano Observatory. Part of this trip included a visit to the quarry to examine and discuss eruptive products.
- Several public and private schools from around the island visited the Unit in 2012. Individual classes from *Hualālai Academy, Mālamalama Waldorf School, Honoka`a Intermediate and High School; and Innovations Public Charter School* all held educational discussions in the Unit, on many current topics, such as, climate change, humans impact on the environment, reducing carbon footprints, endangered species, natural resource management, the history of Pu`u Wa`awa`a, native plants, ecology and evolution of Hawaiian flora and fauna, ahupuaa land management systems, watersheds, dry forest ecosystems and their interconnections, geology of the Hawaiian islands, and the importance

of preservation, conservation, restoration. Classes also participated in outplanting endangered native seedlings.

HETF Facilities

Laupāhoehoe Unit

HETF support facilities for the Laupāhoehoe Unit are present in two locations within Laupāhoehoe but outside the forest boundary. The Laupāhoehoe Science and Education Center (Center) is located on 55 acres of old sugar cane lands within the Laupāhoehoe community, approximately four miles from the HETF boundary. Facilities include a bunkhouse, kitchen, restrooms, and classroom/meeting space. The facility site offers opportunities for research, education, and demonstration. A weather station, installed in 2009, is located onsite. The Center is expected to be operational by October 2013.

Additionally, there are plans to build a covered pavilion with restrooms and parking on a three acre fenced parcel directly below the Laupāhoehoe forest boundary. This site would serve as a stepping stone for education and outreach into the forest with the potential for restoration and other forest activities within the three acre fenced area. The potential date of construction for the facilities is unknown.

Pu`u Wa`awa`a Unit

There are plans to build dedicated HETF facilities including a bunkhouse with kitchen, restrooms and classroom/meetings space at the decommissioned landing strip. The environmental assessment and planning process for these facilities will begin in 2013. Non-exclusive use of specific DOFAW owned buildings are available for HETF related meetings and activities.

2012 USFS-HETF Contributions

Hawai`i Youth Conservation Corps (HYCC) – The USFS received \$51K from the national forest system, Region 5, to support two HYCC Gateway teams (formerly known as the summer teams), during the summer of 2012. The HYCC teams participated in ongoing restoration and invasive species control projects within the HETF and surrounding lands encompassed within the Mauna Kea Watershed Alliance. HYCC team members worked with multiple site managers including NARS staff, the Pu`u Wa`awa`a coordinator, the Mauna Kea Watershed Alliance Coordinator, and USFS staff providing a broad range of interactions with multiple agencies. As a result of the program's success the USFS, was nominated as KUPU's 2012 Site of the Year.

Starts with a Seed Program (SWAS) – Initiated in 2011, the Starts with a Seed Program (SWAS) continues to get kids out of the traditional classroom and into the great outdoors. SWAS is successfully connecting forests, schools, and conservation organizations to each other while providing access and knowledge on forests for students in Hawai`i. In 2012, the SWAS hosted 11 trips with 473 participants visiting various sites across Hawai`i Island. On a trip to Pu`u Hulu Hulu 27 students removed invasive mullein, ivy and fireweed, learned about layers of the forest and how to identify plants and birds, and discussed native and invasive species. The USFS contributed in-kind contributions to the SWAS program, including facility use for two teacher workshops at the Laupāhoehoe Science and Education Center, as well as equipment, personnel and vehicle use.

`Imi Pono no ka `Āina – In 2012, the USFS provided equipment support to multiple `Imi Pono

no ka `Āina programs within and outside the HETF.

Global ReLeaf - Waihou Forest Restoration Project – The USFS purchased equipment (\$1007.02) for the Global ReLeaf outplanting project. The goal of this project was to plant 6000 trees within the 204 acre Waihou enclosure within the HETF Pu`u Wa`awa`a Unit. This outplanting project was coordinated and facilitated by Division of Forestry and Wildlife staff Elliott Parsons and Lyman Perry.

HETF Administrative Challenges

Concerns, comments and challenges associated with HETF administration are provided internally by HETF Planning Group members and other USFS and DOFAW staff and externally by community members and/or research permit holders when they file annual reports. Prior challenges that have been addressed are included.

Current Concerns, Comments and Challenges

- Researchers had a slightly worrying sighting of crossbow hunters entering the park at the upper Kiholo carpark. *Note: Kiholo State park is a no hunting zone (State of Hawai`i, DLNR, DOFAW Map No. FW-0457:2002).*
 - *Researchers will wear high visibility vests to work in the park in the future.*
- Access constraints due to fire danger and drought affected project timing.

Prior HETF Concerns, Comments and Challenges that have been addressed

- A Management Plan is needed for the Laupāhoehoe Unit in order to guide decision making.
 - *This plan is currently in progress and a working draft plan was completed July 2013.*

Respectfully submitted,



ROGER H. IMOTO
Administrator

Attachments

APPROVED FOR SUBMITTAL:



WILLIAM J. AILA, Chairperson
Board of Land and Natural Resources

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
RANDOLPH ISLAND RESERVE COMMISSION
LAND
STATE PARKS

PERMIT TO USE STATE LANDS

Pursuant to the authority granted by the Board of Land and Natural Resources at its meeting of January 25, 2007, (Item C-2), the U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, ("USDA Forest Service" or "Permittee"), is hereby granted a non-exclusive permit to use State lands situated at Laupāhoehoe and Pu'u Wa'awa'a, Hawai'i, identified by tax map key parcel numbers: (3) 3-7-001:002; (3) 3-7-001:012; (3) 7-1-001:001; (3) 7-1-001:004; (3) 7-1-001:004; (3) 7-1-001:006; (3) 7-1-001:007; (3) 7-1-002:001; (3) 7-1-002:013; (3) 7-1-002:002; (3) 7-1-002:008, and as shown on the attached maps, for use as the Hawai'i Experimental Tropical Forest (Laupāhoehoe and Pu'u Wa'awa'a units), in compliance with the herein referenced Cooperative Agreement. The USDA Forest Service is acting through the Institute of Pacific Islands Forestry located in Hilo, Hawaii.

Definitions:

"Assigns" means the employees, contractors, agents, and consultants.

"Cooperative Agreement" means the Cooperative Agreement between the State of Hawaii, Board of Land and Natural Resources and the U.S. Department of Agriculture, Forest Service, dated December 12, 2006.

"Hazardous Material" means any pollutant, toxic substance, hazardous waste, hazardous substance, or oil as defined in pursuant to applicable federal law, including, but not limited to, the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. §§ 9601, et seq., the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901, et seq., the Clean Water Act, 33 U.S.C. §§ 1251, et seq., Clean Air Act, 42 U.S.C. §§ 7401, et seq., the Safe Drinking Water Act, 42 U.S.C. §§ 300f, et seq., the Oil Pollution Act, 33 U.S.C. §§ 2701, et seq., the Toxic Substances Control Act, 15 U.S.C. §§ 2602, et seq., and the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§ 136, et seq., or any state law or regulation promulgated pursuant to such federal law.

This Permit is subject to the following conditions:

1. This permit to use State lands shall be effective from the last date shown below and extend for thirty-five years from December 12, 2006, the date the parties entered the Cooperative Agreement.
2. This permit to use State lands is a non-exclusive authorization for the USDA Forest Service and its assigns to occupy and use the Hawaii Experimental Tropical Forests for

the purpose of research, education, demonstration, and related purposes. This permit shall be effective for the following general purposes:

- a. To conduct long-term ecological, forestry, hydrological, and other natural resources-related research;
- b. To conduct long-term studies at scales from the plot to the watershed on forestry, conservation biology, endangered species, and invasive species;
- c. To conduct baseline studies and monitor results and benefits of forest management practices on important issues facing Hawaii including but not limited to: weed control, invasive pest control, forest restoration, aquatic ecology, hydrology, ungulate management, forest recreation, recreational hunting, fire control, cultural subsistence gathering, and protection and reintroduction of native plants and animals;
- d. To conduct studies on forest silviculture and sustainable management and to develop new commercial forest products;
- e. To conduct global climate change research;
- f. To attract and conduct multidisciplinary research studies by scientists from federal and state agencies, non-governmental organizations, and universities;
- g. To provide for environmental education and demonstration for groups ranging from school children to continuing education for land managers, natural resource professionals, and the general public;
- h. To form a management/research partnership where information needs and new findings are freely exchanged between the USDA Forest Service and the State; and
- i. To construct, maintain, and improve needed infrastructures, including: a new field station facilities at Laupāhoehoe and renovation of existing structures for use as a field station at Pu'u Wa'awa'a consisting of dormitories, work areas, demonstration/education buildings, and storage facilities, gaging stations in streams, weather stations, eddy covariance towers, and similar devices, maintenance of the existing trail system and development of new trails for access, and maintenance and improvement of existing roads.
- j. To engage in the specific activities listed on Exhibit A to this permit.

Research or activities requiring additional Federal, State, or county permits or approvals, including but not limited to environmental assessments or conservation district use permits, will be subject to the procedures in effect for obtaining such permits or authorizations.

The USDA Forest Service must obtain the prior written consent of the Board before construction of infrastructure or making any major improvements, as outlined in section IV.I of the Cooperative Agreement. Any major improvements, including but not limited to buildings and fences, erected on or moved onto the Premises by the USDA Forest Service shall remain the property of the USDA Forest Service and the USDA Forest Service shall have the right, prior to the termination or revocation of this Permit, or within an additional period the Board in its discretion may allow, to remove the improvements from the Premises.

3. This permit to use State lands constitutes an authorization for the USDA Forest Service and its assigns to conduct activities described herein as authorized under the Cooperative Agreement. For activities conducted by entities other than the USDA Forest Service and its assigns permits to conduct those activities shall be secured as outlined in Sections III and VI through IX of the Cooperative Agreement. The permit or any rights hereunder shall not be sold, conveyed, leased, mortgaged, or otherwise transferred or disposed of. Persons acting under this permit shall carry a copy of the permit or a signed authorization from the USDA Forest Service indicating their name, purpose, and dates of authorization with them at all times while in the permit area and

shall, upon request, show the permit or signed authorization to any law enforcement officer, or the authorized representative of the Board of Land and Natural Resources.

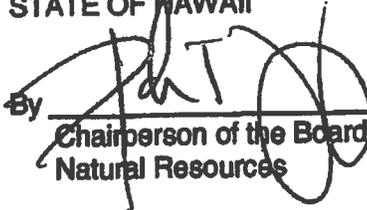
4. **USDA Forest Service shall insure that in the exercise of this permit to use State lands, it shall comply with all laws, statutes, ordinances, rules and regulations of the Federal, State, and county governments affecting the permit area. In addition, prior to activities in Laupāhoehoe Natural Area Reserve, USDA Forest Service shall ensure that proposed activities are to be performed in a manner which is consistent with NARS management objectives, HRS § 195-1 and in consultation with the Hawaii Island Natural Area Reserves System Area Manager to ensure that proposed activities remain consistent with NARS objectives and management actions. Prior to activities in Pu'u Wa'awa'a, USDA Forest Service shall ensure that proposed activities are to be performed in a manner consistent with the Pu'u Wa'awa'a Management Plan and in consultation with the Pu'u Wa'awa'a Coordinator.**
5. **In the event any unanticipated sites or remains such as bone or charcoal deposits, human burials, rock or coral alignments, pavings or walls are encountered USDA Forest Service, its contractors, and consultants shall immediately stop work and contact the State Historic Preservation Division in Kapolei at (808) 692-8015.**
6. **USDA Forest Service agrees to consult regularly with the State, including the appropriate DLNR land manager, on proposed and ongoing activities within the permit area, to ensure open and full communication and to minimize conflicts and maximize benefits between planned and ongoing research projects and between research projects and land management.**
7. **USDA Forest Service, through the Hawaii Experimental Tropical Forest Research Committee established under the Cooperative Agreement, agrees to consult regularly with the State, including:**
 - a. **Providing a copy of the annual report submitted to Congress as required by section 607 of the International Forestry Cooperative Act of 1990, as amended by the Hawaii Tropical Forest Recovery Act;**
 - b. **Providing an annual report on the status of approved new and ongoing research (including the primary investigator, the research topic, the location for the research, dates of field research, date of anticipated results, and contact information for the primary investigator);**
 - c. **Providing an annual report on the number of educational tours and total number of participants; and**
 - d. **Annually reporting on the challenges faced in the administration of the Experimental Forest.**
8. **The USDA Forest Service will maintain the improvements on the land that are being used by the Forest Service or its assigns. The USDA Forest Service will keep the permit area and improvements in a clean, sanitary, and orderly condition. Disturbance of native vegetation and native wildlife shall be avoided as much as possible. The USDA Forest Service will not make, permit, or suffer, any waste, strip, spoil, nuisance or unlawful, improper, or offensive use of the permit area. Precautions shall be taken to prevent introductions of plants and animals not naturally present in the permit area, including inspection and cleaning of clothing, equipment, and vehicles. At all times with respect to the permit area, USDA Forest Service will use due care for public safety and will use appropriate precautions and measures to minimize inconveniences to surrounding residents, landowners, lessees, and the public in general.**

9. The State will remain primarily responsible for normal land management functions, including but not limited to control of public access, fire suppression, law enforcement, regulation of hunting and grazing activities, invasive species management, and forest disease, insect, and ungulate control. The Board will be responsible for maintenance of all improvements not used, built or placed on the land by the USDA Forest Service. The Board reserves the right for its employees, agents or representatives to enter or cross any portion of the permit area at any time.
10. Liability for any loss, damage, claim, demand, or action, caused by, arising out of or connected with the operations authorized by the Cooperative Agreement shall be governed by applicable State and Federal law. To the extent that the USDA Forest Service requires third parties, including but not limited to its contractors or consultants, to procure liability insurance or to indemnify the Forest Service, the USDA Forest Service shall also require such third parties to insure and indemnify the State.
11. This permit may be modified at any time by mutual agreement of the Director, Institute of Pacific Islands Forestry, USDA Forest Service, and the Board of Land and Natural Resources.
12. Permittee and its assigns shall not cause or permit the escape, disposal or release of any hazardous materials except as permitted by applicable federal and state law. Proposed use of hazardous materials in research activities will be disclosed to the State through the research review and approval procedures of the Hawaii Experimental Tropical Forest Research Committee and the processes for activities authorizations prescribed by the Cooperative Agreement. Permittee and its assigns shall store and use hazardous materials only as prescribed by federal law. Liability for release of a hazardous material shall be in accord with applicable Federal and state law.

To the extent that the Permittee requires its contractors or consultants to indemnify, defend, and hold the Permittee harmless from any damages and claims resulting from the release of hazardous materials on the permit area occurring while Permittee or its contractors are in possession of the permit area, or elsewhere if caused by Permittee's contractors acting for or on Permittee's behalf, Permittee shall also require such contractors or consultants to indemnify the State. These covenants shall survive the expiration or earlier termination of this permit.
13. In the event of an alleged violation of this permit, the State will contact the Director of the Institute of Pacific Islands Forestry (or other designated official of the USDA Forest Service) with notice of such violation and a reasonable time permitted to cure the violation.
14. Disputes shall be resolved by the Station Director, Pacific Southwest Research Station, USDA Forest Service, and the Board of Land and Natural Resources. Disputes involving Laupāhoehoe Natural Area Reserve shall be taken to the Natural Area Reserve System Commission first for their recommendation to the Board of Land and Natural Resources.

IN WITNESS WHEREOF, the STATE OF HAWAII, by its Board of Land and Natural Resources, has caused the seal of the Department of Land and Natural Resources to be hereunto affixed and the parties hereto have caused these presents to be executed the day, month and year first above written.

STATE OF HAWAII

By  _____
Chairperson of the Board of Land and
Natural Resources

Approved by the Board of
Land and Natural Resources
at its meeting held on JAN 26 2007

USDA FOREST SERVICE

 _____
James Sedell, Station Director
Pacific Southwest Research Station

APPROVED AS TO FORM:

 _____
Deputy Attorney General
State of Hawaii

Dated: 1/26/07

Exhibit A to Permit

The following activities, when undertaken by the Forest Service or its assigns pursuant to actions authorized in accordance with the provisions of the Cooperative Agreement for research between the State of Hawaii and the Forest Service, are authorized by this Permit. For purposes of this Exhibit A, "nondestructive" means an activity that does not destroy or harm the object of analysis.

1. Operations and maintenance of buildings, dormitories, work areas, demonstration/education buildings, storage facilities, and management structures on experimental forest lands or other state lands encumbered under lease, license or permit.
2. Minor modification of existing buildings, work areas, demonstration/education facilities, and storage facilities to improve their usefulness as per the cooperative agreement, or to provide for public and worker safety.
3. Maintenance or modification of landscaping and other minor land and vegetation improvements around buildings, work areas, storage facilities on experimental forest lands to improve site use or public safety, including cutting and/or removal of vegetation, and use of pesticides and herbicides to maintain landscaping.
4. Cutting and/or removal of exotic/nonnative vegetation and animals or use of pesticides and herbicides to control or prevent the establishment or spread of invasive species.
5. Maintenance and operation of all facilities and improvements that are used by the U.S. Forest Service or its assigns, or those installed under research permits as per agreement of the Forest Service.
6. Maintenance of existing roads to facilitate access and diminish ecological damage from roads in poor condition, including the cutting or removal of roadside vegetation, and use of herbicides and pesticides in road right-of-way.
7. Maintenance of the existing trail system facilitate access, minimize trampling damage and insure safety of users, including the cutting or removal of roadside vegetation, and use of herbicides and pesticides in the trail corridor.
8. To participate in or conduct hikes, nature study, or other passive recreational activities.
9. Non-destructive inventory and monitoring of basic resources of experimental forest lands.
10. To lead site tours or provide access to school children, land managers, natural resource professionals, and the general public for forest education purposes and demonstration projects.

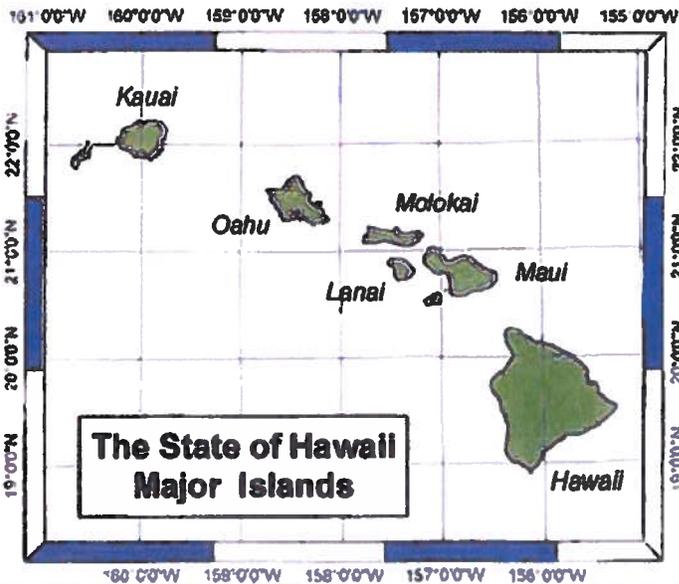
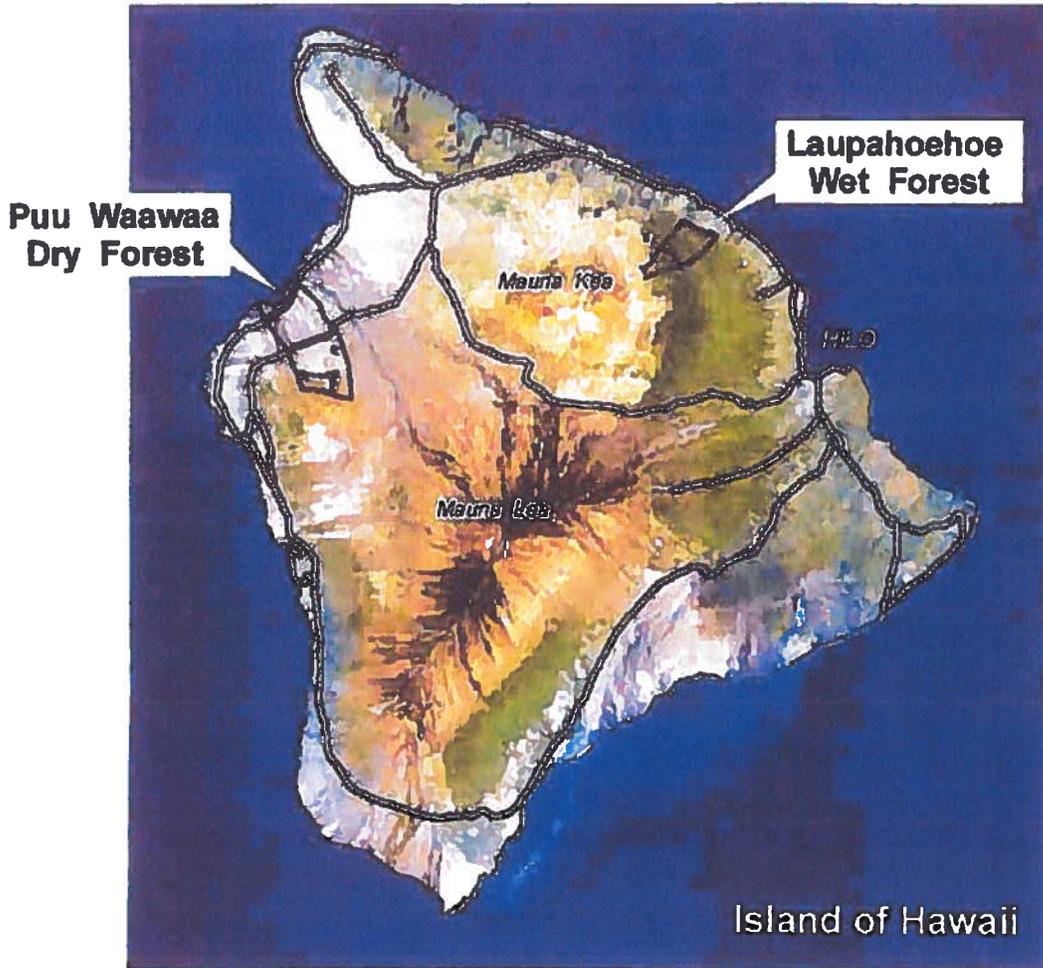
11. Installation and maintenance of directional and informational signs for worker, visitor, and public use and safety.
12. Monitoring of public use and environmental conditions in and around public use facilities, including placement of temporary electronic devices for environmental monitoring or sampling (for periods ≤ 36 months), and the sampling of air and gasses (plant and soil respiration) within the experimental forest.
13. Use of motorized or unmotorized vehicles and equipment off established roads and trails or other designated vehicle-areas for approved management and research plan activities or to respond to emergency situations.

The following eleven activities are also authorized by this permit when undertaken by the Forest Service or its assigns pursuant to research actions authorized by the Hawaii Experimental Tropical Forests Research Committee in accordance with the provisions of the Cooperative Agreement for research between the State of Hawaii and the Forest Service.

14. Non-destructive inventory, measurements, censuses, and monitoring of trees, ferns, understory plants, birds, mammals, insects, and aquatic organisms where there is no harm to the organisms (includes both ground-based and remotely sensed measures).
15. Non-destructive inventory, measurements, and monitoring of the forest floor, dead and downed wood, and soils.
16. Non-destructive inventory, measurements, and monitoring of streams, ponds, and other aquatic ecosystems.
17. Nondestructive hydrological and geomorphic studies which do not involve the erection of structures or long term placement of equipment.
18. Erection of small protective fences and barriers ≤ 10 acre in area (and the removal of exotic species within such plots).
19. Construction of temporary blinds and field observation structures.
20. Soil and plant nutrient cycling research.
21. Biocontrol research to control invasive plants and animals - manipulate densities of state and federally permitted biocontrol agents through redistribution and experimental methods, including caging plants or parts of plants.
22. Introduction and use of carbon, oxygen, nitrogen and other isotopes for research.

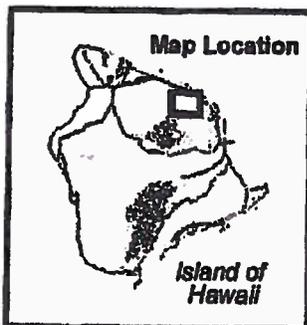
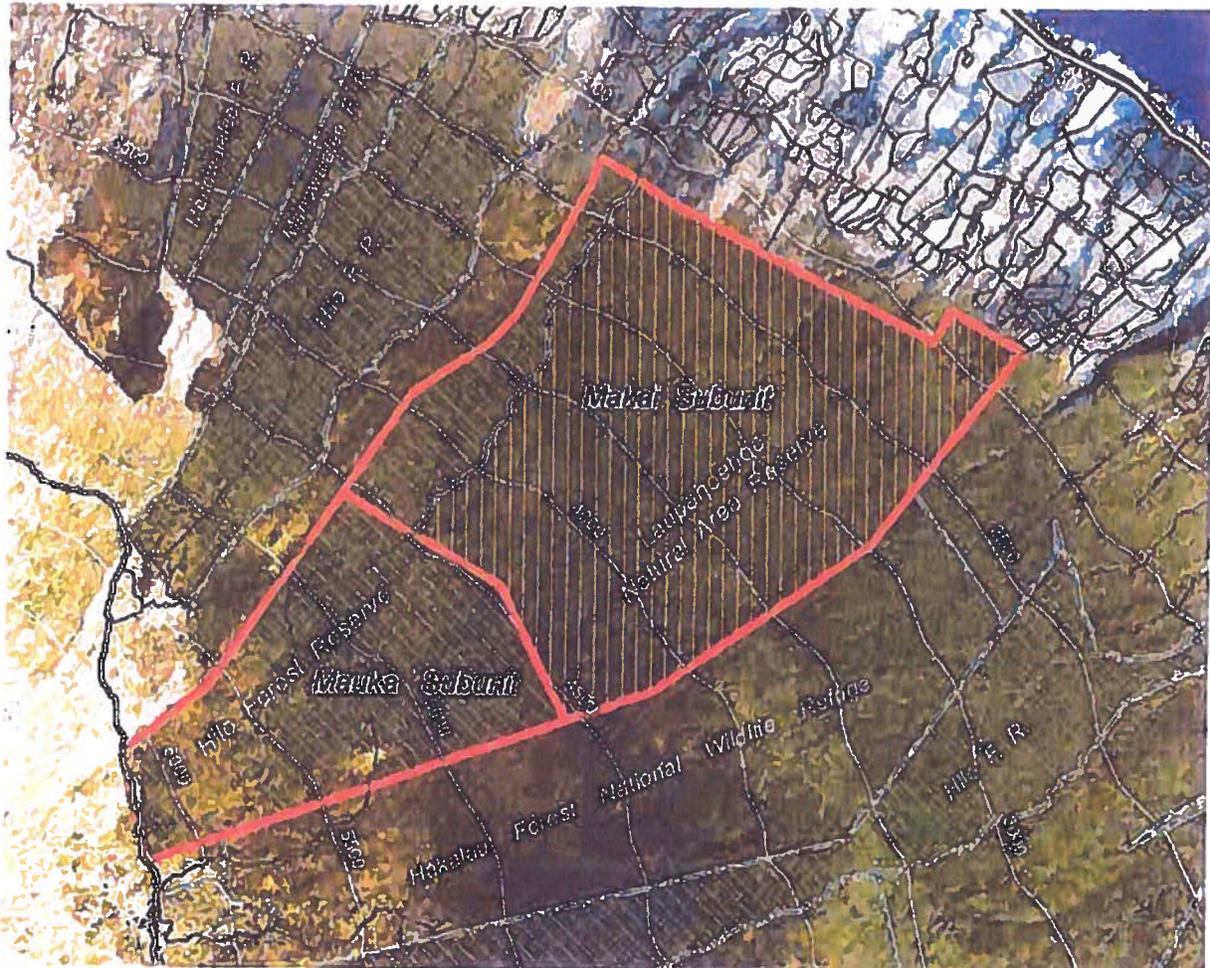
- 23. Non-destructive collection of plant material (excluding all listed T&E plants), soils, and water samples for laboratory analysis.**
- 24. Collection of plant and insect samples that are from common, exotic, and abundant taxa for laboratory, greenhouse, or herbarium sampling (excluding all listed T&E species).**

MAP 1. Location



State of Hawaii
Department of Land and Natural Resources
Division of Forestry and Wildlife
Map No. FW - 0888 (08/2008)
Contact: Ronald Cannarella
Telephone: (808) 383-3077
Email: Ronald.J.Cannarella@hawaii.gov

MAP 2. Laupahoehoe Wet Forest : Subunits and Geography



Legend

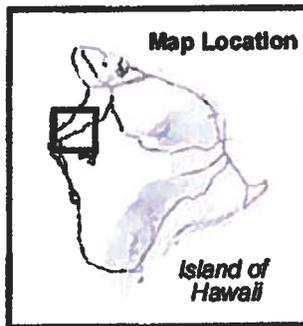
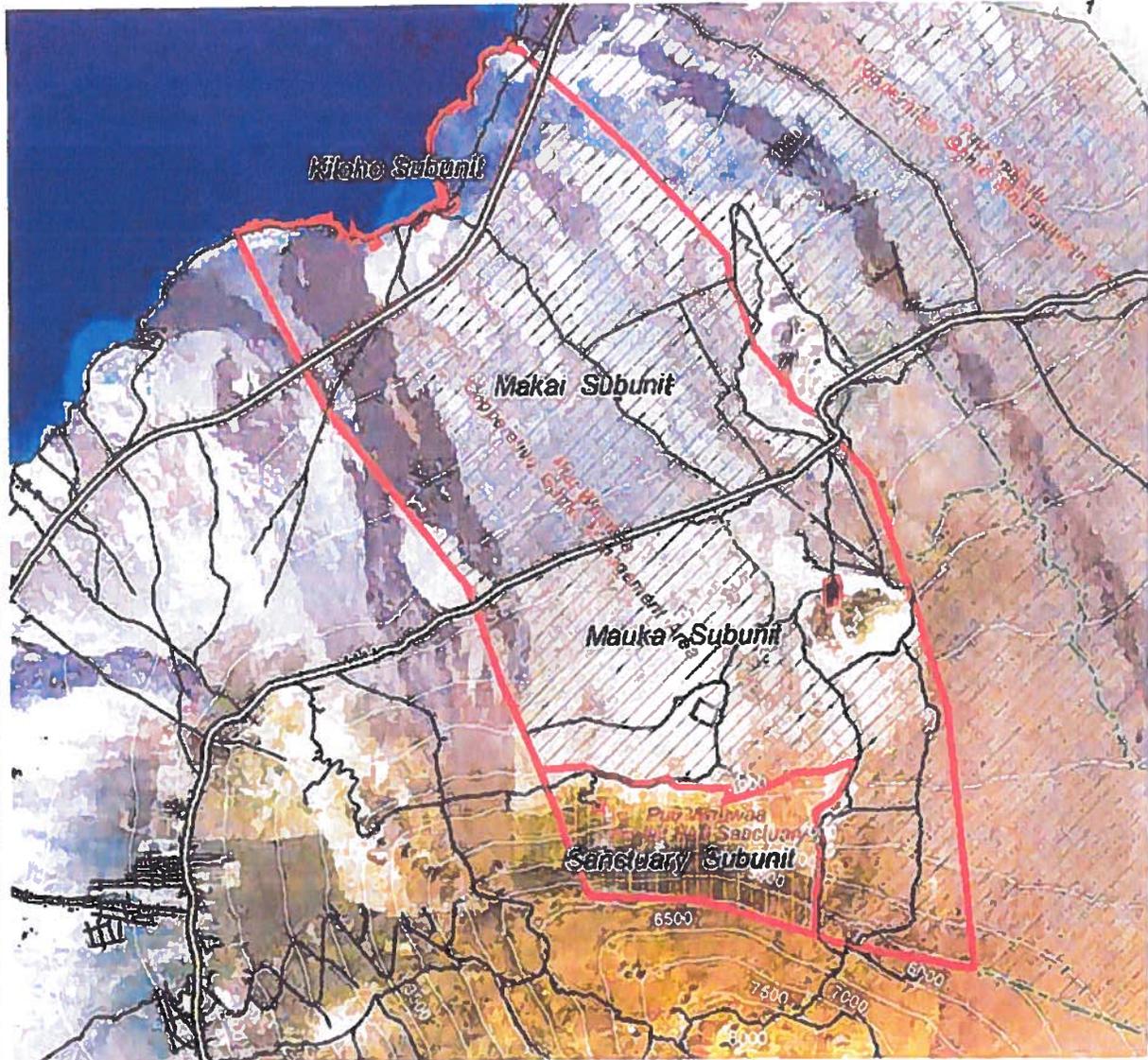
- HETF Boundary
- Forest Reserve
- Natural Area Reserve
- Major Road
- Secondary Road
- Minor Road and Trail
- Stream
- 500-Foot Contour



State of Hawaii
 Department of Land and Natural Resources
 Division of Forestry and Wildlife
 Map No. FW - 0670 (08/2008)
 Contact: Ronald Cannarella
 Telephone: (808) 383-3077
 Email: Ronald.J.Cannarella@hawaii.gov

Data Source : Landsat; State of Hawaii GIS

MAP 3. Puu Waawaa Dry Forest : Subunits and Geography



Legend

- HETF Boundary
- Game Management Area
- Bird Sanctuary
- Major Road
- Minor Road and Trail
- Stream
- 500-Foot Contour



State of Hawaii
 Department of Land and Natural Resources
 Division of Forestry and Wildlife
 Map No. FW - 0673 (08/2006)
 Contact: Ronald Cannarella
 Telephone (808) 363-3077
 Email: Ronald.J.Cannarella@hawaii.gov

Data Source: Landsat; State of Hawaii GIS

COOPERATIVE AGREEMENT

between the

**UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE**

and the

**STATE OF HAWAII
BOARD OF LAND AND NATURAL RESOURCES**

THIS COOPERATIVE AGREEMENT is between the **United States Department of Agriculture, Forest Service**, hereinafter referred to as the "Forest Service", and the **State of Hawaii**, by its **Board of Land and Natural Resources**, hereinafter referred to as the "Board". The Forest Service and the Board are jointly referred to as the "Parties".

RECITALS:

Whereas, the Hawaii Tropical Forest Recovery Act of 1992 (Public Law 102-574) authorizes the establishment of the Hawaii Experimental Forest as a center for long-term research and a focal point for developing and transferring knowledge and expertise for the management of tropical forests.

Whereas, the unique biological diversity, resources, and threats to Hawaii's tropical forests pose a critical need to establish experimental forests in Hawaii, where currently none exist.

Whereas, there are areas of State land which are uniquely suited to the conduct of tropical research and, therefore, for designation as the first two units of the Hawaii Experimental Tropical Forests.

Whereas, the Forest Service, through its Pacific Southwest Research Station and its affiliated Institute of Pacific Islands Forestry in Hilo, Hawaii, is authorized to implement the Hawaii Tropical Forest Recovery Act of 1992 on behalf of the United States Department of Agriculture.

Whereas, the Parties deem a cooperative Federal and State research program to be the best way to effect the purposes of the Hawaii Tropical Forest Recovery Act of 1992 and, to that end, to execute and implement this Cooperative Agreement.

NOW, THEREFORE, in consideration of the mutual benefits of cooperative research and the other terms and conditions of this agreement, the Parties agree as follows:

I. AUTHORITIES.

A. *For the Forest Service:* This Cooperative Agreement is authorized by section 606(d)(1)(B) of the International Forestry Cooperation Act of 1990, as amended by the Hawaii Tropical Forest Recovery Act of 1992 (Public Law 102-574).

B. *For the State:* This Cooperative Agreement is authorized by Hawaii Revised Statutes (HRS) §§ 171-6, 183-1.5, 195-4, and 195-7.

II. HAWAII EXPERIMENTAL TROPICAL FORESTS.

A. Within 90 days of execution of this Cooperative Agreement, the Secretary of Agriculture will designate pursuant to the Hawaii Tropical Forest Recovery Act (Public Law 102-574), two units of the Hawaii Experimental Tropical Forests located on the island of Hawaii, generally depicted on the map appended hereto as Map 1, as follows:

1. Laupāhoehoe Experimental Forest comprising approximately 12,343 acres on the Island of Hawaii and generally depicted on the map appended hereto as Map 2.
2. Pu'u Wa'awa'a Experimental Forest comprising approximately 38,885 acres on the Island of Hawaii and generally depicted on the map appended hereto as Map 3.

B. The Laupāhoehoe and Pu'u Wa'awa'a Experimental Forests are collectively referred to herein as the "Hawaii Experimental Tropical Forests".

C. The purposes of the Hawaii Experimental Tropical Forests are:

1. To learn how to better restore, preserve, and sustainably manage native tropical forests, streams and entire watersheds of the Pacific, and to provide information to land managers challenged with management of these important landscapes;
2. To be a center for demonstration, education, training, and outreach on tropical forestry, conservation biology, and natural resources research and management;
3. To provide sites dedicated to long term research on tropical forestry, ecology, hydrology, conservation biology, and natural resource management; and

4. To promote research cooperation and collaboration between State, Federal agencies, educational, and other institutions in tropical forestry research in Hawaii.

D. Additional lands may be incorporated into the Experimental Forests with the written concurrence of the Parties in accordance with section 606 of the International Forestry Cooperation Act of 1990, as amended by the Hawaii Tropical Forest Recovery Act of 1992.

III. LAND USE AUTHORIZATION.

On or about the date hereof, the Board of Land and Natural Resources ("Board") will issue to the Department of Agriculture, Forest Service, a permit to use the Hawaii Experimental Tropical Forests in accordance with this Cooperative Agreement.

A. The permit is a non-exclusive authorization for the Forest Service and its assigns to use the Hawaii Experimental Tropical Forests for the purpose of research, education, demonstration, and related purposes.

B. Entities conducting research activities requiring additional federal, state, or county permits or approvals, including but not limited to environmental assessments or conservation district use permits, will be required to acquire those permits through the procedures in effect for obtaining such permits.

C. In the event that the Forest Service needs to build valuable improvements and support facilities in furtherance of activities contemplated under this Cooperative Agreement, then the State shall issue a lease for such purposes on terms and conditions necessary to meet the requirements of 7 U.S.C. § 2250a and HRS §§ 171-95 and 183-11.

D. All research activities to be conducted on the Hawaii Experimental Tropical Forests shall be administered by the Hawaii Experimental Tropical Forests Research Committee as provided in Part VI of this Cooperative Agreement.

IV. COOPERATIVE RESEARCH AND MANAGEMENT.

In furtherance of a long-term philosophy for cooperation at the Hawaii Experimental Tropical Forest and to implement the purposes of the Hawaii Experimental Tropical Forests and Section 606 of the International Forestry Cooperation Act of 1990, as amended by the Hawaii Tropical Forest Recovery Act, the Parties agree:

A. To conduct long term ecological, forestry, hydrological and other natural resources-related, research;

B. To conduct long term studies at scales from the plot to the watershed on forestry, conservation biology, endangered species, and invasive species;

C. To conduct baseline studies and monitor results and benefits of forest management practices on important issues facing Hawaii including but not limited to: weed control, invasive pest control, ungulate management, forest recreation, recreational hunting, fire control, cultural subsistence gathering, protection and reintroduction of native plants and animals, hydrology, and water quality;

D. To conduct studies on forest silviculture, restoration, and sustainable management;

E. To conduct global climate change research;

F. To attract and conduct multidisciplinary research studies by scientists from federal and state agencies, non-governmental organizations, and universities;

G. To provide for forest education and demonstration for groups ranging from school children to continuing education for land managers, natural resource professionals, and the general public;

H. To form a management/research partnership where information needs and new findings are freely exchanged between the Parties; and

I. To construct, maintain and improve needed infrastructure, including:

- 1. New field station facilities at Laupāhoehoe and renovation of existing structures for use as a field station at Pu'u Wa'awa'a consisting of dormitories, work areas, demonstration/education buildings, and storage facilities on experimental forest lands or other state lands encumbered under lease, license or permit.**
- 2. Gaging stations in streams, weather stations, eddy covariance towers, and similar research structures. Gaging stations can be placed at the lower reaches of Ka'awali'i Stream, Laupāhoehoe Stream, Kilau Stream, Kiwilahiahi stream, Ha'ako'a Stream, and Pahale Stream within the Laupāhoehoe Natural Area Reserve.**
- 3. Development and maintenance of the existing trail system and the development of a limited network of new trails to achieve access, minimize trampling damage and insure safety of users**
- 4. Maintenance and improvement of existing roads to facilitate access and diminish ecological damage from roads in poor condition.**

V. CONSULTATION.

A. *In General.* Owing to the many values and benefits that arise from research, education, and demonstration on the Hawaii Tropical Forests and elsewhere, the Parties further agree they will consult and reach agreements with each other to coordinate research, management, and educational activities and to:

1. Jointly develop research and management plans for the Hawaii Experimental Tropical Forests and to update these plans at least every five years;
2. Consult and reach agreement prior to implementing any written policy or plan that may affect the management of or research within the Hawaii Experimental Tropical Forests;
3. Consult and reach agreement during planning for the development of facilities or any major ground disturbing activities;
4. Consult and reach agreement before any major ground disturbing activities that may affect the conduct of research or the biological integrity of the area such as logging, scarification, chemical applications, fencing, etc.

B. *External Consultation.* The Parties will consult with scientists, managers, general citizens, and local community members concerning ongoing research activities. Existing State sanctioned advisory councils may be utilized for this purpose.

VI. HAWAII EXPERIMENTAL TROPICAL FORESTS RESEARCH COMMITTEE.

A. There is hereby established a Hawaii Experimental Tropical Forests Research Committee ("Committee") which will be chaired by the Forest Service. The Committee will consist of one Federal representative and one State representative who will review and recommend for approval research, education, and demonstration activities on lands designated as the Hawaii Experimental Tropical Forests, and recommend such terms and conditions for the conduct of such research as the Committee deems in the public interest consistent with this Cooperative Agreement.

B. The Committee will establish its own procedures and guidelines consistent with this Cooperative Agreement, including the establishment of subcommittees which may be composed of staff or consultants to deal with specific proposals for the Pu'u Wa'awa'a and Laupāhoehoe Experimental Forest Units.

C. The Committee shall be comprised of persons familiar with the on-going management, research, and education activities on the Experimental Tropical Forests:

1. The Director of the Institute of Pacific Islands Forestry in Hilo, Hawaii, or such alternative Federal official as may be named by the Station Director of the Pacific Southwest Research Station, and
2. The Hawaii Island Branch Manager of the Division of Forestry and Wildlife, or such alternative as may be named by the Board of Land and Natural Resources.

D. Additional members of the Committee may be added by mutual agreement by way of an amendment to this Cooperative Agreement.

E. The Committee will act by unanimous agreement to recommend research activities, including any recommended terms and conditions set forth in writing in an agreement with each research proponent. Research and other activities will follow State guidelines and management plans specific for the land area designation and experimental forest where the research will be conducted.

F. The Committee will provide mechanisms for public information and oversight of research activities, and will provide such information to the Secretary of Agriculture for inclusion in the annual reports to Congress as required by section 607 of the International Forestry Cooperation Act of 1990, as amended by the Hawaii Tropical Forest Recovery Act of 1992. A copy of this annual report will also be sent to the Board of Land and Natural Resources and Natural Area Reserves Commission.

G. Committee members shall serve such renewable terms as determined at the pleasure of the Station Director of the Pacific Southwest Research Station and the Board, as the case may be.

VII. AUTHORIZATION OF RESEARCH ACTIVITIES.

A. The Parties agree that the procedures of the Committee in administering, reviewing, and approving research activities, and the State procedures for issuance of permits for State lands should be streamlined and, to the extent possible, consolidated.

B. For areas of the Hawaii Experimental Tropical Forests outside the Natural Area Reserves System (NARS), within 90 days of this agreement, the Board will delegate to its representative on the Committee the authority to approve and issue permits for the use of state lands for research activities approved by the Committee. It is recognized that this delegation will be subject to terms and conditions as the Board may prescribe, and is subject to modification or revocation at the sole discretion of the Board.

C. For areas of the Hawaii Experimental Tropical Forests inside the Natural Area Reserves System, the Parties agree to encourage the NARS Commission to adopt policies and procedures to meet the objectives of paragraph A. It is recognized that any delegation would be subject to terms and conditions as the Commission may prescribe, and is subject to modification or revocation at the sole discretion of the Commission. It is recognized that, as of the date of this Cooperative Agreement, the NARS Commission lacks legal authority to delegate permit approval authority.

D. Forest Service research activities which the State determines to be within the scope of the permit issued pursuant to Part III of this Cooperative Agreement may not require additional authorizations.

VIII. RESEARCH ON THE LAUPĀHOEHOE NATURAL AREA RESERVE.

A. The Laupāhoehoe Experimental Forest will be a site where long term research at the landscape or ahupua'a scale will be made possible. Within this ahupua'a will be a field station on State-leased agriculture lands, a Natural Area Reserve (NAR), and a Forest Reserve (FR).

B. In addition to the other requirements of this Cooperative Agreement, any research conducted on the Laupāhoehoe Natural Area Reserve shall be performed in a manner which is consistent with NARS management objectives, HRS § 195-1.

C. Prior to issuing a recommendation for approval of any proposed research on the Laupāhoehoe NAR, the Committee will consult with the Hawaii Island NARS Area Manager. The Area Manager will be consulted regularly on ongoing research activities to insure research activities remain consistent with NARS objectives and management actions.

IX. RESEARCH ON THE PU'U WA'AWA'A EXPERIMENTAL FOREST UNIT .

A. The Pu'u Wa'awa'a Experimental Forest Unit will be a site where long term research at the landscape or ahupua'a scale will be made possible.

B. In addition to the other requirements of this Cooperative Agreement, any research conducted on the Pu'u Wa'awa'a Experimental Forest Unit shall be performed in a manner which is consistent with or provides information that would improve the Pu'u Wa'awa'a management plan.

X. RESEARCH RESULTS.

A. Unless the Parties agree otherwise on any given project, the rights to publication, patent, or otherwise to any research results shall accrue to the respective party(s) conducting the research.

B. Each agency shall be acknowledged in publications and audiovisuals as a result of this Cooperative Agreement.

C. Within a reasonable period after completion of research or management activities, the Committee shall require that all information be included in an Experimental Forest data base.

D. Metadata including weather and streamflow data will be made available to the Parties as soon as is practically possible.

XI. MANAGEMENT ACTIVITIES ON HAWAII EXPERIMENTAL TROPICAL FORESTS.

A. *Occupancy and Use.* By this Cooperative Agreement and the permit referenced in Section III.A, persons employed by the Forest Service, are authorized general entry upon the Hawaii Experimental Tropical Forests for research, education, demonstration, and related purposes as set forth herein.

B. *Assignees, contractors and cooperators.* Either Party may authorize entry to the Hawaii Experimental Tropical Forests to assignees and contractors to carry out activities authorized under any permit or authorization, insofar as such entry and activities undertaken do not interfere with any ongoing or planned research or management activities. This Cooperative Agreement does not restrict the Forest Service or the Board from participating in similar research activities with other public or private agencies, organizations, and individuals.

C. *Public Access.*

1. If so authorized, public access will be regulated by the Board to accommodate, in a manner compatible with, ongoing research or management activities. The Board will appropriately manage public access so that threats to public safety are minimized.

2. The Board shall be primarily responsible to utilize its authorities under state law to enforce regulations and permit requirements.

D. *State Management.* The Board will be primarily responsible for normal land management functions including, but not limited to, control of public access, fire suppression, law enforcement, regulation of hunting and grazing activities, invasive species management, and

forest disease, insect, and ungulate control. The Parties will consult with each other and reach an agreement prior to implementing any activity which may impede ongoing management or research activities.

E. *Emergencies.* Nothing in this Cooperative Agreement shall be interpreted to impede the State's prerogatives in dealing with immediate emergencies such as fire or other immediate threats to human safety, which may be undertaken without prior consultation with the Forest Service or the Committee.

F. *Environmental Compliance.* The Committee shall assure that all research activities fully comply with the requirements of all applicable state and federal environmental laws and regulations.

G. *Maintenance of Improvements.* Unless the Parties agree otherwise on a case-by-case basis, the Forest Service will maintain the improvements on the land that are being used by the Forest Service or its assigns for research purposes. The Board will be responsible for maintenance of all other improvements.

XII. FUNDING.

A. *No Obligations of Funds.* This Cooperative Agreement is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds, transfer of property, services or anything of value between the parties will be handled in accordance with applicable regulations, and procedures including those for Governmental procurement or printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority. Any contract or agreement for training or other services must fully comply with all applicable procurement procedures.

B. *Anti-deficiency.* All activities and operations of the Forest Service and the Board are subject to the availability of appropriated funds. Nothing in this Cooperative Agreement shall be interpreted as obligating unappropriated funds by either entity.

XIII. LIABILITIES.

The Parties agree that liability for any loss, damage, claim, demand, or action, caused by, arising out of or connected with the operations authorized by this Cooperative Agreement shall be governed by applicable state and federal law. For the Forest Service, tort claims will be governed by the provisions of the Federal Tort Claims Act (28 U.S.C. §§ 2671, *et seq.*).

XIV. TERM, EVALUATION AND MODIFICATION.

A. *Term.* This instrument is executed as of the last date shown below which shall be the commencement date. This instrument will remain in effect for Thirty Five (35) years after which it is renewable at the option of the Parties.

B. *Evaluation.* This Cooperative Agreement may be reviewed, evaluated, and updated at any time, but no later than ten (10) years from the commencement date.

C. *Modification.* This Cooperative Agreement may be modified at any time by mutual agreement of the Parties. Modifications shall be in writing executed by the authorized officer representing the Forest Service and the Board respectively. For purposes of this modification provision, such authorized officers are the Station Director of the Pacific Southwest Research Station, and the Board of Land and Natural Resources for all substantive changes and the Chairperson of the Board for nonsubstantive changes to facilitate processing such changes.

XV. DISPUTES.

A. *Laupāhoehoe Natural Area Reserve.* Disputes that cannot be resolved within the Committee concerning research permission on the NAR will be taken to the Natural Area Reserves System Commission for their recommendation to the Board of Land and Natural Resources.

B. *Other Disputes.* Any other dispute among the parties in implementation of the Permit or this Cooperative Agreement shall be elevated to the Station Director, Pacific Southwest Research Station, and the Board of Land and Natural Resources, State of Hawaii.

XVI. TERMINATION.

Either party, in writing, may terminate the instrument in whole, or in part, at any time before the date of expiration. Unless otherwise by mutual agreement, two years advance notice shall be provided prior to termination.

XVII. PRINCIPAL CONTACTS.

The principal contacts for administering this Cooperative Agreement are:

- A. *U.S. Department of Agriculture:*
Director, Institute of Pacific Islands Forestry
Pacific Southwest Research Station
Department of Agriculture, Forest Service

B. *State of Hawaii:*
Administrator, Division of Forestry and Wildlife
Department of Land and Natural Resources

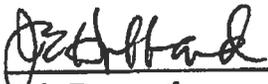
XVIII. MISCELLANEOUS PROVISIONS.

A. *Disclaimers.* Nothing in this Cooperative Agreement shall be construed as affecting in any way the delegated authority or responsibilities of the Board of Land and Natural Resources or the Forest Service. This Cooperative agreement shall not supercede any agreements currently in effect between State and the Forest Service.

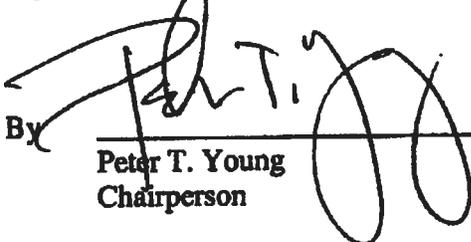
B. *Additional Parties.* By modification of this Cooperative Agreement by the Parties, additional governmental, non-profit organizations, and other entities may be made party thereto on such terms and conditions as the Board and the Forest Service may agree.

IN WITNESS WHEREOF, the parties hereto have executed this Cooperative Agreement as of the last date written below.

**U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE**

By  _____ 12/12/06
for Dale Bosworth Date
Chief

**STATE OF HAWAII
BOARD OF LAND AND NATURAL RESOURCES**

By  _____
Peter T. Young Date
Chairperson

Approved by the Board of Land and Natural Resources
at its meeting held on DEC 08 2006

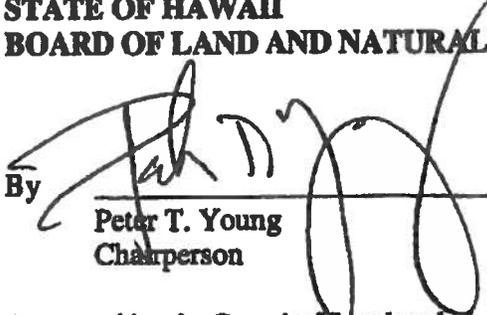
**Delegation of Selected Permitting Approval Authority for Research Activities
Undertaken on the Hawaii Experimental Tropical Forest**

The authority to approve permits and permit terms and conditions for the following research activities conducted on the Hawaii Experimental Tropical Forest is hereby delegated to the Hawaii Island Branch Manager of the Division of Forestry and Wildlife when performing duties as authorized by the Cooperative Agreement for research between the State of Hawaii and the U.S. Forest Service. For purposes of this Exhibit A, "non-destructive" means an activity that does not destroy or harm the object of analysis.

1. Non-destructive inventory, measurements, censuses, and monitoring of trees, ferns, understory plants, birds, mammals, insects, and aquatic organisms where there is no harm to the organisms (includes both ground-based and remotely sensed measures).
2. Non-destructive inventory, measurements, and monitoring of the forest floor, dead and downed wood, and soils.
3. Non-destructive inventory, measurements, and monitoring of streams, ponds, and other aquatic ecosystems.
4. Nondestructive hydrological and geomorphic studies which do not involve the erection of structures or long term placement of equipment.
5. Research involving cutting and/or removal of exotic/nonnative vegetation that does not directly disrupt native forest species, forest composition, or forest structure (limited to test plots ≤ 10 acres in area).
6. Research on the use of pesticides/herbicides/prescribed fire/grazing animals to control invasive species (does not directly disrupt native forest species, composition, or structure, and limited to test plots ≤ 10 acres in area).
7. Erection of small protective fences and barriers ≤ 10 acre in area (and the removal of exotic species within such plots).
8. Construction of temporary blinds and field observation structures.
9. Soil and plant nutrient cycling research.
10. Biocontrol research to control invasive plants and animals - manipulate densities of state and federally permitted biocontrol agents through redistribution and experimental methods, including caging plants or parts of plants.

11. Sampling air and gasses (plant and soil respiration) within the experimental forest.
12. Placement of temporary electronic devices for environmental monitoring or sampling (for periods ≤ 36 months).
13. Introduction and use of Carbon, Oxygen, Nitrogen and other isotopes for research.
14. Non-destructive collection of plant material (excluding all listed T&E plants), soils, and water samples for laboratory analysis.
15. Collection of plant and insect samples that are from common, exotic, and abundant taxa for laboratory, greenhouse, or herbarium sampling (excluding all listed T&E species).
16. Maintenance of a trail system for access.

**STATE OF HAWAII
BOARD OF LAND AND NATURAL RESOURCES**

By  _____ Date _____
Peter T. Young
Chairperson

Approved by the Board of Land and Natural Resources
at its meeting held on DEC 08 2006.

APPROVED AS TO FORM



Deputy Attorney General

Date: 12/8/06