Michigan Tech

Office Memo

Office of the Provost and
Senior Vice President for Academic Affairs

Phone: (906) 487-2440
Fax: (906) 487-2935

TO: Richard Koubek, President

FROM: Andrew Storer, Provost & Senior Vice President for Academic Affairs

DATE: April 1, 2024

SUBJECT: Senate Proposal 4-24

Attached is Senate proposal 4-24, “Establishment of a MS in Wildlife Ecology & Conservation Developed by College of Forest Resources and Environmental Science Graduate Studies Committee,” and a memo stating the Senate passed this proposal at their March 6, 2024 meeting. I have reviewed this memo and recommend approving the proposal.

If you concur with my recommendation, the provost’s office will seek the following approvals.

X Board of Trustees
X Michigan Association of State Universities (MASU)

I concur X do not concur_____ with the provost’s recommendation as stated in this memo.

Richard J. Koubek Digitally signed by Richard J. Koubek
Date: 2024.04.03 10:50:47 -04'00'

Richard Koubek, President

04/03/2024

Date

Michigan Tech

University Senate

DATE:	March 7, 2024
TO:	Richard Koubek, President
FROM:	Robert Hutchinson University Senate President
SUBJECT:	Proposal 4-24
COPIES:	Andrew Storer, Provost & Senior VP for Academic Affairs

At its meeting on March 6, 2024, the University Senate approved Proposal 4-24, "Establishment of a MS in Wildlife Ecology & Conservation Developed by College of Forest Resources and Environmental Science Graduate Studies Committee." Feel free to contact me if you have any questions.

The University Senate of Michigan Technological University

Proposal 4-24

Establishment of a MS in Wildlife Ecology and Conservation

Basic Program Information

Primary Contact: Molly Cavaleri (macavale@mtu.edu), Jared Wolfe (jdwolfe@mtu.edu)
Program/Degree type: Masters
Program Title: Master of Science in Wildlife Ecology and Conservation
Planned Implementation Date: Fall 2024
Program location/modality: On campus/In-person
Target student population: Current enrollment shift

General description and characteristics of program

In the CFRES Wildlife Ecology and Conservation MS program, students, guided by their advisors and committees, tailor their study plans to align with personal academic and research goals while adhering to the broader degree requirements set by the Graduate School. This program mandates a minimum of 30 credits and will follow the standard Graduate School guidelines for coursework, report, and thesis credit distributions.

This new program will have an exclusive focus on wildlife management, conservation, and policy topics, which is distinct from other currently offered MS programs at Michigan Tech and regionally.

Rationale

Over the last decade, CFRES has experienced sustained growth, resulting in an increasingly large and diverse graduate student community. Currently, many of our graduate students pursue a diversity of research questions that no longer reflect the historic forestry-focused research once dominant at CFRES. In particular, a growing number of MS students are pursuing research within the discipline of Wildlife Ecology and Conservation, yet these target students are relegated to degree programs, such as Forest Ecology and Management, that do not reflect the discipline of their graduate research, their expertise, or their professional ambitions.

That discrepancy has been a source of great concern for some graduate students who fear professional disadvantages when applying for wildlife related jobs that align with their expertise, but do not align with their graduate degree program from CFRES (e.g., Forest Ecology and Management). As such, we aim to create a MS degree in Wildlife Ecology and Conservation

located within CFRES. This new program is consistent with the BS degree in Wildlife Ecology and Conservation that is currently offered in CFRES. The college stopped accepting applications for the MS in Forestry a few years ago (and it is in the process of being formally shelved this academic year) because few graduate students were choosing this degree title. Thus, this new MS degree represents a net neutral impact on our past graduate degree offerings and will appear on diplomas as a “Master of Science in Wildlife Ecology and Conservation ”.

The proposed MS degree directly aligns with Michigan Tech’s educational and research goals focus on creating solutions for societal challenges through action-based education, interdisciplinary research, and innovation, aimed at improving quality of life and promoting equity. Further, the proposed MS degree prioritizes initiatives around natural resources, with opportunity for development of autonomous systems to assess wildlife diversity, zoonotic disease impacts on human health, indigenous cultural receptiveness, and education reform.

Resource allocation aligns with these strategic goals, emphasizing interdisciplinary education, research, and engagement that will likely generate funding from state, federal, corporate, and philanthropic sources.

Related programs: within MTU and at other institutions

The College of Forest Resources and Environmental Science (CFRES) at Michigan Tech currently offers three MS programs:

- an MS in Forest Ecology and Management;
- an MS in Applied Ecology; and
- an MS in Forest Molecular Genetics and Biotechnology.

An additional MS in Forestry is currently in the process of being shelved (proposal 8-24) as it is considered too similar to the MS in Forest Ecology and Management program.

The proposed program differs substantially from the most similar at Michigan Tech, the MS degree in Applied Ecology at CFRES. The MS degree in Applied Ecology emphasizes research focused on ecological restoration, wetland ecology, and invasive species management.

Related Programs in the Region

Regionally, MS degrees in Wildlife Ecology and Conservation are only offered at a few high-ranking large research universities. In regard to the proposed MS degree in Wildlife Ecology and Conservation program in CFRES, there are no similar programs in the Upper Peninsula of Michigan. The programs most similar to the proposed Wildlife Ecology and Conservation program in the Midwest Region are listed below.

1. MS Degree in Wildlife Ecology, Department of Forest and Wildlife Ecology, University of Wisconsin–Madison.
2. MS Degree in Wildlife Ecology, Department of Natural Resource Ecology and Management, Iowa State University.

3. MS Degree in Fisheries and Wildlife, Department of Fisheries and Wildlife, Michigan State University.
4. MS Degree in Fisheries and Wildlife Science, Arkansas Tech University.
5. MS Degree in Fisheries and Wildlife, College of Agriculture, Food and Natural Resources, University of Missouri
6. MS in Conservation Science with a track in Wildlife Ecology and Management, Department of Fisheries, Wildlife and Conservation Biology, University of Minnesota.

The MS degree in Wildlife Ecology and Conservation at CFRES distinguishes itself primarily by its exclusive focus on wildlife management, conservation, and policy, unlike broader programs that encompass fisheries (such as Michigan State, Arkansas Tech, University of Missouri) or Conservation Science (University of Minnesota). It closely aligns with programs at University of Wisconsin-Madison and Iowa State University in terms of structure. While University of Wisconsin-Madison prioritizes research with mandatory thesis defense, Iowa State University provides both thesis and non-thesis options. Similar to Wisconsin-Madison, the CFRES program requires 30 credits, including an upper division statistics course and a graduate seminar, with flexible coursework tailored to student needs. However, CFRES's program uniquely emphasizes wildlife ecology and conservation in the Upper Peninsula, an area facing rapid environmental shifts due to climate change and evolving forestry practices. This focus contrasts with Wisconsin-Madison's emphasis on Wisconsin's ecosystems. Additionally, CFRES will foster distinct collaborations and funding opportunities, leveraging partnerships with entities like Michigan DNR and Isle Royale National Park. While Wisconsin-Madison, established by Aldo Leopold in 1933, is one of the oldest and most renowned programs in the U.S., the proposed MS in Wildlife Ecology and Conservation in CFRES is poised to be the nation's newest, offering a fresh and competitive alternative for aspiring wildlife biologists in an ecologically unique region in the Midwest.

Projected Enrollment

We have had an average of 70 graduate students in CFRES over the last 7 years. Based on the number of graduate students currently pursuing wildlife related research, we anticipate that a minimum of 8 MS students will be continually enrolled in the new degree. There is also reason to think that enrollment in the proposed Wildlife Ecology and Conservation MS degree program will increase in the future given the steady and sustained increase in the number of students enrolling in the BS degree in Wildlife Ecology and Conservation in CFRES over the last few years.

The proposed Master's program aims to attract a growing segment of students interested in Natural Resources. With an increasing societal emphasis on environmental sustainability and wildlife conservation, there is a heightened interest among students in these fields. This program is strategically designed to cater to this burgeoning interest, offering specialized curriculum and research opportunities that aligns with contemporary conservation challenges . We anticipate that the introduction of this program will boost the number of Master's students at Michigan Tech, enhancing the institution's role as a leader in environmental and wildlife education. By tapping into this growing student interest, the program not only meets an

educational demand but also contributes to the university's broader mission of fostering sustainable and responsible management of natural resources.

CFRES has demonstrated a successful track record with its past educational initiatives, notably with the creation of the Bachelor of Science programs in Wildlife Ecology and Conservation and Applied Ecology. These programs have been instrumental in driving steady and sustained growth in undergraduate enrollment, reflecting CFRES's capacity to attract and retain students with its innovative and relevant curricular offerings. This history of positive enrollment trends serves as a strong indicator for the prospective impact of the new MS degree in Wildlife Ecology & Conservation. We anticipate that the introduction of this graduate program will mirror the success of its undergraduate counterparts, contributing to a continued increase in enrollment at the master's level. The launch of this MS program is expected to not only enhance CFRES's academic portfolio but also significantly contribute to the department's budget through tuition revenue, reaffirming the college's commitment to expanding its educational impact while supporting the university's broader financial and academic goals.

Specialized Accreditation Requirements

There are no accreditation requirements for this program.

Professional Licensure Requirements

This is not a licensed profession

Curriculum Details

Learning Goals

After completing the Wildlife Ecology and Conservation MS program a student will be able to:

Goal	Program Learning Outcomes
1.	Contribute to the discipline through coursework, report, or research project by demonstrating the ability to:
	a. Apply existing research methodologies and techniques in Wildlife Ecology and Conservation
	b. Critically analyze and evaluate their own findings and the findings of others
2.	Effectively communicate results in Wildlife Ecology and Conservation both in writing and orally
3.	Practice responsible conduct of research

Assessment Plan

Program competencies serve as the exit outcomes for graduates. Performance indicators and rubrics have been developed for each learning goal and are in use to assess the program.

Curriculum Design

Recognizing the vast scope of wildlife ecology and conservation, the coursework requirements are deliberately designed to be flexible. This adaptability is crucial in accommodating the varied research interests of our students, which range from conservation genetics and wildlife management to conservation policy, avian ecology, and mammal ecology. Such flexibility not only caters to the diverse academic backgrounds of our students but also ensures that their educational experience is deeply relevant and directly applicable to their specific research areas. The specific coursework requirements for the MS degree in Wildlife Ecology and Conservation are designed to provide a comprehensive and nuanced understanding of the field, enabling students to delve into specialized topics while gaining a broad base of knowledge.

Program length: 30 credits

- Coursework students: 30 credits of coursework
- Report students: 24 credits of coursework + 6 credits of research
- Thesis students: 20 credits of coursework + 10 credits of research

Core courses (8 credits, *courses are explicitly required of all CFRES MS students)

- FW 5411 (3 cr): Applied Data Analysis
- FW 5412 (1 cr): Data Analysis in R
- FW 5800 (1 cr): Master's Graduate Seminar*
- FW 5810 (2 cr): Research Methods in Natural Resources*
- FW 5811 (1 cr): Advanced RCR in Natural Resources (summer)
    - OR BL 5025 (2 cr): The Scientific Profession (spring)

Additional coursework

- Coursework students: 22 credits
- Report students: 16 credits
- Thesis students: 12 credits

Research:

- Report students: 6 credits FW 5999 - Master's Research
- Thesis students: 10 credits FW 5999 - Master's Research

Model Schedule (thesis)

Semester	Course	Credits	Pre-reqs	co-req
1 - Fall (9 cr)	FW 5800	1	none	none
	FW 5810	2	none	none
	Graduate Elective	3	Depends on selection	

Semester	Course	Credits	Pre-reqs	co-req
	Graduate Elective	3	Depends on selection	
2 - Spring (9 cr)	FW 5411	3	none	FW 5412
	FW 5412	1	none	FW 5411
	Graduate Elective	3	Depends on selection	
	Graduate Elective	2	Depends on selection	
3 - summer (1 cr)	FW 5811	1	none	none
4 - Fall (6 cr)	FW seminar / elective	1	Depends on selection	
	FW 5999	5	none	none
5 - Spring (5 cr)	FW 5999	5	none	none

Overall: 20 credits coursework + 10 credits research

New Course Descriptions

No new courses are being proposed.

Faculty Qualifications

Curriculum vitae of faculty can be found online at: https://www.mtu.edu/forest/about/faculty-staff/
All faculty teaching graduate courses are appointed as Graduate Faculty.

Program-specific policies, regulations, and rules

The responsibility for administration of the program will reside with the Graduate Program Director, and Graduate Program Assistant (CFRES) who report to the CFRES Dean.

Resources Needed

Library and other learning resources needed

The library already maintains a diverse selection of journal and database subscriptions and has significant holdings related to Wildlife Ecology and Conservation, so it is not anticipated that new library or other learning resources will be required.

Suitability of existing space, facilities, and equipment

No new equipment will be needed to develop or support the proposed degree.

No additional space is required at the University or College level to support this program.

Program Costs

No additional funds or faculty are needed to start this program. As there is already significant interest in wildlife-related fields in our current student population, it is not expected that additional funds for specific marketing will be required.

108.1.2: Criteria for Financial Evaluation Proposed Academic Programs

Relation to University Strategic Plan

Michigan Technological University’s stated vision and mission are as follows:

Vision
The creation of a new Master of Science (MS) program in Wildlife Ecology and Conservation at Michigan Tech aligns seamlessly with the university's vision of being a globally recognized technological university committed to education, knowledge advancement, and innovation for improving quality of life. This program addresses key aspects of this vision: it educates students in a critical and emerging field, thereby contributing to the global pool of knowledge and expertise in wildlife ecology and conservation. This field of study is increasingly important in addressing environmental challenges and promoting biodiversity, which is essential for the quality of life and ecological balance. Furthermore, the program's focus on wildlife conservation aligns with the university's commitment to equity and mutual respect for all forms of life, emphasizing the interconnectedness of human and environmental health and well-being. By incorporating this program, Michigan Tech extends its educational and research boundaries, reinforcing its role as a leader in addressing global ecological issues, thus fulfilling its vision of contributing positively both within the state and in the larger global community.

Mission
The introduction of the new Master of Science (MS) in Wildlife Ecology and Conservation at Michigan Tech aligns closely with the university's mission to create solutions for society's challenges through education, research, and innovation. This program directly contributes to addressing some of the pressing environmental challenges faced by society, such as biodiversity loss, wildlife conservation, and ecosystem management. By providing action-based graduate education in this field, the program prepares students to develop practical solutions to these real-world issues, embodying the university's commitment to delivering education that has a tangible impact on society. Furthermore, the research component of the MS program fosters the discovery of new knowledge in wildlife ecology, contributing to the global understanding of ecological issues and the development of innovative strategies for conservation. This

aligns with Michigan Tech's focus on launching new technologies and approaches through innovation. While different in focus from a local nursing program, which addresses immediate healthcare needs, the MS in Wildlife Ecology and Conservation similarly addresses a critical societal need by preparing experts who can tackle environmental challenges, thereby improving quality of life on a broader, ecological scale. This holistic approach to solving societal challenges, whether in healthcare or environmental conservation, exemplifies Michigan Tech's mission in action.

Impact on University Enrollment

- **Projected number of students in the program**: We anticipate the program to enroll between 10 and 20 students.
- **Source of new students**: The new MS program in Wildlife Ecology and Conservation at Michigan Tech is likely to attract a diverse pool of students. The primary sources would include recent undergraduates with degrees in biology, environmental science, ecology, or related fields, seeking advanced specialization. Additionally, the program may appeal to professionals in environmental agencies, non-governmental organizations, or wildlife conservation groups who wish to deepen their expertise or pivot their careers. Michigan Tech's reputation in technological and environmental studies could also draw international students seeking quality education in these fields. The growing global emphasis on sustainability and environmental protection could further bolster interest in the program among a new generation of students motivated by ecological and conservation goals.
- **How will demand for the new program correlate with existing enrollment patterns?** The demand for the new MS program in Wildlife Ecology and Conservation at Michigan Tech is likely to correlate positively with the university's existing enrollment patterns, which have been showing steady growth and diversification. Michigan Tech has experienced consistent increases in its overall enrollment, with a significant uptick in the number of incoming first-year students in recent years. This trend indicates a growing interest in the university's programs, suggesting that the new MS program could also attract a considerable number of students. Additionally, the university has seen a rise in applications from diverse geographic locations, both within and outside of Michigan, and from underrepresented minority students. This expanding geographic and demographic reach may contribute to a diverse pool of applicants for the new MS program. The university's efforts in attracting students in STEM fields, combined with a growing global emphasis on environmental and wildlife conservation, may further increase the appeal of the program. Moreover, Michigan Tech's commitment to innovation and its emphasis on fields like engineering, computing, and the sciences, align with the interests of students seeking advanced education in specialized and emerging fields like wildlife ecology and conservation. Considering these factors, the new MS program is likely to resonate with the current and evolving enrollment trends at Michigan Tech.
- **Current enrollment in the unit**: As of 2023, CFRES has an undergraduate enrollment of around 262 undergraduate students, and 85 graduate students.

Impact on Resources in Home Department

This would include, but not be limited to:

- **Faculty lines**:We do not anticipate a need for additional faculty lines.
- **Faculty and student labs**: An increase in graduate student enrollment at CFRES can lead to a strain on existing resources, particularly office and computer lab spaces. This challenge can be somewhat mitigated by allocating more graduate students to each office, effectively maximizing the use of available space. While this strategy can help accommodate a larger student body, it may also necessitate adjustments in space management and resource allocation to ensure that all students have adequate access to the facilities they need for their academic pursuits.
- **Advising**: We do not anticipate a need for additional administration lines to aid in advising.
- **Assessment**: Assessments for the new MS in Wildlife Ecology and Conservation at Michigan Tech will adhere to preexisting methods employed within the College of Forest Resources and Environmental Science. No substantial impact on resources required for assessment is expected.

Impact on Resources in Other Units Within the University.

Given the moderate increase in graduate student numbers the MS in Wildlife Ecology and Conservation will have on the total student body at Michigan Tech, we anticipate that there will be no significant impact on resources in other units within the university. The growth in the graduate student population is expected to be manageable, allowing for existing resources to be effectively utilized without overburdening facilities or services in other academic or administrative areas.

Additionally, no courses external to CFRES are explicitly required in this program’s curriculum.

Impact on other resources

The moderate increase in students for the new MS in Wildlife Ecology and Conservation at Michigan Tech is expected to have a negligible impact on university-wide resources, including the Student Development Complex (SDC) and the library. These facilities, designed to accommodate the university's student body, are equipped to handle the modest rise in numbers without overextension. Moreover, there is no anticipated need for additional software resources from the IT department, as the existing IT infrastructure and software licenses are deemed sufficient to meet the program's requirements. This balanced approach ensures both efficient resource utilization and the maintenance of high-quality services across the university.

Assessment of the ability to obtain the necessary resources assuming requested funds are obtained

All required faculty and staff, major lab equipment, and supplies are readily available.

Past Proposal Outcomes

The proposing unit has initiated the following new degree programs in the last five years:

- Environmental Science and Sustainability- BS (senate proposal 59-21)
    - Current Enrollment: 13
    - Projected: 100
- Sustainable Bioproducts- BS (senate proposal 40-20)
    - Current Enrollment: 5
    - Projected: 60
- How have degree programs added in the past five years affected total enrollment in the department?
    - Undergraduate enrollment in the college has been increasing since 2015 (139-263). These recent BS programs are too new to appropriately gauge their impact.

Departmental Budget Contribution

- What is the department's total general fund budget?
    - FY 2023-24 General fund budget for CFRES: $4,122,373.90
- How much tuition does the department generate?
    - In AY 2019-20:
    - $3,406,761 for tuition generated by credit hours taught by CFRES
    - $4,520,652 for tuition generated by the number of credit hours taken by CFRES enrolled students

How do the benefits from this program compare to other alternatives that are currently under consideration or development?

Currently, at Michigan Tech, there are no comparable alternatives to the new MS program in Wildlife Ecology and Conservation either under construction or under consideration. This uniqueness positions the program as a distinct offering within the university's academic portfolio, addressing specialized areas of study in ecology and conservation that are not replicated in other current or proposed programs. This exclusivity enhances the program's appeal to students interested in this specific field, filling a unique niche in Michigan Tech's academic landscape.