



UNIVERSITY of HAWAI'I®
MAUI
COMMUNITY COLLEGE

New Degree Proposal

Associate in Science
Cultural and Natural Resource Management - Mālama Ahupua'a



Date of Proposal: February 2009
Proposed Date of Program Implementation: Fall 2009

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The Cultural and Natural Resource Management (CNRM) A.S. degree is an interdisciplinary course of study that combines Biological and Natural Sciences, Hawaiian Studies, Agriculture, Economics, Information Technology and Administration of Justice. The overall goal of the degree is to create a workforce of cultural and natural resource professionals that will expand the current efforts in the county of Maui and the state of Hawai'i to preserve and protect the Hawaiian culture and the unique natural ecosystems of Hawai'i. To meet this goal, faculty from various departments collaborated to devise a relevant curriculum. One fortunate outcome of this collaboration was the majority of the courses for the CNRM degree are already taught at Maui Community College.

The initial funding for the development of the CNRM degree was provided by a United States Department of Agriculture Cooperative State Research, Education, and Extension Service (USDA CSREES) grant entitled *Mālama Ahupua'a*. This core idea of mālama ahupua'a as a foundation for the Cultural and Natural Resource Management degree proposal is supported by the University of Hawai'i's Strategic Plan's Vision Statement:

“Ancient Hawai'i was organized in ahupua'a—land sections extending from mountain summits through fertile valleys to the outer edge of the reef and into the deep sea. The ahupua'a sustained the people, and the people revered and cared for the sacred source of their resources. The University of Hawai'i embraces the Native Hawaiian ethic of sharing, collaboration, and conservation. It is the basis of our vision. Working together for the betterment of all the diverse ethnic populations now a part of Hawai'i, the University of Hawai'i system will help ensure the survival and prosperity of Hawai'i's people and these beautiful islands for generations to come.”

The ahupua'a land sections and land use therein existed within a philosophical framework, as referenced in the vision statement, of Hawaiian's reverence and caring for the sacred source of their resources. The Hawaiian language used for those concepts is mālama 'āina; caring for the land. 'Āina (land) can be more clearly interpreted, from a cultural perspective, as “that which feeds and nourishes.” It is a compelling argument, in the 21st century, for the ethical and moral imperatives for creating a Cultural and Natural Resource Management degree.

1. OBJECTIVES OF THE DEGREE PROPOSAL:

The major objectives of the proposed Cultural and Natural Resource Management (CNRM) A.S. Degree are:

1. to provide a comprehensive curriculum to meet the requirements for entry-level training in areas, such as native habitat restoration; archaeological preservation; invasive species eradication; and cultural and natural resources conservation, maintenance, interpretation, and enforcement;
2. to promote traditional and new applied research technologies as essential elements in workforce training;
3. to combine traditional academic experiences with hands-on applications, problem-based learning, place-based learning, inquiry, and active learning experiences;
4. to utilize culturally-based education and traditional Native Hawaiian ways of knowing to supplement modern knowledge acquisition modalities;
5. to encourage students to practice their native Hawaiian language, culture, and traditions;
6. to develop authentic training programs for local underserved populations;
7. to support the State of Hawai'i, Department of Education (DOE) career pathway in Natural Resources by creating an academic bridge to the University of Hawaii Natural Resource and Environmental Management Program (NREM);
8. to prepare students for Science, Technology, Engineering, and Mathematics (STEM) professions;
9. to provide in-service and retraining educational opportunities for personnel currently in the field, such as Department of Land and Natural Resources Division of Conservation and Resources Enforcement (DLNR/DOCARE) officers and other non-profit and governmental agency resource managers; and
10. to provide a strong grounding in general education.

2. RELATIONSHIP OF OBJECTIVES TO APPROPRIATE FUNCTIONS OF THE MAUI COMMUNITY COLLEGE AND UNIVERSITY:

The Maui Community College's Strategic Plan Goals and Objectives include:

Goal 2

A Learning, Applied Research, and Service Network

Engage in intellectual and educational activities that enable the County of Maui and the State of Hawai'i to flourish.

Objective 1

Support the county and state economy, workforce development, and improved access to lifetime education for all by building partnerships within the UH University system and with other public and private educational, governmental, and business institutions.

- Fourteen Departments of County, State, and Federal Government Agencies as well as Private, Profit, and Non-profit Organizations have expressed commitment to participate with the College in this endeavor. Service learning opportunities,

active lab experiences, providing guest lecturers, encouragement for training for employees and interest in hiring graduates are some of the ways these groups plan to participate.

- A summer enrichment program using a new course, AJ 240 Hawaiian Cultural and Natural Resource Management, was initiated in Summer 2008. This program was developed to provide knowledge of cultural resource management for DLNR/DOCARE officers. Nine officers as well as eleven other community members participated. There was 100% retention rate and a very positive response to this training. See Appendix A; exit survey.
- The Career and Technical Education (CTE) programs in the Hawaii Department of Education (DOE) have been grouped into six career pathways. One of the six pathways is Natural Resources. All students in this pathway take a core course as a freshman or sophomore then may go into agriculture courses or general sciences. This A.S. degree ties directly to the DOE Career pathways initiative and provides an additional educational pathway for high school graduates interested in conservation careers. Other recent high school graduates who participated in ecology clubs or Hawaiian culture clubs may also be interested in the CNRM degree. See Appendix B for the Natural Resources Career Pathway occupational clusters and occupational examples.
- This degree could be offered at the Maui Community College outreach sites, particularly Molokai, which has the advantage of already having the agriculture program with facilities in place.
- UH-Manoa CTAHR (NREM: Natural Resources and Environmental Management degree) and UH- Hilo (Agroecology and Environmental Quality, Environmental Studies) have related degrees for those students who are able to transfer to these other islands and who are ready to pursue a Baccalaureate degree. There is also the potential to develop partnerships with other institutions to provide Baccalaureate degrees via distance delivery to service place-bound students.
- This degree could also lead some students to become interested in a Hawaiian studies Baccalaureate degree which they can get from UH-Manoa, UH-Hilo or through the Maui Community College UH Center.
- The State of Hawaii has demonstrated great interest in “green” initiatives and increasing sustainability in the islands. Both natural resources and our cultural heritage are the lynchpins for the State’s economy. There is increased support from government and industry to expand and improve education in Science, Technology, Engineering and Math (STEM). Education in cultural and resource management dovetail these current economic and industrial trends. This degree can be a bridge for STEM education and employment for recent high school

graduates and also provide workforce development to those already employed in related fields.

Goal 3

A Model Local, Regional, and Global College

Transform the profile of the College, positioning it as one of the world's foremost multicultural centers for island and indigenous studies.

Objective 2

Strengthen the crucial role that the College performs for the indigenous people and general population of Maui County by actively preserving and perpetuating Hawaiian culture, language, and values.

- Unlike a more typical resource management degree that stresses only science, economics and legalities, this degree incorporates several classes to provide an appropriate background in Hawaiian history, language and values (HWST 107, HWST 100BCD, HWST 207, BOT 105). By exposing students to several different areas of Hawaiian studies, this degree should increase respect and knowledge of Hawaiian culture and values. By incorporating Hawaiian studies within a STEM based degree, we believe value is provided to both Hawaiian studies and science courses as students will learn to view issues and management practices from an island-based perspective.
- Students and graduates will be directly involved in preserving natural and cultural resources which are vital to the preservation and perpetuation of Hawaiian culture.

3. NEEDS ASSESSMENT:

The development of an A.S. Degree supports the State Department of Education (DOE) Career Pathway in Natural Resources. Career Pathways serve to guide career exploration and planning activities, to focus teaching and learning, and to link education with relevant real-world experiential activities. The A.S. Degree would also bridge an existing gap and provide a good foundational preparation for the baccalaureate programs in Natural Resources and Environmental Management (NREM) at UH-Manoa and UH-Hilo.

In 2004, Maui Community College was awarded a Tribal College Undergraduate Program (TCUP) grant to be used to implement an institution-wide effort to restructure and strengthen introductory STEM courses with an emphasis on Native Hawaiian student performance and retention. The CNRM A.S. Degree will allow Maui Community College students to play an integral role applying science, technology, engineering, and math to address research questions and utilize experiential education. This project will allow MCC students to engage in a multidisciplinary effort researching both the pre-historic and historic land use of ahupua'a throughout Maui, building on preexisting data

such as archaeological, cultural, demographic, environmental, ethno-botanical, ethno-historical; and to generate new data where none exists.

The College's partnership with the Hawai'i State Department of Land & Natural Resources, Division of Conservation & Enforcement will lead to opportunities in the field of natural resources enforcement. Within the proposed A.S. Degree, a cooperative agreement with the Maui Branch of the State of Hawai'i Department of Land & Natural Resources will prepare students for joining the workforce. Several non-governmental organizations, which have provided MCC students with opportunities for Service-Learning and internships, will benefit from involvement with this program. These organizations include: Maui Nui Botanical Garden, Maui Invasive Species Committee (MISC), The Nature Conservancy, Haleakala National Park, Maui Coastal Land Trust, and East Maui Watershed Partnership. Other career fields and specific agencies that could benefit from graduates with this A.S. Degree include:

- fire fighters and specialists in fire prevention and safety;
- hydrology technicians (USGS);
- archaeologists (State and private companies);
- regional planners e.g., ensuring that large scale destruction of sites, plants, view planes, and natural resources such as sand are reduced when developments are planned or approved (County)
- technicians with public works and environmental management departments and advisory agencies (County, State e.g. UH-Manoa CTHAR Agricultural Extension Service, and Federal e.g. USGS Pacific Bioinformation Node);
- nursery owners and technicians;
- landscape architects and designers;
- planners and technicians for transportation projects and highway improvements (County, State DOT);
- agriculture inspectors at airports and harbors (Federal Department of Agriculture);
- planners for research and development agencies (Tri-Isle Research & Development);
- developers for private large-scale projects (ML&P, West Maui Partners) and small-scale family subdivisions; and
- GIS technicians (County Department of Water Supply, State)

Industry representatives and cultural practitioners were invited to provide input regarding this degree on February 5, 2009. When asked the question "*Do you think there is a need for an AS degree in Cultural & Natural Resource Management in Maui County?*" 93% of participants answered: "Yes". When asked the question "*Overall, the curriculum listed in this proposed degree would properly prepare students to enter the Natural Resource work force?*" 74% responded with strongly agree or agree. Since the meeting, curriculum adjustments were made based on input of the participants. For instance, basic Hawaiian language skills were identified as being important. Therefore, HWST 100BCD became required for all program majors to provide language instruction on a level related to culture and natural features. In addition HAW 101 and 102 were added as electives in the Cultural and Natural Resource Enforcement speciality. Oral

communication skills were deemed essential by our industry representatives so SP 151 or COM 130 are required rather than other personal communication courses. The turning point presentation and results can be reviewed in Appendix C.

This is an emerging field; therefore, no single traditional career identification is available. However, jobs related to these concentrations are anticipated as the environmental landscape changes. EMSI data for Maui County presented illustrates job categories that require some training up to an associate's degree. Although demand for any particular job is low, there is a regular need for replacement personnel.

Description – Maui County	2006 jobs	2017 jobs	New Jobs	Replacement jobs	Median EPW	Annual EPW
Forest and conservation workers	9	9	0	3	-	-
Forest and Conservation technicians	9	9	0	3	-	-
Natural Sciences Managers	29	32	3	6	\$38.92	\$80,945
Fish and Game Wardens	9	9	0	3	-	-
Environmental science and protection technicians	16	17	1	4	\$14.93	\$31,055
Surveying and Mapping Technicians	40	44	4	16	\$11.74	\$24,428
Supervisors, farming, fishing, and forestry workers	22	20	-2	5	\$12.08	\$25,124
Agriculture Inspectors	9	9	0	3		

Note that many jobs appropriate for CNRM graduates do not show up in these types of surveys. For example, one area that is particularly hard to quantify is ecotourism. A reasonable expectation is that a number of graduates will become involved in this expanding area of Hawaii's largest industry.

The Occupational Information Network (O-NET) website that compiles U.S. Department of Labor Statistics provides a picture of the National job market. Examples of job categories include Environmental Engineering Technicians with an annual median wage of \$40,690 and a projected need (2006-2016) of 9,000 additional employees; Forest and Conservation Technicians with an annual median salary of \$33,520 and a projected

need of 13,000 additional employees; and Forest and Conservation workers with an annual median salary of \$20,510 and a projected need of 9,000 additional employees. Occupational statistics for these job categories and others that may pertain to graduates can be viewed in Appendix D.

To provide a snapshot of potential employment opportunities for graduates of CNRM in Hawaii, job postings from February and March 2009 at the Hawaii Ecosystems at Risk Website (www.hear.org) were examined. Several positions appropriate for graduates or students were identified. The identified employment opportunities included seven vacancies at Haleakala National Park for Biological Science Technicians (plants) at the GS-4 level which requires a two year degree. The annual salary for these positions was \$24,156-\$33,477 plus COLA. The Hawaiian Islands Humpback Whale National Marine Sanctuary in Kihei had a posting for a Full time Volunteer & Outreach coordinator with a minimum qualification of associate's degree and appropriate experience and had a base salary of \$2,320 per month. A job opening with the Kohala Watershed Partnership for a Field Crew Member had a requirement of "Knowledge of Hawaiian culture, ecology, plants, forests, streams, and birds". One posting to work with a Utah State University researcher needed two Seasonal Field Technicians for invasive frog/mammal control that required "a formal background in biological sciences or related fields". This type of entry level or temporary position provides excellent opportunities for students and graduates to enter the workforce within the resource management field. The experience gained and the networking provided will afford those employed in such jobs increased ability to seek higher level positions in the future. The job examples highlighted as well as other postings of February and March 2009 job descriptions can be viewed in Appendix E. A binder with job openings appropriate for students and graduates made during from January to August 2008 can be made available upon request for additional ideas of job types, job descriptions, and minimum requirements.

A survey monkey was conducted amongst industry representatives located on Maui about the number of jobs that may become available and the attractiveness of employees having this degree. 78.9% of respondents indicated that a two year Associates Degree would provide adequate training for jobs in their areas. Due to the poor current economy, there is decreased demand for employees in the conservation fields at this time. However, when posed the question ; *Do you believe the addition of an Associates in Science degree in Cultural and Natural Resource Management at Maui Community College has merit; regardless of the amount of current job openings?* 89.5% of respondents answered YES. The written comments from this same question indicate strong support for developing a local, home-grown skilled work force to fill conservation jobs located in Maui County and the State. A sampling of the comments to this question follows:

*"Need to develop local pool of applicants that also have practical experience."
"...it would make them better prepared to work in Hawai'i...."
..."We need competitive applicants who come from Maui!"*

"It has been a long standing issue that more local people are needed to fill vacancies in the conservation field. In order to do that, they need to have the experience and education to qualify them to compete."

"Would supply necessary skills for an entry level position or open doors for a higher degree".

"Excellent core of classes for all people who want to contribute to the future of Hawaii nei".

Results of this survey and all comments are included in Appendix F.

4. CURRICULUM:

Proposed Degree Requirements

Associate in Science (A.S.) Degree in Cultural and Natural Resource Management Requirements (**64-66** credits)

The Cultural and Natural Resource Management Associate in Science (AS) Degree is a two-year degree consisting of at least 64 credits at the 100 or above level. This certification provides students with skills and competencies for gainful employment.

Students applying for the credential may fulfill the Maui Community College General Education requirements by completing the courses in sections 1.a. - 1.c.

1. General Education (22 credits)

a. Quantative Reasoning (3 credits)

- MATH 100: Survey of Mathematics (3) or
- MATH 103: College Algebra (3) or
- MATH 115: Statistics (3) or higher

b. English/Communication (6 credits)

- ENG 100: Composition I (3), and
- SP 151: Personal & Public Speech (3), or
Communications130/Business Communications 130 (3)

c. Elective credits (13 credits)

At least one course from Humanities, Natural Science, and Social Science. Applicable courses may be chosen from the following:

Humanities (3 credits)

- HWST107: Hawai`i: Center of the Pacific (3)

Natural Science (4 credits)

- AG 200: Principles of Horticulture (4)

Social Sciences (3 credits)

- HWST 211/BOT 105: Hawaiian Ethno-botany (3)

Information & Computer Sciences (3 credits)

- ICS 101: Digital Tools for the Information World or
BUSN 150: Introduction to Business Computing (3)

2. Natural Resource Requirement: All Specialties (23 credits)

a. HWST – Culture & Native Knowledge (6 credits)

- HWST 100 B: Intro to Hawaiian Culture: Communication – Basic Language & Phrases (1)
HWST 100 C: Intro to Hawaiian Culture: Worldwide – Values, Folklore, & Cultural Practices (1)
HWST 100 D: Intro to Hawaiian Culture: Landscape – Historical Events, Physical Features, & Unique Flora & Fauna of Maui & Hawaii (1) and
- HWST 207: Mālama Ahupua`a (3)

b. Economic Principles & the Environment (3 credits)

- ECON 120 Introduction to Economics, or
ECON 130: Principles of Economics: Microeconomics (3)

c. Ecosystems (3 credits)

- BIOL 124: Environment & Ecology (3)

d. Mapping Skills, GIS, Land Use Studies (4 credits)

- GIS 150/ICS 150: Introduction to GIS/GPS (4)

e. Entrepreneurship (3 credits)

- AG 230: Agricultural Business Management (3)

f. Native Hawaiian Knowledge & Natural Science (4 credits)

- BIOL 105: Hawaiian Field Biology (4)

3. Specialties (19-21credits)

The remainder of the credits for the Mālama Ahupua`a A.S. Degree may be completed in one of the following three specialties. Courses may be selected from those listed, if not taken to satisfy General Education or Cultural & Natural Resources Requirements.

a. Cultural & Natural Resource Enforcement (Kia'i Studies)

(13 credits)

- AJ 240: Hawaiian Cultural & Natural Resources Management (3)
- AJ 223: Laws of Arrest, Search, & Seizure (3) or
AJ 200: Principles of the Hawai'i Justice System (3)

- POL 180: Introduction to Hawaiian Politics (3)
- ANTH 210: Archaeology (3)
- ANTH 210L: Archaeology Laboratory (1)

{6-8 credits (2 courses)} - electives from the following list:

- AJ 224: Rules of Evidence (3)
- AJ 103: Criminal Investigation (3)
- AJ 221: Criminal Law (3)
- HAW 101: Elementary Hawaiian (4)
- HAW 102: Elementary Hawaiian (4)

b. Ethnobotany & Food Security (Māla Studies)

(11 credits)

- AG 122: Soils Technology (3)
- AG 265: Horticulture of Hawaiian Plants (4)
- AG 253 : Hawaiian Food Plants – Traditional and Contemporary Production Practices (4)

{9-10 credits (3 courses)} - electives from the following list:

- AG 174: Insects and Their Control (3)
- AG 235: Irrigation Principles & Design (3)
- AG 251: Sustainable Crop Production (4)
- AG 281: Weed Science (3)
- HWST 213: Hawaiian Ethno-zoology (3)

c. Natural Resource Management (Mālama `Aina Studies)

(6 credits) – Alien Species

- AG 174: Insects & Their Control (3)
- AG 281: Weed Science (3)

(10-11 credits) - Ecosystem management

- AG 265: Horticulture of Hawaiian Plants (4)
- AG 122: Soils Technology (3)
- OCN 201: Science of the Sea (3) or
ZOOL 200: Marine Biology (4)

{3-4 credits (1 course)} - electives from the following list:

- Administration of Justice 240: Hawaiian Cultural & Natural Resource Management (3)
- Biology 200: Coral Reefs (4)
- Agriculture 201: Introduction to Plant Disease

5. ENROLLMENT PROJECTIONS:

In Fall 2009, the program will commence with 12 students, gradually increasing to 26 in 2011. The expectation is that approximately 8-11 students would graduate annually after the program commenced and had completed its first two-year cycle.

6. RESOURCES REQUIRED FOR PROGRAM IMPLEMENTATION:

a. No additional full time faculty will be needed to cover the courses required by this degree. Recently three new tenure-track faculty members were hired to teach Hawaiian language and Hawaiian Studies courses. No new faculty members will be needed to cover the General Education, Agriculture, or Administration of Justice course offerings. Part time lecturers to fill behind full time faculty may be necessary on occasion. Part time lecturers with particular expertise may also teach certain courses. For example GIS 150 is currently being taught by Derek Masaki who is employed by U.S. Geological Survey (USGS) Pacific Basin Information Node (PBIN). The PBIN office is housed on the Maui Community College campus and is able to offer expertise to the CNRM program. BIOL 105, Hawaiian Field Biology, has been covered by Art Medeiros, a research biologist for USGS and coordinator of the Leeward Haleakala Watershed Restoration Partnership. These partnerships with agencies and experts in particular disciplines will strengthen the CNRM program. Money has been budgeted to cover lecturer expenses.

b. Library resources – New library and media resources are anticipated. Costs will be covered by the USDA CSREES grant.

c. Physical resources – Since the courses required for the CNRM degree are already being taught at Maui Community College, the physical resources necessary are already present. The Agriculture building has a laboratory classroom as well as a greenhouse and a field for hands-on learning. In addition, the faculty of the College will have use of a modern two-room building adjacent to the Palaua Cultural Preserve that will serve as classroom and laboratory space. Besides classes taught on the Maui Community College campus, laboratory and excursions can be conducted at botanical gardens, agricultural facilities, and field research sites around the County of Maui.

d. A grant program coordinator position is covered under a USDA CSREES grant whose job description includes, but is not limited to, recruitment, retention, and data collection.

e. Money has been budgeted for advertising and marketing. Potential CNRM majors would include high school juniors, seniors, recent high school graduates, and students already enrolled in Maui Community College; who have participated in the Natural Resources career pathway; students with an aptitude in biological sciences; students attracted to ecology and sustainability; and students interested in Hawaiian studies. People already employed in agriculture, enforcement, and natural resources management areas that need additional training would benefit from the CNRM degree. Other non-traditional students will be those who want to change careers and are

attracted to a green career, people who enjoy working outside, and those with a propensity for preservation of Hawaiian culture and resources. Thus, marketing will need to be tailored for these various target groups to build awareness of a new CNRM degree.

Mini Cost Review Template

ENTER VALUES IN HIGHLIGHTED CELLS ONLY					
YEAR	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
PROGRAM COSTS					
Faculty w/o fringe*	22,770	23,681	24,628	32,443	33,741
Other personnel costs w/o fringe	46,080	62,743	62,253	67,836	70,578
Library	5,000	5,000	5,000	5,000	5,000
Equipment/Supplies	39,500	43,500	53,500	54,500	45,500
Other	10,600	3,800	10,600	3,800	10,800
TOTAL Expenses	123,950	138,724	158,981	163,606	165,619
REVENUES					
Projected Enrollment	12	22	26	28	29
No. of Courses	7	16	16	16	16
No. of Credits	23	52	52	52	52
SSH	276	554	664	716	745
Tuition Rate/Credit	79	88	97	97	97
Total Revenue from Tuition	21,804	48,752	64,408	69,452	72,265
Other Sources of Income – USDA CSREES grant	108,000	108,000	108,000	108,000	108,000
TOTAL Revenues	129,804	156,752	172,408	177,452	180,265

*Faculty w/o fringe: This reflects the cost of part time lecturers only (15 credits FY2010-2012; 19 credits FY2013-2014). No new full time faculty will need to be hired to implement this degree.

f. The budget indicates that the CNRM degree can sustain itself as it brings in more revenue than expenditures. Money budgeted for equipment and supplies represent a high level of support for this type of degree. This investment in equipment and supplies for the CNRM program will benefit other programs and the students in other majors who would also be taking the courses required by the CNRM degree. It is anticipated that the USDA CSREES grant will continue through 2015. However, if this money becomes unavailable, the initial capitalization of software and equipment would still make offering the degree possible. Supply money and lecturer funds would be the most important long term costs. These costs will be covered by tuition. See Appendix G for full cost review template and a discussion of line items.

7. MEASURES OF PROGRAM EFFICIENCY:

Program health will be examined as part of the annual and 5-year comprehensive program review process. Maui Community College's program review process involves

continuous and systematic evaluation of all programs and serves to support and guide programs in the process of continuous improvement. The reviews will follow the Maui Community College's Self-Study Guide for Annual Assessment and Comprehensive Program reviews. The first projected annual review would be completed in Fall 2010 and the comprehensive review in Fall 2015. Program demand will be based on the number of majors to annual new/replacement positions. Program efficiency will be measured by (a) class fill rate and (b) student to faculty ratio.

8. MEASURES OF PROGRAM EFFECTIVENESS

The effectiveness of the CNRM program will be demonstrated through the program review process and assessment of course and learner outcomes. Program effectiveness will be measured by (a) degrees earned in relationship to the number of majors, (b) degrees earned in relationship to annual/new replacement positions, and (c) persistence from fall to spring. Program outcomes will be measured by (a) student evaluations, (b) course completion rate and (c) assessment of Program Learner Outcomes (PLO's). The PLO's and assessment grids are included in Appendix I. In addition, Maui Community College has general education learner outcomes (CCOWIQ's) for all graduates. CNRM assessment grids of the CCOWIQ's for the CNRM courses are in Appendix J.

Assessment of learning is a continuous process with the goal of improving student learning. Assessment builds a process to evaluate student-learning objectives (what students are expected to learn) compared to student learner outcomes (what was actually learned). Students will be assessed as they progress through each course to provide formative assessment. Courses such as AG 200, AG 230, BOT 105, and GIS 150 have major student projects which will be used for summative assessments to ensure that students have mastered the PLO's and CCOWIQ's by graduation with an A.S. The Grant Objectives Coordinator (GOC) for the *Mālama Ahupua'a* grant will assist the Program Coordinator, STEM Division Chair and Vice Chancellor in gathering data required for the program review. The GOC will track students' progress, collect appropriate data and assist in coordinating industry participation in the program. In addition, the Program Learner Outcomes for the program will be reviewed and validated by industry representatives on an annual basis to ensure that the learner outcomes remain relevant to the current workforce skill requirements.

9. APPENDICIES

Appendix A:

Exit Survey of AJ 240 Summer Enrichment Program 2008

Appendix B:

Hawaii Department of Education Career Pathways and Natural Resources Career Pathways Framework.

Appendix C:

Industry representative meeting on Feb 5th, 2009 - Turning point presentation: Advisory

Committee Meeting 02/05/09

Appendix D:
O-NET SOC Career Data

Appendix E:
February and March job postings from HEAR website

Appendix F:
Survey Monkey results 04/03/09

Appendix G:
Academic Cost and Revenue Template – CRNM Budget

Appendix H:
CNRM Sequence Map

Appendix I:
CNRM Program Learning Outcomes

Appendix J:
CNRM CCOWIQs - Learning Outcomes

Additional Materials (hard copy):

Binder with job descriptions collected Spring & Summer 2008 - Located in Kalama 123;

Tracie Takatani; phone # 984-3424; E-mail: ahupuuaa@hawaii.edu;

Website: <http://maui.hawaii.edu/inside/malama/>

APPENDIX A

MĀLAMA



AHUPUĀĀ

EXIT SURVEY

AJ 240: CULTURAL AND NATURAL RESOURCE MANAGEMENT

SUMMER ENRICHMENT PROGRAM 2008

SUMMER 2008 ENRICHMENT PROGRAM

A PARTNERSHIP WITH THE STATE OF HAWAII DEPARTMENT OF LAND AND
NATURAL RESOURCES – ENFORCEMENT DIVISION



THE ISLAND OF MAUI HAS MANY UNRECOGNIZED AND UNDOCUMENTED HAWAIIAN CULTURAL SITES. THROUGH INCREASED AWARENESS, AJ 240 (HAWAIIAN CULTURAL & NATURAL RESOURCE MANAGEMENT) HOPES TO PRESERVE WHAT REMAINS OF OUR ISLAND'S HISTORY.



AJ 240 – HAWAIIAN CULTURAL & NATURAL RESOURCE MANAGEMENT

Provides a background for on-site management of Native Hawaiian cultural and natural resources. Relates traditional Native Hawaiian resource conservation practices to current governmental policies, rules, and regulations. Introduces duties and responsibilities of conservation and resource enforcement officers.

CLASS OUTLINE:

WEEK 1 (JULY 1, 2008) – Intro / Recognizing significant sites [Ryan Daniels & Randy Awo]

WEEK 2 (JULY 8, 2008) – GPS / GIS training [Derek Masaki - USGS]

LAB #1 (JULY 12TH) – Iao Valley [Kawewehi Pundyke]

WEEK 3 (JULY 15TH) – Aha Moku Councils / Native plants [Timmy Bailey, Les Kuloloio, Ann Emmsley]

WEEK 4 (JULY 22ND) – Burial Sites / Petroglyphs [Scott Fisher & Melissa Kirkendall]

LAB #2 (JULY 26TH) – Maui Coastal Land Trust (Waihe'e)

WEEK 5 (JULY 29TH) – Religious Sites / Specialized worship (shrines) [Kaleikoa Ka'eo]

WEEK 6 (AUGUST 5TH) – Wahi pana (mo'olelo) / Land ownership / Legal issues in Hawaii'i [Kahele Dukelow]

LAB #3 (AUGUST 9TH) – Pellegrino's Place in Waikapu

WEEK 7 (AUGUST 12TH) – Final Presentations

General Course Objectives:

To prepare students for a career in cultural and natural environmental enforcement and resources management.

Please contact Tracie Takatani for more information at ahupuaa@hawaii.edu

- * The hands on practical exercises and the application and integration of learned skills to those practical exercise.
- * The GPS course helps to add an additional tool towards our job. I also enjoyed each guest speaker. You can feel their passion towards their Hawaiian heritage and resource protection.
- * I learned a lot about my culture and the way things ran, could run, and maybe alternate ways to help my people.
- * It really opened my eyes to some of the issues we are faced with today. Thank you for bringing in great speakers and I also enjoyed the labs.
- * Great staff and great curriculum! Thank you.
- * The diversity of the great guest speakers. I though it was a good way to present the Aha Moku concept in the classroom atmosphere.
- * I like the fact that we had these speakers to teach us all these opportunities. I never knew about all these things before. I also like the field labs, and being part of the class with our fellow classmates and all the DLNR people.
- * The variety of subjects and the presenters.
- * The hands on work was excellent. Out door fieldtrips, very interesting. Having the specific guest speakers were great.
- * All the topics covered were interesting and the field labs were very educational. It was interesting to see the passion in all of the guest speakers and they introduced different perspectives on the way some things are viewed. The GIS/GPS was a great twist in using modern technology to help protect ancient resources.
- * I enjoyed the lab and guest speakers. The whole class and assignments, projects was an eye opening experience for me.
- * I like the portions covering the native plants verses invasive species one as what becomes and what hurts.
- * Everything was good. I like the guest speakers and the instructors.
- * Providing DOCARE an opportunity to provide input in shaping course curriculum; ability to share as well as learn from other students within a classroom; learning from good instuctors that provide valuables and relevant info; class labs were excellent!
- * The guest speakers were great and the teacher (Mr. Ryan Daniels) was very organized and very clear with instuctions and speaking to the class.
- * The thing that I really liked about his class was that I got to meet new people and learn how to us a GPS system. I also learned about my 'aina and also how to take care of it.

2. Please state ways we can improve this class and list other topics you would suggest covering.

- * More field type exercises and the inclusion of Kumu Charles Ka'ai as a lecturer on ancient gathering rights and penalties levied.
- * Extend the course with more field trips around Maui. It all ended too soon!!!
- * I think if there was more time, going to Kaho'olawe, going to Hana to see the "blue ponds" project. Presenting other projects that impact our resources as well as exploring ideas of the old ways that have been adapted to our current lifestyle. Mahalo Nui 'oukou for your kokua.
- * Maybe having opportunities of going to places that none of us been to. Have a day out and learn what our DNLR dudes do. And it's too bad it was only one day.
- * To make the entire course longer, more information with the same class work and structure. Really enjoyed the class.

* Spend more time in remote places like behind the mountain. Go out to other sites.

* So far so good.

APPENDIX B



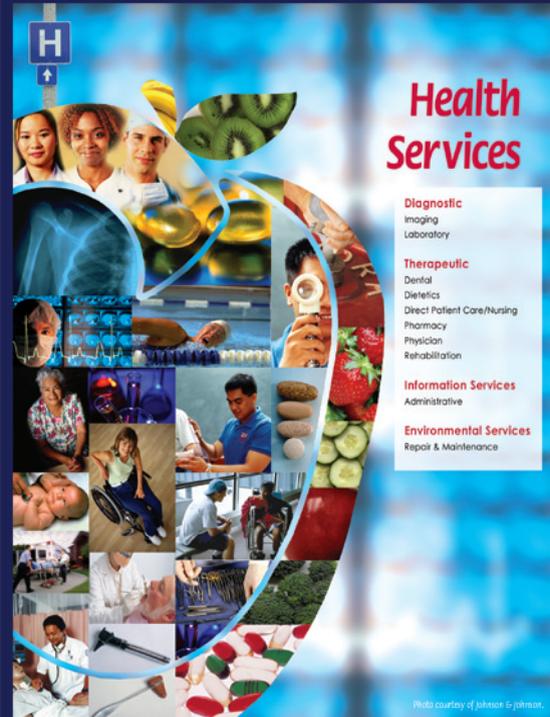
HAWAII DEPARTMENT OF EDUCATION

CAREER PATHWAYS

AND NATURAL RESOURCES CAREER PATHWAYS FRAMEWORK

Hawai'i's Career Pathway System

Office of the State Director for Career and Technical Education  The University of Hawai'i

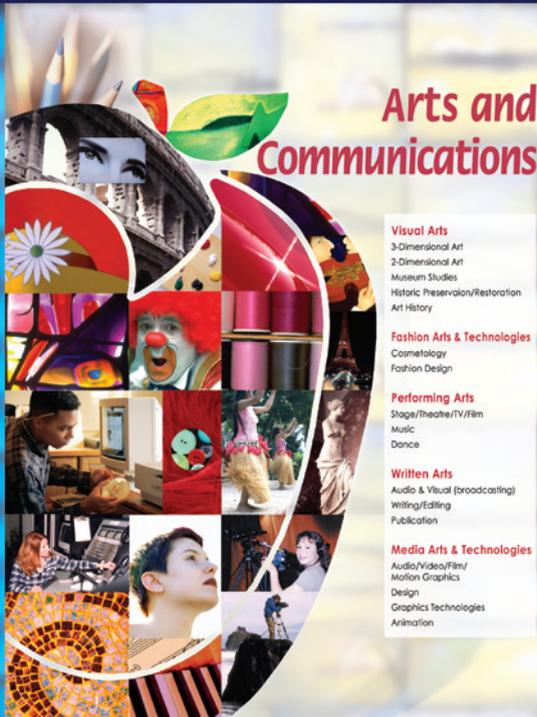


H

Health Services

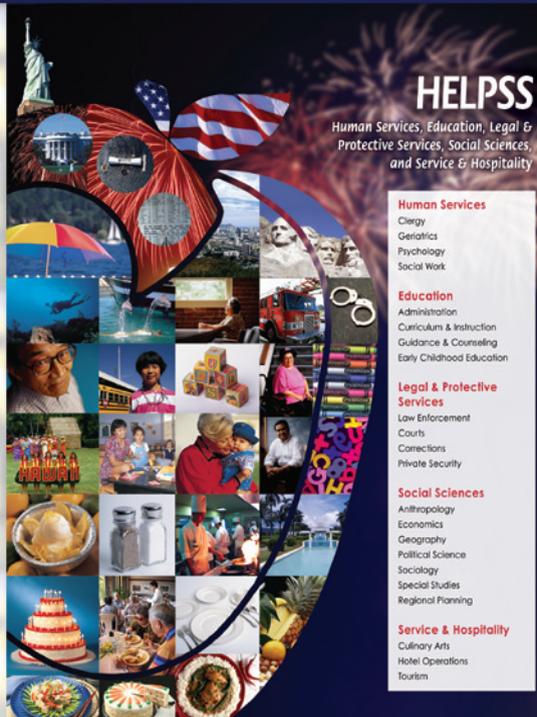
- Diagnostic**
 - Imaging
 - Laboratory
- Therapeutic**
 - Dental
 - Dietetics
 - Direct Patient Care/Nursing
 - Pharmacy
 - Physician
 - Rehabilitation
- Information Services**
 - Administrative
- Environmental Services**
 - Repair & Maintenance

Media courtesy of Johnson & Johnson.



Arts and Communications

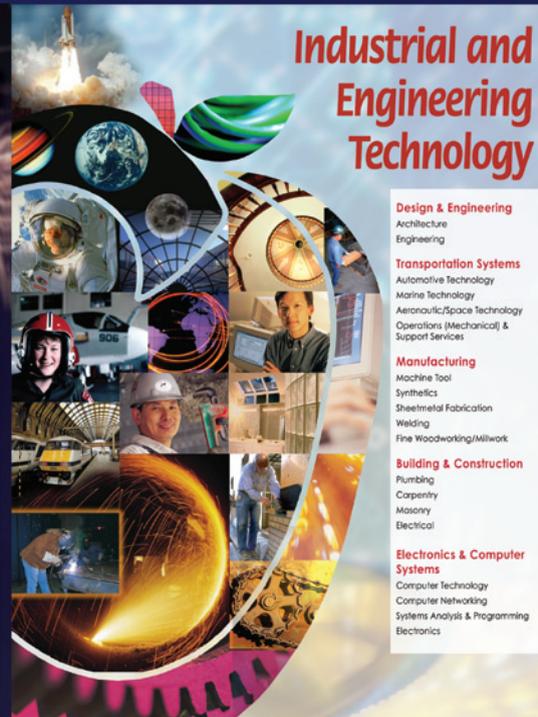
- Visual Arts**
 - 3-Dimensional Art
 - 2-Dimensional Art
 - Museum Studies
 - Historic Preservation/Restoration
 - Art History
- Fashion Arts & Technologies**
 - Cosmetology
 - Fashion Design
- Performing Arts**
 - Stage/Theatre/Film
 - Music
 - Dance
- Written Arts**
 - Audio & Visual (broadcasting)
 - Writing/Editing
 - Publication
- Media Arts & Technologies**
 - Audio/Video/Film
 - Motion Graphics
 - Design
 - Graphics Technologies
 - Animation



HELPSS

Human Services, Education, Legal & Protective Services, Social Sciences, and Service & Hospitality

- Human Services**
 - Clergy
 - Geriatrics
 - Psychology
 - Social Work
- Education**
 - Administration
 - Curriculum & Instruction
 - Guidance & Counseling
 - Early Childhood Education
- Legal & Protective Services**
 - Law Enforcement
 - Courts
 - Corrections
 - Private Security
- Social Sciences**
 - Anthropology
 - Economics
 - Geography
 - Political Science
 - Sociology
 - Special Studies
 - Regional Planning
- Service & Hospitality**
 - Culinary Arts
 - Hotel Operations
 - Tourism



Industrial and Engineering Technology

- Design & Engineering**
 - Architecture
 - Engineering
 - Ecotourism
- Transportation Systems**
 - Automotive Technology
 - Marine Technology
 - Aeronautic/Space Technology
 - Operations (Mechanical) & Support Services
- Manufacturing**
 - Machine Tool
 - Synthetics
 - Sheetmetal Fabrication
 - Welding
 - Fine Woodworking/Millwork
- Building & Construction**
 - Plumbing
 - Carpentry
 - Masonry
 - Electrical
- Electronics & Computer Systems**
 - Computer Technology
 - Computer Networking
 - Systems Analysis & Programming
 - Electronics



Natural Resources

- Cultural/Recreation**
 - Parks & Recreation
 - Auditing
 - Taxes
- Environmental Quality**
 - Air & Water Quality
 - Energy
 - Waste Management
- Policy & Planning**
 - Environmental Assessment
 - Urban/Regional Planning
 - Environmental Law
 - Community Relations
- Agriculture/Aquaculture**
 - Plant Science
 - Biotechnology
 - Animal Science
- Forestry**
 - Forest Industry
 - Agroforestry
- Conservation & Management**
 - Ecosystem Management
 - Marine Science
 - Fisheries
 - Invasive Species
- Atmospheric & Space Science**
 - Astronomy
 - Meteorology/Climatology
- Earth Sciences**
 - Soil Science
 - Geology
 - Hydrology
- Coastal & Marine Science**
 - Oceanography
 - Coastal Management



Business, Management, and Technology

- Accounting**
 - Auditing
 - Taxes
- Finance**
 - Banking
 - Personal Financial Planning
 - Securities/Investment
- Management**
 - Event/Conference Planning
 - General Management
 - Human Resource Management
 - Tour Industry Management
 - Entrepreneurship
- Management Information Systems**
 - Hardware Administration
 - Network Administration
 - System Administration
 - Systems Analysis/Programming
- Marketing**
 - Advertising
 - Distribution
 - Marketing Research
 - Product/Brand Management
 - Public Relations
 - Retail Merchandising
 - Sales
- Office Administration & Technology**
 - Information Processing
 - Records & Information Management

Which pathway is right for you?

COMMON FOCUS

CAREER PATHWAYS PROVIDE A FRAMEWORK FOR COMMON FOCUS AND LINKAGES FOR K-16 EDUCATION.

- A systematic approach to career development that extends from kindergarten to life-long learning and involves career awareness, exploration and preparation.
- A major impetus for education reform, helping change education K-16 and how students plan their future.
- A framework in which learning communities can be organized.
- A focus for integrating academic and occupational learning so that knowledge and applicability are reinforced.
- The Career Pathways framework can be applied to all levels of education allowing educators and students to view education as a continuum.
- Student exposure to the widest range of occupations, including nontraditional options for males and females.

CAREER PATHWAYS

REAL-WORLD RELEVANCE



Improved Student Achievement

CAREER PATHWAYS PROMOTE REAL-WORLD RELEVANCE FOR ALL STUDENTS IN ALL K-16 CLASSROOMS.

- Builds a coherent sequence of courses and focus that prepares students for a first job or for additional education or training.
- Integrated instruction and assessments that teach concepts in real-world settings.
- Guides students through the exploration of careers requiring different levels of education and training but grouped together because the people in them share similar interests, talents, and abilities.
- Exploring Career Pathways provides students with focus for making course selections and career decisions.
- Moves from broad-based exploration and preparation so that students are prepared for a rapidly changing society and business world.
- Emphasizes flexibility so individuals have a field of skills and an educational foundation that will enable them to adapt rapidly to occupational and societal changes.



SEAMLESS TRANSITION

CAREER PATHWAYS ENSURE SEAMLESS TRANSITION THROUGH ALL LEVELS OF THE K-16 EDUCATION SYSTEM.

- Establishes strong linkages among elementary, secondary, and postsecondary institutions and businesses. The business partnership ensures that classroom learning is relevant and that students receive a solid foundation in academic and occupational skills.
- Business and industry validated skill standards provide a foundation for Career Pathways. Standards-based curriculum imbedded within the Pathways facilitates a smooth transition between institutional and occupational opportunities.
- Aligns assessment across all levels of education through the use of state-wide business and industry validated skill standards.
- Facilitates educational transitions for special needs students, including English as a second language learners, single parents, low income, nontraditional and those with disabilities.

The Career Pathways Promise

Career Pathways are broad groupings of career specialties/occupations that have common skills and knowledge. Career Pathways provide a context for exploring career options at all levels of education and a framework for linking learning to the skills and knowledge needed for future success.

Hawai'i has six Career Pathways:

- Arts and Communications
- Business
- Health Services
- Natural Resources
- Industrial and Engineering Technology
- Public and Human Services

Something for Everyone

Natural Resources Career Pathway Framework

Occupational Cluster	Occupational Concentration	Occupational Examples		
		High School Diploma + Training	2-3 years Post-secondary + Training	4-Year or Graduate Degree
		Entrepreneurship		
Agricultural Sciences	Plant Science	Nursery Worker, Farm Worker	Plant Propagator, Lab Worker	Botanist, Horticulturist, Entomologist, Plant Ecologist, Taxonomist
	Bio-Technology	Lab Technician	Lab Technician	Scientist, Agricultural Engineer, Science Teacher, Bioprocessing Technologist
	Animal Science	Animal Worker	Animal Breeder	Geneticist, Veterinarian, Animal Quarantine, Food Inspector
	Forest Industry, Agroforestry	Harvester, Miller	Wood Worker	Forester, Pomologist, Silviculturist
	Soil Science	Farmer, Farm Manager, Agricultural Chemical Salesperson	Golf Course Worker, Ag Inspector	Geophysicist, Soil Conservationist, Extension Agent
	Aquaculture	Agricultural Worker	Hatchery Manager	Aquacultural Engineer, Agricultural Engineer
Earth, Ocean, and Space Sciences	Astronomy		Astronomical Equipment Mechanic	Astronomer
	Meteorology, Climatology			Climatologist, Meteorologist
	Geology			Geologist, Volcanologist
	Marine Science	Underwater Diver, Marine Animal Trainer	Aquarium worker, Wildlife Specialist, Field Technician	Ichthyologist, Marine Biologist, Oceanographer
	Oceanography and Coastal Management		Field Technician	Oceanographer
Environmental and Conservation Sciences	Ecosystem Management	Fish and Wildlife Technician	Fish and Game Warden	Conservation Biologist, Ecological Manager, (Preservation & Restoration), Vector Control, Environmental Engineer, Environmental Inspector
	Air and Water Quality Management		Air and Water Quality Technician	Water Quality Engineer, Environmental Scientist
	Energy Conservation and Management			Petroleum Engineer Researcher
	Waste Management			Green Waste Manager, Recycling Specialist, Sewage Treatment Plant Mgr.
	Environmental Assessment, Urban/Reg. Planning	Field Worker	Paralegal, Environmental Technician	Urban/Regional planner, Environmental Advocate, Attorney, Lobbyist, Environmental Policy Analyst, City Planner

Natural Resources Career Pathway Core

APPENDIX C

MĀLAMA



AHUPUĀĀ

INDUSTRY REPRESENTATIVE MEETING

FEBRUARY 5, 2009

TURNING POINT PRESENTATION & RESULTS



Mālama Ahupuaʻa Advisory Committee Meeting

Thursday, February, 5, 2009

5:00 pm – 6:30 pm

Ka Lama 103



Mālama Ahupuaʻa is:

Funded by the United States Department of Agriculture
(USDA)

Cooperative State Research, Education, and Extension Service
(CSREES)

Title of Project:

University of Hawaiʻi Agribusiness Education, Training and
Incubator (AETI) Project

Collaborative effort between nine UH campuses, associated Cooperative Extension
Services, and the Agricultural Incubator Program



Mālama Ahupuaʻa Curriculum

General Education Courses → 22 credits

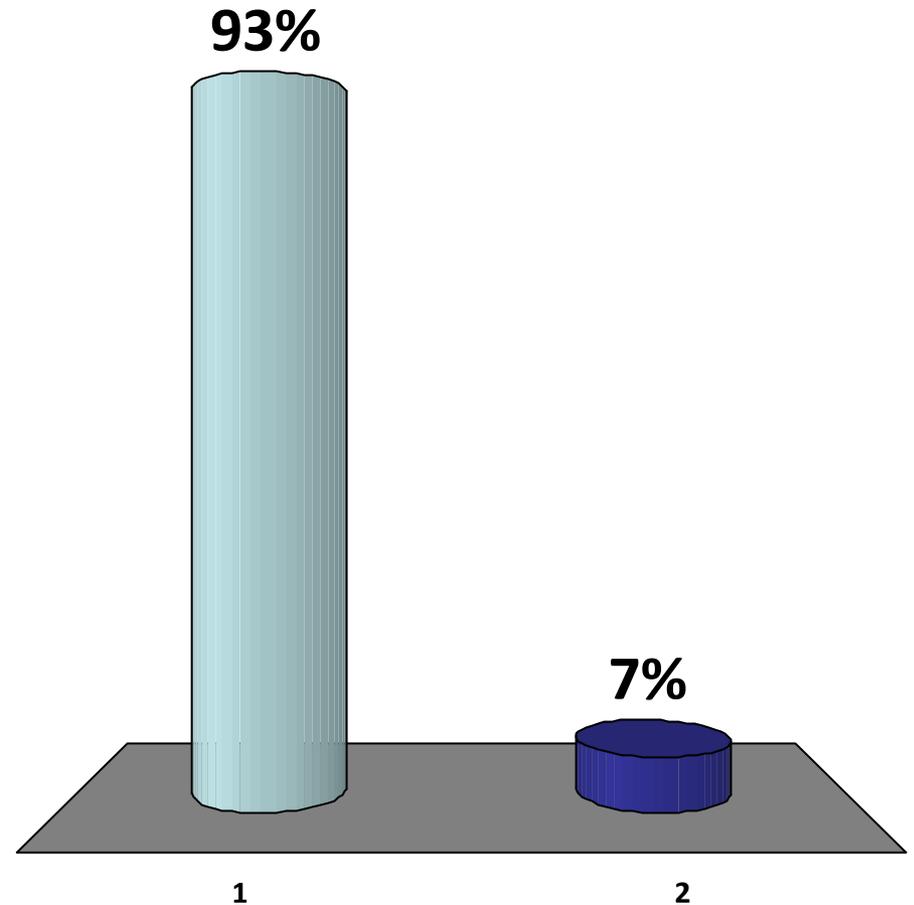
Natural Resource Requirements → 23 credits (All Concentrations)

Three Concentrations → 20 – 26 credits

1. Pono Studies – Cultural & Natural Resource Enforcement
2. Mala Studies – Ethnobotany & Food Security
3. Mālama ʻAina Studies – Natural Resource Management
(focus on matriculation after AS to Baccalaureate)

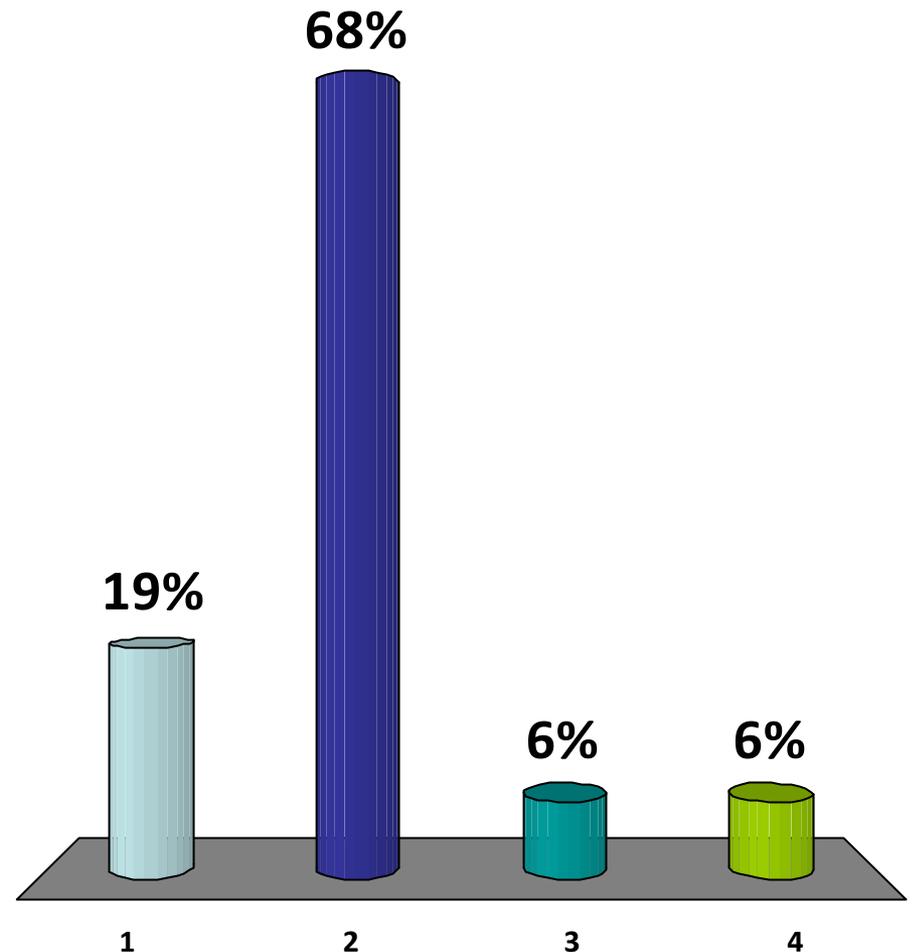
Do you think there is a need for an AS degree in Cultural & Natural Resource Management in Maui County?

1. Yes
2. No



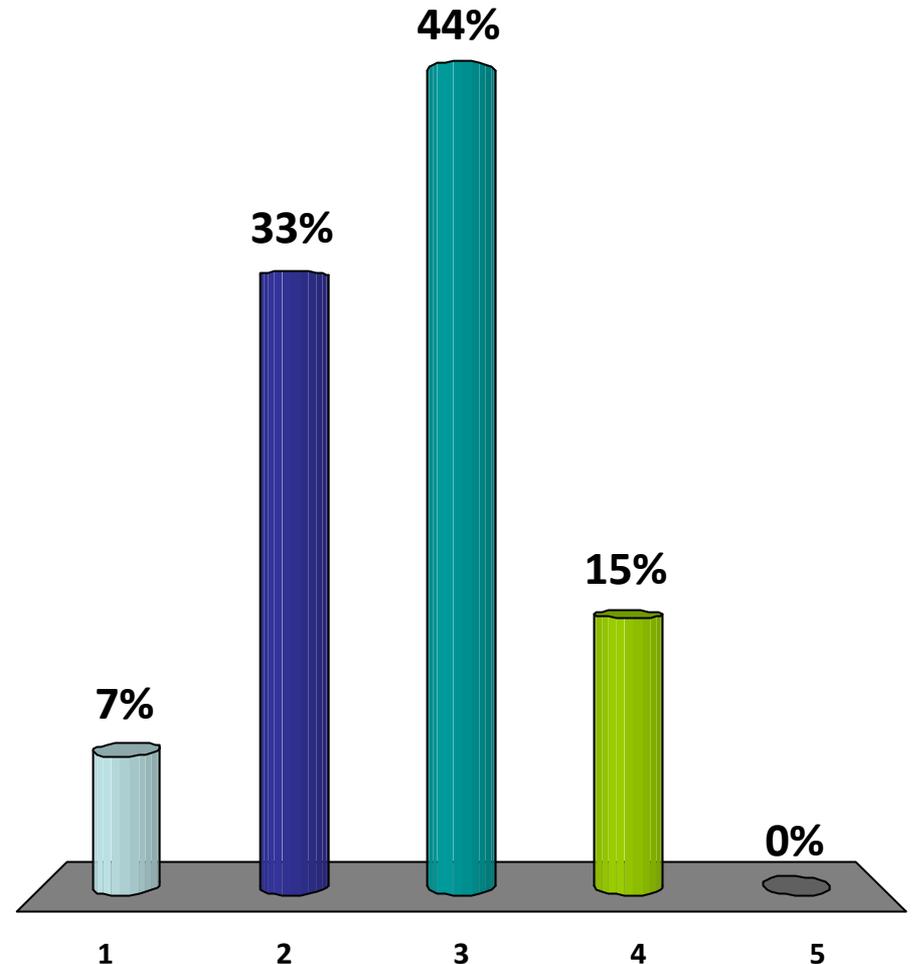
The curriculum under **General Education** adequately prepares students to enter the Natural Resource work force?

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree



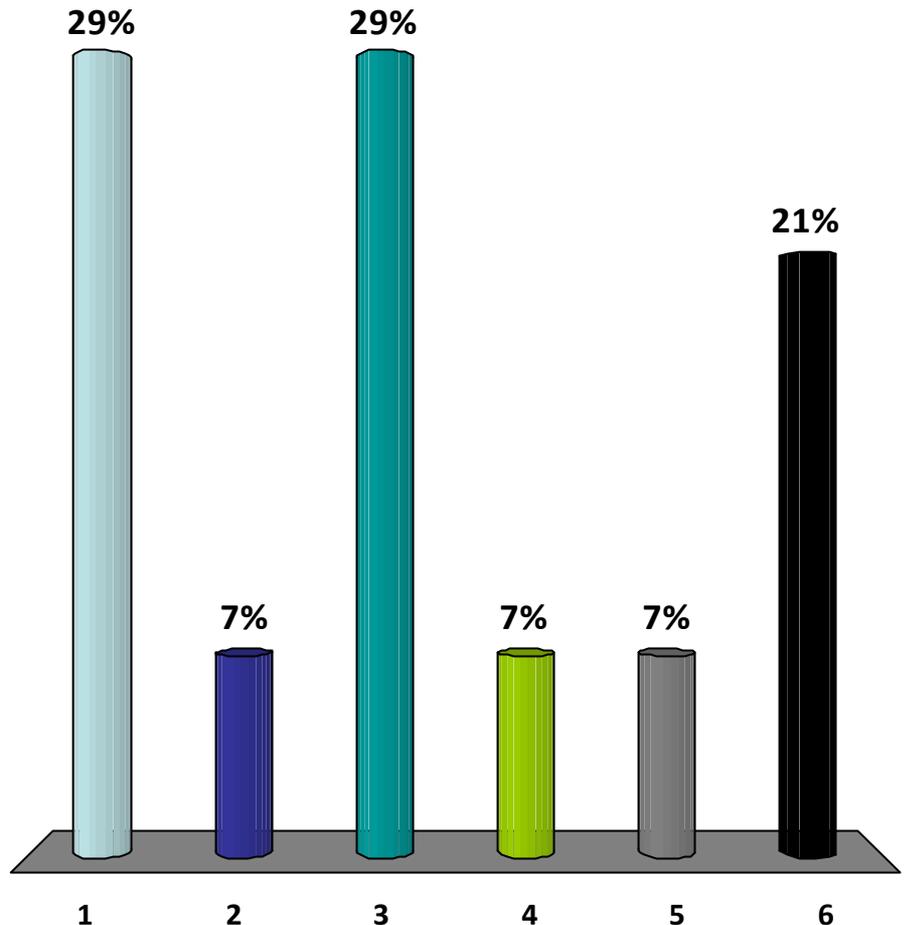
What core skills under **General Education** are most important for your profession?

1. Technological Skills
2. Written Communication
3. Oral Communication
4. Science
5. Math



Under 2. Natural Resource Requirement: All Concentrations, students interested in my field of work will use skills learned from this category the most?

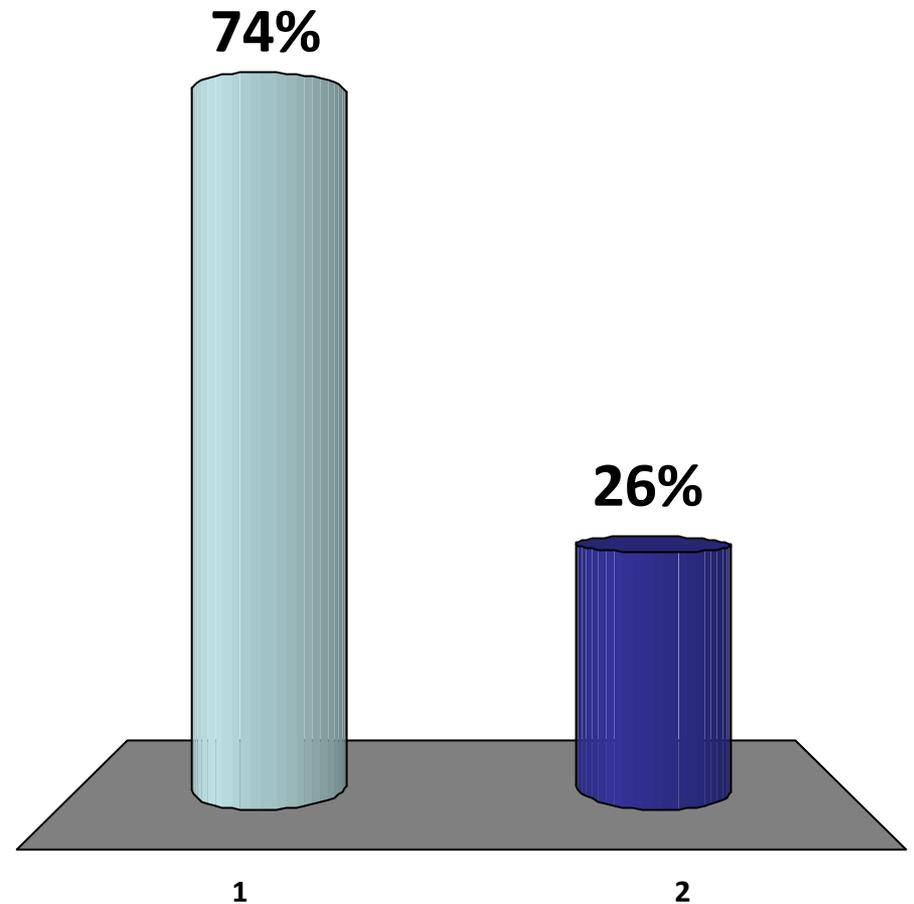
1. HWST – Culture & Native Knowledge
2. Economic Principles & the Environment
3. Ecosystems
4. Mapping Skills, GIS, Land Use Studies
5. Entrepreneurship
6. Native Hawaiian Knowledge & Plant Science



There are three concentrations for students to choose from.
Would classes under **Pono Studies - Cultural & Natural Resource Enforcement** be relevant to your profession?

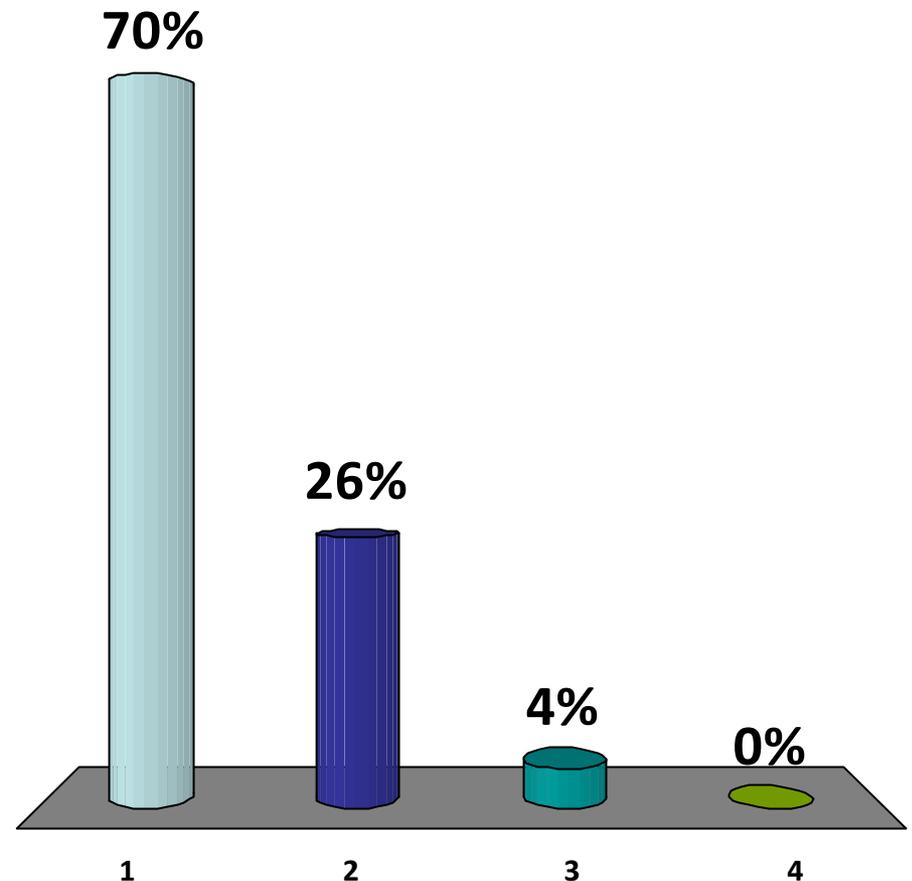
1. Yes

2. No



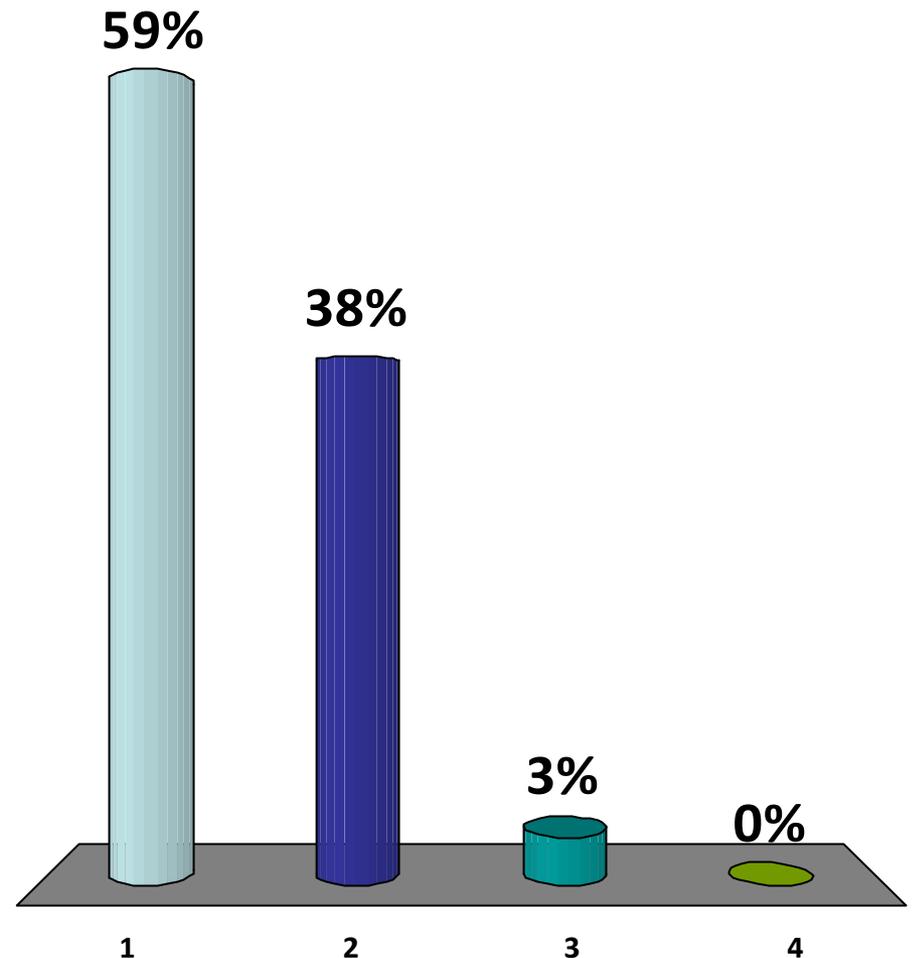
I would consider this class, **AJ 240: Hawaiian Cultural & Natural Resource Management** to be useful for employees entering the natural resource enforcement field.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree



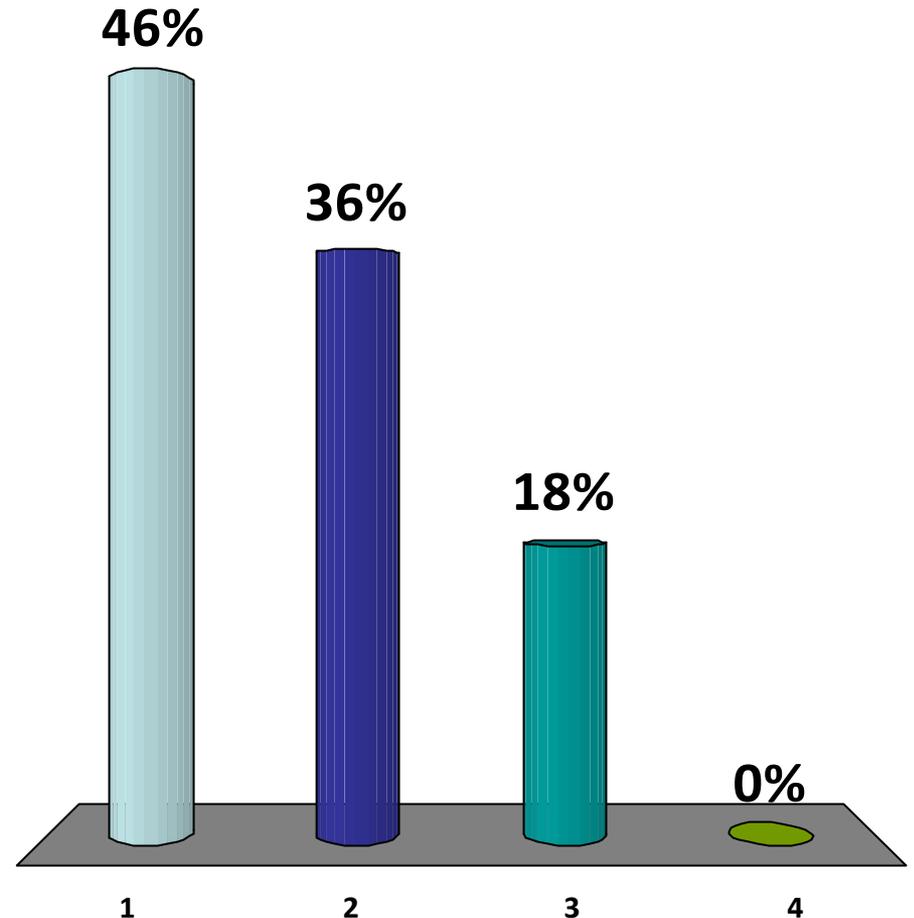
I would consider this class, **AJ 223: Arrest, Search, & Seizure** or **AJ 200: Principles of the Hawai'i Justice System**, useful for employees entering the natural resource enforcement field.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree



I would consider this class, **Political Science 180: Introduction to Hawaiian Politics** to be useful for employees entering the natural resource enforcement field.

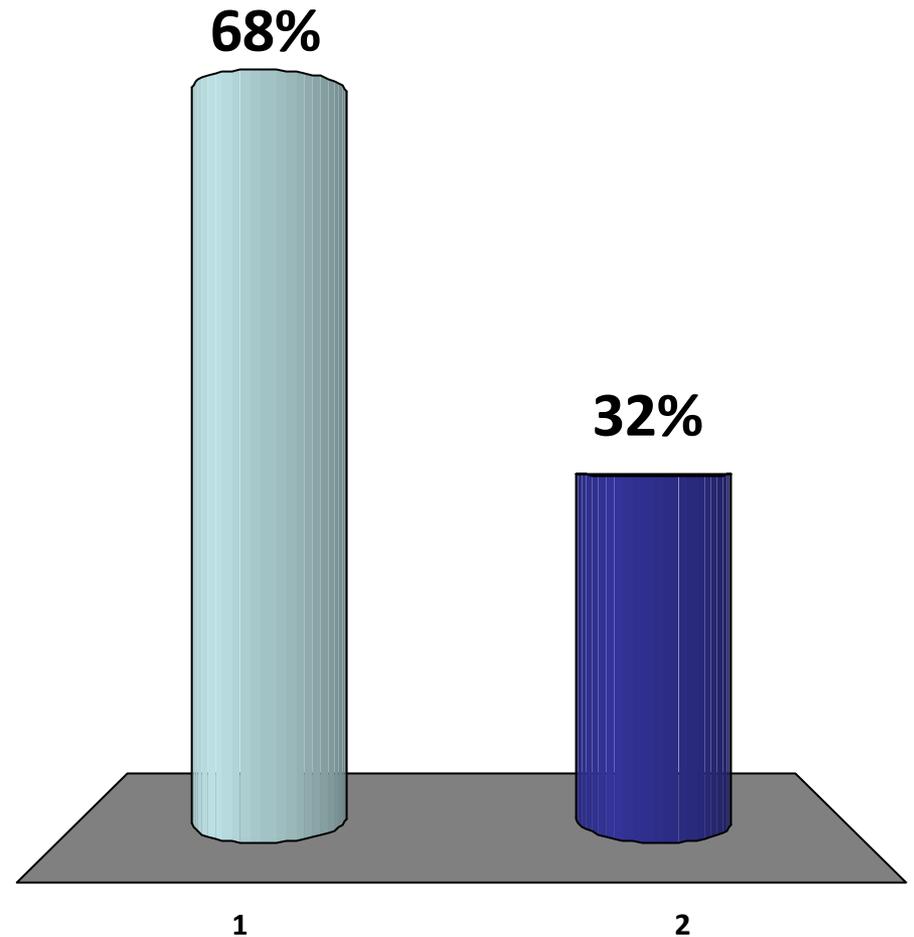
1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree



Would class under **Mala Studies – Ethnobotany & Food Security** be relevant to your profession?

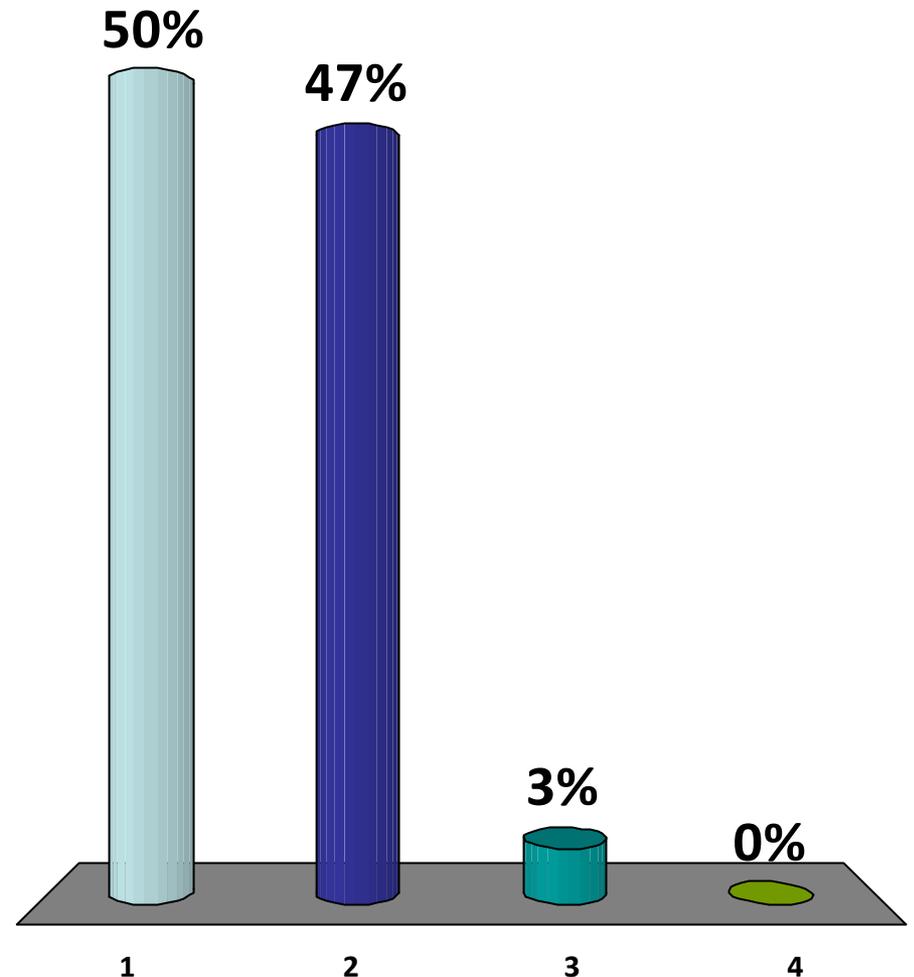
1. Yes

2. No



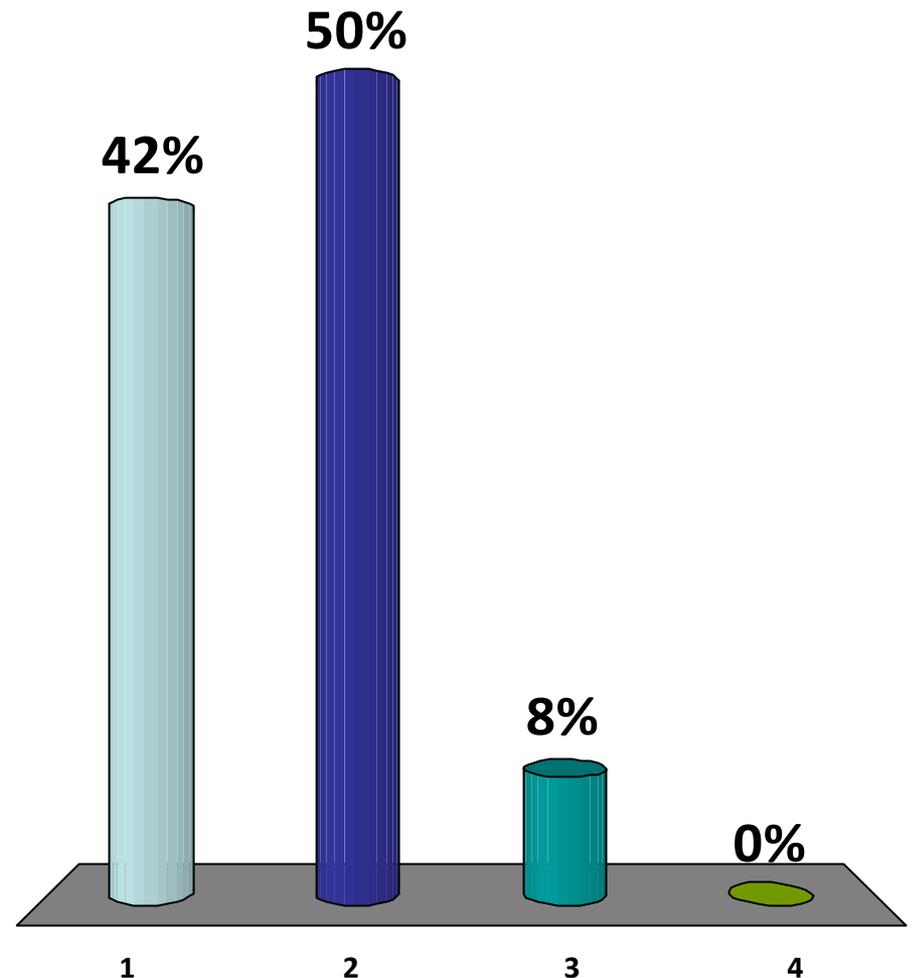
I would consider this class, **AG 122: Soils Technology** to be useful for employees entering the field of sustainable food production.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree



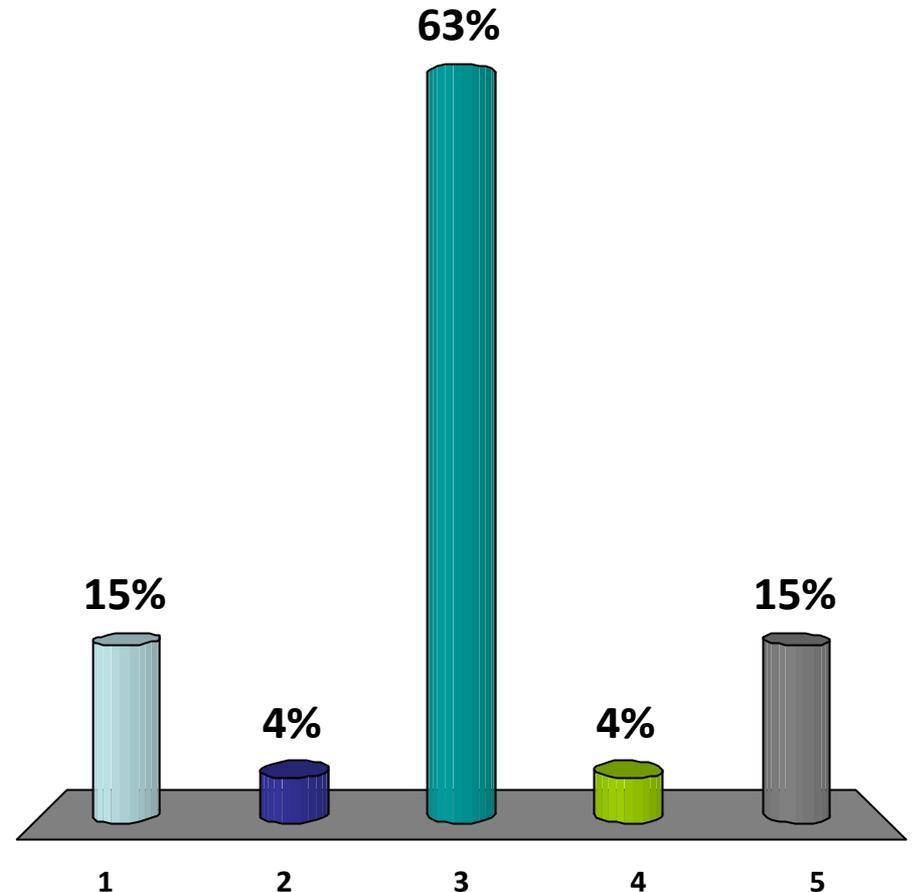
I would consider this class, **AG 265: Horticulture of Hawaiian Plants** to be useful for employees entering the field of sustainable food production.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree



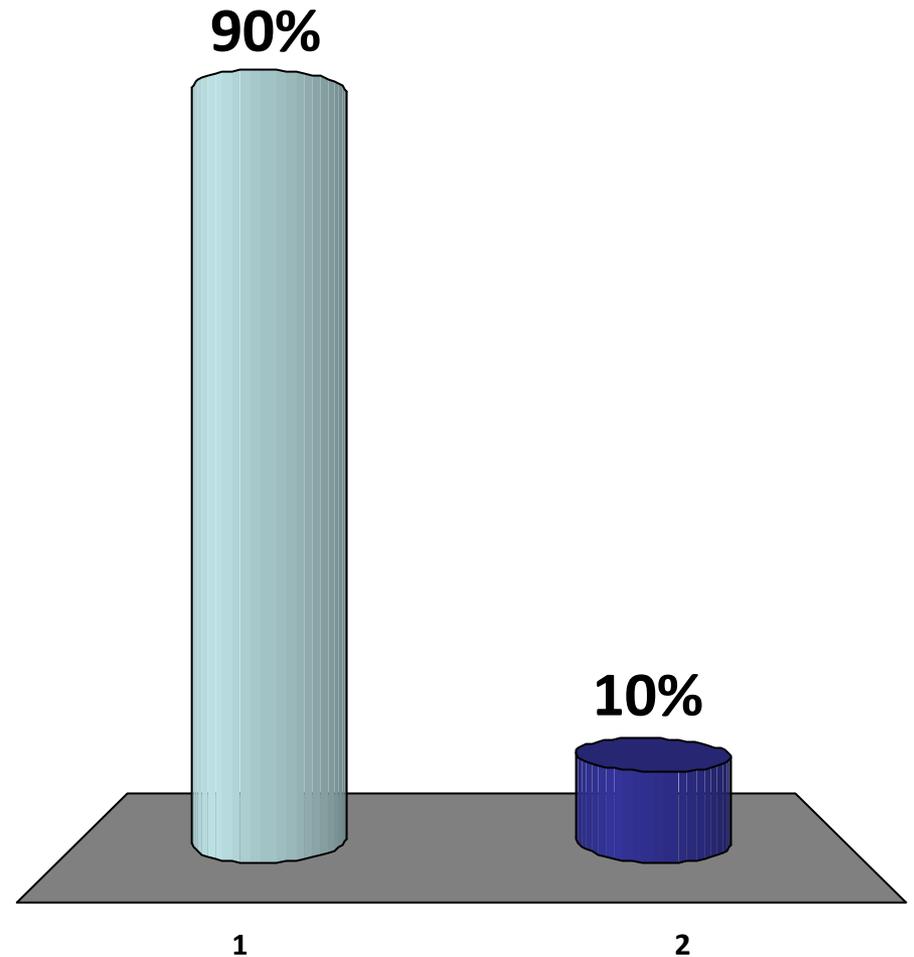
From the following categories, I would consider this class to be most useful for employees entering the field of sustainable food production.

1. AG 174: Insects & Their Control
2. AG 235: Irrigation Principles & Design
3. AG 251: Sustainable Crop Production
4. AG 281: Weed Science
5. Hawaiian Studies 213: Ethnozoology



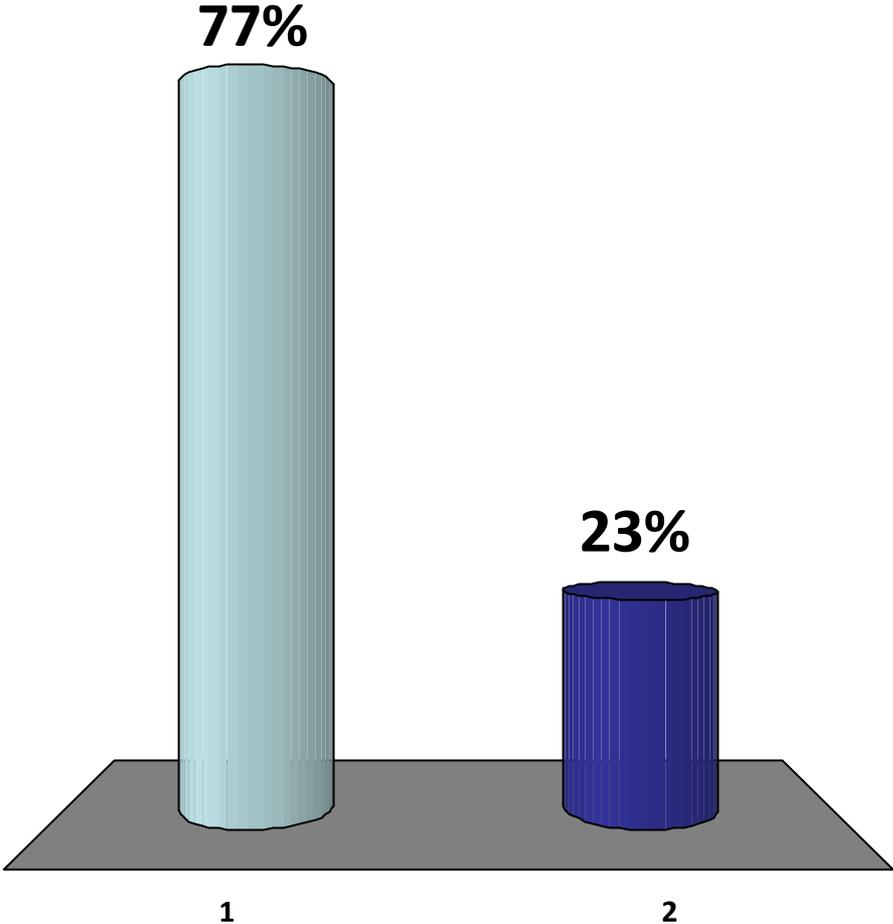
Would classes under **Malama 'Aina Studies – Natural Resource Management** be useful for students who will pursue a Baccalaureate degree upon completion of their AS degree?

1. Yes
2. No



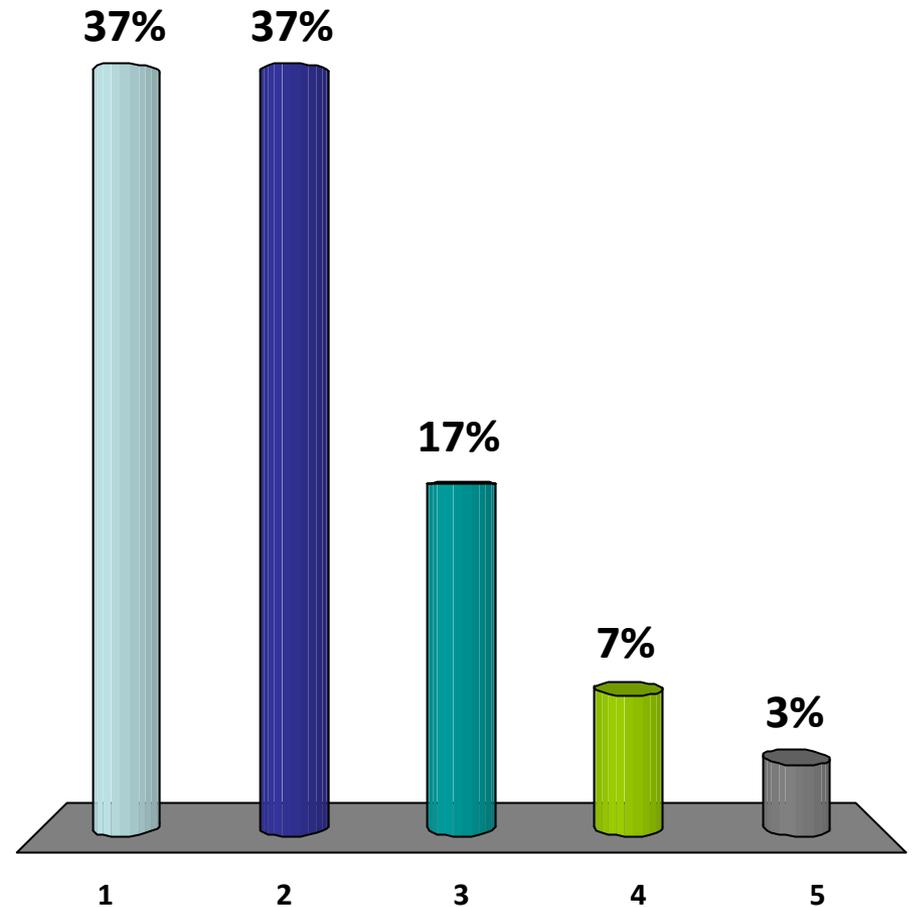
Would your organization be interested in a mentorship program or a work force development partnership with Malama Ahupua'a to assist students seeking this degree?

- 1. Yes
- 2. No



Overall, the curriculum listed in this proposed degree with properly prepare students to enter the Natural Resource work force.

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree





Open Discussion

What are your thoughts?

- ❖ Other courses that can strengthen this proposed degree?
- ❖ Other skills you feel students should have before completing this degree?
- ❖ Questions about certain courses?
- ❖ Feedback...do you have certain concerns?



Mālama Ahupuaʻa Timeline

FEBRUARY

- 1ST week → Advisory Committee Meeting (Prepare Proposed Degree)
- 2nd week → Present ATP to STEM Curriculum Committee & Department Chair
- 3rd week → Submit ATP to MCC Curriculum Committee

MARCH

- 2nd week → ATP to MCC Academic Senate
- 3rd week → ATP to CAO's (Chief Academic Officers)

APRIL

UH system office needs ATP to prepare for Board of Regents (BOR) meeting in May

MAY

Present ATP to Board of Regents (Mānoa)



Mālama Ahupuaʻa Contact Information

Maui Community College
310 W. Kaʻahumanu Ave.
Kahului, Hawaiʻi 96732-1617
Mailbox 114

Email: ahupuuaa@hawaii.edu

Phone: (808) 984-3424

Website: <http://maui.hawaii.edu/inside/malama/>

APPENDIX D



OCCUPATIONAL INFORMATION NETWORK (O-NET)

STANDARD OCCUPATIONAL CLASSIFICATION (SOC)

CAREER DATA

Custom Report for: 17-3025.00 - Environmental Engineering Technicians

Apply theory and principles of environmental engineering to modify, test, and operate equipment and devices used in the prevention, control, and remediation of environmental pollution, including waste treatment and site remediation. May assist in the development of environmental pollution remediation devices under direction of engineer.

Sample of reported job titles: Environmental Technician, Environmental Specialist, Environmental Engineering Technician, Industrial Waste Inspector, Engineer Technician, Environmental Engineering Assistant, Environmental Field Technician

View report:

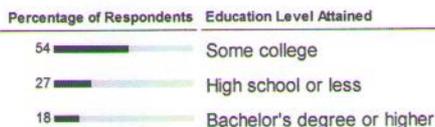
[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Three: Medium Preparation Needed
Overall Experience	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Job Training	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.
Job Zone Examples	These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include funeral directors, electricians, forest and conservation technicians, legal secretaries, interviewers, and insurance sales agents.
SVP Range	(6.0 to < 7.0)
Education	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

[back to top](#)

Education



Source: Bureau of Labor Statistics survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Engineering — Environmental Engineering Technology/Environmental Technology

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$19.56 hourly, \$40,690 annual
Employment (2006)	21,000 employees
Projected growth (2006-2016)	■■■■ Much faster than average (21% or higher)
Projected need (2006-2016)	9,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics 2007 wage data and 2006-2016 employment projections. "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

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Custom Report for: 19-4093.00 - Forest and Conservation Technicians

Compile data pertaining to size, content, condition, and other characteristics of forest tracts, under direction of foresters; train and lead forest workers in forest propagation, fire prevention and suppression. May assist conservation scientists in managing, improving, and protecting rangelands and wildlife habitats, and help provide technical assistance regarding the conservation of soil, water, and related natural resources.

Sample of reported job titles: Forest Technician, Forestry Technician, Wildlife Technician, Resource Manager, Resource Technician, Conservationist, Forest Ranger, Forestry Aide, Natural Resources Technician, Park Ranger

View report:

[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Three: Medium Preparation Needed
Overall Experience	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Job Training	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.
Job Zone Examples	These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include funeral directors, electricians, forest and conservation technicians, legal secretaries, interviewers, and insurance sales agents.
SVP Range	(6.0 to < 7.0)
Education	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

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Education

Percentage of Respondents	Education Level Attained
46	Bachelor's degree or higher
35	Some college
19	High school or less

Source: [Bureau of Labor Statistics](#) survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Life Sciences — Forest Sciences and Biology; Forestry; Natural Resources and Conservation, Other; Natural Resources Management and Policy; Natural Resources/Conservation, General

[back to top](#)

Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$16.12 hourly, \$33,520 annual
Employment (2006)	34,000 employees
Projected growth (2006-2016)	Little or no change (-2% to 2%)
Projected need (2006-2016)	13,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics [2007 wage data](#) and [2006-2016 employment projections](#). "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

Custom Report for: 45-4011.00 - Forest and Conservation Workers

Under supervision, perform manual labor necessary to develop, maintain, or protect forest, forested areas, and woodlands through such activities as raising and transporting tree seedlings; combating insects, pests, and diseases harmful to trees; and building erosion and water control structures and leaching of forest soil. Includes forester aides, seedling pullers, and tree planters.

Sample of reported job titles: Christmas Tree Grower, Tree Planter, Field Laborer, Forestry Support Specialist, Conservation Officer, Geographic Information Systems Coordinator (GIS Coordinator), Reforestation Worker

View report:

[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Three: Medium Preparation Needed
Overall Experience	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Job Training	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.
Job Zone Examples	These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include funeral directors, electricians, forest and conservation technicians, legal secretaries, interviewers, and insurance sales agents.
SVP Range	(6.0 to < 7.0)
Education	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

[back to top](#)

Education

Percentage of Respondents	Education Level Attained
63	High school or less
22	Bachelor's degree or higher
15	Some college

Source: [Bureau of Labor Statistics](#) survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Engineering — Wood Science and Wood Products/Pulp and Paper Technology

Life Sciences — Forest Sciences and Biology; Forestry; Natural Resources and Conservation, Other; Natural Resources Management and Policy; Natural Resources/Conservation, General; Wood Science and Wood Products/Pulp and Paper Technology

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$9.86 hourly, \$20,510 annual
Employment (2006)	20,000 employees
Projected growth (2006-2016)	Slower than average (3% to 6%)
Projected need (2006-2016)	9,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics 2007 wage data and 2006-2016 employment projections. "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents

Custom Report for:

33-3031.00 - Fish and Game Wardens

Patrol assigned area to prevent fish and game law violations. Investigate reports of damage to crops or property by wildlife. Compile biological data.

Sample of reported job titles: Conservation Officer, Wildlife Manager, District Wildlife Manager, Game Warden, Natural Resource Officer, State Conservation Officer, State Game Warden, Wildlife Officer

View report: [Summary](#) [Details](#) [Custom](#)

[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Four: Considerable Preparation Needed
Overall Experience	A minimum of two to four years of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.
Job Training	Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.
Job Zone Examples	Many of these occupations involve coordinating, supervising, managing, or training others. Examples include accountants, human resource managers, computer programmers, teachers, chemists, and police detectives.
SVP Range	(7.0 to < 8.0)
Education	Most of these occupations require a four - year bachelor's degree, but some do not.

There is 1 recognized apprenticeship specialty associated with this occupation:

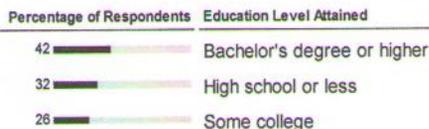
Fish and Game Warden

To learn about specific apprenticeship opportunities, please consult the U.S. Department of Labor [State Apprenticeship Information](#) website.

For general information about apprenticeships, training, and partnerships with business, visit the U.S. Department of Labor [Office of Apprenticeship](#) website.

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Education



Source: [Bureau of Labor Statistics](#) survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Life Sciences — Fishing and Fisheries Sciences and Management; Natural Resources Management and Policy; Wildlife and Wildlands Science and Management

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$23.00 hourly, \$47,830 annual
Employment (2006)	8,000 employees
Projected growth (2006-2016)	Little or no change (-2% to 2%)
Projected need (2006-2016)	2,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics [2007 wage data](#) and [2006-2016 employment projections](#). "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

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[Find Occupations](#)

[Crosswalk](#)

[Skills Search](#)

[Tools & Technology](#)

Custom Report for: 19-1032.00 - Foresters

Manage forested lands for economic, recreational, and conservation purposes. May inventory the type, amount, and location of standing timber, appraise the timber's worth, negotiate the purchase, and draw up contracts for procurement. May determine how to conserve wildlife habitats, creek beds, water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine the best time for harvesting. Develop forest management plans for public and privately-owned forested lands.

Sample of reported job titles: Forester, Area Forester, Fire Prevention Forester, Chief Unit Forester, Environmental Protection Forester, Regional Forester, Resource Forester, Service Forester, Urban Forester

View report:

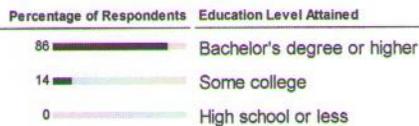
[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Four: Considerable Preparation Needed
Overall Experience	A minimum of two to four years of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.
Job Training	Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.
Job Zone Examples	Many of these occupations involve coordinating, supervising, managing, or training others. Examples include accountants, human resource managers, computer programmers, teachers, chemists, and police detectives.
SVP Range	(7.0 to < 8.0)
Education	Most of these occupations require a four - year bachelor's degree, but some do not.

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Education



Source: Bureau of Labor Statistics survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Engineering — Wood Science and Wood Products/Pulp and Paper Technology

Life Sciences — Forest Sciences and Biology; Forestry; Natural Resources and Conservation, Other; Natural Resources Management and Policy; Natural Resources/Conservation, General; Wood Science and Wood Products/Pulp and Paper Technology

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$25.21 hourly, \$52,440 annual
Employment (2006)	13,000 employees
Projected growth (2006-2016)	Slower than average (3% to 6%)
Projected need (2006-2016)	5,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics [2007 wage data](#) and [2006-2016 employment projections](#). "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

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Custom Report for: 19-1031.01 - Soil and Water Conservationists

Plan and develop coordinated practices for soil erosion control, soil and water conservation, and sound land use.

Sample of reported job titles: Soil Conservationist, Conservationist, Land Reclamation Specialist, Land Resource Specialist, Resource Conservation Specialist, Environmental Analyst, Erosion Control Specialist, Land Manager, Resource Conservationist, Watershed Program Manager

View report:

[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Four: Considerable Preparation Needed
Overall Experience	A minimum of two to four years of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.
Job Training	Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.
Job Zone Examples	Many of these occupations involve coordinating, supervising, managing, or training others. Examples include accountants, human resource managers, computer programmers, teachers, chemists, and police detectives.
SVP Range	(7.0 to < 8.0)
Education	Most of these occupations require a four - year bachelor's degree, but some do not.

There is 1 recognized apprenticeship specialty associated with this occupation:
Soil-Conservation Technician

To learn about specific apprenticeship opportunities, please consult the U.S. Department of Labor [State Apprenticeship Information](#) website.

For general information about apprenticeships, training, and partnerships with business, visit the U.S. Department of Labor [Office of Apprenticeship](#) website.

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Education

Percentage of Respondents	Education Level Attained
86	Bachelor's degree or higher
14	Some college
0	High school or less

Source: [Bureau of Labor Statistics](#) survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Life Sciences — Forest Sciences and Biology; Forestry; Natural Resources and Conservation, Other; Natural Resources Management and Policy; Natural Resources/Conservation, General; Wildlife and Wildlands Science and Management

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Wages & Employment Trends

National

Median wages data collected from Conservation Scientists.
Employment data collected from Conservation Scientists.

Category	Occupation Information
Median wages (2007)	\$27.00 hourly, \$56,150 annual
Employment (2006)	20,000 employees
Projected growth (2006-2016)	Slower than average (3% to 6%)
Projected need (2006-2016)	7,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics [2007 wage data](#) and [2006-2016 employment projections](#). "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

Custom Report for: 45-2011.00 - Agricultural Inspectors

Inspect agricultural commodities, processing equipment, and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.

Sample of reported job titles: Seed and Fertilizer Specialist, Grain Inspector, Meat and Poultry Inspector, Plant Protection Specialist, Apiary Inspector, Food Regulatory Field Supervisor, Plant Pest Inspector

View report: [Summary](#) [Details](#) [Custom](#)

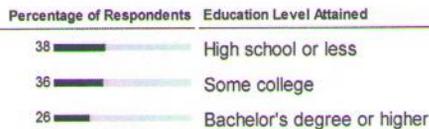
[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Three: Medium Preparation Needed
Overall Experience	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Job Training	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.
Job Zone Examples	These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include funeral directors, electricians, forest and conservation technicians, legal secretaries, interviewers, and insurance sales agents.
SVP Range	(6.0 to < 7.0)
Education	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

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Education



Source: Bureau of Labor Statistics [BLS](#) survey of employees aged 25-44.

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$19.13 hourly, \$39,780 annual
Employment (2006)	16,000 employees
Projected growth (2006-2016)	Little or no change (-2% to 2%)
Projected need (2006-2016)	4,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics [2007 wage data](#) and [2006-2016 employment projections](#). "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

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Custom Report for:

11-9121.00 - Natural Sciences Managers

Plan, direct, or coordinate activities in such fields as life sciences, physical sciences, mathematics, statistics, and research and development in these fields.

Sample of reported job titles: Natural Science Manager, Water Team Leader, Fisheries Director, Health Sciences Manager, Laboratory Manager, Natural Resources Planner, Research and Development Director, Coastal Management Planner, Environmental Manager, Mineral and Aggregate Resources Planner

View report:

[Job Zone](#) | [Education](#) | [Wages & Employment](#)
Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Five: Extensive Preparation Needed
Overall Experience	Extensive skill, knowledge, and experience are needed for these occupations. Many require more than five years of experience. For example, surgeons must complete four years of college and an additional five to seven years of specialized medical training to be able to do their job.
Job Training	Employees may need some on-the-job training, but most of these occupations assume that the person will already have the required skills, knowledge, work-related experience, and/or training.
Job Zone Examples	These occupations often involve coordinating, training, supervising, or managing the activities of others to accomplish goals. Very advanced communication and organizational skills are required. Examples include librarians, lawyers, aerospace engineers, physicists, school psychologists, and surgeons.
SVP Range	(8.0 and above)
Education	A bachelor's degree is the minimum formal education required for these occupations. However, many also require graduate school. For example, they may require a master's degree, and some require a Ph.D., M.D., or J.D. (law degree).

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Education

Percentage of Respondents	Education Level Attained
93	Bachelor's degree or higher
0	High school or less
0	Some college

 Source: [Bureau of Labor Statistics](#) survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Chemistry — Analytical Chemistry; Atmospheric Chemistry and Climatology; Chemical Physics; Chemistry; Inorganic Chemistry; Organic Chemistry ([see all 8 programs](#))

Computer Science — Mathematics and Computer Science

Engineering — Physical Sciences, Other

Geosciences — Geological and Earth Sciences/Geosciences; Geology/Earth Science, General

Life Sciences — Anatomy; Animal Genetics; Animal Physiology; Biochemistry; Biological and Biomedical Sciences, Other; Biological and Physical Sciences ([see all 36 programs](#))

Mathematics — Algebra and Number Theory; Analysis and Functional Analysis; Applied Mathematics; Computational Mathematics; Geometry/Geometric Analysis; Mathematics ([see all 14 programs](#))

Physics/Astronomy — Acoustics; Astronomy and Astrophysics; Astrophysics; Atmospheric Chemistry and Climatology; Atmospheric Physics and Dynamics; Atmospheric Sciences and Meteorology, General ([see all 21 programs](#))

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$50.02 hourly, \$104,040 annual
Employment (2006)	41,000 employees
Projected growth (2006-2016)	■■■■ Average (7% to 13%)
Projected need (2006-2016)	14,000 additional employees

State & National

Custom Report for: 17-1021.00 - Cartographers and Photogrammetrists

Collect, analyze, and interpret geographic information provided by geodetic surveys, aerial photographs, and satellite data. Research, study, and prepare maps and other spatial data in digital or graphic form for legal, social, political, educational, and design purposes. May work with Geographic Information Systems (GIS). May design and evaluate algorithms, data structures, and user interfaces for GIS and mapping systems.

Sample of reported job titles: Photogrammetrist, Cartographer, Production Manager, Photogrammetric Technician, Stereo Compiler, GIS Technician (Geographic Information Systems Technician), Compiler, GIS Analyst (Geographic Information Systems Analyst), Digital Cartographer, GIS Manager (Geographic Information Systems Manager)

View report:

[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Three: Medium Preparation Needed
Overall Experience	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Job Training	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.
Job Zone Examples	These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include funeral directors, electricians, forest and conservation technicians, legal secretaries, interviewers, and insurance sales agents.
SVP Range	(6.0 to < 7.0)
Education	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

There are 2 recognized apprenticeship specialties associated with this occupation:

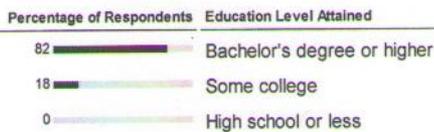
Drafter, Cartographic; Geospatial Specialist

To learn about specific apprenticeship opportunities, please consult the U.S. Department of Labor [State Apprenticeship Information](#) website.

For general information about apprenticeships, training, and partnerships with business, visit the U.S. Department of Labor [Office of Apprenticeship](#) website.

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Education



Source: Bureau of Labor Statistics survey of employees aged 25-44.

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$24.02 hourly, \$49,970 annual
Employment (2006)	12,000 employees
Projected growth (2006-2016)	■ Faster than average (14% to 20%)
Projected need (2006-2016)	6,000 additional employees

State & National

Custom Report for: 11-9012.00 - Farmers and Ranchers

On an ownership or rental basis, operate farms, ranches, greenhouses, nurseries, timber tracts, or other agricultural production establishments which produce crops, horticultural specialties, livestock, poultry, finfish, shellfish, or animal specialties. May plant, cultivate, harvest, perform post-harvest activities, and market crops and livestock; may hire, train, and supervise farm workers or supervise a farm labor contractor; may prepare cost, production, and other records. May maintain and operate machinery and perform physical work.

Sample of reported job titles: Farmer, Dairy Farmer, Rancher, Farm Manager, Farm Operator, Cash Crop Farmer, Dairy Farm Operator, Grain Farmer, Beef Farm Operator, Cattleman

View report: [Summary](#) [Details](#) [Custom](#)

[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Three: Medium Preparation Needed
Overall Experience	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Job Training	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.
Job Zone Examples	These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include funeral directors, electricians, forest and conservation technicians, legal secretaries, interviewers, and insurance sales agents.
SVP Range	(6.0 to < 7.0)
Education	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

There are 2 recognized apprenticeship specialties associated with this occupation:

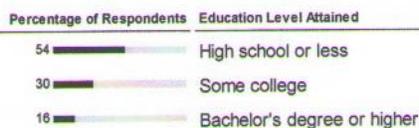
Farmer, General; Beekeeper

To learn about specific apprenticeship opportunities, please consult the U.S. Department of Labor [State Apprenticeship Information](#) website.

For general information about apprenticeships, training, and partnerships with business, visit the U.S. Department of Labor [Office of Apprenticeship](#) website.

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Education



Source: [Bureau of Labor Statistics](#) survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Life Sciences — Agricultural Animal Breeding; Agronomy and Crop Science; Animal Sciences; Animal Sciences, General; Dairy Science; Horticultural Science ([see all 9 programs](#))

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Wages & Employment Trends

National

Category Occupation Information

Median wages (2007) \$16.04 hourly, \$33,360 annual

Employment (2006) 1,058,000 employees

Projected growth (2006-2016) ■ Decline slowly or moderately (-3% to -9%)

Projected need (2006-2016) 95,000 additional employees

State & National

Select a State



Custom Report for: 45-3011.00 - Fishers and Related Fishing Workers

Use nets, fishing rods, traps, or other equipment to catch and gather fish or other aquatic animals from rivers, lakes, or oceans, for human consumption or other uses. May haul game onto ship.

Sample of reported job titles: Captain, Deckhand, Commercial Fisherman, Clam Digger, Commercial Crabber, Menhaden Fishing Crew Member, Crew Member, Fisherman, Lobsterman, Commercial Fishing Vessel Operator

View report:

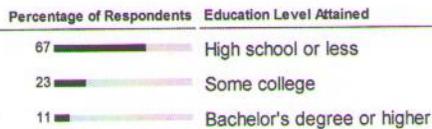
[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone

Component	Description
Title	Job Zone One: Little or No Preparation Needed
Overall Experience	No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a cashier even if he/she has never worked before.
Job Training	Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.
Job Zone Examples	These occupations involve following instructions and helping others. Examples include taxi drivers, amusement and recreation attendants, counter and rental clerks, cashiers, and waiters/waitresses.
SVP Range	(Below 4.0)
Education	These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.

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Education



Source: Bureau of Labor Statistics survey of employees aged 25-44.

This occupation may require a background in the following science, technology, engineering, and mathematics (STEM) educational disciplines:

Life Sciences — Fishing and Fisheries Sciences and Management

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$13.43 hourly, \$27,930 annual
Employment (2006)	38,000 employees
Projected growth (2006-2016)	Decline rapidly (-10% or lower)
Projected need (2006-2016)	5,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics 2007 wage data and 2006-2016 employment projections. "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

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Custom Report for: 37-2021.00 - Pest Control Workers

Spray or release chemical solutions or toxic gases and set traps to kill pests and vermin, such as mice, termites, and roaches, that infest buildings and surrounding areas.

Sample of reported job titles: Pest Control Technician, Chemical Applicator, Service Technician, Pest Technician, Technician, Termite Technician, Pest Control Chemical Technician, Pest Control Applicator, Pest Control Operator, Renewal Technician

View report:

[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone Two: Some Preparation Needed
Overall Experience	Some previous work-related skill, knowledge, or experience may be helpful in these occupations, but usually is not needed. For example, a teller might benefit from experience working directly with the public, but an inexperienced person could still learn to be a teller with little difficulty.
Job Training	Employees in these occupations need anywhere from a few months to one year of working with experienced employees.
Job Zone Examples	These occupations often involve using your knowledge and skills to help others. Examples include sheet metal workers, forest fire fighters, customer service representatives, pharmacy technicians, salespersons (retail), and tellers.
SVP Range	(4.0 to < 6.0)
Education	These occupations usually require a high school diploma and may require some vocational training or job-related course work. In some cases, an associate's or bachelor's degree could be needed.

There is 1 recognized apprenticeable specialty associated with this occupation:

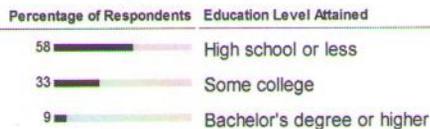
Exterminator, Termite

To learn about specific apprenticeship opportunities, please consult the U.S. Department of Labor [State Apprenticeship Information](#) website.

For general information about apprenticeships, training, and partnerships with business, visit the U.S. Department of Labor [Office of Apprenticeship](#) website.

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Education



Source: Bureau of Labor Statistics survey of employees aged 25-44.

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Wages & Employment Trends

National

Category	Occupation Information
Median wages (2007)	\$13.96 hourly, \$29,030 annual
Employment (2006)	70,000 employees
Projected growth (2006-2016)	■ ■ ■ Faster than average (14% to 20%)
Projected need (2006-2016)	28,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics 2007 wage data and 2006-2016 employment projections. "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

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Custom Report for: 45-2092.01 - Nursery Workers

Work in nursery facilities or at customer location planting, cultivating, harvesting, and transplanting trees, shrubs, or plants.

Sample of reported job titles: Nursery Worker, Grower, Greenhouse Worker, Plant Production Worker, Transplant Worker, Cutter, Field Hand, Garden Center Employee, Harvester, Nursery Harvester

View report:

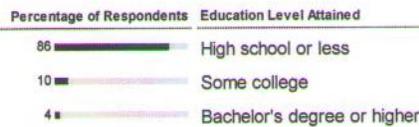
[Job Zone](#) | [Education](#) | [Wages & Employment](#)

Job Zone [Save Table \(XLS/CSV\)](#)

Component	Description
Title	Job Zone One: Little or No Preparation Needed
Overall Experience	No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a cashier even if he/she has never worked before.
Job Training	Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.
Job Zone Examples	These occupations involve following instructions and helping others. Examples include taxi drivers, amusement and recreation attendants, counter and rental clerks, cashiers, and waiters/waitresses.
SVP Range	(Below 4.0)
Education	These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.

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Education



Source: Bureau of Labor Statistics survey of employees aged 25-44.

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Wages & Employment Trends

National

Median wages data collected from Farmworkers and Laborers, Crop, Nursery, and Greenhouse.
Employment data collected from Farmworkers and Laborers, Crop, Nursery, and Greenhouse.

Category	Occupation Information
Median wages (2007)	\$8.19 hourly, \$17,020 annual
Employment (2006)	603,000 employees
Projected growth (2006-2016)	Decline slowly or moderately (-3% to -9%)
Projected need (2006-2016)	151,000 additional employees

State & National

Select a State



Source: Bureau of Labor Statistics 2007 wage data and 2006-2016 employment projections. "Projected growth" represents the estimated change in total employment over the projections period (2006-2016). "Projected need" represents job openings due to growth and net replacement.

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Send comments or inquiries to [O*NET Information](#).

APPENDIX E

MĀLAMA



AHUPUAA

JOB POSTINGS FROM FEBRUARY AND MARCH 2009



Department: **Department Of The Interior**

Agency: **National Park Service**

Sub Agency: **Haleakala National Park**

Job Announcement Number:

PWRH-DEU-09-15

 CLOSE

 PRINT

Overview

Biological Science Technician (Plants), GS-0404-04/05/06/07

Salary Range: 24,156.00 - 33,477.00 USD per year

The salary for Hawaii is based on the basic pay level and is not subject to locality but is subject to 25% Cost of Living Allowance (COLA). This COLA is not included in retirement pay computations.

Series & Grade: GS-0404-04/07

Promotion Potential: 07

Who May Be Considered:

Applications will be accepted from United States citizens and nationals.

Job Summary:

Open Period: Thursday, March 12, 2009 to Wednesday, March 25, 2009

Position Information: Full-Time Term position not to exceed 13 months (subject to furlough up to 26 non-work weeks), may be extended annually to a maximum 4 yrs

Duty Locations: 7 vacancies - Haleakala NPS, Island of Maui, Makawao, HI

Experience your America and build a fulfilling career by joining the National Park Service. Become a part of our mission to unite our past, our cultures and our special places, to establish important connections to the present and build a rich and lasting legacy for future generations.

Several term position vacancies exist for Biological Science Technicians (Plants) at the GS-04/05/06/07 levels at the Summit District of Haleakala National Park.

Duty station ranges from 7000 ft elevation with work extending parkwide from sea level to 10,000 ft elevation. Ability to work at high altitude for up to 8 hours daily is a requirement of the position. Upon consideration of all qualified candidates, tentative selection will be offered pending the successful completion of a pre-employment background investigation.

Up to 7 positions may be filled by this vacancy announcement.

Go to the bottom of this 'page' and click on 'Print Preview' to view and/or print the whole announcement. You are encouraged to read the entire announcement before you submit your application package. Your application may not get full consideration if you do not follow the instructions as outlined.

FOR SPECIFIC AREA AND HOUSING INFORMATION, OR SPECIFIC INFORMATION ON JOB DUTIES, CONTACT: Personnel Department 808-572-4403.

Key Requirements:

- You must be a U.S. Citizen to apply for this job.
- Successful completion of a background security investigation is required.

Duties

Major Duties:

The duty station for this position is at the Summit District of Haleakala National Park with responsibilities extending parkwide. The incumbent leads field crews performing alien plant control, native and rare plant monitoring, and restoration activities. Serves as a crew leader supervising volunteers, field workers, and casual hires in native plant identification, alien plant identification, safety, control and restoration techniques. Monitors vegetation fieldwork performed and data collection. Inputs and error checks data in alien plant control and monitoring, native plant observations, nursery, and out planting databases. Maintains vegetation management databases, writes action plans, performs data analysis and prepares draft reports. Uses databases to refine control and restoration techniques and priorities in consultation with Natural Resources Program Manager and field crew. Spatially references all plant control and monitoring data to link vegetation management actions to GIS to the greatest level of accuracy possible with available GPS units, or if GPS reception is not available, digitizes locations into GIS. Demonstrates proper handling, application, and cleanup of herbicides and related equipment and insures proper and consistent use of personal protective equipment by field crew. Insures that all pesticides and additives are in labeled containers and that current MSDSs and factor labels are on site. Obtains and maintains State of Hawaii Certification for Application of Restricted Use Pesticides. Work is typically in back country areas with crews camping in the field for up to 10 days at a time. Duties are described at a fully successful performance level.

Qualifications and Evaluation

Qualifications:

GS-04: Applicants must have six months of general experience and six months of specialized experience at or equivalent to the GS-03 grade level in the federal government OR successful completion of 2 years of study above high school that included at least 12 semester hours in any combination of courses of scientific or technical courses such as biology, chemistry, statistics, entomology, animal husbandry, botany, physics, agriculture or mathematics, with at least 6 semester hours of courses directly related to the position to be filled may be substituted for the specialized experience requirement for GS-04.

GS-05: Applicants must have 1 year of specialized experience at or equivalent to the GS-04 grade level in the federal government OR successful completion of a full 4-year course of study leading to a bachelor's degree with major study or at least 24 semester hours in any combination of courses such as those shown above for GS-04. At least 6 semester hours of courses must have been directly related to the position to be filled.

GS-06: Applicants must have 1 year of specialized experience at or equivalent to the GS-05 grade level for the GS-06.

GS-07: Applicants must have 1 year of specialized experience at or equivalent to the GS-06 grade level, OR graduate education or internship where it is directly related to the work of the position. One full year of graduate education meets the requirements for GS-07.

Equivalent combinations of education and experience are qualifying for all grade levels and positions for which both education and experience are acceptable.

SPECIALIZED EXPERIENCE REQUIREMENTS: Specialized experience is experience that equipped the applicant with the particular knowledge, skills, and abilities to perform successfully the duties of the position. To be creditable, specialized experience must have been equivalent to at least the next lower grade level in the normal line of progression for the occupation in the organization, and is normally work performed in a controlled environment. Examples of qualifying specialized experience

include: research activity or control program work; nursery work that required the growing and maintenance of plants in a controlled environment; work comparable to that with a large dairy farm where production records, animal environment and sanitary conditions were kept in accordance with modern dairy practice. Farming experience that was not performed in a controlled environment or experience as a laborer who was not responsible for planning and scheduling his/her own work, but only performed assigned tasks, would not qualify as specialized experience. Applicants who have the 1 year of appropriate specialized experience are not required by this standard to have general experience, education above the high school level, or any additional specialized experience to meet the minimum qualification requirements.

TO RECEIVE FULL CREDIT FOR YOUR EDUCATIONAL BACKGROUND IN DETERMINING QUALIFICATIONS, SUBMIT A COPY OF YOUR COLLEGE TRANSCRIPT. Please note: It is the responsibility of the applicant to show how he/she satisfies the course requirements. If you do not provide information that clearly shows how your completed college course work meets the specific course requirements above, you will be rated ineligible. To receive credit, education must have been completed at a school accredited by an accredited organization recognized by the Secretary, U.S. Department of Education.

FOREIGN EDUCATION: Foreign education is acceptable provided that the applicant submits documentation from an accredited source that the foreign education credentials and education has been deemed equivalent to that gained in a conventional U.S. education program.

Equivalent combinations of education and experience are qualifying for all grade levels for which both education and experience are acceptable.

CONDITIONS OF EMPLOYMENT:

Under Executive Order 11935, only United States citizens and nationals (residents of American Samoa and Swains Island) may compete for civil service jobs. Agencies are permitted to hire noncitizens only in very limited circumstances where there are no qualified citizens available for the position.

SELECTIVE SERVICE: If you are a male applicant who was born after 12/31/59 and are required to register under the Military Selective Service Act, the Defense Authorization Act of 1986 requires that you be registered or you are not eligible for appointment in this agency. You must certify that you have registered with the Selective Service System, or are exempt from having to do so under the Selective Service Law.

A background security investigation will be required for all new hires. Appointment will be subject to applicants successfully completing a background investigation and favorable adjudication. Failure to successfully meet these requirements will be grounds for termination.

Position is subject to shift rotation, night and/or weekend work.

This position may require the use of personal protective equipment (PPE). PPE is equipment used to protect the health of the employee, such as a respirator. The Office of Safety and Health Administration (OSHA) establishes the requirements for proper wearing and use of respirators. Facial hair, corrective glasses or goggles that cannot be accommodated within the respirator or any other condition that interferes with or prevents proper seal or valve function is prohibited. Medical examination will determine your fitness to properly wear PPE if considered as a candidate for this position.

Incumbent of this position may be required to wear a NPS uniform.

All Federal employees are required by PL 104-134 to have federal payments made by direct deposit.

How You Will Be Evaluated:

1. Applications will be reviewed to determine if the applicant meets the minimum qualification as described in the announcement and any other legal requirements.
2. Qualified applicants will then be rated based on their possession of the rating factors outlined below. Ratings assigned in the evaluation process will be based solely on information provided by the applicant in the materials submitted for this announcement. (Raters may not use personal knowledge of applicants or assumptions in making rating determinations.)
3. The scores will be used to determine the group from which selection will be made.
4. It is to your advantage to respond individually and specifically to each of the rating factors (knowledge, skills, and abilities) set forth below. Since eligible, qualified candidates are evaluated based on the factors identified, failure to do so WILL adversely impact your rating for the position.

Applicants will be rated based on the rating factors (knowledge, skills and abilities/KSAs) listed below. Candidates should submit a narrative statement on a separate page(s) to address their background as it relates to these factors. Therefore, please provide detailed evidence and description of experience, training, education, awards, hobbies, self-development achievements, pertinent paid or unpaid work, and other information that relates to the specific rating factors outlined below. It is important that your description cover the diversity, difficulty and complexity of your experience. Failure to do so will adversely affect your eligibility and/or rating for this position. Applicants who meet the OPM qualification requirements and any selective factors, but show no evidence of possession of any of the KSAs, will be assigned a transmuted rating of 70.

Knowledge, Skills, and Abilities/KSAs

- 1. Knowledge of the taxonomy, ecology and threats to endemic flora by alien plant and animal invasions sufficient to train field crews.**
- 2. Knowledge of vegetation management techniques, particularly alien plant control and vegetation restoration to perpetuate native ecosystems.**
- 3. Ability to implement vegetation inventories and monitoring. Collect, understand and analyze ecological data to determine results of resource management actions.**
- 4. Knowledge of Global Position System (GPS), digital spatial data post processing and field mapping techniques and analysis of spatial databases using a Geographic Information System (GIS) in a vegetation management program.**
- 5. Ability to communicate orally and in writing to direct interagency field crews, draft funding, planning and reporting documents and present results.**

Benefits and Other Information

Benefits:

You may participate in the Federal Employees Health Benefits program, with costs shared with your employer. More info: <http://www.usajobs.gov/jobextrainfo.asp#FEHB>.

Life insurance coverage is provided. More info: <http://www.usajobs.gov/jobextrainfo.asp#life>

Long-Term Care Insurance is offered and carries into your retirement. More info: <http://www.usajobs.gov/jobextrainfo.asp#ltci>

New employees are automatically covered by the Federal Employees Retirement System (FERS). If you are transferring from another agency and covered by CSRS, you may continue in this program. More info: <http://www.usajobs.gov/jobextrainfo.asp#retr>

You will earn annual vacation leave. More info: <http://www.usajobs.gov/jobextrainfo.asp#VACA>

You will earn sick leave. More info: <http://www.usajobs.gov/jobextrainfo.asp#SKLV>

You will be paid for federal holidays that fall within your regularly scheduled tour of duty. More info: <http://www.usajobs.gov/jobextrainfo.asp#HOLI>

Other Information:

This is a term position not to exceed 13 months (subject to furlough of up to 6 non-work weeks per year), and may be extended annually up to a maximum of 4 years without further competition.

Up to 7 positions may be filled by this announcement.

RELOCATION COSTS WILL NOT BE PAID.

Government housing may be available.

TOUR OF DUTY: 40 hours per week/80 hours per pay period.

PAY: Actual salary for the individual selected for this position will be set in accordance with applicable regulations.

LOCATION: Haleakala National Park is located on the island of Maui, approximately 30 miles from Kahului, the island's largest commercial center (population approximately 25,000). The Summit District is located at 7,000 feet elevation where weather is often cool, wet, and windy. Summer temperatures vary from 50-70 degrees and in winter range from the low 30's to mid 60's. Complete shopping and medical facilities are available in Pukalani/Makawao area, about 19 miles from park headquarters. Elementary schools are located in Kula, Makawao, Pukalani and Haiku. High schools are located in Pukalani, Kahului and Wailuku. Public transportation is not available to the park; personal transportation is essential. Housing may be available in the Summit District. Rental prices for an average 1-bedroom cottage range from \$800-\$1000/month; a 2-bedroom cottage range from \$1400-\$1600/month and \$1800+ for a 3-bedroom house; median price of a home is \$650,000.

How to Apply

How To Apply:

MAIL YOUR APPLICATION SO IT WILL BE POSTMARKED BY THE CLOSING DATE. If hand delivered, be sure your application is received by closing date.

Submit one of the following: Optional Form 612, Optional Application for Federal Employment or a resume containing the information outlined in this section. **OUR OFFICE DOES NOT ACCEPT EMAILED OR FAXED APPLICATIONS. Mail to:**

DOI, National Park Service

ATTN: Elizabeth Jameson

300 Ala Moana Blvd, Rm 6-226, Box 50165

Honolulu HI 96850-0053

Provide proof of status (SF-50 showing current grade and tenure and, if different, an SF-50 showing highest grade ever held on a permanent basis).

Please submit a narrative response to each knowledge, skill or ability listed under How You Will Be Evaluated. Your response should describe what you did, how often you performed this activity, the guidelines available, the complexity of the assignment, and who you performed the activity for or with.

Your application or resume must contain the following information:

- 1) Announcement number, title and grade of this position;
- 2) Your full name, mailing address and day and evening phone numbers;
- 3) Social security number;
- 4) Country of citizenship;
- 5) Work experience including job title (and series and grade if Federal job); duties and accomplishments; employer's name and address; supervisor's name and phone number; starting and ending dates of employment (month and year); hours worked per week; salary; and indicate if we may contact your current supervisor.
- 6) Other Qualifications: Provide job-related training courses (title and year); job related skills (e.g., other languages, computer software/hardware, tools, machinery, typing speed); current certificates and licenses that are job-related; and job-related honors, awards and special accomplishments (provide dates).
- 7) Education (include name, city, state and zip code of high school and colleges and universities attended; date of GED or diploma; college major, type and year of any degrees received or total credits earned, specifying semester or quarter hours or any apprenticeships). If you are substituting education for experience or if there are mandatory course requirements for the job, submit with your application a copy of your college transcripts or a list of college courses with number of semester or quarter hours for each course. You must submit evidence that any education completed in a foreign institution is equivalent to U.S. education standards and that you have the required knowledge, skills, and abilities for this position.

If you are claiming veterans' preference or eligibility for VRA, provide basic eligibility information in your cover letter. You must submit a copy of your DD-214, Certificate of Release or Discharge from Active Duty, or other proof of eligibility. To claim 10-point veterans' preference, you must submit an SF-15, Application for 10-Point Veterans' Preference plus the proof required by that form. Five points may be added to the eligible ratings of veterans who: entered military service prior to October 14, 1976 for more than 180 consecutive days; served on active duty during the Gulf War between August 2, 1990, and January 2, 1992, regardless of where the person served; served on active duty for more than 180 consecutive days, other than for training, any part of which occurred during the period beginning September 11, 2001, and ending on the date prescribed by Presidential proclamation or by law as the last day of Operation Iraqi Freedom; or served in a military action for which they received a campaign badge or expeditionary medal. Medal holders and Gulf War veterans must have served

continuously for at least 24 months or the full period for which called or ordered to active duty. For a complete information, please see the Vet Guide at <http://opm.gov/veterans/>.

Complete DI-1935, Department of the Interior Application Background Survey (at <http://www.doi.gov/diversity/di1935.doc>). The information provided will be used for statistical purposes to monitor applicant response, and will not be maintained in the personnel office or forwarded to the selecting official.

Individuals who have special priority selection rights under the Agency Career Transition Assistance Program (CTAP) or the Interagency Career Transition Assistance Program (ICTAP) must be well qualified for the position to receive consideration for special priority selection. You will be considered well qualified if you have a score of at least 85.0 or above without veteran's preference points based on your responses to the KSAs and your supporting application materials. To be well qualified, you also must meet any job-related personal, suitability, and/or medical requirements established for this position.

Federal employees seeking CTAP/ICTAP eligibility must submit proof that they meet the requirements of 5 CFR 330.605(a) for CTAP and 5 CFR 330.704 for ICTAP. This includes a copy of the Agency notice, a copy of your most recent performance rating, and a copy of your most recent SF-50 noting current position, grade level, and duty station. Please annotate your application to reflect that you are applying as a CTAP or ICTAP eligible.

If you are selected for federal employment, you will be required to fill out a Declaration of Federal Employment, OF-306, prior to being appointed to determine your suitability for Federal Employment and to authorize a background investigation. Failing to answer all questions truthfully and completely or providing false statements on your application may be grounds for not hiring you or for firing you after you begin work. Also, you may be punished by fine or imprisonment (U.S. Cod, Title 18, Section 1001).

Applications received in postage-free Government envelopes or through Government mail channels will be rejected by this Office and returned to the applicant. Applications will not be returned. Do not submit original documents that you may need in the future. Applicants will not be solicited for further data if that provided is found to be inadequate or incomplete.

Contact Information:

Elizabeth Jameson
Phone: 808-541-2693x736
Email: Elizabeth_Jameson@nps.gov

Or write:
Department Of The Interior
300 Ala Moana Blvd, Rm 6-226
Box 50165
Honolulu, HI 96850-0053
US

What To Expect Next:

Once your complete application is received we will conduct an evaluation of your qualifications and determine your ranking. The most highly qualified candidates will be referred to the hiring manager for further consideration and possible interview. We expect to make a selection within 30 days of the closing date of this announcement. You will be notified of the outcome.

PRIVACY ACT INFORMATION: The application you submit for this position contains information subject to the Privacy Act of 1974 (P.L. 93-579, 5 U.S.C. 552a). We are required to provide you with information regarding our authority and purposes for collecting this data, the routine uses which will be made of it and if any, of nondisclosure.

EEO Policy Statement

The United States Government does not discriminate in employment on the basis of race, color, religion, sex, national origin, political affiliation, sexual orientation, marital status, disability, age, membership in an employee organization, or other non-merit factor.

Reasonable Accommodation Policy Statement

Federal agencies must provide reasonable accommodation to applicants with disabilities where appropriate. Applicants requiring reasonable accommodation for any part of the application and hiring process should contact the hiring agency directly. Determinations on requests for reasonable accommodation will be made on a case-by-case basis.

Veterans Information

Please Note:

Veterans' preference does not apply to positions in the Senior Executive Service, and may not apply to other excepted service appointing authorities. If you have questions about the applicability of veterans' preference for a particular vacancy please contact the agency posting the announcement.

Veterans who served on active duty in the U.S. Armed Forces and were separated under honorable conditions may be eligible for [veterans' preference](#). For service after October 15, 1976, the veteran must have received a Campaign Badge, Expeditionary Medal, a service connected disability, or have served during the Gulf War between August 2, 1990 and January 2, 1992 or for more than 180 consecutive days, other than training, any part of which occurred during the period beginning September 11, 2001, and ending on the date prescribed by Presidential proclamation or by law as the last day of Operation Iraqi Freedom.

[The Veterans Employment Opportunity Act \(VEOA\)](#) gives veterans access to job vacancies that might otherwise be closed to them. The law allows eligible veterans to compete for vacancies advertised under agency's promotion procedures when the agency is seeking applications from outside of its own workforce.

To claim veterans' preference, veterans should be ready to provide a copy of their DD-214, Certificate of Release or Discharge from Active Duty, or other proof. Veterans with service connected disability and others claiming 10 point preference will need to submit [Form SF-15, Application for 10-point Veterans' Preference](#).

For more specifics on all veterans employment issues such as Veterans preference or special appointing authorities see the [VetGuide](#).

Legal and Regulatory Guidance

Social Security Number - Your Social Security Number is requested under the authority of Executive Order 9397 to uniquely identify your records from those of other applicants who may have the same name. As allowed by law or Presidential directive, your Social Security Number is used to seek information about you from employers, schools, banks, and others who may know you. Failure to provide your Social Security Number on your application materials, will result in your application not being processed

Privacy Act - Privacy Act Notice (PL 93-579): The information requested here is used to determine qualifications for employment and is authorized under Title 5 U.S.C. 3302 and 3361.

Signature - Before you are hired, you will be required to sign and certify the accuracy of the information in your application.

False Statements - If you make a false statement in any part of your application, you may not be hired; you may be fired after you begin work; or you may be subject to fine, imprisonment, or other disciplinary action.

Selective Service - If you are a male applicant born after December 31, 1959, you must certify that you have registered with the Selective Service System, or are exempt from having to do so under the Selective Service Law.

 **CLOSE** **PRINT**

Send Mail

Send Mail to:

Department Of The Interior
300 Ala Moana Blvd, Rm 6-226
Box 50165
Honolulu, HI 96850-0053
US



Questions?

For questions about this job:

Elizabeth Jameson
Phone: 808-541-2693x736
Email: Elizabeth_Jameson@nps.gov

USAJOBS Control Number: 1498252

 **PRINT**

Job Description

Job Title: Volunteer & Outreach Facilitator
Job ID: 29082
Project Name: HIHWNMS
Full/Part Time: Full-Time
Regular/Temporary: Regular

[Email to Friend](#)[Select Job](#)[Return to Previous Page](#)

Job Summary

Regular, Full-Time, RCUH Non-Civil Service position with the Hawaiian Islands Humpback Whale National Marine Sanctuary, located at the National Oceanic and Atmospheric Administration office in Kihei, Maui. Continuation of employment is dependent upon program/operational needs, satisfactory work performance, and availability of funds.

MINIMUM MONTHLY SALARY: \$2,320/mo.

DUTIES: Responsible for coordinating sanctuary volunteer program including recruitment, training, supervision, and recognition. Coordinate community groups and individuals involved with sanctuary volunteer program. Develop and implement sanctuary outreach program, and assist with operations and outreach efforts for Education Center. Coordinate arrangements for special events and facilitate site visits by visitors, groups, and VIPs. Provide general administrative support to sanctuary staff. Coordinate all efforts with the Maui site manager and sanctuary staff.

PRIMARY QUALIFICATIONS: EDUCATION: Bachelor's Degree from an accredited four (4) year college or university in related field. (Associate's Degree from an accredited community college, and one to three (1-3) years of experience working with volunteer programs may substitute for Bachelor's Degree). **EXPERIENCE:** One to three (1-3) years of experience working with volunteer programs. **ABIL/KNOW/SKILLS:** Knowledge of managing volunteer programs including recruiting, training, supervision, and recognition. Ability to communicate effectively with people with diverse skills and interests and match those with the needs of the sanctuary. Competent in both PC and Macintosh computers with skills in MS Office and other business software.

SECONDARY QUALIFICATIONS: Bachelor's Degree from an accredited four (4) year college or university in Environmental Education, Marine Biology, Natural Resource Management, Zoology, or a related field. Knowledge of Hawaii's marine environment and marine conservation issues. Professional experience managing a successful volunteer program. Experience in environmental education and outreach. Computer skills in desktop publishing and database development.

INQUIRIES: Patty Miller 879-2818 (Maui).

APPLICATION REQUIREMENTS: The preferred method of applying for a job is through our on-line application process. Please go to www.rcuh.com, click on "Employment" and navigate to "Job Announcements/Apply for a Job." However, if you do not have access to the Internet, you may apply by submitting resume; cover letter including Recruitment ID#, referral source, narrative of your qualifications for position and salary history; names, phone numbers and addresses of three supervisory references and copy of degree(s)/transcripts/certificate(s) to qualify for position by fax (808) 956-5022 or mail to Director of Human Resources, Research Corporation of the University of Hawaii, 2530 Dole Street, Sakamaki Hall D-100, Honolulu, HI 96822 before the closing date. If you have questions on the application process and/or need assistance, please call (808)956-3100.

Field Crew Member

Kohala Watershed Partnership (KWP)



Responsibilities:

The Field Crew Member will be implementing on-the-ground watershed conservation efforts for the KWP. This includes, but is not limited to, weed control, constructing and maintaining fences and trails, controlling feral animals and rodents, doing biological surveys, and planting. The Field Crew Member will work with various field crews, landowner partners, volunteers, and students. The Field Crew Member will need to be an observant naturalist, able to collect and summarize data. This requires an individual who enjoys working daily in outdoor Hawai'i, is self-sufficient in harsh wilderness conditions, can work cooperatively with a variety of people, and can communicate effectively. The KWP field crew does physically demanding work that requires a committed effort and high level of motivation.

Requirements:

Experience in fence construction, hunting and weed control in Hawai'i.
Knowledge of Hawaiian culture, ecology, plants, forests, streams and birds.
Possess a valid driver's license, and able to drive standard transmission, off-road vehicles
Safe use of firearms, pesticides, power tools, and helicopter-assisted operations.
Eagerness and ability to learn new skills, new technology, and new information.
Adaptable, cooperative, dependable, honest, quick learner and hard-working.
Able to maintain a good attitude while working in bad weather under difficult conditions.
Carry 50-pound pack over rough terrain.
Flexible schedule to allow for back-country camping trips of up to 7 days, and weekend work.

To Apply:

Send resume that summarizes all relevant education and work experience with dates and responsibilities. Include the names and contact information for three references that can speak to the candidate's abilities and integrity. Cover letter should describe experience in outdoor Hawai'i, qualifications and motivation.

Send resume and letter by **2/24/09** to:

Melora Purell, Coordinator
Kohala Watershed Partnership
P.O. Box 437182
Kamuela, HI 96743
Coordinator@kohalawatershed.org
808/333-0976

♦ **Job Title:** [Seasonal field technician - Invasive frogs/mammals](#)

Job Type: full-time temporary position

Opportunity location: Big Island, Hawaii

Closing date (if specified): 1 Apr 2009

Opportunity Description:

1-2 FIELD TECHNICIANS needed to assist a Master's research project through Utah State University. The project will be investigating the community level effects of the invasive Coqui frog on the Big Island of Hawaii. The study will examine the frogs' distribution and abundance, and their direct impacts on the local faunal structure at different trophic levels. Duties will include conducting nighttime insect and frog surveys, vegetation sampling, and trapping of invasive mammals. Work will entail long days and odd work hours (early morning and late night sessions). Must be able to conduct physically demanding work in adverse tropical conditions, including carrying 35-40 lb packs through dense understory. Must be willing to camp for weeks at a time, if necessary.

Applicant qualifications: Looking for individuals with a positive attitude, sense of humor, flexibility, strong work ethic, valid U.S. driver's license, and enthusiasm for the outdoors. Applicants must have formal background in the biological sciences or related fields. Must have prior field experience, ideally with insect collection, herpetological surveys, and/or small mammal live trapping. Ability to work in a team environment and good organizational skills are desired.

Salary: ~\$1200/month. Shared housing provided. Must be available late May through late August. Individuals must provide own travel to and from Hawaii.

To apply: E-mail a cover letter, CV, and contact info for three references to RYAN CHOI (Ryan.choi@aggiemail.usu.edu). Please state your interest in the field technician position in the subject line of your e-mail. Review of applications will begin March 1, and continue until the position is filled.

For more info, contact:

Ryan Choi
Department of Wildland Resources
Utah State University
5230 Old Main Hill
Logan, UT 84322

Job to help Protect Elepaio (Oahu)

Pono Pacific is looking to fill positions on the island of Oahu to protect the 'elepaio (*Chasiempis sandwichensis ibidis*) a native Hawaiian forest bird. The 'elepaio are found in both the Koolau and Waianae Mountains but their number has decreased dramatically over the last couple decades.

Positions Requires:

- Being physically fit (Need to be able to hike 5-7 miles with forty pound back pack comfortably)
- Being able to hike on very steep terrain.
- Being comfortable in outdoor setting
- Experience using binoculars
- Be willing to work in adverse weather condition
- Desire to protect Hawaii's native species
- Must have basic knowledge Hawaii's natural resources
- Be willing to dispatch 'elepaio predators (Black Rats)

Positions Benefits:

- Health Care
- First Aid CPR Certification
- Equipment Stipend
- Awesome Work Environment
- Hourly pay: \$11.00
- Great Experience in learning more about Hawaii's Natural Resources

If interested please email your resume or to learn more contact Matthew Bauer at matthew.bauer@ponopacific.com

APPENDIX F

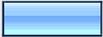


SURVEY MONKEY

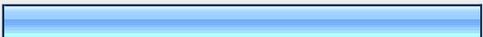
CULTURAL AND NATURAL RESOURCE MANAGEMENT

CAREER SURVEY AND RESULTS

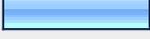
Cultural & Natural Resource Management Career Survey

1. Does your organization or business have any jobs available now?			Response Percent	Response Count
Yes			10.5%	2
No			89.5%	17
			If so, what are they?	5
			<i>answered question</i>	19
			<i>skipped question</i>	0

2. Do you anticipate any new jobs or openings in the next 12 months?			Response Percent	Response Count
Yes			31.6%	6
No			68.4%	13
			If so, what types of positions?	7
			<i>answered question</i>	19
			<i>skipped question</i>	0

3. Do you anticipate any growth in your industry in the next two to three years?			Response Percent	Response Count
Yes			52.6%	10
No			52.6%	10
			If so, please comment.	8
			<i>answered question</i>	19
			<i>skipped question</i>	0

4. Which of the following would provide adequate preparation for positions in your organization or business? Check all that apply.

		Response Percent	Response Count
Job-related Certificates		52.6%	10
Two-year Associate's Degree		78.9%	15
Four-year Bachelor's Degree		84.2%	16
None of the above		15.8%	3
		<i>answered question</i>	19
		<i>skipped question</i>	0

5. Is there any specialized training necessary for positions at your organization or business?

		Response Percent	Response Count
Yes		73.7%	14
No		26.3%	5
		If so, please elaborate.	14
		<i>answered question</i>	19
		<i>skipped question</i>	0

6. What would be the entry-level salary range for positions at your organization or business that require a two-year degree?

		Response Count
		17
		<i>answered question</i>
		17
		<i>skipped question</i>
		2

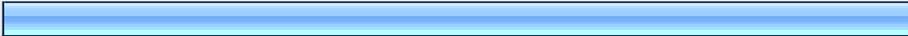
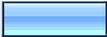
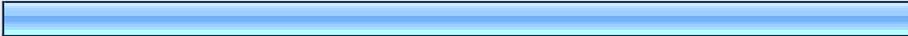
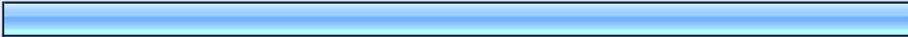
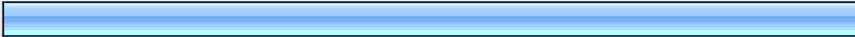
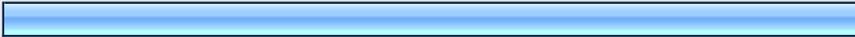
7. Do you believe the addition of an Associate in Science degree in Cultural and Natural Resource Management at Maui Community College has merit; regardless of the amount of current job openings?

		Response Percent	Response Count
Yes		89.5%	17
No		15.8%	3
Please indicate reasons.			11
answered question			19
skipped question			0

8. Are you aware of the 'Aha Kiole and 'Aha Moku Councils; as mandated by the State Legislature?

		Response Percent	Response Count
Yes		73.7%	14
No		31.6%	6
If yes, do you think there may be opportunity for full or part-time employment for community members should the councils get the go-ahead? Please describe.			11
answered question			19
skipped question			0

9. Please provide the following information for our database.

		Response Percent	Response Count
Name:		100.0%	18
Company:		100.0%	18
Address:		100.0%	18
Address 2:		11.1%	2
City/Town:		100.0%	18
State:		100.0%	18
ZIP/Postal Code:		100.0%	18
Email Address:		94.4%	17
Phone Number:		94.4%	17
		<i>answered question</i>	18
		<i>skipped question</i>	1

Q1: Does your organization or business have any jobs available now?

From Cultural & Natural Resource Management Career Survey

Updated: 04/03/09

1. "There are Conservation and Resources Enforcement Officer positions open however, currently frozen."
2. "Fishery Technician positions to conduct resource surveys"
3. "Fishery Technician positions to conduct resource surveys"
4. "We would hire more positions if funding were available. I think this is a nationwide issue and not indicative of Natural resources or need."
5. "GIS Technician II"
6. "We are a small, all volunteer group trying to help people live more sustainably. We are not a 'business' at all. We don't have our own Board or non-profit status. We have a Fiscal Sponsor, or umbrella organization that allows us to accept tax deductible donations."

Q2: Do you anticipate any new jobs or openings in the next 12 months?

1. "CREO positions may open if economy improves."
2. "Interpretive naturalist (working w/ visitors in visitor centers), resource management field labor, fee collection/permits."
3. "Unless funding turns around"
4. "POSSIBLY - but by no means certain - an Executive Director, but it depends on our growth and funding."
5. "Reserve Ranger"
6. "Nursery worker"
7. "Possible if successful in Grant applications."

Q3: Do you anticipate any growth in your industry in the next two to three years?

1. "When economy improves"
2. "We are expecting cutbacks and waiting to see if outside funds might be available to help us with matching funds to expand projects."
3. "We may or may not, depending on budgets. We always have a need for more staff, but hiring depends on budgets."
4. "Optimistic"
5. "Mostly in private sector, some in public sector"
6. "We aren't an industry, but Sustainability Group. I certainly anticipate growth in that area, just not sure how it will affect our group."
7. "Hoping for increased reforestation efforts and landscaping with native plants"
8. "Social service, alternative healthcare and agricultural industries help to address current needs."

Q5: Is there any specialized training necessary for positions at your organization or business?

1. "Education can meet minimum qualifications however; 1 year law enforcement can also qualify."
2. "I would suggest everyone be certified with basic CPR, first aid, etc. They need to be prepared. Scuba, mixed gas, and re-breather certifications would make them better qualified along with a Captain's license or if they work on boats, they should keep track of their sea time. Maintenance would also make them better prepared though not necessarily required. Similar to backgrounds in an assortment of software, they need to be computer literate. For example, knowing word processing, entering data on spreadsheets or databases, create presentations, including using and searching on the Internet. They need to be independent as well as confident in asking for assistance. It would be helpful if they have social skills to be comfortable to talking with individuals to making interactive presentations. They need to be confident. With improvements in technology, it seems GIS use will be increasing, using and understanding gps to obtain tracks and waypoints, depth recorders, full use of cell phones to be aware of other functions such as photos or text messaging. I'm sure some of these functions will be mixed and new technology will be smaller and possibly water proof for underwater use."
3. "Applicants for federal positions are ranked by education and experience. Any degree is helpful, but specifically, any and all the sciences can be useful in most of the non-administrative positions. Knowledge of the Hawaiian language is a competitive advantage for our region."
4. "Here is a job description for an entry level position with us for you to consider. We also have more technical positions.

WMMWP FIELD ASSISTANT – ID# 25385. Pacific Cooperative Studies Unit. Two (2) Regular, Full-Time, RCUH Non-Civil Service positions with the Pacific Cooperative Studies Unit (PCSU), West Maui Mountains Watershed Partnership (WMMWP), located in Wailuku/Lahaina Districts with offices in Napili, Maui, Hawaii. Continuation of employment is dependent upon program/operational needs, satisfactory work performance, and availability of funds. Monthly Salary: \$1,664.00-\$2,582.00. Duties: Will serve as a field crew member building and maintaining fence lines, controlling feral animal populations, locating and controlling alien plant invasions using mechanical and chemical means, monitoring native vegetation/ecosystem recovery, and performing other duties as assigned. Work will focus on the protection of the native Hawaiian forest and related water resources within the ~50,000 acres of forested watershed in the West Maui Mountains. Majority of the work will be performed in remote locations and will require the ability to backpack up to 12 miles over rough terrain or thick unmarked trail conditions with loads up to 50 pounds, camp out in remote areas under extreme conditions for up to a week at a time. Fieldwork requires working with herbicides, working in and around helicopters, and occasional rappelling. Records detailed field data and spatial information and inputs data into Global Positioning System (GPS) and computer systems. Maintains field equipment, tracks supply inventories, and assists with public relations activities. Minimum Qualifications: Education: High School Diploma or General Education Development (GED). Experience: Up to one (0-1) year of experience in field activities related to Natural Resource Management. Abil/Know/Skills: Knowledge of native Hawaiian flora and fauna and threats from alien species. Ability to operate power tools including chain saws, weed eaters, generators, chipper, etc. Ability to communicate orally and in writing and to comprehend complex verbal and written instructions. Ability to use a compass and other navigation tools and to read and navigate with topographic maps and aerial photos. Must hold a valid current driving license and be able to drive a 4-wheel drive vehicle with manual transmission. Post Offer/Employment

Conditions: Must be able to complete basic helicopter safety course and rappelling training within 12 months of hire. Must be able to pass federal firearms certification and legally possess firearms. Physical/Medical Requirements: Ability to hike and camp in remote areas and rugged terrain under inclement weather conditions, up to five (5) consecutive days. Able to backpack and life and carry 50 pounds. Field work may involve elevation changes up to 4,500 feet in a day. Must not be acrophobic (afraid of heights). Fieldwork requires the ability to drive project vehicles both on and off road; and within the scope of training, do occasional rappelling, work in and around helicopters, and handle pesticides. Desirable Qualifications: Field work with emphasis on feral animal and alien plant control with a land management agency. Previous fence building or construction experience. Familiarity with computers, data entry, and use of Global Positioning System (GPS) units. Experience working in and around helicopters and using herbicides to control weedy vegetation. Rappelling experience. College courses or degree in Natural Sciences. Possess valid State of Hawaii Hunting License."

5. "On the job training the best"
6. "Field survey techniques, cartography skills, basic math/stats, native species ID, good verbal and written communication skills, basic computer skills"
7. "Wilderness 1st Aid/1st Responder training, on the job botanical id training"
8. "Geographic applications (such as GIS or GPS), computer data management, practical knowledge of specific areas of interest (planning, engineering, resource management, emergency services, etc)"
9. "I'm sure if we hired an Executive Director, some similar experience would be looked for, perhaps more important than education which is why I checked every box in previous question."
10. "Administration of Justice, or the Malama Ahupuaa would be the best"
11. "Cultural resource experience/ Hawaiian language"
12. "Law Enforcement Experience"
13. "Combining cultural practices e.g., to malama aina, social service skills, and business applications help to support current and developing practices in the industry I am involved in."
14. "Depends on job opening...varies"

Q6: What would be the entry-level salary range for positions at your organization or business that require a two-year degree?

1. "\$34,000 / yr."
2. "We have intermittent divers that dive for a wage (\$10/hr). They help us conduct surveys and monitoring of aquatic habitats."
3. "This varies considerably. Safe to say, approximately \$30K annually, although those with more experience and degrees can enter at \$40K."
4. "30k plus benefits"
5. "My current position is appointed, so there is no salary range."
6. "\$28K"
7. "\$13/hr"
8. "Approx \$37,000/year."
9. "Non profit so no pay"
10. "35K"

11. "24,000+"
12. "\$ 41,040 - \$ 19.73 Hourly"
13. "14\$/hr"
14. "Approximately \$30k"
15. "35,000"

Q7: Do you believe the addition of an Associate in Science degree in Cultural and Natural Resource Management at Maui Community College has merit; regardless of the amount of current job openings?

1. "Need to develop local pool of applicants that also have practical experiences."
2. "As described above, it would make them better prepared to work in Hawai'i and understand local actions. It would be very helpful to folks who were not born and raised in the islands."
3. "It starts closest to the home of the student. The area they care about. We need competitive applicants who come from Maui!"
4. "It has been a long standing issue that more local people are needed to fill vacancies in the conservation field. In order to do that, they need to have the experience and education to qualify them to compete."
5. "Would supply necessary skills for an entry level position or open doors for a higher degree"
6. "I don't have enough information to answer this question. I don't understand what the degree would cover, but by the name, I like the idea of 'Natural Resource Management'."
7. "No just go to the work OJT the best"
8. "Excellent core of classes for all people who want to contribute to the future of Hawaii Nei."
9. "Provides the individual a good understanding of some important aspects that he will be dealing with if he makes Conservation Enforcement a career choice."
10. "We all need to develop more awareness about our resources and the influences that have a detrimental or positive impact on them and eventually our families, friends and associates. It's all relative and important."

Q8: Are you aware of the 'Aha Kiole and 'Aha Moku Councils; as mandated by the State Legislature?

1. "Not sure"
2. "It seems too many things are being ""anticipated"" when the councils are not yet established. It needs to be fully-funded, provided administrative and personnel support, and functioning."
3. ", "Not sure. Don't know that much about them."
4. "On a limited basis, yes. For most jobs, specific skills, education, and experience are required."
5. "Possibly...depends on economic conditions at the time."
6. "I think there is a need to collect and compile data related to traditional land divisions and spatial relationships of the resources within those divisions. I think these can give insight into the concepts of sustainability within an island (Hawai`ian) context."

7. "I have heard of Aha Moku Councils, but don't know much about them except that there would be meetings of these councils. Not sure what intended outcome."
8. "Yes, this council is the necessary to save Hawaii from becoming someplace else. We are still losing our special identity, because too many outsiders are involved in much of the decision making, and the cultural component is missing almost all the time."
9. "They would certainly need members who are qualified and possess an understanding of the issues."
10. "Yeah, if you're willing to volunteer :) Don't know the specifics behind the legislation and so far I'm unaware of any sustainable funding to support these type of initiatives. Interestingly, we have the vision to acknowledge the importance of land use decisions but by our actions indicate that we value other initiatives more when it comes to our culture and money? The issues viewed as more important and the long term strategies they support still appear to have greater leverage from the politically active masses."

APPENDIX G

MĀLAMA



AHUPUĀĀ

PROPOSED DEGREE BUDGET

ACADEMIC COST AND REVENUE TEMPLATE

	A	B	C	D	E	F	G	H	I	J	K
1	Academic Cost and Revenue Template - New Program (adjust template for appropriate number of years)										
2											
3	ENTER VALUES IN HIGHLIGHTED CELLS ONLY										
4	CAMPUS/Program										
5	Provisional Years (2 yrs for Certificate, 3 yrs for Associate Degree, 6 yrs for Bachelor's Degree, 3 yrs for Masters Degree, 5 yrs for Doctoral Degree)										
6			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6			
7	ENTER ACADEMIC YEAR (i.e., 2004-05)			2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-15		
8	Students & SSH										
9	A. Headcount enrollment (Fall)		12	22	26	28	29	30			
10	B. Annual SSH		276	554	664	716	745	774			
11											
12	Direct and Incremental Program Costs Without Fringe										
13	C. Instructional Cost without Fringe		\$ 22,770	\$ 23,681	\$ 24,628	\$ 32,443	\$ 33,741	\$ 35,091			
14	C1. Number (FTE) of FT Faculty/Lecturers		-	-	-	-	-	-			
15	C2. Number (FTE) of PT Lecturers		0.63	0.63	0.63	0.79	0.79	0.79			
16	D. Other Personnel Costs		\$ 46,080	\$ 62,743	\$ 65,253	\$ 67,863	\$ 70,578	\$ 73,401			
17	E. Unique Program Costs		\$ 55,100	\$ 52,300	\$ 69,100	\$ 63,300	\$ 61,300	\$ 62,300			
18	F. Total Direct and Incremental Costs		\$ 123,950	\$ 138,724	\$ 158,981	\$ 163,606	\$ 165,619	\$ 170,791			
19											
20	Revenue										
21	G. Tuition		\$ 21,804	\$ 48,752	\$ 64,408	\$ 69,452	\$ 72,265	\$ 75,078			
22	Tuition rate per credit		\$ 79	\$ 88	\$ 97	\$ 97	\$ 97	\$ 97			
23	H. Other		\$ 108,000	\$ 108,000	\$ 108,000	\$ 108,000	\$ 108,000	\$ 108,000			
24	I. Total Revenue		\$ 129,804	\$ 156,752	\$ 172,408	\$ 177,452	\$ 180,265	\$ 183,078			
25											
26	J. Net Cost (Revenue)		-5,854	-18,028	-13,427	-13,846	-14,646	-12,287			
27											
28											
29											
30	Program Cost per SSH With Fringe										
31	K. Instructional Cost with Fringe/SSH		\$ 87	\$ 45	\$ 39	\$ 48	\$ 48	\$ 48			
32	K1. Total Salary FT Faculty/Lecturers		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -			
33	K2. Cost Including Fringe of K1		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -			
34	K3. Total Salary PT Lecturers		\$ 22,770	\$ 23,681	\$ 24,628	\$ 32,443	\$ 33,741	\$ 35,091			
35	K4. Cost Including fringe of K3		\$ 23,909	\$ 24,865	\$ 25,859	\$ 34,065	\$ 35,428	\$ 36,845			
36	L. Support Cost/SSH		\$ 214	\$ 214	\$ 214	\$ 214	\$ 214	\$ 214			
37	Non-Instructional Exp/SSH		\$ 175	\$ 175	\$ 175	\$ 175	\$ 175	\$ 175			
38	System-wide Support/SSH		\$ 39	\$ 39	\$ 39	\$ 39	\$ 39	\$ 39			
39	Organized Research/SSH										
40	M. Total Program Cost/SSH		\$ 301	\$ 259	\$ 253	\$ 262	\$ 262	\$ 262			
41	N. Total Campus Expenditure/SSH		\$ 385	\$ 385	\$ 385	\$ 385	\$ 385	\$ 385			
42	O. Comparable Cost/SSH										
43	Program used for comparison:		There is no comparable program.								
44											

Appendix G

Cultural and Natural Resource Management A.S. Degree Budget Justification

	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
Year	1	2	3	4	5	6
Resident	12	8				
		14	11			
			15	12		
				16	13	
					16	14
	0					16
% retention		67%	79%	80%	81%	88%
A. Headcount enrollment (Fall)	12	22	26	28	29	30

A. The table above reflects the derivation of fall headcount enrollment figures in the Academic Cost and Revenue Template, Line A. Headcount enrollment was projected by estimating number of students starting the first year. It is a reasonable assumption that not all students will move into the second year so the table reflects some attrition of a cohort into the second year. As the program matures, it is reasonable to assume a slight increase in students per year and an increase in retention of those students.

B. The SSH is based on the Fall headcount enrollment of full time students. First year students would take 23 credits in the major the first year and 29 credits in the second year. SSH was calculated by the number of students in year one multiplied by 23 credits plus the number of students in year two multiplied by 29 credits.

C1. No full time faculty or full time lecturers will be hired because courses required for this degree are already being taught as part of other programs or can be covered with existing faculty or are currently being covered by part time lecturers.

C2. Part time lecturers will be needed to cover courses currently being taught by part time lecturers (BIOL 105 & GIS 150), and part time lecturers may be needed to fill behind current instructors in Agriculture and Administration of Justice to teach classes in these areas. Therefore the assumption was made in year 1-3 15 credits lecturer credits per year would be sufficient. As the number of students grew, 19 lecturer credits would be adequate to cover all classes.

D. Other personnel costs include a full time grant coordinator whose duties include recruitment, retention and data collection; a ¼ FTE counselor for CNRM students; and 30 hours per week for student assistants.

Appendix G

E. Unique program costs

Year	1	2	3	4	5	6
Computer Software & hardware	\$26,000	\$5,000	\$5,000	\$21,000	\$10,000	\$5,000
Dues and Subscriptions	\$500	\$500	\$500	\$500	\$500	\$500
Equipment	\$0	\$25,000	\$35,000	\$20,000	\$22,000	\$35,000
Travel -Intra & out of state	\$8,600	\$1,800	\$8,600	\$1,800	\$8,800	\$1,800
Library	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Marketing, Advertising	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Supplies & lab supplies	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000
Other Misc. Costs	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
	\$55,100	\$52,300	\$69,100	\$63,300	\$61,300	\$62,300

Unique program costs include money for software and computer purchases and upgrades in year one and four. Equipment money is included to purchase high ticket items if needed. (for example \$35,000 in FY2011 for a replacement tractor) As a STEM degree, lab and other supplies are demanded so \$12,000 per year was budgeted. Two thousand dollars was earmarked for marketing and advertising to promote the program and attract students. The Librarian indicated \$5000 per year would be desirable for this program for library subscriptions and purchases. Every other year, the budget includes \$8000 for the USDA CSREES grant PD and three others to travel to Alaska for the annual grant conference. Intra-state travel for meetings or conferences is included and increases every other year to attend the annual USDA CSREES conference when it is held in-State.

G. Tuition was calculated by multiplying SSH by the tuition rate of the community colleges including any known tuition increases.

H. The program receives \$108,000 per year from the USDA CSREES Consortium grant. This grant is expected to continue funding into 2015.

K1. Since the majority of courses required for this degree are already being taught for other programs, no full time faculty will need to be hired.

K2. Two courses (8 credits) required for this degree are currently taught by part time lecturers. Therefore 15 credits are budgeted for part time lecturers in FY 2010-FY2012 to provide an additional two courses for fill-behind for full time faculty. In FY2013-2015 and additional 4 credits for part-time lecturer were added to accommodate more students. The cost for lecturers was determined using \$1518 per credit in FY 2010 with a 4% increase in \$/credit per year.

O. Although there is no perfectly comparable program, Hawaii Community College is the best match because this campus has an Agriculture program, the Forest Team

Appendix G

program, Hawaiian Lifestyles program an Environmental Studies ASC. The average costs are comparable to Hawaii Community College.

APPENDIX H

MĀLAMA



AHUPUĀĀ

CULTURAL AND NATURAL RESOURCES PROGRAM

SEQUENCE MAPS

CIRRICULUM REQUIREMENTS

Appendix H
AGRICULTURE & NATURAL RESOURCES

Cultural and Natural Resource Management – Mālama Ahupua‘a

Requirements for A.S. Degree (64-66 credits)

General Education requirements (22 credits):

ENG 100 (3)

HWST 107 (3)

SP 151 (3) or COM/BUS COM 130 (3)

BOT 105/HWST 211 (3)

MATH 100 (3) or MATH 103 (3) or MATH 115 (3) or higher

AG 200 (4)

ICS 101 (3) or BUSN 150 (3)

Core courses for A.S. Degree – all specialties (23 credits)

HWST 100 B, C, D (3)

HWST 207 (3)

ECON 120 (3) or ECON 130 (3)

AG 230 (3)

BIOL 124 (3)

BIOL 105 (4)

GIS/ICS 150 (4)

Cultural and Natural Resource Management and Enforcement Specialty – Kia‘i studies (19-21 credits)

AJ 240 (3)

6-8 elective credits (2 courses) from:

AJ 223 (3) or AJ 200 (3)

AJ 224 (3), AJ 103 (3), AJ 221 (3)

POL 180 (3)

HAW 101 (4), HAW 102 (4)

ANTH 210 (3) and ANTH 210 L (1)

Ethnobotany and Food Security Specialty – Mala studies (20 credits)

AG 265 (4)

9 elective credits (3 courses) from:

AG 122 (3)

AG 235 (3), AG 251 (3), AG 174 (3)

AG 253 (4)

AG 281 (3), HWST 213 (3)

Natural Resource Management Specialty – Mālama ‘aina studies (19-21 credits)

AG 174 (3)

3-4 elective credits (1 course) from:

AG 281 (3)

AJ 240 (3)

AG 265 (4)

BIOL 200 (4)

AG 122 (3)

AG 201 (3)

OCN 201 (3) or ZOOL 200 (4)

Appendix H

**Cultural and Natural Resource
Management – All Specialties**

YEAR 1	<u>FALL</u> ENG 100 (3) ICS 101 or BSN 150 (3) HWST 107 (3) AG 200 (4) <u>specialty elective (3-4)</u> 16+	<u>SPRING</u> MATH 100 or 103 or 115 (3) HWST 100 BCD (3) GIS 150/ICS 150 (4) BIOL 124 (3) <u>specialty elective (3-4)</u> 16+
YEAR 2	<u>FALL</u> BIOL 105 (4) ECON 120 or 130 (3) Bot 105/HAWST 211 (3) specialty elective (3) <u>specialty elective (3-4)</u> 16+	<u>SPRING</u> HWST 207 (3) AG 230 (3) SP 151 or COM 130 (3) specialty elective (3) <u>specialty elective (4)</u> 16+

APPENDIX I

MĀLAMA



AHUPUĀĀ

CULTURAL AND NATURAL RESOURCES

PROGRAM LERNING OUTCOMES (PLO)

Assessment of Intended Program Learning Outcomes for Cultural & Natural Resources Management AS Degree										
CODE										
3 = A focus of course										
2 = Evaluate using outcome										
1 = Not evaluated										
0 = Not included										
	Program Requirements									
				HWST211/						ECON 120
	HWST107	HWST 100	HWST 207	BOT 105	AG 200	BIOL 124	BIOL105	ICS/GIS 150	AG 230	ECON 130
SCIENCE										
Identify best natural resource management practices using sound biological & scientific principles.	0	0	1	1	2	2	3	2	0	0
HAWAIIAN CULTURE										
Synthesize Hawaiian perspectives of cultural & natural resource management.	1	2	3	2	0	0	1	0	0	0
ECONOMICS										
Explain the relationship between economics and cultural and natural resource management policies	0	0	1	0	1	0	1	1	3	2
Overall										
Evaluate management practices (issues, challenges) from different perspectives.	1	1	3	1	1	2	3	2	1	1

CONCENTRATIONS											
<i>Kia'i</i>	AJ 240	AJ 223	AJ 200	POL 180	ANTH 210		AJ 103	AJ 224	AJ 221	HAW 101	HAW 102
Identify best natural resource management practices using sound biological & scientific principles.	1	0	0	0	0		0	0	0	0	0
Synthesize Hawaiian perspectives of cultural & natural resource management.	2	0	0	1?	1		0	0	0	1	2
Explain the relationship between economics and cultural and natural resource management policies	3	0	0	2	1		0	0	0	0	0
Evaluate management practices (issues, challenges) from different perspectives.	2	0	0	1	1		0	0	0	0	0
Apply, using legal/ethical parameters, knowledge of laws, rules of evidence and confidentiality relevant to cultural and natural resource management.	2	3	3	1	0		3	3	3	0	0

<i>Mala</i>	AG 122	AG 265	AG XX		AG 235	AG 251	AG 174	AG 281	HWST 213		
Identify best natural resource management practices using sound biological & scientific principles.	3	3	3		2	2	3	3	2		
Synthesize Hawaiian perspectives of cultural & natural resource management.	0	2	3		0	0	0	0	3		
Explain the relationship between economics and cultural and natural resource management policies	2	1	1		1	3	1	1	1		
Evaluate management practices (issues, challenges) from different perspectives.	1	3	3		0	1	1	2	2		
Produce native and polynesian crops in a sustainable manner.	2	3	3		1	3	2	2	1		

<i>Malama 'aina</i>	AG 174	AG 281	Ag 265	AG 122	OCN 201	ZOOL 200		AJ 240	BIO 200	AG 201	
Identify best natural resource management practices using sound biological & scientific principles.	3	3	3	3	3	3		1	3	3	
Synthesize Hawaiian perspectives of cultural & natural resource management.	0	0	2	0	0	0		2	0	0	
Explain the relationship between economics and cultural and natural resource management	1	1	1	1	1	1		1	1	1	
Evaluate management practices (issues, challenges) from different perspectives.	2	2	3	2	2	2		2	2	1	

APPENDIX I

MĀLAMA



AHUPUAA

CULTURAL AND NATURAL RESOURCES

CCOWIQ'S

LEARNING OUTCOMES

PLO's with Attributes derived from Intended Student Learner Outcomes Standards														
Standard 1 - Written Communication	ENG 100	COM 130 or SP 151	MATH	BSN 150 or ICS 101	HWST 107	HWST 100 BCD	HWST 207	HWST 211/ BOT 105	AG 200	BIOL 124	BIOL105	ICS/ GIS 150	AG 230	ECON 120 or ECON 130
Program graduates are able to write effectively to convey ideas that meet the needs of specific audiences and purposes.	3	0	0	1	2	2	2	1	3	1	1	1	3	1
Standard 2 - Quantitative Reasoning	ENG 100	COM 130 or SP 151	MATH	BSN 150 or ICS 101	HWST 107	HWST 100 BCD	HWST 207	HWST 211/ BOT 105	AG 200	BIOL 124	BIOL105	ICS/ GIS 150	AG 230	ECON 120 or ECON 130
Program graduates are able to synthesize and articulate information using appropriate mathematical methods and logically address real-life situations.	0	0	3	0	0	0	0	0	0	1	1	2	3	1
Standard 3 - Information Retrieval and Technology (Information Literacy)	ENG 100	COM 130 or SP 151	MATH	BSN 150 or ICS 101	HWST 107	HWST 100 BCD	HWST 207	HWST 211/ BOT 105	AG 200	BIOL 124	BIOL105	ICS/ GIS 150	AG 230	ECON 120 or ECON 130
Program graduates are able to access, evaluate, and utilize information effectively, ethically, and responsibly.	1	1	1	3	1	1	1	1	2	1	1	3	2	2

Standard 4 - Oral Communication	ENG 100	COM 130 or SP 151	MATH	BSN 150 or ICS 101	HWST 107	HWST 100 BCD	HWST 207	HWST 211/ BOT 105	AG 200	BIOL 124	BIOL105	ICS/ GIS 150	AG 230	ECON 120 or ECON 130
Program graduates are able to practice ethical and responsible oral communication appropriate to a variety of audience and purposes.	0	3	0	0	0	2	1	1	2	0	0	1	0	0
Standard 5 - Critical Thinking	ENG 100	COM 130 or SP 151	MATH	BSN 150 or ICS 101	HWST 107	HWST 100 BCD	HWST 207	HWST 211/ BOT 105	AG 200	BIOL 124	BIOL105	ICS/ GIS 150	AG 230	ECON 130
Program graduates are able to apply critical reasoning skills to effectively address challenges and solve problems.	1	2	2	1	1	1	2	2	2	2	2	2	2	2
Standard 6 - Creativity	ENG 100	COM 130 or SP 151	MATH	BSN 150 or ICS 101	HWST 107	HWST 100 BCD	HWST 207	HWST 211/ BOT 105	AG 200	BIOL 124	BIOL105	ICS/ GIS 150	AG 230	ECON 120 or ECON 130
Program graduates are able to express original ideas through a variety of forms.	3	3	0	0	1	2	1	1	0	0	0	0	1	0