



ESF Minor Curriculum Change Proposal Form

Committee on Curriculum - ESF Faculty Governance
Office of Instruction & Graduate Studies

Date: January 15, 2023
Department: Environmental Biology
Curriculum Title: Wildlife Science

For Minor Changes in existing curriculum (check all that apply):

- | | |
|---|--|
| <input type="checkbox"/> revised courses | <input type="checkbox"/> change in total cr. hrs. |
| <input type="checkbox"/> new course sequence | <input type="checkbox"/> new program objectives* |
| <input checked="" type="checkbox"/> new courses added | <input type="checkbox"/> new accreditation/assessment requirements |

*See SUNY Guidelines

1. Rationale for Change

Please provide an explanatory narrative outlining the rationale for the change, and the impacts of this change on the learning outcomes of the curriculum:

Rationale:

The proposed changes to the Wildlife Science curriculum are refinements made to: 1) meet the new SUNY General Education requirements, 2) fill core gaps in skills and abilities required of all wildlife professionals, 3) streamline coursework to better align with assessment criteria, and 4) ensure students meet the educational requirements for federal Wildlife Biology jobs. These changes further provide students greater opportunity to achieve certification as an Associate Wildlife Biologist from The Wildlife Society (requiring only 6 additional credits of communications coursework). Lastly, changes in Directed Electives provide greater programmatic flexibility, enabling students greater opportunity to specialize in key programmatic areas. There are no changes in specific course sequences or to which semester courses are on offer, so there will be no disruption to currently enrolled students.

Changes to General Education Coursework:

- **ADDED** General Education category Diversity: Equity, Inclusion, and Social Justice as a Core Course Requirement as required by SUNY.
- **REMOVED** EWP 290 (Writing, Humanities, and Environment) and **ADDED** EWP 220 (Public Presentation Skills). This choice was made because we assess public presentation skills as an essential skill for the wildlife professional, but previously nowhere in the students' program did we train them in public speaking. We note that students seeking TWS certification will optionally complete an additional 6 credits in communications.
- **UPDATED General Education list:**
Complete courses in two of the following categories (6 cr)
 - Humanities
 - US History and Civic Engagement
 - World History and Global Awareness
 - World Languages
 - Arts
- **Taken together these changes meet the SUNY Requirements as follows:**

Subject Area	We require	Total Credits
REQUIRED: Diversity, Equity, Inclusion and Social Justice	TBD	3
REQUIRED: Basic Communication	EWP 190	3
REQUIRED: Mathematics	APM 105 (calc I)	4
REQUIRED: Natural Sciences and Scientific Reasoning	EFB 101 + 102, FCH 150 + 152	16
Social Science	EFB 120 (Global Env)	3
Humanities	Choose 1 class	6
US History and Civic Engagement	from each of 2 of	
World History and Global Awareness	the remaining 5	
World Languages	categories	
Arts		
	7 categories	35 credits

Under Core Course Requirements, we further modified the following:

ADDED: ESF 300 Intro to Geospatial Information Technologies (3 credits), which provides critical technical skills needed by all wildlife professionals. Previously this course was offered among a larger pick-list of options but was always the most recommended course by advisors.

MODIFIED:

One of the following (+) choices: Physical Science 3 credits minimum

- FCH 210 Elements of Organic Chemistry
- FOR ~~XXX-110~~ Environmental Physics [1] (this replaces current Physics requirement, and see note below)
- FOR 345 Introduction to Soils (this is a new course addition, justified by its ability to count as a physical science course for Federal Wildlife Biologist series education requirements. Our recent survey of alumni indicated that many jobs require soils coursework.)

[1] PHY 101 also will satisfy the requirement. PHY 211 and PHY 221 taken together will also satisfy this requirement and may be necessary if you wish to follow a premed/prevet track.

ADDED:

One of the following (+) choices: Natural Resources Policy 3 credits minimum

- FOR 465 Natural Resources Policy
- FOR 489 Natural Resources Law and Policy

This option was moved from a larger pick-list of Directed Electives to ensure more focused training in Natural Resources Policy relative to wildlife conservation. Students have been performing relatively poorly in this assessment area. Restricting the breadth of potential coursework should ensure better standardization of training on core areas important to wildlife professionals, and will enable us to better assess their learning gains.

ADDED:

One of the following (+) choices: Wildlife Biology 4 credits minimum

- EFB 482 Ornithology
- EFB 483 Mammal Diversity

Under the Directed Elective choices we MODIFIED the following:

- **REMOVED** Directed Elective categories: Vertebrate Diversity (6 credits), Plant Diversity (3 credits), Invertebrate Diversity (3 credits), Policy (3 credits), Structure and Function (3 credits), and Technical Skills (3 credits).
- **ADDED** the following Directed Elective categories, which largely reflects a reconfiguration of several of the previous categories:

Required Courses

	Course	Codes*	Credits
APM 105	Survey of Calculus and Its Applications I	G	4
APM 391	Introduction to Probability and Statistics	G	3
EFB 101	General Biology I: Organismal Biology and Ecology	G	3
EFB 102	General Biology I Laboratory	G	1
EFB 103	General Biology II: Cell Biology and Genetics	G	3
EFB 104	General Biology II Laboratory	G	1
EFB 120	The Global Environment and the Evolution of Human Society	G	3
EFB 132	Orientation Seminar: Environmental and Forest Biology		1
XXX ###	Diversity, Equity, Inclusion, and Social Justice Gen Ed Course	G	3
EFB 202	Ecological Monitoring and Biodiversity Assessment		3
EFB 210	Diversity of Life I		3
EFB 211	Diversity of Life II		3
EFB 307	Principles of Genetics		3
EFB 308	Principles of Genetics Laboratory		1
EFB 311	Principles of Evolution		3
EFB 320	General Ecology		4
EFB 390	Wildlife Ecology and Management		4
EFB 491	Applied Wildlife Science		3
EFB 493	Wildlife Habitats and Populations		4
ESF 300	Intro to Geospatial Information Technologies		3

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EWP 190	Writing and the Environment	G	3
EWP 290	Research Writing and Humanities	G	3
EWP 220	Public Presentation Skills		<u>3</u>
FCH 150	General Chemistry I	G	3
FCH 151	General Chemistry Laboratory I	G	1
FCH 152	General Chemistry II	G	3
FCH 153	General Chemistry Laboratory II	G	1
One of the following: PHY 101 FOR XXX110 OR FCH 210 OR FOR 345	Major Concepts of Physics I Environmental Physics Elements of Organic Chemistry Introduction to Soils		4 <u>3</u> 4 <u>3</u>
One of the following: FOR 465 OR FOR 489	Natural Resources Policy Natural Resources Law and Policy		 <u>3</u> <u>3</u>
One of the following: EFB 482 OR EFB 483	Ornithology Mammal Diversity		 <u>4</u> <u>4</u>

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Electives

Course	Codes*	Credits
General Education Course in two of the following categories: Humanities, US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages General Education Course in two of the following categories: American History, The Arts, Western Civilization, Other World Civilizations, Foreign Language	G	6
Directed Electives		<u>1824</u>

Directed Electives

To ensure that Wildlife Science undergraduates obtain both strength and breadth of knowledge, and position themselves for professional certification by The Wildlife Society, 24 elective credits must be obtained in the following subject areas (A-G) through specific courses that are designed for juniors and seniors (i.e., courses numbered 300 or higher)

A. Field Experience (3 cr):

This requirement can be satisfied during any year, and is normally done via coursework at Cranberry Lake Biological Station, ESF field courses offered during semester break, field courses offered by other institutions or organizations, (e.g., School for Field Studies), independent research projects, or job-related internships during the summer session.

B. ~~Vertebrate Diversity (6 credits): Choose at least two courses from the following:~~

~~EFB 482 Ornithology (4 cr.) S~~

~~EFB 483 Mammal Diversity (4 cr.) F~~

~~EFB 485 Herpetology (3 cr.) F~~

~~EFB 486 Ichthyology (3 cr.) S~~

C. ~~Plant Diversity and Ecology (3 credits) Choose at least one course from the following:~~

~~EFB 326 Plant Evolution, Diversification and Conservation (3 cr.) S~~

~~EFB 336 Dendrology (3 cr.) F~~

~~EFB 337 Ethnobotany (3 cr.) CLBS~~

~~EFB 435 Flowering Plants: Diversity, Evolution and Systematics (3 cr.) F~~

~~EFB 445 Plant Ecology and Global Change (3 cr.) S~~

~~EFB 496 Wetland Plants & Communities of Adirondacks (3 cr.) CLBS~~

~~EFB 496 Flora of Central NY (3 cr.) Maymester~~

D. ~~Invertebrate Diversity (3 credits) Choose at least one course from the following:~~

~~EFB 351 Forest Entomology (3 cr.) F, even years~~

- _____ EFB 352 Entomology (3 cr.) F, odd years
- _____ EFB 355 Invertebrate Zoology (4 cr.) S
- _____ EFB 453 Parasitology (3 cr.) F
- _____ EFB 554 Aquatic Entomology (3 cr.) F
- _____ EFB 566 Systematic Entomology (3 cr.) S, even years

E. _____ Policy (3 credits) Choose at least one course from the following:

- _____ FOR360 Principles of Management (3 cr.) F
- _____ FOR465 Natural Resources Policy (3 cr.) F
- _____ FOR487 Environmental Law and Policy (3 cr.) F
- _____ FOR488 Natural Resources Agencies and Administration (3 cr.) S
- _____ FOR489 Natural Resources Policy and Law (3 cr.) S

F. _____ Structure and Function (3 credits) Choose at least one course from the following:

- _____ EFB 325 Cell Biology (3 cr.) S
- _____ EFB 385 Comparative Vertebrate Anatomy (4 cr.) S
- _____ EFB 462 Animal Physiology: Environmental and Ecological (4 cr.) F
- _____ EFB 480 Principles of Animal Behavior (4 cr.) F
- _____ EFB 516 Ecosystems (3 cr.) S
- _____ EFB 542 Freshwater Wetland Ecosystems (3 cr.) S

G. _____ Technical Skills (3 credits) Choose at least one course from the following:

- _____ BTC 401 Molecular Biology Techniques (3 cr.) F
- _____ ESF 300 Introduction to Geospatial Information Technologies (3 cr.) F, S
- _____ ERE 371 Surveying For Engineers (4 cr.) F

Vertebrate Structure and Function (3 credits): choose at least one course from the following:

- EFB 385 Comparative Vertebrate Anatomy (4 cr.) **S**
- EFB 462 Animal Physiology: Environmental and Ecological (4 cr.) **S**
- EFB 480 Principles of Animal Behavior (3 cr.) **F, Summer**

Botany and Plant Science (6 credits): choose at least two courses from the following:

- EFB 326 Plant Evolution, Diversification & Conservation (3 cr.) **S**
- EFB 336 Dendrology (3 cr.) **F**
- EFB 337 Field Ethnobotany (3 cr.) **Summer (CLBS)**
- EFB 340 Forest Shade and Tree Pathology (3 cr.) **F**
- EFB 427 Plant Anatomy and Development (3 cr.) **F**
- EFB 429 Plant Physiology (3 cr.) **S**
- EFB 435 Flowering Plants (3 cr.) **F**
- EFB 440 Mycology (3 cr.) **F**
- EFB 445 Plant Ecology and Global Change (3 cr.) **S**
- EFB 446 Ecology of Mosses (3 cr.) **S**
- EFB 496 Wetland Plants & Communities of the Adirondacks (3 cr.) **Summer (CLBS)**
- EFB 496 Flora of Central New York (3 cr.) **Maymester**

Wildlife Specialization (6 credits): choose at least two courses from one or more categories as listed below:

1. Population and habitat management:

- EFB 370 Population Ecology and Management (3 cr.) **S**
- EFB 438 Ecology and Management of Waterfowl (3 cr.)
- EFB 449 Wetlands Conservation and Management (3 cr.) **S, even years**
- EFB 487 Fisheries Science and Management (3 cr.) **F**
- EFB 502 Ecology and Management of Invasive Species (3 cr.) **S**
- EFB 518 Systems Ecology: Ecological Modelling and Design
- FOR 232 Natural Resources Ecology (3 cr.) **S**
- FOR 442 Watershed Ecology and Management (3 cr.) **F**
- FOR 496 Forest Management and Wildlife (3 cr.) **S**

2. Wildlife Health:

- EFB 360 Epidemiology (3 cr.) **F**
- EFB 400 Toxic Health Hazards (3 cr.) **F**
- EFB 453 Parasitology (3 cr.) **F**
- EFB 462 Animal Physiology: Environmental and Ecological (4 cr.) **S**

3. Biodiversity

- EFB 352 Entomology (3 cr.) **F**
- EFB 355 Invertebrate Zoology (4 cr.) **S**
- EFB 413 Introduction to Conservation Biology (3 cr.) **F**
- EFB 486 Ichthyology (3 cr.) **S**
- EFB 485 Herpetology (3 cr.) **F**

4. Human dimensions of conservation

- EFB 305 Indigenous Issues and the Environment (3 cr.) **S**
- EST 353 Behavior Change and the Environment (3 cr.) **F**
- EST 390 Social Processes and the Environment (3 cr.) **S**
- EST 366 Attitudes, Values and the Environment (3 cr.) **S, even years**
- EST 460 Land Use Law (3 cr.) **S**
- EST 312 Sociology of Natural Resources (3 cr.) **S**
- EST 493 Environmental Communication Workshop (3 cr.) **S**

Taken together the coursework modifications meet the 126 total credits, provide greater student choice for specialization, yet reduce the total number of available Open Electives from 29 to 22.

We further will provide students with the following recommended schedule:

FRESHMAN YEAR

Fall Semester			Spring Semester		
Course	Title	CR	Course	Title	CR
EFB 101	General Biology I: Organismal Biology & Ecology	3	EFB 103	General Biology II: Cell Biology & Genetics	3
EFB 102	General Biology I Lab	1	EFB 104	General Biology II Lab	1
APM 105	Survey of Calculus I	4	EWP 220	Public Presentation Skills	3
EWP 190	Writing and the Environment	3	FOR 296	Environmental Physics (or Organic Chemistry, or soils next Fall)	3
EFB 132	Orientation Seminar	1		DEI or Global Environment	3
	DEI or Global Environment	3		Elective*	3
Total credits		15	Total credits		16

* Good options: General Education Electives (Humanities, Social Sciences, US History and Civic Engagement, World History and Global Awareness, World Languages)

Summer

Course	Title	CR
EFB 202	Ecological Monitoring & Biological Assessment, Cranberry Lake Biological Station	3

Also a good time to fill your Directed Field Elective by completing a summer field course at the Cranberry Lake Biological Station.

SOPHOMORE YEAR

Fall Semester			Spring Semester		
Course	Title	CR	Course	Title	CR
FCH 150	General Chemistry I	3	FCH 152	General Chemistry II	3
FCH 151	General Chemistry I Lab	1	FCH 153	General Chemistry II Lab	1
EFB 210	Diversity of Life I	3	EFB 211	Diversity of Life II	3
EFB 320	General Ecology	4	ESF 300	Introduction to Geospatial Information Technology	3
	Elective*	3	APM 391	Introduction to Probability and Statistics	3
				Elective*	3
Total credits		14	Total credits		16

* Good options: General Education Electives if not yet completed. Consider an academic minor to help fill your Open Electives, or pick up the extra communications courses needed for TWS certification.

Summer

Good time to fill your Directed Field Elective. Complete a Maymester or summer field course, or seek a professional experience – volunteer, find a paid or unpaid internship, or secure a summer job in the field (academic credit might be arranged to meet your Directed Field Elective Requirement depending upon the experience).

JUNIOR YEAR

Fall Semester			Spring Semester		
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Course	Title	CR	Course	Title	CR
EFB 390	Introduction to Wildlife Ecology and Management	3	EFB 491	Applied Wildlife Science	3
FOR 465	Natural Resources Policy (or FOR 489 in Spring)	3	EFB 311	Principles of Evolution	3
EFB 307	Principles of Genetics	3	EFB 482	Ornithology (or Mammal Diversity in the fall)	3
EFB 308	Principles of Genetics Lab	1		Elective 1*	3
EFB 493	Mammal Diversity (or Ornithology in the spring)	3		Elective 2*	3
	Elective *	3			
Total credits		16	Total credits		15

* Good options: Directed Electives (Structure and Function, Botany and Plant Science, Specialization) or General Education Electives if not yet completed. Consider an academic minor or TWS certification requirements to help fill your Open Electives.

Summer

Good time to fill your Directed Field Elective. Complete a Maymester or summer field course or seek a professional experience – volunteer, find a paid or unpaid internship, or secure a summer job in the field (academic credit might be arranged to meet your Directed Field Elective Requirement depending upon the experience).

SENIOR YEAR

Fall Semester

Spring Semester

Course	Title	CR	Course	Title	CR
EFB 493	CAPSTONE: Wildlife Habitats and Populations	4		Elective 1*	3
	Elective 1*	3		Elective 2*	3
	Elective 2*	3		Elective 3*	3
	Elective 3*	3		Elective 4*	3
	Elective 4*	3		Elective 5*	3
Total credits		16	Total credits		15

* Good options: Directed Electives (Structure and Function, Botany and Plant Science, Specialization) or General Education Electives if not yet completed. Consider an academic minor or TWS certification requirements to help fill your Open Electives.

CHANGES TO THE RECOMMENDED SCHEDULE help ensure the SUNY General Education standards are met within the first 60 hours of academic study, help direct students to filling key pre-requisites for upper division courses early in their program, and attempt to improve the freshman experience by relieving the burden of three major challenging courses in their first year (moving Chemistry classes to the second year because they are not pre-requisites for any required upper division coursework in this program).

2. Institutional Impact:

Changes from existing condition:

Anticipated Enrollment or Enrollment Change: We do not anticipate any changes beyond the long-term trending increase in Wildlife Science students. However, as a relatively large major on campus, requiring EWP 220 (Public Presentation Skills; recommended in freshman year) of all wildlife students

may require additional sections or staffing support to accommodate increased class sizes (and dropping the EWP 290 requirement may likewise free-up some resources dedicated to that course). Similarly, more students will be directed into FOR 345 (Introduction to Soils; taken in any year) than have previously been observed. We anticipate wildlife student enrollment in ESF 300 (Introduction to Geospatial Information Technologies; recommended in sophomore year) may not change, although our recommendation for completion of that course within the sophomore year may have ramifications for enrollments during the transition.

Faculty or Staffing Requirements: No change, unless required by EWP 220, ESF 300, or FOR 345.

Technology, Computing Resources, and Classroom Resource Demands: No change, unless required by EWP 220, ESF 300, or FOR 345.

Change in Accreditation Requirements: N/A

Changes to Assessment Plan: None. These coursework changes were informed by student performance on assessment criteria and, as such, should improve student learning outcomes.

Library Resource Requirements: No change, unless required by EWP 220, ESF 300, or FOR 345.

3. Catalog Narrative:

Please attach to this proposal form a copy of the current catalog description in MS Word format, with revisions shown in "track changes".

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[Bachelor of Science in Wildlife Science • www.esf.edu/efb/wildlife](http://www.esf.edu/efb/wildlife)

~~Wildlife science is the application of ecological knowledge in a manner that strikes a balance between the needs of wildlife populations and the needs of people. Research and teaching in wildlife science began at ESF in 1914, one of the first such programs in the U.S., and was quickly followed by establishment of the Roosevelt Wild Life Station in 1919. Today, our program is recognized nationally and internationally, and our graduates are employed worldwide. The focus is applied ecology, and students engage the environmental challenges associated with managing wildlife, ranging from restoring habitat, securing populations of rare and vulnerable species, mitigating human-wildlife conflicts, controlling invasive species and disease, and ensuring sustainable harvests. The Wildlife Science curriculum provides the coursework required for state and federal Wildlife Biologist positions, with Associate Wildlife Biologist certification by The Wildlife Society readily accessible, providing a professional advantage over graduates from peer institutions, endangered species to overabundant populations. The program recognizes and accommodates the fact that wildlife scientists increasingly must deal with all forms of wildlife, including plants and invertebrates, and the scope is becoming more international.~~

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[Bachelor of Science in Wildlife Science • www.esf.edu/efb/wildlife](http://www.esf.edu/efb/wildlife)

[Wildlife science is the application of ecological knowledge in a manner that strikes a balance between the needs of wildlife populations and the needs of people. Coursework and faculty expertise span the animal kingdom and the planet, with a programmatic emphasis on North American species, policies, and practices. The focus is applied ecology, and students gain the skills, knowledge, and abilities required to meet contemporary and future challenges facing wildlife such as restoring habitat, securing populations of rare and vulnerable species, mitigating human-wildlife conflicts, controlling invasive species and disease, managing sustainable harvests, and ensuring species persistence under climate change. The curriculum prepares students for working in state or federal wildlife agencies, non-governmental conservation organizations, or consulting firms and also prepares students for continuing on to a graduate degree program, which may greatly expand employment opportunities and is often necessary for career-track positions.](#)

4. Curriculum Transition Plan:

Please provide a narrative description of your plan for transitioning from your existing curriculum to the proposed new curriculum. Please provide specific dates for implementing curriculum changes, overlap periods where old and new curricula may exist simultaneously, and final phase out of old curricula. Please also include impacts and mitigating considerations for transfer students and students in mid-program during implementation, impacts of changes in semester delivery of existing courses, addition of new courses within a particular semester, etc.

ADOPTION of the new curriculum would be in place for freshman and transfer students matriculating during or after the Fall 2023 semester. Students will be held to the curriculum in place at the time of their matriculation, so there will be a 4-year window of time during which curriculum requirements will follow either the original or the new coursework. There are no changes in semester delivery of coursework, and so there should be no disruption to currently enrolled students by the changes proposed herein.

Shifting the recommended timing for wildlife students completing the chemistry course sequence should help improve overall student scores.

5. Approval Signatures:

Signatures below, or attached letters, indicate that the affected departments, programs or units have been notified of this proposal and have had an opportunity to assess the impact of the proposal on their respective units. If departments did not respond to your notification, you may wish to document your effort to contact them.

Affected Academic Department(s) or Program(s):

Department/Program 1

Name of Chair/Program Director

Chair Signature

Date

Or letter attached

Department/Program 2

Name of Chair/Program Director

Chair Signature

Date

Or letter attached

Department/Program 3

Name of Chair/Program Director

Chair Signature

Date

Or letter attached

[If more/less than three Departments/Programs, please add/delete lines as appropriate.]

Other Units

Library Director

Date

Or letter attached

Computing and Network Services

Date

Or letter attached

Physical Plant

Date

Or letter attached

Forest Properties

Date

Or letter attached

Environmental Health and Safety

Date

Or letter attached

Admissions

Date

Or letter attached

Other _____

Date

Or letter attached

Other _____

Date

Or letter attached

Office of the Provost

Signature below, or attached letter, indicates that the Provost either a) agrees that that there is no need for additional resources from the College; or b) indicates willingness to provide the extra support to the department.

Provost Signature

Date

Or letter attached

6. Proposer Information and Department Chair Affirmation:

Contact Person:

Name: Jacqueline Frair Department: Environmental Biology

Email: jfrair@esf.edu Phone: x4905

This proposal has been reviewed and approved by the sponsoring Department. Affected departments have been notified and given the opportunity to provide feedback. Department resources are or will be made available to support this curriculum revision, or a plan is in place to meet the resource needs as identified in the Institutional Impacts section of this proposal (see Section 2, above) .

Name: _____ Date: _____
Department Chair (or designated curriculum representative)

Signature: _____ Or letter attached
Department Chair (or designated curriculum representative)

7. Final Approvals:

_____ **Curriculum Committee** _____ **Date**

_____ **Faculty Governance** _____ **Date**

_____ **Provost** _____ **Date**

