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PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR)

SUBMITTED BY:

Department	**SNRAS**	**College/School**	**SNRAS**
Prepared by	**Peter Fix**	**Phone**	**6926**
Email Contact	**pjfix@alaska.edu**	**Faculty Contact**	**Peter Fix**

See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/ for a complete description of the rules governing curriculum & course changes.

PROGRAM IDENTIFICATION:

DEGREE PROGRAM	**Natural Resources Management**
Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.)	**B.S.**

A. CHANGE IN DEGREE REQUIREMENTS: (Brief statement of program/degree changes and objectives)

The NRM degree currently consists of a few major requirements and three concentrations with varying numbers of required courses and several courses that overlap among concentrations. The goal of the program change is to integrate the concentrations into one interdisciplinary Natural Resources Management degree with a stronger focus on sustainability. To do so we will add to the major requirements key courses from each concentration that should be required knowledge for all NRM majors. While this will increase the major requirements, it will streamline the degree and reduce the total number of required credits to 120 for all NRM majors. Two new courses will be added (Introduction to Sustainability and Introduction to Sustainable Agriculture) and several courses will have major changes (Natural Resource Measurements, Forest Ecology, Survey Research in Natural Resources Management, Senior Practicum: Field Studies in Landscape Analysis and Climate Change). The concentrations will be eliminated and the specialized courses currently required in the concentrations will become electives that can be used for the required support field in the proposed degree.

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

Natural Resources Management

School of Natural Resources and Agricultural Sciences
907-474-7083
www.uaf.edu/snras/

BS DEGREE

Minimum Requirements for Degree: 130 credits

Natural resources management involves making and implementing decisions to develop, maintain or protect ecosystems to meet human needs and values. The core natural resources management curriculum provides students with a broad education in the various natural resources and their related applied fields. Programs can be tailored to enhance a student's depth or breadth in a given field of interest. The program is designed for students desiring careers in resources management or in other fields requiring knowledge of resources management and students planning advanced study, as well as those wishing to be better informed citizens.

The BS degree offers three concentrations: forestry; high latitude agriculture; and humans and the environment. The forestry concentration offers students the opportunity to focus on the multi-resource management of forests and associated ecosystems for the sustained production of goods and services and to prepare for forestry-related employment. The natural resources management/forestry program is the only accredited four-year forestry program in Alaska.

The goals of UAF's forestry program are: to produce graduates who are highly competitive in obtaining professional employment, who have the knowledge to perform well on the job and who are valued for work in Alaska and the circumpolar North; to maintain close student interaction with faculty and provide opportunities for students to obtain practical professional experience as part of their education; and to prepare students for lifelong learning and responsible participation in decision-making about the use of natural resources.
The university provides students with a foundation in the biological, social and physical sciences and a blend of classroom, laboratory and field work to develop skills for a career in forestry. The program is accredited by the Society of American Foresters (SAF).

The high latitude agriculture concentration offers opportunities for scientific study and education in

areas such as field and greenhouse plant production, domestication and propagation of native plants, revegetation, domestic and native animal production, and agricultural and ecological aspects of soil science.

The humans and the environment concentration focuses on human interactions with the environment and the balancing of uses, needs and values regarding natural resources. Humans and the environment students will gain a solid foundation in the physical sciences relevant to resources management, but will be distinguished by a focus on social science course work. Students have the opportunity to integrate international study into the degree option. Humans and the environment graduates will have skills needed to identify differing social values, understand policy and the legal foundations of resource management issues, and have knowledge of methods to develop management plans and implement decisions. Graduates will be well-positioned for a variety of careers in public resource management agencies, tribal organizations, private firms and non-profits.

Graduates of the program will have acquired a foundation in the biological, social and physical sciences and a blend of classroom, laboratory and fieldwork experience needed to develop skills for a career. The forestry program leads to a professional degree in forestry. The program is accredited by the Society of American Foresters.

State and federal agencies such as the Alaska Department of Natural Resources, Agricultural Research Service, U.S. Forest Service, Bureau of Land Management, Natural Resource Conservation Service and U.S. Fish and Wildlife Service contribute significantly to the instructional program by providing guest lecturers and internship and fieldwork opportunities for students.

Major -- BS Degree

Concentrations: Forestry; High Latitude Agriculture; Humans and the Environment

1. Complete the general university requirements. (See page 131. As part of the core curriculum requirements, complete a MATH--Calculus course.)

2. Complete the BS degree requirements. (See page 136. As part of the BS degree requirements, complete STAT F200X*.)

3. Complete the following (major) requirements:*
   BIOL F115X--Fundamentals of Biology I**--4 credits
   BIOL F116X--Fundamentals of Biology II**--4 credits
   BIOL F271--Principles of Ecology--4 credits
   CHEM F105X--General Chemistry***--4 credits
   CHEM F106X--General Chemistry***--4 credits
   ECON F235--Introduction to Natural Resource Economics--3 credits
   NRM F101--Natural Resources Conservation and Policy--3 credits
   NRM F106--Orientation to Natural Resource Management--1 credit
   NRM F304W,O--Environmental Decision Making--3 credits
   NRM F380W--Soils and the Environment--3 credits
   NRM F405W--Senior Thesis in Natural Resources Management I--2 credits
   NRM F406W--Senior Thesis in Natural Resources Management II--2 credits

4. Complete one of the following concentrations:*

   Forestry

   a. Complete the following:
      BIOL F239--Introduction to Plant Biology (4)
         or NRM F211--Introduction to Applied Plant Science (3)--3 - 4 credits
      ECON F335O--Intermediate Natural Resource Economics--3 credits
      GEOS F101X--The Dynamic Earth--4 credits
      NRM F204--Public Lands Law and Policy--3 credits
      NRM F251--Silvics and Dendrology--4 credits
      NRM F290--Resource Management Issues at High Latitudes--2 credits
      NRM F338--Introduction to Geographic Information Systems--3 credits
      NRM F340--Natural Resources Measurement and Inventory--3 credits
      NRM F365--Principles of Outdoor Recreation Management--3 credits
      NRM F370--Introduction to Watershed Management--3 credits
      NRM F430--Resource Management Planning--3 credits
      NRM F450--Forest Management--3 credits
      NRM F440--Silviculture--3 credits
      NRM F452--Forest Health and Protection--3 credits
      NRM F453--Harvesting and Utilization of Forest Products--3 credits
      WLF F322W--Principles and Techniques of Wildlife Management (3)
         or FISH F487W,O--Fisheries Management (3)--3 credits

b. Complete three of the following to total at least 8 credits:****

i. Complete at least one of the following non-measurements courses:
BIOL F331--Systematic Botany--4 credits
FIRE--Any course on wildland fire control/management--3 credits
GEOS F408--Photogeology--2 credits
NRM F277--Introduction to Conservation Biology--3 credits
NRM F300--Internship in Natural Resources Management†--1 - 6 credits
NRM F303X--Environmental Ethics and Actions‡--3 credits
NRM F312--Introduction to Range Management--3 credits
WLF F322W--Principles and Techniques of Wildlife Management (3)
or FISH F487W,O--Fisheries Management (3)--3 credits

ii. Complete at least one of the following measurements courses:
CE F112--Elementary Surveying--3 credits
GEOS F422--Geoscience Applications of Remote Sensing--3 credits
NRM F435--GIS Analysis--4 credits
STAT F401--Regression and Analysis of Variance--4 credits
STAT F402--Scientific Sampling--3 credits

** Students must earn a C- grade or better in each course.*
*** Satisfies core natural science requirement.*
**** Satisfies BS degree natural science requirement.*
***** Courses other than those listed must be approved by student's advisor.*
† Must be forestry-related.
‡ If used to fulfill the baccalaureate core requirement for ethics/values and choices in the perspectives on the human condition, NRM F303X may not also count toward a natural resources management major. However, in this case, only two courses that total at least 5 credits are required from this list, exclusive of NRM F303X.

High Latitude Agriculture

a. Complete the following:
BIOL F331--Systematic Botany (4)
or BIOL F310--Animal Physiology (4)
or BIOL F317--Comparative Anatomy of Vertebrates (4)--4 credits
NRM F211--Introduction to Applied Plant Science--3 credits
NRM F290--Resource Management Issues at High Latitudes--2 credits
NRM F312--Range Management--3 credits
NRM F320--Animal Science--3 credits
NRM F480--Soil Management for Quality Conservation (3)
or NRM F485--Soil Biology* (3)
or NRM F466--Environmental Soil Chemistry (3)--3 credits

b. Complete at least 8 credits in biology, botany, physics, chemistry, geosciences and/or mathematics, in addition to the above basic courses. Courses must be approved for science majors.

c. Complete at least 9 credits in natural resources management electives:
any NRM course at the F200-level or above that has not been used to meet other requirements.

d. Complete at least 12 credits beyond those taken to fulfill categories above in a support field which is a group of courses selected for its clear pertinence to a cohesive program. Support fields may include but are not limited to: animal science, chemistry, communications, education, engineering, forestry, geography, marketing, natural resources management, nutrition, plant science, rural development or soils. The courses must be approved by the student's academic advisor prior to attaining senior standing.

**The same course cannot be used to satisfy requirements in both sections a and c.*

Humans and the Environment

a. Complete the following:
ECON F335--Intermediate Natural Resource Economics--3 credits
NRM F204--Public Lands Law and Policy--3 credits
NRM F365--Principles of Outdoor Recreation Management--3 credits
NRM F430--Resource Management Planning--3 credits
NRM F465--Survey Research in Natural Resources Management--3 credits

b. Complete at least 12 credits from the following:
FISH F487W,O--Fisheries Management--3 credits
NRM F312--Range Management--3 credits
NRM F340--Natural Resources Measurement and Inventory--3 credits
NRM F370--Introduction to Watershed Management--3 credits
NRM F410--Numerical Methods for Natural Resources Management--3 credits
NRM F450--Forest Management--3 credits
NRM F463--Wilderness Management--3 credits
NRM F480--Soil Management for Quality Conservation--3 credits
WLF F322W--Principles and Techniques of Wildlife Management--3 credits

c. Complete at least 2 credits from the following:
NRM F290--Resource Management Issues at High Latitudes (2)
or NRM F300--Internship in Natural Resources Management and Geography (2)--2 - 6 credits

d. Complete 9 credits in a skills-building single field of study:
Skills building provides depth of study in fields employed in humans and the environment-related careers. Courses to be determined by students in consultation with their advisor and approval of the department head. Examples of skills-building fields are: agriculture, art, aviation, business, computer application, curation, fire science, fisheries management, forestry, GIS/remote sensing, hazardous materials, language, law enforcement, statistics and wildlife management.--9 credits

e. Complete 15 credits in breadth electives:
Electives in humans and the environment provide exposure to a breadth of topic areas relevant to understanding human interaction with the natural environment. A list of approved classes for each topic area is available from the department.
9 credits must be at the F300-level or above. Students are required to complete at least 3 credits from three separate topic areas in meeting the 15 credit requirement:
Alaska and Native Alaskans
Energy and Minerals
Environmental Issues
Law and Politics
Parks and Wilderness--15 credits
Minimum credits required--130 credits

Note: Courses required for the major may also be used to satisfy the general university and BS degree requirements as appropriate.

Minor

1. Complete the following:
NRM F101--Natural Resources Conservation and Policy--3 credits
NRM electives*--15 credits
2. Minimum credits required--18 credits

** At least 6 credits must be upper-division. The minor program must be approved by an NRM advisor.*

C. PROPOSED REQUIREMENTS AS IT WILL APPEAR IN THE CATALOG WITH THESE CHANGES:
(Underline new wording ~~strike through old wording~~ and use complete catalog format)

Natural Resources Management

School of Natural Resources and Agricultural Sciences
907-474-7083
www.uaf.edu/snras/

BS DEGREE

Minimum Requirements for Degree: ~~130~~ 120 credits

The complexity and inter-relatedness of society and the environment require an interdisciplinary approach to making and implementing sustainable natural resource decisions. The Natural Resources Management degree integrates knowledge in natural science, policy, economics and human values to advance the sustainable management of natural resources and agricultural systems. Students learn through a variety of approaches, including classroom instruction, hands-on laboratory experiences, and opportunities for internships and independent research under the guidance of a faculty mentor. Successful graduates will be qualified for employment in a broad range of private enterprise, government agencies, and non-profit organizations in the various natural resources fields, and will be well equipped for graduate studies.

~~Natural resources management involves making and implementing decisions to develop, maintain or protect ecosystems to meet human needs and values. The core natural resources management curriculum provides students with a broad education in the various natural resources and their related applied fields. Programs can be tailored to enhance a student's depth or breadth in a given field of interest. The program is designed for students desiring careers in resources management or in other fields requiring knowledge of resources management and students planning advanced study, as well as those wishing to be better informed citizens.~~
~~The BS degree offers three concentrations: forestry; high latitude agriculture; and humans and the~~

~~environment. The forestry concentration offers students the opportunity to focus on the multi-resource management of forests and associated ecosystems for the sustained production of goods and services and to prepare for forestry-related employment. The natural resources management/forestry program is the only accredited four-year forestry program in Alaska.~~

~~The goals of UAF's forestry program are: to produce graduates who are highly competitive in obtaining professional employment, who have the knowledge to perform well on the job and who are valued for work in Alaska and the circumpolar North; to maintain close student interaction with faculty and provide opportunities for students to obtain practical professional experience as part of their education; and to prepare students for lifelong learning and responsible participation in decision-making about the use of natural resources.~~
~~The university provides students with a foundation in the biological, social and physical sciences and a blend of classroom, laboratory and field work to develop skills for a career in forestry. The program is accredited by the Society of American Foresters (SAF).~~

~~The high latitude agriculture concentration offers opportunities for scientific study and education in areas such as field and greenhouse plant production, domestication and propagation of native plants, revegetation, domestic and native animal production, and agricultural and ecological aspects of soil science.~~

~~The humans and the environment concentration focuses on human interactions with the environment and the balancing of uses, needs and values regarding natural resources. Humans and the environment students will gain a solid foundation in the physical sciences relevant to resources management, but will be distinguished by a focus on social science course work. Students have the opportunity to integrate international study into the degree option. Humans and the environment graduates will have skills needed to identify differing social values, understand policy and the legal foundations of resource management issues, and have knowledge of methods to develop management plans and implement decisions. Graduates will be well-positioned for a variety of careers in public resource management agencies, tribal organizations, private firms and non-profits.~~

~~Graduates of the program will have acquired a foundation in the biological, social and physical sciences and a blend of classroom, laboratory and fieldwork experience needed to develop skills for a career. The forestry program leads to a professional degree in forestry. The program is accredited by the Society of American Foresters.~~

~~State and federal agencies such as the Alaska Department of Natural Resources, Agricultural Research Service, U.S. Forest Service, Bureau of Land Management, Natural Resource Conservation Service and U.S. Fish and Wildlife Service contribute significantly to the instructional program by providing guest lecturers and internship and fieldwork opportunities for students.~~

Major -- BS Degree

~~Concentrations: Forestry; High Latitude Agriculture; Humans and the Environment~~

1. Complete the general university requirements. (See page 131. As part of the core curriculum requirements, complete BIOL F115X, BIOL F116X, and, NRM F303X, a MATH--Calculus course.)

2. Complete the BS degree requirements. (See page 136. As part of the BS degree requirements, complete CHEM F105X and STAT F200X*.)

3. Complete the following (major) requirements:*

NRM F101--NR Conservation & Policy--3 credits
NRM F111--Introduction to Sustainability--3 credits
NRM F240--Natural Resource Measurements--3 credits
NRM F210--Introduction to Sustainable Agriculture--3 credits
ECON F235--Intro to Natural Resource Economics--3 credits
NRM F277--Conservation Biology--3 credits
NRM F290--Resource Management Issues at High Latitudes--2 credits
NRM F366—Survey Research in Natural Resources Management--3 credits
NRM F370--Intro to Watershed Management--3 credits
NRM F375--Natural Resource Ecology--3 credits
NRM F380W--Soils and the Environment--3 credits
NRM F403W/O--Environmental Decision Making--3 credits <NRM F403 W O; 404 not available.
NRM F430--Resource Management Planning--3 credits
NRM/GEOG F483W--Research Design, Writing, and Presentation Methods--3 credits

~~BIOL F115X--Fundamentals of Biology I**--4 credits~~
~~BIOL F116X--Fundamentals of Biology II**--4 credits~~
~~BIOL F271--Principles of Ecology--4 credits~~
~~CHEM F105X--General Chemistry***--4 credits~~
~~CHEM F106X--General Chemistry***--4 credits~~
~~ECON F235--Introduction to Natural Resource Economics--3 credits~~
~~NRM F101--Natural Resources Conservation and Policy--3 credits~~
~~NRM F106--Orientation to Natural Resource Management--1 credit~~

~~NRM F304W,O--Environmental Decision Making--3 credits~~
~~NRM F380W--Soils and the Environment--3 credits~~
~~NRM F405W--Senior Thesis in Natural Resources Management I--2 credits~~
~~NRM F406W--Senior Thesis in Natural Resources Management II--2 credits~~

a. Complete one of the following GIS courses:
NRM 338--Introduction to Geographic Information Systems--3 credits
NRM369--GIS and Remote Sensing for Natural Resources--3 credits
NRM 435--GIS Analysis—4 credits

b. Complete one of the following policy/law courses
NRM 204--Public Lands Law and Policy--3 credits
NRM 407--Environmental Law--3 credits

c. Complete a minor, pre-vet, or 15 credits in a support field which is a group of courses selected for its clear pertinence to a cohesive program. Support fields may include but are not limited to natural resources management, chemistry, communications, education, art, fisheries and wildlife management. Courses must be approved by the student's academic advisor and department head prior to attaining senior standing. Note, students must take a total of 39 upper division credits.

4. Minimum credits required--120

** Students must earn a C- grade or better in each course.*

~~4. Complete one of the following concentrations:*~~

~~**Forestry**~~
~~a. Complete the following:~~
~~BIOL F239--Introduction to Plant Biology (4)~~
~~or NRM F211--Introduction to Applied Plant Science (3)--3 - 4 credits~~
~~ECON F335O--Intermediate Natural Resource Economics--3 credits~~
~~GEOS F101X--The Dynamic Earth--4 credits~~
~~NRM F204--Public Lands Law and Policy--3 credits~~
~~NRM F251--Silvics and Dendrology--4 credits~~
~~NRM F290--Resource Management Issues at High Latitudes--2 credits~~
~~NRM F338--Introduction to Geographic Information Systems--3 credits~~
~~NRM F340--Natural Resources Measurement and Inventory--3 credits~~
~~NRM F365--Principles of Outdoor Recreation Management--3 credits~~
~~NRM F370--Introduction to Watershed Management--3 credits~~
~~NRM F430--Resource Management Planning--3 credits~~
~~NRM F450--Forest Management--3 credits~~
~~NRM F440--Silviculture--3 credits~~
~~NRM F452--Forest Health and Protection--3 credits~~
~~NRM F453--Harvesting and Utilization of Forest Products--3 credits~~
~~WLF F322W--Principles and Techniques of Wildlife Management (3)~~
~~or FISH F487W,O--Fisheries Management (3)--3 credits~~
~~b. Complete three of the following to total at least 8 credits:****~~
~~*i. Complete at least one of the following non-measurements courses:*~~
~~*BIOL F331--Systematic Botany--4 credits*~~
~~*FIRE--Any course on wildland fire control/management--3 credits*~~
~~*GEOS F408--Photogeology--2 credits*~~
~~*NRM F277--Introduction to Conservation Biology--3 credits*~~
~~*NRM F300--Internship in Natural Resources Management†--1--6 credits*~~
~~*NRM F303X--Environmental Ethics and Actions‡--3 credits*~~
~~*NRM F312--Introduction to Range Management--3 credits*~~
~~*WLF F322W--Principles and Techniques of Wildlife Management (3)*~~
~~*or FISH F487W,O--Fisheries Management (3)--3 credits*~~
~~*ii. Complete at least one of the following measurements courses:*~~
~~*CE F112--Elementary Surveying--3 credits*~~
~~*GEOS F422--Geoscience Applications of Remote Sensing--3 credits*~~
~~*NRM F435--GIS Analysis--4 credits*~~
~~*STAT F401--Regression and Analysis of Variance--4 credits*~~
~~*STAT F402--Scientific Sampling--3 credits*~~
~~** Students must earn a C- grade or better in each course.*~~
~~*** Satisfies core natural science requirement.*~~
~~**** Satisfies BS degree natural science requirement.*~~
~~***** Courses other than those listed must be approved by student's advisor.*~~
~~*† Must be forestry related.*~~
~~*‡ If used to fulfill the baccalaureate core requirement for ethics/values and choices in the perspectives on the human condition, NRM F303X may not also count toward a natural resources management major. However, in this case, only two courses that total at least 5 credits are required from this list, exclusive of NRM F303X.*~~

~~***High Latitude Agriculture***~~

~~a. Complete the following:~~

~~BIOL F331--Systematic Botany (4)~~
~~or BIOL F310--Animal Physiology (4)~~
~~or BIOL F317--Comparative Anatomy of Vertebrates (4)--4 credits~~
~~NRM F211--Introduction to Applied Plant Science--3 credits~~
~~NRM F290--Resource Management Issues at High Latitudes--2 credits~~
~~NRM F312--Range Management--3 credits~~
~~NRM F320--Animal Science--3 credits~~
~~NRM F480--Soil Management for Quality Conservation (3)~~
~~or NRM F485--Soil Biology* (3)~~
~~or NRM F466--Environmental Soil Chemistry (3)--3 credits~~

~~b. Complete at least 8 credits in biology, botany, physics, chemistry, geosciences and/or mathematics, in addition to the above basic courses. Courses must be approved for science majors.~~

~~c. Complete at least 9 credits in natural resources management electives:~~
~~any NRM course at the F200-level or above that has not been used to meet other requirements.~~

~~d. Complete at least 12 credits beyond those taken to fulfill categories above in a support field which is a group of courses selected for its clear pertinence to a cohesive program. Support fields may include but are not limited to: animal science, chemistry, communications, education, engineering, forestry, geography, marketing, natural resources management, nutrition, plant science, rural development or soils. The courses must be approved by the student's academic advisor prior to attaining senior standing.~~

~~**The same course cannot be used to satisfy requirements in both sections a and c.*~~

~~***Humans and the Environment***~~

~~a. Complete the following:~~

~~ECON F335--Intermediate Natural Resource Economics--3 credits~~
~~NRM F204--Public Lands Law and Policy--3 credits~~
~~NRM F365--Principles of Outdoor Recreation Management--3 credits~~
~~NRM F430--Resource Management Planning--3 credits~~
~~NRM F465--Survey Research in Natural Resources Management--3 credits~~

~~b. Complete at least 12 credits from the following:~~
~~FISH F487W,O--Fisheries Management--3 credits~~
~~NRM F312--Range Management--3 credits~~
~~NRM F340--Natural Resources Measurement and Inventory--3 credits~~
~~NRM F370--Introduction to Watershed Management--3 credits~~
~~NRM F410--Numerical Methods for Natural Resources Management--3 credits~~
~~NRM F450--Forest Management--3 credits~~
~~NRM F463--Wilderness Management--3 credits~~
~~NRM F480--Soil Management for Quality Conservation--3 credits~~
~~WLF F322W--Principles and Techniques of Wildlife Management--3 credits~~

~~c. Complete at least 2 credits from the following:~~
~~NRM F290--Resource Management Issues at High Latitudes (2)~~
~~or NRM F300--Internship in Natural Resources Management and Geography (2)--2 - 6 credits~~

~~d. Complete 9 credits in a skills-building single field of study:~~
~~Skills building provides depth of study in fields employed in humans and the environment-related careers. Courses to be determined by students in consultation with their advisor and approval of the department head. Examples of skills-building fields are: agriculture, art, aviation, business, computer application, curation, fire science, fisheries management, forestry, GIS/remote sensing, hazardous materials, language, law enforcement, statistics and wildlife management.--9 credits~~

~~e. Complete 15 credits in breadth electives:~~
~~Electives in humans and the environment provide exposure to a breadth of topic areas relevant to understanding human interaction with the natural environment. A list of approved classes for each topic area is available from the department.~~
~~9 credits must be at the F300-level or above. Students are required to complete at least 3 credits from three separate topic areas in meeting the 15 credit requirement:~~
~~Alaska and Native Alaskans~~
~~Energy and Minerals~~
~~Environmental Issues~~
~~Law and Politics~~
~~Parks and Wilderness--15 credits~~
~~Minimum credits required--130 credits~~

~~*Note: Courses required for the major may also be used to satisfy the general university and BS degree requirements as appropriate.*~~

Minor

1. Complete the following:
   NRM F101--Natural Resources Conservation and Policy--3 credits
   NRM electives*--15 credits

2. Minimum credits required--18 credits

** At least 6 credits must be upper-division. The minor program must be approved by an NRM advisor.*

D. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

We are not requesting additional faculty, facilities or space to facilitate these changes. The new courses will fit within workloads of current faculty. We anticipate the sharper focus and stronger emphasis on sustainability will attract new students to the program and UAF, resulting in a positive impact on the budget.

E. IMPACTS ON PROGRAMS/DEPTS:

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

BIOL 371 will no longer be required in the core and the requirement of either BIOL 331, 310 or 317 in the High Latitude Agriculture concentration is no longer required. Diane Wagner, chair Biology and Wildlife is aware of this and has no issues with the change (see email).

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

The current outcomes assessment evaluates the grades on the written senior thesis and the oral presentation of the senior thesis. In addition a sample of past and current written theses are evaluated to detect any changes in the students' writing skills and their ability to think independently and solve problems.

With the proposed degree we will evaluate the grades on the written research proposal and oral presentation associated with the new capstone course: NRM 483 Research Design, Writing, and Presentation Methods. NRM 483 requires the development of a portfolio of their individual work, group work, peer reviews, and self-assessment. The portfolios will also be evaluated as part of the outcome assessment process.

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you drop a course, is it because the material is covered elsewhere? Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the program is not compromised as a result.

Overview

The current NRM degree consists of a core set of courses and three concentrations. The concentrations are High Latitude Agriculture (HLA), Forestry, and Humans and the Environment (H&E), each associated with the respective department of the same/similar name. There are several issues with the current structure.

1. Unequal requirements across concentrations. Because of accreditation of the Foresty concentration and availability of courses, the number of specific courses required beyond the core varies from 20 for Forestry to 6 for HLA. As students in these concentrations receive the same degree (NRM) there is potential for students to select the concentration with the fewest required courses. This results in low enrollment in some specialized courses within the concentrations.

2. Lack of faculty to teach Forestry requirements. In the past few years, for a variety of reasons, four Forest Sciences faculty members have left SNRAS. Because of budget constraints these positions will not be immediately filled. This essentially makes it impossible to offer a viable Forestry concentration.

3. A degree shared across three departments. The content of the concentrations is under the purview of the

respective departments, but the core classes in the degree are shared among those departments. This structure results in challenges when changing degree requirements.

4. Barriers to integration across disciplines in NRM. A strength of the SNRAS faculty is its interdisciplinary composition. For example, other schools in the Western University Exchange (WUE) often offer separate degrees in the fields of our concentrations, with a trend to create new interdisciplinary departments or degrees to focus on responding to complex problems (e.g., Colorado State University's Department of Forest and Rangeland Stewardship and associated Natural Resources Management degree, University of Montana's Resource Conservation degree). SNRAS has a functional structure for integration of faculty members from various disciplines, but we have yet to fully capitalize on that structure.

5. Courses with low enrollment. As mentioned in #1, some SNRAS classes have low enrollment. It is not plausible to continue to offer courses with low enrollment.

The goals of this program change are to build on the current strengths of the SNRAS and the NRM degree, while addressing the issues mentioned above. More specifically:

- **Better align the degree with the current move to more integrated natural resource decision making grounded in sustainability science.**
- **Combine academic departments into one department and offer a degree without concentrations.**
- **Increase coordination among courses to ensure a sustainability theme is present.**
- **Clearly convey the intent of the degree to students.**
- **Reduce credits required to 120.**

Proposed Changes

Courses dropped from the core

The new NRM core drops three courses from the current core:

1) **NRM F106x Orientation to Natural Resource Management, 1 credit**
2) **BIOL F371 Principles of Ecology**
3) **NRM F406W Senior Thesis in Natural Resource Management II, 2 credits**

The reasons for these changes are as follows.

- **NRM F106 was often petitioned out of by students and the material will be covered in other courses.**
- **BIOL F371 is a 4-credit lab course that covered a wide range of basic principles of ecology. The proposed degree will offer a course in applied ecology that stresses the link between principles of ecology and the sustainable management of natural resources.**
- **NRM F406W was changed from a required course to an elective (and renumbered to NRM 484). The reason for this change is that the quality of the theses has become polarized with one group of students conducting work with extremely rigorous standards and another group just doing enough to pass. This does a disservice to those adhering to high standards, and those just getting by are not realizing the targeted learning outcomes and might be better served taking different NRM courses. This change will hopefully provide a greater reward to those who produce a high quality thesis and better meet the needs of the students without adequate motivation for self-directed research. Furthermore, the goal of NRM 406, to foster speaking, writing, and independent research skills, will also be met by the newly revised proposal writing course.**

Courses added to the core

The majority of the proposed changes involve positioning existing courses required in the concentrations into the core and eliminating the concentrations. The goal was to ensure all students receiving an NRM degree are exposed to the topics to graduate with a comprehensive understanding of natural resource management. To achieve this goal, two new courses will be developed for the core and four existing courses will undergo major revisions.

New courses developed for NRM the core:

1) **NRM F111 Introduction to Sustainability Science. This course will build on NRM F101 Natural Resource Conservation and Policy and will introduce the students to sustainability science. This course will form the basis for a common theme for the remainder of the core courses.**
2) **NRM F2xx Introduction to Sustainable Agriculture. This course will introduce students to the role of agriculture in society and provide students with the foundation to examine contemporary issues associated with food production and agricultural systems.**

Revised NRM courses in the core:

1) **NRM F240 Natural Resource Measurements. The existing NRM 340 course will be taught at the 200 level to provide students with an introduction to measurements prior to taking the 300-level NRM courses.**
3) **NRM F366 Survey Research in Natural Resources Management. This course is currently offered at the 400 level. It will be offered at the 300 level so it better aligns as a course to be taken prior to the NRM capstone courses.**
4) **NRM F375 Natural Resource Ecology. This course will be revision of NRM 375 Forest Ecology. The revised course will expand the focus beyond forests and stress the implications for decision making.**
5) **NRM/GEOG F483 W/O Research Writing and Presentation Methods is a revision of NRM 405 Senior Thesis I and GEOG F489W. The course will be similar to the existing senior thesis course in that it will involve writing a research proposal under guidance of a faculty mentor and providing a public presenting. However we have increased the credits from 2 to 3 to allow more contact time with the course instructor.**

Existing courses added to the core
The following courses were either required in a concentration or as restricted electives. We feel these courses, in addition the courses already in the core, make up the topics in which NRM graduates should show competence. As such we propose adding them to the core. These courses are typically required in comparable programs at other universities.

- **NRM F277--Conservation Biology--3 credits**
- **NRM F290--Resource Management Issues at High Latitudes--2 credits**
- **NRM F370--Introduction to Watershed Management--3 credits**
- **NRM F430--Resource Management Planning--3 credits**

Existing courses added to the core as restricted electives

- **NRM F338--Introduction to Geographic Information Systems--3 credits**
- **NRM F369--GIS and Remote Sensing for Natural Resources--3 credits**
- **NRM F435--GIS Analysis--4 credits**
- **NRM F204--Public Lands Law and Policy--3 credits**
- **NRM F407--Environmental Law--3 credits**

Concentrations
The concentrations will be dropped. Many courses currently required in the concentrations will be moved to the core, a few will be dropped, and the rest will remain as electives that could fulfill the required support field.
Existing courses that will be become electives in the proposed degree:

- **NRM F211--Introduction to Applied Plant Science--3 credits**
- **NRM F251--Silvics and Dendrology--4 credits**
- **NRM F312--Introduction to Range Management--3 credits**
- **NRM F320--Animal Science--3 credits**
- **NRM F365--Principles of Outdoor Recreation Management--3 credits**
- **NRM F440--Silviculture--3 credits**
- **NRM F452--Forest Health and Protection--3 credits**
- **NRM F453--Harvesting and Utilization of Forest Products--3 credits**
- **NRM F480--Soil Management for Quality Conservation--3 credits**
- **NRM F485--Soil Biology--3 credits**
- **NRM F466--Environmental Soil Chemistry--3 credits**

The following courses were listed as restricted electives in one of the concentrations. These courses would also be applicable to the required support field.

- **GEOS F101X – The Dynamic Earth--4credits**
- **CE F112--Elementary Surveying**
- **BIOL F331--Systematic Botany--4 credits**
- **BIOL F310--Animal Physiology--4 credits**
- **BIOL F317--Comparative Anatomy of Vertebrates--4 credits**
- **WLF F322 – Principles and Techniques of Wildlife Management--3 credits**
- **ECON F335 – Intermediate Natural Resource Economics--3 credits**
- **STAT F401--Regression and Analysis of Variance--4 credits**
- **STAT F402--Scientific Sampling--3 credits**
- **GEOS F422--Geoscience Applications of Remote Sensing--3 credits**

- **FISH F487--Fisheries Management--3 credits**

Courses that will likely not continue to be offered:

- **NRM F410 Numerical methods for Natural Resource Management. Currently there is not an instructor for this course.**

SEE ATTACHED SIGNATURES

APPROVALS:

	Date	
Signature, Chair, Program/Department of:		
	Date	
Signature, Chair, College/School Curriculum Council for:		
	Date	
Signature, Dean, College/School of:		

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

	Date	
Signature, Chair, UAF Faculty Senate Curriculum Review Committee		

- **STAT F402--Scientific Sampling--3 credits**
- **GEOS F422--Geoscience Applications of Remote Sensing--3 credits**
- **FISH F487--Fisheries Management--3 credits**

Courses that will likely not continue to be offered:

- **NRM F410 Numerical methods for Natural Resource Management. Currently there is not an instructor for this course.**

APPROVALS:

Signature, Chair, Program/Department of:	Humans & the Environment	Date 10-4-13
Signature, Chair, College/School Curriculum Council for:	SNRAS	Date 10/4/13
Signature, Dean, College/School of:	SNRAS	Date 10/4/13

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair, UAF Faculty Senate Curriculum Review Committee	Date

UNIVERSITY OF ALASKA FAIRBANKS

Office of the Dean & Director
P.O. Box 757140
Fairbanks, Alaska
99775-7140
Phone: (907) 474-7083
Fax: (907) 474-6567
email: uaf-snras-afes@alaska.edu

School of Natural Resources and Agricultural Sciences
Agricultural and Forestry Experiment Station

MEMORANDUM

TO: Susan Henrichs, Provost

FROM: Stephen D. Sparrow, Interim Dean and Director
School of Natural Resources and Agricultural Sciences
Agricultural and Forestry Experiment Station

DATE: September 27, 2013

RE: Signature Authority

I will be in Girdwood for the 8th Circumpolar Agricultural Conference/University of the Arctic Inaugural Food Summit meetings September 29-October 3, and Palmer October 4. During my absence, Professor John Yarie will have signature authority for all routine paperwork for the School of Natural Resources and Agricultural Sciences and Agricultural and Forestry Experiment Station.