

HSU Academic Program Criteria
Academic Program in Forestry
October 10, 2008

I. The Vision for Humboldt State University

A distinctive character of the programs in Forestry at Humboldt resides in our focus on the sustainable management of forest resources. While many natural resources-related programs around the nation have shifted to “the study of” or the “the science of”, our department remains steadfast in its commitment to prepare individuals for careers in the sustainable management of the resources we use. Humboldt has a well-established reputation for producing graduates who are technically well-prepared, who have a grasp of the basic and applied natural sciences, social sciences, and analytical skills, and who are capable of participating in the management decision-making process at a professional level upon graduation. This department is committed to hands-on, experiential education that promotes basic and applied knowledge, technical and analytical skills, and professional qualities in our graduates. Our program thus fosters knowledge of forest-based resources broadly conceived. Through our educational programs we strive to serve the needs of the state of California, the western region, the nation, and the world for highly qualified professional forestland managers. The fact that we are the largest Forestry Program in California and the states composing the Western University Exchange Program is evidence that Humboldt is the campus of choice for individuals who seek above all else to improve the human condition and our environment.

It is because Forestry is an inherently interdisciplinary profession that we have been able to meet the needs of students and a society with diverse values. Our program rightfully depends on the integration of work across the full complement of natural resource programs at Humboldt as well as the vast array of forestry professionals and organizations in the area. Three strategies enable us to maintain the interdisciplinary character of our program. The first strategy is to maintain a breadth of expertise within the department, including biology, measurements, management, and policy. The second strategy is to call upon the expertise of faculty from other closely-related programs for both required and elective courses in our major. We work with faculty from Environment and Natural Resource Sciences, Biological Sciences, Fisheries, Wildlife, Environmental Science, Range Resources, Wildland Soils, and Mathematics and use them to

supply parts of the program requiring their expertise. As examples, our students may take advanced courses in biometry, wilderness area management, conflict resolution, economics, and range management, among others, from faculty in other departments. The third strategy is to develop meaningful relationships with the large number of professionals and organizations in forestry that exist in the area and then seek opportunities to collaborate on teaching and scholarship. For example, senior forestry students regularly work on capstone projects that bring them into meaningful contact with professional land managers in both private and public agencies. According to a 2003 survey by Career Development, 84% of our Forestry graduates found jobs related to their major, second only to Nursing graduates. Trends in hiring of graduates from the last few years suggest the rate now exceeds 90%. In article by Paul Mann published in Humboldt Now (*Natural Resources Jobs in High Demand* by Paul Mann published on-line August 13, 2008 <<http://now.humboldt.edu/news/natural-resource-jobs-in-high-demand/>>.), it was noted that *Green Diamond Resources Company*, a progressive forestry company here in northern California, filled 43 management and technical positions between January 1 and July 15, 2008, with 31 of the 43 positions going to Humboldt State graduates. The strong demand for our graduates from employers is strong evidence that Humboldt Forestry is indeed a premier center for the interdisciplinary study of the environment and its natural resources.

Our program provides sufficient background and depth of education to give a sound basis for professional growth within the broad range of forestry-related careers. Our graduates often start as forest rangers, park rangers, fire fighters, timber cruisers, or surveyors. Some hold staff positions in the forest products industry or with environmental organizations. Graduates go on to build careers in forest management, forest protection, park management, watershed management, forest biology, forest engineering, industrial forest management, resource planning, forest conservation, and education. There are few other programs at Humboldt that can match Forestry for the opportunity afforded graduates to pursue careers related to their majors here in northern California. These are good jobs, the type in which one can support a family, put down roots in the community, and make a meaningful contribution to life on the North Coast.

II. Demand

A. Internal demand for the degree program and courses in the degree program

1. Headcount Data

NA = Not Applicable because the Option was not in existence

Major Academic Year (Fall/Spring) Average Headcount Summary									
Majors_overview_FOR report generated: 16-APR-08									
Major Code	Major Description	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
FOR	Forestry (pre-major status)	161	144	129	113	102	83	68	56
FOPM	Forestry (Production Mgmt)	3	4	3	7	7	9	14	16
FORC	Forestry (Resource Conserv)	15	15	13	16	16	18	18	31
FORF	Forestry (Wildland Fire Mgmt) Began F2003	NA	NA	NA	2	9	17	24	33
FORH	Forestry (Hydrology) Began F2001	NA	1	1	4	4	6	13	13
FORL	Forestry (Soils) Began F2005	NA	NA	NA	NA	NA	0	2	5
FORM	Forestry (Resources Mgmt)- Discontinued F2005	12	10	12	16	11	7	6	3
FORS	Forestry (Resources Science)- Discontinued S1992	1	1	0	0	0	0	0	1
Total		191	173	157	157	147	139	143	156

Second Majors by Academic Year (exclusive of primary majors)									
Majors_overview_FOR report generated: 16-APR-08									
Major Code	Major Description	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
FOR	Forestry (pre-major status)	2	3	2	2	2	0	0	0
FORC	Forestry (Resource Conserv)	0	0	0	0	0	1	1	1
FORF	Forestry (Wildland Fire Mgmt)	NA	NA	NA	0	0	0	0	1
FORH	Forestry (Hydrology)	NA	0	0	1	1	0	0	0
Total		2	3	2	3	3	1	1	2

Minors enrolled AY Average in Forestry								
minors_enrolled_FOR report generated: 06-MAR-08								
CLASS	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Soph	0	0	0	1	1	0	0	0
Jr	1	1	0	1	4	0	0	0

Sr	6	4	5	5	5	6	5	3
	6	5	5	7	9	6	5	3
Minors enrolled AY Average in Watershed Management minors_enrolled_WSHD report generated: 06-MAR-08								
CLASS	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Jr	1	0	1	1	0	0	0	0
Sr	0	0	0	3	4	4	3	1
	1	0	1	4	4	4	3	1

Majors by Sex and Ethnicity Majors_overview_FOR report generated: 16-APR-08									
SEX	Ethnicity	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Female	Asian	1	0	0	0	1	2	2	3
	Black	0	0	0	1	0	1	1	0
	Hispanic	4	4	3	3	4	6	6	3
	Native Amer	1	0	1	3	4	2	1	2
	Pacific Is	1	0	0	0	0	0	0	0
	White	34	26	24	28	22	19	14	19
	Other	2	0	0	2	3	3	3	2
	Unknown	5	5	6	5	5	4	4	4
sum		47	34	34	41	38	36	30	32
Male	Asian	3	5	3	1	2	6	6	8
	Black	1	1	0	0	0	1	3	1
	Hispanic	13	9	6	5	6	9	9	9
	Native Amer	3	3	2	3	3	2	4	4
	Pacific Is	0	1	2	2	2	0	1	0
	White	97	93	79	76	75	65	67	80
	Other	5	4	3	4	5	8	12	12
	Unknown	24	25	30	27	17	15	12	12
sum		144	139	124	117	109	103	114	124

Forestry (with options) Degrees Awarded (incl. primary and second majors) degrees_awarded_B_FOR report generated: 25-JUN-08										
MAJOR	AY 99/00	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08	
Forestry (pre-major status)	0	0	0	0	0	1	2	0	1	
Forestry (Production Mgmt)	12	6	6	2	13	9	7	4	6	
Forestry (Resource Conserv)	16	12	13	13	7	8	9	10	9	

Forestry (Wildland Fire Mgmt) Began F2003	NA	NA	NA	NA	1	5	7	6	4
Forestry (Hydrology) Began F2001	NA	NA	0	0	5	5	4	2	3
Forestry (Soils) Began F2005	NA	NA	NA	NA	NA	NA	0	0	1
Forestry (Resources Mgmt)- Discontinued F2005	19	12	20	19	5	6	2	3	1
Forestry (Resources Science)- Discontinued S1992	3	1	1	0	0	0	0	0	0
sum	50	31	40	34	31	34	31	25	25

Forestry Degrees Awarded by Sex and Ethnicity (incl. primary and second majors)									
degrees_awarded_B_FOR report generated: 25-JUN-08									
SEX	Ethnicity	AY 99/00	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07
Female	Black	1	0	0	0	0	0	0	0
	Hispanic	1	1	0	1	1	0	0	1
	Native Amer	1	1	0	0	0	1	1	0
	White	4	5	10	6	4	6	7	2
	Unknown	2	0	0	1	1	1	2	2
sum		9	7	10	8	6	8	10	5
Male	Asian	1	1	0	0	0	0	0	0
	Hispanic	1	0	1	4	0	0	2	3
	Native Amer	2	0	0	1	1	0	0	0
	Pacific Is	0	0	0	0	0	0	0	1
	White	30	21	23	16	16	20	14	13
	Other	3	0	4	1	1	0	2	1
	Unknown	4	2	2	4	7	6	3	2
sum		41	24	30	26	25	26	21	20

Minors Awarded by Year in Forestry									
minors_awarded_FOR report generated: 25-JUN-08									
MINOR	AY 99/00	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	
Forestry	2	5	4	2	2	1	1	3	
Minors Awarded by Year in Watershed Management									
minors_awarded_WSHD report generated: 25-JUN-08									
MINOR	AY 99/00	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	
Watershed Management	1	1	1	0	1	2	1	1	

2. FTES by Course Code

FTES taken in Forestry classes by Majors (AY 02/03 - AY 07/08)								
course_ftes_smry_FOR report generated: 30-JUN-08								
SUBJ	Course level	Student Major	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
FOR	Lower-div	Forestry	19.5	22.5	24.9	24.7	26.9	28.0
		Environmental Science	.6	.5	.8	.7	.8	2.3
		Nat Resources Plng & Interptn	.9	.9	.5	1.0	1.0	2.0
		Undeclared	1.2	1.1	.4	1.0	1.3	1.5
		Biology	.1	.2	.5	.3	1.2	1.2
	Sub-total		26.1	31.1	30.8	31.5	39.1	43.8

FTES taken in Forestry classes by Majors (AY 02/03 - AY 07/08)								
course_ftes_smry_FOR report generated: 30-JUN-08								
SUBJ	SUBJ	SUBJ	SUBJ	SUBJ	SUBJ	SUBJ	SUBJ	SUBJ
FOR	Upper-div	Forestry	44.0	51.2	43.3	33.6	36.0	38.1
		Nat Resources Plng & Interptn	2.0	2.1	2.4	1.6	1.5	2.4
		Rangeland Resource Science	.5	1.0	.1	.8	.8	1.8
		Liberal Studies-Recreation Adm	.1	.3	.6	.7	.3	1.5
		Environmental Science	1.9	1.2	2.3	1.6	1.3	1.4
	Sub-total		62.4	70.2	62.4	54.4	54.8	68.4

FTES taken in Forestry classes by Majors (AY 02/03 - AY 07/08)								
course_ftes_smry_FOR report generated: 30-JUN-08								
SUBJ	Course level	Student Major	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
FOR	All Levels	Forestry	63.8	74.5	68.4	58.3	63.4	66.1
		Natural Resources (Forestry)-Grad	5.9	4.7	2.1	3.6	2.7	6.9
		Nat Resources Plng & Interptn	3.2	3.5	3.4	2.7	3.2	4.6
		Environmental Science	2.5	1.7	3.1	2.2	2.2	3.7
		Rangeland Resource Science	.9	1.2	.6	1.6	1.3	2.9
Total			94.7	106.3	96.9	89.7	99.6	119.6

FTES taken in Watershed Management classes by Majors (AY 02/03 - AY 07/08)								
course_ftes_smry_WSHD report generated: 30-JUN-08								
SUBJ	Course level	Student Major	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
WSHD	Upper-div	Forestry	6.9	7.7	4.8	3.8	4.6	4.9
		Environmental Science	2.8	3.0	2.7	2.1	.8	1.4

		Rangeland Resource Science	.3	.5	.5	.9	.1	.8
		Nat Resources Plng & Interptn	1.7	.8	.6	.7	.4	.7
	Sub-total		17.3	16.1	11.0	9.5	7.7	9.2
	Graduate	Nat Resources (Watershed Mgmt)-Grad	1.0	2.5	2.7	1.4	.8	1.5
		Nat Resources (Plan & Interptn)-Grad	.1	.3	.0	.1	.0	.5
		Environmental Systems (Geol)-Grad	.0	.0	.0	.0	.0	.1
		Natural Resources (Forestry)-Grad	.2	.3	.0	.0	.0	.1
	Sub-total		2.2	5.7	4.0	3.4	1.5	2.4
Total			19.5	21.8	14.9	12.9	9.2	11.6

FTES taken in Watershed Management classes by Majors (AY 02/03 - AY 07/08)								
course_ftes_smry_WSHD report generated: 30-JUN-08								
SUBJ	Course level	Student Major	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
WSHD	All Levels	Forestry	6.9	8.2	4.9	4.2	4.8	4.9
		Nat Resources (Watershed Mgmt)-Grad	1.6	4.2	3.2	1.6	1.2	1.7
		Environmental Science	3.4	4.5	3.3	2.6	.8	1.4
		Rangeland Resource Science	.3	.5	.5	1.0	.1	.8
		Nat Resources Plng & Interptn	1.8	.9	.7	.8	.5	.7
		Nat Resources (Plan & Interptn)-Grad	.5	.4	.0	.3	.2	.7
Total			19.5	21.8	14.9	12.9	9.2	11.6

3. Service to other HSU program/options

The following information was adapted from the course list identified by the Task Force and the University Catalog (08-09).

Other HSU program/option name	Courses required	Restricted electives
GE Lower Division Area A Environmental Science	FOR 100 (3)	
Rangeland Resource Science	FOR 116 (4)	
Natural Resources Planning & Interpretation	FOR 216 (4)	
Environmental Ethics – Minor Natural Resources Planning & Interpretation Rangeland Resource Science Wildland Soil Science	FOR 230 (3)	
Environmental Science Natural Resources Planning & Interpretation Rangeland Resource Science	FOR 231 (3)	
GE Upper Division Area B Environmental Ethics - Minor	FOR 302 (3)	
GE Upper Division Area B	FOR 307 (3)	

Biometry - Minor	FOR 311 (4)	
Environmental Science Natural Resources – Master Natural Resources Planning & Interpretation Rangeland Resource Science Wildland Soil Science	FOR 315 (3)	
Natural Resources Planning & Interpretation	FOR 321 (3)	
Wildland Soil Science	FOR 331 (4)	
Watershed Management - Minor	FOR 365 (4)	
Environmental Ethics – Minor Natural Resources – Master Natural Resources Planning & Interpretation Rangeland Resource Science	FOR 374 (3)	
GE Lower Division Area E Environmental Ethics - Minor Environmental Science	FOR 400 (3)	
Rangeland Resource Science	FOR 422 (3)	
Natural Resources Planning & Interpretation	FOR 423 (3)	
Environmental Science	FOR 430 (3)	
Environmental Science	FOR 431 (3)	
Environmental Ethics - Minor	FOR 432 (4)	
Environmental Science	FOR 468 (3)	
Natural Resources Planning & Interpretation	FOR 506 (3)	
ENVS/Ecological Restoration Option	WSHD 310 (4)	
ENVS/Climate and Energy	WSHD 458 (3)	

4. Comment on the internal demand **FOR EACH OPTION** of the Major. Explain any significant changes in internal program demand over past 7 years. Provide any additional relevant information of internal demand.

Forestry

Forestry is not an option but rather a pre-major. Students who have not identified an option are listed as *Forestry* until the time they select an option. Students are advised to select an option, or multiple options, during their sophomore year or as a new transfer student for a better academic planning experience.

Forestry (Production Management)

This option helps students acquire the professional knowledge and skills needed in today's forest management and operations. Upper division core courses such as Forest Roads (FOR 343), Forest Harvesting (FOR 350) and Harvesting Systems Design & Cost Analysis (FOR 444) provide practical academic background in forest operations. To reflect this demand, we are in the

process of changing the curriculum to include a new lower division core class, Introduction to Forest Operations (FOR 250), required of all Forestry students. Demand for Production Management has remained stable over the most recent years.

Forestry (Resource Conservation)

Enrollment in this option has held relatively steady from AY 00/01 to AY 04/05 at 13 to 16 students. Enrollments increased to 18 in AYs 05/06 and 06/07. In 07/08, demand increased by 72% to 31 students. We expect demand to continue growing in the years ahead, because our enrollments this fall represent a significant increase over the previous 7 academic years. This option has had the second highest headcount over the past few years as well as the highest number of degrees awarded for any option since AY 99/00.

Forestry (Soils)

The forest soil option started in Fall 2005 and is gaining in popularity as students realize that upon graduation they can qualify for both the Forester (GS-460) and Soil Scientist (GS-470) Job Series in federal employment. Students in this option of the Forestry major are likely to have a better background in soil fertility, productivity and management and are better prepared to undertake detailed mapping and interpretation of forest soil resources. Increasing demand in Forest Soils complement the rising numbers of students enrolled in the Wildland Soils option of Rangeland resources science such that upper division course enrollments (annual basis) are on an upward trend (e.g. 68 total in upper division SOIL courses in AY 01/02, 87 total in AY 07/08).

Forestry (Wildland Fire Management)

This option (also known as the Fire Option), has grown tremendously since it was started in Fall 2003. Headcount data for the last two academic years reveal that the Fire Option is the most popular among Forestry's five options. This increase in students is primarily focused in the freshman and sophomore students, with substantial interest from transfer students.

We recently submitted proposed curricular changes that affect the delivery of Fire Option courses, and will likely increase the popularity and internal demand from HSU students.

Specifically, we have taken action to eliminate an upper-division course that suffered from low enrollment and was operationally demanding. We transferred the most relevant information from FOR 422 Wildland Fire Use to a new core course for all Forestry majors, FOR 223 Introduction to Wildland Fire. This introductory course should stimulate interest from undeclared students in Forestry and provide a conduit with few prerequisites for students in other majors who have interests in fire science. Additionally, we proposed adding two upper-division courses, Rangeland Ecology Principles (RRS 370) and Forest Restoration (FOR 431), two subject areas with tremendous relevance for students who work in fire science.

Forestry (Hydrology)

This option was started in Fall 2001 and has seen increasing enrollment during recent years. Student recruitment efforts for this option were severely impaired during the period of 2003-2005 by the departure of two watershed faculty members. There were two watershed faculty and now there are one. Curriculum changes recently approved by the College Curriculum Committee should help increase demand. The total number of units for the option will drop from 133 to 124 units and this alone should increase student interest.

Fire Ecology Minor

Students are enrolled; however, because the program is relatively new no students have been awarded this minor. Efforts to raise student awareness of the option (see efforts in Wildland Fire Management Option above) should help increase enrollment.

Forestry Minor

This minor builds understanding of forest biology and interactions between forests and human demands. It is especially relevant to other natural resources majors planning to work in forested environments. Demand for the minor, as evidenced by eight year trends in minors awarded (~3 per year), has been consistent. No major trends, either positive or negative, are discernible from the data. We expect modest growth in demand in years to come as interest in forestry and natural resource management programs grows.

Watershed Management Minor

Internal demand has been low for this minor. Efforts to raise student awareness of the option should help increase enrollment.

Forest Measurements Certificate

There has been no demand for the Forest Measurements Certificate in recent years and the decision was to stop offering the certificate in AY 07/08.

Wildland Fire Management Certificate

Thirty-nine students were awarded Certificates of Study in Wildland Fire Management in AY 06/07 and 18 were awarded for AY 07/08. Approximately 37 students will be eligible next year and a like number the following academic year. All of these students earned their certificates while attending the “GS-401” courses sponsored by the U.S. Forest Service. These courses are required by the Secretaries of Agriculture and Interior in order to upgrade professional skills of wildland fire fighters. The demand for the certificate will likely continue for years to come.

B. External demand for “graduates” from the program

Forestry

Forestry is not an option but rather a pre-major. See external demand comments for the options.

Forestry (Production Management)

This option prepares students to work as managers and planners in both private industry and public agencies. Such managers are responsible for sustainable forest operations that achieve objectives of forest products companies, forest engineering consulting firms, and government

agencies. The program provides background in the development and design of efficient harvesting operations plans, protection of environmental values during forest operations, supervision of logging crews, design and layout of forest roads, wood procurement, and implementation of forest health restoration projects. This option offers a curriculum that is not available at any other university in California. The California Market Survey (<http://www.labormarketinfo.edd.ca>, 2008) indicated the employment demand for “foresters” is projected to increase by 27.6% over a 10-year period (2006-2016). The following information was adapted from the web site:

Occupation	Projected employment (2006 – 2016)
Forest, conservation, and logging workers	6100
Foresters	1400

Forestry (Resource Conservation)

External demand for this option is very strong, according to “Employment opportunities for college graduates in the U.S. Food, Agricultural, and Natural Resources System” produced by Cooperative State Research, Education, and Extension Service for the period 2005-2010. This report states that there will be over 52,000 job opportunities nationwide, yet only 32,000 graduates. In particular, employment demand/supply data for students in the scientific and engineering category indicates approximately 13,000 employment opportunities and only approximately 7,500 graduates. Similar data are reported for the general category that includes the job title forest manager, 8,000 employment opportunities and only 6,400 graduates. One reason for the increase in demand is due to a large number of baby boomer retirees in the next 5 to 10 years. The Bureau of Labor Statistics reported that 20,000 to 21,000 forest conservation workers will be needed between 2006 and 2016.

Forestry (Soils)

External demand for Forest Soils options will fall along the same trends as other forestry majors, but students will be qualified to compete for the additional position of Soil Scientist (and Soil Conservationist). A search of federal positions using the terms “Forest Soils” found 93 openings (accessed October 8, 2008). Our first graduate with a Forest Soils option, Seth Smith, was

employed as a land surveyor by Green Diamond Resources, immediately after graduation in 2008.

Forestry (Wildland Fire Management)

External demand for Fire Option graduates continues to grow. Graduates from this option are currently employed by federal (USDA Forest Service, USDI National Park Service, Bureau of Land Management, and US Fish and Wildlife Service) and State (primarily CalFire) agencies, as well as with private firms (Green Diamond Resource Company, Humboldt Redwoods Company, The Campbell Group, and others). The Bureau of Labor Statistics predicts that job demand for conservation scientists and foresters is expected to grow by 5 % during the 2006-16 decade, and job demand for fire fighting is expected to grow by 12 % during this decade.

Both the *Association for Fire Ecology* and *International Association for Wildland Fire* anticipate tremendous growth in both public and private sector employment for graduates in the Fire Option. Anecdotally, the federal government predicts 60 % turnover in fire and forestry professionals over the next 5-10 years, and the state agencies predict a 40 % turnover. Any constriction in public agency hiring will increase hiring of contract employees, an area where fire science and management companies are increasing.

Adapted from the Bureau of Labor Statistics: Fire prevention and suppression will become a main activity for some conservation scientists and foresters, especially within the Federal Government, as the human population spreads into previously uninhabited lands. Federal land management agencies, such as the United States Forest Service, have de-emphasized their timber programs and increasingly focused on wildfire suppression and law enforcement, which may require hiring people with other skills.

Forestry (Hydrology)

Adapted from the Bureau of Labor Statistics and California State Employment Department: A growing population places increasing demands on the environment and water resources, creating an urgent need for professionals with training and background in hydrology. Currently there are 1000 hydrologists employed in California with that job title. Employment is expected to grow 30

% to 1300 by 2016. Nationwide, employment of environmental scientists is expected to grow from 92,000 in 2006, to 114,000 by 2016, a 25 % increase. Environmental scientists with the specific hydrologist job title are expected to grow from 8300 to 10,000 employees by 2016, a 24% increase. In addition to job openings from growth of the profession, numerous retirements, advancements and people making career changes will create new openings for hydrologists. The number of qualified hydrologists is limited by the few colleges and universities that offer the training. A number of trends will increase employment opportunities for hydrologists, including the need for storm water management and water conservation, rising sea levels, and deteriorating coastal environments. One measure of the demand for hydrologists is the high salary commanded by members of the profession. The average for hydrologists in the state of California is \$79,177. Nationwide the median salary is \$66,260. Currently the federal website USAJOBS lists 75 federal job listings for hydrologists at all levels. Demand is also high for hydrologists with training and experience in forestry settings. Complying with California Forest Practice rules depends on significant understanding of aquatic resources and potential impacts of forestry operations. The newest approach by timber companies of developing Aquatic Habitat Conservation Plans has created a large demand for forest hydrologists to help actively manage and monitor aquatic resources. Dr. Stubblefield is frequently contacted by agency professionals in Oregon and California looking for recent graduates of our program.

Fire Ecology Minor

External demand for students who choose this minor is hard to gauge. If the student is majoring in an allied natural resource discipline, the demand could be high. These students would bring important knowledge about fire ecology and fuels management to jobs such as wildlife manager, range manager, and natural resource planner.

Forestry Minor

External demand for students who choose this minor is expected to mirror the overall demand for Forestry as detailed in the response for the options. The interdisciplinary nature of forestry and the increasing role forestry is playing in carbon issues is expected to increase external demand.

Watershed Management Minor

There is a growing demand for professionals with training and background in hydrology. Adding this background with a minor is an excellent way to start developing these skills and will distinguish a job applicant from others without the minor. It is an excellent complement to majors in soil science, geography, geology, natural resources planning and interpretation, and others.

Forest Measurements Certificate

There has been no demand for the Forest Measurements Certificate in recent years and the decision was to stop offering the certificate in AY 07/08.

Wildland Fire Management Certificate

The external demand for the Wildland Fire Management Certificate of Study comes from federal fire-fighting agencies, namely the U.S. Forest Service, the U.S. Park Service, the U.S. Bureau of Indian Affairs, the Bureau of Land Management, and the U.S. Fish and Wildlife Service. Fire managers currently employed by the federal agencies must upgrade their professional skills in order to qualify for the recently created GS-401 Fire Management Specialist Positions. The U.S. Office of Personnel Management, in consultation with staff in the Departments of Interior and Agriculture, has written qualifications standards for the positions. HSU's Certificate of Study in Wildland Fire Management fulfills the qualification standards and our program currently serves federal agency employees from California and occasionally from other western states. Our program has been a national model, and it promises to grow and include more non-California employees.

III. Program Quality [30%]

A. Students

1. For undergraduate programs

Forestry (with options) Mean GWPE Scores (incl. primary and second majors) degrees_awarded_B_FOR report generated: 25-JUN-08

MAJOR	AY 99/00	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07
Forestry (pre-major status)						18.0	18.0	
Forestry (Production Mgmt)	15.7	15.2	15.3	15.0	16.8	16.1	16.0	17.0
Forestry (Resource Conserv)	16.1	15.4	16.6	16.3	15.9	16.3	16.7	16.5
Forestry (Wildland Fire Mgmt) Began F2003	NA	NA	NA	NA	16.0	16.8	16.3	16.7
Forestry (Hydrology) Began F2001	NA	NA			16.6	17.8	16.3	15.0
Forestry (Resources Mgmt)- Discontinued F2005	16.1	15.0	15.9	16.0	16.8	17.2	15.0	16.3
Forestry (Resources Science)- Discontinued S1992	14.0	14.0	15.0					
Overall	15.9	15.2	16.0	16.1	16.5	16.7	16.4	16.5

HSU forestry graduates taking the Registered Professional Forester Examination from 2001-2007 represented 55% of those passing this challenging state licensing test (graduates of the next largest California university only represented 8%). According to a 2003 survey by Career Development, 84% of our graduates found jobs related to their major, ranking second at HSU. Trends in hiring from the last few years suggest the rate now exceeds 90%. Our students receive numerous internal and external scholarships; in 2008 they received \$41,500. Humboldt fields a *Quiz Bowl* team every year at the *SAF National Convention*. Humboldt students won the *National Championship* twice since 2001. Last year, the team finished 3rd overall nationally and placed higher than any other Western program, making Humboldt “Best In The West.” Lastly, students are regularly involved in faculty research and scholarly activities. During 2008 alone, three papers were presented at national meetings with undergraduate student co-authors.

B. Faculty

1. Teaching effectiveness and commitment to continuous teaching improvement.

Faculty maintain currency in their courses through active involvement with research and interaction with professionals worldwide. They receive and respond to feedback on teaching evaluations from students, colleagues, and professionals who take extended education courses. Specific examples of evidence of teaching effectiveness and commitment include faculty involvement in *Universal Design for Learning* (2 faculty participating), *Accessibility Institute* (6), *Summer Accessibility Institute (San Jose State University)* (1), *Ensuring Access through Collaboration & Technology (EnACT)* (2), *Writing Across the Curriculum* (2), *Scholarship of*

Community Engagement (1), *Teaching Showcase* (1), *Center for Excellence in Learning and Teaching* (1), *Assessment Workshop* (3), *Diversity Workshop* (1), and *Mid-semester Evaluations* (many). Faculty are also involved in the *Learning Outcomes and Teaching Assessment Initiative*; the Department has submitted all assessment materials on-time and made changes as appropriate. Lastly, faculty co-authored a manuscript on education's role in the future of our profession.

2. Evidence of faculty engagement in scholarship/creative activities and service.

Scholarship/Creative Activities/Service	05/06	06/07	07/08
At least one peer-reviewed publication or creative product	100%	75%	75%
At least one funded grant or contract related to scholarship	75%	87.5%	75%
Invited participant or leader of workshops, expert panels, or task forces	87.5%	75%	62.5%
At least one presentation (paper, poster, exhibition, etc.) given at a professional society meeting	87.5%	75%	87.5%
Professional service activities at a regional or national level	75%	75%	75%
Service on at least one university or college-level committee (at least 1 hour/wk avg.)	37.5%	50%	50%

3. Explanation of faculty engagement: scholarly and creative activities, and service.

In the last three academic years, faculty in the program have:

- published in the top journals in forestry and ecology (*Canadian J. of Forest Research*, *Forest Ecology & Management*, *Ecology*, *Forest Products J.*, *Int. J. of Forest Engineering*, *Tree Physiology*, *Forest Science*, *Oecologia*, *Nature*, *Ecological Modelling*, *Ecological Monographs*, *Fire Ecology*, *Restoration Ecology*, and *Int. J. of Wildland Fire*, among others).
- served as reviewers for numerous journals, books, technical reports, and on review panels for federal granting agencies (list available on request).
- been featured in magazines (*National Geographic*, *The New Yorker*), books (*The Wild Trees*), television (*Planet Earth*, *Wild Chronicles*), radio (*Science Friday*, *California Report*, *National Public Radio*), and newspapers (*LA Times* and *San Francisco Chronicle*).

- received grants totaling in excess of \$2,300,000 from the following sources: *National Science Foundation, USDI/USDA Joint Fire Science Program, National Park Service, USDA Forest Service, California EPA, and USDA CSREES McIntire-Stennis*, among others.
- made many scholarly presentations at national and international professional meetings.
- served professional societies and NGOs in leadership roles, including: *Association for Fire Ecology, Timber Harvesting Technical Interest Group in the Forest Products Society, National Association of University Forest Resources Programs, and Forest Foundation.*
- served on campus committees: *Faculty Development, Budget, International Programs Screening, Library, Athletics Compliance, College Curriculum, Campus United Way Coordinator*, and numerous university and college-level search committees.

4. Evidence for faculty mentoring of students.

Forestry utilizes a one-on-one approach to advising with frequent meetings: progress is evaluated, future courses planned, and career advice offered. Advising is shared among faculty.

Directed Study or Research

In the last three years, faculty mentored >200 undergraduates, co-authoring peer-reviewed papers, securing funding for graduate study, and employing undergraduate students in research with federal and state agencies, forest industry, and NGOs.

Clubs and Student Professional Chapters: Mentoring in active clubs and honor societies includes:

- *Student Chapter of the Society of American Foresters (SAF)*. Fields *Quiz Bowl* teams at *SAF National Conventions* and is active in fundraising and *Forestry Alumni Weekend*.
- *Student Association for Fire Ecology*. Students attended national conferences in San Diego, Tucson, and Yellowstone National Park. Faculty nominated for *Advisor of the Year (07-08)*.
- *Forestry Club*, one of the oldest clubs on HSU's campus. Numerous activities include the Annual Christmas Tree Sale, an Arcata tradition frequently featured in local media.
- *Xi Sigma Pi*, The National Forestry Honor Society. Active in local service activities.

5. Other evidence of quality indicators related to faculty that may not be listed elsewhere, including, for example, faculty diversity within the program.

Two of our faculty members were long-term residents of other countries (New Zealand and South Korea) and the others bring regional, cultural, experiential diversity to the program.

C. Curriculum

1. Writing and oral communication learning outcomes

The program has identified four professional qualities broadly dealing with writing and oral communication: 1) writing skills; 2) public speaking, debate, and persuasion; 3) group cooperation; and 4) conflict resolution. The extents to which core and option classes satisfy these professional qualities are determined through surveys of the faculty teaching these courses. Courses are scored as 1) skill not being developed, 2) skill being developed, and 3) skill being applied. The extent to which curriculum provides for the development and application of these skills is then assessed to ensure overall objectives are being met. Additionally, students are required to complete a capstone project that includes a written report and public presentation.

Specific examples of how written and oral communication skills are developed include:

- FOR 100 students prepare an argumentative essay where they take a position on an issue, provide arguments for their position, and counter arguments against their position.
- In FOR 323, students write a term paper with substantial quantitative analysis, and present their findings in an open *Poster Session* in the Forestry Building Lobby.
- WSHD 310 students are taught how to write professional reports, short essays, and reading summaries. Student teamwork is emphasized in lecture and lab.

2. Assessment

Three faculty attend capstone presentations and provide evaluations of critical thinking and professionalism using an evaluation matrix. After findings from our accreditation process in 2003 and faculty evaluations of capstones, we focused on student professionalism in presentations. As a result, evaluations for 2007-2008 capstones had much higher ratings. To meet persistent issues, we have matched specific courses to address specific learning outcomes.

3. Accreditation

Accreditation of our Forestry program: ensures that persons entering forestry acquire core competencies; ensures that we offer a professional degree having necessary faculty expertise, research facilities, and resources to provide a high-quality forestry education; assures professionals and employers that graduates have breadth and depth in their curriculum; provides the structure to help us remain current in our curriculum; assures the public and policy makers that our alumni have received a professional education; provides differentiation at HSU of forestry from other environmental or natural resource oriented discipline, helping with recruitment of new students; helps employers gain public recognition for employing professionally qualified foresters; ensures that the State of California has a steady supply of professionally trained foresters and registered professional foresters; is a requirement for membership into the Association of Consulting Foresters; and assures students, parents, and families that HSU provides a sound professional program that increases the likelihood for professional employment of the program's graduates.

4. Relevance and innovation

We have completed an extensive curricular revision approved by the CNRS Curriculum Committee (10.10. 2008). Of the extensive revisions, two specific examples illustrate our commitment to innovation and responsiveness to changing trends:

Introduction to Forest Operations (FOR 250), a new course including harvesting, roads, and use of equipment to meet changing management goals, will be in the core.

Mechanized equipment is increasingly being used in progressive ways, including fuel reduction treatments, road decommissioning, and as a tool in ecosystem restoration.

Climate Change and Land Use (WSHD 458) will be required for students in the Conservation Option. This course responds to the evidence that the careers of our graduates will increasingly involve helping society manage climate change impacts.

5. Interactions between graduate and undergraduate programs

Graduate students commonly mentor undergraduates in student clubs and interact in advanced undergraduate courses on projects, and help build critical thinking, communication, and quantitative analysis skills. Graduate students lecture on topics related to their thesis research. Mutual mentoring during thesis research is encouraged: undergraduate students work with

graduate students on field and lab research, imparting supervisory skills, teaching and learning about research questions and methods, and understanding the importance of facilitating learning.

6. Program uniqueness

Forestry (all options, minors, and certificates included)

HSU and Cal Poly SLO are the only CSU campuses that offer programs in Forestry, and two of only 47 programs nationwide. Both HSU and Cal Poly are accredited by the *Society of American Foresters* and meet minimum breadth and depth curricular standards, but HSU's breadth of options (*forest production management, forest soils, or forest resource conservation* are unique to HSU) and depth within common options (HSU's *wildland fire* program offers more courses in fire science and fuels management; HSU's *watershed management* program is the only one to meet the federal qualifications for both forester and for hydrologist). Further, our minors (*Fire Ecology* and *Forestry*) are unique to the CSU. Our certificate in Wildland Fire Management is offered by no other university in California. HSU was selected by the U.S. Forest Service to offer a program to help federal wildland fire personnel meet recently enacted requirements; approximately 125 Forest Service employees have gone through the program to date. No other program in California offers a similar package, and HSU is among three nationwide.

7. Opportunities for undergraduate scholarship/creative activities/service

100% of forestry students take the Forestry Capstone (FOR 479) where they conduct a project related to pressing scientific and management issues that culminates in a written report and public presentation. Students design a project, perform a lengthy literature review, write a proposal, collect and analyze data, and present their findings to peers and instructors. Several projects have resulted in presentations at conferences and publication in peer-reviewed journals.

Students can participate in service activities in the *Forestry Club, Logging Sports Team, Student Chapter—Society of American Foresters, Student Association for Fire Ecology, and the Xi Sigma Pi Honor Society*. Graduates can join the *Forestry Alumni Chapter*. As a specific example of a recent service project, several of our *Forestry Club* students worked with Eureka High School

students to teach them basic forestry skills. These students competed at a state-wide forestry competition hosted by *Future Farmers of America* where they finished second.

D. Affiliations/Equipment/Facilities/Environment

1. Affiliations

Specific affiliations:

USDA Forest Service Six Rivers NF	Research projects and internships for students; guest lectures
USDA Forest Service Pacific Southwest Research Station	Station scientist are adjunct faculty, co-primary investigators, and serve on graduate committees
US Geological Survey	Scientists serve on graduate committees and provide guest lectures
US Fish and Wildlife Service	Scientists serve on graduate committees and collaborate on research
Klamath Watershed Institute	Purpose is to coordinate development of water quality plan
Green Diamond Resource Company and Humboldt Redwood Company	Provide sites for classes and research, internships, and full-time employment opportunities; instructors for courses

Facilities and Resources

The following facilities and resources are essential to the mission of the Department:

Forestry Stockroom	Manager orders, calibrates, repairs, replaces, and sets up equipment for classes
Greenhouse	An extensive area for plant studies; used in both teaching and research
Wildland Fire Lab	Recently renovated and one of the best facilities in the western U.S. The combustion facility is one of two in any university in the country
McLean and Forestry Computer Labs	Extensively used by students and faculty; in the past year 24 of 38 computers were replaced; software is state of the art
Watershed Mgmt Lab	Full wet-chemistry laboratory with water quality and soils analytical equipment
Herbarium	Extensive collection of forest and wildland plants for students and faculty
Fisher Lab	Renovated in 2006 as part of the <i>Kenneth L. Fisher Chair in Redwood Forest Ecology</i> endowment; equipped with state-of-the-art ecology equipment.

2. Unique local and regional environment

We are located in the perfect place to gain hands-on experience managing forest resources. Private forestlands and state and federal lands, all just minutes from campus, provide us with opportunities to gain experience that employers seek during laboratory experiences in our classes, including study of to the world's tallest forests, the *Arcata Community Forest*, nationally important wildfires (1977, 1987, 2003, 2008) and local rivers and streams.

IV. Investments, Revenues, and Efficiencies

A. Program Investments

1. Program Investment – Degree Requirements

The data below reflect curriculum changes scheduled to be approved for AY 2009-2010.

Student Units

Total required Program SCUs		Required Program SCUs in the primary Course Code	
Forestry (Production Mgmt)	124		64
Forestry (Resource Conserv)	124		63
Forestry (Wildland Fire Mgmt)	124		60
Forestry (Hydrology)	124		50
Forestry (Soils)	124		46

Weighted Teaching Units (WTU's)

Total Required Program WTUs		Required Program WTUs in the primary Course Code	
Forestry (Production Mgmt)	144		81
Forestry (Resource Conserv)	143		78
Forestry (Wildland Fire Mgmt)	143		75
Forestry (Hydrology)	144		63
Forestry (Soils)	144		58

2. Program investment – by Minimum Weighted Teaching Units required to offer coursework so students can make reasonable progress toward their degree.

Course Code Total	GE and service	Production Management	Resource Conservation	Wildland Fire Mgmt	Hydrology	Soils
345.5	53	208	211	203	174	159

3. Program Investments – by staff allocations.

	Major Program
Percents of Staff FTEF	100%

Staff FTE

	1/31/2004		1/31/2005		1/31/2006		1/31/2007		1/31/2008	
FORESTRY	Count	Sum	Count	Sum	Count	Sum	Count	Sum	Count	Sum

& WILDLAND RESOURCES										
R07	1	1.00	1	1.00	2	2.00	1	1.00	1	1.00
R09	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00
Total	2	2.00	2	2.00	3	3.00	2	2.00	2	2.00

The Departments of Forestry & Watershed Management and Rangeland Resources & Wildland Soils were officially merged prior to AY 07/08 into the Department of Forestry and Wildland Resources.

4. Program Investments – Other annual costs.

For period of 2005/2006 through 2007-2008

Category	Estimated Cost
Equipment (including maintenance)	\$37,900
Instructional Supplies	\$42,620
Temporary Help (graders, lab assistants, GA's, etc.)	\$51,260
Other program costs (indirect costs, etc.)	\$5,820

5. Program Investments – accreditation

Annual assessment from the Society for American Foresters is \$500.00.

B. Gross Revenues

Revenue DEPARTMENTS COMPLETE THIS SECTION	05/06	06/07	07/08
Fundraising/donations	\$16,301	\$21,024	\$29,960
Extended Education	\$122,204	\$248,708	\$188,692
Student fees	\$23,588	\$23,468	\$23,407
Instructionally Related Activities (IRA)	\$5,320	\$5,320	\$8,250
Instructionally-related grants	\$4,175	\$4,175	\$5,425
Grants and contracts to P.I.s	\$727,456	\$826,411	\$819,904
Other revenues	\$13,725	\$40,146	\$17,846

Revenues primarily originate from funds to Extended Education and Grants and Contracts to faculty PIs. Extended education funds originate from the U.S. Forest Service and Concurrent

Enrollment, and fund equipment purchases, faculty salary, and student teaching assistants. Grants and contracts to PIs from external sources (*National Science Foundation, USDA and USDI* competitive grants) and Trusts (*L.W. Schatz Demonstration Tree Farm and Fisher Trust*) support faculty and student scholarship. In most instances, scholarship would not be possible without grants and contracts and therefore the funds are indispensable to the department. Lastly, fundraising and donations include club activities such as the Christmas Tree Sale and Alumni Golf Tournament and various donations from local businesses and alums.

C. Efficiency

1. Efficiency – By SFR for course code

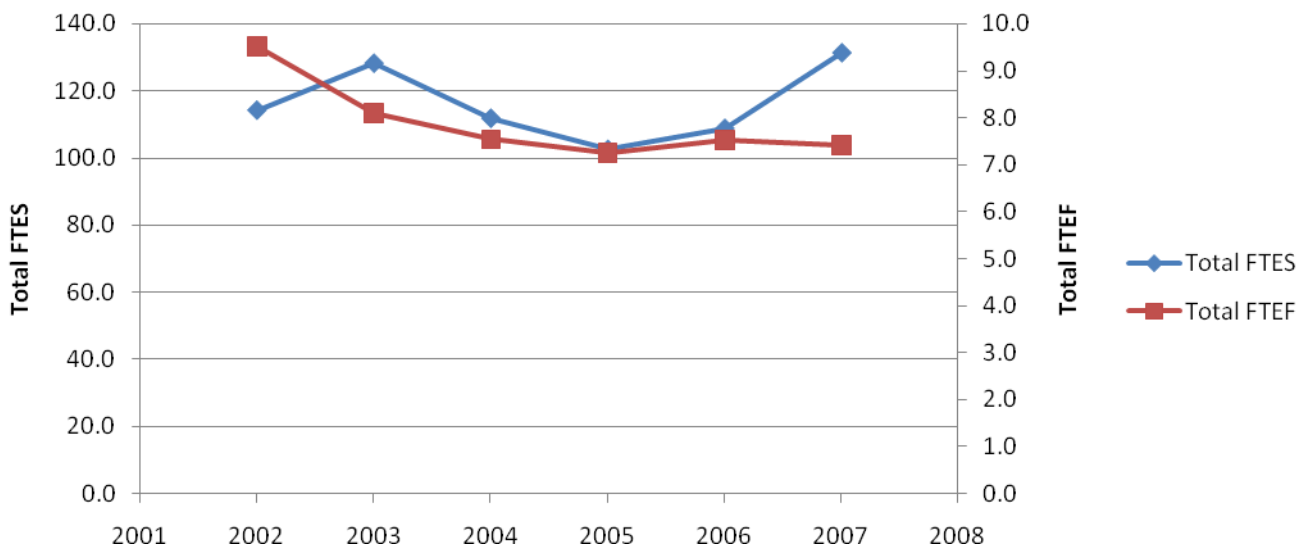
Academic Year Averages	Subject	02/03	03/04	04/05	05/06	06/07	07/08
SFR	FOR	12.52	16.59	14.88	14.45	15.29	18.30
SFR	WSHD	10.08	12.90	14.51	12.42	9.11	13.12
FTEF	FOR	7.57	6.41	6.51	6.21	6.51	6.53
FTEF	WSHD	1.94	1.69	1.03	1.04	1.01	0.88

SFR SUMMARY	02/03	03/04	04/05	05/06	06/07	07/08
AHSS	20.36	22.05	21.94	20.61	21.19	22.91
CNRS	15.66	16.90	17.17	16.04	16.82	18.28
CPS	15.12	16.29	15.68	15.22	20.80	25.33
UNIVERSITY TOTALS	17.28	18.65	18.57	17.52	19.32	21.43

SFRs in FOR and WSHD courses differ from the college and the university because we offer a higher proportion of lab classes. We have been improving our efficiency by reducing offering courses only once per year with the exception of two introductory courses which are needed to help attract and keep students in our program and smooth the transition of transfer students. SFR in WSHD has been lower than University averages over the period of record due to a few factors. The program hired three new faculty members over this time period, of which two have since left HSU. Several curriculum changes (5 courses substantially altered; some courses changed to alternate year offerings) recently approved by the CNRS committee should improve the efficiency of WSHD course offerings.

2. Efficiency – Other views.

Our efficiency has increased in recent years and the momentum is increasing. The number of degrees granted will increase in the next few years as the large recently admitted cohorts make progress towards graduation. Momentum will accelerate when the large number of Fall 08 admits are considered and as admissions continue to increase given our recruiting activities.



Changes in total FTES and FTEF from AY 2002-2007

D. Budget cut impacts

Our program has been affected by budget cuts primarily by reduced faculty in forest health, restoration, hydrology, soils, and human dimensions. One faculty member in the area of Forest Health and Protection departed at the end of AY 06/07 and has not been replaced. This gap continues to affect students interested in forest health and those from around campus interested in ecological restoration. Faculty with scholarship in the area of forest health, protection and restoration in several departments and our affiliated research partners in the region have suffered from this lack of faculty replacement. There has been a net loss in watershed and soils faculty. The current watershed faculty member has had to reduce the number of course offerings and the offering frequency of many of the watershed (WSHD) courses. Many upper division soils classes are being taught by temporary lecturers and/or have gone to an alternate year basis with adverse impacts on student progress to graduation. Lastly, the departure of FERP faculty in the areas of

economics, policy, and management has adversely affected the program's ability to teach several of the core areas of Forestry, which is always a concern for maintaining accreditation status.

E. Additional Data

Course Offerings Profile in Forestry (AY 00/01 - AY 07/08)								
class_offerings_FOR report generated: 27-JUN-08								
	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Distinct Courses Enrolled	21	19	24	23	22	20	21	24
Sections Enrolled	38	41	47	42	41	36	37	40
Average Section Enrollment	18	16	15	18	17	18	19	21

Distinct Courses Enrolled in Forestry by Level (AY 00/01 - AY 07/08)								
class_offerings_FOR report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Lower-div	4	3	5	7	5	5	6	6
Upper-div	14	13	15	13	13	12	11	13
Graduate	4	3	5	4	4	4	4	5
Total	21	19	24	23	22	20	21	24

Sections Enrolled in Forestry by Level (AY 00/01 - AY 07/08)								
class_offerings_FOR report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Lower-div	9	8	10	12	11	11	12	13
Upper-div	24	26	29	25	24	22	19	20
Graduate	5	7	9	6	7	4	7	7
Total	38	41	47	42	41	36	37	40

Avg Section Enrollment in Forestry by Level (AY 00/01 - AY 07/08)								
class_offerings_FOR report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Lower-div	19	22	21	22	23	26	26	28
Upper-div	20	17	15	20	18	17	20	22
Graduate	7	3	4	4	3	4	5	4
Total	46	42	41	46	45	46	51	54

FTES in Forestry by Course Level (AY 00/01 - AY 07/08)								
class_offerings_FOR report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Lower-div	20.7	21.1	26.1	31.1	30.8	31.5	39.1	43.8
Upper-div	69.7	67.8	62.4	70.2	62.4	54.4	54.8	68.4
Graduate	5.4	4.0	6.2	5.0	3.7	3.7	5.7	7.4
Total	95.8	92.9	94.7	106.3	96.9	89.7	99.6	119.6

NOTE: In the above tables all class sections have 2 or more students enrolled. This is done to minimize the influence of independent student sections.

Distinct Courses count each distinct SUBJ/Course-number combination enrolled.

All figures are Fall/Spring term averages. Due to the rounding of average Academic Year counts, the various breakouts may not add to the exact same amounts.

Other Class Offering Breakouts

These examine independent study sections and sections by different modes of instruction. The Lecture-only sections have only a C1 through C6 mode. The Lab/Activity-only sections have only a C7 through C-16 mode. Other modes and combinations contain the remaining modes or combinations of lecture and lab/activity modes.

Other Special breakouts in Forestry (AY 00/01 - AY 07/08)								
class_offerings_FOR report generated: 27-JUN-08								
	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Sections with 1 student enrolled	7	5	7	6	5	13	6	10
Lecture only sections	17	13	20	13	16	15	15	17
Lab/Activity only sections	16	16	15	17	17	16	15	16
Other modes and combinations	6	12	13	13	9	6	7	7

Service Courses

The following shows sections which are considered service for either General Education, CWT (Communication and Ways of Thinking), DCG (Diversity and Common Ground), or Institutions Requirements.

Service Course Sections Enrolled in Forestry (AY 00/01 - AY 07/08)								
class_offerings_FOR report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Lower-div	0	0	0	1	0	0	1	2
Upper-div	2	2	3	3	2	2	2	3

Service Course FTES in Forestry (AY 00/01 - AY 07/08)								
class_offerings_FOR report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Lower-div	.0	.0	.0	2.4	.0	.0	6.6	8.9
Upper-div	10.9	11.2	13.8	13.0	14.7	15.2	17.4	26.8
Course Offerings Profile in Watershed Management (AY 00/01 - AY 07/08)								
class_offerings_WSHD report generated: 27-JUN-08								
	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Distinct Courses Enrolled	4	3	7	7	6	6	6	5
Sections Enrolled	7	5	10	12	8	8	8	6
Average Section Enrollment	16	23	15	13	14	11	9	13

Distinct Courses Enrolled in Watershed Management by Level (AY 00/01 - AY 07/08)								
class_offerings_WSHD report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Upper-div	2	2	4	3	3	3	3	2
Graduate	2	1	4	4	3	3	3	3
Total	4	3	7	7	6	6	6	5

Sections Enrolled in Watershed Management by Level (AY 00/01 - AY 07/08)								
class_offerings_WSHD report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Upper-div	5	5	6	6	5	5	5	4
Graduate	2	1	4	6	3	3	3	3
Total	7	5	10	12	8	8	8	6

Avg Section Enrollment in Watershed Management by Level (AY 00/01 - AY 07/08)								
class_offerings_WSHD report generated: 27-JUN-08								
Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Upper-div	21	25	20	21	16	13	13	18
Graduate	5	4	5	6	10	7	3	5
Total	26	29	25	27	25	20	16	23

FTES in Watershed Management by Course Level (AY 00/01 - AY 07/08)								
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class_offerings_WSHD report generated: 27-JUN-08

Course Level	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Upper-div	14.2	15.3	17.3	16.1	11.0	9.5	7.7	9.2
Graduate	1.7	.3	2.2	5.7	4.0	3.4	1.5	2.4
Total	15.9	15.6	19.5	21.8	14.9	12.9	9.2	11.6

NOTE: In the above tables all class sections have 2 or more students enrolled. This is done to minimize the influence of independent student sections. Distinct Courses count each distinct SUBJ/Course-number combination enrolled. All figures are Fall/Spring term averages. Due to the rounding of average Academic Year counts, the various breakouts may not add to the exact same amounts.

Other Class Offering Breakouts

These examine independent study sections and sections by different modes of instruction. The Lecture-only sections have only a C1 through C6 mode. The Lab/Activity-only sections have only a C7 through C-16 mode. Other modes and combinations contain the remaining modes or combinations of lecture and lab/activity modes.

Other Special breakouts in Watershed Management (AY 00/01 - AY 07/08)

class_offerings_WSHD report generated: 27-JUN-08

	AY 00/01	AY 01/02	AY 02/03	AY 03/04	AY 04/05	AY 05/06	AY 06/07	AY 07/08
Sections with 1 student enrolled	1	1	1	1	2	2	0	0
Lecture only sections	3	3	4	3	4	4	4	3
Lab/Activity only sections	3	3	3	3	3	2	2	2
Other modes and combinations	2	0	3	6	2	2	2	2

V. Potential

FOREST PRODUCTION MANAGEMENT OPTION

A. Program capacity with existing resources:

1. What is your program's maximum capacity with current resources? Use two metrics to define "capacity": The number of graduates per year, and the number of FTES generated by courses that are unique to this option, per year.

	Graduates year ⁻¹	FTES in major option year ⁻¹
Existing	7.7 (FPM) ^a	6.9 ^b
Maximum capacity with existing resources	10.0 (FPM) ^c	9.0 ^d

^a An average of three years (05/06 – 07/08)

^b 27 units per year including electives x 7.7 / 30 full time units per year = 6.9

^c Maximum capacity as relatively even distribution of 50 graduates per year.

^d 27 units per year including electives x 10 / 30 full time units per year = 9.0

2. If you have capacity to grow with existing resources, what steps have been taken to increase enrollment? What have been the effects of these steps, and what results are still anticipated?

Faculty are actively engaged in curricular revisions with the purpose of facilitating transfer students and increasing the efficiency of course offerings. Several years ago, we merged two related options (Forest Production and Resource Management) to focus student interest. Faculty are engaged in recruiting students and working actively with the CNRS Recruiter. The program is the only one of its kind in the CSU and California, a strategic recruiting and retention point.

B. Opportunities for future growth or substantial curricular changes

1. What opportunity does the program have for future expansion?

Forest Operations is increasingly important to areas where it has not before been applied. For instance, harvesting tools are being utilized for ecological restoration purposes. It is our belief that adoption of forest operations into broader areas of forestry will result in a modest rate of expansion. Existing programs in several western states have shuttered their forestry programs and we expect to see an increase in enrollment of Western University Exchange area students who seek traditional forest operations education.

2. Describe the curricular changes and/or staffing increases required to accomplish such an expansion?

The Production Management Option may be further expanded with additional faculty members in forest economics/policy and forest products. The curriculum in this option focuses on forest management and wood utilization and will be significantly enhanced by strengthening those areas.

C. Impact of augmented resources

A 10% augmentation of resources could be used to purchase additional harvesting equipment and tools to enhance in-field lab capacity at the L.W. Schatz Tree Farm. Our students do not have in-house resources and are currently depending on the industry partners to demonstrate

forest operations practices. A 20% augmentation would provide resources to fill major gaps in expertise on the faculty, primarily in the area of forest economics, policy, and management.

D. Impact of reduced resources

With reduced resources, our educational capability will be significantly impacted, especially with helping students gaining “hands-on” skills and experience.

E. Impact of program elimination

There are no other colleges and universities in California that offer a forest operations curriculum similar to our Forest Production Management Option at HSU. The state and region would lose a source of unique, specialized workforce in forest operations. The sustainability of the state’s forest resources will be severely impacted.

FOREST RESOURCE CONSERVATION OPTION

A. Program capacity with existing resources:

1. What is your program's maximum capacity with current resources? Use two metrics to define “capacity”: The number of graduates per year, and the number of FTES generated by courses that are unique to this option, per year.

	Graduates year ⁻¹	FTES in major option year ⁻¹
Existing	10.3 (FRC)	11.0
Maximum capacity with existing resources	10.0 (FRC)	10.7

^aSee footnotes on table for Production Management for explanation of calculation

2. If your program is at maximum capacity, proceed to part B. If you have capacity to grow with existing resources, what steps have been taken to increase enrollment? What have been the effects of these steps, and what results are still anticipated?

Based on the analysis above, the Forest Resource Conservation option is at maximum capacity.

B. Opportunities for future growth or substantial curricular changes

1. What opportunity does the program have for future expansion? Provide evidence for your response.

There is currently sufficient capacity to grow in Forest Resource Conservation option-specific courses. The major limitation on growth, then, is the ability to offer enough sections in required core courses, especially those courses that are required by other majors, e.g. FOR 116 (The Forest Environment [our introductory course]), FOR 230 (Dendrology), and FOR 231 (Forest Ecology), all of which have been fully enrolled (most semesters with overfull classes and labs) for the last 3 academic years.

2. Describe the curricular changes and/or staffing increases required to accomplish such an expansion?

Adding another section to each of the courses listed above would add capacity not only to the forest resource conservation option, but other options as well. Additional faculty would be needed to teach the new sections. Additionally, new faculty in forest protection and forest economics/policy would meet critical demands and allow us to increase student capacity.

C. Impact of augmented resources

Suppose that your program were ranked in a category that recommended augmentation of resources. What would be the impact of augmented resources? (Answer for a 10% augmentation and a 20% augmentation.)

A 10% augmentation of resources could be used to hire a faculty member with expertise in either forest protection or forest economics/policy to meet growing student demand and to provide for a modest increase in operating expenses. A 20% augmentation of resources could be used to hire faculty members in both forest protection and in forest economics/policy and to further increase operating expenses.

D. Impact of reduced resources

A 10% reduction in resources would be tantamount to losing a faculty member and this would seriously compromise our ability to offer our current complement of courses/sections. Student capacity would have to be reduced and we would likely be put on probation or lose accreditation from the Society of American Foresters. A 20% reduction in resources would be catastrophic. It would be very difficult to meet the needs of our program and we would most likely lose accreditation from the Society of American Foresters.

E. Impact of program elimination

There are no other colleges or universities in California that offer a curriculum in Forest Resource Conservation. The State of California would not be producing students and professionals trained in Forest Resource Conservation. The state’s forest resources would suffer and would be increasingly managed by foresters from other states, who may not be knowledgeable of California ecosystems, or will increasingly be managed by poorly qualified individuals as the currently employed professionals retire.

 FOREST SOILS OPTION

A. Program capacity with existing resources:

1. What is your program's maximum capacity with current resources? Use two metrics to define “capacity”: The number of graduates per year, and the number of FTES generated by courses that are unique to this option, per year.

(Completed by the department)

	Graduates year ⁻¹	FTES in major option year ⁻¹
Existing	0.5 (FS)	0.3
Maximum capacity with existing resources	10.0 (FS)	5.1

See footnotes on table for Production Management for explanation of calculation

2. If you have capacity to grow with existing resources, what steps have been taken to increase enrollment? What have been the effects of these steps, and what results are still anticipated?

Steps to increase enrollment in the Forest Soils option include:

- 1) Hiring the CNRS recruiter, whose credentials in education and experience from the California Forest Products Commission are invaluable in talking to young people, their parents and teachers about abundant educational and employment opportunities.
- 2) Active participation with the California Forest Soils Council, whose membership includes the top foresters and soil scientists in the state. Our students have competed successfully for scholarships and have comprised the majority of students from any California university in attendance at workshops and field trips.
- 3) Submission of a USDA grant written to support from 10 to 20 new “Wildland Multicultural Scholars.”

B. Opportunities for future growth or substantial curricular changes

1. What opportunity does the program have for future expansion? Provide evidence for your response.

We feel that this program has great promise for expansion. Several national occurrences have been promoting broader awareness of soil science (e.g., a July 2008 Smithsonian Institution exhibit; a recent issues of National Geographic Magazine and the online publication “E”) and an on-going national survey on nationwide student demand by the Soil Science Society of America will soon be made available, all of which point to future opportunities and needs in forest soils expertise.

2. Describe the curricular changes and/or staffing increases required to accomplish such an expansion?

We need additional faculty to teach in the area of Soil Fertility and Chemistry. This expertise would further complement efforts to understand soil’s role in carbon cycling and global climate change. In terms of curricular changes, an injection of expertise in geospatial technology is needed. Another goal would be to add courses to better cover important areas, such as surface and deep seated erosion and mass wasting phenomena.

C. Impact of augmented resources

Priorities at either augmentation level are to increase faculty numbers in the areas of Soil Fertility and Chemistry.

D. Impact of reduced resources

Given that there is one professor teaching soils courses, with itinerate lecturers filling in existing gaps, reduced resources at any level would severely limit our ability to offer the degree option.

E. Impact of program elimination

If the Forest Soils program were eliminated, we would be losing a unique program in the state of California. Nowhere else in the state is there such a critical mass of forestry, range and other natural resources expertise configured to prepare students for successful careers sustainably

managing soil resources. It is a small but important use of taxpayer money in service to our terrestrial ecosystems.

 WILDLAND FIRE MANAGEMENT OPTION

A. Program capacity with existing resources:

1. What is your program's maximum capacity with current resources? Use two metrics to define “capacity”: The number of graduates per year, and the number of FTES generated by courses that are unique to this option, per year.

	Graduates year ⁻¹	FTES in major option year ⁻¹
Existing	5.7 (FWM)	5.5
Maximum capacity with existing resources	10.0 (FWM)	9.7

See footnotes on table for Production Management for explanation of calculation

2. If your program is at maximum capacity, proceed to part B. If you have capacity to grow with existing resources, what steps have been taken to increase enrollment? What have been the effects of these steps, and what results are still anticipated?

We anticipate that the Fire Option continues its steady growth in the near future. To build student interest, faculty are actively involved with the student club (*Student Association for Fire Ecology*), a chapter of an international organization. Local and regional speaking engagements along with poster displays and planned web site development are all paying dividends with respect to increasing enrollment. We have worked closely with the CNRS Recruiter to explain the breadth and focus of our program. The continued use of the upgraded Wildland Fire Laboratory for campus tours for potential students and their family will continue. Lastly, the increasing national interest in fire ecology and management should continue to interest students in our unique program.

B. Opportunities for future growth or substantial curricular changes

1. What opportunity does the program have for future expansion?

The Fire Option is undergoing curricular revisions that will focus the program considerably, injecting a course (FOR 223) into the Forestry core and better incorporating the expertise on campus in range fire ecology and ecological restoration. The addition of a replacement faculty

member in forest health and restoration will increase student demand and the quality of our student graduates.

2. Describe the curricular changes and/or staffing increases required to accomplish such an expansion?

Substantive curricular changes have been approved and will take effect in AY 2009/10, inserting a fire course in the Forestry core. Staffing needed would include a replacement faculty member in forest health and restoration.

C. Impact of augmented resources

For the Fire Option, a 20% augmentation could be used to replace a faculty member (Forest Health and Restoration) to teach courses and develop strengths in related areas. This faculty member could “back fill” for current faculty so that they could develop opportunities to facilitate greater field exposure to wildland and prescribed fires, a shortcoming cited by recent graduates and a result of our strapped current faculty staffing. At a 10% augmentation, opportunities exist to invest in web site development, increased journal access, temporary faculty focused in fire use and spatial modeling, and to facilitate student internships with regional land management agencies and industry.

D. Impact of reduced resources

With a 10% reduction, reduced opportunities to witness the variety of landscapes and fuels would result, an important draw of our current program. With a 20% reduction, the ability of our field- and software-based curriculum would be severely compromised.

E. Impact of program elimination

The region would lose a substantial source of wildland fire fighters, fire and fuels program managers, and foresters. Our past graduates have served as presidents of both national professional societies and consistently serve as regional directors for large land management agencies at state and national levels.

FOREST HYDROLOGY OPTION

A. Program capacity with existing resources:

1. What is your program's maximum capacity with current resources? Use two metrics to define “capacity”: The number of graduates per year, and the number of FTES generated by courses that are unique to this option, per year.

	Graduates year ⁻¹	FTES in major option year ⁻¹
Existing	3.0 (WSHD)	3.2
Maximum capacity with existing resources	10.0 (WSHD)	10.7

See footnotes on table for Production Management for explanation of calculation

2. If your program is at maximum capacity, proceed to part B. If you have capacity to grow with existing resources, what steps have been taken to increase enrollment? What have been the effects of these steps, and what results are still anticipated?

Faculty have worked with the CNRS Recruiter to educate her about the program and career prospects for graduates in Forest Hydrology. Faculty meet with high school students from the local area and had an undergraduate in the forest hydrology option discuss research opportunities he experienced while enrolled in the option. A major step for the option has been to revise the curriculum, changes that will take place in AY 09/10. The number of units required for graduation has been reduced while still meeting the requirements to qualify for federal jobs in the forester and hydrologist series. This semester watershed graduate students and faculty will be hosting a “Watershed management” night to raise the visibility of the undergraduate and graduate program. A seminar series in the spring will present guest lecturers from professionals in watershed management across the region, helping increase program visibility across campus.

B. Opportunities for future growth or substantial curricular changes

1. What opportunity does the program have for future expansion? Provide evidence for your response.

With increased visibility of the major option, excellent career prospects, and streamlined curriculum changes currently in the approval process, the WSHD program could expand substantially.

2. Describe the curricular changes and/or staffing increases required to accomplish such an expansion?

Expansion would require another faculty member in watershed management. This could potentially be accomplished with temporary faculty to teach another section of the upper division hydrology course (WSHD 410).

C. Impact of augmented resources

An augmentation of resources would provide support for recruitment and retention of students. It would be used for educational resources such as field and lab equipment, other educational materials, as well as travel expenses for guest speakers. A 20% augmentation would be enough to hire temporary faculty to teach aspects of the WSHD curriculum that currently cannot be offered.

D. Impact of reduced resources

With reduced resources, the ability to offer field trips to observe watershed management projects in the region would be reduced. The ability to train students with field and lab equipment in current professional use would be reduced.

E. Impact of program elimination

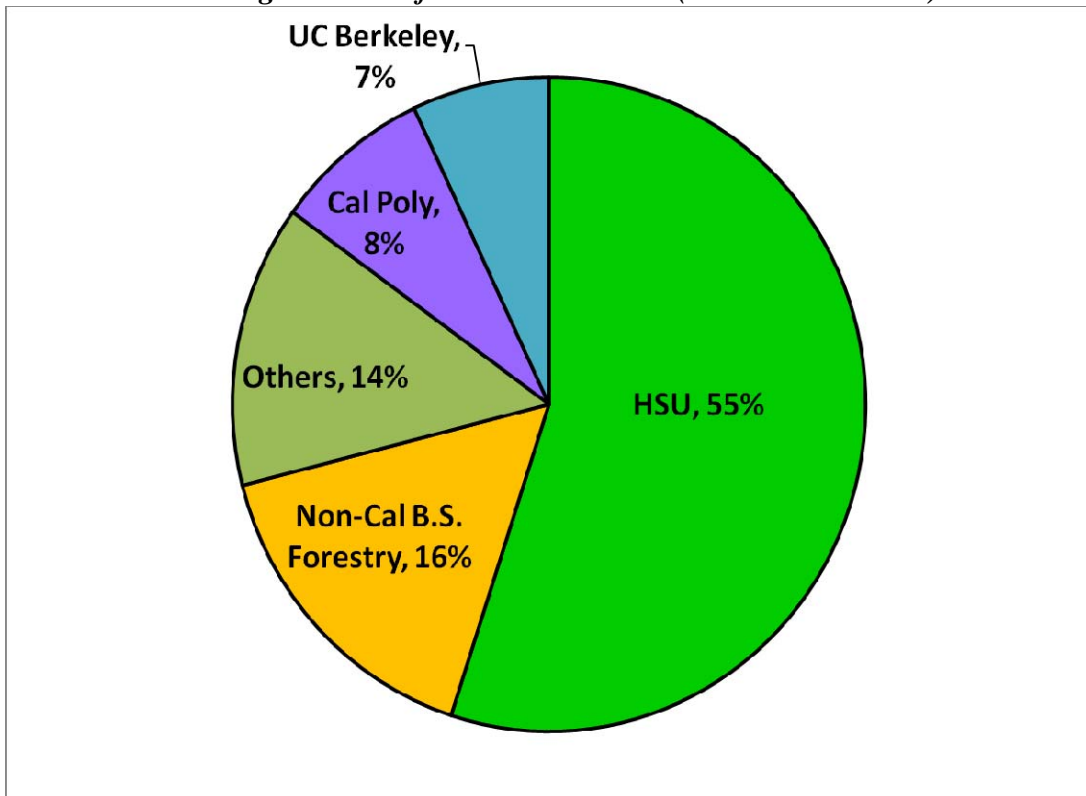
The state and region would lose a significant source of trained forest hydrologists able to work on important regional and national issues at the nexus of forest land management and aquatic resource protection.

General FWR Department information on program capacity:

CNRS has employed a full-time recruiter in conjunction with the USDA Forest Service. Funding came from US Forest Service grant submitted by FWR faculty, along with several US Forest Service personnel to meet the court ordered Settlement Agreement for Region 5 (R5) of the US Forest Service to increase the number of Hispanic employees at all levels within R5-California. Match funding for this multi-year program came from the Office of Enrollment Management and the CNR&S Dean's Office. Following the August 2007 hire of the CNRS Recruiter, enrollments have increased across CNR&S as a result of her efforts.

Critical needs across options are filling vacant faculty positions. In particular, the replacement of the lost faculty position in Forest Health and Restoration and the position in Forest Administration, Economics, and Policy vacated by the termination of a FERP. These faculty positions are critical for the undergraduate and graduate students, our scholarly productivity and grantsmanship, and our continued *Society of American Foresters* accreditation.

New Registered Professional Foresters (RPF: 2001 – 2007)



(California Licensed Foresters Association - 2008)

VI. Additional Information

- Fully accredited by the Society of American Foresters (SAF), one of only 47 nationwide and one of two in the CSU.
- Student-oriented program with approximately 160 undergraduate and 15 graduate students representing one of the largest baccalaureate forestry programs in the country
- Students clubs including the Forestry Club, Logging Sports Team, Xi Sigma Pi, SAF Quiz Bowl Team, and the Student Association for Fire Ecology
- Broad array of options within the major, including Forest Hydrology, Forest Production Management, Forest Resource Conservation, Forest Soils, and Wildland Fire Management.
- Forestry building located within walking distance to the 600+ acre Arcata Community Forest, with redwoods, recreation trails, and a diversity of forest and watershed management issues and examples; the 385-acre L.W. Schatz Demonstration Tree Farm forest devoted to field experiments and outdoor classrooms within 1 hour from campus; the Freshwater Forest of over 300 acres containing second-growth redwood forest on perpetual lease to Humboldt State University; and the state-of-the-art McLean Computer Laboratory exclusively for use by students.
- Access to millions of acres of forestland managed by various national forests, state and national parks, industrial forests, and private forests.
- Graduates are highly sought after for employment by federal and state agencies, the forest products industry, consulting firms, and non-governmental organizations.
- Graduates are leaders within forestry in local industry, state, and federal agencies.
- Outstanding career opportunities; over 90% placement rate and graduate programs in Masters of Natural Resources with options in Forestry or Watershed Management