1-20-2017

Educational Policies Committee Program Proposal, College of Natural Resources, January 20, 2017 - Forest Ecology Specialization Within the M.S. and Ph.D. Ecology Degrees

Utah State University

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Institution Submitting Request: Utah State University
Proposed Title: Forest Ecology specialization within the M.S. and Ph.D. Ecology degrees
Currently Approved Title: n/a
School or Division or Location: Quinney College of Natural Resources, USU Logan campus
Department(s) or Area(s) Location: Wildland Resources
Recommended Classification of Instructional Programs (CIP) Code\(^1\) (for new programs): 03.0502
Current Classification of Instructional Programs (CIP) Code (for existing programs): n/a
Proposed Beginning Date (for new programs): 01/07/2017
Institutional Board of Trustees’ Approval Date: 01/06/17

Proposal Type (check all that apply):

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*Requires “Section V: Program Curriculum” of Abbreviated Template

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

Laurens H. Smith
Signature | Date: 01/04/17

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\(^1\) CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.
Section I: Request

Utah State University offers MS and PhD degrees in Ecology through multiple departments and colleges at Utah State University. Two specializations exist for this degree: the Aquatic Ecology specialization (offered through the Watershed Sciences Department) and the Wildlife Ecology specialization (offered through the Wildland Resources Department). The Wildland Resources Department (WILD) proposes to add a Forest Ecology specialization at the MS and PhD levels. This would be a specialization conferred only by the Wildland Resources Department, which is the home to the majority of courses involved in the proposal, and is also home to the majority of USU faculty with expertise in Forestry.

In the past, departments offered a variety of different types of ecology-related graduate degrees, but several years ago most of these (including Forest Ecology) were collapsed into a single degree in Ecology (MS or PhD) with a set of core requirements. Some of these original degrees were retained as specializations, including Aquatic Ecology and Wildlife Ecology. Forest Ecology was not retained as a specialization at that time by WILD.

Section II: Need

The forestry profession is increasingly incorporating ecological principles, with sustainability, wildlife and fisheries habitat conservation, water quality issues, and carbon sequestration become management priorities. Similarly, forestry-related employers increasingly value ecological experience and expertise in students, and students are increasingly interested in ecological perspectives. For example, beginning in 2012, the USDA Forest Service is required to include substantive assessment of “ecological integrity” of forest ecosystems in their management plans. The Utah State University Wildland Resources Department offers a degree in Forestry, but this degree is not explicitly focused on forest ecology. Students with specific interest in forest ecology careers must choose between having a degree called “Forestry” but enjoying none of the benefits of Ecology Center affiliation, or having a degree called “Ecology” and relying on future employers to notice forestry-related coursework on their transcripts. A Forest Ecology specialization transcript designation would make it simpler for both students and future employers to understand the degree focus and content. Through informal discussions among faculty and graduate students in WILD, both of these advantages have become apparent. As an example, of the 26 graduate students completing Ecology degrees in WILD since 2012, 5 would likely have opted for the Forest Ecology specialization had it existed, according to their advisors. There are at least 4 graduate students currently enrolled in WILD Forestry and Ecology degree programs who would also prefer a Forest Ecology specialization designation.

Section III: Institutional Impact

No significant institutional impact is anticipated. Two of the courses required for this specialization (WILD 6350 and WILD 6730) are already options in the Ecology degree course menus so students choosing a specialization would simply choose those courses. The proposed specialization will also require one additional course for MS students (2 for PhD students) to come from a menu of 5 WILD courses which are
already being offered. The enrollment in all of these courses is currently quite small, and additional students can easily be accommodated without adding sections, instructors, or teaching assistants. Graduate students in forest ecology research are typically in WILD and typically take these courses anyway, so the specialization is a way to formalize and recognize this emphasis.

Section IV: Finances

No budgetary impacts are anticipated.

Section V: Program Curriculum

The Forest Ecology specialization within the Ecology degree would meet existing requirements within WILD as well as the existing requirements for the Ecology graduate degree (MS or PhD). The proposed Forest Ecology specialization would require the following elements:

1) Both MS and PhD students are required to take:
   WILD 6350 Wildland Soils (Spring, 3 cr.; satisfies existing Biophysical Ecology block requirement in Ecology degree)
2) Both MS and PhD students are required to take:
   WILD 6730 Forest Community Ecology (Spring, offered in odd numbered years, 3 cr.; satisfies existing Organismic, Population & Evolutionary Ecology block requirement in Ecology degree)
3) For PhD students: one course from any of the other remaining Ecology blocks (an existing requirement for the Ecology degree)
4) One of the following courses for MS students, two for PhD students:
   WILD 5710 Forest Vegetation Disturbance Ecology and Management (Fall, 3 cr.)
   WILD 6570 Forest Ecology of the Sierra Nevada and White Mountains (Summer, 3 cr.)
   WILD 5700 Forest Assessment and Management (Spring, 3 cr.)
   WILD 7200 Plant Physiological Ecology (Fall, 3 cr.)
   WILD 7400 Plant Population Ecology (Fall, 3 cr.)
5) WILD 6800/7800 Wildland Resources Department seminar (Fall & Spring, 1 cr., an existing requirement for all WILD graduate students)
6) WILD 6780 Ecology seminar (Fall, Spring, 1 cr., an existing requirement for the Ecology degree)
   MS students must register for this seminar once in each of the two years of their programs; PhD students must register for this seminar once in each of three years of their programs.
7) The remaining credit hours for the MS or PhD degree would be determined by the student and his/her committee and following the remaining requirements of the Ecology degree.

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The existing Ecology degree core requirements (MS and PhD) are described below. Courses designated in the proposed Forest Ecology specialization which are also in the Ecology degree course menus (blocks) are in bold font. The Ecology graduate degree requirements are few and flexible. Students must meet these requirements, as well as any additional ones specified by their home departments. Specific courses are chosen in consultation with the student’s Graduate Advisory Committee. There are no additional requirements in WILD Ecology degrees.
1) The degree is research-based and requires a thesis or dissertation.

2) Regular participation in the Ecology Center Seminar Series and associated events is expected.
   MS students must register for the Ecology Seminar in each of two years during their program of study.
   PhD students must register for Ecology Seminar in each of three years during their program of study.

3) The degree requires some demonstrated breadth of knowledge in Ecology, most often satisfied with courses from the topical Blocks listed below.

   MS students must take three credits each from two of the Blocks.
   PhD students must take three credits each from three of the Blocks.
   Students may substitute other courses from the same topical area by request of the graduate supervisory committee to the Ecology Center Director.

**Block #1: Biophysical Ecology**

CEE 6740 Environmental Quality Modeling/Surface Water Quality Modeling  
GEO/ PSC/WATS 6680 Paleoclimatology  
GEO/WATS 6150 Fluvial Geomorphology  
PSC 6130 Soil Genesis, Morphology, and Classification  
PSC 6500 Environmental Physics of Land Ecosystems and Climate  
PSC 6820 Environmental Biophysics  
WATS 6900 Fluvial Hydraulics & Ecohydraulics  
WILD/PSC 5350/6350 Wildland Soils

**Block #2: Organismic, Population, and Evolutionary Ecology**

BIOL 6240 Physiological Ecology of Vertebrates  
BIOL 6260 Behavioral Ecology  
BIOL 6380 Evolutionary Genetics  
BIOL 6600 Comparative Animal Physiology  
WATS 6230/7230 Fish Ecology  
WILD 6401 Population State Variables  
WILD 6402 Demographic Vital Rates  
WILD 6403 Dynamics of Structured Populations  
WILD 6720/7720 Advanced Conservation Biology  
WILD 6730 Forest Community Ecology  
WILD 7200 Plant Physiological Ecology  
WILD 7400 Plant Population Ecology

**Block #3: Community, Ecosystem, and Landscape Ecology**

BIOL 6010 Biogeography  
BIOL/PSC/WILD 6200 Biogeochemistry of Terrestrial Ecosystems  
BIOL 6590 Animal Community Ecology
WATS 6310 Wetland Ecology and Management
WATS/WILD 6700 Restoration Ecology
WATS 6820/7820 Stream Ecology
WILD 6710/7710 Landscape Ecology
WILD 6770 Plant Community Ecology
WILD 6900 Invasion Ecology
WILD 7000 Wildland Ecosystem Management

Block #4: Quantitative Ecology

BIOL/MATH 6820 Applied Math in Biology (Powell)
BIOL 6750 Introduction to Programming and Database Management for Biologists
BIOL 6750 Advanced Programming and Database Management for Biologists
STAT 5120 Categorical Data Analysis
STAT 5570/6570 Statistical Bioinformatics
STAT 5600 Applied Multivariate Statistics
STAT 6200 Analysis of Unbalanced Data and Complex Experimental Designs
WATS 6900 Hydrologic Modeling for Watershed Sciences
WATS 6920 Geographic Information Systems
WILD 6510 Topics in Spatial Ecology

Block #5: Human Ecology

ASTE 5260/6260 Environmental Aspects of Agricultural Systems
ENVS 6150 Conservation Policy for Private Lands
ENVS 6320 Water Law and Policy in the United States
ENVS 6900 Introduction to Environmental Law and Policy
ENVS 6400 Ecological Aspects of Wildland Recreation
ENVS 6580 Sustainable Nature-Based Tourism
ENVS 6200 Bioregional Analysis and Planning
LAEP 6110 Landscape Planning for Wildlife
LAEP 6270 Site Analysis: Social, Behavioral, and Biophysical Dimensions
ENVS 6900 Translational Ecology
APEC 5560 Natural Resource and Environmental Economics
ENVS 5550/6550 Sustainability: Concepts and Measurement
ANTH 5340/6340 Archaeology of the Desert West
ENVS 6300/7300 Social and Environmental Psychology of Natural Resources
HIST 6460 Environmental History (Conte)
SOC 5640/6640 Conflict Management in Natural Resources
SOC 6620 Environment, Technology, and Social Change
SOC 6630 Natural Resources and Social Development