

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Sustain, Protect, and Manage Hawaii's Natural Resources and Environment

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	18%		7%	
111	Conservation and Efficient Use of Water	6%		9%	
112	Watershed Protection and Management	10%		3%	
121	Management of Range Resources	13%		3%	
123	Management and Sustainability of Forest Resources	10%		4%	
124	Urban Forestry	0%		2%	
125	Agroforestry	5%		4%	
131	Alternative Uses of Land	0%		5%	
133	Pollution Prevention and Mitigation	11%		6%	
135	Aquatic and Terrestrial Wildlife	0%		1%	
136	Conservation of Biological Diversity	0%		4%	
205	Plant Management Systems	17%		12%	
211	Insects, Mites, and Other Arthropods Affecting Plants	0%		5%	
212	Pathogens and Nematodes Affecting Plants	0%		15%	
402	Engineering Systems and Equipment	0%		2%	
403	Waste Disposal, Recycling, and Reuse	5%		6%	
404	Instrumentation and Control Systems	0%		1%	
605	Natural Resource and Environmental Economics	5%		9%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%		2%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	6.0	0.0
Actual Paid Professional	4.3	0.0	7.0	0.0
Actual Volunteer	2.4	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
142532	0	162326	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
561414	0	1392120	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
67567	0	1366852	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and extension efforts to promote harmony between agriculture and environment continue to be a priority for CTAHR. Areas addressed by research and extension projects include agricultural waste management, forest resource management, agroforestry, range management, fire science, nutrient management, soil erosion, soil quality and bioremediation, biological diversity, rehabilitation of degraded and idle lands, handling of hazardous materials, and water quality. Research and extension efforts at preserving, protecting, and renewing Hawaii's natural resources continue to be an area of focus.

The goal of the Wildfire Extension program for Hawaii is a reduced threat to ecosystems and communities in the Pacific from wildfire. To further this goal, the Pacific Fire Exchange (PFX) is a partnership between CTAHR, the US Forest Service (USFS) and the Hawaii Wildfire Management Organization (HWMO). Regular interactions through the PFX advisory panel include the US Fish and Wildlife Service (USFWS) in Honolulu, the USDA National Resource Conservation Service in Guam, Kamehameha Schools (a native Hawaiian educational institute), the Hawaii state Department of Forestry and Wildlife (DOFAW), the US Army Environmental Division, the Pacific Island Climate Change Cooperative, the Center for the Environmental Management of Military Lands, the Army Fire Department, the Nature Conservancy, and the Pacific Disaster Center. Facilitation of wildfire preparedness planning has been applied in one-on-one settings and provides clientele with increase awareness of the problem, knowledge about how to improve conditions, and a better understanding of their ability to mitigate fire risk.

The CTAHR sponsored Agriculture and Environmental Awareness Day continued to enjoy great popularity in FY2013 on the islands of Kauai, Oahu, and Maui. Participating fifth and sixth grade students explore issues such as food sustainability in Hawaii and globally, ecosystem protection, and bioenergy needs. With respect to job creation, they are introduced to a broad variety of agricultural and environmental career choices. For example, in March 2013 600 5th graders were hosted by the UH Cooperative Extension Service at the Pearl City Urban Garden Center, and presentations and educational

booths were extended to the public by hosting the event for two days, with 431 visitors on the Saturday after the event, coinciding with the monthly Second Saturday at the Garden program

Waste management and cleanup of environmental contaminants are serious issues in island ecosystems. In FY2013, researchers synthesized and characterized nano-scale photocatalysts to degrade synthetic chemicals and medical wastes such as endocrine disruptors in wastewater. Conversion of sewage sludge to biochar for soil amendment, and use of cellulosic wastes for biochar were also found to be highly useful processes, although both the source of the biochar and the characteristics of the soil have major impacts on the value of biochar applications for promotion of plant growth. Sewage sludge biochar in infertile soil increased plant biomass by nearly 300%, but applications to fertile soil had no significant impact on plant growth.

CTAHR faculty continued efforts to conserve Hawaii's resources and endangered biota, including research on the impacts of animals and human interactions on natural environments, evaluation of biological control efforts post-implementation, such as release of an herbivorous moth for fireweed control, and conservation of endangered native plants and insect species. The University of Hawaii Insect Museum (UHIM) supported by CTAHR increased their collection by 5,000 specimens, and museum staff participated in 25 events.

2. Brief description of the target audience

As intended by the Land Grant perspective, CTAHR's "targeted" clients for this program in teaching are the undergraduate and graduate students in agriculture, natural resource management, and allied fields. Targeted clients for research are peers and extension specialists. Clients for extension specialists are CTAHR's county extension agents and the counterpart professional personnel of sister state and federal agencies (such as the Hawai'i State Departments of Agriculture, Health, and Land and Natural Resources, and the USDA Natural Resources Conservation Service, NRCS). Clients for extension agents are land users and commodity producers and their organizations (such as the Hawai'i Association of Soil and Water Conservation Districts, Hawai'i Forestry Industry Association, and the Hawai'i Farm Bureau), extension staff in other CTAHR units and at sister institutions, and other members of the professional community who deal with managing land, soil and water resources especially in tropical agro-ecosystems. Interfacing with other professional and community groups who can provide new and useful knowledge to facilitate making decisions is an important expectation for effectively meeting its commitments.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	7873	138306	2141	10

2. Number of Patent Applications Submitted (Standard Research Output)
Patent Applications Submitted

Year: 2013
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	7	41	48

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Grant proposals submitted.

Year	Actual
2013	40

Output #2

Output Measure

- Presentations at international and national meetings.

Year	Actual
2013	40

Output #3

Output Measure

- Number of workshops and other educational activities held

Year	Actual
2013	58

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of people who actually adopt one or more recommended practices
2	Total dollar value of grants and contracts obtained.

Outcome #1

1. Outcome Measures

Number of people who actually adopt one or more recommended practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	90

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

All residents and visitors in the State of Hawaii enjoy the State's natural environment and will suffer should it not be sustained. Many residents also rely on the environment to support the tourism industry and provide employment for residents.

What has been done

Various stakeholders were educated about how to better manage Hawaii's open ranges, forest and urban landscapes using workshops, demonstrations, field days, websites, publications, and other outreach activities.

Results

Hawaii's watersheds and all the resource contained in these watersheds are more sustainable.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
125	Agroforestry
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife

205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
605	Natural Resource and Environmental Economics
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #2

1. Outcome Measures

Total dollar value of grants and contracts obtained.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1677582

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Protecting Hawaii's natural resources preserves the islands unique environments and native species, enhances the well-being of Hawaii residents, and promotes the main economic engine of the state, which is tourism.

What has been done

Forest conservation and restoration activities have taken place throughout the state, but particularly on the Big Island of Hawaii, where preservation and restoration of endangered native bird habitat has been enhanced by koa forest restoration. Invasive species control is being promoted by CTAHR faculty, particularly through collaboration with other agencies and private organizations. Soil and water conservation remain important activities statewide, along with animal waste management.

Results

Through a variety of research and extension programs, Hawaii residents and visitors are more aware of the environmental impacts of their activities. Many are increasingly adopting more

sustainable and environmentally responsible practices.

4. Associated Knowledge Areas

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102	Soil, Plant, Water, Nutrient Relationships
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V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Other (Quarantine procedures)

Brief Explanation

- Natural disasters such as hurricanes, typhoons, floods and fires are often destructive to natural resources such as reefs, water sheds, forests, indigenous species habitats, research plots or equipment.
- When the economy is poor, public and private funding decreases and is more difficult to obtain.

- Current and new quarantine and inspection procedures for imported materials affect the rate of new introductions of invasive species into the State

V(I). Planned Program (Evaluation Studies)

Evaluation Results

All projects conducted under this program were peer-reviewed before installation. Annual progress reports were collected and evaluated by the associate deans for research and extension. Funds are not released for those projects which did not show tangible progress.

Key Items of Evaluation

None.