Self-Study Report
for
Society of American Foresters’ Continued Accreditation
of Bachelor of Science Degree in Forestry

Volume I

Department of Wildland Resources
College of Natural Resources
Utah State University
Logan, UT 84322-5230

December 2009
PREFACE

Utah State University (USU), established in 1888, has a long and rich history in forestry education. Forestry was first mentioned as a major area of emphasis in 1891, and undergraduate course offerings initially appeared in the university catalog in 1908. The authority for establishing a major in forestry was granted by the USU Board of Trustees in 1927, and the following year the Department of Forestry and Range Management was established—along with the (student) Forestry Club. The first BS degree in Forestry was awarded in 1931, and initially accredited by the Society of American Foresters (SAF) in 1936—the same year in which the first forestry summer camp was held and one year following the initial granting of accreditation by SAF nationwide. The first awarding of MS and PhD degrees in Forestry followed in 1946 and 1968, respectively.

The last re-accreditation of the BS degree in Forestry at USU occurred in November 2000, at which time the degree was administered by the Department of Forest Resources in the College of Natural Resources. Final approval of the degree by SAF was contingent upon the completion of a progress report by July 2002, addressing issues related to the departmental budget and physical facilities. The progress report was accepted by SAF in October 2002 and accreditation continued through 2005, at which time an interim status report was due as a matter of standard protocol. In December 2002, USU was notified that the SAF accreditation process had been revised to eliminate the interim status review, and thus accreditation was extended through 2010.

In 2002, the College of Natural Resources reorganized, eliminating the four departments of Forest Resources, Rangeland Resources, Geography and Earth Resources, and Fisheries and Wildlife, and creating in their place the Departments of Forest, Range, and Wildlife Sciences (FRWS, currently Wildland Resources); Aquatic, Watershed, and Earth Resources (AWER, currently Watershed Sciences); and Environment and Society (ENVS). The re-organization essentially resulted in the creation of three new departments focused on terrestrial ecosystems, aquatic ecosystems, and human systems, respectively. The GIS and remote sensing expertise was shared between FRWS and AWER. All existing degrees were maintained and transferred to the most appropriate department, with the degrees in Forestry (BS, MS, and PhD) and associated students going to FRWS—along with other degrees and students related to the science and management of terrestrial ecosystems. Likewise, faculty were redistributed along appropriate lines. Of the 14 full-time faculty reporting to the head of the Department of Forest Resources, six went to FRWS and eight to ENVS. One of the faculty members who went to FRWS had a joint appointment in AWER. Initially, these faculty continued to teach the courses they had taught in their former departments, but over time with the revision of curricula, their teaching assignments changed. Thus, the “forestry faculty” is now a complex mixture of faculty from all four previous departments in the college, plus new hires.
Planning for curricular revision for the new department began in 2001 with establishment of a committee of core faculty from the departments of Forest Resources, Rangeland Resources and Fisheries and Wildlife. A major outcome of this effort was the decision to establish a "departmental common" curriculum that would provide a common course work foundation for each of the existing professional degrees (i.e., Forestry, Range Management, and Wildlife Management, and subsequently Conservation and Restoration Ecology). In principle, students would take a common set of courses through their junior year and in their senior year focus on courses specific to their respective majors. The original department common curriculum has been modified to the extent that some of the courses have been moved to the senior year (and some major-specific courses moved to the junior year). In addition, an interdisciplinary capstone course will be taught for the first time in Spring 2010.

Terry Sharik, Committee Chair
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USU COMMITTEE ON SAF ACCREDITATION

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Lana Barr, Administrative Assistant, Department of Wildland Resources

Donovan Birch, Undergraduate Forestry major and President, USU Forestry Club

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Johan du Toit, Professor and Head, Department of Wildland Resources (Ecology and Conservation of Large Mammals in Terrestrial Ecosystems)

Michael Kuhns, Professor, Forestry Extension Specialist, and Undergraduate Forestry majors Adviser, Department of Wildland Resources (Urban Forestry, Tree Physiology)

James Long, Professor, Department of Wildland Resources (Forest Ecology, Silviculture)

Dustin Ranglack, Undergraduate Student Organizer, Department of Wildland Resources

Terry Sharik, Committee Chair, Professor, Department of Wildland Resources (Forest Ecology)

Brian Shirley, Academic Advisor, College of Natural Resources
Utah State University’s undergraduate forestry program is offered within the Department of Wildland Resources in the College of Natural Resources (CNR).

1. **Mission, goals, and objectives**

The mission of Utah State University is:

To be one of the nation's premier student-centered land grant and space-grant universities by fostering the principle that academics come first; by cultivating diversity of thought and culture; and by serving the public through learning, discovery, and engagement (from the USU President’s web site at [www.usu.edu/president/missionstatement/](http://www.usu.edu/president/missionstatement/)).

The mission of the College of Natural Resources is:

To promote scholarship and creativity in discovery, synthesis, and transfer of knowledge for the mutual sustainability of ecosystems and human communities in Utah, our country, and the world; encourage critical thinking and collaborative problem solving through debate and constructive criticism while ensuring open exchange and respect for the values and opinions of others; engage a high-quality, diverse and creative faculty, staff and student community, who collectively integrate the biological, physical and social sciences, and who constantly expand their knowledge and skills; and educates natural resource and environmental professionals and others interested in healthy ecosystems and their value for future generations (from the CNR web site at [http://cnr.usu.edu/htm/about/mission-statement](http://cnr.usu.edu/htm/about/mission-statement)).

The mission of the Department of Wildland Resources is:

To achieve excellence in integrating forest, range, and wildlife sciences. As researchers, we apply internationally recognized scientific expertise, an interdisciplinary approach, and a collaborative spirit to develop innovative solutions for the conservation and management of the natural resources of our changing planet. As educators, we mentor students at undergraduate and graduate levels, synthesizing established knowledge and cutting-edge research into a dynamic and highly relevant curriculum. As extension specialists, we help the people on the land understand and use research-based knowledge to improve their livelihoods through enlightened stewardship of ecosystem goods and services (from the department’s web site at [http://www.cnr.usu.edu/wild/](http://www.cnr.usu.edu/wild/)).

In terms that apply across disciplines, the accomplishment of the department’s mission is through a series of goals, each having several tactical objectives, as follows:
Goal 1: Provide an internationally recognized program of instruction that fulfills the University’s mission of graduating an educated person while, at the same time, providing disciplinary training in the ecology and management of natural resources in terrestrial ecosystems.

Objective A. Continually revise and update curricula, deleting unneeded and adding needed courses as appropriate.

Objective B. Expose faculty and students to nationally/internationally recognized individuals in the Department’s seminar series to stimulate new ideas and promote the flow of information on a diversity of concepts.

Objective C. Improve the opportunities for “hands-on” educational experiences by actively encouraging and facilitating student participation in summer internship programs, field trips, study abroad programs, and research projects.

Objective D. Provide undergraduate and graduate students with a voice in departmental policies and affairs through their elected representatives.

Objective E. Nurture professional growth by encouraging students to be involved with professional societies (principally the Society of American Foresters, the Society for Range Management, The Wildlife Society, and the Berryman Institute) and providing them with support to attend and participate in professional meetings.

Objective F. Promote the development of effective communication skills by making communications intensive courses, which entail graded writing and speaking assignments, a required component of the curriculum.

Goal 2: Provide the conditions and incentives for a meritorious research program that addresses not only the biophysical elements of terrestrial ecosystems, but also the social and economic features that characterize social-ecological systems.

Objective A. Provide an environment in the Department that stimulates and rewards creative thought and activity.

Objective B. Emphasize research that addresses the multiplicity of ecosystem goods and services.

Objective C. Continue to strengthen our graduate program by recruiting and critically screening applicants and providing challenging and useful study programs.
Objective D. Emphasize the critical need for research that addresses scientific principles and functional processes while keeping a clear view of the application of results to real-world management problems.

Objective E. Encourage and reward the continued submission of grant proposals for research support from outside the University.

Goal 3: Provide citizens of Utah, the Nation and the World with the benefit of new and existing knowledge and its application through extension, continuing education, and distance learning programs.

Objective A. Deliver continuing education short courses on particular ecosystem management practices and principles to personnel in federal and state agencies, county agricultural agents, ranchers, youth groups, and the general public.

Objective B. Deliver online courses to place-based students and provide synchronous interactive broadcasts of classes to students across the USU regional campus system.

Objective C. Continue the publication of popular and application-oriented articles so that fundamental research findings get applied to current day problems.

Objective D. Encourage the entire departmental faculty to actively participate in extension and continuing education efforts.

Objective E. Provide the professional leadership necessary to develop, promote, and present symposia on state-of-the-art research topics, future directions for the profession, and educational needs.

Goal 4: Provide the incentive and the means for professional growth in all departmental personnel: faculty, staff, students, and technicians.

Objective A. Encourage and facilitate sabbatical leaves for eligible faculty so that continued studies and self-renewal will add to the overall departmental excellence.

Objective B. Encourage and facilitate involvement in professional societies, working groups, advisory boards and other service-related functions.

Objective C. Encourage and facilitate international experience to enlarge the individual’s perspective and, especially, to improve teaching.

Objective D. Maintain or increase, as necessary, morale and desire of faculty and staff to achieve our set-forth goals and objectives through a reward system that recognizes both accomplishment and the lack of it.
**Objective E.** Provide our support staff with opportunities for professional enrichment through special workshops and seminars both on-campus and off-campus.

**Objective F.** Provide directed leadership training for undergraduate and graduate students through incorporation of leadership principles and techniques into formal academic courses, and through informal, personal interactions with students.

**Goal 5:** Foster harmonious faculty, staff, and administrator relationships.

**Objective A.** Maintain up-to-date role statements for all faculty and staff.

**Objective B.** Conduct annual performance appraisals for all faculty and staff, with careful attention to the relationship between expectations (role statement) and performance.

**Objective C.** Keep departmental faculty and staff informed through adequate meetings, memos, and informal interchanges.

**Objective D.** Provide ample opportunity and a non-threatening atmosphere for faculty, staff, and students to express themselves to the department head and to each other.

**Objective E.** Develop and nurture an atmosphere of mutual trust and respect among all levels within the Department and among departments in the College and the University.

**Objective F.** Maintain a commitment to education and professionalism that prevents any discrimination against individuals within faculty, staff, and students on grounds of age, race, color, sex, creed, religion, or physical disability, while demonstrating a zero-tolerance policy for cases of infringement.

The mission of the undergraduate forestry program can be inferred as:

To mentor undergraduate students by facilitating instruction and experiential learning based on a dynamic and highly relevant forestry curriculum synthesized from established knowledge and cutting-edge research. The specific mission of the forestry program, within the overall mission of the Department, has shifted over the past few decades away from the traditional paradigm in which the emphasis was on timber production as the primary commercial endeavor in forested landscapes. In keeping with the integration of forest, range, and wildlife sciences within the Department, the current paradigm emphasizes *understanding, valuing, and sustainably managing the full spectrum of ecosystem goods and services provided by wildlands.* Our rationale is that
the managers and custodians of forests in Utah, North America, and other continents, are rapidly
diversifying their scope of operations to include wildlife production, water stewardship,
ecotourism and outdoor recreation, and conservation incentives. In response, the curricula of our
BS degrees are designed to educate students within the new paradigm while also providing them
with the qualifications required for meeting expectations of the traditional paradigm (e.g. the

Goals for the program are stated in the introductory paragraphs of the Forestry Major advising
brochure available in print and on the college website (at http://www.usu.edu/majorsheets/09-10/Forestry09.pdf) as follows:

Forestry majors at Utah State University work to gain the knowledge and skills they will need to
manage public or private forests for a wide variety of resources: timber, recreation, water,
biological diversity, and more. The goal of the Department of Wildland Resources [for the
undergraduate forestry program] is to provide America’s future foresters with the broadest
possible understanding of the biological, physical, economic, political, and social environment
that they will be working in as forestry professionals.

Evidence that our mission, goals, and objectives are consistent with the SAF Standards for
Accreditation (required by Standard I.1.1) will be shown throughout this document and the
program’s review visit. It is indicated by the quality of forestry graduate we produce and the
contributions they make to the profession.

Through the diverse list of subject matters and disciplines included in our goals – timber,
recreation, water, biological diversity and biological, physical, economic, political, and social
environment – it is clear that the program intends to educate students who reflect the
interdisciplinary nature of the forestry profession (Standard I.1.2), and who can fulfill their
professional roles in dealing with diverse and changing social, cultural, economic, and
environmental needs and values (Standard I.1.4). The CNR mission statement also is consistent
with these standards, and the university’s mission stresses the importance of diversity –
cultivating diversity of thought and culture.

2. **Self-evaluation and revision**

The faculty and staff of the Department of Wildland Resources meet off-campus at the end of the
summer each year for a day-long annual retreat, during which the status of the Department’s
finances, enrollments, teaching quality, research productivity, personnel, curricula, mission and
vision are all discussed. For example, in the 2008 retreat we brought in a facilitator, Dr. Steve
Daniels, who has a forestry background, to run an afternoon of plenary sessions and working
groups. The purpose was to explore how each faculty member, whether from a background in
wildlife, rangeland, or forest ecology and management, could contribute to all academic
programs within an integrated department. It is during such retreats that we discuss the need for changes (or not) to undergraduate curricula, department policies, procedures for graduate programs, etc. and appoint faculty sub-committees to work on any such changes during the following semester. The Department has two scheduled meetings of all faculty and staff members (with undergraduate and graduate student representatives) during each semester, and some unscheduled department meetings are also called as and when required.

We endeavor to keep the program responsive to the needs of its constituencies (Standard I.1.3) by ensuring interaction and exchange among faculty, students, and practicing professionals. Examples of this include faculty and student participation in SAF activities, both at local and national levels, student interaction with practicing professionals in the WILD 2000 professional orientation class, student and faculty participation in seminars and conferences on campus, and in other ways. The college’s professional advising office also keeps in close contact with prospective employers, connecting them to students with particular education and skills.

Ethics and professionalism are implied in these mission and goal statements (see Standard I.1.5), but not explicitly stated. They are covered under Standard II.10.
STANDARD II: CURRICULUM

The University requires that each academic department and college publish a “curriculum sheet” or “major requirement sheet” annually for each of its undergraduate degrees, showing all course requirements. These curriculum sheets are available in hard copy and on the USU web site (http://www.usu.edu/majorsheets/09-10/Forestry09.pdf), are updated yearly, and represent a contract between the student and the university. A student is held responsible for fulfilling the requirements described on the sheet published in the year in which s/he enters the university, and it also serves as a guideline in meetings with the student’s academic adviser.

Table II-1 shows the curriculum sheet for the Forestry major for the 2009-2010. The curriculum sheet for 1999-2000, when the Forestry major was last re-accredited, is shown in Table II-2 for comparison. This is the only major for which SAF re-accreditation is sought. A total of at least 120 credits is required for the degree, including the components of (1) University Studies (30-34 credits plus 4 Depth courses), (2) General Science Foundation (34 credits), (3) Departmental Common (24 credits), (4) Forestry Degree Program (32 credits), and (5) Electives (variable credits). Courses may be double-counted in categories (1), (2), and (4) (Documents A-1, A-2, and B-1).

1. University studies (~general education)

The first component, University Studies, is designed to fulfill USU’s citizen scholar objective, and consists of two sets of requirements, including General Education (30-34 credits minimum) and Depth Education (4 courses). General Education, in turn has three sets of requirements, i.e., Competency (9-10 credits), Breadth (18-20 credits), and Exploration (3-4 credits). The Competency requirements are aimed at insuring that students are able to communicate effectively, utilize quantitative methods, make appropriate use of technology, and function effectively in groups. They include 6 credits of Communications Literacy (CL), 3-4 credits of Quantitative Literacy (QL), and 0 credits of Computer and Information Literacy (CIL). CIL requires no specific course, but students must pass six competency exams before earning 37 USU credits, covering the areas of public access networks and electronic mail, ethics of computer-assisted access and use, information resources, operating systems and environments, documentation preparation, and data visualization and presentation (spreadsheets).

Breadth requirements are designed to introduce students to the nature, history, and methods of different disciplines; to help them understand the cultural, historical, and natural contexts shaping the human experience; and to focus on the important cultural, socio-economic, scientific, and technological issues of today’s global community. These requirements must be distributed among the six categories of American Institutions (BAI), Creative Arts (BCA), Humanities (BHU), Life Sciences (BLS), Physical Sciences (BPS), and Social Sciences (BSS).
The Exploration requirement is designed to allow students to investigate areas that especially interest them and mandates that a course be chosen from the QL category or one of the six Breadth categories listed above.

Depth requirements for the Forestry major include two Communications Intensive (CI) courses, one Quantitative Intensive (QI) course, and one course each in the Humanities and Creative Arts (DHA) and Social Sciences (DSS). Given that Forestry is classified as a “Life Sciences” major, Depth courses in the Physical (DPS) and Life Sciences (DLS) cannot be used to fill this requirement.

2. **General science foundation (34 credits)**

Courses included in the General Science Foundation for the Forestry major are listed in Table II-1. Document A-2 shows the distribution of semester credits for these courses among the categories of Communications, Science and Mathematics, and Social Science and Humanities. Ninety percent of the credits fall in the second category, reflecting the Life Sciences nature of the degree. However, it is noteworthy that all courses except those in mathematics and statistics include some coverage in at least two of the three categories, and the chemistry courses consistently span all three categories. When University Studies and the General Science Foundation are combined, total credits are about evenly divided between the two groups of ‘Biophysical Sciences and Mathematics’ and ‘Social Sciences, Humanities, and Communications’—indicative of the solid liberal arts background our Forestry majors are obtaining (Documents A-1 and A-2).

3. **Professional education (56 credits)**

The professional education requirements for the Forestry major include two components, i.e., the Departmental Common and the Forestry Major courses (Table II-1). Syllabi for all required courses are included in Appendix II-1. The Departmental Common, consisting of 24 credits in eight courses, is required of all four undergraduate majors in the department, i.e., Conservation and Restoration Ecology, Forestry, Rangeland Resources, and Wildlife Science. It provides a broad overview of wildland resources science and management, and the opportunity for our Forestry majors to interact strongly with other majors in the department. The first course in the common, WILD 2000 (Introduction to Wildland Resources), is designed to expose freshman and transfer students to natural resources issues, professions, student clubs/activities, and faculty advisors given that many of them enter the program with very little background in natural resources. The remaining seven courses are collectively organized to: 1) familiarize students with native flora and fauna of the Intermountain West; 2) expose them to population, community and ecosystem concepts; 3) and develop their capacity to assess and interpret landscapes and make informed management decisions. An underlying feature of the commons curriculum is the
mixing of students with different majors and backgrounds in the same courses. Broad training in an interdisciplinary atmosphere makes them better suited for varied employment opportunities and job demands.

Originally organized to be offered in the junior year, the advanced courses constituting the Departmental Common were subsequently redistributed evenly across the junior and senior years. These changes were driven by student input from a survey conducted in 2007, and faculty discussions at department retreats in 2006 and 2007. The main rationale is to provide students with a more logical sequence of courses that moves from identification and description (“what”) to assessment and management (“how”). The revised common curriculum also strengthens linkages between courses within semesters and allows for the development of WILD 4910 as an integrative, problem-solving, “capstone” course in the spring semester of the senior year.

The Forestry Major courses are designed to meet the unique needs of those students pursuing a career in the field of forestry and to meet SAF accreditation requirements. Included in this category are ten courses totaling 32 credits (Table II-1). In contrast to the Departmental Common, which places a heavy emphasis on the bio-physical sciences, the Forestry Major cluster strikes a balance between the bio-physical and social sciences. Document B-1 shows the distribution of credit hours across the four SAF-required areas of study, i.e., Ecology and Biology; Measurement of Forest Resources; Management of Forest Resources; and Policy, Economics, and Administration and Law for all courses in the professional curriculum. Ecology and Biology accounts for nearly two-thirds of the credits in the Departmental Common, with the remainder of the credits distributed fairly evenly among the other three areas. In contrast, for the Forestry Degree (specific) cluster, credits are distributed evenly among the four areas, reinforcing what was stated above regarding the balance between the bio-physical and social sciences. Note that in AY 2010-2011, ENVS 3000, a four-credit course that encompasses the topics of natural resources policy and economics, will be replaced by two three-credit courses in policy and economics, respectively, adding further strength to the social sciences dimension of the Forestry curriculum.

4. Electives (variable credits)

The number of electives varies with the individual student, depending on a number of factors, including the amount of advance college credit and the number of terms they choose to complete their degree. For the student with no advance credit and wanting to finish in four years, there are currently 9 credits available for electives, which will be reduced to 7 in AY 2010-2011 when ENVS 3000 is replaced by APEC 3012 and ENVS 3010.
5. **Highly recommended electives**

Document B-2 lists courses that are not required but highly recommended to forestry majors and shows the distribution of credits among the four SAF-required areas of study, plus where they contain significant content in field work, ethics, communications, and integration. These courses include Wildland Fire Behavior (WILD 4520), Dendrology (Wild 4950/6900), Urban/Community Forestry (WILD 5650), and International Forestry and Natural Resources Management (WILD 4950). Only the first two existed and were required as part of the AY 1999-2000 curriculum. In nearly all cases, material offered in these courses is covered at a more introductory level or less comprehensively in courses that are required of the major. For example, wildland fire behavior is included in the course on “Wildland Disturbance: Ecology and Management” (WILD 5710), which looks at selected agents of disturbance in ecosystems over large spatial and long temporal scales, and the interactions among these agents in influencing the dynamics of ecosystems and their management. Dendrology is introduced in “Wildland Plant Ecology and Identification (WILD 3600), where 25 species of trees from the western U.S. and two naturalized trees species from Eurasia are among the 193 species treated in the class. In contrast, the Dendrology course (WILD 4950/6900) covers over 150 tree species, mostly from North America, but also a select number from all other continents where trees grow. Urban/Community Forestry (WILD 5650) and International Forestry and Natural Resources Management have less coverage in the required courses in the Forestry curriculum, but are more integrative in nature and thus are deserving of serious consideration by students in the curriculum—especially those with a strong interest in the urban/community and international dimensions of forestry.

The fact that there is little flexibility in the Forestry curriculum (and in most other departmental majors as well) and that there are so few students in the Forestry major makes it challenging to offer these highly recommended electives on a regular basis. This lack of flexibility is due to several factors, including the 120-credit limit imposed by the university, the credits wrapped up in the departmental common (including nine credits of chemistry), and SAF and OPM requirements.

6. **Courses currently not offered**

There are currently three courses officially on the books that are relevant to the forestry major and were required in the AY 1999-2000 curriculum, but are no longer offered as a result of curriculum revision associated with the reorganization of the college and creation of new departments in 2002. These include Computer Applications in Natural Resources (WILD 2500), Forest Entomology (WILD 5510), and Forest Harvest and Utilization (WILD 4540). Most of what was included in WILD 2500 seems to be covered in WILD 4750 (Monitoring and Assessment in Natural Resource and Environmental Management) and WATS 4930 (Geographic Information Systems) (Appendices II-1 and II-3). Likewise, some of what was covered in WILD
5510 is now covered in WILD 5710 (Wildland Disturbance: Ecology and Management), where fire, bark beetles, and snow avalanches are studied as interrelated, interacting forces in vegetative succession in Intermountain subalpine forest ecosystems; and bark beetle taxonomy, damage, and “pest” management are incorporated. WILD 4540 is more challenging with respect to its current coverage in the curriculum in that there is no systematic treatment of harvesting systems and utilization of the products of harvesting. However, WILD 5700 (Forest Assessment and Management) includes a discussion of how different harvesting systems fit with different reproduction methods and thinnings, and how the non-availability of a particular harvesting system may constrain the choice of a particular silvicultural practice (Appendices II-1 and II-3). Moreover, WILD 5350 (Wildland Soils) includes a discussion of the use of machinery and its effect on soil compaction, and generalities related to slope stability and erosion, along with guidelines on such elements as road design and logging direction. Finally, WILD 5420 (Forest and Shade Tree Pathology) covers processing systems, transportation, and harvesting activities in terms of how different logging systems affect disease in the residual/regenerating stand. It also includes lectures on wood products deterioration (Appendices II-1 and II-3). In addition, USU extension forestry has begun working with the Forestry Club to enhance exposure of forestry (and other) students to educational opportunities related to timber harvesting and utilization. For example, extension offers a timber harvest tour to landowners and agency professionals each fall. In the future, extension will facilitate student attendance at these tours and other educational events. Extension also will compile a list of web and other resources available to students, such as videos, archived presentations, and fact sheets.

7. Assessment of competencies/educational outcomes

In addition to the traditional modes of assessing SAF-specified competencies/educational outcomes expected of students majoring in Forestry at USU, such as graded performance in courses, especially those of a capstone nature, and interviews with graduating seniors (see Standard III), we recently conducted surveys of all instructors of general science and professional courses (n=35) in the Forestry curriculum, all Forestry majors (n=13), and all graduates of the Forestry degree program over the past ten years (n=47) to determine the degree to which they viewed these competencies/outcomes being met. The results of these analyses are summarized in Tables II-3 and II-4, and treated in greater detail in Appendices I-2 through II-5. Specifically, we asked various individuals to rate each course in our curriculum with respect to the degree to which it met each of the SAF-specified competencies/educational outcomes, using the following scale: (1) not at all, (2) a little, (3) somewhat, (4) quite a lot, and (5) very much. The alumni survey differed somewhat in that we also asked these people to rate each of the competencies/outcomes with respect to its importance to their career development, and then to rate the extent to which their forestry education at USU enhanced each of those competencies/outcomes. We then asked all persons to provide us with examples of ways in which competencies/outcomes receiving a score of 4 or 5 were met. We also asked them to
provide us with examples of ways in which each of eight requirements in the SAF accreditation guidelines were met, including oral and written communication, field instruction and practice, analytical and critical reasoning skills, awareness of historical and current issues and policies, variety of educational experiences, distance learning, student involvement in faculty research, and professional ethics. Finally, these results were coupled to those in Documents B-1 through B-3 where respondents were asked to indicate courses that contained significant content in one or more of four areas deemed important by SAF accreditation guidelines, i.e., field work, ethics, oral and written communications, and integrated resource management.

Table II-3 presents the frequency of responses by instructors and Forestry majors regarding the degree to which required courses in the General Science Foundation collectively contribute to various SAF-specified competencies/outcomes in the Forestry curriculum at USU in AY 2009-2010. It also lists particular courses that received high scores (i.e., 4 or 5) from instructors and Forestry students in each of the 11 SAF-specified competencies/outcomes in four general areas, i.e., Communications, Science and Mathematics, Social Sciences and Humanities, and Computer Literacy. For Science and Mathematics outcomes/competencies, nearly 90% of all required courses (n=9, discounting alternatives and labs as separate from lectures) received high ratings by both instructors and students, compared to none for the other three areas. Every individual competency/outcome included at least one required course where ratings were high by at least one group, except for oral communication (Competency A1), “understanding of human behavior and social and economic structures, processes, and institutions of importance across a broad range of societies” (C2), and “understanding of human diversity and the diverse dimensions of the human experience and culture” (C3). These results reflect the life sciences emphasis in the curriculum and reinforce those presented above in Document A-2. Student responses pretty much paralleled those of faculty, except mainly for the Chemistry courses where students quite frequently scored these courses substantially lower than the instructors in nearly all areas except the physical sciences. Conversely, students rated NR 2220 (General Ecology) and ENVS 2340 high in ability to read comprehensively and critically (A2b) when the instructors of these courses did not. ENVS 2340 (Natural Resources and Society), a Breadth Social Sciences General Education course, is included in Table II-3 to demonstrate its impact on bolstering the Social Sciences and Humanities competencies/outcomes in the General Science Foundation of the Forestry major, as it was rated high by both instructors and students for competencies C2 and C3, thus filling the social science hole in the required General Science Foundation. It, however, was not included in the analysis presented above.

Table II-4 shows the frequency of responses by instructors and Forestry majors regarding the degree to which required Professional courses collectively contribute to various SAF-specified competencies/outcomes in the Forestry curriculum at USU in AY 2009-2010. It also shows Professional courses in the curriculum that received high scores from instructors in 18 SAF-specified competencies/outcomes in four general areas, i.e., Ecology and Biology; Measurement of Forest Resources; Management of Forest Resources; and Forest Resource Policy, Economics,
and Administration. For Ecology and Biology competencies/outcomes, 45% of all required courses (n=18) received high ratings by both students and instructors, compared to 15%, 10%, and 5% for Measurement; Management; and Policy, Economics and Administration, respectively--again underscoring the life sciences emphasis in the curriculum. Student ratings again tended to parallel those of instructors, but only in about two-thirds of the courses across all competencies/outcomes. For most of the remaining competencies/outcomes student ratings were lower (i.e., 1-3). There were a few exceptions to this trend for students, including WILD 4750 regarding “the ability to make ecosystem, forest, and stand assessments” (Competency A4); WILD 4850 concerning “understanding ecological concepts and principles” (A3) and “understanding of tree physiology and the effects of climate, fire, pollutants, moisture, nutrients, genetics, insects and diseases on tree and forest health and productivity (A5); and WILD 5700 regarding “understanding of the administration, ownership, and organization of forest management enterprises” (C6). In sum, the above analysis seems to bring into focus at least one competency/educational outcome that may be in need of strengthening in the forestry curriculum, i.e., C6. This is not to say that effort in this area is completely lacking (Appendix II-3). For example, in WILD 2000 students study the historical settlement pattern of the Great Basin and Colorado Plateau resulting in the current private, state, and federal land ownership pattern, and the implications of this pattern for the use and management of the region. The new WILD 4910 course will likewise bear on this competency/outcome in a project that focuses on managerial financing.

The fact that WILD 4910, Assessment and Synthesis in Natural Resource Science, plays a critical role in meeting several of the professional competencies/outcomes where coverage is otherwise thin, highlights the importance of adding this course to the curriculum in the current academic year (Appendix II-3).

How oral and written communication skills are reinforced throughout the curriculum. Among the 9 courses (13 if alternatives and labs are counted) required for the General Science Foundation component of the Forestry curriculum, only the math and statistics courses do not devote at least 0.1 credits to communications (Document A-1). Likewise, all but two of the 18 courses required in the Professional Education component of the curriculum contain “significant” content in communications, i.e., WILD 3600 (Wildland Plant Ecology and Identification) and WILD 5750 (Applied Remote Sensing) (Document B-1). Nonetheless, in WILD 3600 there is a substantial essay component to each exam, and in WILD 5750 written reports are required throughout the course, including a final term paper (Appendix II-3).

Appendix II-3 provides numerous examples by instructors of the incorporation of communications in the Professional Education component of the curriculum. Included are
exercises that involve both oral and written communications, some done individually by students and others in small groups. In several instances, written assignments are reviewed by the instructor and returned to the student for revision. In one course (WATS 4930), students are required to give a poster presentation. Two of the courses (WATS 3700 and WILD 5420) are officially designated as Communications Intensive (CI) by the university, requiring a minimum of four written assignments. In such courses, it is common practice for students to submit first drafts of their papers to a student peer reviewer who is a member of USU’s Rhetoric Associates (RA). The RA makes language (but not content) corrections and meets with the student to go over their comments, whereupon the student submits the first and final drafts of their paper to the instructor for grading. Likewise, Forestry majors indicated that significant communications content resides in all but one of the required courses in the Professional Education component (Appendix II-4) and provide several examples, which largely parallel those given by instructors.

*How adequate field instruction and practice are provided to ensure that graduates have the opportunity to be competent to practice forestry as professionals.* As reported in the previous re-accreditation report in 2000, the six-credit required CNR Summer Camp experience was a critical part of the education of Forestry (and Range) majors at USU, and positioned them well to secure jobs in the same and subsequent summers with various natural resource employers. A number of factors led to the eventual discontinuance of this experience following the summer of 2002, including the partial loss of the summer camp facility to a fire in the spring of 1998, the change to the current early-fall academic calendar in the fall of 1998, declining enrollments starting in the mid-1990s, and re-organization of the college in 2002. Previously, the credits associated with the required summer camp did not count against a Forestry major’s total allowable credits. With the change to semesters this was no longer the case. With reorganization and associated curricular revision, we have attempted to at least partially compensate for this loss of field time. In particular, the departmental common courses were designed to include as much field lab time as possible. Indeed, instructors of the required Professional courses in the Forestry curriculum indicate that half of their courses contain significant field work (Document B-1), while forestry majors feel that slightly more than half (10 of 18) of these courses do so (Appendix II-4). This proportion would likely be higher were not some of the courses offered in the Spring term (January-early May) only, as indicated by the instructors in at least three courses (Appendix II-3). High elevation mountain locations where Utah’s forests exist generally are not accessible during the Spring term. Appendices II-3 and II-4 provide several examples by instructors and Forestry majors, respectively, of substantial field work in various professional courses. Notable among these is an intensive three-day field trip in WILD 4850 and 4910, as part of the departmental common that focuses on inventory, monitoring, and vegetation management.

It is noteworthy that while internships are not required, by the time they graduate, Forestry majors typically have a great deal of quality summer work experience, i.e., three or more
summers in fire, timber, etc. Additional opportunities for field experience are provided by the Forestry Club and other student organizations in CNR (Appendix II-4).

How the forestry curriculum fosters analytical and critical reasoning skills, including systematic problem-solving and decision-making for individuals and in a team environment. Appendix II-3 provides examples by instructors in 13 of the required 18 professional courses in the Forestry curriculum regarding the fostering of analytical and critical reasoning skills, especially as they relate to problem-solving and decision making. Examples are also provided from the two courses in the General Education Component (ENVS 2340) and the General Science Foundation (NR 2220), respectively, that are closely related to the professional curriculum. Such skills are most highly developed in courses that emphasize integrated resource management. In this regard, instructors in 13 of the 18 professional courses in the curriculum indicated that their courses contain “significant content” in integrated resource management (Document B-1), while Forestry majors indicated that all but two of these required courses do so (Appendix II-4)—and one of these (WILD 4910) they have not yet had an opportunity to take. A closely related measure of the substantial treatment of integrated resource management in the curriculum can be found in the contributions of various courses to SAF-specified competencies/educational outcomes listed under “Management of Forest Resources” (Table II-4 and Appendix II-3), in particular “the ability to analyze the economic, environmental, and social consequences of forest resource management strategies and decisions” (C2) and “the ability to develop management plans with specific multiple objectives and constraints” (C3). Faculty rated four required courses in the Professional curriculum (WILD 4850, 4910, 5420, and 5700) and one closely related course in the General Education component (ENVS 2340) as contributing “quite a lot” or “very much” to these competencies/outcomes. Appendix II-3 provides specific examples of these contributions. Notably, several of these examples include team exercises.

How student awareness of historical and current issues and policies affecting resource management and conservation is established. This awareness is most strongly developed in two professional courses in the curriculum, ENVS 3000 (Natural Resources Policy and Economics) and WILD 4910 (Assessment and Synthesis in Natural Resource Science) (Appendix II-1) and is reflected in the high ratings that instructors gave to these courses in relationship to SAF-specified competencies/educational outcomes in the area of Forest Resource Policy, Economics, and Administration, in particular “understanding of forest policy and the processes by which it is developed” and “understanding of how federal, state, and local laws and regulations govern the practice of forestry” (Table II-4, Appendix II-3). Examples of the contributions of these courses to these competencies/outcomes are found in Appendix II-3, along with examples from eight other required courses in the curriculum. Students likewise gave high ratings to ENVS 3000 in this regard, but have not yet had an opportunity to experience WILD 4910, which is being offered for the first time in the Spring 2010 term. Overall, with ENVS 3000, a 4-credit course being replaced in AY 2010-2011 by two 3-credit courses in the form of ENVS 3010 (Natural Resources Policy) and APEC 3012 (Introduction to Natural Resource and Regional Economics),
coupled to the new capstone course (WILD 4910) as part of the departmental common, the Forestry curriculum should be even stronger in providing an awareness of historical and current issues and policies affecting resource management and conservation.

*How the forestry curriculum provides a variety of educational experiences, enabling students to apply the scientific methodologies necessary to attain an array of beneficial forest products, services, and conditions.* The great variety of educational experiences available to Forestry majors can be gleaned from reading course syllabi (Appendix II-1) and from specific examples provided by course instructors in Appendix II-3. Of particular note are the mix of lecture, laboratory, and field experiences; the strong computational/analytical approach; the high incidence of working in teams; and the many opportunities for students to develop their communication skills.

*How any distance-learning component of the program is consistent with the program’s stated objectives.* USU has three regional campuses in Brigham City, the Uintah Basin, and Tooele; two “campus partnerships” at Price (College of Eastern Utah) and Ephraim (Snow College), and multiple “educational centers” scattered around the state. Three CNR faculty currently reside in the Uintah Basin and a search is underway for a position in Moab. The offering of courses among campuses is nearly seamless in that all CNR faculty, regardless of location, are members of the academic departments based on the main campus in Logan and adhere to the same standards of course development and delivery. Thus, a course may originate on any of the campuses and be available throughout the system. At last count, there were eleven CNR courses that are either required of or highly recommended to Forestry majors that currently have or recently had a distance emphasis. The required courses include WILD 2000, 3600, 3610, 3800, 3810, and 4910; ENVS 2340 and 3330; and WATS 3700, while those highly recommended (electives) include WILD 4520 and WILD 5650. Appendix II-3 provides specific examples of the distance component in a subset of these courses. The most common form of delivery is synchronously and interactively by video streaming to one or more campuses beyond the campus of origin on the same calendar as non-distance courses and involving matriculated students. All the required courses utilize this mode, while those that are highly recommended are web-based. Among those that are video-streamed, there are some differences. For example, those that have a lab component (WILD 3600, WILD 4910) typically have this component taught/managed by an instructor at each site of delivery. WATS 3700 is a special case in that in addition to its typical non-distance mode of delivery. The course was offered last spring (2009) on an experimental basis to non-matriculated students throughout the state for 6-10 hours daily for ten consecutive days via video streaming. It did not prove to be an especially effective learning experience and was very time-demanding, and thus has been discontinued. WILD 5650 is seemingly one of the most highly evolved and unique among CNR courses in the use of CT-Web to deliver course content on a synchronous calendar that requires students to complete assignments on a weekly basis and be involved in group discussions of the subject matter. In contrast, WILD 4520 is offered in an asynchronous mode, with students completing individual modules at their own pace.
within a given term. This self-paced mode can be advantageous to persons whose commitments preclude participating on a set schedule.

How faculty research enriches the curriculum and opportunities available to students to participate in research activities. Appendix II-3 provides several examples of how research enriches the education of Forestry students at USU. The most common mode seems to be that of faculty incorporating their research and that of others into their courses, not only with respect to knowledge acquisition, but also with regard to approaches to problem-solving. A smaller number of faculty provide opportunities for students to work in their laboratories and/or on their field projects. A few faculty members offer an array of opportunities for experiential learning by students that may include agency internships, lab- or field-based tasks for which a student has major responsibility, and independent research and/or honors theses. In the latter case, students are encouraged to participate in and present their work at regional and national meetings and serve as co-authors on peer-reviewed publications.

Where and how professional ethics are incorporated into the professional curriculum and reinforced by faculty. Among the 18 required professional courses in the Forestry curriculum, instructors indicated that seven contained significant content in ethics (Document B-1), while forestry majors identified only five courses as such (Appendix II-4). The two groups agreed on only two courses, i.e., ENVS 3000 (Natural Resources Policy and Economics) and ENVS 4000 (Human Dimensions of Natural Resources Management). When faculty and students were asked to rate which specific courses contributed to the SAF-specified competency/outcome dealing with ethics, i.e., “understanding of professional ethics, including the SAF code, and recognition of the responsibility to adhere to ethical standards in forestry decision-making on behalf of clients and the public” (D3), only one course received a rating of 4 (“quite a lot”) on a five-point scale and none received a 5 (“very much”) (Table II-4 and Appendix II-3). The course receiving a rating of 4 was WILD 4910 (Assessment and Synthesis in Natural Resource Science), which will be taught for the first time in the upcoming Spring (2010) term. Eight professional courses were given a rating of 2 (“a little”) by faculty, while students gave this rating to five courses (Appendix II-3). Students gave a score of 3 (“somewhat”) to ENVS 2340, a general education course closely related to the professional curriculum. Specific examples of the incorporation of ethics into various professional courses are given in Appendices II-3 and II-4 by faculty and Forestry majors, respectively. Although the examples are quite diverse, those of faculty seem to focus more on ethical practice as professionals, whereas those of students seem to emphasize the conflicting nature of values and ethics in natural resource management.

8. Alumni perspectives

Of the 47 BS Forestry graduates to whom we sent surveys for completion, eight have returned them to date, which makes it very difficult to draw meaningful conclusions from the results (Appendix II-5). Nonetheless, there are a few trends that seem to be emerging. When asked to
rate the importance of various SAF-specified competencies/educational outcomes in the realm of General Education to their career development and the degree to which their educational experience at USU enhanced these competencies/outcomes, alumni noted slight to modest deficiencies in their educational experience in all four major categories, i.e., Communications, Science and Mathematics, Social Sciences and Humanities, and Computer Literacy. The largest deficiencies were noted in the “ability to understand and use the basic approaches and applications of mathematics and statistics for analysis and problem solving as appropriate for the program’s stated outcomes” (B3) and in “understanding of human diversity and the diverse dimensions of the human experience and culture” (C3). There was only one area where alumni felt that their educational experience at USU exceeded the importance of specific competencies/outcomes in their career development, i.e., understanding of physical and chemical properties, measurements, structure, and states of matter” (B2). This is interesting from the standpoint that this category received the lowest rating of any, juxtaposed against the fact that the curriculum requires 9 credits of chemistry—more than any other basic area of knowledge.

In the Professional realm, among the categories of Ecology and Biology; Measurement of Forest Resources; Management of Forest Resources; and Forest Resource Policy, Economics, and Administration, the greatest deficiencies were noted in the latter two categories, in particular with respect to “the ability to analyze the economic, environmental, and social consequences of forest resource management strategies and decisions” (C2) and “understanding of how federal, state, and local laws and regulations govern the practice of forestry” (D2) (Appendix II-5). Notably, these two competencies/outcomes were given the highest ratings of any professional competencies/outcomes with respect to their importance in career development. In only two instances did the experience at USU appreciably exceed the importance of those competencies/outcomes in their career development as perceived by alumni, i.e., “understanding of soil properties and processes, hydrology, water quality, and watershed functions” (A2) and “understanding of forest policy and the processes by which it is developed” (D1). It should be noted that the absolute ratings given by alumni regarding their educational experience at USU were mostly high, and thus the deficiencies noted were relative to the importance that alumni place on various competencies/outcomes in their career development.

When asked to rate the degree to which eight different SAF requirements were enhanced by their experience at USU, the lowest scores were given in the areas of distance learning, professional ethics, and field instruction/practice, in that order (Appendix II-5). It would seem that the issues raised with respect to distance learning have been dealt with effectively in recent years as current students did not raise these same issues. With respect to field instruction/practice, one alumnus highlighted the importance of the now defunct summer camp experience.

When asked to look back on their undergraduate experience at USU to those aspects that stand out as very positive, hands-on/field experience seemed to emerge more frequently than any other (Appendix II-5), with two respondents mentioning their summer camp experience in particular. When asked to do likewise regarding areas for improvement, one gets the impression that the
practical aspects of forest management (e.g., wood products, wood markets, and harvesting systems) offer the greatest opportunities for enhancement.

In sum, it seems that the feedback received from alumni is not wholly different from that received from course instructors and current Forestry majors and may thus lay the groundwork for focusing our efforts in improving the curriculum to a few select areas.

9. Future steps

Having conducted an assessment of our undergraduate curriculum in Forestry relative to SAF accreditation, faculty teaching the professional courses, Forestry majors who have taken these courses, and professional advisers of these students gathered to discuss ways in which the curriculum might be improved. Several recommendations emerged from this and ensuing discussions. The first, which is more of an observation than a recommendation, is that the new courses coming on board in natural resources economics (APEC 3012) and policy (ENVS 3010) should substantially bolster our coverage in this part of the curriculum, in particular regarding SAF-specified professional competency/outcome C5, i.e., “understanding of the valuation procedures, market, and non-market forces that avail humans the opportunities to enjoy non-consumptive products and services of forests. Likewise, our new senior capstone course (WILD 4910) required of all majors in the department should provide an excellent forum for “real-world” problem-solving in an interdisciplinary setting and strengthen our contributions to SAF-specified professional competency/outcome C6, i.e., “understanding of the administration, ownership, and organization of forest management enterprises.” The new ENVS 3010 should also help in this regard.

Second, in assessing our Forestry curriculum, it became clear that the “general science foundation” component is nearly void of social sciences. Forestry is a professional degree that is grounded in natural resource science, meaning that it is based in the biological, physical, and social sciences. Thus, when the curriculum sheet provides a list of required courses in the "Forestry Major" under the heading of "General Science Foundation" and includes only biological and physical sciences, it seems less comprehensive than it should be given the nature of this professional degree. Thus, our accreditation planning committee will recommend to the departmental curriculum committee that ENVS 2340 (Natural Resources and Society), currently a highly recommended course that meets the breadth social sciences requirement in the General Education component of the Forestry degree, be required of all Forestry majors.

Third, we identified harvesting and utilization of forest products as perhaps the weakest element in the Forestry curriculum. This element is strongly related to SAF-specified professional competency/outcome C4, i.e., “understanding of the valuation procedures, market forces, processing systems, and transportation and harvesting activities that translate human demands for
timber-based and other forest consumable forest products into the availability of those products.” Moreover, we note where harvesting is being recast as an invaluable tool in forest restoration and sustainability. The new effort on the part of USU Extension Forestry, aimed at helping forestry majors identify educational opportunities in the harvesting and utilization of forest products, will help in this regard. We have also identified an on-line course in harvesting and utilization at Oregon State University that we will highly recommend to our Forestry majors.

Fourth, although perhaps not as critical to the curriculum as the above components, we are sensitive to the fact that forest entomology has been de-emphasized in the curriculum given that the Forest Entomology course (WILD 5510) is no longer taught. Thus, we are strongly considering offering it in the future on an alternate-year basis.

Fifth, while we feel that the fundamentals of dendrology are adequately covered in WILD 3600 (Wildland Plant Ecology and Identification), there is some question regarding the lack of inclusion of tree species beyond the Intermountain West given the national scope of SAF accreditation. We thus turn to the SAF Committee on Accreditation for advice on this matter.

Sixth, given that alumni gave the lowest ratings to the physical sciences among 13 areas of general education in terms of importance to their career development, coupled with the fact that most accredited Forestry programs in the U.S. require only a single semester of Chemistry rather than two as is the case at USU, we recommend that serious consideration be given to eliminating the second semester of chemistry and that the 4-5 credit hours recovered be made available as electives—given the small number that now exist.

Finally, we are deeply concerned about the low enrollments in the Forestry major as they clearly relate to the demand for the curriculum (and the hiring of faculty) and thus we will be taking several measures in an attempt to reverse this downward trend, as outlined in Standard V. The implementation of these measures depends heavily on the CNR professional advising office, which is in the process of developing a “natural resources in the classroom” curriculum to assist high school teachers in more accurately portraying to students what the profession of forestry is about and what career opportunities exist. The professionals in the CNR advising office, although new, have a much stronger background in forestry than the previous advisers, and thus should be able to attract more students to the Forestry major from both the high school and community college ranks. Moreover, these advisers will be working with Forestry majors in the Forestry Club at USU to enlist them as student ambassadors to help with recruiting. They will also be working with administration and faculty at the USU regional campuses and centers to recruit new students from the rural sector of the state given the rural setting of most of these units.
Document A-1: General Education Foundation Summary—Required Courses

Institution Name: Utah State University  Academic Year: 2009-10

Official Degree Program Title: Bachelor of Science in Forestry

<table>
<thead>
<tr>
<th>Required Courses: # &amp; Title</th>
<th>Total Credit Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Communications</td>
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<tr>
<td>ENGL 1010 (CL1) - Introduction to Writing: Academic Prose</td>
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<tr>
<td>ENGL 2010 (CL2) - Intermediate Writing: Research in a Persuasive Mode</td>
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<tr>
<td>Breadth American Institutions (BAI) USU 1300-U.S. Institutions*</td>
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<tr>
<td>Breadth Creative Arts (BCA) USU 1330-Civilization: Creative Arts*</td>
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<tr>
<td>Breadth Humanities (BHU) USU 1320-Civilization: Humanities*</td>
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<tr>
<td>Breadth Social Sciences (BSS) ENVS 2340-Natural Resources and Society*</td>
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<tr>
<td>Depth Humanities and Creative Arts (DHA) PHIL 3510-Environmental Ethics*</td>
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</tr>
</tbody>
</table>

*The specific course listed is recommended for Forestry majors, but they can choose from an extensive list of courses that would meet the same requirement.

---

1 The Breadth Life Science (BLS), Breadth Physical Science (BPS), Depth Social Science (DSS), Communications Intensive (CI), Quantitative Intensive (QI), and Quantitative Literacy (QL) General Education requirements are met by courses required for the General Science Foundation or Professional Education portions of the Forestry major.
<table>
<thead>
<tr>
<th>Required Courses: # &amp; Title</th>
<th>Total Credit Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Communications</td>
</tr>
<tr>
<td>BIOL 1610- Biology I</td>
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<tr>
<td>BIOL 1620 (BLS)- Biology II</td>
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<tr>
<td>MATH 1050 (QL)- College Algebra</td>
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<tr>
<td>MATH 1100- Calculus Techniques</td>
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</tr>
<tr>
<td>SOIL 3000- Fundamentals of Soil Science</td>
<td>0.5</td>
</tr>
<tr>
<td>STAT 2000 (QI)- Statistical Methods</td>
<td></td>
</tr>
<tr>
<td>STAT 3000 (QI)- Statistics for Scientists</td>
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<tr>
<td>NR 2220- General Ecology</td>
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<tr>
<td>CHEM 1110 (BPS)- Principles of Chemistry I</td>
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<td>CHEM 1115- General Chemistry Laboratory</td>
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<tr>
<td>CHEM 1120- General Chemistry II</td>
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<td></td>
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<tr>
<td>CHEM 1210 (BPS)- Principles of Chemistry I</td>
<td>0.2</td>
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<tr>
<td>CHEM 1215- Chemical Principles Laboratory I</td>
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<tr>
<td>CHEM 1220- Principles of Chemistry II</td>
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### Required Courses:

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<tr>
<td></td>
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<td>Ecology and Biology</td>
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<td>Wild</td>
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<td>Management of Forest Resources</td>
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<tr>
<td>WILD 3610</td>
<td>Wildland Animal Ecology &amp; Identification</td>
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<td>WILD 3800</td>
<td>Wildland Ecosystems</td>
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<td>WILD 3810</td>
<td>Plant &amp; Animal Populations</td>
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<td>WILD 4750</td>
<td>Monitoring &amp; Assessment in NR &amp; Environmental Management</td>
<td>0.9</td>
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<td>WILD 4850</td>
<td>Vegetation and Habitat Management</td>
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<tr>
<td>WILD 4910</td>
<td>Assessment &amp; Synthesis in NR Science</td>
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<td></td>
<td>15.65 1.7 4.25 2.4</td>
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<td>WILD 5350</td>
<td>Wildland Soils</td>
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<td>WILD 5420</td>
<td>(CI)- Forest and Shade Tree Pathology</td>
<td>2.25</td>
<td>0.75</td>
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Institution Name: Utah State University

Official Degree Program Title: Bachelor of Science in Forestry

Academic Year: 2009-10
<table>
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<tr>
<th>Required Courses: # &amp; Title</th>
<th>Credit Hours in SAF-Required Areas of Study</th>
<th>Course Contains Significant Content in (check all that apply)</th>
<th>Total Credit Hours</th>
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<tbody>
<tr>
<td>WILD 5700- Forest Assessment &amp; Management</td>
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<td>0.5</td>
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<td>WILD 5710- Wildland Disturbance: Ecology &amp; Management</td>
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<td>WILD 5750- Applied Remote Sensing</td>
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<td>ENVS 3000- Natural Resources Policy and Economics*</td>
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<tr>
<td>ENVS 3300- Fundamentals of Recreation Resources Management</td>
<td>1.5</td>
<td>0.75</td>
<td>0.75</td>
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<tr>
<td>ENVS 4000 (DSS)- Human Dimensions of Natural Resource Management</td>
<td>0.4</td>
<td>1.3</td>
<td>1.3</td>
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<tr>
<td>WATS 3700 (CI)- Fundamentals of Watershed Science</td>
<td>0.5</td>
<td>0.5</td>
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<td>WATS 4930- Geographic Information Systems</td>
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<td><strong>12.4</strong></td>
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<tr>
<td>APEC 3012- Introduction to Natural Resources &amp; Regional Economics</td>
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<tr>
<td>ENVS 3010- Natural Resource Policy</td>
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<td></td>
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<td><strong>FORESTRY MAJOR SUBTOTAL AY 2010-11</strong></td>
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<td><strong>8.15</strong></td>
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<tr>
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<td><strong>10.8</strong></td>
<td><strong>12.4</strong></td>
</tr>
</tbody>
</table>

*ENVS 3000 will be taught for the last time in AY 2009-2010 and replaced by ENVS 3010 and APEC 3012 collectively in AY 2010-2011.
### Courses: # & Title

<table>
<thead>
<tr>
<th>Courses: # &amp; Title</th>
<th>Credit Hours in SAF-Required Areas of Study</th>
<th>Course Contains Significant Content in (check all that apply)</th>
<th>Total Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WILD 4520- Wildland Fire Behavior (online)</td>
<td>0.6</td>
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<td>3</td>
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<tr>
<td>WILD 4950- Dendrology</td>
<td>4.0</td>
<td>X</td>
<td>4</td>
</tr>
<tr>
<td>WILD 5650- Urban/Community Forestry (online)</td>
<td>1.5</td>
<td>X</td>
<td>3</td>
</tr>
<tr>
<td>WILD 4950- International Forestry &amp; Natural Resources Management</td>
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<td>X</td>
<td>2</td>
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<tr>
<td><strong>TOTAL CREDIT HOURS</strong></td>
<td><strong>6.6</strong></td>
<td></td>
<td><strong>12</strong></td>
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</table>
Table II-1. The curriculum sheet for the Forestry Major at Utah State University, AY 2009-2010.

Forestry Major

Department of Wildland Resources
College of Natural Resources

Published November 2009 Effective for students beginning degree Summer Sem. 2009 thru Spring Sem. 2010

Admission Requirements For This Major

1. New freshmen admitted to USU in good standing qualify for admission to this major.

2. Transfer students from other institutions or other USU majors need at least a 2.5 total GPA for admission to the Forestry major in good standing. Special attention will be given to the amount of, and performance in, prerequisite math and science courses.

The Program

Forestry majors at Utah State University work to gain the knowledge and skills they will need to manage public or private forests for a wide variety of resources: timber, recreation, water, biological diversity, and more. The goal of the Department of Wildland Resources is to provide America's future foresters with the broadest possible understanding of the biological, physical, economic, political, and social environment that they will be working in as foresters.

Students begin their college careers by building the academic foundation for future professional courses. The first two years are devoted to studying biology and chemistry, math and statistics, and writing. The first two years are also when students take most of their University Studies courses, several of these also fulfill departmental requirements. Transfer students who have completed their general education requirements elsewhere may need to take additional lower-division courses to be ready for professional courses.

Professional courses in forestry are taken mainly by juniors and seniors. They include several classes in forest biology and ecology, as well as economics and management. Students also take courses that introduce them to related natural resource topics, such as range, wildlife, and watershed management.

The formal requirements for a Forestry major, together with University Studies requirements, are outlined in this program guide, which students are urged to read carefully and discuss with their academic advisor. The Forestry major is an interdisciplinary, open-ended program designed with the expectation that students will acquire additional practical experience through various summer internships provided within the College of Natural Resources. Furthermore, undergraduate students are encouraged to join the Forestry Club, which is Utah State University's student chapter of the Society of American Foresters. The club provides enjoyable opportunities for getting acquainted with the forestry profession.

Career Opportunities

Forestry majors typically find work in private companies, such as private consulting firms or the timber industry; in federal agencies, such as the USDA Forest Service or Bureau of Land Management; or with forestry offices at other levels of government. Foresters may work as wildlife biologists, timber sale administrators, fire, insect, or disease control specialists; or, with advanced training, researchers and teachers. Employment opportunities may be further enhanced by obtaining a master's degree in this field.

Degrees and Programs Offered

Through This Department

Conservation and Restoration Ecology Bachelor of Science (BS)
Forestry: BS, Master of Science (MS), and Doctor of Philosophy (PhD)
Range Resources: BS
Wildlife Science: BS
Wildlife Biology: MS and PhD
Ecology: MS and PhD
Natural Resources: Master of Natural Resources (MNR)

Academic Advisement

All students should contact their academic advisor for assistance with course selection, program planning, and meeting graduation requirements. If they do not know who their advisor is, students should contact the Department of Wildland Resources (NR 200) or the College of Natural Resources Academic Service Center (NR 125).

Graduation Requirements:

BS Degree in Forestry

Minimum University Requirements

- Total credits: 120
- Grade point average (most majors require higher GPA): 2.00 GPA
- Credits of C- or better: 100
- Credits of upper-division courses (10000 or above): 40
- USU credits: 12
- Credits in American institutions: 12
- Completion of approved major program of study: See department
- Credits in science (if required by department): 12
- University Studies requirements: See below

*Colleges and departments may require more credits or a higher GPA. See requirements on this sheet.

University Studies Requirements for Forestry Major

Note: Approved University Studies courses and requirements are listed in the General Catalog. The most current listings are shown online at:
http://www.usu.edu/generalcatalog/

General Education Requirements (30-34 credits)

- Competency Requirements (9-14 credits)
- Communications Literacy (CL1 and CL2) (6 credits)
- ENGL 1010 (CL1) (3 credits) or satisfactory AP, CLEP, IBO, ACT, or SAT score
- AND
- ENGL 1020 (CL2) (3 credits) or satisfactory IBO score

- Quantitative Literacy (QL1) (0-4 credits)
- MATH 1050 (4 credits)
- OR
- MATH 1100 (3 credits)
- OR
- Satisfactory AP, CLEP, IBO, ACT, or SAT score

- Computer and Information Literacy (9 credits)
- Passing grade on six computer and information literacy related examinations.
- Students must pass all six examinations before earning 27 USU semester credits. (Effective Spring Semester 2010, students must fulfill this requirement prior to enrolling in ENGL 1010."

26
Table II-1 continued

Breadth Requirements (18-20 credits)

Select at least one approved course from each of the following six categories:
American Institutions (BAI), Creative Arts (BCA), Humanities (BHU), Life Sciences (BLS), Physical Sciences (BPS), and Social Sciences (BSS). (CLEP or AP credit may be used.) At least two of the six breadth courses must be University Studies courses with a UBU prefix (excluding USU 1000, 1010, 1110, 3300, 4900, and 6900). BLS 1200 (III.L.) and CHEM 1110 (BPS), 1120 (BPS), or 1220 (BPS) may be used toward this requirement. ENV 2340 (IBS) is recommended.

Exploration Requirement (0-4 credits)

Choose an additional class from one of the following General Education categories: BLS, BAI, BCA, BHU, BLS, BPS, or BSS. Since MATH 1500 and 1000 are both required for the Forestry major, one of these courses will fulfill the Quantitative Literacy requirement and the other will fulfill the Exploration requirement.

Depth Education Requirements

Communications Intensive (CI) (2 courses)

WATS 2700 and WILD 5420 will meet this requirement.

Quantitative Intensive (QI) (1 course)

STAT 2000 or 3000 will meet this requirement.

Depth Course Requirements (4-credits minimum, including 2 credits minimum completed in each of two courses)

Complete at least 2 credits in approved 3000- or 4000-level or above courses from each of the following two categories: Humanities and Creative Arts (DHA) and Social Sciences (DSS). ENV 4000 (DSS) may be used toward this requirement. PHIL 3010 (DHA) is recommended.

Forestry Major (90 credits)

All courses required for the major must be taken on a B-C-D-F-Final basis. A grade of B or better is required for all WILD courses used to meet the requirements for a major in Forestry. The grade point average for all courses taught by the College of Natural Resources must be 2.5 or higher.

A. General Science Foundation Courses (34 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 1610 Botany I (F)</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1620 BLS III Botany II (Sp)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1500 QI I College Algebra (F,Sp)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1100 QI II Calculus Techniques (F,Sp)</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 3000 Fundamentals of Soil Science (F)</td>
<td>3</td>
</tr>
<tr>
<td>STAT 2000 QI I Statistical Methods (F,Sp) (3 cr. or 3 cr.)</td>
<td>3</td>
</tr>
<tr>
<td>STAT 3000 QI II Statistics for Scientists (F,Sp,Sp) (3 cr.)</td>
<td>3</td>
</tr>
<tr>
<td>NR 2220 General Ecology (F)</td>
<td>3</td>
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</table>

Select one of the following chemistry series (9 credits)

General Chemistry Series

<table>
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<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>CHEM 1110 (BPS) General Chemistry I (F)</td>
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</tr>
<tr>
<td>CHEM 1120 (BPS) General Chemistry II (Sp)</td>
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</table>

Chemistry Principles Series

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<tr>
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<th>Credits</th>
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<tr>
<td>CHEM 1210 Principles of Chemistry I (F,Sp)</td>
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</tr>
<tr>
<td>CHEM 1215 Chemical Principles Laboratory I (F,Sp)</td>
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<tr>
<td>CHEM 1220 (BPS) Principles of Chemistry II (F,Sp,Sp)</td>
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</table>

B. Departmental Common Courses (24 credits)

<table>
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<tr>
<th>Course</th>
<th>Credits</th>
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<tr>
<td>WILD 2000 Introduction to Wildland Resources (F,Sp)</td>
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</tr>
<tr>
<td>WILD 2030 Wildland Plant Ecology and Identification (F)</td>
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</tr>
<tr>
<td>WILD 5610 Wildland Animal Ecology and Identification (F)</td>
<td>4</td>
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<td>WILD 3800 Wildland Systems (F)</td>
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<tr>
<td>WILD 4010 Plant and Animal Populations (Sp)</td>
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<tr>
<td>WILD 4740 CL Monitoring and Assessment in Natural Resource and Environmental Management (F)</td>
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</tr>
<tr>
<td>WILD 4880 Vegetation and Habitat Management (F)</td>
<td>3</td>
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<tr>
<td>WILD 4910 Assessment and Synthesis in Natural Resource Science (Sp)</td>
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</tr>
<tr>
<td>CHEM 1110 (BPS) General Chemistry I (4 cr. or 4 cr.)</td>
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</tr>
<tr>
<td>CHEM 1210 Principles of Chemistry I (4 cr.)</td>
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<tr>
<td>ENV 3300 Natural Resources Policy and Economics</td>
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C. Degree Program Courses (52 credits)

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<th>Course</th>
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<tr>
<td>ENV 3300 Natural Resources Policy and Economics</td>
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<tr>
<td>ENV 3300 Fundamentals of Recreation Resources Management</td>
<td>3</td>
</tr>
<tr>
<td>ENV 4000 Illness Dimensions of Natural Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>WATS 2700 (CI) Fundamentals of Watershed Science (Sp)</td>
<td>3</td>
</tr>
<tr>
<td>WATS 4920 Geographic Information Systems (F)</td>
<td>4</td>
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<tr>
<td>WILD 5220 Wildland Soils (Sp)</td>
<td>3</td>
</tr>
<tr>
<td>WILD 5220 Forest and Shade Tree Pathology (Sp)</td>
<td>3</td>
</tr>
<tr>
<td>WILD 5710 Forest Assessment and Management (Sp)</td>
<td>3</td>
</tr>
<tr>
<td>WILD 5710 Wildland Disturbance Ecology and Management (F)</td>
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</tr>
<tr>
<td>WILD 5750 Applied Remote Sensing (F)</td>
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</table>

D. Electives

Students may take the remainder of the 12 credits from any department. The guidelines described previously under “Breadth Requirements” and “Depth Education Requirements” should be consulted to ensure meeting University Studies requirements.

Students transferring to USU within an Associate of Arts (AA) or Associate of Science (AS) degree from an approved institution will have satisfied the General Education portion of the University Studies requirements, but will still need to complete the Depth Education portion.

University Studies designations, including (II.L.), (QF), (QSS), (CI), (QI), and (QL), indicate these courses may be counted toward University Studies requirements, as well as for the Forestry major.

Note: Students wanting to pursue federal employment should check the following U.S. Office of Personnel Management website for a listing of required coursework:
http://www.usajobs.gov/Qualifications/SECY/68/G8949/9499.HTM

Forestry Major

Recommended Four-Year Plan of Study

Students should meet regularly with their faculty advisor and carefully plan their academic program, keeping in mind that many upper-division courses have prerequisites and must be taken in sequence. Students following the recommended schedule listed below should be able to complete degree requirements in four years (eight semesters).

A. First Year (28 credits)

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<tr>
<td>BIOL 1610 Biology I</td>
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<tr>
<td>ENGL 1010 (CI) Introduction to Writing: Academic Purpose</td>
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<tr>
<td>ENVS 2340 BSS Natural Resources and Society (3 cr.)</td>
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<tr>
<td>Other approved Breadth Social Sciences (BSS) courses (3 cr.)</td>
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</tr>
<tr>
<td>USU 1200 (BAI) U.S. Institutions (3 cr.)</td>
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</tr>
<tr>
<td>Other approved Breadth Humanities (BHU) courses (3 cr.)</td>
<td>3</td>
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<tr>
<td>WILD 2000 Introduction to Wildland Resources</td>
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Spring Semester (14 credits)

<table>
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<tr>
<th>Semester</th>
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<tr>
<td>BIOL 1620 BLS III Botany II</td>
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</tr>
<tr>
<td>MATH 1060 (QI) College Algebra</td>
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<tr>
<td>USU 1230 (BHU) Civilization: Heronness (3 cr.)</td>
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<tr>
<td>Other approved Breadth Humanities (BHU) courses (3 cr.)</td>
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<tr>
<td>USU 1350 (BHA) Civilization: Creative Arts (3 cr.)</td>
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</tr>
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<td>Other approved Breadth Creative Arts (BHA) courses (3 cr.)</td>
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</table>

B. Second Year (33 credits)

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<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall</td>
<td>17</td>
</tr>
<tr>
<td>CHEM 1110 (BPS) General Chemistry I (4 cr. or 4 cr.)</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1210 Principles of Chemistry I (4 cr.)</td>
<td>4</td>
</tr>
<tr>
<td>ENV 3300 Natural Resources Policy and Economics</td>
<td>4</td>
</tr>
<tr>
<td>ENV 3300 Fundamentals of Recreation Resources Management</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1160 (QI) Calculus Techniques</td>
<td>3</td>
</tr>
<tr>
<td>NR 2220 General Ecology</td>
<td>3</td>
</tr>
</tbody>
</table>

27
Table II-1 continued

<table>
<thead>
<tr>
<th>Spring Semester (14 credits)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1115 General Chemistry Laboratory (1 cr) or</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 1215 Chemical Principles Laboratory I (1 cr)</td>
<td>1</td>
</tr>
<tr>
<td>CHIM 1120 BPS General Chemistry II (4 cr) or</td>
<td>4</td>
</tr>
<tr>
<td>CHIM 1220 BPS Principles of Chemistry II (4 cr)</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 2510 (CL) Intermediate Writing Research Writing in a Persuasive Mode</td>
<td>3</td>
</tr>
<tr>
<td>STAT 2000 (QD) Statistical Methods (3 cr) or</td>
<td>3</td>
</tr>
<tr>
<td>STAT 2000 (QD) Statistics for Scientists (3 cr)</td>
<td>3</td>
</tr>
<tr>
<td>Elective course(s)</td>
<td>3</td>
</tr>
</tbody>
</table>

C. Third Year (30 credits)

<table>
<thead>
<tr>
<th>Fall Semester (15 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOIL 3000 Fundamentals of Soil Science</td>
</tr>
<tr>
<td>WILD 3660 Wildland Plant Ecology and Identification</td>
</tr>
<tr>
<td>WILD 3610 Wildland Animal Ecology and Identification</td>
</tr>
<tr>
<td>WILD 5750 Applied Remote Sensing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring Semester (15 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATS 3700 (CI) Fundamentals of Watershed Science</td>
</tr>
<tr>
<td>WILD 3800 Wildland Ecosystems</td>
</tr>
<tr>
<td>WILD 3810 Plant and Animal Populations</td>
</tr>
<tr>
<td>WILD 5550 Wildland Soils</td>
</tr>
<tr>
<td>Approved Depth Humanities and Creative Arts (DHA) course</td>
</tr>
</tbody>
</table>

D. Fourth Year (30 credits)

<table>
<thead>
<tr>
<th>Fall Semester (15 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS 4000 (DS) Human Dimensions of Natural Resource Management</td>
</tr>
<tr>
<td>WATS 4930 Geographic Information Systems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring Semester (15 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WILD 4750 (CI) Monitoring and Assessment in Natural Resource and Environmental Management</td>
</tr>
<tr>
<td>WILD 4850 Vegetation and Habitat Management</td>
</tr>
<tr>
<td>WILD 5710 Wildland Disturbance: Ecology and Management</td>
</tr>
<tr>
<td>WILD 4910 Assessment and Synthesis in Natural Resource Science</td>
</tr>
<tr>
<td>WILD 5420 (CI) Forest and Shade Tree Pathology</td>
</tr>
<tr>
<td>WILD 5700 Forest Assessment and Management</td>
</tr>
<tr>
<td>Elective course*</td>
</tr>
</tbody>
</table>

*As part of these electives, it is recommended that students complete a 3-credit course having an economic emphasis.

Requirement Changes

Graduation requirements shown on this sheet are subject to change. Students should check with their faculty advisor regarding possible changes or for additional information regarding degree requirements, course sequencing, and departmental specialization options and their related coursework.

Materials for Persons with Disabilities

This requirement sheet is available in digital format, recordings, or large print upon request to the USU Disability Resource Center.

For information contact

Wildland Resources Department, Natural Resources 206, Utah State University, 5200 Old Main Hill, Logan UT 84322-5200; tel: (435) 797-3219; e-mail lars.burr@usu.edu; http://www.cnr.usu.edu/wild
Prepared by Registrar’s Office, Utah State University
Table II-2. The curriculum sheet for the Forestry Major at Utah State University, AY 1999-2000.

Forestry Major

Department of Forest Resources
College of Natural Resources

Published May 1999
Effective for students beginning degree Fall Sem., 1999 thru Summer Sem., 2000

Admission Requirements For This Major
1. New freshmen admitted to USU in good standing qualify for admission to this major.
2. Transfer students from other institutions or other USU majors need a 2.5 total GPA for admission to this major in good standing. Special attention will be given to the amount of, and performance in, prerequisite math and science courses.

The Program
Forestry majors at Utah State University work to gain the knowledge and skills they'll need to manage public or private forests for a wide variety of resources: timber, recreation, water, biological diversity, and more. The goal of the Department of Forest Resources is to provide America's future foresters with the broadest possible understanding of the biological, physical, economic, political, and social environment that they'll be working in as foresters.

Students begin their college careers by building the academic foundation for future professional courses. The first two years are devoted to studying biology and chemistry, math and statistics, writing and speaking, and economics, and other topics that are important to forest science and management. A few Natural Resources "core" courses offer an introduction to the field. The first two years are also when students take most of their University Studies (General Education) courses; several of these also fulfill departmental requirements. Transfer students who have completed their general education requirements elsewhere may need to take one or more additional lower-division courses to be ready for professional courses.

For most students, the true introduction to forestry comes during the four-week summer camp held at the university's field facility in the mountains west of Logan. This field school is required for all Forestry majors and is normally taken at the end of the first or second year. Students learn how to identify and manage forest stands and how to measure a wide variety of forest resources—skills that will come in handy when seeking summer employment.

Professional courses in forestry are taken mainly by juniors and seniors. They include several classes in forest biology and ecology, as well as computer applications, economics, management, recreation, and law. Students also take courses that introduce them to related natural resource topics such as range, wildlife, and watershed management. Several of these are required for all majors in the College of Natural Resources. Finally, students complete a "capstone" course in Field Management that helps them learn and master some of these many elements of forestry together.

Career Opportunities
Forestry majors typically find work in private companies, such as private consulting firms or the timber industry; in federal agencies, such as the USDA Forest Service or Bureau of Land Management; or with forestry offices at other levels of government. Usually, there are more positions available in seasonal than year-round jobs, especially in public agencies. These temporary jobs are typically filled by students, as are many careers in the timber industry; foresters may work as silviculturists; timber sale administrators; fire, insect, or disease control specialists; or, with advanced training, researchers and teachers.

Degrees and Programs Offered Through This Department
Environmental Studies: Bachelor of Science (BS)
Forestry: BS, Master of Science (MS), and Doctor of Philosophy (PhD)
Recreation Resource Management: BS, MS, and PhD
Forest Ecology: MS and PhD
Forest Management: Master of Forestry (MF)
Natural Resources: Master of Natural Resources (MNRR)

Academic Advisement
All students should contact their academic advisor for assistance with course selection, program planning, and meeting graduation requirements. If they do not know who their advisor is, students should contact their department or college.

Minors
The Department of Forest Resources offers minors in Recreation Resources and Environmental Studies. Contact the Department of Forest Resources for details.

Graduation Requirements:
BS Degree in Forestry

Minimum University Requirements*:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade point average (most majors require higher GPA).</td>
<td>2.00</td>
</tr>
<tr>
<td>Credits of C- or better.</td>
<td>100</td>
</tr>
<tr>
<td>Credits of upper-division courses (6000 or above).</td>
<td>40</td>
</tr>
<tr>
<td>USU credits (10 of last 40 must be USU credits).</td>
<td>30</td>
</tr>
<tr>
<td>Completion of approved major program of study.</td>
<td>See department</td>
</tr>
<tr>
<td>Credits in minor (if required by department).</td>
<td>12</td>
</tr>
<tr>
<td>Credits in American Institutions (Econ 1500; Hist 1700, 2700, or 2710; PolS 1100; or USU 1300)</td>
<td>3</td>
</tr>
<tr>
<td>Credits in University Studies (General Education) as shown below.</td>
<td>30</td>
</tr>
</tbody>
</table>

*Colleges and departments may require more credits or a higher GPA. See requirements on this sheet.

Limitations
No more than 80 junior college transfer semester credits can be used for a bachelor's degree. No more than 30 semester credits of Independent Study courses can be used toward a bachelor's degree.

University Studies (General Education) Requirements for Forestry Major
(30 credits, plus 3 courses)

Note: Approved University Studies (General Education) courses and requirements are listed in the front section of each semester's Schedule of Classes.

Competency Requirements (9 credits, plus 2 CI and 1 QI courses)

Communications Literacy (CI) (6 credits)

Plus two Communications Intensive (CI) courses:
- Engl 1010 (3 credits) or satisfactory AP, CLEP, or ACT score
AND
- Engl 1020 (3 credits)
AND
Two Communications Intensive (CI) courses (Spch 1050 and FR 5420)
Table II-2 continued

<table>
<thead>
<tr>
<th>Table II-2 continued</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quantitative Literacy (QL) (3-4 credits)</strong></td>
</tr>
<tr>
<td>One Quantitative Intensive (QI) course</td>
</tr>
<tr>
<td>Math 1050 (4 credits)</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>Math 1100 (3 credits)</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>AP Math score of 3 or higher</td>
</tr>
<tr>
<td>AND</td>
</tr>
<tr>
<td>One Quantitative Intensive (QI) course (NR 3600)</td>
</tr>
</tbody>
</table>

| **Computer and Information Literacy (8 credits)** |
| Passing grade on Computer and Information Literacy competency exam (must complete within first 37 credits at USU) |

| **Breadth Requirements (15 credits)** |
| Select at least one approved course from each of the following five categories: Humanities, Social Sciences, Physical Sciences, Creative Arts, and American Institutions. (CLEP or AP credit may be used.) At least two of the five breadth courses must be University Studies courses with a USU prefix. (USU BAF 1300, NR 1130, and NR BSS 2540 may be used toward this requirement.) |

| **Depth Requirements (6 credits)** |
| Select at least one approved 3000-level or above course from each of the following two categories: Humanities and Arts and Social Sciences. (FR 1000 pass a DHA course) |

| **Forestry Major (104-105 credits)** |
| Students in this major must have a 2.5 GPA in all courses taken from departments within the College of Natural Resources. |

| **A. Disciplinary Foundation (34 credits)** |
| Credits |
| Biol 1210 Biology I (F) | 3 |
| Biol 1220 Biology II (Sp) | 3 |
| Biol 1230 Biology I Laboratory (F) | 2 |
| Chem 1110 General Chemistry I (F,Sp) | 4 |
| Engl Cl 1010 Introduction to Writing: Academic Prose (F,Sp,Sp) | 3 |
| Engl Cl 2010 Intermediate Writing: Academic Prose (F,Sp,Sp) | 3 |
| Math QL 1100 Calculus Techniques (F,Sp,Sp) | 3 |
| Soil 1000 Fundamentals of Soil Science (F,Sp) | 4 |
| Soil 1100 Principles of Soil Science (F,Sp) | 3 |
| USU BAF 1300 U.S. Institutions (F,Sp,Sp) | 3 |

| **B. Natural Resources Core (30-21 credits)** |
| Credits |
| NR BSS 1130 Physical Geography (F,Sp,Sp) (3 cr) or |
| Biol 1150 The Dynamic Earth: Physical Geography (4 cr) | 3 or 4 |
| NR 2220 General Ecology (F,Sp) | 3 |
| NR BSS 2340 Natural Resources and Society (F,Sp) | 3 |
| NR 3600 Management of Natural Resources and the Environment (F,Sp) | 4 |
| NR 3600 Quantitative Assessment for Natural Resources (F,Sp) | 3 |
| NR 4600 Natural Resources Policy and Economics (F,Sp) | 4 |

| **C. Professional Coursework (44 credits)** |
| Credits |
| FR 1550 Professional Orientation Seminar (F) | 1 |
| FR 2260 Biology of Woody Plants (F) | 4 |
| FR 2250 Forest Ecology (F) | 4 |
| FR 3590 Computer Applications in Natural Resources (F) | 3 |
| FR 3700 Fundamentals of Watershed Science (Sp) | 3 |
| FR DSS 4000 Human Dimensions of Natural Resource Management (F) | 3 |
| FR 4250 Silviculture (F) | 4 |
| FR 4300 Forest Measurements (Sp) | 3 |
| FR 4660 Forest Management and Economics (Sp) | 3 |
| FR 45601 Wildland Fire Management and Planning (Sp) | 2 |
| FR 45601 Forest Harvest and Utilization (F) | 2 |
| FR 45501 Forest Recreation (F) | 2 |
| FR Cl 24201 Forest Pathology (Sp) | 2 |
| FR 55101 Forest Entomology (F) | 2 |
| FR 55601 Natural Resource Law and Policy (F) | 2 |
| NR 5900 Ecosystem Management (Sp) | 3 |

| **D. Summer Camp (6 credits)** |
| Students must attend a four-week summer camp. Normally this is done after the freshman or sophomore year. Courses taken during summer camp do not count toward the University's 120-credit minimum required for graduation. |

| Credits |
| FR 2100 Forest Inventory (Su) | 3 |
| FR 2100 Forestry Practice (Su) | 3 |

| **E. Electives** |
| Students may take the remainder of their 120 required credits from any department in order to meet University Studies requirements, graduating students will need to have completed three courses (9 credits) in addition to those required for the Forestry major: a Breadth Humanities (BHU) course, a Breadth Creative Arts (BAC) course, and a Depth Humanities and Arts (DHA) course. |

| **Requirement Changes** |
| Graduation requirements shown on this sheet are subject to change. Students should check with their department concerning possible changes. |

| **Materials for Persons with Disabilities** |
| This requirement sheet is available in large print, audio, and braille format upon request to the USU Disability Resource Center. |
Table II-3. Frequency of responses by instructors and Forestry majors regarding the degree to which required courses in the General Science Foundation contribute to various SAF-specified competencies/outcomes in the Forestry curriculum at USU in AY 2009-2010, where 1 = not at all, 2 = a little, 3 = somewhat, 4 = quite a lot, and 5 = very much. Courses that were rated high (4 or 5) are listed by number.

<table>
<thead>
<tr>
<th>COMPETENCY/OUTCOME</th>
<th>COMPOSITE INSTRUCTOR RATINGS</th>
<th>COMPOSITE STUDENT RATINGS</th>
<th>HIGHLY RATED COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Communications</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Oral: Ability to prepare and deliver effective oral presentations.</td>
<td><img src="chart1" alt="Bar Chart" /></td>
<td><img src="chart2" alt="Bar Chart" /></td>
<td>See Appendix II-2 for multiple smaller contributions</td>
</tr>
<tr>
<td>2. Written:</td>
<td><img src="chart3" alt="Bar Chart" /></td>
<td><img src="chart4" alt="Bar Chart" /></td>
<td>BIOL 1610*, 1620*; NR 2220*; CHEM 1115*, 1215*</td>
</tr>
<tr>
<td>a. Proficiency in English composition, technical/business writing, and writing for non-professional audiences.</td>
<td><img src="chart5" alt="Bar Chart" /></td>
<td><img src="chart6" alt="Bar Chart" /></td>
<td>NR 2220**, ENVS 2340**</td>
</tr>
<tr>
<td>b. Ability to read with comprehension a variety of documents and critically evaluate opposing viewpoints.</td>
<td><img src="chart7" alt="Bar Chart" /></td>
<td><img src="chart8" alt="Bar Chart" /></td>
<td></td>
</tr>
<tr>
<td><strong>B. Science and Mathematics</strong></td>
<td><img src="chart9" alt="Bar Chart" /></td>
<td><img src="chart10" alt="Bar Chart" /></td>
<td>BIOL 1610, 1620; NR 2220; CHEM 1110*, 1120*</td>
</tr>
<tr>
<td>1. Biological Sciences:</td>
<td><img src="chart11" alt="Bar Chart" /></td>
<td><img src="chart12" alt="Bar Chart" /></td>
<td>BIOL 1610, 1620; NR 2220; CHEM 1110*</td>
</tr>
<tr>
<td>a. Understanding of the components, patterns, and processes of biological and ecological systems across spatial and temporal scales.</td>
<td><img src="chart13" alt="Bar Chart" /></td>
<td><img src="chart14" alt="Bar Chart" /></td>
<td>BIOL 1610, 1620; NR 2220; CHEM 1110*</td>
</tr>
<tr>
<td>b. Understanding of molecular biology, cells, organisms, populations, species, communities, and ecosystems.</td>
<td><img src="chart15" alt="Bar Chart" /></td>
<td><img src="chart16" alt="Bar Chart" /></td>
<td></td>
</tr>
<tr>
<td>2. Physical Sciences: Understanding of physical and chemical properties, measurements, structure, and states of matter.</td>
<td><img src="chart17" alt="Bar Chart" /></td>
<td><img src="chart18" alt="Bar Chart" /></td>
<td>SOIL 3000*, CHEM 1110/15, 1120, 1210/15, 1220</td>
</tr>
</tbody>
</table>
### Table II-3 continued

<table>
<thead>
<tr>
<th>COMPETENCY/OUTCOME</th>
<th>COMPOSITE INSTRUCTOR RATINGS</th>
<th>COMPOSITE STUDENT RATINGS</th>
<th>HIGHLY RATED COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Mathematics: Ability to understand and use the basic approaches and applications of mathematics and statistics for analysis and problem solving as appropriate for the programs stated outcomes.</td>
<td><img src="image1" alt="Graph" /></td>
<td><img src="image2" alt="Graph" /></td>
<td>BIOL 1610*, 1620*; MATH 1050, 1100; SOIL 3000*; STAT 2000, 3000; CHEM 1110/15*, 1120*, 1210/15*, 1220*</td>
</tr>
</tbody>
</table>

### C. Social Sciences and Humanities

| 1. Understanding of, and ability to address, moral and ethical questions, and an ability to use critical reasoning skills. | ![Graph](image3) | ![Graph](image4) | CHEM 1110/15*, 1120*, 1215*; ENVS 2340* |
| 2. Understanding of human behavior and social and economic structures, processes, and institutions of importance across a broad range of societies. | ![Graph](image5) | ![Graph](image6) | ENVS 2340 |
| 3. Understanding of human diversity and the diverse dimensions of the human experience and culture. | ![Graph](image7) | ![Graph](image8) | ENVS 2340 |

### D. Computer Literacy

| 1. Ability to use computers and the other contemporary electronic technologies in professional life. | ![Graph](image9) | ![Graph](image10) | BIOL 1610*, 1620*; CHEM 1110/15*, 1120*, 1215*; MATH 1050*, 1110*; STAT 2000*, 3000*; ENVS 2340* |

*Instructor only.

**Student only.

*ENVS 2340 is a General Education course, but is an important social science foundational course for Forestry majors.
Table II-4. Frequency of responses by instructors and Forestry majors regarding the degree to which required Professional courses contribute to various SAF-specified competencies/outcomes in the Forestry curriculum at USU in AY 2009-2010, where 1 = not at all, 2 = a little, 3 = somewhat, 4 = quite a lot, and 5 = very much. Courses that were rated high (4 or 5) are listed by number.

<table>
<thead>
<tr>
<th>COMPETENCY/OUTCOME</th>
<th>COMPOSITE INSTRUCTOR RATINGS</th>
<th>COMPOSITE STUDENT RATINGS</th>
<th>HIGHLY RATED COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Ecology and Biology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Understanding of taxonomy and ability to identify forest and other tree species, their distribution, and associated vegetation and wildlife.</td>
<td>[Graph]</td>
<td>[Graph]</td>
<td>WILD 3600, 3610, 5710*</td>
</tr>
<tr>
<td>2. Understanding of soil properties and processes, hydrology, water quality, and watershed functions.</td>
<td>[Graph]</td>
<td>[Graph]</td>
<td>WILD 3600*, 3800*, 5350; NR 2220*; WATS 3700</td>
</tr>
<tr>
<td>3. Understanding of ecological concepts and principles including the structure and function of ecosystems, plant and animal communities, competition, diversity, population dynamics, succession, disturbance, and nutrient cycling.</td>
<td>[Graph]</td>
<td>[Graph]</td>
<td>WILD 3800, 3810, 4850**, 5350*, 5420*, 5700**, 5710; NR 2220</td>
</tr>
<tr>
<td>4. Ability to make ecosystem, forest, and stand assessments.</td>
<td>[Graph]</td>
<td>[Graph]</td>
<td>WILD 4750**, 5700</td>
</tr>
</tbody>
</table>
### Table II-4 continued

<table>
<thead>
<tr>
<th>COMPETENCY/OUTCOME</th>
<th>COMPOSITE INSTRUCTOR RATINGS</th>
<th>COMPOSITE STUDENT RATINGS</th>
<th>HIGHLY RATED COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Understanding of tree physiology and the effects of climate, fire, pollutants, moisture, nutrients, genetics, insects and diseases on tree and forest health and productivity.</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>WILD 3600*, 4850**, 5420, 5710</td>
</tr>
</tbody>
</table>

**B. Measurement of Forest Resources**

<table>
<thead>
<tr>
<th>1. Ability to identify and measure land areas and conduct spatial analysis.</th>
<th>![Graph]</th>
<th>![Graph]</th>
<th>WILD 4910*, 5350*, 5750; WATS 4930</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Ability to design and implement comprehensive inventories that meet specific objectives using appropriate sampling methods and units of measurement.</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>WILD 4750, 4910*, 5700**; WATS 4930*</td>
</tr>
<tr>
<td>3. Ability to analyze inventory data and project future forest, stand, and tree conditions.</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>WILD 4850*, 4930*, 5700**</td>
</tr>
<tr>
<td>1. Ability to develop and apply silvicultural prescriptions appropriate to management objectives, including methods of establishing and influencing the composition, growth, and quality of forests, and understand the impact of those prescriptions.</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>WILD 4850, 5420*, 5700</td>
</tr>
<tr>
<td>COMPETENCY/OUTCOME</td>
<td>COMPOSITE INSTRUCTOR RATINGS</td>
<td>COMPOSITE STUDENT RATINGS</td>
<td>HIGHLY RATED COURSE</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------</td>
<td>---------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>C. Management of Forest Resources</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Ability to analyze the economic, environmental, and social consequences of forest resource management strategies and decisions.</td>
<td><img src="image1" alt="Graph" /></td>
<td><img src="image2" alt="Graph" /></td>
<td>WILD 4850*, 5420*, 5700; ENVS 2340*</td>
</tr>
<tr>
<td>3. Ability to develop management plans with specific multiple objectives and constraints.</td>
<td><img src="image3" alt="Graph" /></td>
<td><img src="image4" alt="Graph" /></td>
<td>WILD 4850, 4910*, 5700; APEC 3012*a</td>
</tr>
<tr>
<td>4. Understanding of the valuation procedures, market forces, processing systems, and transportation and harvesting activities that translate human demands for timber-based and other consumable forest products into the availability of those products.</td>
<td><img src="image5" alt="Graph" /></td>
<td><img src="image6" alt="Graph" /></td>
<td>WILD 4850*, 4910*, 5700*</td>
</tr>
<tr>
<td>5. Understanding of the valuation procedures, market, and non-market forces that avail humans the opportunities to enjoy non-consumptive products and services of forests.</td>
<td><img src="image7" alt="Graph" /></td>
<td><img src="image8" alt="Graph" /></td>
<td>APEC 3012*</td>
</tr>
<tr>
<td>6. Understanding of the administration, ownership, and organization of forest management enterprises.</td>
<td><img src="image9" alt="Graph" /></td>
<td><img src="image10" alt="Graph" /></td>
<td>See Appendix II-3 for multiple smaller contributions</td>
</tr>
</tbody>
</table>
Table II-4 continued

<table>
<thead>
<tr>
<th>COMPTENCY/OUTCOME</th>
<th>COMPOSITE INSTRUCTOR RATINGS</th>
<th>COMPOSITE STUDENT RATINGS</th>
<th>HIGHLY RATED COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Forest Resource Policy, Economics, and Administration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Understanding of forest policy and the processes by which it is developed.</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>ENVS 3000*, 3010*; WILD 5650*</td>
</tr>
<tr>
<td>2. Understanding of how federal, state, and local laws and regulations govern</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>WILD 4910*; ENVS 3000*, 3010*</td>
</tr>
<tr>
<td>3. Understanding of professional ethics, including the SAF Code, and recognition</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>WILD 4910*</td>
</tr>
<tr>
<td>4. Ability to understand the integration of technical, financial, and human</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>ENVS 3000*, 3010*;</td>
</tr>
<tr>
<td>resources, and legal aspects of public and private enterprises.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Instructor only.

**Students only.

aAPEC 3012 and ENVS 3010 will replace ENVS 3000 beginning AY 2010-11.
STANDARD III: FORESTRY PROGRAM ORGANIZATION AND ADMINISTRATION

1. Administration and organization

Being an integrated academic unit delivering multiple undergraduate and graduate degree programs, the Department of Wildland Resources is administered by a department head with multiple responsibilities, including the forestry program. The department head has the same title and authority as the heads of all other academic departments at USU. Organizational charts showing the forestry program in relation to USU’s central administration and other units and programs within the College of Natural Resources are presented in Figs. III-1 and III-2.

2. Cultivating quality in instruction

Excellence in education is promoted by a strong set of policies implemented at University, College, and Department levels. Examples include a faculty development workshop series driven by the Provost’s Office, which brings in experts in pedagogy to inspire instructors and impart new techniques. An example is Dr. Ken Bain, who wrote the book *What the Best College Teachers Do* (2004, Harvard University Press). A series of discussion groups about his book were arranged within the College in advance of his recent campus visits, which were very well received. At the Department level, all tenure-track faculty members have to undertake peer review of their teaching and as of 2007 all new faculty members are participating in a “Teaching Academy,” in which they are mentored by outstanding instructors in the Department. In addition, we have instituted a “Panel of Examiners,” which meets at the end of each semester to peer-review the final exam papers set by each faculty member teaching that semester. This is very helpful for all instructors to learn what their colleagues are expecting their students to know, and also to improve the standard of exam papers to enhance academic rigor. All courses are evaluated by students for both instructor effectiveness and course effectiveness, as is standard across public universities, and those evaluation scores are discussed each year by the faculty member and the Department Head in an annual performance management meeting. College awards are presented annually on a very competitive basis to recognize faculty members for excellence in teaching, advising, mentoring undergraduate research, etc. Finally, faculty members are encouraged to attend national conferences and workshops on pedagogy, and the costs of that are covered by the Department and College on a shared basis. The importance of attending such training opportunities applies particularly to the distance learning skills that are increasingly required in all our degree programs.

Faculty members are strongly encouraged to take sabbatical leave when they become eligible. The planning to accommodate the responsibilities (teaching, advising, administration, etc.) of the faculty member applying for sabbatical leave has to be undertaken well in advance. These opportunities are essential for refreshing the creativity of faculty members. As regards
maintaining their grounding in the forestry profession and maintaining contact with production
forestry practitioners, faculty members have opportunities to undertake consultancy work and are
commonly involved in extension activities such as those arranged by Dr. Mike Kuhns and his
associate Darren McAvoy (USU Extension).

Multidisciplinary team research is dependent on the types of grants that are secured, but one
project that has been very successful in this regard is a project to investigate the wider ecological
effects of vegetation manipulation in the sagebrush steppe ecosystem and the conifer/aspen
forests in the Rocky Mountain ecosystem. That project was funded (2004-2008) through a
congressional earmark passed through NRCS and allowed a diverse team of applied ecologists to
work together with graduate students to generate a wide range of sub-projects. The “Restoring
the West” conference series at USU highlights research going on at USU and elsewhere. There
have been four of these conferences that have attracted wide attention for showcasing research
on aspen restoration (2006), the sagebrush steppe ecosystem (2007), aspen population ecology
and conservation (2008), and the integration of applied research across landscapes from peaks to
valleys (2009). Graduate students are actively involved in the organization and management of
this conference series and their registration fees were covered by the College in 2009.

3. Staff resources

The administrative affairs of the Department of Wildland Resources are facilitated by an office
staff comprising an Administrative Assistant to the Department Head (Lana Barr) and a Staff
Assistant III (Marsha Bailey). Ms. Barr is employed 100% time and Ms. Bailey 75% time. Both
staff members perform a wide range of duties depending on the needs of the day, including
telephone reception duties and directing e-mail enquiries. The main division in roles is that Ms.
Barr assists the Department Head with appointments, meetings, and budget matters, while also
administering the vehicle fleet, office and lab space, and undergraduate affairs; Ms. Bailey
processes supply orders and mail, tracks inventory, and also administers graduate affairs. Both
staff members have BS degrees from USU, are fully competent in a range of office software
packages, and have excellent literary skills for proof-reading and editing documents, writing
reports, etc. Both are trained, authorized, and fully competent with the ‘Banner’ software system
that is used for all administrative transactions at USU. Ms. Barr maintains the web site for the
Department.

These staff resources are adequate for the needs of the students, faculty, and administration of
the forestry program as well as the Department as a whole. Such adequacy is, however, by virtue
of the efficiency, skill, and positive attitudes of both staff members when faced with workloads
that are sometimes excessive. When there is a spike in the administrative load (such as when a
reaccreditation review is underway) the Department employs temporary staff for these specific
tasks.
The forestry extension program is staffed by a Forestry Extension Associate (Darren McAvoy) and a Forestry Extension Assistant (Olivia Salmon), who serve under the direction of the Forestry Extension Specialist (Mike Kuhns). Mr. McAvoy and Ms. Salmon, who both have relevant MS degrees, assist with arranging field logging demonstrations, developing extension materials, and arranging the annual Restoring the West Conference. In addition, Mr. McAvoy directs the Utah Forest Landowner Education Program and edits the quarterly publication *Utah Forest News*. He was recently awarded the State of Utah Department of Natural Resources’ 2009 Forest Stewardship Achievement Award in recognition of his efforts in educating Utah landowners and professionals about healthy forestry management practices.

A new staff position is currently being filled within a memorandum of understanding among the Department of Wildland Resources, the Department of Biology, and the Ecology Center, to facilitate the development of research proposals by the faculty members of the three units. This Grant Writer III position, which is to be filled by a person with graduate-level training and several years of appropriate experience, will be housed in the Department of Wildland Resources and will allocate a third of his/her time to the faculty members of each unit.

4. Procedures for evaluating and accepting students, and transferring credit

All incoming freshmen are evaluated based upon the university standard measure. A student is assigned an index value (90 is the minimum score accepted) based upon a combination of high school GPA and SAT/ACT score. The minimum high school GPA is 2.5 with an ACT 22 (SAT 1020) and the minimum ACT score is an 18 (SAT 860) with a high school GPA of 2.9. The index table can be found on the Utah State admissions web page at the address [http://www.usu.edu/admissions/img/admissionsIndex_2009-2010.pdf](http://www.usu.edu/admissions/img/admissionsIndex_2009-2010.pdf)

Transfer students are evaluated based upon their institution of transfer GPA. Students with a GPA greater than 2.5 are typically admitted following review of transcripts by the Wildland Resources department head and dean of the College of Natural Resources. The exception to this is when a student has a high number of transfer credits and has not demonstrated success in math and science. Students who fall into this category are encouraged to get their general science and math scores to a higher level before admission to the program, or advised into another major. Utah State University (USU) has direct articulation of credit agreements with all Utah institutions of higher education. However, these direct articulation agreements typically only cover general education requirements and the student’s math, biology, and chemistry requirements. The upper division and major specific courses must be evaluated on a course-by-course basis. For this process the course syllabi are presented to the student’s forestry faculty advisor for review. Following the faculty review they are then passed on to the Wildland Resources department chair.
The process is different for students transferring in from a school with which USU does not have a direct articulation agreement. The school from which the student is transferring must be affiliated with the Northwest Commission of Colleges and Universities (NWCCU), or be part of an institutional accreditation association that is a member of the Council for Higher Education Accreditation (CHEA). The courses a student takes at one of these member institutions will be evaluated first by the forestry faculty advisor, then by the department head. Courses that are intended to transfer for general education requirements must also go through a final round of review with the dean of the College of Natural Resources.

5. Academic planning, reviewing, and updating

The process for self-evaluation and revision of the forestry program (Standard I.2) is coordinated by the department’s forestry curriculum committee, consisting of faculty members who teach in the forestry major, the forestry undergraduate advisor, and the department head. The pertinent statements in the forestry advising brochure are reviewed and updated annually by this committee and the department as a part of the document’s revision for the next year’s printing. Proposals for changes are discussed in the annual faculty retreat. All academic programs in the department are continually monitored and revised in an adaptive management cycle as illustrated in Fig. III-3.

6. Outcomes assessment

The Wildland Resources Department evaluates the effectiveness of its undergraduate programs in three main ways: 1) Capstone courses require each student to become involved in the analysis of a real-world environmental problem. How the students fare in these capstone experiences depends on the effectiveness of the instruction they received in previous courses, and grades are determined in part from faculty-student interviews in which the complete learning experience is evaluated. 2) The Department Head meets informally with graduating seniors at a working luncheon, followed by a formal, anonymous questionnaire to determine how well the students feel they have attained the desired outcomes of their program. 3) The Department conducts 9-month and 5-year surveys of all of our graduates to determine how well our degree programs prepared them for their professional careers. We also periodically conduct interviews with leaders in governmental regulatory and funding agencies to determine how our graduates served their needs. In addition, the department has formulated specific learning objectives with each course. These learning objectives are explicitly outlined in each course syllabus and are summarized for each degree program. To maximize placement of our graduates into career tracks that best match their aspirations and abilities, faculty members work with individual students to determine their professional aspirations, design course work and research, initiate participation in professional meetings, and introduce them to professionals at other universities or natural resource agencies. Learning objectives are tailored to individual students but will
likely encompass aspects of experimental design, data analysis, statistics, modeling, and public education. In our graduate programs we educate students to fill positions in other academic institutions, state and federal agencies, and non-governmental environmental organizations. We accept high-achieving students from a diversity of backgrounds and our graduate education programs are specifically tailored to meet the interests and goals of each individual student.

In December 2008 and April 2009 the graduating seniors met for working luncheons with the Department Head. Those meeting in December (N = 8) were graduating at the end of the fall semester and those meeting April (N = 13) were graduating at the end of the spring semester. Before each luncheon, students were asked to complete an anonymous written questionnaire and deposit it in a box at the luncheon. All attendees at the luncheons completed the questionnaire. During each luncheon, the Department Head used the attendees as a focus group to identify the strengths and weaknesses of the academic services provided to students by the Department throughout their undergraduate years. Numeric responses to the questionnaires in spring and fall were combined and are presented in Tables III-1 & III-2. Table III-1 rates the degree to which various services are provided to students by the department in the areas of advising, course content, employment, and the impacts of faculty research. All ratings are generally favorable and are discussed in more detail in Standards II (Curriculum) and V (Students). Table III-2 rates the degree to which various department-generated competencies/outcomes (skills/abilities, knowledge, and professional behaviors) are met. All competencies/outcomes received favorable ratings overall, but some exhibited a much wider range of ratings than others. Included in this latter category are: (1) ability to deal with economic considerations of natural resources, and (2) skills in communicating research findings in one-on-one discussions with people from non-scientific backgrounds. These results are treated in more detail in Standard II. It is worth noting that there is considerable overlap between the competencies/outcomes generated by the department and those articulated by SAF (Table III-3). At the same time, there are several desirable outcomes/competencies that are unique to each of the two listings.

In May 2008 the Department of Wildland Resources conducted a telephone survey of students who received bachelor’s degrees (across all four of our majors) during the 2007-08 academic year (Appendix III-1). The Wildland Resources Department awarded 30 degrees during this period and 93% of Employment/Education surveys were completed. We were able to obtain information concerning the graduates from a variety of sources including the student, a parent, or a spouse. When asked if the student was currently continuing his/her education, 36% responded “yes”. Graduates continuing their education were asked to name the school they were attending, with USU the most frequently reported choice. Of the students indicating they were not full-time students, 16 already had a full-time job, and 2 were seasonal. Although some students may choose to work in areas outside of their discipline, as a general rule, the Wildland Resources students pick majors because they expect to work in that field. Of the 18 students that had full-time/seasonal jobs, 14 indicated that the job was directly related to their degree, 3 somewhat
related, and 1 not related. In evaluating the effect of state resources used for higher education, the issue of where graduates take full-time jobs is relevant. Students who remain in Utah add human capital to the state’s work force and contribute to the tax base of the state. Out of our 18 employed graduated students, 9 were employed in the state of Utah and 9 out-of-state. Graduates were asked who their employer was. Graduates from the Wildland Resources Department were most likely to be employed in the public sector. Obtaining numbers on starting salaries for recent graduates is difficult. However, a surprising proportion of the survey contacts were willing and able to provide salary data, allowing us to identify the starting salary range of recent graduates with full-time jobs; these ranged from a low of $1,200/month to a high of $3,360/month, with 1 graduate doing unpaid volunteer work (Appendix III-1).

Assessment of the degree to which the Forestry curriculum at USU currently meets SAF-specified competencies/educational outcomes and requirements is presented in Standard II (Curriculum), as are the methods used to conduct this assessment. Results of ongoing assessments by the Department of Wildland Resources, introduced here, are also presented in Standard II.
Table III-1. Provision of services to students by the Department of Wildland Resources. Responses include ‘strongly agree’ (SA), ‘agree’ (A), ‘neutral’ (N), ‘disagree’ (D), or ‘strongly disagree’ (SD). Respondents were from graduating seniors of AY 2008-09 (N=21). Values in cells indicate the number of times each response was selected.

<table>
<thead>
<tr>
<th>Responses:</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>My advisor was generally helpful in guiding my progress through the program.</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>My advisor was usually available when I needed suggestions.</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I feel that little or no student advisement is needed.</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>There was too much repetition of course content across classes.</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel laboratories in courses are necessary to apply skills and knowledge learned in classrooms.</td>
<td>11</td>
<td>8</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course field trips and field exercises are important for professional development.</td>
<td>17</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The best teachers were able to illustrate classroom principles with examples from their research.</td>
<td>6</td>
<td>10</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>I feel the WILD Department has a responsibility to help its students find employment.</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>The WILD Department did an adequate job of informing students about the outlook for jobs in the field.</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>I received adequate assistance from the WILD Department and/or CNR in applying for and locating jobs in my field.</td>
<td>2</td>
<td>9</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Professors heavily involved in research tend to neglect their teaching duties.</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

1 One student gave no rating for this statement.
Table III-2. Success in providing graduating seniors the skills/abilities, knowledge, and professional behaviors required for managing wildland resources. Scores range from 0 (completely unsuccessful) to 10 (completely successful). Respondents were combined from graduating seniors of AY 2008-09 (N=21). Values in cells indicate the number of times each score was selected.

<table>
<thead>
<tr>
<th>Ability to deal with economic considerations of natural resources.</th>
<th>Scores:</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to assess how much use ecosystems can withstand and still be productive on a sustained basis.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Skills in observing a terrestrial ecosystem and determining its current condition.</td>
<td></td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Ability to observe a landscape and evaluate how past uses and events have affected current conditions.</td>
<td></td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Understanding of the economic valuation of environmental services (clean water, aesthetics, recreation, pollination, C storage, etc.).</td>
<td></td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Understanding of conservation biology and managing for threatened and endangered species.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Ability to deal with political processes associated with resource management decisions.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>A working knowledge of sources of information available to wildland managers.</td>
<td></td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Ability to use computers.</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Skills in applying sampling theories and evaluation techniques to analyze field problems.</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>8</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge of plant identification and the ability to apply that knowledge in the field.</td>
<td></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skill in recognizing and dealing with problems of soil erosion and watershed management.</td>
<td></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to systematically solve problems from a broad ecological perspective.</td>
<td></td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to apply management principles to solve problems in field situations.</td>
<td></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>9</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to incorporate social attitudes to address environmental management problems and issues.</td>
<td></td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>8</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to critically read, analyze, and use information in the scientific literature.</td>
<td></td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to make persuasive and effective public presentations.</td>
<td></td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skills and practice in technical report writing.</td>
<td></td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skills in communicating research findings in one-on-one discussions with people from non-scientific backgrounds.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to think holistically and identify the consequences of management practices on the entire ecosystem.</td>
<td></td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to analyze a problem by examining its component parts, then organizing data and information into a coherent whole.</td>
<td></td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation to stay current in the field by continually updating knowledge and skills.</td>
<td></td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation to maintain involvement with professional organizations in the field of your major.</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commitment to professional standards and ethics.</td>
<td></td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broad general knowledge of world environmental management problems.</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge of current sociopolitical issues in wildland management.</td>
<td></td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Overall success across all categories:</td>
<td></td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>12</td>
<td>15</td>
<td>30</td>
<td>58</td>
<td>76</td>
<td>139</td>
<td>129</td>
<td>78</td>
</tr>
</tbody>
</table>

1 One student gave no rating for this statement.
Table III-3. Relationship between SAF competencies/educational outcomes for Forestry majors and those of the Department of Wildland Resources at USU.

<table>
<thead>
<tr>
<th>SAF</th>
<th>USU Department of Wildland Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26</td>
</tr>
<tr>
<td>General Education</td>
<td></td>
</tr>
<tr>
<td>A. Communications:</td>
<td></td>
</tr>
<tr>
<td>1. Oral: Ability to prepare and deliver effective oral presentations</td>
<td>X ?</td>
</tr>
<tr>
<td>2. Written:</td>
<td></td>
</tr>
<tr>
<td>a) Proficiency in English composition, technical/business writing, and writing for non-professional audiences</td>
<td>X</td>
</tr>
<tr>
<td>b) Ability to read with comprehension a variety of documents and critically evaluate opposing viewpoints</td>
<td>?</td>
</tr>
<tr>
<td>B. Science and Mathematics:</td>
<td></td>
</tr>
<tr>
<td>1. Biological Sciences:</td>
<td></td>
</tr>
<tr>
<td>a) Understanding of the components, patterns, and processes of biological and ecological systems across spatial and temporal scales</td>
<td>?</td>
</tr>
<tr>
<td>b) Understanding of molecular biology, cells, organisms, populations, species, communities, and ecosystems</td>
<td>?</td>
</tr>
<tr>
<td>2. Physical Sciences: Understanding of physical and chemical properties, measurements, structure, and states of matter</td>
<td></td>
</tr>
<tr>
<td>3. Mathematics: Ability to understand and use the basic approaches and applications of mathematics and statistics for analysis and problem solving as appropriate for the programs stated outcomes</td>
<td>?</td>
</tr>
<tr>
<td>C. Social Sciences and Humanities:</td>
<td></td>
</tr>
<tr>
<td>1. Understanding of, and ability to address, moral and ethical questions and an ability to use critical reasoning skills</td>
<td>X</td>
</tr>
<tr>
<td>2. Understanding of human behavior and social and economic structures, processes, and institutions of importance across a broad range of societies</td>
<td>?</td>
</tr>
<tr>
<td>3. Understanding of human diversity and the diverse dimensions of the human experience and culture</td>
<td>?</td>
</tr>
<tr>
<td>D. Computer Literacy:</td>
<td></td>
</tr>
<tr>
<td>1. Ability to use computers and other contemporary electronic technologies in professional life</td>
<td>X</td>
</tr>
<tr>
<td>Professional Education</td>
<td></td>
</tr>
<tr>
<td>A. Ecology and Biology:</td>
<td></td>
</tr>
<tr>
<td>1. Understanding of taxonomy and ability to identify forest and other tree species, their distribution, and associated vegetation and wildlife</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>2. Understanding of soil properties and processes, hydrology, water quality, and watershed functions.</td>
<td></td>
</tr>
<tr>
<td>3. Understanding of ecological concepts and principles including the structure and function of ecosystems, plant and animal communities, competition, diversity, populations dynamics, succession, disturbance, and nutrient cycling.</td>
<td></td>
</tr>
<tr>
<td>4. Ability to make ecosystem, forest, and stand assessments.</td>
<td></td>
</tr>
<tr>
<td>5. Understanding of tree physiology and the effects of climate, fire, pollutants, moisture, nutrients, genetics, insects and diseases on tree and forest health and productivity.</td>
<td></td>
</tr>
<tr>
<td>B. Measurement of Forest Resources:</td>
<td></td>
</tr>
<tr>
<td>1. Ability to identify and measure land areas and conduct spatial analysis.</td>
<td></td>
</tr>
<tr>
<td>2. Ability to design and implement comprehensive inventories that meet specific objectives using appropriate sampling methods and units of measurement.</td>
<td></td>
</tr>
<tr>
<td>3. Ability to analyze inventory data and project future forest, stand, and tree conditions.</td>
<td></td>
</tr>
<tr>
<td>C. Management of Forest Resources:</td>
<td></td>
</tr>
<tr>
<td>1. Ability to develop and apply silvicultural prescriptions appropriate to management objectives, including methods of establishing and influencing the composition, growth, and quality of forests, and understand the impact of those prescriptions.</td>
<td></td>
</tr>
<tr>
<td>2. Ability to analyze the economic, environmental, and social consequences of forest resource management strategies and decisions.</td>
<td></td>
</tr>
<tr>
<td>3. Ability to develop management plans with specific multiple objectives and constraints.</td>
<td></td>
</tr>
<tr>
<td>4. Understanding of the valuation procedures, market forces, processing systems, and transportation and harvesting activities that translate human demands for timber-based and other consumable forest products into the availability of those products.</td>
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</tr>
<tr>
<td>5. Understanding of the valuation procedures, market, and non-market forces that allow humans the opportunities to enjoy non-consumptive products and services of forests.</td>
<td></td>
</tr>
<tr>
<td>6. Understanding of the administration, ownership, and organization of forest management enterprises.</td>
<td></td>
</tr>
</tbody>
</table>

46
Table III-3 continued

|                              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| **D. Forest Resource Policy, Economics, and Administration:** |   |   |   |   |   |   |   |   |   | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1. Understanding of forest policy and the processes by which it is developed. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2. Understanding of how federal, state, and local laws and regulations govern the practice of forestry. |   |   |   |   |   |   |   |   |   |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |
| 3. Understanding of professional ethics, including the SAF Code, and recognition of the responsibility to adhere to ethical standards in forestry decision making on behalf of clients and the public. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |
| 4. Ability to understand the integration of technical, financial, and human resources, and legal aspects of public and private enterprises. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |

1. Ability to deal with economic considerations of natural resources.
2. Ability to assess how much use ecosystems can withstand and still be productive on a sustained basis.
3. Skills in observing a terrestrial ecosystem and determining its current condition.
4. Ability to observe a landscape and evaluate how past uses and events have affected current conditions.
5. Understanding of the economic valuation of environmental services (clean water, aesthetics, recreation, pollination, C storage, etc.).
7. Ability to deal with political processes associated with resource management decisions.
8. A working knowledge of sources of information available to wildland managers.
9. The ability to use computers.
10. Skills in applying sampling theories and evaluation techniques to analyze field problems.
11. Knowledge of plant identification and the ability to apply that knowledge in the field.
12. Skill in recognizing and dealing with problems of soil erosion and watershed management.
13. Ability to systematically solve problems from a broad ecological perspective.
14. Ability to apply management principles to solve problems in field situations.
15. Ability to incorporate social attitudes to address environmental management problems and issues.
16. Ability to critically read, analyze, and use information in the scientific literature.
17. Ability to make persuasive and effective public presentations.
19. Skills in communicating research findings in one-on-one discussions with people from non-scientific backgrounds.
20. Ability to think holistically and identify the consequences of management practices on the entire ecosystem.
21. Ability to analyze a problem by examining its component parts, then organizing data and information into a coherent whole.
22. Motivation to stay current in the field by continually updating knowledge and skills.
23. Motivation to maintain involvement with professional organizations in the field of your major.
24. Commitment to professional standards and ethics.
25. Broad general knowledge of world environmental management problems.

X=Strong Match, ?=Weak Match
Figure III-1. Organizational chart: Utah State University.
Figure III-2. Organizational chart: College of Natural Resources.
Figure III-3. The adaptive management cycle for an academic program.
STANDARD IV: FACULTY

1. Background summaries

See Documents C-1, C-2, and D.

2. Individual faculty information

See Document E.

3. Quality of instruction

Quality of instruction is monitored through multiple separate channels: standardized multi-criteria evaluation sheets completed in class by students at the end of each course; focus-group discussions involving the Department Head and all graduating seniors; peer-review of teaching by faculty members who sit in on classes of assistant and associate professors; structured activities and discussions in the integrative capstone course; etc. These feedback channels provide the Department Head with ample information for intervening if a faculty member is clearly not providing high quality instruction, but this is very seldom necessary because promotion and tenure reviews involve close scrutiny of all these assessments and metrics.

In general the faculty members teaching forestry-specific courses are better positioned to provide high quality instruction than their colleagues teaching courses directed at other majors, simply because the forestry-specific courses have small class sizes. Graduating forestry seniors consistently rate their educational experience at USU as being exceptional because of their one-on-one interactions with instructors in the classroom, laboratory, and field.

Any faculty member in the Department is entitled to propose changes to the undergraduate or graduate curricula and such proposals are debated by the body of the faculty. If there is a prima facie case for considering a curriculum change then a faculty sub-committee is appointed by the Department Head and charged with investigating the issue and proposing recommendations. In addition, any instructor responsible for any course is entitled to discuss the course syllabus with the body of the faculty. If changes are proposed and approved at the level of the Department, then such changes (e.g., in course content and/or title) are formally proposed through the office of the CNR Associate Dean for ratification by the USU Educational Policies Committee, which is a committee of the Faculty Senate.

Effective guidance to forestry majors is provided through several avenues. The College of Natural Resources has an Academic Service Center to assist all undergraduates, especially freshmen and transfer students, with planning their coursework schedules. There is one faculty member (Dr. Kuhns) dedicated to the academic advising of the forestry majors, and students are
encouraged to meet with him in his office to discuss their course schedules and any matters
associated with their degree or career planning. The USU student chapter of SAF (the ‘Forestry
Club’) provides informal interaction between students and faculty members with ample
opportunity for guidance to be sought and given. The small class sizes and personal interactions
between students and faculty members are key features of the USU forestry program, with
students receiving as much guidance as they can request and assimilate during contact time with
their instructors. Finally, the Department Head maintains an ‘open-door’ policy and encourages
undergraduates to seek his guidance on career or academic decisions.

4. Faculty expertise

Coursework for the USU undergraduate forestry major is taught by a diverse faculty in an
integrated department that offers a suite of undergraduate and graduate degrees simultaneously
with forestry. The forestry program is thus broader than the forestry major because the faculty
of the department is engaged in a wide range of research, teaching, and extension activities
related to wildland resources. Documents D and E demonstrate that the USU undergraduate
forestry major is taught and advised by a group of faculty members that exceeds the SAF
requirement for eight full-time equivalent faculty members having their primary academic
responsibilities in the program and reporting to the Head of the Department of Wildland
Resources. Students in the forestry major are taught and advised by six ‘core’ forestry faculty
members whose academic training has a specific forestry ‘label’; these being Drs. Baker,
Jenkins, Kuhns, Long, Sharik, and Van Miegroet. Another two faculty members, Drs. Mock and
Ryel, have academic training in genetics and plant physiological ecology respectively and their
research programs (which involve undergraduates) are presently centered on aspen ecology from
molecular to ecosystem levels. Others, such as Drs. Adler, Call, and Schupp are plant ecologists
with teaching responsibilities and research programs that cover forests as well as rangelands, and
trees as well as shrubs, forbs and grasses. Dr. Ramsey, being a specialist on remote sensing and
geographic information systems, is concerned with all land cover patterns and a large component
of the material he teaches and much of the subject matter of his research can be classified as
forest-related.

5. Faculty involvement in professional development and scholarly activities

See Document E.

6. Recruitment and retention of faculty

Utah State University is a Carnegie Research Doctoral Extensive University, an affirmative
action/equal opportunity employer, and a National Science Foundation ADVANCE Gender
Equity Program recipient. The university is sensitive to the needs of dual-career applicants and
is dedicated to recruiting stellar candidates from a diverse pool including women, minorities, veterans and persons with disabilities. USU offers competitive salaries and outstanding medical, retirement, and professional benefits (see http://www.usu.edu/hr for details).
<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Academic Rank or Title</th>
<th>Major Field</th>
<th>Highest Degree Held Degree/Year/Inst.</th>
<th>Experience (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adler, Peter</td>
<td>Assistant Professor</td>
<td>Plant Community Ecology</td>
<td>PhD/2003/Colorado State</td>
<td>3 1 2</td>
</tr>
<tr>
<td>Baker, Frederick*</td>
<td>Associate Professor</td>
<td>Forest Pathology, Computer Applications</td>
<td>PhD/1981/University of Minnesota</td>
<td>25 5 1</td>
</tr>
<tr>
<td>Busby, F.E.</td>
<td>Professor</td>
<td>Grazing</td>
<td>PhD/1977/Utah State University</td>
<td>11 6 15</td>
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<tr>
<td>Call, Christopher</td>
<td>Associate Professor</td>
<td>Vegetation Management and Rangeland Ecosystems Ecology</td>
<td>PhD/1982/Utah State University</td>
<td>22 12 5</td>
</tr>
<tr>
<td>Jenkins, Michael*</td>
<td>Associate Professor</td>
<td>Disturbance Ecology &amp; Management, Insects, Fire, Snow Avalanches</td>
<td>PhD/1982/Utah State University</td>
<td>27 0 10</td>
</tr>
<tr>
<td>Kuhns, Michael*</td>
<td>Professor</td>
<td>Forestry Extension Specialist, Urban Forestry, Tree Physiology</td>
<td>PhD/1986/Auburn University</td>
<td>18 7 0</td>
</tr>
<tr>
<td>Long, James*</td>
<td>Professor</td>
<td>Forest Ecology, Silviculture</td>
<td>PhD/1976/University of Washington</td>
<td>29 0 3</td>
</tr>
<tr>
<td>Mock, Karen</td>
<td>Associate Professor</td>
<td>Conservation Genetics and Applied Molecular Ecology</td>
<td>PhD/2000/Northern Arizona University</td>
<td>9 0 0</td>
</tr>
<tr>
<td>Rogers, Paul</td>
<td>Adjunct Assistant Professor</td>
<td>Aspen Ecology, Vegetation Monitoring, Lichen Communities, Disturbance Ecology</td>
<td>PhD/2007/Utah State University</td>
<td>2 0 16</td>
</tr>
<tr>
<td>Faculty Member</td>
<td>Academic Rank or Title</td>
<td>Major Field</td>
<td>Highest Degree Held Degree/Year/Inst.</td>
<td>Experience (years)</td>
</tr>
<tr>
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<td>------------------------</td>
<td>-------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Ryel, Ronald</td>
<td>Associate Professor</td>
<td>Plant Physiological Ecology</td>
<td>Doctor of Natural Science/1994/University of Wurzburg, Germany</td>
<td>7 0 29</td>
</tr>
<tr>
<td>Schupp, Eugene</td>
<td>Associate Professor</td>
<td>Plant Population Ecology and Restoration Ecology</td>
<td>PhD/1987/University of Iowa</td>
<td>17 0 0</td>
</tr>
<tr>
<td>Sharik, Terry*</td>
<td>Professor</td>
<td>Forest Ecology</td>
<td>PhD/1970/University of Michigan</td>
<td>16 22 2</td>
</tr>
<tr>
<td>Van Miegroet, Helga*</td>
<td>Professor</td>
<td>Wildland Soils and Biogeochemistry</td>
<td>PhD/1986/University of Washington (Seattle)</td>
<td>17 0 6</td>
</tr>
<tr>
<td>Wolfe, Michael</td>
<td>Professor</td>
<td>Wildlife Ecology and Management</td>
<td>PhD/1967/Forstliche Fakultat Der University, Gottingen</td>
<td>39 0 5</td>
</tr>
</tbody>
</table>

*Core Forestry Faculty
Document C-2: Background Summary for Faculty Teaching Courses Listed in Forms B-1 and B-2 but NOT reporting to the Forestry Program Head

Institution Name: Utah State University

Official Degree Program Title: Bachelor of Science in Forestry

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Course(s) Taught</th>
<th>Academic Rank or Title</th>
<th>Major Field</th>
<th>Highest Degree Held Degree/Yr./Inst.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baker, Michelle</td>
<td>NR 2220</td>
<td>Associate Professor</td>
<td>Stream Ecology &amp; Biogeochemistry</td>
<td>PhD/1998/University of New Mexico</td>
</tr>
<tr>
<td>Brunson, Mark</td>
<td>ENVS 2340</td>
<td>Professor</td>
<td>Human Dimensions of NR</td>
<td>PhD/1991/Oregon State University</td>
</tr>
<tr>
<td>Goodrich, Sherel*</td>
<td>WILD 3600</td>
<td>Lab Instructor</td>
<td>Plant Taxonomy &amp; Ecology</td>
<td>MS/1991/Brigham Young University</td>
</tr>
<tr>
<td>Jakus, Paul</td>
<td>APEC 3012</td>
<td>Professor</td>
<td>Environmental Economics</td>
<td>PhD/1992/North Carolina State University</td>
</tr>
<tr>
<td>Ma, Zhao</td>
<td>ENVS 3000/3010</td>
<td>Assistant Professor</td>
<td>Natural Resources and Environmental Policy</td>
<td>PhD/2008/University of Minnesota</td>
</tr>
<tr>
<td>Sturman, Samuel*</td>
<td>ENVS 3300</td>
<td>Adjunct Assistant Professor</td>
<td>Outdoor Recreation, Recreation Education</td>
<td>EdD/1992/University of Northern Colorado</td>
</tr>
<tr>
<td>Wheaton, Joseph</td>
<td>WATS 4930</td>
<td>Assistant Professor</td>
<td>Physical Geography, Hydrology</td>
<td>PhD/ 2008/ University of Southampton</td>
</tr>
<tr>
<td>Wyman, Miriam*</td>
<td>ENVS 2340/ENVS 4000</td>
<td>Visiting Assistant Professor</td>
<td>Forestry / Human Dimensions of Natural Resource Management</td>
<td>PhD/2008/ School of Forest Resources and Conservation, University of Florida</td>
</tr>
</tbody>
</table>

*Instructor- Non-tenure track
<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Budgeted Time Allocation (%)</th>
<th>All Courses Taught</th>
<th>Title and Course #</th>
<th>Required</th>
<th>Credit Hours</th>
<th>Contact Hours/week</th>
<th>Total Enrollment</th>
<th># of Advisees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adler, Peter</td>
<td>40 50 0 10</td>
<td>WILD 3800 Wildland Ecosystems SAF 3 2.5 28 0</td>
<td>WILD 6770 Plant Community Ecology 3 2.5 0 16</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>WILD 2300 Mushroom Identification 1 1 2 0</td>
<td>WILD 5420 Forest and Shade Tree Pathology 3 4.5 0 7</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>WILD 5650 Urban/Community Forestry SAF 3 2.5 0 2</td>
<td>0</td>
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<tr>
<td>Baker, Frederick*</td>
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<td>WILD 2000 Intro. to WILD SAF 1 1 84 0</td>
<td>WILD 4950 Range Plants 2 2 5 0</td>
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<td></td>
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<td>WILD 4950 URME 2 2 1 0</td>
<td>WILD 4950 Noxious Weeds 1 1 0</td>
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<tr>
<td>Busby, F.E.</td>
<td>50 0 40 10</td>
<td>WILD 3000 Wild Plant Ecology and Identification SAF 4 4.5 41 0</td>
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<td>WILD 4850 Vegetation and Habitat Management (co-taught) SAF 1.5 1.25 18 0</td>
<td>WILD 7000 Theory and Applications of Rangeland Ecosystem Management 3 0 0</td>
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<td>WILD 4600 Conservation Biology 3 3 10 0</td>
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<tr>
<td>Jenkins, Michael*</td>
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<tr>
<td>Kuhns, Michael*</td>
<td>10 10 70 10</td>
<td>None n/a n/a n/a n/a</td>
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<tr>
<td>Faculty Members</td>
<td>Budgeted Time Allocation (%)</td>
<td>All Courses Taught</td>
<td>Title and Course #</td>
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<tr>
<td></td>
<td>Teaching</td>
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<td>Extension</td>
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<td>Credit Hours</td>
<td>Contact Hours/week</td>
<td>Total Enrollment</td>
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<tr>
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*Core Forestry Faculty

**Course Enrollments were taken from AY 2009-10
Document E: Individual Faculty Information

Institution Name: Utah State University  Academic Year: 2009-10

Official Degree Program Title: Bachelor of Science in Forestry

Peter B. Adler
Assistant Professor, plant community ecology, 9-month

Academic education background:
PhD, Colorado State University, ecology, 2003
AB, Harvard College, environmental studies, 1994

Professional and research experience:
Post-doctoral fellow, National Center for Ecological Analysis and Synthesis, 2005-2006
NSF post-doctoral fellow, UC Santa Barbara, 2003-2005

Teaching experience:
Utah State University, Assistant Prof., Ecology, 2006-present, 3 years
Colorado State University, Instructor, Ecology, 2001-2002, 1 year

Date of appointment and promotions at present institution:
Appointment: Assistant Professor, 2006

Publications:


Off-campus consulting, or other professional activities, special honors, recognition:
NSF mid-term review of NCEAS, January 2009
NSF Ecology Panel, Fall 2007
NEON Institutional Board representative for Utah State University
Editorial board, Journal of Vegetation Science, 2007-10
Advisory board, the Nutrient Network, an NSF funded Research Coordination Network

Major professional self-improvement activities during past 10 years (including sabbatical):
Teaching workshop, Ecological Society of America Annual Meeting, 2009

External grants and other research funding:
(during the last five years)
2008 "Climate change effects on rangeland resources: Using the past to predict the future," USDA Rocky Mountain Research Station ($52,000)
2007 "Forecasting changes in rangeland vegetation under future climate and grazing management," Utah Agriculture Experiment Station ($80,000)
2006 "Demographic inertia: persistence of plant species under climate change," NSF ($50,000)
2006 "Coexistence in a changing environment," NSF ($206,000)

60
Frederick A. Baker
Associate Professor, forest pathology, computer applications, 9-month

Academic Rank:
PhD, University of Minnesota, plant pathology, 1976-1981
BS, University of Minnesota, forest science, 1972-1975

Academic education background:
University of Minnesota, research specialist, July 1983-June 1984, 1 year
University of Minnesota, shade tree extension specialist, January 1976-April 1981, 5 years
University of Minnesota, teaching assistant, January 1976-April 1981, 5 years
University of Minnesota, research assistant, January 1975-January 1976, 1 year

Professional and research experience:
Utah State University, assistant professor, 1984-1990, 6 years
Utah State University, associate professor 1990-present, 19 years

Dates of appointment and promotions at present institution:
Appointment: July 1984-July 1989 Extension Forester
July 1989-July 1990 Assistant Professor
July 1990-present Associate Professor

Publications:
Doi:10.1016/j.revpalbo.2009.06.007

**Off-campus consulting, or other professional activities, special honors, recognition:**
Golden Mouse Award, 2005 Awarded by Utah State University for innovative use of technology in the classroom.
Advisory Board, Utah Division of Forestry, Fire and State Lands (2005 - present)
Senior University
BLM Pesticide management training

**Membership and offices held in professional organizations:**
American Phytopathological Society Forest Pathology Committee (1985-1988)
Society of American Foresters
  - Intermountain Society Forest Technology Coordinator (1988-present)
  - Intermountain Society Education Committee
  - Wasatch Chapter Program Co-Chairman (1986-1989)
  - Continuing Forestry Education Coordinator (1988-2001)
  - Advisor, Student Chapter (1995-present)
North Central Forest Pest Workshop
Western International Forest Disease Work Conference
  - Chair, Dwarf Mistletoe Committee (2001-present)

**Major professional self-improvement activities during past 10 years:**
Through an interest in improving teaching and submitting grants for improving teaching, I have become an expert in pedagogy and online instruction, and continually seek to improve my teaching.

**External grants and other research funding:**
Developing a Damage Threshold for Dwarf Mistletoe Infested Spruce Stands, USDA Forest Service, October 2005-September 2008
Using Bark Beetles to Kill Low Value Conifers Encroaching in Aspen Stands June 2009-June 2011
Aspen manipulation at Deseret Ranch January 2004-present
Michelle A. Baker  
Associate Professor, ecology, hydrology, 9-month

Academic education background:  
PhD Biology, University of New Mexico, 1998  
BS Biology (with Honors), Lafayette College, 1992

Professional and research experience:  
Assistant then Associate Professor, Department of Biology, Utah State University, 1999-present  
Adjunct Associate Professor, Department of Watershed Sciences, Utah State University, 2002-present  
Postdoctoral Fellow, Centre d’Ecologie des Systemes Aquatiques Continentaux, CNRS/Universite Paul Sabatier, Toulouse, France, 1998-1999  
Research Assistant, Department of Biology, University of New Mexico, 1994-1998  
Teaching Assistant, Department of Biology, University of New Mexico, 1992-1994

Teaching experience:  
Utah State University, Assistant then Associate Professor, Biology, Ecology, Hydrology, 1999-present

Dates of appointment and promotions at present institution:  
Appointment: Assistant Professor, 1999  
Associate Professor, 2002

Publications:  


**Off-campus consulting, or other professional activities, special honors, recognition:**

Chair, Special Sessions, Annual Meeting of the North American Benthological Society, 2008

Panelist, Geosciences Directorate, National Science Foundation, 2005, 2007-2010

Associate Editor, Journal of the North American Benthological Society, 2001-2009

Best Paper Award Soil Science Society of American for Van Miegroet, H., J. Boettinger, and M. Baker “Soil organic quality in wildland soils: what is it and why is it important”, 2006 annual meeting

USU Mortar Board Top Professor 2005


Ad hoc proposal review: National Science Foundation (EAR- Hydrologic Sciences, DEB- Ecosystem Studies, BE- Coupled Biogeochemical Cycles); NIWR-USGS National Competitive Grants Program, European Union Young Investigator Award

**Membership and offices held in professional organizations:**

Elections and Place Committee, North American Benthological Society, 2007-2008


Member, American Geophysical Union

Member, American Society of Limnology and Oceanography

Member, American Water Resources Association

Member, Ecological Society of America

Member, North American Benthological Society

**Major professional self-improvement activities during past 10 years:**

Research mentor for high school students in NASA sponsored Science Camp, USU, 2006
**External grants and other research funding:**
National Science Foundation, Ecosystem Studies Program (DEB 09-22153). Collaborative Research: Using empirical and modeling approaches to quantify the importance of nutrient spiraling in rivers. Principal Investigator, 2009-2013. $152,647.
National Science Foundation, Ecosystem Studies Program (DEB 05-19327). Collaborative Research- Landscape limnology of mountain watersheds: Nutrient retention and ecosystem stability in complex aquatic ecosystems. Co-Principal Investigator, 2005-2010, $1,043,959.
Environmental Protection Agency – STAR. Testing watershed classifications relevant to bioassessment, conservation planning, and watershed restoration. Co-Principal Investigator, 2003-2006, $855,515.
National Science Foundation, Ecosystem Studies Program (DEB 01-32983). Influence of stream-lake interactions on nutrient transport and function of aquatic ecosystems. Co-Principal Investigator, 2002-2005, $1,008,140.

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**Mark W. Brunson**
Professor, human dimensions of rangelands, 12-month

**Academic education background:**
PhD, Oregon State University, forestry, 1991
MS, Oregon State University, recreation resource management, 1989
BA, State University of New York at Binghamton, history, 1974

**Teaching experience:**
Utah State University, professor, 2005-2009, 4 years
Utah State University, director of undergraduate education, 2004-2006, 2 years
Utah State University, associate professor, 1997-2005, 8 years
Utah State University, assistant professor, 1992-1997, 5 years
Oregon State University, assistant professor, 1991-1992, 1 year
Date of appointment and promotions at present institution:
Appointment: Assistant Professor, 1992
Associate Professor, 1997
Full Professor, 2005

Publications:

Off-campus consulting or other professional activities, special honors, recognition:
Current member: Ecological Society of America; International Association for Society and Natural Resources; Society for Conservation Biology; Society for Range Management.


Current professional society service: *Rangelands* Steering Committee, Society for Range Management; Rangeland Ecology section, Ecological Society of America

Other service activities: Sustainable Rangelands Roundtable (2001-2006); Information and Education Committee, Society for Range Management (3 year term); Media Committee, Society for Conservation Biology (3-year term); program chair, Utah Society for Range Management annual meeting (2004, 2005); awards chair, Intermountain Society of American Foresters (1994-2004)

**Membership and offices held in professional organizations:**

ARIDnet science network for study of desertification in the Americas, 2007

Science advisory team member, Canyonlands Research Center, The Nature Conservancy, 2006-present


Scientific review team, Ecological Health Assessment in Southern Nevada, Desert Research Institute, Las Vegas, NV, May-Dec 2006.


**Major professional self-improvement activities during past 10 years (including sabbatical):**

Sabbatical leave, Jornada Long-Term Ecological Research Site, Las Cruces, NM, 2006-07

Sabbatical leave, University of Arizona, College of Natural Resources, Tucson, 1999-2000


**External grants and other research funding:**


National Park Service (Rocky Mountain National Park), "Workplace Implementation of Innovation/Adoption Strategies to Improve the Use of Science in Management Decisions," 2008-2011, $19,151
USDA-USDI Joint Fire Science Program, “A Regional Experiment to Evaluate Effects of Fire and Fire Surrogate Treatments in the Sagebrush Biome,” 2005-2010, $527,000 (co-investigator on multi-investigator project, total award $12.9 million).

Frank E. (Fee) Busby
Professor, effects of livestock grazing, 9-month

Academic Rank:
PhD, Utah State University, range watershed science, 1977
MS, Texas Tech University, range and wildlife science, 1970
BS, Texas Tech University, agricultural education, 1968

Academic education background:
Utah State University, professor; Professions in Wildland Resources; Rangeland Plant Identification; Rangeland Management; Coach Range Plant Identification Team and Undergraduate Range Management Exam Team; July 2005-present; 4 years
University of Wyoming, Laramie, professor; Range Planning and Management; July 1979 to July 1974 and July 1987 to July 1988, total 6 years
Utah State University, Logan, extension range management specialist and assistant-associate professor (teaching and research), September 1972 to May 1979, 7 years
Professional and research experience:
Professor, Department of Wildland Resources; teaching and extension, 2005 – present, 4 years
Utah State University, dean, college of natural resources, July 1998 to June 2005, 7 years
Winrock International Institute for Agricultural Development, Morrilton, Arkansas, assigned full
time from Winrock as Deputy Chief for Science and Technology for the Natural
Resource Conservation Service (USDA), March 1995 to June 1998, 3 years.
Winrock International Institute for Agricultural Development, Morrilton, Arkansas, assigned full
time from Winrock as special assistant to the chief of the Natural Resources Conservation
Service (USDA) to work on grazing land conservation issues and in training programs,
February 1995 to March 1997, 2 years
Winrock International Institute for Agricultural Development, Morrilton, Arkansas, director of
U.S. Programs, August 1988 to February 1995, 7 years
University of Wyoming, Laramie, director of the Wyoming Cooperative Extension Service, June
1984 to July 1987, 3 years
University of Wyoming, Laramie, professor and head of the department of range management,
June 1979 to May 1984, 5 years
Utah State University, Logan, Assistant and Associate Professor of Rangeland Resources;
September 1972 – May 1979; 7 years

Date of appointment and promotions at present institution:
Appointment: Dean of the College of Natural Resources and professor or Rangeland Resources, 1998

Publications:
Busby, F. E. 2004. International experience: The 1930s dust bowl experience in the Great
Plains, USA. pp 34 - 45. IN: Squires, V. R. (ed). Integrated Ecosystem Management:
Putting it into China’s Natural Resource Management Agenda. Asian Development
IN: Squires, V. R. (ed). Integrated Ecosystem Management: Putting it into China’s

Off-campus consulting, or other professional activities, special honors, recognition:
Spring Semester 2008. Recognized as Advisor of the Year by the College of Natural Resources
and Utah State University.
2005–present: Part of a national training team for the Bureau of Land Management and Natural
Resources Conservation Service that does field training on how to conduct Rangeland
Health assessments. Training during the past five years conducted in Colorado, New
Mexico, Oregon, Wyoming, Idaho, and Utah.
2007–2008: Assisting the BLM Colorado Salinity Program to plan and conduct workshops on
road maintenance in the oil and gas field near Farmington, NM.
2005–2008: Coordinated USU offering of distance education courses to help fire fighters
employed by federal government to meet the “0401 Biologist” education requirements.
September–November 2005: Provided technical assistance to the Government of Uzbekistan
and United Nations Development Program related to developing improved rangeland
management programs in two communities.
Membership and offices held in professional organizations:
Society for Range Management
Wyoming Section: Youth Committee and Director of Wyoming Range Youth Camp (1979-1981), Section President-Elect (1981), President (1982), Rangeman of the Year (1984)


Christopher Call
Associate Professor, vegetation manipulation/management, 9-month

Academic education background:
PhD, Utah State University, range science, 1982
MS, Oregon State University, horticulture, 1977
BS, University of Nevada, plant, soil, and water science, 1973

Professional and research experience:
Utah State University, director, natural resources environmental education program, July 1998-June 2002, 4 years
Bio/West Inc., Logan, Utah, consultant, May 1980-August 1981, 1 year

Teaching experience:
Utah State University, associate professor, July 1991 to present, 18 years
Utah State University, assistant professor, June 1987-June 1991, 4 years
Texas A&M University, assistant professor, September 1981-May 1987, 6 years
Utah State University, graduate research/teaching assistant, July 1977-December 1980, 3 years
Oregon State University, graduate teaching assistant, July 1975-June 1977, 2 years
University of Nevada, Reno, Nevada, instructor, January 1974-June 1975, 1 year

Dates of appointment and promotions at present institution:
Appointment: Assistant Professor, 1987
Associate Professor, 1991

Publications:


Off-campus consulting, or other professional activities, special honors, recognition:
Teacher of the Year (1993, 2005), College of Natural Resources, Utah State University
Advisor of the Year (2000), College of Natural Resources, Utah State University
Top Professor (2007), Mortar Board Honor Society, Utah State University
Outstanding Undergraduate Teaching Award (2007), Society for Range Management
Outstanding Achievement Award (1999), Society for Range Management

Membership and offices held in professional organizations:
American Association for Higher Education
International Society for the Scholarship of Teaching and Learning
National Science Teachers Association
Society for Range Management

Major professional self-improvement activities during past 10 years:
Nine-month sabbatical (2002-2003 academic year) focused on outreach education; reviewed outreach education and free-choice learning literature, and interacted with natural resources scientists and managers, educators, and communication specialists in the western U.S.

External grants and other research funding:
Education and technology transfer for ecologically-based invasive plant management of annual grasses in the Great Basin; USDA-ARS; 9/1/2009 to 12/31/2012; Principal Investigator; $113,618.

Using grazing, prescribed fire and herbicide practices to rehabilitate cheatgrass-infested rangelands; USDA-ARS; 7/1/2008 to 8/31/2011; Co-principal Investigator; $69,900.

Characterization of ecological site descriptions and associated state-and-transition models for Camp Williams Military Training Area; U.S. Army/Utah National Guard; 6/1/2008 to 5/31/2010; Principal Investigator; $48,770.

Using cattle as vegetation manipulation agents in sagebrush communities; Utah Agricultural Experiment Station; 7/1/2005 to 6/30/2009; Principle Investigator; $80,000.

Using cattle as fuel reduction and seeding agents in annual and perennial grass stands in northern Nevada; Joint Fire Science Program (BLM); 7/1/2004 to 12/31/2006; Principal Investigator; $239,271.
Sherel Goodrich
U.S. Department of Agriculture Forest Service, Ashley National Forest, 12-month

**Academic education background:**
MS, Brigham Young University, Provo, Utah, plant taxonomy, 1981
BS, Utah State University, Logan, Utah, range science, 1971

**Professional and research experience:**
U.S. Department of Agriculture Forest Service, Ashley National Forest, experience included monitoring studies and rare plant inventories which required identification and ecological interpretations of plants, 1984-2009, 25 years
U.S. Department of Agriculture Forest Service, Intermountain Research Station, Shrub Sciences Laboratory, Provo, Utah, experience included rangeland studies for research and rare plant surveys, which required plant identification and ecological interpretations of plants throughout Utah and local areas of Idaho, 1980-1984, 4 years
U.S. Department of Agriculture, Forest Service, Toiyabe National Forest, experience including rangeland studies which required identification and ecological interpretations of numerous plant taxa in central Nevada, 1976-1980, 4 years
U.S. Department of Agriculture, Forest Service, Ashley National Forest; continuing education; 2-year military duty; mission for the Church of Jesus Christ of Latter Day Saints, 1962-1976, 14 years
Family owned small timber/lumber business that provided experience working with draft horses, hand tools, front-end loader, and trucks, 1955-1961, 6 years

**Teaching experience:**
Teaching experience includes instruction at several rangeland monitoring, riparian evaluation, and rare plant training sessions for Federal and State agencies and seminars. Training has included assisting summer seasonal employees to identify numerous plant taxa to facilitate forest and rangeland studies.
Formal teaching of classes for credit includes courses in general plant taxonomy and rangeland plant identification at Uintah Basin Branch Campus, Utah State University, Vernal, Utah. I have also been a guest instructor at Brigham Young University on a biannual basis for the past 15 years. However, this instruction has been limited to two vascular plant genera (*Carex* and *Juncus*).

Paul M. Jakus
Professor, economics, 12-month

**Academic education background:**
PhD, North Carolina State University, economics, 1992
MS, Colorado State University, agricultural and natural resource economics, 1984
BS, University of Nevada, Reno, agricultural and natural resource economics, 1982
Professional and research experience:
Graduate Research Assistant, Colorado State University, August 1982-August 1984, 2 years
Research Assistant, University of Nevada, Reno, September 1980-August 1982, 2 years

Teaching experience:
Professor, Department of Economics, Utah State University, July 2003-June 2008, 5 years
Associate Professor, Department of Economics, Utah State University, July 2001-June 2003, 2 years
Associate Professor, Dept. of Agricultural Economics and Rural Sociology, University of Tennessee, Knoxville, TN, February 1992-June 1997, 5 years
Assistant Professor, Dept. of Agricultural Economics and Business, North Carolina State University, Raleigh, NC, May 1987-February 1992, 5 years

Date of appointment and promotions at present institution:
Appointment: Associate Professor, 2001
Professor, 2003

Publications:

Membership and offices held in professional organizations:
J. Agricultural and Resource Economics, Associate Editor, 2003-2006
Society and Natural Resources, Associate Editor, 2003-2005

Michael J. Jenkins
Associate Professor, disturbance ecology and management, insects, fire, snow avalanches, 9-month

Academic Rank:
PhD, Utah State University, biology/entomology, 1982
MS, Utah State University, forest science, 1978
BS, University of Redlands, biology, 1971
Academic education background:
Utah State University, forest ecology research, associate professor, 1989-present, 20 years
Utah State University, forest ecology research, assistant professor, 1982-1989, 7 years
Snowbasin Resort Co., resort management, patrol and snow safety manager, 2005-2009, 4 years
Snowbasin Resort Co., resort management, director snow safety, 1999-2005, 6 years

Professional and research experience:
Utah State University, associate professor, forest disturbance ecology and management, 1989-present, 20 years
Utah State University, assistant professor, forest disturbance ecology and management, 1982-1989, 7 years
Utah State University, teaching and research assistant, forest biology, 1975-1981, 7 years

Dates of appointment and promotions at present institution:
Appointment: Assistant Professor, 1982
Associate Professor, 1989

Publications:

Off-campus consulting, or other professional activities, special honors, recognition:
Patrol and Snow Safety Manager, Snowbasin Resort Co.
Avalanche Instructor, American Institute for Avalanche Research and Education and National Ski Patrol System
Membership and offices held in professional organizations:
American Avalanche Association
National Ski Patrol System

Major professional self-improvement activities during past 10 years:
Director of Avalanche Mitigation for 2002 Olympic Winter Games, Snowbasin, Utah. 1999-2002

External grants and other research funding:
USDA Forest Service, Forest Health Monitoring, Evaluation Monitoring Program, FY, $63,200
USDA Forest Service, Special Technology Development Program, FY, $58,850

David N. Koons
Assistant Professor, animal population ecology, 9-month

Academic education background:
PhD, Auburn University, wildlife science with minor in statistics, 2005
MS, Montana State University, fish and wildlife management, 2001
BS, Montana State University, biology with minor in statistics, 1998

Professional and research experience:
October 2005-August 2007: Post-doctoral Fellow, Max Planck Institute for Demographic Research, Rostock, Germany.
May 2005-September 2005: Post-doctoral Research Associate, School of Forestry and Wildlife Sciences, Auburn University, Auburn, Alabama, U.S.A.

Teaching experience:
August 2007-Present: Assistant Professor, Department of Wildland Resources and the Ecology Center, Utah State University, Logan, Utah, U.S.A.

Date of appointment and promotions at present institution:
Appointment: Assistant Professor, 2007

Publications:

Membership and offices held in professional organizations:
The Wildlife Society
Ecological Society of America
The American Society of Naturalists

External grants and other research funding:
James N. Long  
Professor, forest ecology, silviculture, 9-month

Academic Rank:  
PhD, University of Washington, Seattle, forest ecology and silviculture, 1976  
MS, University of Washington, Seattle, forest ecology, 1973  
BS, University of Washington, Seattle, forest science, 1968

Academic education background:  
Utah State University, teach undergraduate courses in the area of forest ecology and silviculture;  
conduct a research and graduate education program in forest ecology and silviculture;  
participate in the department’s undergraduate advising and service programs; supervision of four professional staff and up to six seasonal employees; professor, 1980-present, 29 years  
Weyerhaeuser Company, conduct research in the area of applied forest ecology and silviculture;  
facilitate technology transfer of scientific information to resource professionals and company management; supervision of three full-time professional staff and 15 seasonal staff; research scientist, 1977-1980, 3 years

Professional and research experience:  
Utah State University, assistant professor, forest ecology & silviculture, 1980-1984, 4  
Utah State University, associate professor, forest ecology & silviculture, 1984-1991, 7  
Utah State University, professor, forest ecology & silviculture, 1991-, 18

Dates of appointment and promotions at present institution:  
Appointment: Assistant Professor, July 1980  
Associate Professor, 1984  
Full Professor, June 1991

Publications:  
Long, J.N.; Shaw, J.D. in press. The influence of compositional and structural diversity on forest productivity. Forestry.  


**Off-campus consulting, or other professional activities, special honors, recognition:**

Barrington Moore Memorial Award 2005, Society of American Foresters

Chair, Silviculture Instructors Subworking Group, SAF (1990-2005)

Member, Utah Division of Forestry, Fire and State Lands Advisory Council (1999-2005)

Coordinator, Continuing Education in Ecosystem Management (CEEM) for the Rocky Mountains and Intermountain West.

Member, USDA-Forest Service R-4 and Bureau of Indian Affairs Silviculturist Certification Panels

**Membership and offices held in professional organizations:**

Society of American Foresters, Fellow

Science and Technology Coordinator, Intermountain SAF

**Major professional self-improvement activities during past 10 years:**

Sabbatical – Andalucia, Spain, 2002-2003

Certified Forester, Society of American Foresters

**External grants and other research funding:**

Ecosystem Management at Camp Williams, UT. Utah Army National Guard. $380,936 (2009-2010)

Forest Ecosystem Classification in the Intermountain West. USDA Forest Service. $160,000 (2009-2011)

Reversing aspen decline: assessing the effects of forest manipulation on resource values and ecosystem processes and function. USDA-NRI $397,391 (w/ Ron Ryel, Josh Leffler, and Karen Mock).


Extending the Record of Drought and Discharge Variations in the Bear River Drainage through Tree Ring Reconstructions: Collection of initial data from the Logan River basin. USU
Water Resources Lab. $19,930 (w/ Tammy Rittenour, Lawrence Hipps, Robert Gillies, and Justin DeRose)
FIA Increment Core (Tree Ring) Archiving and Database Development. USDA Forest Service $50,000 (2009-2011)
Ecosystem Management at Camp Williams, UT. Utah Army National Guard. $430,558 (2008-2009)
Ecosystem Management at Camp Williams, UT. Utah Army National Guard. $399,316 (2007-2008)
Ecosystem Management at Camp Williams, UT. Utah Army National Guard. $685,000 (2005-2006)

Zhao Ma
Assistant Professor, natural resources and environmental policy, 9-month

Academic education background:
PhD, University of Minnesota, St. Paul, MN, natural resources science and management with minor in statistics, 2008
MS, Brandeis University, Waltham, MA, sustainable international development, 2004
BS, University of Science and Technology Beijing, China, material physics, 2002

Professional and research experience:
Post-doctoral Research Associate, Department of Natural Resources Conservation, University of Massachusetts, Amherst, MA, 03/2008-06/2009, 1 year
Research Assistant, Department of Forest Resources, University of Minnesota, ST. Paul, MN, 09/2005-02/2008, 3 years
The Nature Conservancy, Lima, Peru, database researcher, 02/2004-04/2004, 3 months
United Nations Development Programme, La Paz, Bolivia, research intern, public policy unit, 07/2003-02/2004, 1 year
Brandeis University, Waltham, MA, research assistant, program in sustainable international development, 01/2003-08/2003, 8 months
Woodrow Wilson International Center for Scholars, Washington, DC, research assistant, environmental change and security program, 02/2003-06/2003, 4 months
Beijing, China, campaign assistant, Greenpeace, 09/2000-07/2002, 2 years
Beijing, China, founder and editor, China Bird Watch, 11/2001-08/2002, 1 year
Beijing, China, student organizer, The Save Tibetan Antelope Campaign, 04/2001-12/2001, 8 months

Teaching experience:
Utah State University, assistant professor of natural resources and environmental policy, 08/2009-present, 5 months
University of Minnesota, St. Paul, MN, teaching assistant, Department of Forest Resources, Spring 2006
University of Minnesota, St. Paul, MN, instructor, Department of Forest Resources, Fall 2005
University of Minnesota, St. Paul, MN, teaching assistant, Department of Forest Resources, Summer 2005
University of Minnesota, St. Paul, MN, co-instructor, Department of Forest Resources, Spring 2005

**Dates of appointment and promotions at present institution:**
Appointment: Assistant Professor, 2009

**Publications:**


**Membership and offices held in professional organizations:**
Xi Sigma Pi Forestry Honor Society
International Association for Society and Natural Resources
Reviewer, Journal of Environmental Planning and Management

**External grants and other research funding:**
America Forest Foundation (2009), Proposal title: *Effects of state & local taxes on family forests*  
Grant amount approved: $109,926

USDA Forest Service, Northern Research Station (2009), Proposal title: *Family forest research*  
Grant amount approved: $17,190

The Massachusetts Agricultural Experiment Station (2008), Proposal title: *Forests as carbon sinks: exploring the viability of carbon sequestration programs for family forest owners in Massachusetts*  
Grant amount approved: $98,240

Northeastern States Research Cooperative (2008), Proposal title: *Estimating willingness to accept recreation access policies, incentives, and compensation among private forest landowners in Maine’s inland rim counties,*  
Grant amount approved: $44,570

Grant-in-Aid of Research, Artistry, and Scholarship Program at the University of Minnesota (2006)  
Proposal title: *Assessing barriers to implementation of state cumulative environmental impact review,*  
Grant amount approved: $25,250

Graduate School Block Grant at the University of Minnesota (2005), Amount awarded: $1,000

Graduate School Tuition Fellowship at the University of Minnesota (2005), Amount awarded: $2,045

Global Greengrants Fund (2003), Project title: *China Bird Watch monthly newsletter publication and circulation,*  
Grant amount approved: $4,000
Robert Douglas Ramsey
Professor, remote sensing, geographic information systems, landscape ecology, spatial analysis;
Director, Remote Sensing and GIS Laboratory, 9-month

Academic education background:
PhD, University of Utah, Salt Lake City, Utah, geography, 1989
MS, Brigham Young University, Provo, Utah, botany (plant ecology), 1983
BS, Brigham Young University, Provo, Utah, range science, 1982

Professional and research experience:
Professor and Director of the Remote Sensing and GIS Laboratory: Department of Geography and Earth Resources, College of Natural Resources, Utah State University, Logan, Utah 84322-5240. April 1995-present, 14 years.
Program Manager: University of Utah Research Institute, Center for Remote Sensing and Cartography, 391 Chipeta Way Suite D, Salt Lake City, Utah 84108, July 1986 to December 1988, 2 years
Project Scientist: University of Utah Research Institute, Center for Remote Sensing and Cartography, June 1984 to July 1986. 2 years
Range Research Technician: USDA, Intermountain Forest and Range Experiment Station, Shrub Sciences Laboratory, Provo, Utah, October 1981 to December 1983. 2 years

Teaching experience:
Assistant Professor: Department of Geography and Earth Resources, College of Natural Resources, Utah State University, Logan, Utah 84322-5240. July 1989 to April 1995, 6 years.
Post-Doctoral Fellow: Department of Geography and Earth Resources, College of Natural Resources, Utah State University, Logan, Utah 84322-5240. January 1989 July 1989, 7 months

Date of appointment and promotions at present institution:
Appointment: Assistant Professor, 1989
Associate Professor, 1989
Professor,

Publications:
Schrader, K.A. Thomas, D. Schrupp, K. Schulz, B. Thompson, C. Wallace, C. Velasquez,
E. Waller, and B. Wolk. 2007. Mapping Meso-Scale Land Cover Over Very Large
Geographic Areas Within a Collaborative Framework: A Case Study of the Southwest
Regional Gap Analysis Project (SWReGAP). Remote Sensing of Environment, Vol. 108,
pp 59-73

71(1), pp 245- 252

Koetz, M. Kneubuehler, T.C. Edwards. 2007. Modern remote sensing for environmental
monitoring of landscape states and trajectories. Chapter 3.1 in: A Changing World:
Wildi, and S. Ghosh, (Eds.)

Book Cliffs: Effects of Site Water Demand and Conifer Cover. Ecological Modeling,
198: pp 301-311

Retrospective Remote Sensing-Based Ecological Monitoring of Rangelands, Rangeland
Ecology and Management. 59(1): pp 19-29

field tree cover product using 3954 ground plots in the southwestern USA. International

classification for Utah’s West Desert. Western North American Naturalist, 65(3): pp 281-
309.

Reflectance Estimation of Wheat Nitrogen Content for Grain Protein Management.
GIScience and Remote Sensing, 41(4) pp 287-300

with Traditional Techniques to Detect Nitrogen Stress in Wheat. Geocarto International,
20(1) pp. 63-68

Dry Season Vegetation Response of Sagebrush Steppe. Community Ecology 5(1) pp 69-
79. Also in Feldmeyer-Criste, et al., Eds. 2004. Modern Approaches in Vegetation

StatMod: An ArcView 3.x Extension for Classification Trees Using SPLPLUS. GAP


Mapper to Monitor Vegetation Cover in Shrub Steppe Environments. Geocarto

**Off-campus consulting, or other professional activities, special honors, recognition:**
Outstanding Mentor Award. 2004. NASA Affiliated Research Center

**Membership and offices held in professional organizations:**
Association of American Geographers
American Society of Photogrammetry and Remote Sensing
Society for Range Management
International Association of Landscape Ecologists

**External grants and other research funding:**
Intermountain Region Digital Image Processing and Archive Center for Landscape Planning and Maintenance, National Aeronautics & Space Administration, 1/15/2006 to 1/14/2007, $992,000
The Intermountain Region Digital Image Processing and Archive Center for Landscape Planning and Monitoring, National Aeronautics & Space Administration, 11/15/2004 to 5/14/2007, $934,000
Intermountain Region Digital Image Processing and Archive Center for Landscape Planning and Monitoring, National Aeronautics & Space Administration, 9/15/2003 to 9/14/2005, $671,000
NASA-Affiliated Research Center, FIOT - Utah State University Research Foundation, 8/1/2003 to 9/30/2005, $16,505
Paul C. Rogers
Adjunct Assistant Professor, 12-month

Academic education background:
PhD, Utah State University, ecology, 2007
MS, University of Wisconsin-Madison, geography with minor in cartography, 1986
BS, Utah State University, geography with minor in history, 1983

Professional and research experience:
Director, Western Aspen Alliance & Adjunct Assistant Professor Dept. of Wildland Resources & Dept. of Environment and Society, Utah State University, 2008–present, 1 year
Technical Writer/Editor, Management and Engineering Technologies International, 2004-2006, 2 years
Ecologist, U.S. Forest Service, Rocky Mountain Research Station, June 1992-2004, 12 years
Forestry Technician, U.S. Forest Service, Rocky Mountain Research Station, June 1988-May 1992, 4 years
Biological Technician, U.S. Forest Service, Bridger-Teton National Forest, June-Nov. 1987, 6 months
Cartographic Aid, U.S. Forest Service, Payette National Forest, August-October 1986, 3 months
Project Assistant, Environmental Remote Sensing Ctr., Univ. of Wisc.-Madison, September 1985-July 1986, 1 year

Teaching experience:
Utah State University, adjunct assistant professor, Fall 2009
Utah State University, adjunct assistant professor, Spring 2008, 2009

Date of appointment and promotions at present institution:
Appointment: Adjunct Assistant Professor, 2009

Publications:


Membership and offices held in professional organizations:
Western Aspen Alliance (Director), Utah State University & USFS Rocky Mountain Research Station, 2008–present
Natural Areas Association (Member), 2006–present
Utah Forest Restoration Working Group (Member/advisor, Ecology sub-group), 2009-2010.
Restoring the West (Organizing Committee), 2008 & 2009.
North American Forest Ecology Workshop (Co-Chair 2009; Organizing Committee 2008-present).
International Association of Wildland Fire (Member), 2008–2009.
Cache County [Utah] Bike and Pedestrian Advisory Committee (Member; University to Downtown Linkages group Chair), 2007-present
Utah Bioneers (Organizing Committee), 2008-2009.

Technical Paper Reviewer:
Journals: *Ecological Indicators; J. of Biogeography; Western North American Naturalist; Plant Ecology; Northern J. of Applied Forestry*
Agency General Tech. Reports: USFS Southern Research Station; USFS Rocky Mountain Research Station; USFS National Forest Inventory & Analysis Program, Washington Office

External grants and other research funding:
Quinney Foundation Grant to Support Western Aspen Alliance (awarded 2008; $112,200 for 4-years) with Dr. Ronald Ryel. Funds are to provide “seed money” to establish this regional research and management working group tasked with collaborating and facilitating ecological Aspen research to improve management.
Cedar Mountain Initiative, Utah State University Extension, (awarded 2008; $150,000 for 3-years) with Dr. Karen Mock. Monies will support research on Cedar Mountain, southern Utah that will evaluate conditions across a large landscape of pure Aspen stands and assess genetic expression in stand structure, browsing intensity, and incidence of stem disease.

Ronald J. Ryel
Associate Professor, plant physiological ecology, 9-month

Academic education background:
PhD, University of Wurzburg, Germany, plant physiological ecology, 1994
MS, Utah State University, wildlife ecology, 1980
BS, Michigan State University, environmental science, 1977

Professional and research experience:
1995-1998. (1 month each year) Guest Scientist, Lehrstuhl für Experimentelle Ökologie und Ökosystembiologie, Universität Bielefeld, Germany, 3 years.
1981-1986. Systems Ecologist, Data Analyst and Manager, Ecosystem Research Institute, Logan, Utah, 5 years.
1975-1977. Student Biological Aid, Utah Division of Wildlife Resources, Cedar City, Utah, 2 years.

**Teaching experience:**
2007-present. Associate Professor, Department of Wildland Resources and the Ecology Center, Utah State University, Logan, Utah, 2 years.
2002-2007. Assistant Professor, Department of Wildland Resources and the Ecology Center, Utah State University, Logan, Utah, 5 years.
1997-2001. (2 weeks each year) Guest instructor, Lehrstuhl für Experimentelle Ökologie und Ökosystembiologie, Universität Bielefeld, Germany.

**Date of appointment and promotions at present institution:**
Appointment: Assistant Professor, 2002
Associate Professor, 2007

**Publications:**


Off-campus consulting, or other professional activities, special honors, recognition:
Associate Editor, Rangeland Ecology and Management (2009-present)
Associate Editor, Western North American Naturalist (2004-present)
Manuscript reviews (since Mar, 2002): 50+ reviews in 20+ journals
Peer Reviewer for San Juan River Recovery Implementation Program Biology Committee (1999-present)
Board member of Cache County Water Advisor Board (2003-present)
Records Committee member of Utah Ornithological Society (2000-present)
USU Library Committee (2002-present)

Membership and offices held in professional organizations:
Associate Editor, Western North American Naturalist
Ecological Society of America (regular member, plant ecophysiology)
German Ecological Society (Gesellschaft für Ökologie e. V.)
Society for Range Management
American Association for the Advancement of Science
Utah Ornithological Society

External grants and other research funding:
Reversing aspen decline: assessing the effects of forest manipulation on resource values and ecosystem processes and function, 6-2-07 to 5-31-10, USDA NRI, $397,391
Evaluating the magnitude and extent, and assessing causes, of aspen (*Populus tremuloides*) mortality (die-off) in southern Utah, 7-1-2008 to 6-30-2011, USU Cedar Mountain Initiative Research Program, $148,778
Ecohydrology of quaking aspen (*Populus tremuloides*) communities, 7-1-2008 to 6-30-2009, USU Water Initiative, $20,000
Assessing the coexistence of woody and herbaceous plants in sagebrush steppe and mountain aspen rangelands, 7-1-2008 to 6-30-2013, Utah Agricultural Research Station, $90,000
Alliance for aspen research and restoration, 1-1-2008 to 12-31-2009, CNR Quinney Foundation Grant, $60,000
Epidermal transmittance for UV: assessing effects of light climate and drought, 8-1-2008 to 7-31-2009, USDA-CSREES, $41,681
Develop, Evaluate and Exchange Promising Plant Germplasm for the Western US, 9-15-05 to 9-14-11, Cooperative agreement with USDA/ARS Forest and Range Research Lab, Logan, UT, USDA/ARS, $266,500
Assessing the Effect of Conifer Encroachment on Watershed Water Relations and Other Resources, 9-1-06 to 9-30-10, US Forest Service, Rocky Mountain Research Station, $140,000
Expanding Aspen Research Opportunities at Utah State University, 7-1-06 to 6-30-07, USU Community/University Research Initiative (CURI), $23,043
Carbon Dynamics of Cool Desert Rangelands, 7-1-02 to 6-30-08, Utah Agric. Exp. Station, $230,000
Using Solar Ultraviolet Radiation to Test Plant Acclimation and Biological Spectral Weighting Functions, 7-1-06 to 6-30-07, Subcontract with Colorado State University, USDA - UV-B Radiation Monitoring Program, $55,000
Water Yield and Vegetation Manipulation, 10-1-06 to 3-31-08, Natural Resources Conservation Service, $304,938
Water Yield and Vegetation Manipulation, 4-1-04 to 9-30-06, Natural Resources Conservation Service, $523,000
Genetic Variation in Western Aspen (Populus tremuloides): Establishment of an Integrative, Long-term Research Initiative at USU, 5-1-05 to 6-30-06, USU Community/University Research Initiative (CURI), $29,181
Using Solar Ultraviolet Radiation to Test Plant Acclimation and Biological Spectral Weighting Functions, 8-31-03 to 6-30-06, Subcontract with Colorado State University, USDA - UV-B Radiation Monitoring Program, $140,000
Investigation of the Changes in the Water Quality in the Little Bear River Watershed in Response to the Implementation of Best Management Practices, 1-1-05 to 12-31-07, USDA, CSREES, $645,000
Application of phytolith analysis to infer vegetation and disturbance regime changes over the past 200 years, 6-1-07 to 5-31-08, US National Science Foundation, $9,917
Historic Vegetation of the California Trail—Challenge Cost Share Program with NPS, 7-1-06 to 12-31-07, US National Park Service, $20,000
Historic Vegetation of the California Trail—Challenge Cost Share Program with NPS, 7-15-04 to 3-31-06, US National Park Service, $20,000
Pulsing of Plant Available Moisture and Nitrogen in Great Basin Communities, 8-1-98 to 7-31-04, National Science Foundation $2,500,000

Terry L. Sharik
Professor, forest ecology, 9-month.

Academic Rank:
PhD, University of Michigan, forest botany, 1970
MF, University of Michigan, forest recreation, 1964-1970
BSF, West Virginia University, forestry and wildlife management, June 1964

Academic education background:
West Virginia University, undergraduate research assistant, 1963
University of Michigan, teaching fellow and research assistant, 1964-70, 6 years
Oberlin College, Assistant Professor of Biology, 1971-73, 2 years
NUS Corporation, Biologist, 1973-1975, 2 years
Virginia Polytechnic Institute and State University, Assistant Professor of Forest Biology and Research Associate, 1975-86, 11 years
University of Michigan, faculty – Biological Station, 1982-92 (summers), 11 years
Michigan Technological University, Associate Professor and Professor of Forest Ecology, 1986-1993, 8 years
Utah State University, Professor, Forest Ecology, 1993-present, 16 years

**Professional and research experience:**
University of Michigan, teaching fellow, 1964-68, 4 years
University of Michigan, instructor in adult education (Biology of Woody Plants), 1967-1970, 3 years
University of Michigan, teaching assistant, forest genetics, 1970, 1 year
Oberlin College, Assistant Professor of Biology, 1971-73, 2 years
Virginia Polytechnic Institute and State University, Assistant Professor of Forest Biology, 1975-82, 7 years
University of Michigan, faculty – Biological Station, 1982-92 (summers), 11 years
Michigan Technological University, Associate Professor and Professor of Forest Ecology, 1986-1993, 8 years
Utah State University, Professor, Forest Ecology, 1993-present, 16 years

**Date of appointment and promotions at present institution:**
Appointment: Professor and Head, Department of Forest Resources, 1993-2002
Professor and Head, Department of Environment and Society, 2002-2007
Professor, Department of Wildland Resources, 2007-present

**Publications:**


Sharik, T.L. and S. Frisk. 2008. The educational values of trees and forests. Proceedings Conference on University Education in Natural Resources. Oregon State University, Corvallis. ScholarsArchive@OSU: http://hdl.handle.net/1957/8180.


Membership and offices held in professional organizations:
Alpha Zeta (Chancellor, 1964); Gamma Sigma Delta; Phi Epsilon Phi; Phi Sigma, Sigma Xi; Xi Sigma Pi (Ranger, 1964; Forester, 1966); Society of American Foresters (Natural Areas Council, 1975-1982, Forest Ecology Working Group: Chair-elect and Chair, 1992-1996; special recognition for significant contributions in science and technology transfer, 1997; Editorial Board, Journal of Forestry, 1995-1998, 2006-present; Science and Technology Board, 1997-2000; Graduate, Leadership Academy, 1998; Planning Team, Leadership Academy, 1998-2000; Science and Technology Chair, Wasatch Chapter, 1999; Executive Committee, Intermountain Section, 2000; Critical and Emerging Issues Subgroup, 2000; Committee on Genetically-Modified Organisms, 2000-2001; elected Fellow, 1997); Guest Editor, International Journal of Forestry Research, 2009; Chair, Sustainable Forests Partnership, 2009; Forest History Society; International Association for Society and Natural Resources; Ecological Society of America; American Institute of Biological Sciences; Society for Conservation Biology.

Major professional self-improvement activities during past 10 years:
Sabbatical leave, School of Natural Resources and Environment, University of Michigan (Visiting Scholar), 2007-2008

External grants and other research funding:
Establishment of the Gombe School of Environment and Society, Tanzania, 2006-2007 (New England Biolabs Foundation, $8,000, with Y. Fubusa and K. Clark)
Development of measures for Montreal Process Indicator 44 on the Importance of Forests to People2007-2008 (USDA Forest Service, $75,000; with faculty at Auburn University, Michigan State University, Penn State University, Oregon State University, and University of Vermont)
Establishment of the Gombe School of Environment and Society, Tanzania, 2007-2008 (New England Biolabs Foundation, $10,000, with Y. Fubusa and K. Clark)
Undergraduate Enrollment Trends in Natural Resources in the U.S., 2007-2012 (State of Utah, $22,500)
Establishment of the Gombe School of Environment and Society, Tanzania, 2008-2009 (International Community Foundation, $77,500, with Y. Fubusa and K. Clark)
Establishment of the Gombe School of Environment and Society, Tanzania, 2005-present (Various private donors, $117,868)
Sam Sturman  
Adjunct Assistant Professor, recreation resource management, 12-month  

**Academic education background:**  
EdD, University of Northern Colorado, higher education-community college administration  
MS, University of Wyoming, Laramie, WY, higher education-emphasis on community college  
MS, Brigham Young University, Provo, UT, community school leadership  
BS, Brigham Young University, Provo, UT, recreation—therapy and outdoor education  

**Professional and research experience:**  
Associate Director of Utah State University Moab  
Responsible for all operations of the Moab Center, including advising, financial aid, marketing, public relations, risk management, supervision of center staff  
Employment with USU – 6 years  

**Teaching experience:**  
Instructed College Credit Classes, Laramie County Community College  
  Introduction to Recreation -- 2 years  
  Study Skills -- 1 year  
  Introduction to Racquetball -- 15 years  
  Intermediate Racquetball --15 years  

**Date of appointment and promotions at present institution:**  
Appointment: Adjunct Assistant Professor, August 2009  

**Off-campus consulting, or other professional activities, special honors, recognition:**  
Outstanding Service Award 2009--Regional Campuses and Distance Education, Utah State University  
Distinguished Leadership Award--Cheyenne Chamber of Commerce 2000  
Business of the Year Utah State University Moab 2009  

**Membership and offices held in professional organizations:**  
Board Member, Moab Chamber of Commerce  
Facilitator/Author, ‘Moab Rocks’ Customer Service Program  
Member, Moab Literacy Committee  
Member, Grand Foundation for Higher Education  
Information Specialist, Arches National Park  
Information Specialist, Moab Informational Center  
Past-Chair, Leadership Cheyenne  
Past-President, Wyoming Adult Community and Continuing Ed. Assoc.  

**External grants and other research funding:**  
Wrote grant to the Williams Pipeline Company for $10,000 to reestablish a GED Testing Center in Moab Utah. Grant was awarded.
Other Work Related Experiences
Community Services and Continuing Education: Responsible for the development of noncredit classes at the college. Number of courses were nearly 300 a semester with enrollments in the thousands.
Workforce Development Training: It was my responsibility to work with the local economic development group to provide the educational component for new company relocations.
Manager of the Center for Conferences and Events: I created a conference and events program. I managed 600,000 square feet in our rental of facilities and conferences program.
Manager of the Small Business Incubator: Worked with a community advisory board in recruiting tenants, accountability for grant monies, monthly board meeting presentations, and making recommendations on who should graduate.
Summer Enrichment for Children (SEEK): Created a summer enrichment program for youth at the college. Duties included program development, securing instructors, registrations, promotion, budget development and promotion of programs.
Elderhostel Coordinator: I was responsible for the development of Elderhostel programs.
County Outreach and Senior Citizen Program Coordinator: I developed credit and noncredit programs for county residents.
Community School Director: Hanna, WY.

Other Positions and Titles at Laramie County Community College:
Business Training and Development
Director of Continuing Education/Community Services
Acting Director of Continuing Education/Community Services
Coordinator of Community Services/Conference and Events
Assistant to the Associate Dean of Instruction
Coordinator of Rural Outreach and Senior Citizen Programs

Helga Van Miegroet
Professor, wildland soils and biogeochemistry, 9-month

Academic Rank:
PhD, University of Washington, Seattle, forest soils and mineral cycling, 1986
MS, University of Washington, Seattle, forest soils and mineral cycling, 1980
BS, State University of Ghent, Belgium, agricultural engineering: specialty water and forest resources/silviculture, 1978

Academic education background:
Institute of Forest Ecology of the University of Natural Resources and Applied Life Sciences (BOKU) Vienna, Austria, guest professor in Biogeochemistry, 2008-2009, 6 months
Austrian Federal Research & Training Centre for Forests, Natural Hazards and Landscape (BFW), visiting scientist, 2008-2009, 1 year
Institute of Silviculture of the Albert Ludwigs University of Freiburg, Germany, guest professor, 2009, 2 months
Utah State University, associate professor, 2008-present, 1 year
Utah State University, associate professor, 1998-2008, 10 years
Soil Science Society of America Journal, associate editor, 2002-2007, 5 years
Australian National University, honorary research fellow, 2000, 1 year
Utah State University, assistant professor, 1993-1998, 5 years
Oak Ridge National Laboratory, research staff, 1987-1993, 6 years
University of Washington, post-doctoral research associate and lecturer, 1986-1987, 1 year
University of Washington, graduate research associate, 1978-1986, 7 years

Professional and research experience:
University of Natural Resources and Applied Life Sciences (BOKU) Vienna, Austria, guest professor, terrestrial biogeochemistry, 2008-2009, 6 months
Utah State University, professor, wildland soils and biogeochemistry, 2008-present, 1 year
Utah State University, associate professor, wildland soils and biogeochemistry, 1998-2008, 10 years
Utah State University, assistant professor, wildland soils and biogeochemistry, 1993-1998, 5 years
University of Tennessee, Dept Forestry, Wildlife and Fisheries, Knoxville, Adjunct assistant professor, forest soils, 1991-1999, 8 years

Date of appointment and promotions at present institution:
Appointment: Assistant Professor, 1993
Associate Professor, 1998
Full Professor, 2008

Publications:


Off-campus consulting, or other professional activities, special honors, recognition:
- Guest Professor at the Institute of Forest Ecology of the University of Natural Resources and Applied Life Sciences (BOKU) in Vienna, Austria, 2008-2009
- Guest Professor at the Institute of Silviculture of the Albert Ludwigs University of Freiburg, Germany, 2009
- Utah State University, Outstanding Faculty Employee Award, 2007
- Soil Science Society of America – Citation for Excellence as Associate Editor of Soil Science Society of America Journal, 2007
- Outstanding Presentation for S-7 Division (Forest, Range, and Wildland Soils) at the Soil Science Society of America Annual Meeting, 2006
- Utah State University – College of Natural Resources Undergraduate Research Mentor of the year, 2004

Membership and offices held in professional organizations:
- Ecological Society of America
- American Geophysical Union
- Society of American Foresters
- Xi Sigma Pi
- American Association for Women in Science
- Soil Science Society of America
- American Institute of Biological Sciences
- Association of Women Soil Scientists
- Sigma Xi

Major professional self-improvement activities during past 10 years:
- 2000: Sabbatical leave in Australia; visiting scientist at the CSIRO Forestry and Forest Products Division and at Australian National University, Dept. of Forestry, Canberra, Australia. Focus: characterizing soil organic carbon and the role of soil organic matter as an indicator of sustainable management in pine plantations
- 2008: Sabbatical leave in Europe; guest professor and visiting scientist at the Institute of Forest Ecology of the University of Natural Resources and Applied Life Sciences (BOKU) and at the Austrian Federal Research & Training Centre for Forests, Natural Hazards and Landscape (BFW) in Vienna, Austria and at the Institute of Silviculture of the Albert
Ludwigs University of Freiburg, Germany. Focus: carbon sequestration and accounting in forests, new techniques to detect vegetation imprints on soil organic carbon.

**External grants and other research funding:**
USU, VP for Research Office, Research Catalyst Grant “Can fire-induced soil water-repellency be reversed?” $20,000 as PI, 2008-2009.
NPS-Air Quality Division, “Assessment of nitrogen deposition and its possible effects on alpine vegetation in the Grand Teton National Park,” $100,000 as PI, 2006-2008
NPS-GRT & RM-CRSU, “Establishing baseline nitrogen status and edaphic conditions for alpine vegetation in Grand Teton National Park,” $10,000 as PI, 2005
NPS-UWY, “The effect of nitrogen deposition and edaphic conditions on microbial activity in the alpine zone,” $4,000 as PI, 2006-2007
NRCS “Effect of Vegetation Manipulation on Watershed Processes – Deseret Land and Livestock”, $260,000 as Co-PI (Congressional Earmark), 2004-2008

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**Joseph M. Wheaton**
Assistant Professor, fluvial geomorphology and ecohydraulics, 9-month

**Academic education background:**
PhD, University of Southampton, Southampton, United Kingdom, geography, 2008
MS, University of California at Davis, Davis, CA, hydrologic sciences, 2003
BS, University of California at Davis, Davis, CA, hydrology, 2002

**Professional and research experience:**
Associate Consultant, CH2MHill, Water Group, Boise, ID, November 2008-to present, 1 year
Research Assistant Professor, Idaho State University, Department of Geosciences, Pocatello, ID, August 2008-August 2009, 1 year
Research Assistantship, U.C. Davis Watershed Hydrology & Geomorphology Laboratory, Davis, CA, 2001-2003, 2 years
Sub-Consultant, Jennifer Chandler Landscape Architect, Napa, CA, 2001-2003, 2 years
Civil Engineering Technician, Bartelt Engineering, Napa, CA, 1997-2000, 3 years
Civil Engineering Intern, County of Napa Public Works Department, Napa, CA, 1995-1996, 1 year

**Teaching experience:**
Assistant Professor, Department of Watershed Sciences, Logan, UT, August 2009 to present, 5 months
Lecturer in Physical Geography, Aberystwyth University, Institute of Geography & Earth Sciences, Aberystwyth, Wales, UK, January 2006-August 2008, 2 years
Teaching Assistant, University of Southampton, School of Geography, Southampton, UK, Spring Term 2005
Demonstrator, University of Southampton, School of Geography, Southampton, UK, Fall Term 2004
Demonstrator, University of Southampton, School of Geography, Southampton, UK, Fall Term 2003 & 2004
Demonstrator, University of Southampton, School of Geography, Arolla, Switzerland, Summer 2003 & 2004
Instructor, Utah State University Physical Education Department, Logan, UT, Spring Quarter 1997
Instructor and Organizer, St. Helena, CA, 1995-1996

**Date of appointment and promotions at present institution:**
Appointment: Assistant Professor, 2009

**Publications:**


Off-campus consulting, or other professional activities, special honors, recognition:

External grants and other research funding:
USDA Forest Service, 2009. “Comparison of traditional versus ground-based LiDaR in-stream habitat assessments.” Challenge Cost Share Program, Awarded $45,000 US (PI)
Horton Research Grant, 2005-2006. “Uncertainties in River Restoration.” American Geophysical Union, Awarded $10,000 US (Principal Investigator)

Michael L. Wolfe
Professor, ecology and wildlife management, 9-month

Academic education background:
PhD, Univ. of Gottingen, wildlife science, 1967
BS, Cornell University, wildlife management, 1963

Professional and research experience:
Mammals Program Coordinator, Utah Division of Wildlife Resources, 2000-2002, 2 years
Research Associate--Purdue University, 1967-1970, 3 years

Teaching experience:
Interim Head, Forest, Range, and Wildlife Sciences Department, Utah State University, 2004-2005, 1 year
Utah State University, professor, 1989-2009, 20 years
Utah State University, associate professor, 1975-1989, 14 years
Utah State University, assistant professor, 1970-1975, 5 years

Date of appointment and promotions at present institution:
Appointment: Assistant Professor, 1970
Associate Professor, 1975
Full Professor, 1989

Membership and offices held in professional organizations:
The Wildlife Society (Past President of the Utah Chapter, 1977-78; served as Associate Editor for The Journal of Wildlife Management, 1980-1982; Faculty advisor to USU Student Chapter.
Society for Conservation Biology
Miriam S. Wyman
Visiting Assistant Professor, human dimensions of natural resource management, 12-month

Academic education background:
PhD, University of Florida, forest resources and conservation, 2008
MS, University of Wisconsin-Stevens Point, natural resource management, 2002
BS, University of Massachusetts, Amherst, MA, environmental science, 1995

Professional and research experience:
Poverty Environmental Network Project Consultancy, Center for International Forestry Research (CIFOR), May 2009, 8 months
Post-Doctorate Research Fellow, University of Florida/School of Forest Resources and Conservation Extension, January 2009-August 2009, 8 months
Research Fellow, University of Florida/United States Forest Service Southern Research Station, August 2008-December 2008, 5 months
Research Partner, Center for International Forestry Research (CIFOR) Poverty Environmental Network (PEN) Project, 2005, 4 years
NSF IGERT/Research Fellow, National Science Foundation (NSF) Integrated Graduate Education and Research Traineeship (IGERT) Program/University of Florida Working Forests in the Tropics, August 2003-December 2008, 5 years
Research Consultant, Conservation International (CI), May 2007-October 2007, 6 months
Environmental Researcher, State Environmental Resource Center (SERC), Madison, Wisconsin, January 2003-March 2003, 3 months
Lead Community Organizer, All Parks Alliance for Change (APAC), Minneapolis, MN, September 1998-August 2000, 2 years
Lead Field Researcher, Iowa State University/Patagonia Wildlife Research Station, Torres del Paine Nat’l Park, Chile, September 1997-March 1998, 1 year
Assistant Director, Fund for Public Interest Research/US PIRG, Minneapolis, MN, August 1996-August 1997, 1 year

Teaching experience:
Visiting Assistant Professor, Environment and Society Department, 2009, 1 semester
Course Instructor, Department of Geography, University of Florida, January 2008-May 2008, 5 months
Course Instructor, Department of Latin American Studies, University of Florida, August 2007-December 2007, 5 months
Graduate Teaching Assistant, School of Forest Resources and Conservation, University of Florida, August 2008-December 2008, 5 months
Graduate Teaching Assistant, School of Forest Resources and Conservation, University of Florida, August 2007-December 2007, 5 months
Graduate Teaching Assistant, School of Forest Resources and Conservation, University of Florida, August 2006-December 2006, 5 months
Graduate Teaching Assistant, Department of Natural Resource Management, University of Wisconsin-Stevens Point, September 2000-June 2002, 2 years
Date of appointment and promotions at present institution:
Appointment: Visiting Assistant Professor, August 2009

Publications:

Off-campus consulting, or other professional activities, special honors, recognition:

Membership and offices held in professional organizations:
International Association for Society and Natural Resources (IASNR)
Center for International Forestry Research (CIFOR)’s Poverty Environmental Network (PEN) Project
Americorps/VISTA (Volunteers In Service To America) Service alumni
STANDARD V: STUDENTS

1. Forestry graduate employment summary

Of the 18 baccalaureate forestry students who have graduated over the past six years, twelve have provided us with information on their employment status (Document F). Among the twelve, four are permanently employed in forestry, three are employed in a forestry-related field, one is temporarily employed in forestry, three are in graduate school, and only one is unemployed. These values compare very favorably with those reported in May 2008 for all majors graduating from the Wildland Resources Department in AY 2007-2008 (Standard III, Appendix III-1).

2. Recruitment and retention of students

Figure V-1 shows relativized undergraduate enrollments in natural resources nationally (for 15 institutions where these data are available) and for USU during the period 1980-2009. Nationally, enrollments follow a more or less sinusoidal pattern, with highs in the early 1980s and the mid 1990s interspersed with lows in the late 1980s and early 2000s. The pattern at USU pretty much parallels that of the nation, except in the most recent upturn, where it tends to lag behind by about three years and is not as steep. Figure V-2 shows enrollments nationally over the same period by fields of study represented at USU, excluding Geography where data are incomplete. Forestry showed a steady decline in the proportion of enrollments over this time period, going from 59.3% in 1980, to 41.5% in 2000, and 30.5% in 2009, and in the last two years was eclipsed by enrollments in “natural resources and environment.” At USU, Forestry enrollments showed even more precipitous declines, going from 27.5% in 1980 to 10.2% in 2000 (the year of the last accreditation review), to 4.5% in 2009 (Figure V-3). Moreover, while national enrollments in Forestry have been increasing since about 2004, at USU they show a continuing downward trend. In absolute terms, USU forestry enrollments have dropped from 134 students in 1980 to 13 in 2009.

The reasons for the sharp decline in Forestry enrollments at USU are not entirely clear. In part, they parallel national trends, where it is clear that other fields of study have shown more robust gains since the turn of the present century, notably Wildlife and Fisheries and Natural Resources and Environment (Figure V-2). Another part of the answer may reside in the fact that Utah is a state dominated by semi-arid and arid environments, where forests are pretty much confined to montane situations and thus do not receive the attention they do in heavily forested states with respect to wood products. Indeed, Forestry enrollments at USU have never dominated enrollments in natural resources over the last three decades in the way they have at other institutions in states with moisture environments. On the other hand, with its high scenic quality and other recreational opportunities, coupled with a high premium placed on water, it is perhaps
not surprising that enrollments at USU would be more balanced among various fields of study than at institutions elsewhere. Still another part of the explanation may be the creation of the Conservation and Restoration Ecology (CREC) degree in 2004, which offers greater flexibility than the Forestry degree and is attractive to those interested in the conservation and restoration of forests. We do not know the exact number of current CREC students who might have been Forestry majors otherwise, but the results of our survey of Forestry Club members (Appendix V-1) suggests that it could be substantial.

Document G-1 shows enrollments in the Forestry major at USU from 2006 to the present by class standing, gender, and race/ethnicity. Males constituted 71.4\% of the student population over this period, while non-Hispanic Caucasians made up 86.9\% of enrollment, with the highest values in both cases being for the current academic year. These values in the year 2000 were 60 and 98\%, respectively. Minorities constituted on average 4.8\% of Forestry enrollments over the past four years. Number of graduates appears to follow the same trends over the last four years, although the small values make it difficult to draw meaningful conclusions. Table G-2 presents comparable data for the College of Natural Resources (CNR) as a whole. Values are not appreciably different from those for Forestry majors, with averages of 66.4\% males, 87.5\% non-Hispanic Caucasians, and 4.0\% minorities. At the university level for the current academic year, averages for percent non-Hispanic Caucasians males and minorities are likewise not all that different from CNR values, at 78.8\% and 5.3\%, respectively. In contrast, the 46.8\% males in the university population is significantly lower than that for CNR and the Forestry program (http://aaa.usu.edu/p&a/EnrolSum/2009-10/Fall09Summary.pdf).

Beginning in 2006, Utah State embarked on an aggressive enrollment management initiative that resulted in the major reorganization of enrollment units to Student Services from Academic Affairs. These units have formed an Enrollment Service Team to facilitate discussion, partnerships, and improved processes for students. In 2007, an Executive Enrollment Management Committee was also formed to discuss the broader vision of the university and set enrollment and scholarship goals to be approved by the president.

Utah State is at a crossroads when the focus on academics rather than numbers is at stake. For 2009, the enrollment managers of the University must marry quality with numbers in order to meet the fiscal needs of the university. While the demographic numbers will begin an upward trend—in fact, a significant increase that will challenge the university—in the meantime, care must be taken not to stifle or reserve the forward movement of the university to assume its role as a research university and maintain its ranking of Third Tier in the US News and World Report study and then to advance.

Annually, the Office of Admissions develops a Recruitment Plan for bringing in the next year’s class. While Enrollment Management focuses on recruiting, retaining, and graduating students, much of this report deals with the nuts and bolts of recruitment. Particular challenges and goals
in 2009 include establishing a presence in the Salt Lake City area with particular attention on Salt Lake Community College and continuing to seek out-of-state enrollment from areas other than Idaho—while trying to recapture the Idaho market.

While the Office of Admissions has primary responsibility for recruiting students, the entire campus is much more alert to its role in recruiting, retaining, and graduating students than it was just a few years ago. Clearly, recruitment and retention of students at Utah State University is key as the university seeks to accomplish its institutional mission and goals (2009-2010 Undergraduate Recruitment Plan at Utah State University).

The College of Natural Resources is well aware of its role in recruitment and retention of students and follows the policies and guidelines established by the University by sending professional advisors and student ambassadors to all University sponsored recruiting events that time and resources allow. Prospective students who visit campus are not only treated to a campus tour and information session by the Admissions Office, but the CNR also has the student meet with its professional advising staff and student peer advisors to answer questions regarding specific majors in the College, and often provide the student with a tour of the CNR if the students schedule permits.

Because of the demographics of the Utah population and the fact that about 88% of the undergraduates at USU are Utah residents, enhancing cultural and ethnic diversity is a challenge. USU’s Multicultural Student Services (MSS) Division does much to promote the recruitment, retention, and general well-being of students (http://multic peace.usu.edu/). Multicultural student organizations currently number a dozen, encompassing Native American, Asian, African American, Hispanic, and Oceanic cultures. The University also hosts a “Diversity Days” recruiting event where traditionally underrepresented cultural, ethnic, and gender groups are specifically invited to campus to meet with advisors and student ambassadors from all the academic colleges, including the College of Natural Resources.

Targeted recruiting in CNR will be focused in part on the agricultural classes in high schools throughout the region (Fig. V-4). Our advising office personnel, who also do the recruiting, have already begun working with the agricultural teachers in the state (many of whom are also the instructors for natural resource courses) to be able to attend classroom sessions and present information about majors/careers in natural resources, including forestry. The advising office will also be working with the Forestry Club and with the Regional Campuses and Distance Education (RCDE) division of the university to identify potential students.

The CNR advising office is working to develop a “natural resources in the classroom” curriculum that would enable high school teachers to accurately present issues and knowledge pertaining to the management of natural resources. Our recruiters have observed that the typical high school senior has very little concept of what forestry is, and what it means to manage natural resources. Additionally, this curriculum should assist in recruiting students who are first-
generation college students and minorities. These types of students often select majors with clear “traditional” career pathways, i.e., engineering, medicine, teaching, etc. By developing a curriculum that can be used in rural and urban settings we hope to be able to expose more students to the field of forestry who would typically not be aware that such careers exist.

We are projecting a modest increase in enrollments over the next three years due to a number of factors, including the lag we have experienced in the upturn of CNR student numbers in general compared to national trends, the high level of activity in the Forestry Club (see section 4), the hiring of new professional advisors in the college with educational backgrounds and experience in forestry, and targeted recruiting on the part of these new advisers. We are projecting no increase in the number of graduates over this same period given the current number of students who are freshman, sophomores, and juniors, although this could be an underestimate given a larger than expected number of recruits into our junior class in subsequent years as transfer students, who typically comprise about half of our student body.

With regard to retention of students, WILD 2000, Introduction to Wildland Resources (a course that is required of all students in the department) is designed to integrate the student into the department through involvement in the student clubs, meetings with the professional and faculty advisors, and other student activities. In 2009, the Department hired a former student to work specifically with incoming freshman and transfer students to ensure all were involved in club activities and knew of the opportunities available to them. This was partially achieved by distributing a USB drive to all the incoming students. These were preloaded with information regarding all clubs, study groups, honors, undergraduate research, advisors, etc., available to them.

3. Advising

Every student has an assigned faculty academic advisor for help with class scheduling, graduation planning, and other academic issues. One faculty member currently covers all forestry undergraduate advising as part of their duties since the number of undergraduates is modest. This person also provides career and professional counseling and meets with prospective students and parents. In addition, the College’s Academic Service Center (ASC) provides additional academic information and advising, working closely with the faculty advisor to keep these activities coordinated. The ASC handles student recruiting, reviewing transfer student transcripts for course articulation, providing job and career information, reviewing graduation applications, student club and organization coordination, handling the scholarship program, and personal counseling and referral. The ASC is staffed by a head advisor, an assistant advisor, and student peer advisors and is an early point of contact for entering freshmen and transfer students to learn about general university requirements. The advisors in the ASC also provide recommendations to students when their faculty advisors are off campus, and they perform initial reviews of
graduation forms. After being admitted to USU, freshmen and transfer students are assigned a faculty advisor to guide them through their degree program.

All newly admitted freshmen (Utah residents and out-of-state students within 400 miles of campus) are required to participate in a Student Orientation, Advising, and Registration (SOAR) session before being permitted to register for courses. Students entering for fall semester typically meet with the department head or a designated advisor during one of the many summer SOAR sessions to receive individual advice about degree requirements and fall semester courses. Online orientation is available for students who are unable to attend SOAR sessions in person. Newly admitted transfer students are not required to participate in SOAR; however, they must contact their departmental academic advisor before registering for courses. During SOAR sessions, the first meeting with an advisor in the CNR Academic Service Center, the first meeting with a faculty advisor, and the Introduction to Wildland Resources (WILD 2000) course, students are informed that they need to meet with their faculty advisor each semester prior to registering for courses for the upcoming semester. Faculty advisors are given lists with advisee names and contact information (e-mail and phone), to contact advisees during the registration period, if necessary. Students are encouraged to contact their faculty advisor or an advisor in the CNR Academic Service Center any time a problem arises.

Each of the four undergraduate majors in the Wildland Resources Department has a designated faculty advisor. Chris Call advises all students in the Rangeland Resources major, Gene Schupp advises all students in the Conservation and Restoration Ecology major, Mike Kuhns advises all students in the Forestry major, and Karen Mock advises all students in the Wildlife Science major. One of the requirements for freshmen and transfer students in the Introduction to Wildland Resources (WILD 2000) course is to meet with their designated advisors and plan out the coursework for their degree program. Prior to these meetings, designated faculty advisors make presentations about the majors and associated degree requirements in the WILD 2000 course.

Faculty advisors meet with the head advisor of the CNR Academic Service Center once each semester to review any new additions to the USU Advisor Handbook, and any changes in policies for required courses taught in other departments across campus. The handbook is updated each fall, and is available online and as a hard copy. Any course policy changes requiring immediate attention are sent to faculty advisors via e-mail by the head advisor in the CNR Academic Service Center.

Every course listed in the General Concepts curriculum is available at USU. In many cases, more than one course offered at USU meets the criteria for many of the courses (e.g., chemistry, statistics, animal production, and hydrology), providing some flexibility in course selection. Most of our transfer students come from colleges and universities in Utah and surrounding states. We have articulation agreements with these institutions for the basic courses (e.g., biology,
chemistry, math, statistics, general ecology, general soils, and plant taxonomy) and some of the more advanced courses (e.g., plant physiology, wildlife management, and recreation management). A flow chart showing the alignment of prerequisites for most of the courses in the General Concepts curriculum has been developed for each major in the department. When substitution issues arise, faculty advisors first try to choose a substitute course based on their knowledge of similar courses offered across campus. In some instances, advisors help students make arrangements with a faculty member to teach a Special Topics course that fulfills the intent of a required course that has been cancelled. In some cases, particularly with transfer students who did not take appropriate coursework at their first institution or in their first major at USU, students are advised at the outset that they will require an additional semester or two to complete the required coursework for the major.

4. Student club activities

The Forestry Club, which is also the SAF Student Chapter at USU, was on the verge of disbanding three years ago because of low participation. In response to a plea from professional advisers in the college, a small group of students decided to attempt to turn the situation around and as a result of their hard work, the club now has 45 members, 21 of whom are active. The club offers many opportunities for involvement in various professional forestry-related activities, including: measuring plots for professors (fixed and variable), tree identification for local citizens, and tree pruning/removal. The student chapter offers numerous on-campus events like the Logger’s Breakfast, Day on the Quad, and the Annual Logger’s Ball, and is also involved in many of the activities sponsored by the CNR. For fundraisers, the club cuts and sells firewood, privately and also to the USU Outdoor Recreation Center to maintain firewood for yurt rentals located around the Cache Valley. One of the major fundraisers for the year is the Christmas tree sale, in which more than 175 trees cut from the wild as part of a silvicultural learning exercise are sold. Among others, these funds are used to send several students to the SAF national convention annually. In 2008, the club fielded a team that won the quiz bowl competition at the convention and this coming spring will host a meeting of the Intermountain Section of SAF. It also provides transportation for students to attend local chapter meetings of SAF, which typically are held about 45 miles to the south in Ogden, Utah.

In an attempt to better understand why there has been a resurgence in the club, we sent a questionnaire to the membership, asking what attracted them to the club and why they chose the major they did. We received responses from eight members, six of whom are Forestry majors and the remaining two Conservation and Restoration Ecology (CREC) majors (Appendix V-1). The Forestry majors indicated a strong desire to connect with the profession of forestry through the club, as did the CREC majors--both of whom have a long history of working with trees and forests. When asked what attracted them to their major, the Forestry students cited a love of trees and forests, and the opportunity to work outdoors. The CREC students were more focused on the conservation and restoration of forests. When the non-forestry majors were asked why
they did not pursue a degree in Forestry, one indicated that he was dissuaded from doing so by “the CNR general advisor” who felt that the Forestry major was for those who wanted to harvest timber more so than for those who wanted to study forest ecology. The other non-forestry major indicated that the “general vibe” was “one of not so popular a major here in CNR” and that the “passion and student involvement in practical hands-on forestry activities is fairly low.” This same student also pointed to the fact that the more of his/her community college credits were transferrable to the CREC major than to the Forestry major, and that the CREC major provided greater versatility for those who are uncertain about a career path.

5. Other professional opportunities for students

Undergraduate students who desire to participate in independent undergraduate research and then travel to conferences or professional meetings to present their research and/or compete in competitions have several opportunities for financial assistance from the University. Undergraduate Research and Creative Opportunity (URCO) grants are available on a competitive basis twice a year for the costs of equipment, supplies, technical support or travel to do research. The URCO portion of the award is limited to a maximum of $500; however, the student's sponsoring academic department must provide matching support; that means that a student could receive a maximum total of $1000 to support research (http://research.usu.edu/undergrad/htm/funding-opportunities/urco). The Associated Students of Utah State University (ASUSU) provides an Academic Opportunity Fund, to provide financial support to undergraduate students who have been accepted or invited by a reputable organization to present a scholastic achievement or participate in an academic competition of up to $500 per semester per student (http://www.usu.edu/asusu/htm/government/academic-senate). The University Honors Program also provides an Honors Research Fund, which is designed to give Honors students access to direct funding for activities that will academically enhance their undergraduate experience (http://honors.usu.edu/htm/benefits/honors-research-fund). Should these opportunities not provide all the assistance a student needs to complete and present an independent undergraduate research project; professors are very willing to work with students on an individual basis to find additional funding. The department will then match travel funds that undergrads can secure from the student association and/or their advisers to always ensure that every student can attend a national conference at which they have a paper or poster presentation.
Document F: Forestry Graduate Employment Summary

Institution Name: Utah State University  Academic Year: 2009-10

Official Degree Program Title: Bachelor of Science in Forestry

<table>
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<th>Post Graduation Status</th>
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Document G-1: Forestry Student Data Summary

Institution Name: Utah State University Academic Year: 2009-10

Official Degree Program Title: Bachelor of Science in Forestry

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<th>STUDENTS ENROLLED</th>
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<th>Year: 2011-12</th>
<th>Year: 2012-13</th>
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Document G-2: College of Natural Resources Student Data Summary

Institution Name: Utah State University

Official Degree Program Title: Bachelor of Science

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Projected Total Enrollment for Next Three Years

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Projected Total Graduates for Next Three Years

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Figure V-1. Relativized undergraduate enrollments in natural resources at Utah State University and 15 other U.S. Institutions, 1980-2009.
Figure V-2. Undergraduate enrollments in natural resources by select field of study at 15 U.S. institutions, excluding USU, 1980-2009.
Figure V-3. Undergraduate enrollments in natural resources by field of study at Utah State University, 1980-2009, excluding geography.
Forestry is the science and art of attaining desired forest conditions and benefits. Forests provide the raw materials for our homes and many products we use in our daily lives. Forest ecosystems supply our water, maintain our climate, help purify the air, protect soils, provide for recreational experiences, and serve as habitat for wildlife and preserves of biological diversity. Foresters develop, use, and communicate their knowledge to sustain and enhance forest resources for diverse benefits now and in the future.

A major for students who...

- Want to work outdoors.
- Are interested in plants and ecology.
- Are interested in sustainability issues.

What do Forestry majors study?

- Foundation courses in biology, math, chemistry, and statistics.
- Forest ecology, inventory, water quality, wildlife habitat, and identifying tree species.
- Advanced computer applications: geographic information systems and resource assessment programs.
- How to integrate biological, social, political, economic, and historical considerations into forest management decisions.

What kind of JOBS do graduates get?

The curriculum meets the USA Federal Government’s Office of Personnel Management requirements for the post of Forestry Specialist.

- Silviculturists (dealing with the development and care of forests; timber sale administrators; and fire, insect, or disease control specialists for state and federal land management agencies such as the USDA Forest Service.
- Work for private consulting firms or timber industry.
- Manage urban tree resources for cities
- Provide assistance and advice to private landowners.

For more information, contact CNR Advising at 435.797.2448, nradvice@usu.edu or www.cnr.usu.edu

Figure V-4. Forestry Major Recruitment flyer
STANDARD VI: PARENT INSTITUTION SUPPORT

1. Support for the forestry program

Because the USU forestry program is not an individual academic unit within the institution but is part of the Department of Wildland Resources, this section will refer to the Department. USU provides funding to the Department for salaries and operating money in the form of an Education and General (E&G) budget derived from the annual legislative appropriation from the State of Utah combined with Tier II tuition revenues from fees paid by enrolled students.

In the summer of 2008 the USU Provost’s Office presented the results of a survey aimed at exploring the competitiveness of USU in attracting the best faculty available to comparable (essentially Land Grant) universities in the USA. The survey quantified the competitiveness of entry-level (assistant professor) employment packages at USU by use of an algorithm that integrated starting salaries with the benefits package (presently 44.5% of base salary) and a cost of living index for Logan, Utah. Research start-up packages for new faculty members were not considered because these vary widely across disciplines. The results placed USU at the top of the Land Grant universities in the West (followed by Wyoming and Arizona), largely due to the generous benefits package and comparatively low cost-of-living in the Cache Valley of Utah.

For the past two years, funding for departmental operating purposes has been progressively increased in accordance with an ongoing five-year plan to standardize operating budgets across all USU academic departments on the basis of the number of faculty full-time equivalent positions held in each department. This five-year plan has been held harmless from all budget cuts associated with the current economic recession. As a result, the Department is continually reducing the additional fees (‘lab fees’) charged to students for costs of specific courses that require software licenses, field trips, laboratory supplies, etc. No forestry courses are currently constrained by a lack of operating funding. Instead, the biggest constraint applies to the logistics of field instruction with the time required to transport students to and from field sites beyond the environs of the USU campus.

2. Comparisons across academic units

Salaries within the College of Natural Resources are reviewed by the Dean and all three department heads whenever E&G funding is available for salary adjustments. Particular attention is paid to rectifying cases of salary compression or inversion, subject to faculty performance evaluations. The result is that salaries within each academic rank are generally consistent across departments in the College, with variation in salaries occurring only because of variation in individual performance. In the Department of Wildland Resources the current mean salaries of core faculty members paid with E&G funds are:
assistant professors - $65,501 (range 62,220 - 69,784; n = 3);
associate professors - $80,010 (range 73,145 - 91,354; n = 8);
professors - $105,098 (range 98,850 - 119,010; n = 9).

With the exception of faculty members with extension appointments, all faculty members are on nine-month contracts, but the above salaries are adjusted to 12 months to make them comparable across institutions. Salaries have not increased over the past two years and are unlikely to increase for at least another year (until July 2011 at the earliest) due to the lagged effect of the global economic recession on the tax revenues received by the State of Utah. These salaries can be compared across institutions by reference to the online survey information presented by the Western National Association of University Forest Resource Programs at http://faculty.washington.edu/bare/naufrpsurvey.html. The information for USU has recently been provided for 2009 but is not yet updated on the web site. Nevertheless, by reference to the figures above it can be seen that, in the Department of Wildland Resources at USU, all faculty ranks are paid higher than at Northern Arizona and our professors are paid better than at Idaho and similar to those at Oregon State. Our associate and assistant professors are paid slightly less than their peers at Oregon State and Idaho, but this does not take into account the 44.5% benefits package at USU and the favorable cost-of-living index for the Cache Valley.

Despite the comparatively favorable data on compensation packages at USU, the present economic crunch is affecting faculty and staff through the requirement for a five-day furlough in 2008-2009 and some type of furlough will probably be implemented again in 2010-2011. Furloughs do not affect base salaries but the actual take-home pay of USU personnel is obviously somewhat reduced below the values reported above. This, combined with the lack of cost-of-living salary increases for a period of perhaps three years, is the topic of discussion between the USU administration and the USU Faculty Senate. Administrators have been notified that compensation packages will be the priority for budget adjustments when the effects of the economic recession have passed.

The total E&G budget for the Department of Wildland Resources over the past three years has been as follows:

- FY 2009-2010 – salaries $944,955, operating $49,450;
- FY 2008-2009 – salaries, $927,548, operating $38,245;

The above figures reflect a 10% increase in the total salary budget due mainly to promotions across faculty ranks, and an almost 200% increase in operating funds due to the USU administration’s policy of standardizing operating funds across departments on the basis of faculty full-time equivalents.
No E&G funds are budgeted for travel; such costs have to be paid from external grants or the
overhead funds returned to the department from such grants. The faculty in the Department
bring in about $5 million/year in external grants, generating overhead funds to the University of
about $400,000/year. These overhead funds are used to develop the research ‘engine’ of the
department, which can include travel if approved by the Department Head.

3. Faculty development and continuing education

All full-time faculty members in the Department have terminal (PhD) degrees. However,
opportunities exist for faculty members to attend national conferences and workshops on
pedagogy, and funds for this are typically provided by the College with subsidies from the
Department if needed. At USU there is a Teaching Academy for assistant professors to develop
their teaching skills, and the Provost’s Office runs a seminar program that brings in national
experts on a variety of topics related to pedagogy, best practice in the classroom, and faculty
development in general. Any faculty member or graduate student with a presentation accepted at
a national or international conference is eligible to apply for Department funds (from the
research overhead account) to enable their participation in the conference.

4. Student support programs

All students at USU have access to counseling and psychological support programs
(http://www.usu.edu/counseling/), career services (http://www.usu.edu/career/), child care
(http://www.childrenshouse.usu.edu/), a disability resource center (http://www.usu.edu/drc/), an
international student office (http://www.usu.edu/oiss/), multicultural services
(http://www.usu.edu/multiculture/), and student support services to support disadvantaged
students (http://www.usu.edu/sss/). This is in addition to all the usual student services (health,
housing, dining, etc) and cultural and sports programs that would be expected on any university
campus in the USA.

All forestry majors are entitled to enroll for non-forestry courses subject to having completed any
pre-requisite courses that might be specified. Exceptions might only apply if a course is capped
due to laboratory space limitations and non-major students are excluded to allow majoring
students to complete their coursework on schedule.

5. Strengths and weaknesses

As regards the forestry program, the over-riding strength of USU is that it offers students one-on-
one instruction from nationally renowned faculty members in an environmental setting that is
highly conducive to forestry studies. Tuition fees at USU are comparatively low, the University
has a strong reputation for academic excellence, and student housing is affordable and safe. In
addition the College of Natural Resources provides a close-knit and supportive environment in which students interact across majors and departments. Enrollments in our forestry program are not, however, rebounding in step with the national norm and this seems to be related to the fact that Utah does not have the production forestry and timber industries that several other states do, especially in the Pacific Northwest. In addition, the town of Logan is small for a university of USU’s size and is culturally conservative. These are not weaknesses of USU but to attract substantial enrollments to our program, despite the lack of a traditional forestry industry, will require some additional attractants to draw out-of-state students. Targeted recruiting, tuition waivers, and additional scholarships might help, but are difficult for USU to provide in the present economic situation.

6. **Library facilities**

Utah State University’s Merrill-Cazier Library is a new, state-of-the-art facility with an advanced computerized book retrieval system and subscriptions to multiple electronic resources and databases. This facility, supported by interlibrary services, provides USU faculty and students with a world-class library. In addition, the College of Natural Resources has its own Quinney Library, which is an endowed facility that provides access to a wide range of print and electronic reference materials with specific relevance to natural resources. These facilities will be toured by the SAF visitation team.

7. **Physical environment**

The main campus of Utah State University in Logan is well known for its scenic setting at the mouth of Logan Canyon. The College of Natural Resources has its own building so faculty offices, classrooms and laboratories are all in close proximity on the campus. Undergraduate students have access to quiet and safe study space in the Quinney Library, as well as the Merrill-Cazier library, which is next door to the College. Access to and from campus can be by free public transport into the center of town, or it is safe to walk and cycle at any time of the day or night. The town of Logan is ranked among the top ten safest metropolitan centers in the USA.