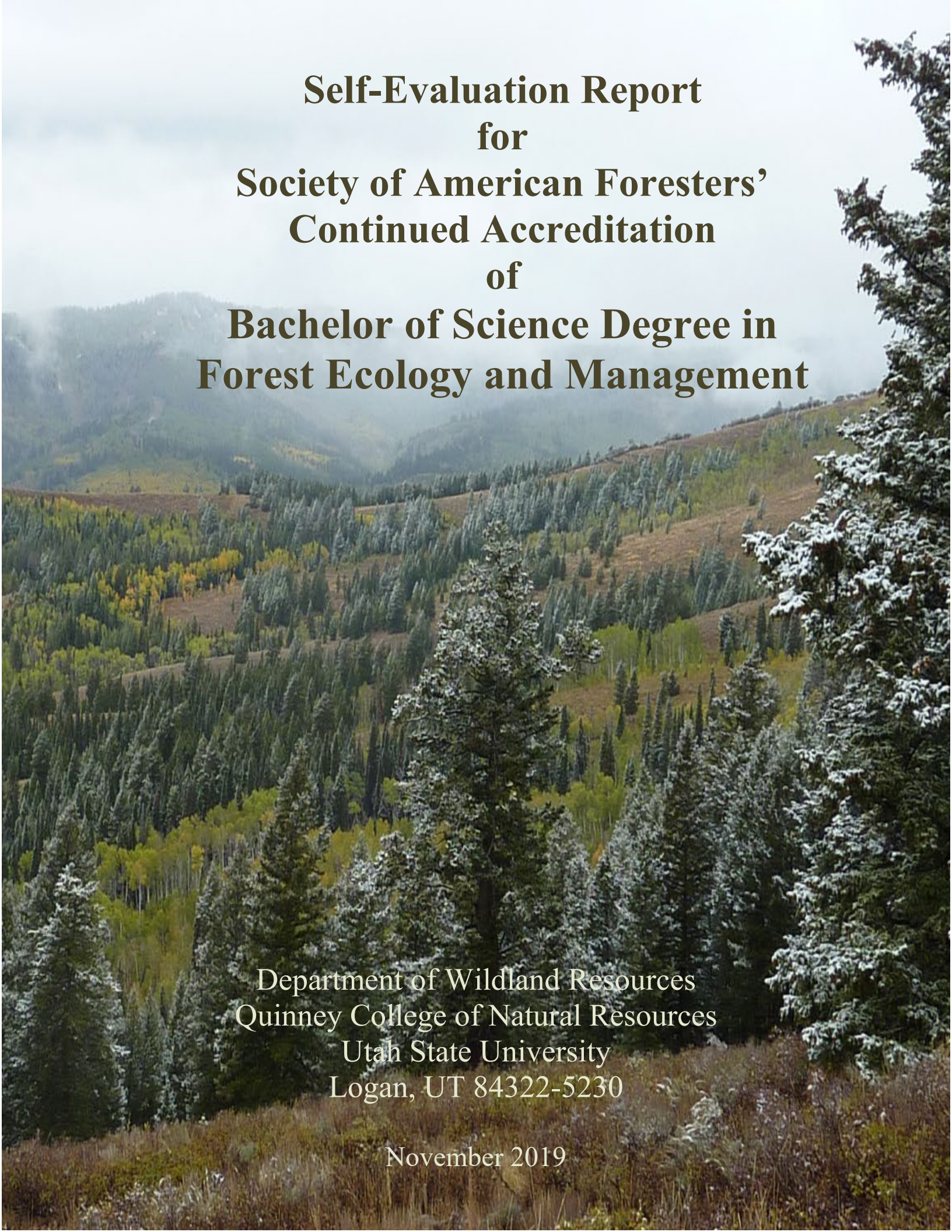
2019

Self-Evaluation Report for Society of American Foresters' Continued Accreditation of Bachelor of Science Degree in Forest Ecology and Management

Karen E. Mock
Utah State University, karen.mock@usu.edu

Department of Wildland Resources, Utah State University



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

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PREFACE

This self-evaluation report has been produced for the purpose of reaccreditation of the Utah State University Forest Ecology and Management (FEMA) undergraduate degree program by the Society of American Foresters (SAF). Utah State University has maintained an SAF-accredited forestry program since 1936 and was most recently reaccredited by SAF in 2010.

Utah State University has a long and influential legacy in the forestry profession. Our faculty have led and shaped the profession, and our graduates have become leaders in a variety of state, federal, international, and academic organizations. Our institutional structure, degree program components, and enrollments have changed over time, consistent with national trends, but our program remains strong and is evolving to meet both the needs of today's students and the needs of today's society for well-rounded professional foresters. Over the years our program has focused on increasingly diverse forest management goals, including ecological functions and processes, wildlife habitat, recreation, species and structural diversity, and resilience with respect to fire, native and novel insect pathogens, and climate change. Similarly, our program has evolved with respect to content (e.g. increasing emphasis on ecology, geospatial tools and social sciences) and is preparing students for a broader and more interdisciplinary range of career tracks.

Enrollment in the FEMA program has been increasing since 2010, and is at its highest point since 2005. We attribute this trend to increasing forestry-related employment opportunities, an increasing awareness among students about forestry career options, and the increasing relevance of silviculture to ecological and social goals. Since the 2010 reaccreditation, we have seen the retirement of several key faculty in the forestry program, most recently Dr. James Long, the T.W. Daniel Professor of Forestry, SAF Fellow, and recipient of the 2018 National SAF Award in Forest Science. Dr. Long's retirement was a tremendous loss, but we have several recently-hired faculty members who are bringing new energy and perspectives to the FEMA program. We are excited about the program's future and its impact on the future of forestry.

Karen Mock,
Chair, Steering Committee for SAF Reaccreditation

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FOREST RESOURCE SETTING

The forests of Utah cover more than 7.4 million hectares (18.3 million acres), or 29 percent of the total state land area. Forests in Utah are remarkably diverse, with four primary forest types (pinyon/juniper, woodland hardwoods, aspen, and fir/spruce) occurring across six ecoregion provinces (Bailey 1995, Werstak et al. 2016). Most (74%) of these lands are administered by two federal agencies: the USDOI Bureau of Land Management and the USDA Forest Service (Figure 1). Although the quantity of forested lands is substantial in Utah, only a relatively small proportion, just over 1.5 million ha (27%), is considered potentially suitable for timber production (Werstak et al. 2016) (Figure 2). Therefore, while Utah does support a small wood products industry, forest management in Utah has a broad range of functional goals, including watershed protection, wildlife habitat, and scenic/recreational value. Increasingly, forest management in the Intermountain West is also viewed as a tool to control wildfire impacts, support biodiversity, and to sequester carbon. This ecological and socioeconomic setting requires forest professionals who are proficient in a broad range of skillsets, able to work in interdisciplinary teams, and able to understand the needs of a diverse set of stakeholders. The USU Forest Ecology and Management Program has a long history of producing outstanding forest management professionals who can meet these challenges both in Utah forests, and in forests throughout the continent.

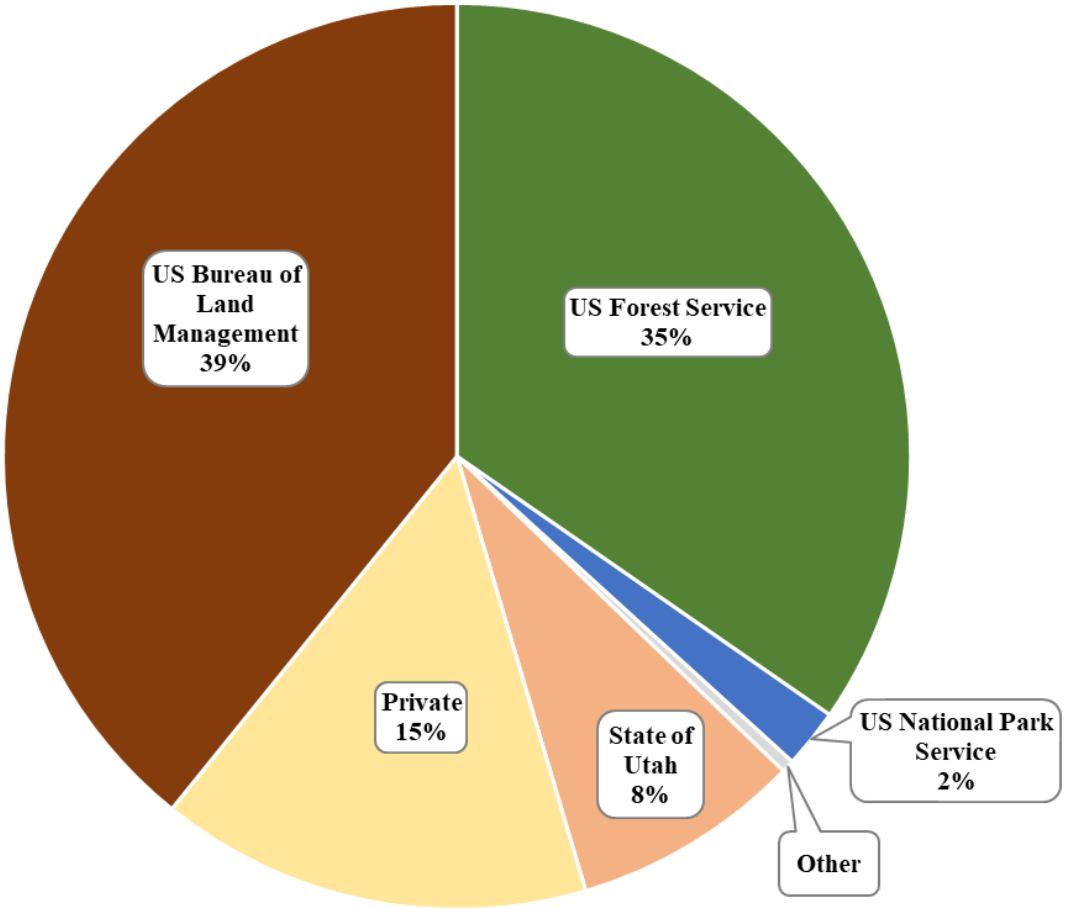

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Figure 1. Owner classifications for forested land in Utah (Werstak et al. 2016).

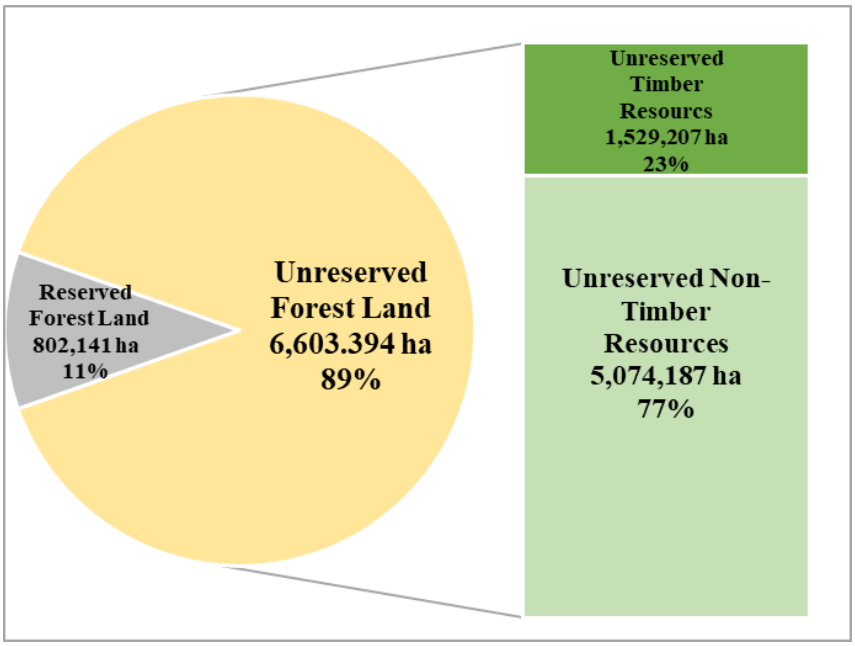

Figure 2. Proportion of reserved and unreserved forest land (total in Utah, across ownership categories (Figure 1). Reserved forest lands are considered to be unavailable for harvesting activity. Unreserved forest land is further subdivided into land suitable for timber production and land unsuitable for timber production but suitable for other forest management objectives (Werstak et al. 2016).

HISTORY

Utah State University (USU), established in 1888 as Utah's land-grant institution, 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 Bachelor of Science degree in Forestry was awarded in 1931, and the program was initially accredited by the Society of American Foresters (SAF) in 1936—just one year following the initiation of SAF's accreditation program. The first MS and PhD degrees in Forestry at USU were awarded in 1946 and 1968, respectively.

The last re-accreditation of the BS degree in Forestry at USU occurred in December 2010. At that time, constituent departments in the USU College of Natural Resources had reorganized, and the previous Department of Forest Resources became part of the Department of Forest, Range, and Wildlife Sciences. This reorganization, which occurred in 2002, is described in more detail in the 2010 Self-Study report for SAF reaccreditation in 2009. In 2006, the Department of Forest, Range, and Wildlife Sciences was re-named the Department of Wildland Resources to reflect the increasing integration and cross-disciplinary nature of terrestrial natural resource management. This integration is also reflected in the structure of the WILD BS degree programs and in the makeup of the faculty contributing to these degree programs, including the SAF-accredited Forest Ecology and Management degree. Courses central to the forestry degree taught by faculty in other departments include fundamentals of soil science, watershed science, natural resources economics, recreational resource management, and natural resources and

environmental policy. This cross-campus integration is a fundamental strength of the forestry degree.

College of Natural Resources Name Change

In September 2012, the USU College of Natural Resources was renamed the S. J.& Jessie E. Quinney College of Natural Resources (QCNR). The naming of the College accompanied a $20M pledge from the Quinney Foundation that would provide $500,000 annually for twenty years beginning in 2018. This new pledge allowed QCNR to expand the Quinney Scholarship program to recruit outstanding undergraduate students from six recipients per year to eight recipients per year, and also allowed QCNR to create the Quinney Fellowship program to provide graduate stipends to recruit two graduate students each year. Currently one of these Quinney Fellows is a PhD student in Ecology with a Forest Ecology specialization. Funding from the Quinney Foundation also allows QCNR to continue to provide funds for undergraduate research, travel funds for students and faculty, and research initiation funds for new faculty.

Forestry Degree Name Change

In 2017 the name of USU's forestry degree program was changed from 'Forestry' to 'Forest Ecology and Management (FEMA)', concurrent with changes in the names of the 'Range Science' degree to 'Range Ecology and Management' and the 'Wildlife Science' degree to 'Wildlife Ecology and Management'. These name changes were not accompanied by course requirement changes, but were made to emphasize the importance of ecology in all these disciplines and to help students interested in ecology to find these degrees.

T.W. Daniel Legacy

Prof. Theodore W. Daniel joined the faculty of the (then) School of Forestry in 1946. For six decades he was a force in the program and in the forestry profession. Dr. Daniel's impressive legacy continues at USU in multiple ways. The T.W. Daniel Experimental Forest (TWDEF), located in Logan Canyon about 20 miles from the USU main campus, represents an important partnership between USU and the USDA Forest Service Logan Ranger District. In 2004, Dr. Daniel established two endowments in QCNR. One was to provide support for an undergraduate scholarship each year. A second endowment was created to provide for research on and maintenance of the Daniel Experimental Forest in Logan Canyon, a field site located about 20 miles from the USU campus. Justin DeRose, who was hired as an Assistant Professor in WILD in 2019, was the first Daniel Fellow during his PhD program in WILD. In July of 2016, these two endowments were combined to form the Daniel Professorship Endowment to name the Professorship and to provide continuing support for graduate students and for management of the Daniel Forest. The corpus of the combined endowments now stands at $1.35M. Dr. James Long, who received the SAF Award in Forest Science, was the first recipient of the Daniel Professorship title in 2016. Dr. James Lutz was the second recipient of this professorship starting in 2019. This endowment provides for full stipend support for about one PhD student each year, as well as some operating funds.

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Alumni Highlights

Although the USU program in forestry has always been small in terms of student numbers, we have had several notable alumni since the previous accreditation. Among these are:

Nick Miro. 2019. Nick recently accepted a Timber Sales Administrator position for the Siskiyou National Forest.

Liz Winters. 2017. Liz is a Forester on the Colville National Forest in Washington State.

Raychel Skay. 2017. Raychel works for Weyerhaeuser Company in Washington State.

Scott Frost. 2015. Silviculture Forester for Uinta-Wasatch-Cache National Forest.

Richard Gardner. 2013. Richard was the Silviculture Forester for the Confederated Tribes of the Umatilla Indian Reservation for 5 years and is currently the Forest Silviculturist for the Umatilla National Forest in Oregon.

Peter Howard. 2010. Peter is currently the Northern Zone Forest Silviculturist for the Uinta-Wasatch-Cache National Forest.

Seth Ex. 2010. Seth is a member of the forestry faculty at Colorado State University.

Brien Torres. 2010. Brien is a Mescalero Apache and a first-generation college graduate. He is a forester for the Bureau of Land Management.

USU STEERING COMMITTEE FOR SAF REACCREDITATION

Karen Mock, Professor and Associate Department Head, Department of Wildland Resources

Michael Kuhns, Professor and Department Head, Department of Wildland Resources

Allison Cochley, Staff Assistant III, Department of Wildland Resources

Justin DeRose, Assistant Professor, Department of Wildland Resources

James Lutz, Associate Professor, Department of Wildland Resources

Jim Long, Emeritus Professor, Department of Wildland Resources

Gabe Henry, Undergraduate FEMA Student and President of the SAF Student Chapter

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STANDARD I: FORESTRY PROGRAM MISSION, GOALS, AND OBJECTIVES

Utah State University's undergraduate forestry program is offered within the Department of Wildland Resources (WILD) in the S. J. and Jessie E. Quinney College of Natural Resources (QCNR).

I. 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 website).

The mission of the **S. J. and Jessie E. Quinney College of Natural Resources**, as articulated on the Leadership and Mission web page 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.
- Educate natural resource and environmental professional and others interested in healthy ecosystems and their value for future generations.

The QCNR Vision, on the same web page, is to "be a leader in discovery, innovative and lifelong learning to promote healthy, diverse and enduring ecosystems upon which human communities depend". The QCNR home page also has the following brief characterization of our College:

> "The S.J. & Jessie E. Quinney College of Natural Resources employs teaching, research, and extension programs to better understand our natural ecosystems and to foster the sustainable use of our resources. Our programs integrate across biological, physical, and socioeconomic aspects of ecosystems, with the goals of advancing scientific knowledge relevant to natural resources, producing effective future leaders in both research and management arenas, and translating research findings into management practices."

The objectives of QCNR are stated in the current USU Catalog as follows:

> "The S.J. and Jessie E. Quinney College of Natural Resources provides programs of study and professional training in the use and management of natural resources and the

> environment. These programs educate students to understand the processes that govern the natural ecosystems that comprise our lands, lakes, and streams. The college focuses on the value that these ecosystems have to humans and the impact that human activities have on the land. The goal is to foster the sustainable use of our natural resources by people. Our academic and research programs train students to assess the condition and value of our natural landscapes, to prioritize problems with current land use activities and policies, to restore degraded ecosystems, and then to develop monitoring programs to assess progress. The S.J. and Jessie E. Quinney College of Natural Resources programs and facilities provide exceptional opportunities for field experiences through class field trips and projects, undergraduate research and internships, club activities and service projects."

The mission of the **Department of Wildland Resources** is

> "to use our educational, research, and extension expertise in ecology and resource management to advance the understanding and stewardship of wildland ecosystems and the services they provide" (from the WILD home page).

We accomplish this mission in several ways. 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 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 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. The scope of this mission is worldwide, although the primary responsibility is to the State of Utah and then the nation.

The mission of the undergraduate **Forest Ecology and Management** program is consistent with the USU and QCNR mission statements and is embedded in the degree description:

> "Forest Ecology and Management students will gain the knowledge and skills needed to manage public or private forests for a wide variety of objectives such as timber production, recreation, wildlife, water, biological diversity, conservation, and resilience to disturbances such as fire and insects. This professional degree provides future foresters with a broad understanding of the biological, physical, economic, political, and social environmental context that they will work in as forestry professionals. The Forest Ecology and Management (FEMA) degree is the only 4-year forestry program in Utah and has been accredited by the Society of American Foresters since 1936."

The mission of the forestry program continues to shift 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, outdoor recreation, and conservation of plant and animal resources. With effects of climate change becoming more pronounced, forest management goals in North America and other continents are increasingly focused on wildfire mitigation. The FEMA degree curriculum is designed to educate students within this paradigm while also providing them with the qualifications required for meeting traditional expectations (e.g. the U.S. Office of Personnel Management series GS-0460 standards for foresters) and preparing them for the SAF certification program. The alignment of our FEMA program with the GS-0460 standards is described on USU's FEMA web pages under "Links/Documents".

I. 2. Self-evaluation and revision

The faculty and staff of WILD meet off-campus at the end of summer each year for a day-long annual retreat, during which the status of the department's finances, enrollment and retention trends, teaching quality and content, research productivity, and personnel, are discussed. It is during such retreats that we discuss the need for changes 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. Because all faculty are expected to attend these retreats, this is a natural venue for discussion and revisitation of program missions, goals, and objectives. Furthermore, WILD has a standing Curriculum Committee (Table 1, Standard II.6) which is tasked with monitoring student needs, industry/profession/academic needs, and opportunities for integration and flexibility across the curriculum. The WILD Curriculum Committee meets 1-2 times per semester. The assessment program for the FEMA degree is also described in detail in Standard II.7, below. WILD also has a standing FEMA Curriculum Subcommittee (Table 1, Standard II.6) which is a subset of the WILD Curriculum Committee but also includes two USU Extension Foresters. The learning objectives for the FEMA curriculum (Table 2) are the basis for part of our outcomes assessment program, as described in Standard II.7.

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STANDARD II: PROGRAM ORGANIZATION AND ADMINISTRATION

II. 1. Department overview

The Department of Wildland Resources began as the Department of Forest, Range, and Wildlife Sciences, which was formed in July 2002 when the College of Natural Resources was reorganized. Faculty and staff originally came from the former Departments of Fisheries and Wildlife, Forest Resources, Geography and Earth Resources, and Rangeland Resources. However, many faculty members have been hired more recently and they have no memory of these past arrangements. Faculty expertise is diverse, but the common theme remains applied ecology and management in terrestrial ecosystems. To take advantage of this diverse expertise and promote crosscutting programs that integrate the faculty and staff in one unit, the department adopted its current name, the Department of Wildland Resources, in June 2006.

The Department is fortunate to have several federal- and state-funded collaborators in the Utah Cooperative Fish and Wildlife Research Unit (US Geological Survey and Utah Division of Wildlife Resources) and the USDA Predator Research Facility (National Wildlife Research Center). These are described in more detail in Standard II.8. In addition, the Department hosts the Jack H. Berryman Center, which promotes research, teaching, and outreach in the field of wildlife damage management and mitigation of human-wildlife conflict.

II. 2. Administration and organization

The Department of Wildland Resources is an integrated academic unit delivering multiple undergraduate and graduate degree programs, and is administered by a department head with multiple responsibilities, including the FEMA program. The department head has the same title and authority as the heads of all other academic departments at USU, and reports directly to the dean of QCNR. Organization charts showing the FEMA program in relation to USU's central administration and other units and programs within QCNR are provided in Figures 3 and 4. At the time of this writing, Dr. Michael Kuhns is the WILD Department Head and Dr. Karen Mock is the Associate Department Head. However, Dr. Kuhns is stepping down as Department Head on June 30, 2020, and Dr. Mock was chosen after a national search to be the new Department Head starting July 1, 2020. The WILD department head convenes faculty meetings approximately twice per semester, and solicits input from faculty on items for discussion or decision. Federal and State collaborators and Adjunct faculty are invited to attend and participate in these meetings, and they do so regularly. The WILD Department Head conducts annual evaluations of each faculty member in WILD, carefully reviewing and providing feedback on all components of the role statement and associated performance metrics.

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II. 3. Procedures for recruitment, admission, and transferring credit

II. 3. 1. Recruitment activities

Student recruitment in QCNR is handled through the College's Academic Advising Center (AAC). Shelly Kotynek, the QCNR Director of Academic Advising, is primarily responsible for undergraduate recruitment. Shelly participates in all of the USU Admission Office's Open Houses to which she is invited. In addition, Shelly uses social media outlets to promote these events, including short videos describing QCNR opportunities for students. Shelly attends a number of other events for recruitment purposes as opportunities arise. This past year she attended National Future Farmers of America (FFA) convention in Indianapolis, Indiana, and conducted a recruitment campaign (with in-person school visits) targeted to the high schools in the vicinity of USU regional campuses. These efforts were specifically focused on increasing student involvement on the Blanding campus in southeastern Utah and outreach to the Navajo student population in the area. Shelly also advertises and recruits specifically for our Quinney Scholarships program, which targets high-ability students who also show promise for student leadership roles in QCNR, e.g. through high school AP Biology teachers and school counselors. Prospective students, once identified, are tracked with ongoing communication to encourage application. As part of QCNR's efforts to increase student diversity, the AAC also works to facilitate prospective students' applications for scholarship funds offered by NR professional societies to Hispanic and Native American students. Most summers, QCNR faculty also participate in a USU program to bring Navajo and Hopi high school and undergraduate students to campus for multi-week research experiences.

The AAC also periodically conducts studies of incoming WILD students to determine whether they are transferring to or from other majors within USU. These data suggest that many students come to WILD majors from "Undecided" or "Exploratory" degree designations as well as from other USU degrees, and that students initially signing up for these degrees were unaware of the QCNR majors. In response, QCNR has increased its visibility on campus through signage, and encourages students from across campus to attend our outdoor Opening Social in the fall, where we provide informational tables on QCNR degrees, clubs, and research demonstrations by QCNR graduate students and professors. USU has recently reorganized its Exploratory undergraduate program into specific interest areas, and QCNR will be working closely with advisors in other colleges to increase awareness of QCNR programs. In the spring, QCNR hosts a series of activities, including public seminars and social events, which are designed to increase awareness of our programs beyond QCNR students.

Figure 3. Organizational chart showing the Forest Ecology and Management program within the academic structure of USU. The Ecology Center (*) is integrated with several of the USU Colleges, including the Quinney College of Natural Resources.

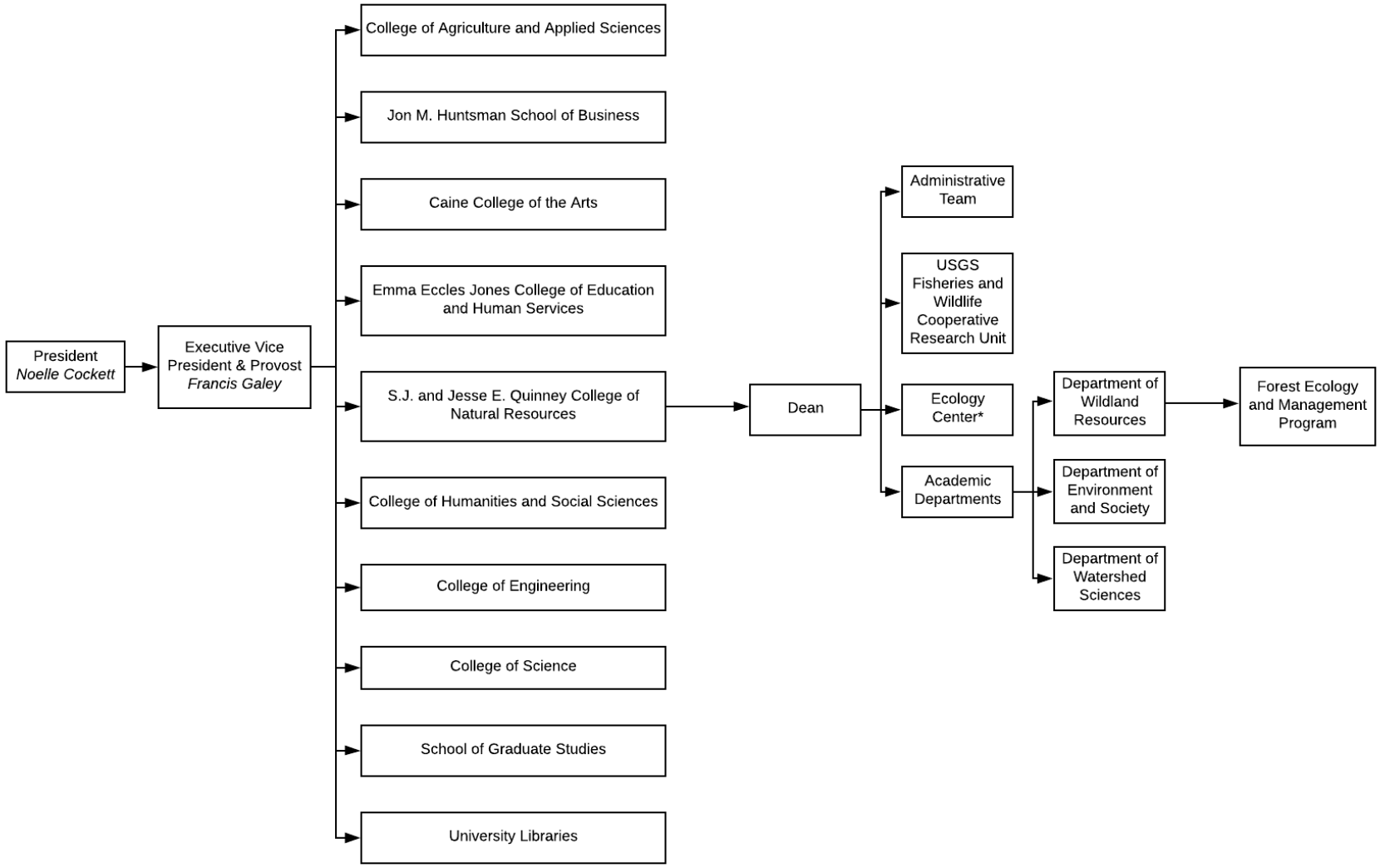
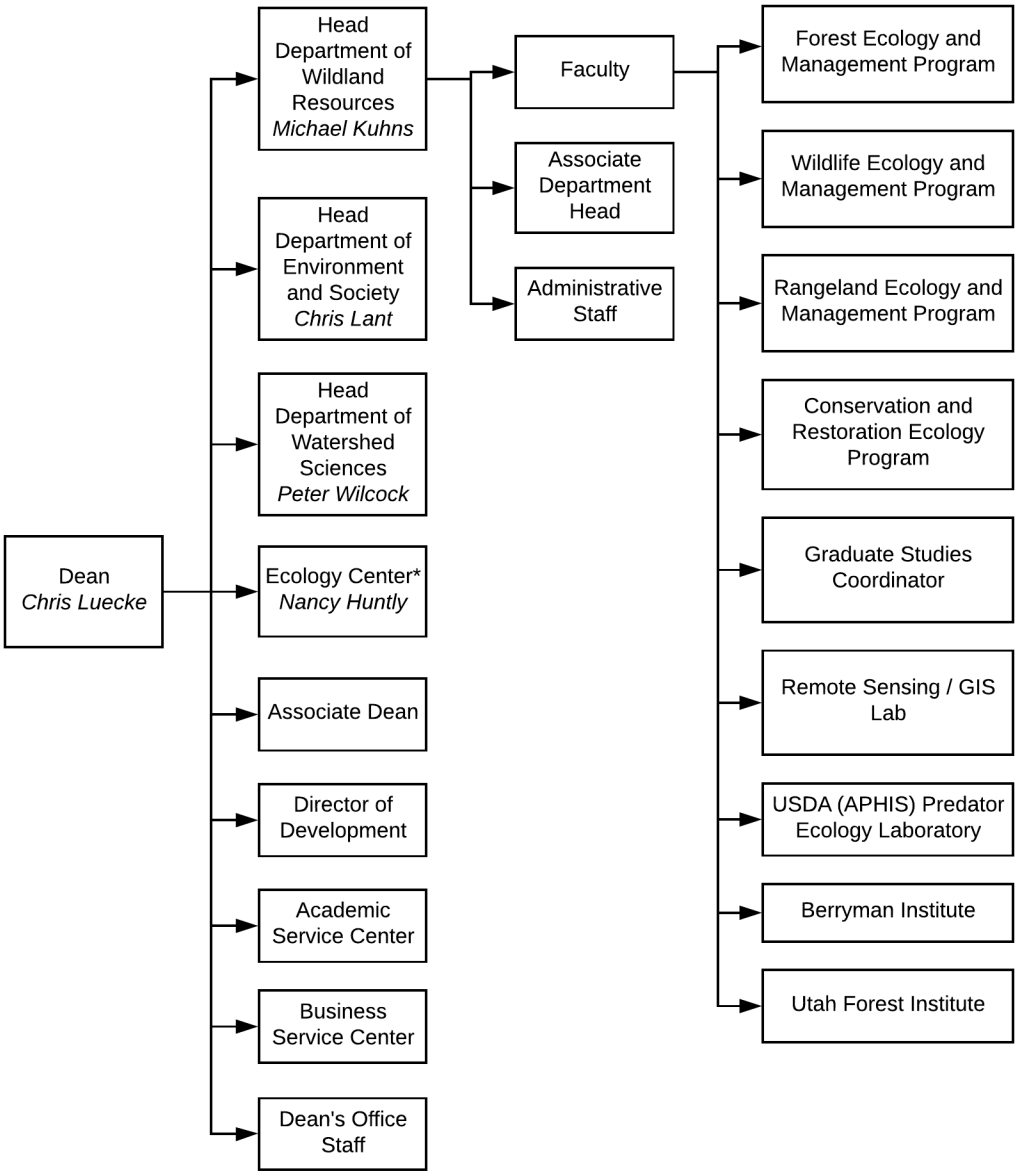


Figure 4. Organizational chart showing the Forest Ecology and Management program within the academic structure of the Quinney College of Natural Resources (QCNR). The Ecology Center (*) is integrated with several of the USU Colleges, including QCNR.



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In the past, AAC data indicated that students signing up for QCNR degrees (particularly WEMA), were not well-informed about other QCNR degree options. In response, the three QCNR departments have cooperated on the development of a 1-cr. orientation course (WILD/WATS/ENVS 2000). This course was initiated in Fall 2014, is required for all QCNR majors, and is also designed to attract students from outside QNCR. This course introduces students to other degrees early in their programs. Anecdotally, this course seems to have reduced the number of transfers among QCNR majors and increased the efficiency of student programs of study, although data supporting these correlative trends have not been assembled.

II. 3. 2. Admission policies

All incoming freshmen are evaluated based upon university standard measures, with minimums for high school GPA or GED, ACT or SAT, and an admissions index which represents a combination of these metrics. The minimum high school GPA is 2.5 with an ACT 22 (SAT 1020) and the minimum ACT score is 17 (SAT 900) with a high school GPA of 3.0. The index table can be found on the Office of Admissions web page for freshmen.

II. 3. 3. Transfer policies

USU's transfer policies and procedures are explained on the Registrar's website. Transfer students must have a 2.5 GPA at their institution of transfer in order to be admitted into a major in QCNR. Credit for courses they took from their original institution is determined in several ways depending on the school. USU has agreements for direct articulation of credit with all Utah institutions of higher education. Course-specific articulations are described for each of these institutions on the Registrar's website. Every year, the curricula of all the schools in the Utah System of Higher Education are evaluated by the USU Registrar's Office supervisor, and if there is a significant change in content in a course already being articulated, a description is sent to the corresponding USU department for review and articulation approval. However, these direct articulation agreements typically only cover general education requirements and the student's math, biology, and chemistry requirements. The acceptance of upper division and major-specific courses for transfer to USU degree programs must be evaluated on a course-by-course basis to assure that the content equals or exceeds existing USU courses. For this process a course summary is sent by an online system (TES by CollegeSource) to the department head for review, and the head either i) approves the course as a substitute for a specific USU-required course, ii) approves the course as an elective only, not a substitution for a specific course, or iii) rejects the course. This information is then passed on to the USU Registrar's office.

This is also the process 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). In this case, the course approval process is the same as described in the previous paragraph.

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II. 4. Cultivating quality in instruction

Excellence in education is promoted at university, college, and department levels. At the university level, the Empowering Teaching Excellence (ETE) program is offered through the Provost's Office. Several of the ETE activities are part of the required Tenure Academy program for new faculty. The ETE hosts an annual conference for faculty in the late summer during the week when college and department retreats occur. The ETE program also hosts a series of seminars which feature faculty presenters, panelists, and guest speakers, and is broadcast statewide and recorded. The ETE program also organizes "learning circles" for faculty across colleges to discuss teaching ideas and issues, and e-learning workshops to introduce faculty to new and changing tools for online, broadcast, blended, and flipped instruction. An overview of the ETE program can be found on the ETE website and on the Tenure Academy website.

All tenure-track faculty members at USU are expected to undertake peer review of their teaching on at least an annual basis. Peer reviewers provide written feedback to the instructor, which usually becomes part of the instructor's promotion dossier. These peer-review activities serve not only to establish mentoring relationships between junior and more senior faculty members, but also to expose senior faculty members to innovative approaches being explored and used by junior faculty.

All courses offered at USU are also evaluated by students for both instructor effectiveness and course effectiveness. This evaluation is required for all courses at USU with an enrollment of over 5 students. The instruments for course evaluations at USU are provided by the IDEA Student Ratings System, and the USU Office of Analysis, Assessment, and Accreditation provides extensive resources on using this instrument and interpreting the results. IDEA evaluations for WILD courses from 2011-2019 (Figure 5) suggest that instructor/course evaluations are both favorable and improving over this period relative to peer institutions. A summary of WILD IDEA course evaluations for each semester from Spring 2013 to Spring 2019 is provided on the WILD Undergraduate Assessment page. Teaching, including IDEA course evaluations, is a component of annual faculty evaluations conducted by the WILD department head (Standard II.7, Figure 5).

At the college level, teaching excellence is also valued and recognized. Faculty members are encouraged to attend national conferences and workshops that include pedagogy, and the travel costs for such meetings are generally 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 an increasing component of all our degree programs. University, college and department-level awards are presented annually on a very competitive basis to recognize faculty members for excellence in teaching, advising, mentoring undergraduate research, and other activities.

The faculty hiring practices in QCNR and WILD also give weight to teaching experience, both in the qualifications listed in job descriptions and in the interviewing process, where a teaching seminar is generally required. Most faculty in WILD have role statements emphasizing research,

teaching and service in 50:40:10 proportions. We have also recently hired faculty for the Uintah Basin campus (Chynoweth in 2017) and for the Logan main campus (LaMalfa in 2019), and for the USU-Eastern campus (Brosi in 2020), each of whom has a role statement that emphasizes teaching above other roles (see Standard VI). Faculty with predominantly teaching role statements are expected to advance pedagogy for teaching, as evidenced by publications and other peer-reviewed products.

II. 5. Staff resources

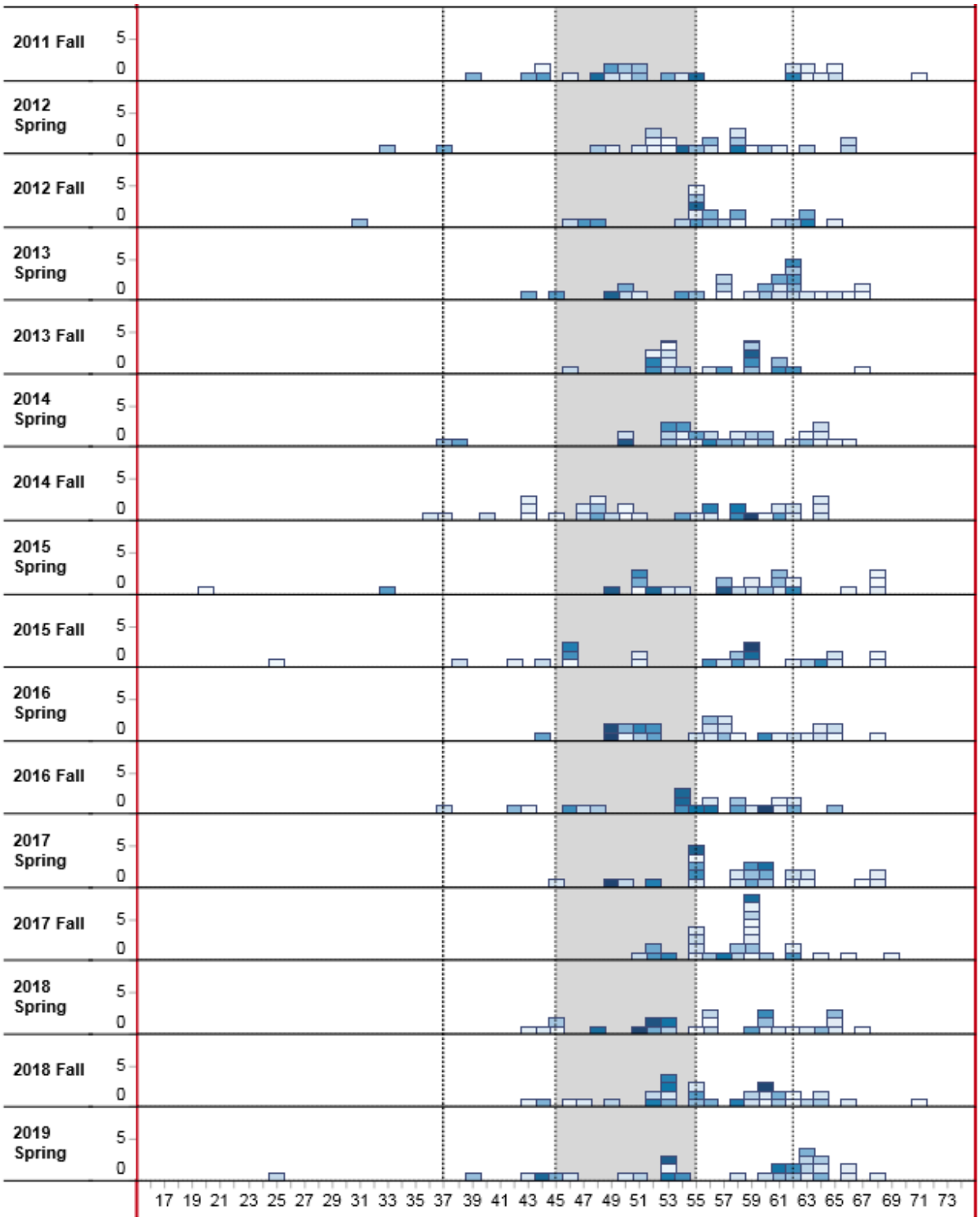
The administrative affairs of WILD are facilitated by two Staff Assistant III positions: Allison Cochley and Marsha Bailey. Ms. Cochley is employed 100% time and Ms. Bailey 75% time. Both staff members perform a wide range of duties depending on the needs of the day. These include telephone and in-person reception duties, directing e-mail inquiries, and much more. Ms. Cochley assists the department head with appointments, meetings, website maintenance, dealing with vehicle checkout and care, course fees, course scheduling, catalogue updates, and undergraduate affairs. Ms. Bailey administers graduate affairs (including hiring, pay, insurance, tuition, admission, dealing with the grad school, thesis and dissertation review and processing, and many other grad-related tasks), course evaluations, office upkeep and stocking, space allocation, and mail. Both are involved in hiring procedures and logistics for faculty, staff, and student workers. 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 in Banner and other software systems that are used for administrative transactions at USU.

Financial affairs for QCNR and WILD are managed by the QCNR Business Service Center (BSC) in coordination with the department head. The BSC handles accounting, payroll, travel, and purchasing in conjunction with USU's Sponsored Programs Division, Human Resources Office, and Travel Office. The QCNR BSC is staffed by a Business Manager, a Financial Officer, a Business Manager, and four Business Assistants.

The forestry extension program is staffed by Forestry Extension Specialist and Professor Dr. Michael Kuhns, who is also currently the department head, tenure track Extension Professor Darren McAvoy, and a Forestry Extension Educator (Megan Dettenmaier). Mr. McAvoy and Ms. Dettenmaier, who both have relevant MS degrees, provide field demonstrations, develop extension materials, and arrange the annual Restoring the West Conference. In addition, Mr. McAvoy directs the Utah Forest Landowner Education Program and edits the online publication *Utah Forest News.* Mr. McAvoy was named an SAF Fellow in 2017 for his outstanding work in forestry extension, and is currently a member of the FEMA Curriculum Subcommittee. Dr. Kuhns was presented with a Lifetime Achievement Award in 2017 from the Utah Community Forest Council and the Utah Chapter of the International Society of Arboriculture.

These staff resources are adequate for the needs of the students, faculty, and administration of the FEMA program as well as the department as a whole. When there is a spike in the administrative load, the college and department occasionally employ temporary staff or arrange for a temporary faculty assignment for specific tasks.

Figure 5. Student IDEA evaluations of WILD courses (horizontal axis) compared to the IDEA database of peer institutions (quantiles below). Gray vertical bar is interpreted as "Similar" to the IDEA database. Cells represent individual courses/instructors, and cell color corresponds to respondent numbers.



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II. 6. Program planning, review, and updating

The process for ongoing internal evaluation and revision of the forestry program is largely embedded within the self-evaluation and revision activities of the department and the WILD Curriculum Committee (see Standard I). Three of the 11 WILD Curriculum Committee members are also members of the FEMA Curriculum Subcommittee (Table 1). The FEMA Curriculum Subcommittee consists of 6 faculty members (Table 1), was established in Fall 2019, and will meet at least once per semester. The overlapping membership of the WILD and FEMA Curriculum Committees is beneficial given the extensive integration across WILD majors.

Table 1. Faculty membership on the Wildland Resources Department (WILD) Curriculum Committee and the Forest Ecology and Management (FEMA) Curriculum Subcommittee.

WILD Faculty Member	WILD Curriculum Committee	FEMA Curriculum Subcommittee
Justin DeRose (starting Fall 2019)	Y	Y
James Lutz (sabbatical 2019-2020)	Y	Y
Larissa Yocom	N	Y
Eric LaMalfa (starting Fall 2019)	Y	N
Mike Kuhns	N	Y
Karen Mock	Y-Chair	Y-Chair
Darren McAvoy	N	Y
Andrew Kulmatiski (sabbatical 2019-2020)	Y	N
Peter Adler (sabbatical 2019-2020)	Y	N
Mark Chynoweth	Y	N
Kari Veblen	Y	N
Clark Rushing	Y	N
Eugene Schupp	Y	N
Johan du Toit	Y	N

Four of the five members of the FEMA Curriculum Committee (Mike Kuhns, Justin DeRose, Karen Mock, Larissa Yocom and Darren McAvoy) frequently attend regional and national SAF conferences (and often, associated Silviculture Instructors Tours), where there are specific sessions related to forestry education and many opportunities for curriculum-related discussions among representatives from peer institutions, agencies, and industry.

II. 7. Outcomes assessment and reporting

The Wildland Resources Department evaluates the effectiveness of its undergraduate programs, including FEMA, in several ways:

- Assessment of course learning objectives (Standard II.7.1)
- IDEA Course Evaluation Surveys (Standard II.4)
- Graduating senior interviews and surveys for WILD students (Standard II.7.2)

- First Destination Alumni surveys conducted USU Career Services (Standard II.7.5, III.5)
- Surveys of FEMA alumni conducted by WILD (Standard II.7.5)
- Surveys of FEMA graduating seniors conducted by WILD (Standard II.7.3)
- Surveys of FEMA matriculating students conducted by WILD (Standard II.7.3)
- Employer interactions and interviews (Standard II.7.6)
- Capstone course evaluations (Standard II.7.7)

II. 7. 1. Assessment of course learning objectives *Return to Table of Contents*

WILD has a well-developed program for undergraduate program assessment based on learning objectives (LOs), which is documented on the WILD undergraduate assessment website. Our assessment procedure was reviewed by our campus Analysis, Assessment, and Accreditation (AAA) Office in the summer of 2019 and was found to meet expectations for stating learning objectives for each of our four undergraduate majors, and for having an assessment plan that we are following. We were also found to be providing outcomes data in a timely manner for each learning objective and major, and to be using these data for modifying our curriculum. The AAA Office would like us to work on identifying and collecting educational artifacts as a part of our future assessment plans, and we will be doing that in the coming year.

Each of WILD's four undergraduate programs has five LOs which are similar in framework but unique for each major. For FEMA, these LOs are presented in Table 2. The FEMA LOs are real and relevant because we incorporate elements of them into our own WILD course syllabi and into course objectives that are a part of the IDEA Student Ratings program. For key non-WILD courses we examine syllabi and determine which LOs they address. To estimate our graduates' level of attainment for each LO we calculate a weighted mean "GPA" of final numeric grades for many of the courses they took while they were here, then we assign each person to an achievement category for each LO based on that GPA. The categories are Achieves Mastery (AM; GPA > 3.333), Achieves Proficiency (AP; GPA 2.667 to 3.333), Approaching Proficiency (ApP; GPA 2 to 2.666), and Lacks Proficiency (LP; GPA <2). The courses we include and their weighting are decided separately for each major and LO by WILD faculty who teach in these majors. The courses that were used for each LO and major, along with their weightings, are provided in Table 3 and on the WILD undergraduate assessment website, as well as details on how we obtain the data and how we process it and come up with our LO Scores. Data summaries and interpretations for the most recent three years-worth of graduates also are available there. While the small number of students in three of our degree programs limits the interpretation of these results, quantitative trends and comments are made each year based on these outcomes. These and other assessment data are available on our website, and are presented to faculty and discussed at annual retreats. Starting in the fall of 2019, results from previous years are reviewed by the WILD Curriculum Committee annually, and necessary changes/concerns/successes will be discussed.

A tabular summary of the results of this assessment for the past three years is presented in Table 4. For all five learning objectives, our FEMA students fall into the "Achieves Mastery" or "Achieves Proficiency" categories. For the past three years, FEMA students are consistently in the "Achieves Proficiency" category for Learning Objective F1, and the "Achieves Mastery"

category for Learning Objective F5. Achievement in the F2-F4 categories is mixed between these categories, with no obvious trends over time.

Table 2. Learning objectives (LOs) for the Forest Ecology and Management degree program and relevance to specific SAF curriculum standards (Standard V).

	FEMA Learning Objective	Relevant SAF Standards
F1	***Functional knowledge of biology and ecology in relation to forestry*** - includes understanding of soil properties and processes, hydrology, and watershed functions; plant taxonomy and identification; and understanding of forest succession, stand dynamics, disturbances, and growth-growing stock relations.	Science and Mathematics A. Ecology and Biology
F2	***Competence in collecting and analyzing data related to forestry*** - includes ability to measure, describe and interpret forest vegetation inventories; ability to measure land/habitat areas and conduct spatial analysis using GIS and Remote Sensing; comprehend approaches to designing and implementing inventory and monitoring using appropriate sampling methods; and ability to analyze data and use models to project future population, community, and ecosystem conditions resulting from forest management actions.	Technological Literacy B. Measurement of Forest Resources C. Management of Forest Resources
F3	***Understanding of the social context in which forestry is conducted*** - includes understanding of how human behavior, experiences, culture, and social and economic structures influence, and are affected by, forest management; of the valuation procedures, market forces, processing systems, and management activities that relate human demands for forest resources with their availability; of the administration, ownership, and organization of forest management enterprises; of the importance of professional ethics in forest stewardship; and of the ecosystem services that forests provide to society.	Social Sciences and Humanities D. Forest Resource Policy, Economics, Administration
F4	***Ability to communicate*** - includes the ability to understand scientific, regulatory, and management documents to critically evaluate opposing viewpoints in forestry; to prepare and deliver effective oral presentations to professionals and stakeholders; and to write clearly for both technical and non-technical audiences.	Communications
F5	***Understanding of and ability to apply what is learned in the major program to forestry*** - ability to research possible solutions to forestry management problems, then develop a forest management plan with specific objectives and constraints; competent understanding of how forest management plans are carried out in practice.	B. Measurement of Forest Resources C. Management of Forest Resources

Table 3. Courses contributing to undergraduate LOs and their weighting by major (F-FEMA, C-CREC, R-REMA, W-WEMA). Courses that contribute to FEMA objective are shown in bold.

Course	1° Objective	2° Objective	3° Objec.
ADVS 2080 – Beef Health & Production Practices *-or-* ADVS 2090 – Sheep Production Practices	R1, R5 (take one)		
APEC 3012 – Introduction to Natural Resource and Regional Economics	C3, **F3**, R3		
APEC 3012 *-or-* ENVS 4000 *-or-* SOC 3610 *-or-* SOC 4620 (take one)	W3 (take one)		
BIOL 1610, 1620 – Biology I *and* II	C1, **F1**, R1, W1		
BIOL 5560 – Ornithology *-or-* BIOL 5570 – Herpetology *-or-* WATS 3100 – Fish Diversity	C1 (if taken), W1 (take one)		
ENGL 2010 – Intermediate Writing	C4, **F4**, R4, W4		
ENVS 3010 – Fundamentals of NR & Envtl. Policy	C3, R3		
ENVS 3300 – Fund. Rec. Resource Management	**F3**		
ENVS 4000 – Human Dimensions of NR Mgt.	C3, W3		
PSC 3000 – Fundamentals of Soil Science	C1, **F1**, R1		
PSC 5130 – Soil Genesis, Morph., Classification	C1 (if taken), R1		
SOC 3610 – Rural Sociology	W3		
SOC 4620 – Sociology of the Environment and Natural Resources	W3		
WATS 2220 – General Ecology	C1, **F1**, R1, W1		
WATS 3100 – Fish Diversity and Conserv. (CI)	W4 (need for CI)		
WATS 3700 – Fundamentals of Watershed Science (CI)	C1 (if taken), **F1**, R1 (all 50%)	C4 (if taken), **F4**, R4 (all 50%)	
WILD 1800 – Intro. to Geographic Info. Science	C2, **F2**, R2, W2		
WILD 2400 – Wildland Resource Techniques	C2, **F2**, R2, W2		
WILD 3300 – Mgt. Aspects of Wildlife Behavior	W1 (75%)	W4 (25%)	
WILD 3800 – Wildland Plants and Ecosystems	C1, **F1**, R1, W1 (all 75%)	C4, **F4**, R4, W4 (all 25%)	
WILD 3810 – Plant and Animal Populations	C1, **F1**, R1, W1 (all 50%)	C2, **F2**, R2, W2 (all 50%)	
WILD 3820 – Forest Plants: Identification, Biology, and Function *or* WILD 3830 Range Plant Tax. & Function	C1, **F1**, R1, W1 (all 80%)	C2, **F2**, R2, W2 (all 20%)	
WILD 3850 – Vegetation and Habitat Mgt.	C1, **F1**, R1, W1		
WILD 4000 – Principles of Rangeland Management	C1 (if taken; 75%), R1 (75%), R3	C5 (if taken), R5 (all 25%)	
WILD 4500 – Principles of Wildlife Mgt.	W5 (50%)	W3 (30%)	W4 (20%)
WILD 4600 – Conservation Biology	C5 (60%), W4	C4 (40%)	
WILD 4700 – Ecol. Foundations of Restoration	C5 (60%)	C4 (30%)	C3 (10%)
WILD 4750 – Monitoring and Assessment in NR and Environmental Management	C2, **F2**, R2, W2		
WILD 4880 – Genetics in Conservation & Mgt.	C1 (if taken), W1		
WILD 4910 – Assessment and Synthesis in Natural Resource Science (CI)	R5 (60%)	R4 (40%)	
WILD 5350 – Wildland Soils	**F1**		
WILD 5700 – Forest Assessment and Mgt. (CI)	**F5** (60%)	**F4** (30%)	**F3** (10%)

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Table 4. Average GPAs and Learning Objective GPAs for WILD students for the past three academic years. Traditional GPAs are shown for all USU courses and QCNR courses by major, as well as Learning Objective GPAs for each learning objective and each major. Learning Objective GPA categories are "Achieves Mastery" (AM; GPA > 3.333; red, "Achieves Proficiency" (AP; GPA 2.667 to 3.333; blue), "Approaching Proficiency" (ApP; GPA 2 to 2.666; green), and "Lacks Proficiency" (LP; GPA <2; orange).

GPAs and LO Attainment by Major for 2015-16 Graduates													
Major		GPA		LO1 Score		LO2 Score		LO3 Score		LO4 Score		LO5 Score	
	N	USU	Major	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CREC	10	3.690	3.694	3.828	0.14	3.751	0.27	3.797	0.2	3.930	0.07	3.920	0.07
FEMA	6	3.186	3.219	3.021	0.61	3.371	0.36	3.498	0.24	3.558	0.35	4.000	0.00
REMA	4	2.768	2.875	2.798	0.13	2.787	0.14	3.056	0.27	3.261	0.19	3.520	0.16
WEMA	33	3.258	3.300	3.197	0.21	3.448	0.36	3.604	0.36	3.464	0.24	3.424	0.00
Total	**53**	**3.294**	**3.333**										
GPAs and LO Attainment by Major for 2016-17 Graduates													
Major		GPA		LO1 Score		LO2 Score		LO3 Score		LO4 Score		LO5 Score	
	N	USU	Major	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CREC	7	3.395	3.333	3.443	0.29	3.477	0.25	3.630	0.15	3.522	0.29	3.667	0.23
FEMA	8	3.373	3.232	3.073	0.24	3.151	0.13	3.266	0.18	3.378	0.22	3.584	0.00
REMA	6	3.177	3.228	3.298	0.19	3.330	0.16	3.353	0.12	3.463	0.2	3.619	0.48
WEMA	28	3.064	3.118	3.019	0.22	3.393	0.35	3.378	0.24	3.414	0.23	3.429	0.00
Total	**49**	**3.176**	**3.181**										
GPAs and LO Attainment by Major for 2017-18 Graduates													
Major		GPA		LO1 Score		LO2 Score		LO3 Score		LO4 Score		LO5 Score	
	N	USU	Major	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CREC	7	3.361	3.425	3.387	0.17	3.48	0.18	3.614	0.19	3.703	0.13	3.818	0.15
FEMA	3	3.265	3.335	3.092	0.06	3.421	0.06	3.782	0.08	3.285	0.01	3.890	0.00
REMA	4	3.445	3.495	3.523	0.17	3.622	0.09	3.446	0.16	3.768	0.2	3.681	0.33
WEMA	29	3.249	3.316	3.105	0.27	3.566	0.27	3.742	0.29	3.520	0.24	3.494	0.00
Total	**43**	**3.287**	**3.351**										

II. 7. 2. Graduating senior interviews and surveys

The WILD department head meets informally with WILD graduating seniors at an end-of-semester luncheon (Fall and Spring semesters). During the luncheon, the students and department head discuss high and low points of their educational experiences at USU. In the past, students attending the luncheon filled out an anonymous survey to self-assess their accomplishment of the 26 historical learning objectives. Results from these graduating senior surveys are posted on the WILD undergraduate assessment page and are provided in Appendix 1.

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Beginning in fall 2016, graduating seniors have been asked to complete an anonymous survey with the following components:

(a) Employment Status: the nature of their employment immediately after graduation
(b) Program Experience: the nature of experiences with advising, faculty, and courses in their major.
(c) Learning Objectives: accomplishment of an updated set of learning objectives (the same learning objectives used in the WILD undergraduate assessment program described in Standard II.7.1).

Results from the last 3 years of the WILD Graduating Senior Survey indicate that among FEMA students responding to the survey (n=14), four had a full-time, permanent job related to forestry, four had a full-time, temporary job related to forestry, and two were planning to enter directly into a graduate program (Document F, Table F-1). Only one did not have a job pending graduation.

Summaries of the WILD Graduating Senior responses from the last 3 years for WILD experiences (Table 5) and WILD learning objective progress (Table 6) are presented below, although responses were not partitioned by major. Overall, students:

- were satisfied with advising and felt it was necessary
- valued laboratories and field trips associated with courses
- appreciated instructors using examples from their research during classes, but were neutral about whether faculty with active research programs neglected teaching duties
- were neutral to slightly positive about assistance with job searches, and whether this should be a WILD responsibility
- were generally positive about progress on WILD learning objectives but were slightly less positive about competency in data analysis and communication skills.

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Table 5. Summary of subjective experiences while at USU: Results from 123 WILD graduating seniors surveyed across majors for May 2017 (35 respondents), May 2018 (38 respondents), and May2019 (50 respondents): SA = strongly agree, A = agree, N =neither agree nor disagree, D =disagree, SD = strongly disagree.

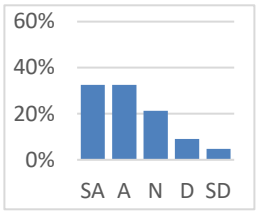
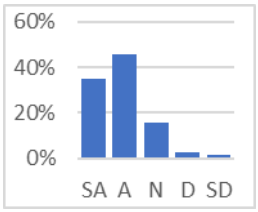
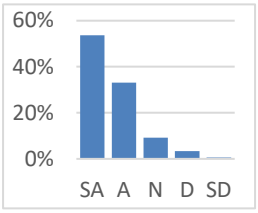
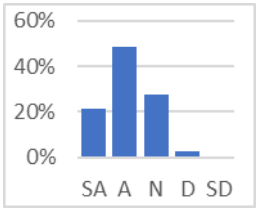
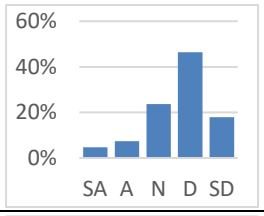
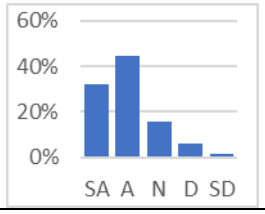
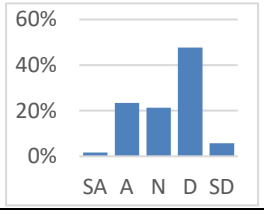
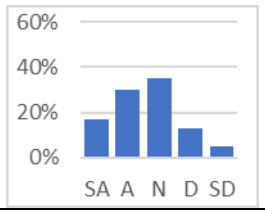
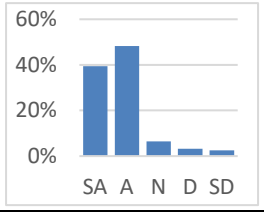
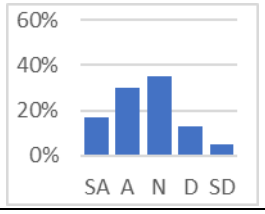
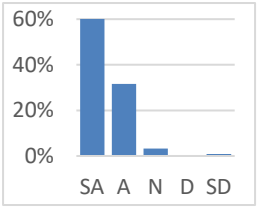
My faculty advisor was generally helpful in guiding my progress through the program.		The best teachers illustrate classroom principles with examples from their research.	
The CNR Academic Advising Center was generally helpful in guiding my progress through the program.		I feel the WILD Department has a responsibility to help its students find employment.	
I feel that little or no student advisement is needed.		The WILD Department did an adequate job of informing students about job prospects in my field.	
There was too much repetition of course content in my classes.		I received adequate assistance from the WILD Department and/or CNR in applying for and locating a job in my field.	
I feel laboratories in courses are necessary to apply skills and knowledge learned in classrooms.		Professors heavily involved in research tend to neglect their teaching duties.	
Course field trips and field exercises are important for professional development.			

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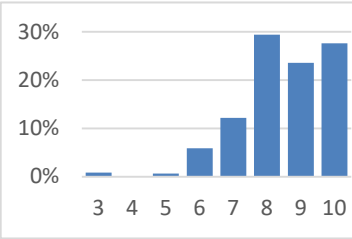
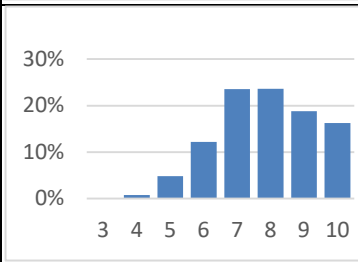
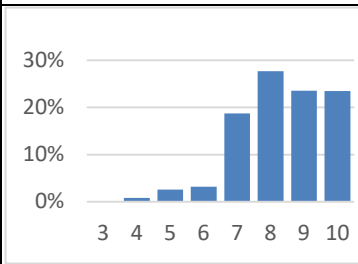
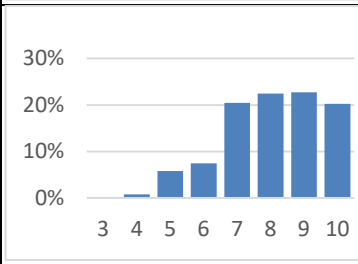
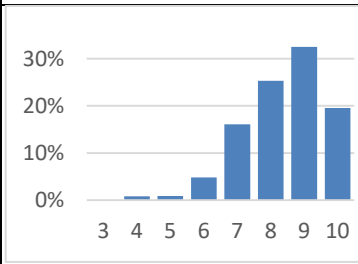
Table 6. Summary of subjective progress on WILD learning objectives: Results from WILD graduating seniors survey across majors for May 2017 (35 respondents), May 2018 (38 respondents), and May2019 (50 respondents). Categories 1and 2 were deleted from histograms since there were no responses in these categories.

Learning Objectives	Proportion of students rating their progress on attaining LOs at a particular level (low=1, high=10)	Average Level
1. Knowledge of biology and ecology in relation to your major.		8.7
2. Competence in collecting and analyzing data.		8.1
3. Understanding of the social context in which natural resource management is conducted.		8.7
4. Ability to communicate.		8.2
5. Understanding of and ability to apply what is learned in your major to manage, conserve, and restore natural resources.		8.5

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II. 7. 3. FEMA surveys for students entering and graduating from the program

In the spring 2019, the WILD Curriculum Committee developed a survey specifically for FEMA students based on SAF competencies, to be administered to students (a) upon matriculation into the FEMA major and (b) again at graduation, along with the WILD graduating senior interviews and other WILD graduating senior surveys (Standard II.7.2). At both stages in the program, students will be asked to rate both (1) the importance of these skills to forestry professionals and (2) their current level of proficiency in these skills. These proficiencies are also used in the alumni surveys (Standard II.7.5) and in the course coverage survey of instructors (Standard II.7.5) (Table 7, Table 27). We anticipate that in coming years, information from these surveys will help us document students' growing proficiency as they progress through the program and also their growing awareness of the importance of these subjects/skills. Furthermore, the alumni surveys will help us confirm that these same subjects/skills are important in their careers and will give alumni an opportunity to provide feedback on our program. The subjects/skills in this survey are listed below:

1. Plant taxonomy, distribution, and associated vegetation and wildlife.
2. Soil properties and relationship to hydrology, water quality, and watershed functions.
3. Ecological concepts (e.g. structure/function of ecosystems, plant/animal communities, competition, diversity, population dynamics, succession, disturbance, nutrient cycling).
4. Assessment of ecosystem, forest, and stand conditions.
5. Tree physiology and the effects of climate, fire, pollutants, moisture, nutrients, genetics, insects and diseases on tree and forest health and productivity.
6. Mechanisms and predictions of climate change and its relevance to forests.
7. Measurement of land areas and spatial data analyses (e.g. GIS applications or other measurement approaches.
8. Design and implementation of forest-related inventories for specific objectives, using appropriate sampling methods and units of measurement.
9. Use of inventory data to project future forest conditions.
10. Development and assessment of silvicultural prescriptions for particular management objectives.
11. Analysis of economic, environmental, and social consequences of forest resource management actions and policies.
12. Development of management plans with multiple objectives and constraints.
13. Recognition and evaluation of ecosystem services associated with forest resources.
14. Public policies and laws related to public and private forest management.
15. Professional ethics related to land management practice.

The ratings categories for each of the above subjects/skills will be ranked by students according to their perceived importance in the program (Critically Important, Moderately Important, Slightly Important, Not Important, and I Don't Know) as well as their self-assessed level of proficiency:

- Expert - can provide guidance, troubleshoot, and answer questions.
- Advanced - can perform actions associated with this skill without any assistance.

- Intermediate - can successfully complete tasks but may require help from time to time.
- Novice - understand this skill but frequently need help when performing this skill.
- Fundamental Awareness - understand only the most basic techniques/concepts.
- I have no familiarity with this skill at all.

The survey was only taken by one of the two graduating FEMA seniors in Spring 2019. This student ranked all the subjects/skills as "Critically Important", with the exception of questions 2) and 3), which were both ranked as "Very Important". This same student self-assessed their own proficiency as "Advanced" in all the subjects/skills except 2 (Novice) and 9, 11, 14, and 15 (Intermediate). This student also commented that:

> *"In classes where we were mixed with wildlife, range and other majors it seemed that the forestry section took a back seat. In WILD 4750 in particular was bad we did not even make it to the forestry section of the class. It seemed to me that the focus of those classes was on wildlife techniques."*

This response, and other program feedback from students (Standard II.7.4), is being actively considered and acted upon by the Forestry Curriculum Subcommittee and the WILD Curriculum Committee.

II. 7. 4. Recent student concerns and responses *Return to Table of Contents*

During the spring semester of 2019, a group of 5 FEMA students meeting informally with the WILD department head expressed concerns about their courses. The Department Head summarized these concerns for the WILD Curriculum Committee, who discussed them at length on April 11, 2019. The specific concerns of these students were:

a) *That they would like to see a required course on fire as part of the FEMA program* - The WILD Curriculum Committee had already initiated the addition of WILD 3100 (Introduction to Wildland Fire) as a requirement to the FEMA program, and will make this change credit-neutral by reducing the soils course requirement from two courses, (PSC 3000: Fundamentals of Soil Science and WILD 5350: Wildland Soils) to one course (PSC 3000 only). In conjunction with this change, the FEMA Curriculum Subcommittee is currently considering a restricted menu of courses, from which one course will be required (Standard V.5). One of those courses will be WILD 5350. This change will be reflected in the Fall 2020 catalog, and FEMA students are being advised about the anticipated change.

b) *That WILD 3810 (Plant and Animal Populations) contained too much content on R and not enough on plant populations.*
Dr. Clark Rushing, the instructor for WILD 3810, will be working with Dr. Justin DeRose, our new assistant professor of silviculture and forest ecology, to include more plant-related material in this course. Additionally, Dr. DeRose will be working to include population/stand dynamics and metrics specific to silviculture in WILD 5700 (Forest Assessment and Management). The inclusion of R, spreadsheets, and databases in WILD common courses is a topic currently under discussion in the WILD Curriculum Committee, and is a topic being included in the Employer Interviews (Standard II.7.6).

c) *That the FEMA program was missing content on tree anatomy and physiology.*
Dr. Lutz, instructor for WILD 3820 (Forest Plants: Identification, Biology, and Function) acknowledged this deficiency and will be including additional material on tree anatomy and physiology in his course starting in Fall 2020.

d) *That the FEMA curriculum lacked a forestry-oriented social science course.*
The WILD Curriculum Committee considered but discounted this problem, as there are two required courses which deal with human dimensions in ways applicable to forestry. These are ENVS 3010: Fundamentals of Natural Resource and Environmental Policy and ENVS 4000: Human Dimensions of Natural Resource Management.

e) *That WILD 2400 (Wildland Resource Techniques) included far more activities relevant to animals than to plants*.
Drs. LaMalfa and DeRose will both be contributing to WILD 2400 starting Fall 2019, and will be including many more exercises and field experiences relevant to plants.

Dr. DeRose met with members of the Forestry Club/SAF Student Chapter at the beginning of the Fall 2019 semester to let them know that their concerns were being carefully considered and that responses were underway. We consider this a good example of how students feel welcome to present ideas and concerns to faculty and the WILD Department Head, and how those concerns are carefully considered and acted upon by the WILD faculty and Curriculum Committee.

II. 7. 5. Alumni surveys *Return to Table of Contents*

USU Career Services conducts a First Destination Survey of graduates by telephone survey every year including graduates from all USU colleges and departments. Respondents are asked to provide the names of their employers, job titles, and locations. The annual results for WILD from 2011 through 2017 are provided on the WILD undergraduate assessment page. Although these data are reviewed prior to annual departmental retreats, this survey receives only a low number of respondents from WILD alumni (9 FORE/FEMA majors since 2011), and thus these data cannot be used to make broad inferences about the FEMA major in particular. Data from 2017 forward are not yet available from the USU Career Services office.

As a part of the 2019 SAF self-study process, WILD constructed and undertook a survey of FEMA and Forestry alumni over the past 10 years (see previous section on Graduating Senior Questionnaires). This survey is directly linked to SAF competencies, and respondents are asked to rank the subjects/skills as to their perceived importance to forestry professionals (Critically Important, Moderately Important, Slightly Important, Not Important, and I Don't Know), as well as their recommendations about whether each subject/skill should be taught. In addition, the Alumni Surveys include questions about respondents' year of graduation, current employment, and level of satisfaction with their current employment (given career stage). The results of this survey are presented alongside instructor ratings of courses (content related to proficiencies) for the 19 FEMA professional education courses (Table 7). We acknowledge that there is a temporal discrepancy between the experiences of alumni who have graduated up to 10 years ago and the course content as described by current instructors (several of whom are recent hires), and are interpreting the results cautiously. Responses about employment status of alumni are summarized in Document F, Tables F-4 and Table F-5 and discussed in Standard III.5.

Overall, the following patterns were noted:

- Alumni thought that tree physiology and tree health needed more coverage in the curriculum and that this knowledge was a critical proficiency for the profession, but course coverage is light. We have begun to address this deficit by emphasizing these topics more in WILD 3820 and in WILD 5710, and by creating a restricted menu of courses that includes two plant physiology options.
- Alumni thought that the implementation and interpretation of forest inventories in management plans were critical skills that could use more attention in the FEMA curriculum, and we rely heavily on WILD 5700 for this content. The FEMA Curriculum Subcommittee is actively discussing ways to give students broader experience with this proficiency.

II. 7. 6. Employer interactions and interviews *Return to Table of Contents*

WILD faculty have a range of ongoing informal interactions with potential employers, including research collaborations, professional conferences, agency consultations, and involvement in student internship placements. SAF meetings (national and regional) and the annual Restoring the West Conference are particularly good venues for interactions with potential employers (many of whom are USU alumni).

As a part of the current self-study, WILD has initiated a more formal series of interviews with forest management agency, industry, and academic representatives to discuss the preparation of our graduates (where applicable), as well as trends in the profession and how the FEMA curriculum could evolve to anticipate future needs and to best prepare our students. The interviewees are listed in Table 8. The interviews are guided by the questions summarized in Table 9.

Opinions about USU FEMA graduates: Not all interviewees had experience with USU FEMA graduates, but some were familiar with our program and were able to provide comments based on that experience. Of those who were able to comment, the consensus was that our students have a strong background in ecology and are good interdisciplinary team members, but that they sometimes lack practical forestry skills (depending on their employment/internship experiences). This is consistent with the opinion of our FEMA Curriculum Subcommittee, and we are already actively looking for ways to incorporate more practical skills into our existing courses (see Standard II.7.4).

GIS skills: Across all sectors, proficiency in GIS software (data access, analysis, and presentation) were seen as critical. One federal interviewee indicated that their hiring process often included an impromptu demonstration of these skills. All interviewees saw this as an important skill for forest inventory, prescription design and implementation, road design, and communication with professionals and the public. The FEMA program (with one GIS course and one course in remote sensing), along with the availability USU's GIS certification program and minor, are meeting these needs well.

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Climate change science: Interviewees were mixed on the importance of understanding climate change science. All acknowledged that climate change was driving many of the current forest management issues and economic impacts, and all agreed that climate change as a context should be incorporated across the curriculum. However, most interviewees (particularly those from agencies and the private sector) thought it was more important to how climate change projections could be incorporated into management plans, and how to plan for forest resilience, rather than understanding the climate change science itself. The FEMA program does not currently require a course in climate change science per se, but climate change as a context for management is covered in most, if not all courses.

Ecological and fire modeling: Interviewees thought this was an important skill for FEMA majors proceeding to graduate studies or research careers. For all FEMA students, interviewees felt that an understanding of the basic process, assumptions, and outputs were important. Most interviewees felt that understanding fire models was important for all FEMA students. Interviewees familiar with our FEMA students and program felt that our students were adequately prepared in this area.

Forest health: Interviewees felt that forest health issues were at the forefront of the profession, and that students across forestry programs were often poorly prepared in this arena. Interviewees stated a need for regionally specific continuing education in this arena, and emphasized the importance of local context. Specifically, interviewees cited the need for students to be able to identify forest pathogens and diseases, and to understand pathogen interactions with other stressors (e.g. drought). The FEMA program does not currently have a course in forest health, or core faculty who specialize in forest health issues, but there is an effort underway to incorporate forest health issues and associated field experience into several of our courses (see Standard II.7.4). As a result of this employer feedback, the FEMA Curriculum Subcommittee will be exploring the potential for short courses in this topic.

Carbon sequestration: Interviewees felt that this would be a more important issue in the future (e.g. with future carbon taxes and sustainability certifications) than it is currently. The FEMA program does not emphasize carbon sequestration in our current curriculum, but we anticipate that this will become an issue as other markets for wood products develop (e.g. biochar, cross-laminated timber). In our curriculum, carbon sequestration is tangentially tied to broader climate change issues.

Botany/dendrology/Plant ID: All interviewees thought that plant ID, the use of keys, and basic botany were important basic skills, particularly in terms of habitat typing, site indices, and indicator species. Identification of tree species was seen as critical, along with familiarity with common shrubs and grasses. The FEMA program currently emphasizes plant identification, and will be increasing coverage of dendrology topics (see Standard II.7.4), but does not require a course in botany, which is consistent with this feedback.

Tree physiology: All interviewees thought that a basic understanding of tree physiology was important for understanding stand conditions with respect to drought and disease, but that there

was not a need for a specific course in plant physiology unless a student intended to pursue graduate work in forestry or forest health. The FEMA program currently covers basic tree physiology in WILD 3820, and the FEMA Curriculum Subcommittee is considering the addition of a plant physiology course as an option in a future menu of courses (see Standard V.5).

Genetics: Interviewees agreed that an evolutionary perspective on forests was important, including linkages to local adaptation and climate change, but that a course in genetics would not be a high priority. The FEMA Curriculum Subcommittee is considering the addition of WILD 4880 (Genetics in Conservation and Management) as an option in a future menu of courses (see Standard V.5).

Traditional forest mensuration: Interviewees mentioned a range of specific skills that they thought were essential, including basal area, stand density index, trees/acre, fixed and variable plots, and a basic understanding of what a forest looks like based on this information. One interviewee felt that students should be able to set up and accomplish a cruise. Another interviewee emphasized the importance of understanding forest operations and basic equipment. Most interviewees emphasized the importance of understanding treatment and regeneration processes in the context of mensuration. One interviewee made the statement that "…just understanding the ecology doesn't do it…students need to be able to apply it, think about it, do statistics on it, and interpret the data." Interviewees familiar with FEMA students and the FEMA program expressed concern that with the retirement of Dr. Jim Long, the emphasis on forest mensuration would be diminished. The FEMA Curriculum subcommittee has similar concerns, and is taking action to specifically incorporate forest mensuration skills into existing courses topics (see Standard II.7.4).

Fire risk assessment: Interviewees from state and federal agencies were particularly adamant about the importance of this skill and management techniques to reduce wildfire risk. However, one state agency interviewee stated that they don't do prescribed burns, and that while fire expertise was necessary, the biggest hiring demand was for forestry students with GIS and basic forestry skills. This same interviewee commented that students should be well-grounded in fire ecology concepts. The FEMA program has recently made WILD 3100 (Introduction to Wildland Fire) a required course, starting in Fall 2020.

Hydrology: Interviewees felt that students should have a good understanding of watershed functions and the impact of forest conditions on water yield and quality. Some interviewees emphasized the importance of linkages between fire impacts, soils, tree physiology and hydrology. One interviewee emphasized the need for students to understand watersheds as a unit of management. The FEMA program requires WATS 3700 (Fundamentals of Watershed Science), which addresses these topics.

Oral and written communication skills: Interviewees were unanimous in stating that these skills were increasingly important and frequently lacking in students across natural resource sciences. Some interviewees emphasized oral skills, and some written skills, but all emphasized the need to communicate more effectively with a range of stakeholders. One interviewee stated that

employees would spend most of their time with public engagement. Interviewees from academic institutions commented that a lack of communications skills in students is something they increasingly struggle with. In WILD, we have recently created a new course WILD 4950 (Scientific Communication for Natural Resource Professionals) starting Fall 2019. This course will be designated as "communications intensive" starting in Fall 2020, so all WILD students will be encouraged to choose this course in meeting their Depth requirements (see Standard V.1.1).

Management of non-timber resources: Interviewees generally thought that forestry students generally understood this very well, and that this was an issue of increasing importance in forestry. Two interviewees from federal agencies stated that this is all they do and that forest management plans are mostly about non-timber resources. Interviewees familiar with the FEMA program and students thought that our program prepared students well in this regard, and that FEMA students tended to be good interdisciplinary team members because of their cross-disciplinary training (i.e. the departmental commons structure).

Economics: Interviewees were in agreement that an understanding of market values and timber valuation were important, but just at a basic level. One interviewee stated that "Economics is always a part of what we do, and students need to be able to estimate and project costs". Another interviewee stated that "Students need to understand that someone needs to make money in order to manage trees." None of the interviewees thought this was a pressing deficit in forestry education. The FEMA program requires APEC 3012 (Introduction to Natural Resources Economics).

Policy: Interviewees were somewhat mixed on the importance of policy in forestry education, but generally agreed that students should have a basic understanding of NEPA. Some of the relevant quotes from interviewees:

> "Policy runs your life as a forester"
> "Students will learn policy anyway on the job, and different agencies have different policies"
> "I often include policy questions (NEPA, CWA) in interviews"
> "Students need to know policy processes and implications for decisions on the ground."
> "Students need an understanding of what drives policy at the state and federal level, and how NEPA requirements are being streamlined in some programs (e.g. FORFRI)."

None of the interviewees mentioned that policy is a significant gap in FEMA or other forestry programs. The FEMA program requires ENVS 3010 (Fundamentals of Natural Resources Policy), and policy issues are also covered in ENVS 3300 (Recreational Resources Management) and ENVS 4000 (Human Dimensions in Natural Resources).

Overall, implications for the FEMA program coming from these interviews are (1) that the FEMA program is generally consistent with training needs from employer standpoints, (2) that the FEMA program is evolving in ways that are consistent with employer opinions about training needs, and (3) that skills related to forest health and forest mensuration are valued by employers, suggesting a need to be more intentional about the coverage of these skills in our curriculum.

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Table 7. Summary of results for the 2010-2019 Alumni Survey, with corresponding instructor ratings (compiled across all FEMA professional education courses). Alumni ratings of "Importance to Profession" are ranked "Critically Important", "Very Important", "Moderately Important", and "Slightly Important". Alumni ratings for "Program Recommendations" are recommendations that the proficiency be covered "More", the "Same", or "Less" than the respondent experienced in their degree program. Instructor ratings were compiled from a 2019 survey of all instructors of FEMA professional education courses. Instructors categorized their courses as contributing to each competency (1) not at all, (2) a little, (3) somewhat, (4) quite a lot, and (5) very much. The vertical axis in the instructor ratings plots represents the number of courses in each category. Proficiency wording based is on SAF proficiencies but condensed for alumni survey efficiency. Instructor surveys used exact SAF proficiency wording. A link to course names and descriptions is provided for "Highly Rated Courses".

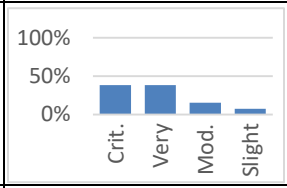
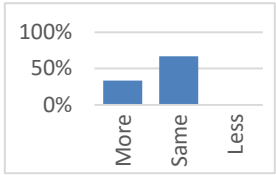
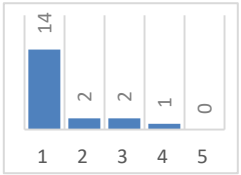
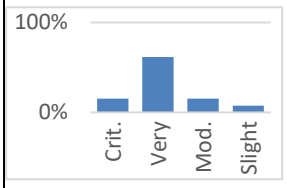
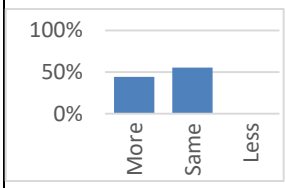
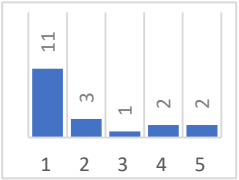
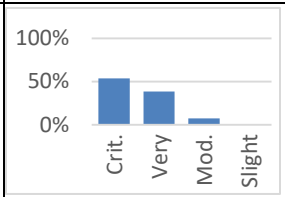
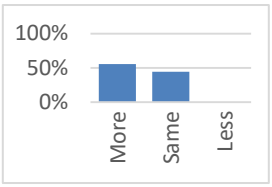
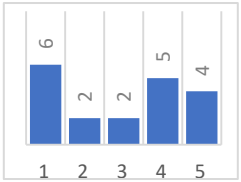
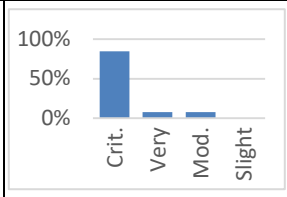
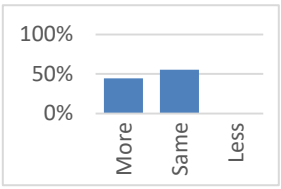
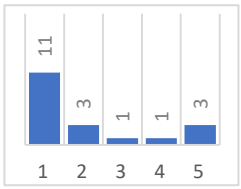
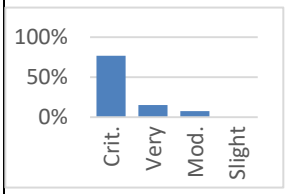
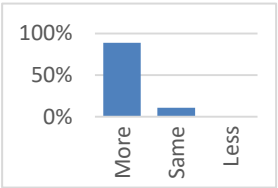
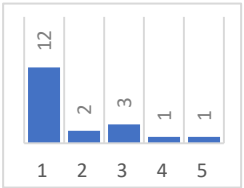
	Alumni 2010-2019 Survey (13 respondents)		Instructor Ratings (19 courses)	
Proficiency	**Importance to Profession**	**Program Recommendations**	**Course content low (1) – high (5)**	**Highly rated courses**
Plant taxonomy, distribution, and associated vegetation and wildlife. (A1)				WILD 3820, WILD 3800, WILD 3850
Soil properties and relationship to hydrology, water quality, and watershed functions. (A2)				PSC 3000, WILD 5350, WATS 3700, WILD 3800
Ecological concepts. (A3)				WILD 3800, WILD 3820, WILD 3850, WILD 5700
Assessment of ecosystem, forest, and stand conditions. (A4)				WILD 5700, WILD 2400, WILD 4750, WILD 3850
Tree physiology and the effects of climate, fire, pollutants, moisture, nutrients, genetics, insects and diseases on tree and forest health and productivity. (A5)				WILD 3820, WILD 3850, WILD 3800

Table 7 (continued)

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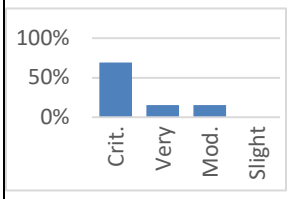
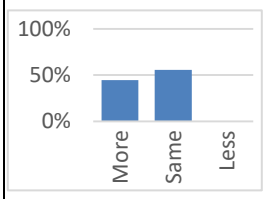
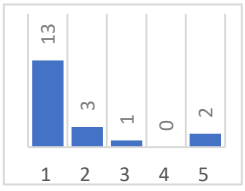
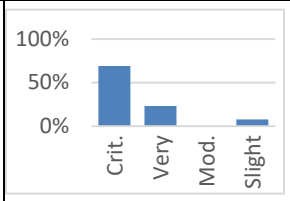
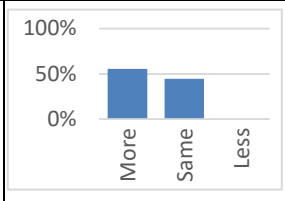
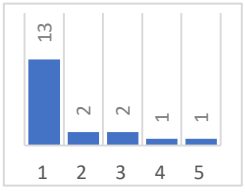
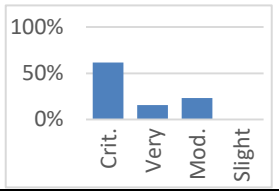
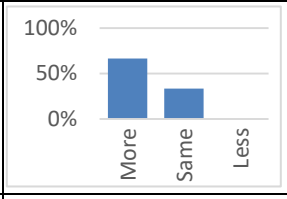
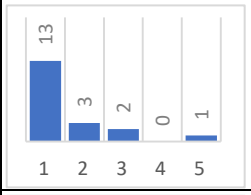
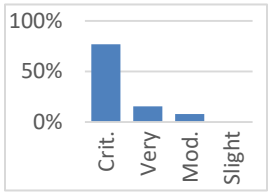
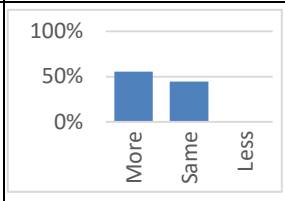
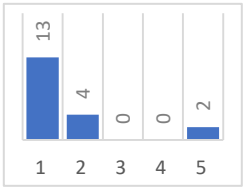
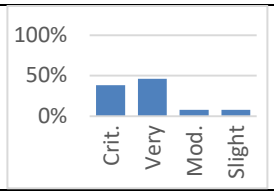
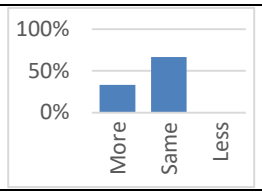
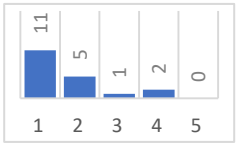
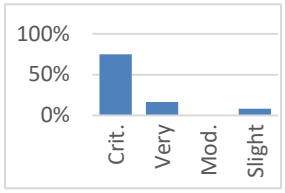
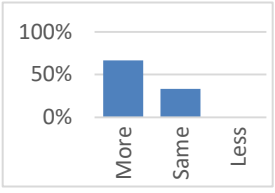
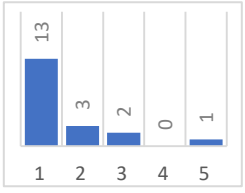
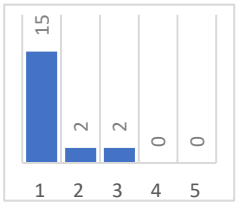
	Alumni 2010-2019 Survey (13 respondents)		Instructor Ratings (19 courses)	
Proficiency	**Importance to Profession**	**Program Recommendations**	**Course content low (1) – high (5)**	**Highly rated courses**
Measurement of land areas and spatial data analyses (e.g. GIS applications or other measurement approaches). (B1)				WILD 1800, WILD 5750, WILD 2400
Design and implementation of forest-related inventories for specific objectives. (B2)				WILD 5700, WILD 4750, WILD 2400, ENVS 3300
Use of inventory data to project future forest conditions. (B3)				WILD 5700, WILD 3850, WILD 4750
Development and assessment of silvicultural prescriptions for particular management objectives. (C1)				WILD 3850, WILD 5700
Ability to assess the economic, envt'l, and social consequences of forest mgt. (C2)				ENVS 3300, WILD 5700, APEC 3012
Development of management plans with multiple objectives and constraints. (C3)				WILD 5700, ENVS 3300, WILD 3850
Understanding of the economic forces and forest activities that link demand and availability of forest products. (C4)	Not surveyed	Not surveyed		APEC 3012, WILD 3850

Table 7 (continued)

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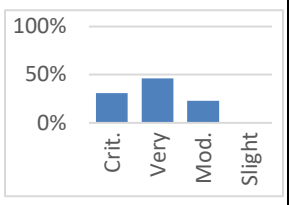
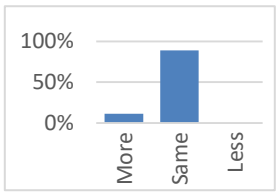
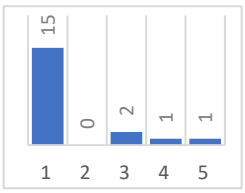
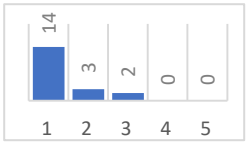
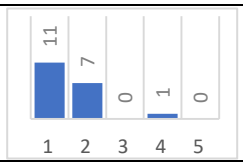
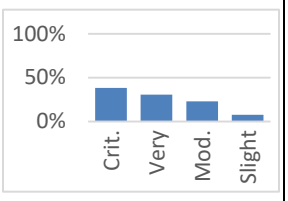
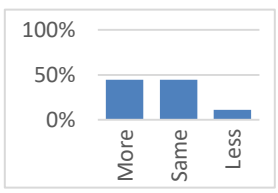
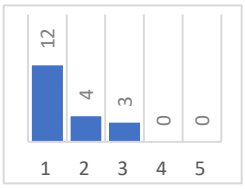
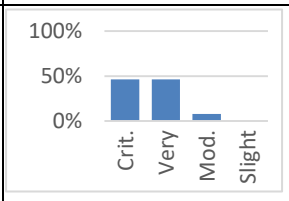
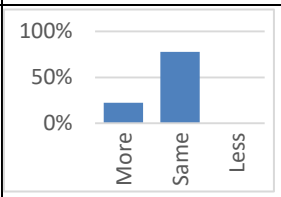
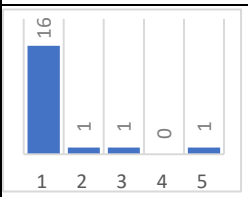
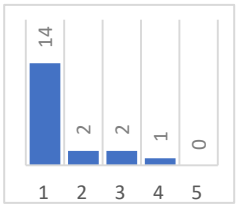
	Alumni 2010-2019 Survey (13 respondents)		Instructor Ratings (19 courses)	
Proficiency	**Importance to Profession**	**Program Recommendations**	**Course content low (1) – high (5)**	**Highly rated courses**
Recognition and evaluation of ecosystem services associated with forest resources. (C5)				ENVS 3300, APEC 3012, WILD 3850, ENVS 3010
Understanding admin., ownership, and org. of forest mgt. enterprises. (C6)	Not surveyed	Not surveyed		APEC 3012, WILD 3850
Understanding of forest policy and the processes by which it is developed (D1)	Not surveyed	Not surveyed		ENVS 3010
Public policies and laws related to public and private forest management. (D2)				ENVS 3010, ENVS 3300, WILD 5700
Professional ethics related to land management practice. (D3)				WILD 5700, WILD 3850
Understanding of the technical, financial, human resources, and legal aspects of public and private enterprises (D4)	Not surveyed	Not surveyed		WILD 3850, WILD 5700, ENVS 3300

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Table 8. Potential employers interviewed in 2019 about the FEMA curriculum.

Sector	Name	Position
State Agency	PJ Abraham	Area Forester, Utah Division of Forestry, Fire, and State Lands, Utah Department of Natural Resources
	Eric Besaw	Northern Operations Chief, Idaho Department of Lands
Federal Agency	Jennefer Parker	District Ranger, Logan Ranger District, Wasatch-Cache National Forest
	John Riling	Forest Silviculturist, Boise National Forest
	Peter Howard	Silviculturist, Mountain View Ranger District, Wasatch-Cache National Forest
	David Whittekiend	Forest Supervisor, Wasatch-Cache National Forest
	Richard Gardner	Forest Silviculturist, Umatilla National Forest
Academia	Owen Burney	Associate Professor and Superintendent, John T. Harrington Forestry Research Center, New Mexico State University
	Linda Nagel	Department Head, Forest and Rangeland Stewardship Department, Warner College of Natural Resources, Colorado State University
Private Industry	Rachel Vandenburg	Woodgrain Millwork,Inc. Fruitland, Idaho

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Table 9. Questions structuring interviews with representative employers of FEMA graduates.

Q1. If you have employed USU graduates in the past several years for forest management positions, what do you feel are their academic strengths/weaknesses?
Q2. What are the primary, current, and anticipated needs for students in FOREST-RELATED MANAGEMENT and/or RESEARCH, and which skills are becoming LESS necessary than in the past?
a. GIS, programming, data access, data analysis b. Climate change science c. Ecological and fire modeling d. Forest health e. Carbon sequestration f. Botany/dendrology/plant ID g. Tree physiology h. Genetics i. Traditional forest mensuration j. Fire risk assessment k. Hydrology l. Oral and written communication skills m. Management of non-timber resources n. Economics o. Policy

II. 7. 7. Capstone course evaluation

The capstone course for FEMA, WILD 5700 (Forest Assessment and Management), provides an opportunity for students to develop silvicultural prescriptions as part of a forest management plan designed to meet a range of specific objectives, including consideration of the costs and benefits of alternative management strategies. The course is intended to incorporate skills and subjects from the students' previous courses. The grades in WILD 5700, along with the quality of the final projects and presentations, are important components of ongoing program evaluation. The instructor of WILD 5700 is also a member of the FEMA Curriculum Subcommittee and the WILD Curriculum Committee, and discusses the capstone course results with those groups in order to initiate any necessary curricular changes. Although the original instructor for this course (Dr. James Long) recently retired, a new faculty member, Dr. Justin DeRose, will be taking over the course in Spring 2020 and intends to have similar course activities and assignments.

II. 8. Cooperative relationships with regional organizations and agencies

QCNR has several federal and state cooperators who participate as members of our faculty stationed on campus, adjuncts on campus and elsewhere, and in less formal ways. We have two Federal Cooperator faculty employed by the USGS Cooperative Research Unit (Drs. Phaedra Budy and Tom Edwards). These faculty work on collaborative research with the Utah Division

of Wildlife Resources (UDWR) and other USU faculty. We also have two Federal Research faculty in our department from USDA Wildlife Services, Drs. Julie Young and Eric Gese, who conduct predator research and outreach. The Federal Cooperators and Researchers are on the USU campus through cooperative agreements that were developed a number of years ago.

For many years we have also had an employee of the state Division of Wildlife Resources (DWR) stationed at USU in our department. The current person in that position (Dr. Frank Howe) teaches an avian ecology class, chairs and serves on graduate committees in our MS and MNR programs, coordinates DWR research needs and USU faculty research interests, and helps place WILD undergraduates in UDWR internships. In November of 2019 we formalized this role by designating that person as an Associate Professor (State Cooperator), which is a new faculty designation passed by our Faculty Senate last year.

We have long-held ties with the US Forest Service Rocky Mountain Research Station facility and scientists located here on campus and in the Forest Inventory and Analysis unit based in Ogden, Utah, including adjunct faculty Dr. Barbara Bentz on campus (Forest Research Entomologist) and Dr. John Shaw in Ogden (FIA Analyst). Dr. Bentz has co-advised graduate students and employed WILD undergraduate students over many years, working with several of our core FEMA faculty. She frequently provides guest lectures on forest health issues in WILD courses and at USU. Dr. Shaw has been involved with WILD faculty and students on a number of projects, and often provides employment opportunities for WILD undergraduates.

In 2015 QCNR entered into a partnership with the US Forest Service to fund 12-18 summer internships each year (see Standard III.3.2). This internship program was intended to increase student exposure to field techniques and management operations. The MOU for this program indicates that stipends for internships are to be paid jointly from USFS and QCNR funds. QCNR pays for half of the stipend for the first two interns in the program (approximately $3,000 per summer per student), and the USFS pays for the other half of the first two interns and 100% of any additional interns in the program. For summer 2019 internships, a delay in federal funding diminished the number of internships funded by the USFS, and with ongoing cuts to the USFS budget and increasing demands of fire suppression, financial support for these internships may be similarly diminished in the coming year. However, internships have been and continue to be available through other sources (e.g. Utah Division of Forestry, Fire, and State Lands), and students are readily finding summer employment with the USFS and other federal agencies which gives them valuable experience in forest management and field skills. FEMA students are strongly advised (by staff and faculty advisors and in WILD 2000) to engage in internships or summer jobs relevant to the forestry profession.

II. 9. Public representation of SAF accreditation

USU, QCNR, and WILD are proud of our SAF accreditation, and feel that it is an indicator of the quality of our program and of the consistency of our program goals with SAF goals. We highlight our SAF accreditation in the following locations:

- WILD home page (Figure 6)

- FEMA degree web pages, with links to both the SAF and Intermountain SAF chapter home pages
- WILD assessment web pages
- Description of the US Office of Personnel Management (OPM) standards and how the FEMA program meets these requirements (Appendix 2)
- various printed materials describing the FEMA degree program (Figure 7)
- during advising and recruiting activities
- in our WILD/WATS/ENVS 2000 orientation courses.

USU also maintains a web page for the Intermountain chapter of the Society of American Foresters, linked on the FEMA degree webpage (Figure 6), where meetings and activities are announced and where the newsletter is distributed.

Figure 6. Excerpt from the home page for the Forest Ecology and Management degree.

Figure 7. Recruitment flyer for the Forest Ecology and Management major.

II. 10. Publicly available data on student achievement

Data on student achievement and job placement is provided on the WILD Assessment pages, as described in Standard II.6., and on the degree program information web page.

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STANDARD III: STUDENTS

Relevant Documents and Appendices:
Document F: Forestry Graduate Employment Summary
Document G: Student Data Summary

III. 1. Enrollment trends

Relativized undergraduate enrollments in the FEMA program have increased relative to 52 NAUFRP Forestry programs with complete data from 2005-2018 (Figure 8). Nationally, the trends are relatively stable, with a slight upturn in the past two years. FEMA trends showed a more precipitous drop than national trends through 2010, but have shown an increasing trend since that time. The increased variability relative to national trends is at least partially due to the small numbers of FEMA students relative to enrollments in the 52 NAUFRP programs. The generally upward trend since 2010 reflects an increasing popularity of the FEMA program. We attribute this positive trend to a) positive changes in the job market, with increasing employment opportunities following a wave of retirements, b) increasing public awareness of the importance of forests, as large wildfires become more common and the need for recreational opportunities in western landscapes becomes more apparent, and c) improved awareness of the FEMA program due to coverage in WILD 2000, the professional orientation course.

FEMA relativized enrollment increases since 2010 have also been more dramatic than increases at USU across all majors, within QCNR, and within WILD (Figure 9). Within QCNR, FEMA enrollment increases since 2010 have been similar to increases in the Conservation and Restoration Ecology program (CREC), and together, FEMA and CREC are our fastest growing degrees (Figure 10). FEMA is the only degree in WILD that did not decline in enrollment in 2019 (Figure 10). Raw enrollment numbers for FEMA, other WILD degree programs, QCNR, and overall at USU are provided in Table 10 and Table 11, respectively.

Table 10. Enrollments in WILD degree programs

Degree Program	Number of Students Enrolled Fall 2018	Number of Students Enrolled Fall 2019
WEMA	162	160
CREC	61	51
FEMA	35	42
REMA	32	21

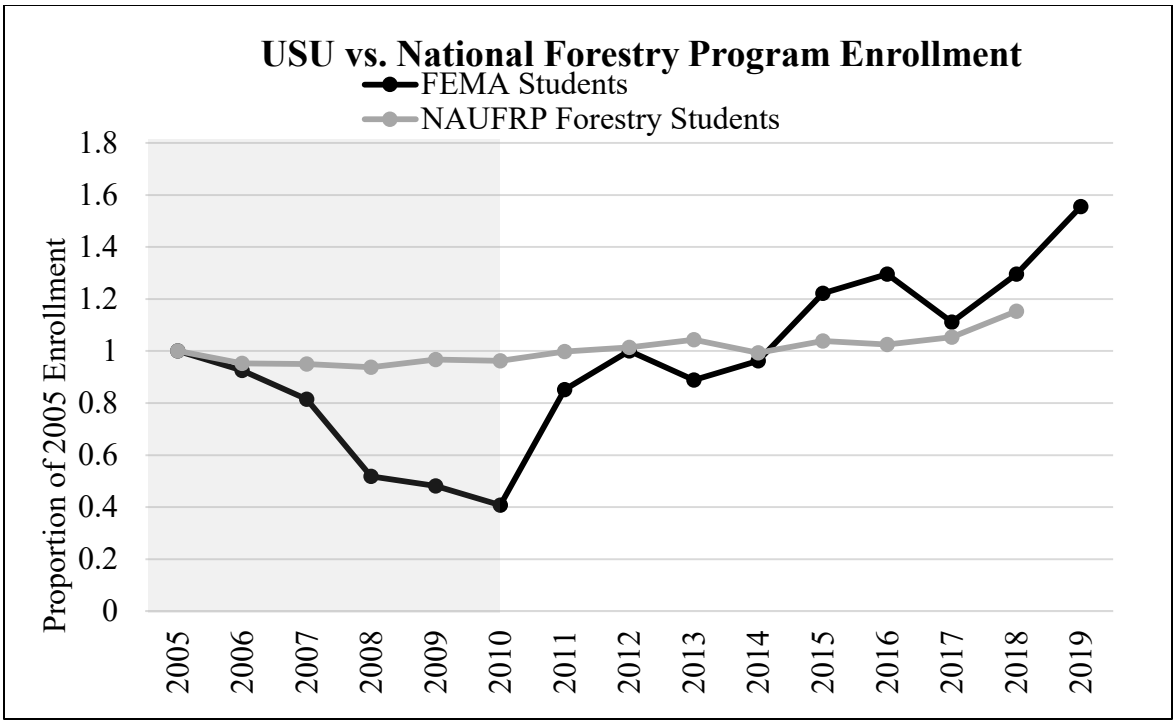

Figure 8. Relativized enrollment trends in the FEMA program relative to forestry undergraduate programs nationally (from FAEIS data on 52 NAUFRP institutions through 2019). Shaded area represents trends prior to 2010 SAF Reccreditation.

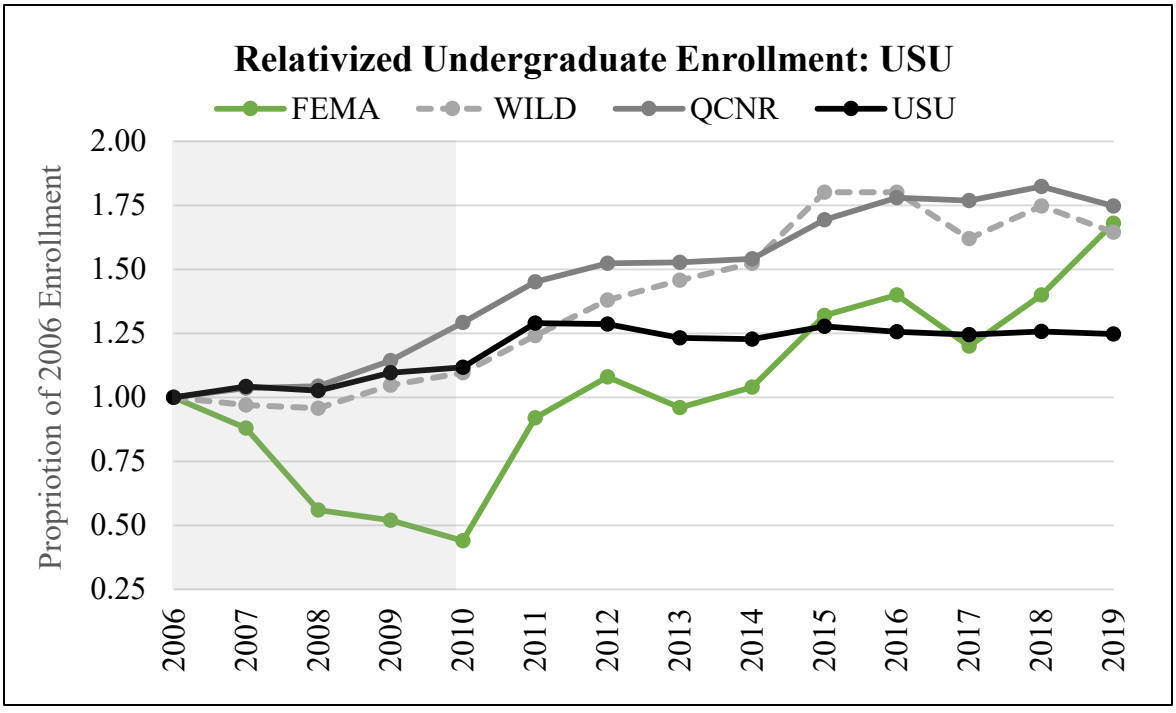

Figure 9. Relativized enrollment trends in all FEMA relative to WILD, QCNR, and USU undergraduate degree programs. Shaded area represents trends prior to 2010 SAF reccreditation.

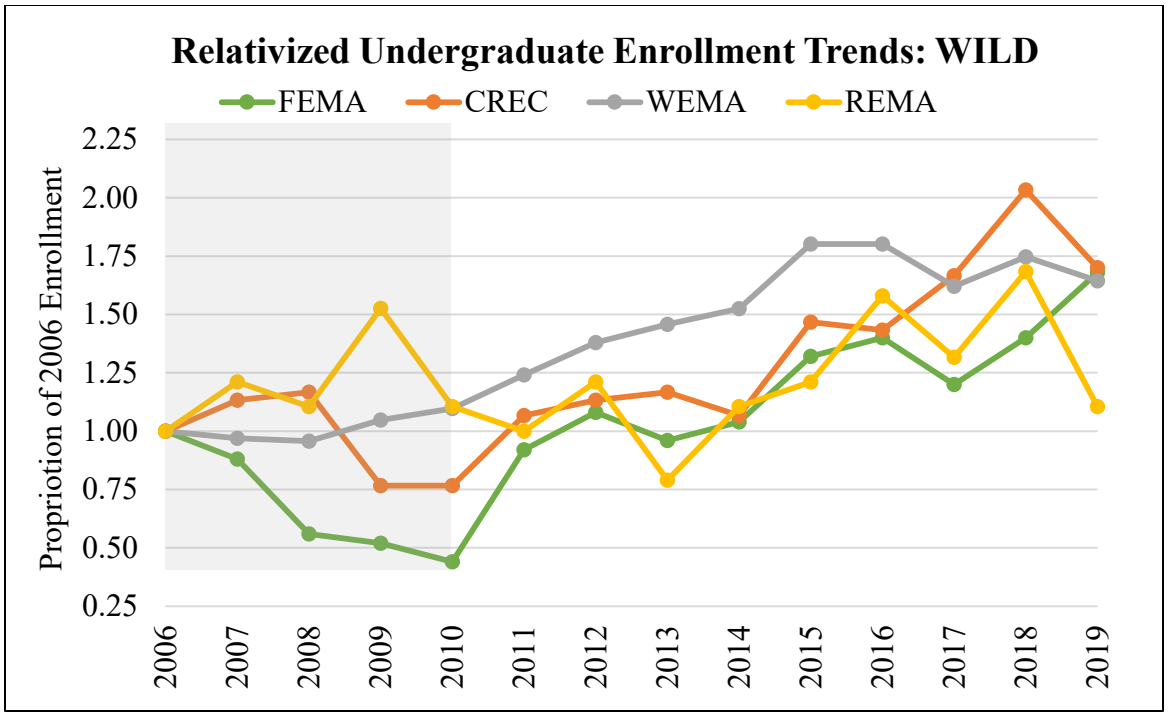

Figure 10. Relativized enrollment trends in all WILD undergraduate degree programs. Shaded area represents trends prior to 2010 SAF reccreditation.

III. 2. Student composition *Return to Table of Contents*

Students at USU, as well as in QCNR and the FEMA program are primarily Utah residents (Table 12), and between 18-25 years of age (Table 13). Tables with detail on student gender, ethnicity, class level, and graduation data are provided in Document G: Student Data Summary.

Table 11. Total numbers of students in the Forest Ecology and Management (FEMA) degree program, relative to Utah State University and the Quinney College of Natural Resources (QCNR), for 2016-2019 fall full-time undergraduate enrollments.

Program/Unit	2016	2017	2018	2019
Utah State University	24,838	24,618	24,880	24,669
Quinney College of Natural Resources	493	490	505	484
Wildland Resources Department (WILD)	299	269	290	273
Forest Ecology and Management Program	35	27	35	41

Table 12. Proportion of students with Utah state residency in the Forest Ecology and Management (FEMA) degree program, relative to Utah State University and the Quinney College of Natural Resources (QCNR), for 2016-2019 fall full-time undergraduate enrollments.

Program/Unit	2016	2017	2018	2019
Utah State University	83%	83%	83%	84%
Quinney College of Natural Resources	85%	86%	86%	86%
Forest Ecology and Management Program	86%	96%	94%	88%

Table 13. Proportion of students aged 18-25 in the Forest Ecology and Management (FEMA) degree program, relative to Utah State University and the Quinney College of Natural Resources (QCNR), for 2016-2019 fall full-time undergraduate enrollments.

Program/Unit	2016	2017	2018	2019
Utah State University	73%	78%	74%	73%
Quinney College of Natural Resources	74%	75%	76%	77%
Forest Ecology and Management Program	69%	74%	71%	76%

III. 2. 1. Gender composition *Return to Table of Contents*

The proportion of students in the FEMA major who self-identify as female has generally increased since 2010, but has been oscillating since 2014 and is currently at 37% (Figure 11). This is lower than the proportion of female students in QCNR and NAUFRP Natural Resources programs, but higher than NAUFRP forestry programs (Table 14).

Table 14. Percent of students who self-identify as female in USU's Forest Ecology and Management degree program, based on fall enrollments, in comparison to USU's Quinney College of Natural Resources and 42 Forestry programs at NAUFRP Institutions (CIP codes 3.0501, 0502, 0506, 0508, 0509, 0510, and 0511).

Program(s)	2016	2017	2018	2019
USU QCNR FEMA	34%	19%	37%	41%
NAUFRP Forestry Programs	24%	23%	23%	Not available
USU QCNR	43%	48%	51%	54%
NAUFRP NR Programs	45%	47%	48%	Not available

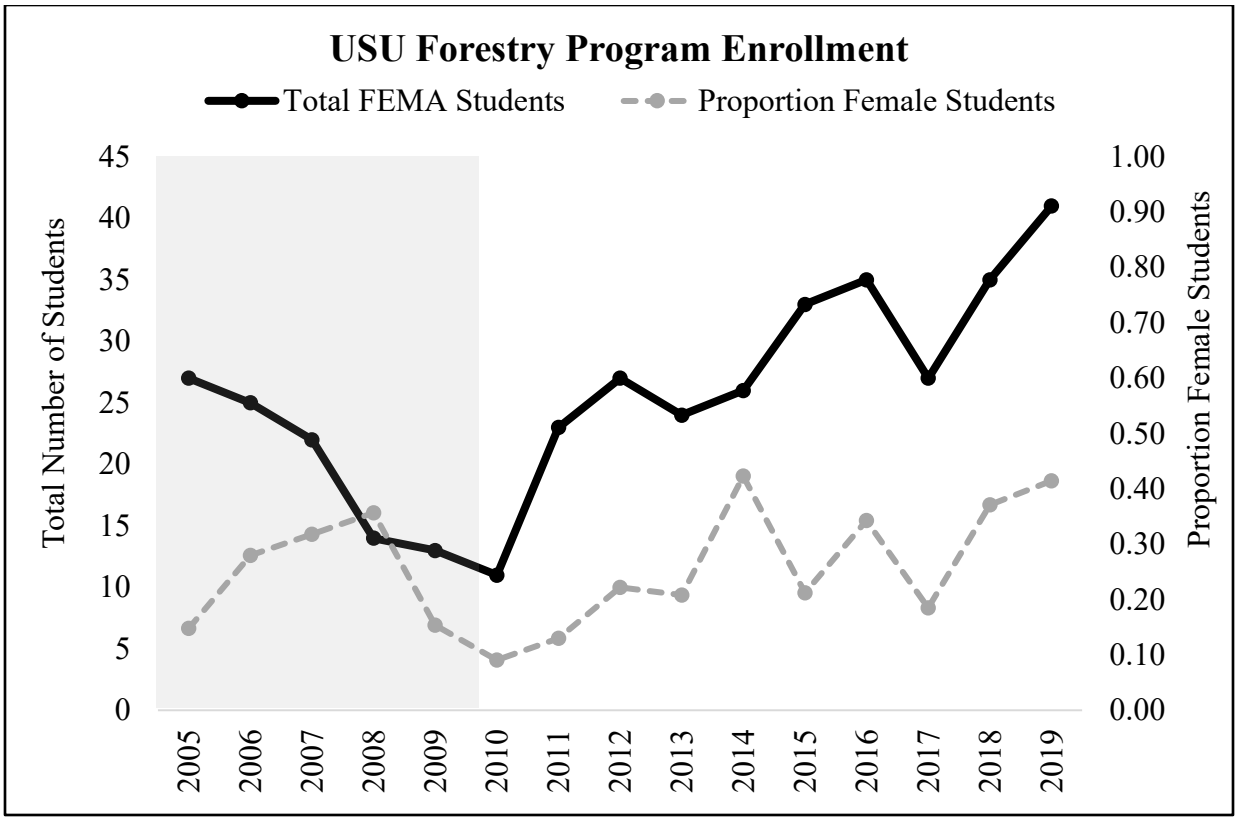

Figure 11. Annual student enrollments and proportion of students self-reporting as female, 2005-2019. Data include Forestry degree (2005-2016) and Forest Ecology and Management degree (2017-2019). Shaded area represents trends prior to 2010 SAF reccreditation.

III. 2. 2. Racial composition *Return to Table of Contents*

The racial composition of FEMA students over the past 13 years, relative to that of forestry-related enrollments at National Association of University Forest Resource Programs (NAUFRP) Institutions, is provided in Figure 12. Over this period of time there has been a general increase in the proportion of minority races in the FEMA major and a concomitant decrease in the proportion of students identifying as "white, non-Hispanic". For both groups, there was an uptick in the proportion of white, non-Hispanic students in 2018, which has continued for FEMA in 2019. For both FEMA and the NAUFRP forestry-related programs, Hispanics comprise the largest racial minority group, although their representation is quite small. This two-year trend may be an artifact of small enrollment numbers, but also suggests that our efforts to recruit from local high schools (where up to 28% of students are Hispanic) may be an opportunity we should explore more carefully (see Standard III.4).

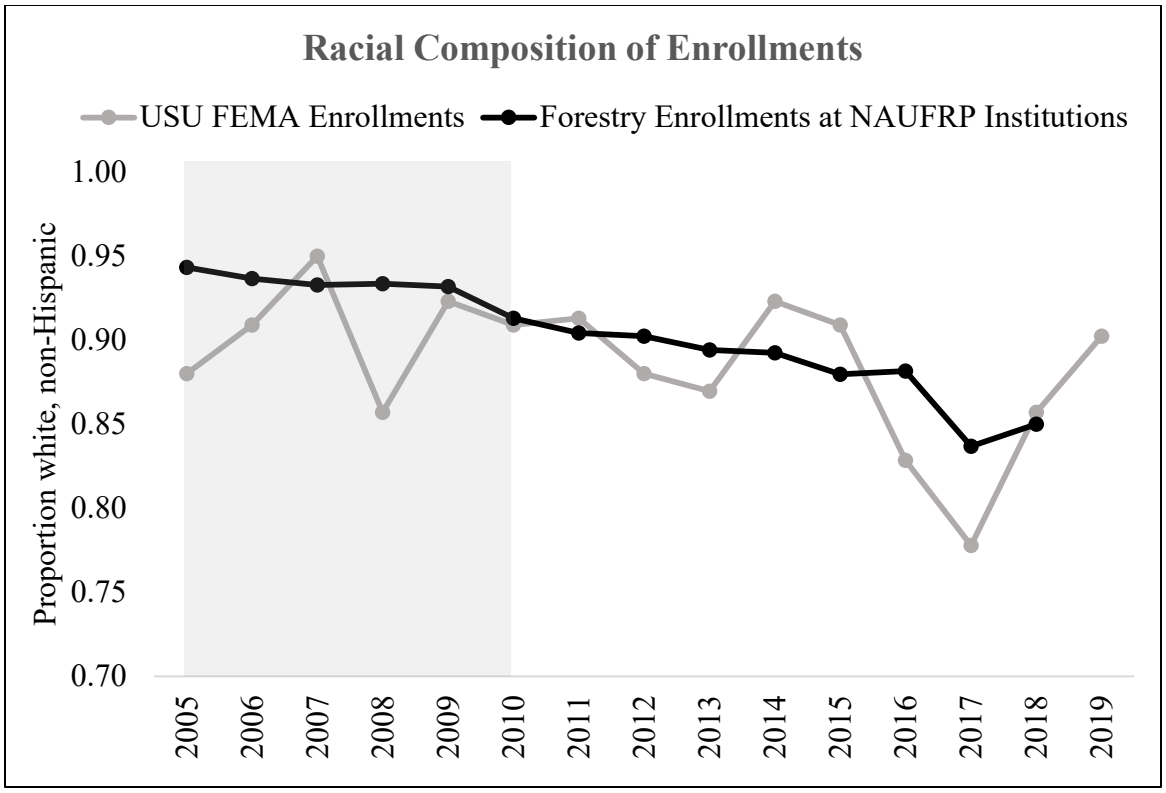

Figure 12. Self-described racial composition of annual enrollments in the USU Forest Ecology and Management program and in the Food and Agricultural Information System (FAEIS; 42 Forestry programs at NAUFRP Institutions, CIP codes 3.0501, 0502, 0506, 0508, 0509, 0510, and 0511). Data include the USU Forestry degree (2005-2016) and Forest Ecology and Management degree (2017-2019).

III. 3. Student participation in academic and extracurricular opportunities

QCNR students have a broad range of opportunities for participation in academic and extracurricular activities. Participation is strongly encouraged in WILD 2000 (Natural Resources Professional Orientation), which is a required course for all WILD majors.

III. 3. 1. Clubs *Return to Table of Contents*

Forestry Club: The Forestry Club, which is also the SAF Student Chapter at USU, offers many opportunities for involvement in various professional forestry-related activities. Justin DeRose is the faculty advisor for the Forestry Club. Membership and participation vary over years, and there are approximately 10 students who are actively participating as of Fall 2019. The student chapter offers numerous on-campus events, such as 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 QCNR. For fundraisers, the club cuts and sells firewood and also sells Christmas trees which are cut from local forests as part of a silvicultural learning exercise. These funds are used to send several students to the SAF national convention annually. Every year the Forestry Club is also represented by a Quiz Bowl team at the SAF national convention (2nd place in 2013). The

Forestry Club organizes and hosts the Intermountain SAF's spring meeting every year, providing members with a regular opportunity to interact with the professional community. Every year the Forestry Club also organizes a workshop to help students navigate USAJobs and get an introduction to the importance of quality seasonal employment.

Xi Sigma Pi National Forest Management Honor Society: The Lambda chapter of Xi Sigma Pi was formed in 1939, and has expanded its view of forest management to recognize fields such as fisheries, wildlife, policy, and outdoor recreation as integral parts of forest management. In keeping with the stated national goals of the society, the Lambda Chapter seeks both to recognize and encourage academic excellence among students of the College of Natural Resources. All undergraduates with senior standing (90 credits or more) in the top 20% of QCNR are invited to join Xi Sigma Pi in the spring semester. Graduate students in good standing may also apply. Members may participate in any of Xi Sigma Pi's activities, most of which provide services to the College. Members participate in and represent QCNR at college and university-sponsored functions. The Xi Sigma Pi faculty advisor is Dr. Jim Lutz. An average of about nine new student members per year have joined our chapter of Xi Sigma Pi since 2015.

Fire Club: The USU Fire Club is a student chapter of the Association of Fire Ecology, and was founded in the Spring 2018. The Fire Club strives to bring opportunities to students who are interested in a variety of aspects of wildfire from fire suppression to research. They seek to learn more about fire ecology and dynamics, as well as provide career boosting workshops, potential for certification, and opportunities to get hands-on experience in the field. The faculty advisor for the Fire Club is Dr. Larissa Yocom.

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS): The Utah State University Chapter of SACNAS is a student organization established in 2013. The main goal of the organization is promoting "the success of Chicano/Hispanic and Native American scientists, from college students to professionals, in attaining advanced degrees, careers, and positions of leadership in STEM." The club website can be found here: https://sacnas7.wixsite.com/sacnasusu. The chapter advisor is Dr. Ricardo Ramirez, from the USU Biology Department. SACNAS involves students from multiple departments and colleges.

Student Organization for Society and Natural Resources (SOSNR):
SOSNR is a club focused on bridging the gap between humans and the natural environment through service opportunities. The faculty advisor for this club is Sarah Klain (ENVS).

III. 3. 2. Extracurricular academic programs *Return to Table of Contents*

Undergraduate Teaching Fellowships: QCNR students have the opportunity to serve as undergraduate teaching fellows (UTFs). The UTF program (https://utf.usu.edu/) pairs faculty mentors with high-achieving undergraduate students who assist with day-to-day classroom management, as well as administrative and teaching tasks. The program affords teaching and leadership opportunities for UTFs and facilitates a learner-centered classroom experience for students enrolled in the courses they support. Faculty who mentor UTFs benefit from their feedback and associated opportunities to improve course content and delivery. UTFs are paid a small stipend of $750 per semester and may not work as a UTF for more than 100 hours per

semester. Claudia Radel, the QCNR Associate Dean, is the college liaison. Typically, there are around 20 QCNR students who serve as UTFs per year, and at least half of them are WILD students. We request all of the UTFs allotted to us and we usually pay for at least 2-3 more.

Undergraduate Research: QCNR has an active undergraduate research program. This program encourages undergraduate students to seek out faculty mentors and to apply for grants to fund their research. Funding can come from QCNR, the USU Undergraduate Research and Creative Opportunity (URCO) program, and/or faculty research grants. Funding from QCNR totaled $28,222 across 19 projects in FY 2019, and is often used as a required match for university-level URCO funding. For either QCNR or URCO funding, students must work with a faculty mentor to develop a project idea, write a grant proposal for the idea, and manage the award budget if they are successful. The grant proposal submission and review process is rigorous, and involves multiple rounds of review and revision. The review and selection processes are overseen by the QCNR Undergraduate Research Committee, comprised of faculty from each department, and a university-level URCO Committee. Students also may obtain transcript credit for undergraduate research activities.

Summer Internships: As described in Standard II.8, above, QCNR has established an active paid internship program, funded in part through the US Forest Service. Information on internships can be found on the QCNR web site. Students are strongly encouraged to participate in these internships to gain field experience, make professional contacts, and better understand the range of options open to them in various career tracks. Besides these more organized and formal internships, the WILD department allows and encourages students who have an upcoming summer job or volunteer activity coming up to approach a faculty member or the department head about turning it into an internship and getting college credit for it (typically 3 credits for working full-time for a summer). Forms are available through the QCNR Advising Center that lead the student through the process and help the student, supervisor, and faculty mentor formulate learning objectives and assess their achievement of them. If the student wants official credit for their efforts they can enroll for either WILD 2250 (Introductory Internship/Co-op) or WILD 4250 (Advanced Internship/Co-op).

Special Topics in Forestry Practices: Starting in the Fall 2019, WILD initiated a variable-credit Special Topics course focusing on forestry practices. This course was designed as a way to encourage students to participate in a range of workshops and field tours on forestry practices, in response to student, faculty, and employer concerns that FEMA students would benefit from more such experience (see Standard II.6, above). The course credit requires attendance of the workshop or tour, as well as attendance of a faculty-led discussion afterwards. In Fall 2019, two activities were available for this course: the 2019 Central Idaho Active Management Tour, a 3-day IMSAF activity, and the Timber Harvest and Forestry Practices Tour, a one-day event hosted by USU Extension Forestry. We anticipate that more opportunities will become available in the future.

Departmental, College, and Ecology Center Seminars: QCNR organizes a weekly seminar series in the fall semester and WILD organizes one in the spring, both of which include speakers from

around the West and beyond. The USU Ecology Center also sponsors a monthly seminar series (https://ecology.usu.edu/seminar_series/ecology_center_seminar_series) which is followed by a social. Topic for these seminars range from basic to applied science, and emphasize current issues. These seminars are generally well attended, and students can get one credit each semester if they attend most of the seminars in the semester. These seminars often attract undergraduate students who are not signed up for credit, and they provide an opportunity for undergraduate students to mingle with graduate students and faculty. These seminars are promoted through posters, QCNR/WILD websites, social media, classrooms, and clubs.

QCNR Graduate/Undergraduate Mentor Program: This program was created less than two years ago to help bridge the gap between undergraduate and graduate students within QCNR departments. The goal of this program is to provide an opportunity for QCNR undergraduates to work with a graduate student in their department on issues pertaining to graduate school and entering the workforce. We have a diverse team of 18 mentors across ENVS, WATS, and WILD. They are available to meet with students on a one-time or regular basis. The program is further described on the QCNR website (https://qcnr.usu.edu/undergraduates/involvement/mentor). The program is growing, and is being promoted among faculty members and students through fliers, emails, and social media, and will be promoted in WILD 2000 in Fall 2019.

USU Career Services: USU Career Services holds several Job Fairs each year. Many of the federal and state agencies that hire our majors, along with various environmental consulting firms, participate. Students are made aware of the Job Fair opportunities by e-mail and class announcements. The USU Career Services office also assists students in preparing their resumes.

QCNR Job Fair and Resume Support: QCNR has several events and resources in place to help students with seasonal and fulltime employment. The QCNR Advising Center has a peer advisor that is specifically trained to help student create a resume focused on natural resource employment. The peer advisor receives training from USU Career Services, USU Huntsman School of Business to best help with resume editing and creation. The peer advisor also receives specific training on applying for jobs on the USAjobs website. QCNR students are able to schedule one-on-one appointments with the peer advisor. These activities prepare students for the QCNR Job Fair. Each spring semester the QCNR Advising Center organizes a job fair for natural resource jobs, which is held in the NR atrium. This job fair includes state and federal agencies, non-profit organizations, and municipalities. In preparation for the job fair, QCNR and USU Career Services host an event entitled “Prepare for the Fair”. The event includes a resume review station and also the opportunity for student to practice interview questions. The SAF Student Chapter also hosts a USAJobs workshop every winter.

III. 4. Recruitment and retention of a diverse student body

Recruitment of a racially diverse student body is a continuing challenge for QCNR and WILD. As of 2018, 83% of USU undergraduate students were white and 6% were Hispanic, and other race categories combined were <6% of the total. Proportions are similar for QCNR, WILD, and FEMA. The proportion of Hispanic students at USU, QCNR, and WILD is lower than for

residents in Logan, Utah (74.6% white 15.7% Hispanic in 2010;) and in the state of Utah (88% white and 13.3% Hispanic, suggesting that we may be missing local and regional recruiting opportunities for Hispanic students. Discussions about recruiting at local and regional high schools with higher proportions of Hispanic students, potentially through high school agriculture instructors and clubs, are underway between forestry faculty and the Academic Advising Center. USU, QCNR, and WILD value racial, gender, and socioeconomic diversity among our students and try to promote a welcoming atmosphere both in recruiting and in day-to-day interactions. Efforts to support and promote diversity at USU take several forms:

- The USU Admissions Office hosts "Diversity and First Generation" events on the Logan and Price campuses.
- The USU President recognizes individuals and organizations who further the principles of affirmative action by providing diversity awards in several categories.
- A range of clubs are available representing different cultural groups, each sponsoring events throughout the year: the Asian Student Association, Black Student Union, LatinX Student Union, Polynesian Student Union, Aggie Dreamers United, the Native American Student Council, and the Society for Advancement of Chicanos/Hispanics and Native Americans in Science.
- Other clubs and activities supporting students who represent other forms of diversity are available: the Perspectives Club, the Queer Student Alliance, the Nontraditional Student Association, and ongoing Gender and Sexuality programs through the LGBTQA Center.
- The Native American summer mentorship program, an annual month-long program in which 20-25 scholars from the USU Blanding campus stay in Logan and participate in a wide range of research laboratories to learn more about STEM majors. Several QCNR faculty have been involved in this program over the past 5 years.

USU programs on diversity, equity and inclusion are described on the Provost's website, and our policies on discrimination are provided through USU's Office of Equity. QCNR faculty have been particularly active in the Allies on Campus program, which includes a training seminar to help create "safe zones" for students identifying as non-binary genders.

III. 5. Student employment data *Return to Table of Contents*

Several efforts have been made to collect student employment data for FEMA majors:
(1) Graduating senior surveys conducted by WILD (Standard II.7.2) (Document F, Table F-1).
(2) Employment status surveys conducted USU Career Services First Destination Surveys (Standard II.7.5, III.5; Document F Tables F-2 and F-3).
(3) Surveys of FEMA alumni conducted by WILD (Standard II.7.5) (Document F, Tables F-4 and F-5).

None of these approaches gives us a complete picture of our students' employment status, but together the data suggest that the majority of FEMA students do achieve permanent full-time employment in their field of study. The survey of FEMA matriculating students and graduating seniors (Standard II.7.3) was implemented in response to the lack of data in this area. We hope to improve response rates in the future by discussing the importance of these data to the FEMA students.

III. 6. Student advising *Return to Table of Contents*

All newly admitted freshmen and transfer students are required to participate in an Online Orientation before being permitted to register. An on-campus Aggie Orientation is also available for incoming freshman. In 2019, 28 of the 49 incoming QCNR students came to an on-campus session. During Aggie Orientation students meet with the QCNR academic advisors and get an introduction to the resources available in the QCNR Advising Center. The QCNR Academic Advising Center is staffed by two professional advisors and a student peer advisor. The center provides support for students beginning with entrance to the college and culminating in degree completion and job placement. Some of the resources available through the center include job search and resume help, internship placement, scholarships, undergraduate teaching fellow opportunities, undergraduate research opportunities, and funding to attend professional meetings.

The QCNR advisors have a student caseload that allows every student to meet with an advisor at a minimum of three times a year and as much as needed to support academic success. QCNR advisors use an appointment management system that logs every student appointment and also allows students to complete a satisfaction survey after every advising appointment. The questions and responses for evaluating advisors are summarized in Table 15. The results are overwhelmingly positive. These surveys are reviewed each month by the director of the advising center. The surveys are used to implement advising program changes if necessary. With the use of this software, the advising center is also able to track students' participation in advising and to complete outreach initiatives for those students who do not participate in academic advising each semester. Students are proactively encouraged to meet with advisors in a variety of ways. For example, all QCNR students are required to take Natural Resources Professional Orientation (WILD 2000). Course assignments include meeting with a professional academic advisor and an assigned faculty advisor. This proactive approach to advising in QCNR has resulted in 90% of students participating in academic advising each year. Students report a high level of satisfaction with their advising experience in QCNR. The QCNR Advising Center has repeatedly been recognized at Utah State University as having above average rates of student retention. For example, QCNR retention rates for the 2018-2019 cohort are 13.45% above the average of other USU colleges, and QCNR has the highest retention rate of all USU colleges for female students (89.5%) and second highest retention rate for male students (83.3%). At the departmental level, WILD retention rates are provided in Table 16. Each of the four undergraduate majors in the Wildland Resources Department has a designated faculty advisor. The role of the faculty advisor is to provide information and advice about course choices, extracurricular experiences, and career options. Department Head Mike Kuhns has been advising all FEMA students, but Justin DeRose will be taking on that responsibility starting in 2020.

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Table 15. QCNR Advising satisfaction survey data from Dec. 2, 2015 – Sep. 3, 2019. Surveys are completed after every advising visit, so some students may be overrepresented relative to all QCNR students.

Question	N	Responses	
I was able to efficiently schedule an advising appointment.	964	Strongly Agree	81%
		Agree	14%
		Disagree	1%
		Strongly Disagree	1%
		Not Answered	4%
The reception staff was courteous and helpful.	957	Strongly Agree	64%
		Agree	14%
		Disagree	1%
		Strongly Disagree	0%
		Not Answered	22%
My academic advisor was welcoming.	956	Strongly Agree	93%
		Agree	5%
		Disagree	0%
		Strongly Disagree	1%
		Not Answered	1%
My academic advisor assisted me with selecting appropriate courses that will meet my degree requirements.	835	Strongly Agree	87%
		Agree	7%
		Disagree	0%
		Strongly Disagree	1%
		Not Answered	5%
I was provided with accurate and timely information about college, department and university policies, regulations and procedures.	767	Strongly Agree	80%
		Agree	12%
		Disagree	0%
		Strongly Disagree	1%
		Not Answered	7%
My academic advisor was knowledgeable about campus resources and assisted with referrals.	767	Strongly Agree	80%
		Agree	10%
		Disagree	0%
		Strongly Disagree	1%
		Not Answered	9%
My academic advisor was proficient in the use of Banner and Degree works in assisting me with my advising.	850	Strongly Agree	89%
		Agree	7%
		Disagree	0%
		Strongly Disagree	1%
		Not Answered	3%
My time with my advisor was well spent and productive.	886	Strongly Agree	93%
		Agree	6%
		Disagree	0%
		Strongly Disagree	1%
		Not Answered	0%

Table 15 (continued) *Return to Table of Contents*

I plan to follow up on the resources and referrals that were discussed during my advising appointment.	750	Strongly Agree Agree Disagree Strongly Disagree Not Answered	79% 12% 0% 1% 8%
I was well prepared for my advising appointment.	668	Strongly Agree Agree Disagree Strongly Disagree Not Answered	70% 26% 2% 1% 1%
I am satisfied with my advising appointment.	511	Strongly Agree Agree Disagree Strongly Disagree Not Answered	92% 7% 0% 1% 0%

First year retention rate of the fall cohort in WILD				
2013	**2014**	**2015**	**2016**	**2017**
57.1 %	61.5 %	56.0 %	65.9 %	82.1 %
Six-year retention rate of the fall cohort in WILD				
2008	**2009**	**2010**	**2011**	**2012**
44.4 %	82.8%	51.9%	79.2%	69.0%

Table 16. Undergraduate student retention for the Wildland Resources Department.

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STANDARD IV: PARENT INSTITUTION SUPPORT

IV. 1. Overview of parent institution support

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 (WILD). 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.

Departmental operating funds have been fairly steady since the previous accreditation report (Table 18), though we received increases as a part of an effort to encourage departments to teach courses that can be accessed by students not on the Logan campus, either by broadcasting courses from Logan that also are being taught live to students in Logan (or broadcasting from non-Logan campuses to students in Logan), teaching labs for broadcast courses on other campuses when a lab is required, having and being supportive of department faculty at non-Logan campuses who have non-typical heavy teaching loads, and teaching online courses. Being willing to do such teaching aimed at students who are not in Logan and who may never be in Logan has brought our department $5K to almost $20K a year in fairly unrestricted operating funds at least for the last four years. Also, because it has made it possible to offer one of our undergraduate majors, Wildlife Ecology and Management (WEMA), at USU's branch campus in Vernal and at USU Eastern in Price, we have two additional faculty fully paid for by those campuses, and those faculty do teach courses that are available to FEMA majors. We also get funding from course fees when there are legitimate expenses for things like 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.

IV. 2. Funding and support for retention of faculty, staff, and administrators

IV. 2. 1. Faculty hiring and retention

Hiring and retention of core FEMA faculty requires that remuneration packages are competitive with national norms. Base salaries for USU faculty are comparable to national averages for research faculty in natural resources and conservation fields at 4-year research universities, and somewhat below other western Land Grant universities with SAF-accredited forestry programs (Table 17). However, these deficits are offset by the very favorable benefits package offered by USU, which is currently worth an additional 44.56% of the annual salary, which includes a 14% retirement benefit, and the comparatively low cost of living (particularly housing) in Logan. The retention of faculty is generally not compromised by weak financial incentives. The biggest challenges to recruiting and retaining outstanding faculty members are related to the small size of Logan and the low diversity of economic enterprises in Logan, which can make it difficult to

find suitable jobs for faculty partners. USU has a dual career assistance policy that eases the interviewing and hiring of partners when a job that they qualify for is available, but it is more difficult to get funding to create jobs for partners. WILD faculty salaries in 2017 were somewhat below USU averages (Table 17), but this pattern varies by rank and is influenced by small sample sizes and variation among individuals, especially at the rank of professor. The 13 faculty most involved in the FEMA program (Table 26) account for a total of $1,565,021 (42%) of the WILD departmental budget in Table 18.

The central administration of USU maintains a strong emphasis on promoting best practices in the tenure and promotion process. At USU this process involves a Tenure Advisory Committee (TAC) comprised of ~5 senior colleagues who conduct both formative and summative evaluations of the candidate every year. Formative evaluations are based on peer reviews of teaching, including classroom visits, as well as reviews of research directions and productivity. Summative evaluations are communicated by letter from the TAC to the department head and copied to the candidate. While this system has some drawbacks, the benefit is that each faculty member is actively mentored by a small group of close colleagues who provide detailed feedback and thus support excellence in education, extension, and research.

Table 17. Academic year (9 month) base salaries of tenured or tenure-track faculty in the Department of Wildland Resources (as of June 2017) compared with averages for USU, national values for faculty in Natural Resources and Conservation at 4-year public institutions (2018-19), and peer institutions with SAF accreditation (2017-18), as provided by the most recent Chronicle of Higher Education's faculty salary survey of universities (Carnegie Foundation classification of research universities – high research activity).

Rank	USU, WILD	USU	Nat'l NR & Cons. 4-year	CSU	OSU	NAU	UofI	UMont
	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
Professor	$96k	$105k	$103k	$125k	$123k	$106k	$103k	$82k
Associate Professor	$72k	$83k	$84k	$92k	$96k	$78k	$80k	$65k
Assistant Professor	$65k	$72k	$75k	$77k	$84k	$66k	$72k	$59k

IV. 2. 2. Faculty office and laboratory space

WILD provides faculty offices for all faculty members, and for research faculty members and others with research programs, laboratory space and graduate student office space is also provided. Faculty involved in the FEMA program have offices and laboratories interspersed throughout the NR and BNR buildings. USU also houses a Dendrochronology Laboratory, directed by Justin DeRose. This laboratory is on the third floor of the NR building and a sample processing lab exists in the basement of the BNR building.

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Table 18. Wildland Resources Department budgets for the past three fiscal years. Education and General funds (E&G) are a combination of funding from the Utah State Legislature and tuition revenues.

Source	WILD department costs	FY17 $	FY18 $	FY19 $
E&G	Faculty salaries	1,095,105	1,016,995	1,160,825
E&G	Staff salaries	37,245	33,780	34,797
E&G	Graduate assistant salaries	12,425	41,151	2,288
E&G	Wages	28,467	33,702	19,175
E&G	Benefits	498,831	485,428	538,303
E&G	Awards and sponsorships	2,985	1,685	28,559
E&G	Computer & telecommunication service	16,498	18,364	18,069
E&G	Contracted services	3,061	9,279	11,285
E&G	Equipment	25,281	1,933	7,490
E&G	Moving expenses		12,038	
E&G	Other administrative expenses	18,794	13,794	23,251
E&G	Supplies	8,953	2,759	2,141
E&G	Travel	5,256	20,611	8,350
E&G	Subtotal operating expenses	80,829	80,463	99,145
	Total departmental costs	**1,752,901**	**1,691,519**	**1,854,533**
Other funding sources-internal	**WILD department costs**	**FY17**	**FY18**	**FY19**
Utah Ag. Exp. Station	Salaries	330,368	350,151	366,841
USU Extension	Salaries	418,620	486,979	500,941
USU Ecology Center	Salaries	179,167	183,968	185,193
USU Uintah Basin campus	Salaries		63,000	64,695
	Benefits	404,912	497,194	503,128
	Operating funds	167,460	167,460	167,460
	Total other funding sources-internal	**1,500,527**	**1,748,752**	**1,788,258**
Other funding sources-external	**WILD department costs**	**FY17**	**FY18**	**FY19**
Utah State Legislature	Graduate assistant support	38,371	38,400	34,370
Federal Renewable Resources Extension Act funds	Salaries & benefits	49,345	49,345	49,345
	Total other funding sources-external	**87,716**	**87,745**	**83,715**
	GRAND TOTAL	**3,341,145**	**3,528,016**	**3,726,506**

IV. 2. 3. Computational support *Return to Table of Contents*

USU provides support for a broad range of software package for faculty and students. A variety of software licenses are maintained at the university level for all university-owned systems for Adobe, Corel, ESRI, MatLab, Roxio, SPSS, Apple, Faronics, Microsoft, SAS, and many others. Discounted prices for personal use are also available. USU Information Technology (IT) provides password-secured access to this software, and also provides a help desk accessible by phone, email, or chat window. IT Services also provides information on common questions on their website, along with links to topics through the Knowledge Base and Service Catalog. QCNR employs a full-time person (Wes James) to provide direct support to faculty with computer hardware and software issues. In addition, computational resources are available for USU faculty through an agreement with the University of Utah's High Performance Computing Center.

There tends to be low turnover in staff and administrators in QCNR and in WILD, which provides for a depth of institutional knowledge and efficient operations. Marsha Bailey has been an administrative assistant in WILD since 2008, and was the QCNR Employee of the Year in QCNR (2013, 2019). Allison Cochley has been an administrative assistant in WILD since 2018, and she has quickly become a valuable and efficient asset to WILD faculty and students. Michael Kuhns has been the WILD Department Head since 2012, and plans to step down from this position in Summer 2020 and return to his position as an Extension Forester.

IV. 3. Program support relative to other academic units at USU

Salaries within QCNR 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, and to retention of our most productive faculty members. The result is that salaries within each academic rank are generally consistent across departments in QCNR, and other similar departments, with variation in salaries occurring primarily due to variation in individual performance and role statements. Current mean salaries of core faculty members paid with E&G funds in QCNR departments and similar departments in two other colleges are provided in Table 19. Cost of living raises for USU employees (which exclude merit pay or other types of raises) from 2015-2019 have ranged from 1% to1.5%.

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Table 19. Average academic year (9-month) base salaries of core faculty at different ranks in the three departments within the Quinney College of Natural Resources as of Fall 2019.

USU College	Quinney College of Natural Resources						College of Science		College of Agriculture	
	Wildland Resources Department		Watershed Sciences Department		Environment and Society Department		Biology Department		Plants, Soils & Biometeorology Department	
Rank	Average	N	Average	N	Average	N	Average	N	Average	N
Professor	$97,269	9	$121,563	2	$99,987	5	$98,217	7	$105,713	6
Associate Professor	$89,118	5	$84,757	5	-	0	$76,648	6	$72,710	2
Assistant Professor	$64,713	6	$65.261	4	$75,153	4	$77,523	8	$73,271	5

IV. 4. Professional development and continuing education

Support is available for faculty members to participate in national conferences and workshops on research, professional practice, and teaching pedagogy. Travel funds for these activities are available through QCNR, WILD, the Utah Agriculture Experiment Station, and the USU Ecology Center. The Tenure Academy and Empowering Teaching Excellence program, described in Standard II.4, is also provided for faculty to continually develop and update their teaching skills. The USU Office of Research also offers annual grant-writing workshops for graduate students and faculty. Other in-house workshops and seminars are available throughout the year. For example, the USU Office of Research, the College of Science, and the Ecology Center are sponsoring a workshop entitled "Enabling Interdisciplinary and Team Science: A Professional Development Program, Presented by the American Institute of Biological Sciences" in fall 2019 for faculty members. In another recent example, The President's Office recently sponsored an Inclusive Excellence symposium entitled "Disrupt" to address issues of diversity and inclusion on campus.

IV. 5. Student support services

The USU Academic Success Center provides access to a variety of tutoring services, supplemental instruction (through organization of peer study groups), resources for building studying and test-taking skills, and links to a variety of other USU support services. The USU Academic Success Center provides assessment processes and outcomes through its website.

The USU Student Support Services program is a federally funded program focusing on recruiting, retaining, and improving success for students who are low income, first generation, and/or have a documented disability. This program provides access to intensive academic and career advising services a variety of preparatory and remedial courses for target students.

In addition to the usual student services (health, housing, dining, etc) and cultural and sports programs that would be expected on any U.S. university campus, all USU students have access to:

- counseling and psychological support programs
- counseling and information about sexual assault
- career services
- child care
- a disability resource center
- gender and sexuality programs
- an international student office
- multicultural services, and
- a veterans resource office

Within QCNR, the Academic Advising Center (see Standard III.6) provides advising services as well as connections to undergraduate research, scholarships, clubs, internships, a graduate/undergraduate mentoring program, and provides organized study sessions for QCNR students in Biology 1610/1620, courses that often present a struggle for incoming freshmen. The QCNR Academic Advising Center is also involved in student awards, undergraduate research referrals, and referral to other student services on campus.

IV. 6. Strengths and weaknesses of USU and WILD *Return to Table of Contents*

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, QCNR provides a close-knit and supportive environment in which students interact across majors and departments. Enrollments in our forestry program are low compared to many other SAF-accredited forestry programs. 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. The REMA program in WILD is also an accredited (by Society for Range Management) but low-enrollment program which is valued by both WILD and USU. In order to retain the teaching capacity for these low-enrollment programs, WILD curricula are designed to be integrative, so that all undergraduate students take a set of common courses. WILD curricula also make use of courses taught outside the department and QCNR (see Standard V). This arrangement provides FEMA students with exposure to other disciplines, which is particularly important for forestry professionals working in the Intermountain West, where forest resources are often managed for goals other than timber production, and where professionals frequently work in interdisciplinary teams.

IV. 7. Library facilities

USU's Merrill-Cazier Library is a modern facility occupying 305,000 square feet and is centrally located on campus near the QCNR building. The spaces, services, and resources provided by this library serve our students and faculty very well. The library provides access to almost 2

million print books and journals, 7.6 million e-books, 480,000 government publications, and over 60,000 electronic journals. Additionally, the Merrill-Cazier Library contains an automated storage and retrieval system for efficient storage of printed materials, along with a very efficient Resource Sharing and Document Delivery Service for access to materials not owned by USU Libraries. As a physical space, the Merrill-Cazier Library houses over 150 computer workstations for student use, has a variety of reservable group study rooms for students, and several classrooms. The Merrill-Cazier Library also houses a Writing Center, a proctored Testing Center, and a variety of resources for printing, scanning, and recording. Subject librarians serve and represent the needs of students and faculty in academic departments, making recommendations about the purchase of materials and services, and providing personalized consultation about library research and instructional resources. The USU Libraries provides access to over 400 databases, including many specific to natural resources and science, and provides access to 115 journals directly relevant to forestry (Appendix 3). Through either direct subscriptions (e.g. Elsevier, Springer, or Wiley) or aggregators (e.g. EBSCO, ProQuest, or Gale), the Merrill-Cazier library provides access to 47 of the 50 (94%) most-cited journals in forestry.

As with most academic libraries, the Merrill-Cazier library struggles to maintain journal access as publishers increase prices for individual or bundled subscriptions and publications. In response, the library promotes open access publishing by faculty by providing financial assistance for page charges, providing open access solutions for research faculty, and providing access to Open Educational Resources for faculty and students. The Merrill-Cazier Library also provides an institutional repository (Digital Commons) for open access to scholarly works, databases, research, reports, publications, and courses produced by Utah State University faculty, staff, students, and others.

In addition to the Merrill-Cazier Library, QCNR is fortunate to have been endowed with the Quinney Library, which is physically connected to the Natural Resources building. This library specifically maintains collections of materials pertaining to natural resources and the environment. These are available in a number of formats that support the programs of study and research of QCNR students and faculty. The Quinney Library is particularly efficient in curating and locating "grey literature" which can be extremely valuable in natural resources but often difficult to find. Between the QCNR's Quinney Library and USU's Merrill-Cazier Library there is an extensive collection of reference books relevant to forestry, and the extensive list of relevant journals is available from the library web site.

IV. 8. Physical learning environment

The availability of classroom and teaching laboratory facilities to the Department of Wildland Resources is becoming a limiting factor, largely due to the needs of the WEMA degree. Enrollments in some courses are restricted to students who require those courses for their major, meaning that some courses are not available as electives. Generally, the delivery of FEMA-specific courses is not yet being compromised by space constraints, although there is a concern that some courses, such as WILD 3600 (Wildland Plant Ecology and Identification), need more

bench space for laying out specimens. On the positive side, the Department has recently purchased an advanced microscope for use in these classes, and most classrooms are equipped with updated multimedia equipment to facilitate high-quality interactive broadcast of classes to and from regional campuses.

QCNR faculty and staff offices, laboratories, workspaces, and classrooms exist in four adjacent buildings: Natural Resources (NR), the south wing of Biology and Natural Resources (BNR), the Janet Quinney Lawson building (JQL), and the new Life Sciences building (LSB), which was completed in 2019. The NR building includes classroom space dedicated to WILD and to QCNR as well as office space for faculty, postdoctoral scholars, graduate students, and federal collaborators, as well as faculty laboratory space. The JQL building provides office space for beginning graduate students and research labs for geospatial analysis and animal migration studies. The north wing of the BNR building (previously occupied by the Biology Department) is currently undergoing a major renovation, and renovating the south wing is expected to occur in the next few years. Remodeling of the south wing will allow WILD to upgrade faculty office and laboratory space.

Safety in laboratory and field settings is a priority for USU, WILD, and QCNR. Information on USU policies, reporting, and training related to safety is provided on the USU Environmental Health and Safety website. Safety plans for individual faculty and their students and technicians, including laboratory and field activities, are kept updated and are available through the WILD website "Research" tab. In addition, basic Wilderness First Aid (WFA) and advanced Wilderness First Responder (WFR) training is available on campus several times a year. WFA is completely funded (and is required for students working in the field) and WFR is partially funded by WILD and QCNR.

IV. 9. Outdoor laboratory sites

Field instruction facilities available for FEMA courses include the Green Canyon research facility on the outskirts of Logan, the T. W. Daniel Experimental Forest (about 60 km from campus), and the Hardware Ranch Wildlife Management Area (about 40 miles from campus). These facilities are frequently used for undergraduate instruction and undergraduate research. In addition, the USU campus is just over a mile from the border of the Uinta-Wasatch-Cache National Forest, which provides extensive opportunities for students.

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STANDARD V: CURRICULUM

Relevant Documents and Appendices:
Document AB-1: Required Courses
Document AB-2: Restricted Electives

V. 1. Curriculum overview

WILD offers four Bachelor's degrees: Forest Ecology and Management (FEMA), Range Ecology and Management (REMA), Wildlife Ecology and Management (WEMA), and Conservation and Restoration Ecology (CREC). Both the FEMA and REMA degrees are accredited by their professional societies. There is no program accreditation for wildlife professionals by a professional society. The CREC degree was initiated in 2004 to provide a highly flexible alternative to the other degrees, which are constrained by accreditation requirements and discipline-specific federal qualification standards. Many WILD students opt for a degree in CREC although they take many of the professional courses in forestry offered through the FEMA program, and these students frequently go on to forestry-related careers. CREC is our second most popular major (behind WEMA, Table 10), and CREC students focused on forestry directly benefit from the courses, faculty, and students in the FEMA program. Thus, the impacts of the FEMA program are underrepresented when only FEMA students are counted (as is the case in this self-study document).

The University requires that each academic department and college publish a "requirement sheet" and "sample 4-year plan" for each of its undergraduate degrees, showing all course requirements. These requirement sheets and sample 4-year plans are available in hard copy, on the USU General Catalog web site, and current links are provided on the FEMA degree program website. These resources are updated annually, and represent a contract between the student and the university. A student is held responsible for fulfilling the requirements described in the catalog published in any year during their matriculation, and the requirements also serve as a guide in meetings with the student's academic adviser.

All USU Bachelor's degrees (including the FEMA degree) require a minimum of 120 credits with a grade of C- or better (including general education and depth education requirements), and a minimum of 40 upper division credits. The FEMA degree meets these requirements in the required courses described in Documents AB-1 and AB-2, along with 18-19 free elective credits. The elective courses allow students to obtain minors (e.g. Biology, GIS, Soils, Fisheries Science, Recreation Resource Management) within a 4-year program, depending on course availability, offering times, and other student-specific variables.

The degree requirements for the FEMA curriculum can be divided into the following components:

- General education and depth requirements
- Scientific foundation courses
- Departmental common courses
- Professional coursework

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The degree requirements in the FEMA program meet and exceed those articulated in the U.S. Office of Personnel Management Forestry Series 0460 requirements. The specific way in which the Series 0460 requirements align with the FEMA program requirements is explained in an OPM-FEMA information sheet provided on the FEMA degree website, and in Appendix 2. This information sheet is helpful to students applying for federal jobs in forestry.

The syllabi for required professional courses in the FEMA degree are provided in Appendix 5.

V.1.1. Communications

All USU Bachelor's degrees require 6 credits of general education courses designated as "Communications Literacy" (CL1 and CL2). These are generally covered by ENGL 1010 and ENGL 2010, although students may fulfill this requirement through AP English classes and/or performance standards on ACT, SAT, RSAT, CLEP, or IBO tests.

In addition, as part of the USU depth requirements, students are required to take two courses (no credit minimums specified) that are designated "Communication Intensive" (CI). These courses must meet rigorous criteria for both oral and written communication components, including rounds of feedback and revision. There are a variety of CI courses available for students, but the CI requirement for FEMA students is met as a part of the required courses (WATS 3700 and WILD 5700) (Documents AB-1 and AB-2). Many of the general education courses required for the FEMA degree also have a communications component although they are not designated as a CL or CI course (Documents AB-1 and AB-2).

Nevertheless, both faculty and employers feel that students generally lack communication skills even at the end of their programs of study, and this issue has been discussed extensively by the WILD Curriculum Committee. A course entitled "WILD 4950 – ST Scientific Communication for Natural Resource Professionals" (Appendix 5) is being piloted in Fall 2019 and will become a recommended option for the FEMA curriculum starting in Fall 2020. This course will focus on proposal writing, poster presentations, and oral presentations in natural resource areas. As envisioned, this class will have prerequisites from the departmental common courses, and will be a junior- or senior-level course which will build communication skills from a base of coursework experience shared by students. We anticipate that this course will also be approved as a CI course, and will also serve the needs of other WILD majors.

V.1.2. Sequential integration

The FEMA curriculum is carefully designed to have sequential prerequisites and recommended course orders which allow students to attain basic skills and then use those skills to learn and apply management techniques. The series of prerequisites (Table 20) and careful advising following the four-year plan (Table 21) ensure that students take courses in a logical, accumulative order and that they finish their degrees in an efficient manner. During WILD 4750 Monitoring and Assessment, students conceptualize a research project, design the project data collection and statistical analysis, collect data, and then report on findings. This course builds on courses covering statistics, plant ID, and ecology. During the FEMA capstone course, WILD

5700, students use skills and knowledge from previous courses to analyze the costs and benefits of alternative forest management strategies and develop silvicultural prescriptions to meet specific objectives. The sequence of courses is also arranged so that most of the elective credit hours are at the end of the curriculum. This encourages students to use elective hours to follow interests, develop individualized competencies, and often to earn minors in other subjects. USU recently invested in Curricular Analytics software and training, which assesses curriculum complexity by mapping prerequisites. Output from this software for the FEMA program is provided in Figure 13. Courses in the FEMA curriculum are placed so that core prerequisite courses occur early in the curriculum, minimizing graduation delays for students who do not pass these courses the first time they take them. Elective courses are also generally later in the curriculum, allowing students to make decisions about electives at a time when they have more clarity about their career goals.

V.1.3. Fostering analytical and critical reasoning skills and systematic problem solving & decision making

Analytical and critical reasoning skills are emphasized throughout the curriculum, and to the extent possible, instructors strive to engage students by questioning them during class, and having them work in small groups to solve problems on long- and short-time scales. Critical reasoning skills are particularly emphasized in WILD 4750 (Monitoring and Assessment in Natural Resource and Environmental Management) and WILD 5700 (Forest Assessment and Management), where students work on a capstone project. The small size of most classes (especially in the junior and senior levels) allows individualized time with faculty members and teaching assistants. Quantitative skills are a challenge for our students, but there is an increasing need for these skills in the workforce, particularly in long-term or large-scale monitoring programs which foresters are likely to design or encounter. Three of the most recent faculty hires in WILD (Manlove, Rushing, Avgar) were for positions that were explicitly quantitative, and other recent hires (DeRose, Yocom) also have strong quantitative, modeling, and computational skills. In the September 2019 WILD Department meeting there was an extended discussion about the need to revisit the way quantitative topics are taught for WILD graduate and undergraduate students. A subgroup of faculty is currently working on proposals to update the instruction of quantitative skills and increase coordination across classes so that these skills are reinforced.

V.1.4. Awareness of historical and current issues and policies affecting resource management and conservation

With rapidly changing ecological and political landscapes, it is particularly important that WILD students understand historical issues, the policies that were motivated by these issues, and the emerging current issues impacting natural resources. Most courses in FEMA curriculum cover current issues and policies in forest management by way of examples and ecological contexts. WILD 3100, 3800, 4750 and 5700 in particular address management legacies, climate change impacts, and ecological trends. ENVS 3010 is specifically dedicated to natural resource policy.

Table 20. FEMA Required Courses Having Prerequisites.

FEMA Required Course	Prerequisite Courses	FEMA 4-Year Plan
BIOL 1620 Biology II	BIOL 1610 Biology I	Freshman Fall
MATH 1050 College Algebra (QL)	ACT, SAT, AP, or math placement exam	Freshman Spring
MATH 1100 Calculus Techniques (QL)	ACT, SAT, AP, or math placement exam, or grade of C- or better in MATH 1050 College Algebra	Sophomore Fall
WATS/BIOL 2220 General Ecology	BIOL 1610 Biology I BIOL 1620 Biology II or concurrent enrollment	Sophomore Fall
WILD 2400 Wildland Resource Techniques	MATH 1050 College Algebra or higher BIOL 1610 Biology I BIOL 1620 Biology II or concurrent enrollment	Sophomore Fall
CHEM 1110 General Chemistry I (BPS)	MATH 1050 College Algebra or concurrent enrollment	Soph. Spring
STAT 2000 Stat. Methods or STAT 3000 Stat. for Sci.	MATH 1050 College Algebra or MATH 1100 Calc. Tech. with a grade of C- or better	Soph. Spring
PSC 3000 Fundamentals of Soil Science	CHEM 1110 General Chem. I or higher MATH 1050 College Algebra or higher	Junior Fall
WILD 3820 Forest Plants: ID, Biol.,Funct.	MATH 1050 College Algebra or higher	Junior Fall
WILD 3800 Wildland Plants and Ecosystems	BIOL 1620 Biology II WATS/BIOL 2220 Gen. Ecol.	Junior Fall
WILD 3810 Plant and Animal Populations	WATS/BIOL 2220 Gen. Ecol. MATH 1100 Calculus Techs. or higher STAT 2000 Stat. Methods or STAT 3000 Stat. for Sci. with a grade of C- or better	Junior Fall
WILD 3850 Vegetation & Habitat Mgt.	WILD 3800 Wildland Plants and Ecosystems	Junior Spring
WILD 4750 Mon. & Asst. in Natural Resources & Envtl. Mgt.	WATS/BIOL 2220 Gen. Ecol. MATH 1100 Calculus Techs. or higher STAT 2000 Stat. Methods or STAT 3000 Stat. for Sci. with a grade of C- or better WILD 2400 Wildland Resource Techniques WILD 3810 Plant and Animal Populations or concurrent enrollment	Senior Fall

Figure 13. Curricular Analytics output for the FEMA program. Lines between courses represent prerequisites. The number for each course represents a "complexity" score incorporating the length of the prerequisite chain and the delay potential of each course.

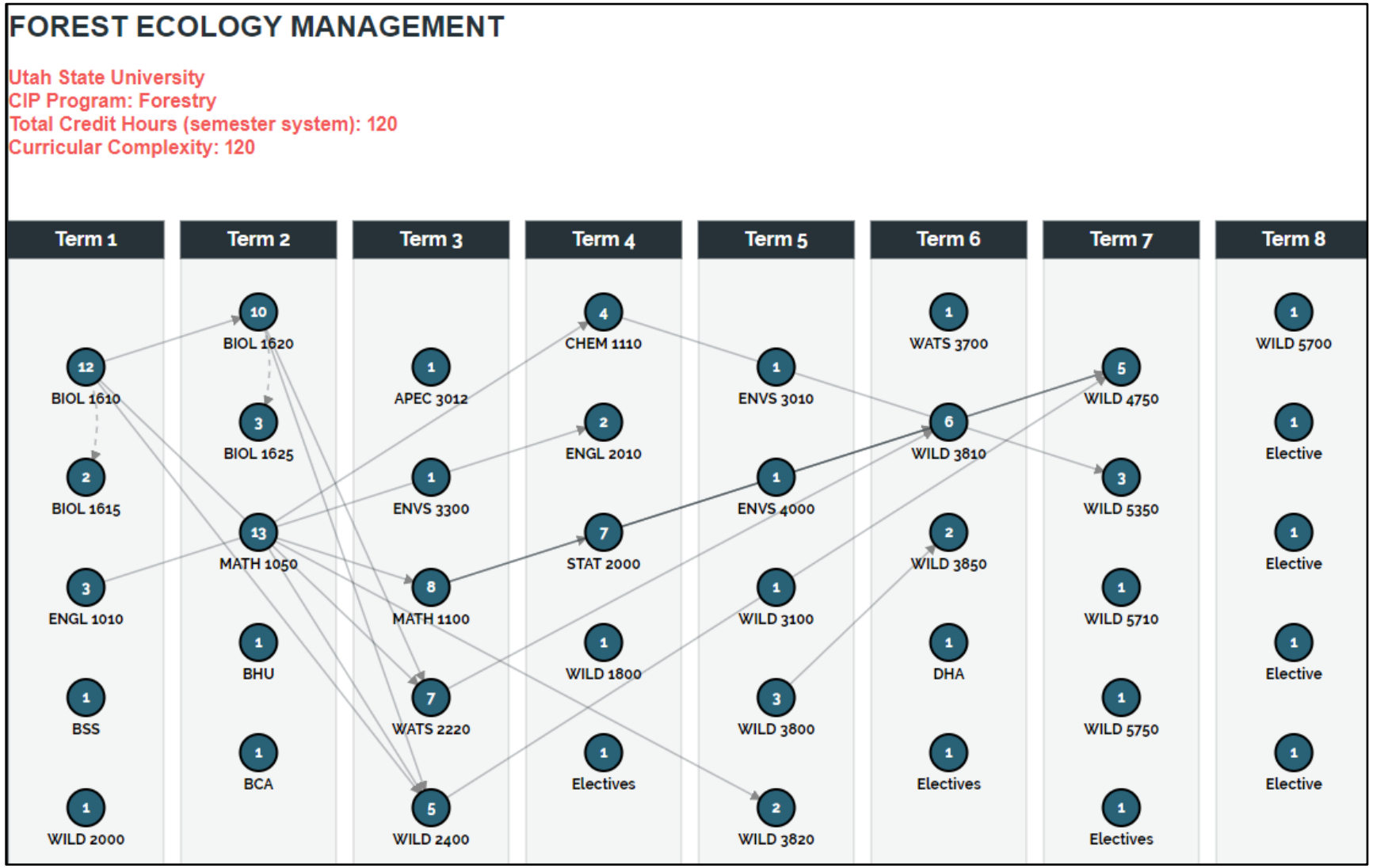

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Table 21. FEMA curriculum recommended four-year plan as it appears on the FEMA degree website.

Year 1 (28 credits)		**Year 2 (30-31 credits)**	
Fall (14 cr.)		Fall (15 cr.)	
BIOL 1610: Biology I	3 cr.	APEC 3012: Intro NR Econ.	3 cr.
BIOL 1615: Biology I lab	1 cr.	ENVS 3300: Rec. Res. Mgt.	3 cr.
ENGL 1010: Intro. to Writing	3 cr.	MATH 1100: Calc. Techs.	3 cr.
Breadth Social Sciences course	3 cr.	WATS 2220: Gen. Ecology	3 cr.
WILD 2000: NR Prof. Orient.	1 cr.	WILD 2400: Wildland Techs.	3cr.
Breadth Am. Inst. Course	3 cr.		
Spring (14 cr.)		Spring (15-16 cr.)	
BIOL 1620: Biology II	3 cr.	CHEM 1110: Gen.Chem. I	4 cr.
BIOL 1625: Biology II lab	1 cr.	ENGL 2010: Intermed. Writ.	3 cr.
MATH 1050: Coll. Algebra	4 cr.	STAT 3000 or STAT 2000	3/4 cr.
Breadth Humanities course	3 cr.	WILD/GEOG 1800 Intro GIS	3 cr.
Breadth Cr. Arts course	3 cr.	Elective*	2 cr.
Year 3 (31 credits)		**Year 4 (31 credits)**	
Fall (17 cr.)		Fall (16 cr.)	
ENVS 3010: Fund. NR Policy	3 cr.	WILD 4750: Inv. & Mon.	4 cr.
ENVS 4000: Hum. Dim. NR	3 cr.	WILD 5350: Wildland Soils*	3 cr.
PSC 3000: Fund. Soil Sci.	4 cr.	WILD 5710: For. Disturb.	3 cr.
WILD 3800: Wild.Plants & Ecol.	4 cr.	WILD 5750: App. Rem. Sens.	3 cr.
WILD 3820: Forest Plants	3 cr.	Elective*	3 cr.
Spring (14 cr.)		Spring (15 cr.)	
WATS 3700: Watershed Sci.	3 cr.	WILD 5700: For Asst. & Mgt.	3 cr.
WILD 3810: Pl. & An. Pops.	3 cr.	Electives*	12 cr.
WILD 3850: Veg & Hab. Mgt.	3 cr.		
Depth Humanities course	3 cr.		
Elective*	2 cr.		

V.1.5. Variety of educational experiences including lectures, discussion, simulations, computer applications, and individual and group projects in laboratories and field experiences

The value of using a variety of educational experiences to enhance student interest and knowledge/skill retention is well understood by FEMA faculty, and emphasized in the Tenure Academy as well as professional development workshops provided by the Empowering Teaching Excellence (ETE) program (see Standard II.4). Even within a class period, but certainly within each course, instructors strive to provide a diversity of learning experiences. The varied experiences may include field trips, computational labs, group projects, and flipped classroom

formats, among others. One aspect of the departmental common courses that sometimes limits the use of these varied approaches is the need to include synchronous broadcast sections to and from other locations throughout Utah. While these broadcast sections are generally a small portion of the classes and a low number of students (often only one or two), they do constrain the ability of students to participate in field experiences or ad hoc small group discussions. FEMA courses which typically include a broadcast section are described in Table 22. Other factors that can constrain the ability to use field experience in courses include vehicle logistics, snow and weather logistics, and interference with other classes.

Table 22. FEMA courses that typically include a broadcast or online section as an option in addition to the face-to-face section.

Course	Instructor	Originating Campus	Delivery Method
WILD 3810	Chynoweth	Uintah Basin	Online
WILD 3850	LaMalfa/DeRose	Logan	Broadcast to other campuses
WILD 3100	Yocom	Logan	Broadcast to other campuses
WILD 3800	Adler/LaMalfa	Logan	Broadcast to other campuses
WILD 3820	Lutz	Logan	Broadcast to other campuses
WILD/GEOG 1800	Ramsey/Howe/Belmont	Logan	Online (Fa)
PSC 3000	Grossl	Logan	Avail. online in Fall semesters
ENVS 3010	Klain/Welsh	Logan	Broadcast to other campuses (Sp)
ENVS 4000	Coppock	Logan	Broadcast to other campuses (Fa)
APEC 3012	Bosworth	Logan	Broadcast to other campuses (Fa)

Technological Literacy: Technological literacy includes the ability to use computers, find printed and electronic resources (publications and data), use a variety of software, be able to do a limited amount of programming, and use field instruments such as GPS units. The ability to use search engines, electronic library resources, and basic word processing and spreadsheet software is fundamental to success in courses and to be prepared for an increasingly technological workplace. Almost all USU instructors use Canvas software to interface with their students. This software requires that students be able to navigate a variety of course structures, discussions, and assignment formats. Canvas is highly flexible in terms of course design, and USU courses are automatically populated with students as they register. Most courses and employers require familiarity with Microsoft Word and Excel software, at a minimum. Excel spreadsheets are also a useful gateway to databases and R programming, which are increasingly used in FEMA courses (see discussion above about quantitative content). FEMA students also become proficient in the use of the Forest Vegetation Simulation software.

Distance-learning components: The FEMA degree is not an online degree, and is only available on the Logan campus, but some courses do have online sections that are available (Table 22). Although students are generally encouraged or required to enroll in face-to-face sections when they are available, online sections may be appropriate when key instructional faculty are on

sabbatical (and an online section is available from another instructor) or when students live or are employed in locations other than Logan for a semester. Additionally, WILD students living outside Logan sometimes begin their coursework at a different USU campus (primarily the Uintah Basin Campus) and relocate to Logan during their sophomore or junior years to complete their degrees.

V. 2. USU General Education and Depth requirements

All USU Bachelor's degree programs include both General Education requirements (30-34 credits total) and Depth Education requirements (5 courses), consistent with USU's Citizen Scholar objectives . The General Education standards are set by the Utah System of Higher Education as outlined in the Board of Regents Policy R470. The specific course requirements for General and Depth Education requirements, and how they are met in the FEMA curriculum, are provided in Table 23.

Table 23. USU General Education and Depth Education requirements for Bachelor's degrees, and courses taken as a part of the FEMA program to meet these requirements.

USU General Education Requirements		
Category	**Requirement**	**FEMA Curriculum**
Communications Literacy (CL1 & CL2)	6 credits	ENGL 1010, ENGL 2010
Quantitative Literacy (QL)	3-4 credits	MATH 1050, MATH 1100
Breadth American Institutions (BAI)	3 credits	any BAI course
Breadth Creative Arts (BCA)	3 credits	any BCA course
Breadth Humanities (BHU)	3 credits	any BHU course
Breadth Life Sciences (BLS)	3 credits	BIOL 1620
Breadth Physical Sciences (BPS)	3 credits	CHEM 1110
Breadth Social Sciences (BSS)	3 credits	any BSS course
Integrated Studies Requirement	3-4 credits	MATH 1050 + MATH 1100 (both QL) -or- ENVS 4000 + APEC 3012 (both DSS)
USU Depth Education Requirements		
Communications Intensive (CI)	2 courses	WATS 3700 + WILD 5700
Quantitative Intensive (QI)	1 course	STAT 2000 or STAT 3000
Depth Humanities & Creative Arts (DHA)	1 course	any DHA course
Depth Social Sciences (DSS)	1 course	ENVS 4000 or APEC 3012

V. 3. Scientific foundation

There are 29-30 credit hours of science and mathematics content in the FEMA degree (Documents AB-1 and AB-2), including 8 cr. of Biology courses, 7 cr. of Math courses, 3 or 4 cr. of Statistics, 4 cr. of Soils, 3 cr. of Ecology, and 4 cr. of Chemistry. The FEMA degree is a

science-intensive degree, and the program is intended to prepare students for graduate research study as well as professional careers.

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V. 4. Professional education

The professional education requirements for the FEMA degree fall into two general categories: departmental common courses and the FEMA-specific courses (Documents AB-1 and AB-2). Course descriptions and syllabi for all currently required courses, along with those proposed for inclusion in the Fall 2020 curriculum requirements are provided in Appendix 5.

The departmental common courses consist of 24 credit hours in 8 courses (Table 24) which are required of all WILD undergraduate majors. The departmental common courses integrate the degree programs and provide for teaching efficiency. The faculty believe that this approach is effective for educating students to understand and manage sustainable ecosystems, and to prepare them for careers where an understanding of a range of natural resource sciences and issues is increasingly important. The interdisciplinary undergraduate curriculum is consistent with trends in the forestry profession and other forestry degree programs, where ecosystem services beyond timber are increasingly important in management and research.

V. 4. 1. FEMA course coverage of SAF competencies

All faculty teaching professional education courses in the FEMA curriculum (Documents D-1 and D-2) were surveyed in summer/fall 2019 and asked to provide their estimates of the amount of coverage each of their courses provided for each of the SAF competencies. Similarly, we asked alumni to rate the FEMA program (as they experienced it) for coverage of these same proficiencies. The results are provided in Table 7. The primary courses contributing to each proficiency, based on instructor ratings for these proficiencies, are also provided in Table 7. Course syllabi are provided in Appendix 5.

According to the instructor survey, every proficiency was addressed to a moderate degree by at least two required FEMA courses, and most proficiencies were addressed at moderate to high levels by three or more courses (Table 7, Appendix 4). The proficiencies addressed most strongly were “3. Understanding ecological concepts and principles” and “4. Ability to make ecosystem, forest, and stand assessments”. The proficiencies covered least thoroughly was “5. Understanding of the valuation procedures…”.

According to the alumni survey, all proficiencies were rated “critical” or “very important” in terms of importance to the profession. Alumni recommended that tree physiology and forest health issues, as well as stand inventory skills be covered more than when they experienced the program, which is consistent with the message from the employer interviews (Standard II.7.6). Alumni also recommended that skills related to the development of management plans also be increased in the FEMA program. All of these areas are already being carefully considered by the FEMA Curriculum Subcommittee (see Standard 11.7.4). Alumni did not think that any of the proficiencies should be covered “less” than what they experienced in their programs.

Table 24. WILD departmental common courses (common to all WILD degrees) and courses required for the FEMA degree beyond the departmental common.

Common	Course Name	Sem	Cr. Hrs.	Regular Instructor(s)
WILD 2000	Natural Resources Professional Orientation	Fa,Sp	1	Eric LaMalfa Mark Chynoweth Justin DeRose Mike Kuhns
WILD/GEOG 1800	Introduction to GIS	Fa,Sp	3	Peter Howe (fall) Doug Ramsey (spring) Shannon Belmont (labs)
WILD 2400	Wildland Resource Techniques	Fa	3	Eric LaMalfa
WILD 3800	Wildland Plants and Ecosystems	Fa	4	Peter Adler
WILD 3810	Plant and Animal Populations	Sp	3	Clark Rushing Mark Chynoweth
WILD 3820	Forest Plants: Ident., Biol., Function	Fa	3	Jim Lutz
WILD 3850	Vegetation and Habitat Management	Sp	3	Eric LaMalfa Justin DeRose
WILD 4750	Monitoring and Assessment in N.R. and Environmental Management	Fa	4	Kari Veblen Mark Chynoweth (online)
FEMA specific				
APEC 3012	Intro. to Natural Resource and Regional Economics (DSS)	Fa	3	Ryan Bosworth (APEC)
ENVS 3010	Fundamentals of Natural Resource and Environmental Policy	Fa	3	Sarah Klain (ENVS) (Sp) Lisa Welsh (ENVS) (Fa)
WILD 3100*	Introduction to Wildland Fire	Fa	3	Larissa Yocom (WILD)
ENVS 3300	Fundamentals of Recreation Resources Management	Fa	3	Zachary Miller (ENVS)
ENVS 4000	Human Dimensions of Natural Resource Management (DSS)	Fa	3	Layne Coppock (ENVS)
WATS 3700	Fundamentals of Watershed Science (CI)	Sp	3	Soren Brothers (WATS)
WILD 5350*	Wildland Soils	Sp		Andrew Kulmatiski (WILD)
WILD 5700	Forest Assessment and Management (capstone) (CI)	Sp	3	Justin DeRose (WILD)
WILD 5710	Forest Vegetation Disturbance Ecology and Management	Even Years	3	Larissa Yocom (WILD)
WILD 5750	Applied Remote Sensing	Fa	3	Doug Ramsey (WILD)

* WILD 5350 will no longer be required, but WILD 3100 will be required beginning in Fall 2020.

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V. 4. 2. Curricular changes since 2010 SAF reaccreditation

Since the 2010 SAF accreditation, the FEMA program has undergone several course changes, described in Table 25. The rationale for each of these changes is detailed below.

Table 25. Course (credit hour) changes since 2010 SAF accreditation.

#	Removed	Added	Change
1		WILD 2400 Wildland Resource Techniques (3 cr.)	+ 3 cr.hr.
2	ENVS 3000 Natural Resources Policy & Economics (4 cr.)	APEC 3012 Introduction to Natural Resource and Regional Economics (3 cr.)	+ 2 cr.hr.
		ENVS 3010 Fundamentals of Natural Resource and Environmental Policy (3 cr.)	
3	WILD 3610 Wildland Animal Ecology & Identification (4 cr.)		- 4 cr.hr.
	WILD 3800 Wildland Ecosystems (3 cr.)	WILD 3800 Wildland Ecosystems (4 cr.)	
	WILD 3600 Wildland Plant Ecology (4 cr.)	WILD 3820 Forest Plants: Identification, Biology, and Function (3 cr.)	
4	WILD 4850 Vegetation and Habitat Management (3 cr.)	WILD 3850 Vegetation and Habitat Management (3 cr.)	0 cr.hr.
5	WILD 4910 Assessment & Synthesis in NR Science (3 cr.)		- 3 cr.hr.
6	WILD 5420 Forest & Shade Tree Pathology (3 cr.)		- 3 cr.hr.
7	WILD 4750 Monitoring & Assessment in Natural Resources & Environmental Management (3 cr.)	WILD 4750 Monitoring & Assessment in Natural Resources & Environmental Management (4 cr.)	+ 1 cr.hr.
8	WATS 4930 Geographic Information Systems (4 cr.)	WILD/GEOG 1800 Introduction to Geographic Information Systems (3 cr.)	- 1 cr.hr.
9		WILD 3100: Introduction to Wildland Fire (3 cr.)	+ 3 cr.hr.
10	PSC/WILD 5350 Wildland Soils (3 cr.)		see #10 below
11	CHEM 1120/1115 General Chemistry II & lab (5 cr.)		- 5 cr.hr.
	TOTAL		**- 7** cr.hr.

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Change #1: The 2010 self-study, along with WILD program assessment results and subsequent WILD Curriculum Committee discussions, identified three issues which were addressed by the addition of WILD 2400, Wildland Resource Techniques. First, there was a need for more familiarity with field techniques across all WILD majors. Second, WILD students were not discovering the other WILD majors until too late in their programs to change without adding a semester or a year to their programs. Most students are attracted to the wildlife degree for charismatic reasons, but become interested in other majors with better job prospects as they learn more about these majors and fields of study. Third, students were postponing MATH 1050 until their junior year, and students unable to pass MATH 1050 were changing majors, both leading to inefficient programs and seats in upper-level classes being taken by students who did not complete the program. WILD 2400 is a field-based course which covers techniques for forest, range, and wildlife resources, is required of all WILD majors (as of 2015), and has a MATH 1050 prerequisite. This course is appreciated by students (IDEA course ratings were "higher" or "much higher" than courses in the IDEA database for 2017 and 2018) and initiation of WILD 2400 is at least correlated with improved retention and reduced times to graduation. As a part of the SAF self-study process, FEMA students and alumni have noted that WILD 2400 is dominated by wildlife monitoring techniques, due in part to the course founder, Dr. Dan MacNulty, who is a wildlife biologist. Beginning in Fall 2019, WILD 2400 will be taught by Dr. Eric LaMalfa, who is an expert at range and forest measurements and will be working with Dr. Justin DeRose (another new hire) to include more forest-specific exercises and experiences.

Change #2: ENVS 3000 (3 cr.) was replaced by a combination of APEC 3012 and ENVS 3010 to improve coverage of both topics. This change was made following the 2010 SAF re-accreditation.

Change #3: WILD 3600 and WILD 3610 were discontinued to reduce redundancy among those courses and WILD 3800 (as well as WILD 5580 for WEMA majors). This was initiated based on the concerns of both students and faculty. WILD 3800 was increased to a 4 cr. course to include content from both WILD 3600 and WILD 3610, and WILD 3820 was initiated to provide a course specific to forest plants.

Change #4: The course number for WILD 4850 was changed to WILD 3850 in 2014 to better reflect its sequence in the curriculum.

Change #5: WILD 4910 was initiated in 2010 and envisioned as an integrated, problem-solving capstone course for all WILD majors which would mitigate the problem of low-enrollment capstone courses, especially for REMA and FEMA. In practice, however, the course was too broad to serve the needs of seniors in various majors, and was largely redundant with other courses. Neither the faculty nor the students were satisfied with it, and student ratings were either lower or much lower than other courses in the IDEA database in 2012, when the IDEA course evaluation instrument became available. This course was discontinued as a FEMA requirement in 2013, with capstone designations returning to a more degree-specific arrangement. For FEMA, the capstone course is now WILD 5700, Forest Assessment and Management, which has also been designated a communications intensive (CI) course.

Change #6: WILD 5420 was discontinued because of the retirement of Dr. Fred Baker in 2014. This expertise was not replaced with subsequent faculty hires.

Change #7: WILD 4750 was increased to 4 cr. hrs. to more accurately represent the time demands on students and an increased focus on monitoring and assessment fieldwork and lab work.

Change #8: WILD/GEOG 1800 was added as a departmental common requirement. It was changed to lower division status to make it more of an introductory course and to allow WILD students to take this course earlier in their programs, and to allow subsequent courses to incorporate GIS methods.

Change #9: WILD 3100 was added as a FEMA degree requirement because of the increasing importance of wildfire and silvicultural prescriptions targeting fuels reduction. One of our new faculty members, Dr. Larissa Yocom, was hired because of her expertise in forest fire ecology. FEMA students are currently advised to take this course, and it will become a requirement starting in Fall 2020.

Change #10: PSC/WILD 5350 will no longer be required for FEMA majors starting in Fall 2020. This decision was made to enable us to add WILD 3100 without adding credits. The FEMA Curriculum Subcommittee anticipates adding a list of restricted electives, from which one is required, and PSC/WILD 5350 will be among those courses.

Change #11: CHEM 1120/1115 was removed as a requirement for FEMA because based on both student feedback and faculty assessment, this course was marginally relevant to FEMA (then FORE) majors and was a major deterrent to enrollment and student success.

V. 5. Anticipated future changes

With the recent faculty changes, the WILD Curriculum Committee and the FEMA Curriculum Subcomittee have already made minor changes to courses to increase forestry content (see Standard II.7.4). Additional changes under discussion include:

- Requirement of WILD 4950 (Scientific Communication for Natural Resource Professionals) beginning Fall 2020. This course has been proposed for "Communication Intensive" (CI) status (Standard V.1.1) and is expected to be approved. Once approved, the course will receive a unique course number and will either be required or strongly advised for FEMA majors. The CI status will allow students to use this course to meet USU Depth requirements (Table 23).
- Requirement of one course from a restricted menu of courses for FEMA majors. The restricted menu will encourage students to seek out additional depth in particular areas, depending on their career aspirations. The courses being proposed for this restricted menu include:

- **WILD 5350 Wildland Soils 3 cr.** Catalog description: *Application of basic principles of soil science to wildland ecosystems. Effects of disturbance and land use on wildland soil properties. Role of soils in natural resource management.*
- **PSC 5130 Soil Genesis, Morphology, and Classification 3 cr.** Catalog description: *Morphology, development, and classification of soils. Lectures and weekly field exercises emphasize soil as a natural body of the landscape: its properties, distribution, behavior, and interpretations for diverse land uses.*
- **WILD 4700 Ecological Foundations of Restoration 3 cr.** Catalog description: *An advanced plant ecology course emphasizing topics especially relevant to successful establishment of plants in disturbed environments and restoration of functioning dynamic ecosystems. It covers basic ecological processes from the population the ecosystem level and applications to ecological restoration.*
- **BIOL 4400 Plant Physiology (QI) 4 cr.** Catalog description: *Introduction to plant metabolism, water relations, and growth*.
- **PSC 3500 Structure and Function of Plants 3 cr.** Catalog description: *Introduction to principles of plant physiology and fundamentals of plant anatomy, emphasizing implications for management and utilization.*
- **WILD 3830 Range Plant Taxonomy 3cr.** Catalog description: *This is a field and laboratory-based course. Students will learn how to identify dominant grass, forb, and woody plants of the Intermountain West using taxonomic keys.*
- **WILD 4570 Forest Ecology of the Sierra Nevada and White Mountains 3 cr.** Catalog description: *This field experience uses an ongoing research project at the Yosemite Forest Dynamics Plot as a vehicle for learning field methods, natural history, and ecological theory. Students learn the ecology of mixed-conifer forests of the Sierra Nevada and bristlecone pine.*
- **WILD 4880 Genetics in Conservation and Management 3 cr.** –Catalog description: *Introduces principles of modern genetics, with applications, examples, and assignments related to ecology and management issues. Emphasizes genetic marker systems, gene flow, genetic drift, and adaptation.*

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STANDARD VI: FACULTY

Relevant Documents and Appendices: *Return to Table of Contents*
Document C-1: Background Summary for Faculty reporting to the WILD Department Head
Document C-2: Background Summary for Faculty in the FEMA program NOT reporting to the WILD Department Head
Document D: Academic Summary for Faculty Reporting to the WILD Department Head
Document E: Individual Faculty Information

Table 26. FTE faculty substantively connected to the FEMA program in WILD and reporting to the WILD Department Head. Many of these faculty have advising responsibilities in other areas, including REMA and WEMA, and not all teach required FEMA courses. Providing undergraduate experiences in forestry (last column) may include undergraduate research or organizing workshops or conferences involving FEMA students.

FTE Faculty member	Dept	WILD Curr. Ctee.	FEMA Required Course(s)	Forestry Curr. Subctee.	WILD Advising	Forestry or Fire Club	Undergrad Experiences in Forestry
Peter Adler	WILD	Y	WILD 3800	N	REMA	N	N
Mark Chynoweth	WILD	Y	WILD 2000 WILD 2400 WILD 3810 WILD 4750	N	WEMA Uinta Basin campus, GEOG-GIS	N	N
Justin DeRose	WILD	Y	WILD 2000 WILD 3850 WILD 5700	Y	FEMA	Forestry Club mentor	Y
Mike Kuhns[1]	WILD	N	N	Y	N	N	Y
Andrew Kulmatiski	WILD	Y	WILD 5350 (thru 2019)	N	N	N	N
Eric LaMalfa	WILD	Y	WILD 2000 WILD 2400 WILD 3850	N	REMA	N	Anticipated
James Lutz	WILD	Y	WILD 3820	Y	N	Sigma Pi advisor	Y
Darren McAvoy[2]	WILD	N	N	Y	N	N	Y
Karen Mock[3]	WILD	Y-head	N	Y-head	WEMA	N	Y
Doug Ramsey	WILD		WILD 1800 WILD 5750	N	N	N	Y
Clark Rushing	WILD	Y	WILD 3810	N	WEMA	N	N
Kari Veblen	WILD	Y	WILD 4750	N	N	N	N
Larissa Yocom	WILD	N	WILD 3100 WILD 5710	Y	N	Fire Club mentor	Y

[1]WILD Department Head with Extension Forestry appointment
[2]Extension faculty member with little or no teaching role but who is a substantial resource to core forestry faculty as well as to FEMA students.
[3]WILD Associate Department Head with a research focus on aspen forests and involvement with graduate and undergraduate FEMA students.

VI. 1. Individual faculty information

See Documents C-1, C-2, D-1, and D-2, above. *Return to Table of Contents*
Document E is provided in Documents and Appendices

As shown in Table 7, above, courses which are highly rated by instructors for content related to SAF proficiencies vary broadly. A list of these courses and the number of proficiencies for which they are highly rated is provided in Table 27. Appropriately, the course highly rated for the most proficiencies is WILD 5700, the FEMA capstone course.

Table 27. The number of SAF proficiencies for which a required FEMA course is "highly rated" according to instructor assessments (see Table 7, Standard II.7.5).

Course	Course Name	# SAF Proficiencies
WILD 5700	Forest Assessment and Management	8
WILD 3850	Vegetation and Habitat Management	6
ENVS 3300	Fundamentals of Recreation Resources Management	4
WILD 3800	Wildland Plants and Ecosystems	4
WILD 2400	Wildland Resource Techniques	3
WILD 3820	Forest Plants: Identification, Biology, and Function	3
WILD 3850	Vegetation and Habitat Management	3
WILD 4750	Monitoring and Assessment in NR and Environmental Management	3
ENVS 3010	Fundamentals of Natural Resource and Environmental Policy	2
WILD 1800	Introduction to Geographic Information Sciences	1
PSC 3000	Fundamentals of Soil Science	1
APEC 3012	Introduction to Natural Resource and Regional Economics	1
WATS 3700	Fundamentals of Watershed Science	1
WILD 5350	Wildland Soils	1
WILD 5750	Forest Assessment and Management	1

VI. 1. 1. Faculty expertise

Courses in the FEMA program are largely taught by research faculty with doctorate degrees closely related to their courses (Documents C-1, C-2, D, and E), and their courses are well-received by students (Figure 5). Courses are taught by a diverse faculty in an integrated department that simultaneously offers a suite of other undergraduate and graduate degrees. 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. Table 26 demonstrates that the FEMA major is taught and advised by a group of faculty members that exceeds the SAF requirement for eight full-time equivalent faculty members who are engaged and responsible for delivery of the FEMA curriculum and who report to the head of the department of Wildland Resources. Students in the FEMA major are taught and advised by four WILD faculty members whose academic training has a specific 'forestry' label (Drs. DeRose, Yocom, Lutz, and LaMalfa). Two other faculty members in other

departments who teach required courses for the FEMA major also have academic degrees with 'forestry' labels (Dr. Miller, ENVS; Dr. Grossl, PSC). Another faculty member, Dr. Mock, has a strong research record in aspen although her original training was in genetics. Others (Drs. Adler, LaMalfa, Veblen, Schupp, and Kulmatiski) 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, a specialist in remote sensing and GIS, 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. Our department is united by the theme of terrestrial ecology, and even the many faculty who have wildlife research study systems (Drs. Connor, Du Toit, MacNulty, Manlove, Rushing, and Villalba) frequently work in forested habitats. We believe that exposure to this interdisciplinarity is a benefit to FEMA students (as well as REMA, WEMA, and CREC students) because of the evolving nature of the workplaces for natural resource managers.

VI. 1. 2. Faculty turnover

Since the last reaccreditation in 2010, there have been several changes in the core forestry faculty. Five faculty members previously involved in the forestry program have retired (Drs. Sharik, Baker, Jenkins, Long and Van Miegroet) and one has changed roles (Dr. Etchberger). These changes are offset by the addition of five new assistant professors (Drs. Chynoweth, DeRose, LaMalfa, Lutz, and Yocom) with substantial roles in the FEMA program (Table 26). Additionally, a new Extension Assistant Professor (Darren McAvoy, SAF Fellow) has been hired, and although he does not teach classes, he does help provide experiences (IMSAF meetings, Restoring the West Conference, various field workshops) that involve our undergraduate FEMA students, and he is active in discussions on curriculum content. Finally, Dr. Mock has taken on some key responsibilities related to the FEMA program, including heading the WILD Curriculum Committee, and forming and heading the FEMA Subcommittee. Although Dr. Mock does not teach classes required in the FEMA curriculum, her research focus on aspen ecology and management has provided field experience and employment for several undergraduate students. The retirement of Dr. Long in 2018 was particularly impactful on the FEMA program, since for most of the last 40 years, he had been largely responsible for the advising, curriculum, and teaching of the WILD 5700 capstone course. However, our cohort of new faculty is very active in forest ecology research as well as forestry practice, is actively forming collaborative relationships with federal and state agencies, and is enthusiastic about building this program both in terms of enrollments and content.

VI. 1. 3. Keeping the curriculum current, relevant, and effective

WILD faculty are encouraged to propose necessary changes to the undergraduate or graduate curricula, and such changes are discussed at the annual faculty retreat and regular faculty meetings. The WILD Curriculum FEMA Subcommittee (Standard I.2, II. 6., Table 1) was established in Fall 2019, motivated by the retirement of Dr. Jim Long, the hiring of Drs. Justin DeRose and Larissa Yocom, and the timing of the SAF reaccreditation self-study. Until this point, FEMA-specific curricular issues and alignment with SAF standards was largely

accomplished informally by Dr. Long. The assessment and revision of WILD curricula have been described in detail in Standard II.6.

VI. 1. 4. Faculty involvement in professional development and scholarly activities

The majority of the faculty involved in the FEMA program have research appointments (at least 50% of the role statement), and are highly involved in professional development and scholarly activities. See Document E (Documents and Appendices). Faculty commonly use examples or datasets from their own research in courses, and most employ undergraduate students or mentor undergraduate researchers in their labs, which greatly enriches the FEMA student experience (Table 5).

VI. 1. 5. Recruitment and retention of diverse faculty

USU is dedicated to recruiting stellar candidates for faculty positions from a diverse pool including women, minorities, veterans, and persons with disabilities. Natural resource academic programs have long been male-dominated, from undergraduate enrollments to graduate enrollments to faculty hires to faculty promotions. The proportion of female tenure-track research and teaching faculty in 2010 and presently is shown in Table 28. The proportion of female faculty has increased somewhat since 2010, and the proportion of tenured female faculty has increased more dramatically since 2010. The proportion of female faculty represented in the past 3 years of hires in WILD is at ~29%. Together these trends suggest that although recruitment of female faculty is low in WILD, it is increasing with new hires and females are representing an increasing proportion of tenured faculty. Among the 13 faculty who are 'substantively connected' to the FEMA program (Table 26), only three are female. While this is an improvement since 2010, we are not satisfied with this discrepancy, and as positions open in the future, we hope to be able to recruit additional female faculty with involvement in FEMA. The WILD and FEMA faculty are also predominantly white, reflecting the composition of the professions and the state of Utah. WILD hiring committees always make an effort to bring in diverse pools (in terms of both race and gender) of applicants for interviews, but there are generally lower numbers of qualified female and racially diverse applicants than male applicants for these positions.

To some extent, this pattern is a legacy of student demographic trends in past years in natural resources majors. These slowly improving trends in diversity (more female, less white) are reflected in USU enrollment trends at both the graduate and undergraduate levels (see Standard III.2). We hope that because increasing numbers of female and ethnically diverse undergraduate students are choosing careers in natural resource sciences (Sharik 2018), the applicant pools for academic natural resource faculty positions will continue to become more gender-balanced, as will the faculty composition. Our graduate student body is increasingly female, with a steadily increasing proportion since 2015. Currently 42% of our MS students and 45% of our PhD students are female, based on data collected annually at the WILD graduate student retreat.

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Table 28. Number and gender of tenure-track research and teaching faculty (excluding federal and state collaborators, extension faculty, adjunct faculty, and instructors) in WILD in 2010 and fall 2019.

Category	Male	Female	Total	% Female
Total 2010	11	2	14	0.21
Total 2019	14	5	19	0.26
Tenured as of 2010	10	2	12	0.17
Tenured as of 2019	9	3	12	0.25
Last 3 yr hires	5	2	7	0.29

CITATIONS

Bailey RG (1995**)** Descriptions of the ecoregions of the United States. 2nd ed. rev. and expanded. Misc. Publ. No. 1391. Washington, DC: U.S. Department of Agriculture, Forest Service. Online: http://www.fs.fed.us/land/ecosysmgmt/. [July 30, 2013].

Sharik TL, Bal TL (2018) Enrollment trends in natural resources degree programs in the U.S. with an emphasis on diversity: an update. Presentation at the Biennial Conference on University Education in Natural Resources, Nacodoches, Texas, March 9, 2018.

Werstak CE Jr., Shaw JD, Goeking SA, Witt D, Menlove J, et al. (2016) Utah's Forest Resources, 2003–2012. Resource Bulletin RMRS-RB-20. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 159 p.