

*Department of  
Wildlife, Fisheries, and Conservation  
Biology*

## **Graduate Program Requirements**

The Department of Wildlife, Fisheries, and Conservation Biology (WFCB) in the College of Natural Sciences, Forestry and Agriculture offers graduate study leading to the Masters of Science degree in Wildlife Ecology, the Doctor of Philosophy degree in Wildlife Ecology, and the Masters of Wildlife Conservation degree in Wildlife Conservation. Faculty in the department also advise graduate students pursuing Master of Science and Doctor of Philosophy degrees in the Ecology and Environmental Science (EES) program. The Department's graduate program promotes professional development of students; provides training for future service in the fields of wildlife management, wildlife ecology, conservation biology, and wildlife research; expands the boundaries of knowledge of students and in the profession; and, encourages the systematic application of critical thinking in wildlife ecology and natural resource management.

This document describes the departmental requirements for completion of graduate degrees in Wildlife Ecology, other departmental requirements or policy applicable to graduate students, and additional guidelines or recommendations to help guide graduate students successfully through the program in a timely manner. The EES degrees have different academic and course requirements, but all other departmental policy and guidelines are applicable to EES students in the Department of Wildlife, Fisheries, and Conservation Biology (e.g., timelines for proposals, proposal seminars, and other departmental responsibilities). The requirements established herein are in addition to those of the Graduate School.

### **Requirements Common to Wildlife Ecology and Master of Wildlife Conservation Degrees**

#### **Advisors and Graduate Committee**

Students are accepted into the program by individual faculty, and the same faculty serve as advisor (or co-advisor). The faculty advisor is the primary supervisor of a graduate student during their program. Students will work with their advisor to select a graduate committee to oversee and guide them through their graduate program. Students are expected to select their graduate committee before the research proposal is finalized. At least one member of the committee must be external to the Department. Cooperating faculty who hold a joint appointment in the Department serve as an external member on graduate committees. The initial meeting of the academic committee is intended to establish the student's course of study and should occur early enough to be able to effectively provide useful guidance. The student will produce a written proposal for research that meets the approval of the graduate committee both in terms of content and delivery date. Consequently, the graduate committee will usually discuss the student's proposed research during the initial committee meeting.

Before the initiation of research beyond pilot work (typically by student's second semester), both MS and PhD students are expected to present a research prospectus to the Department in an informal seminar format (a 15-20-minute presentation followed by an equal measure of discussion is suggested). The objectives of the seminar requirement are to i) provide an opportunity to solicit faculty input on study design and logistics and ii) encourage communication within the Department. PhD students will make a second presentation the following year, with a similar format and informed with preliminary results of their pilot research. These presentations should focus on fostering discussion may be coordinated with the departmental seminar series.

At a minimum, the graduate advisor(s), in consultation with the committee, shall annually evaluate the progress and level of achievement of the student. Students should meet with the graduate committee for this review. Students will receive feedback (oral, written, or both) from the committee. Copies of written evaluations may be submitted to the student and to the Department Chair.

### **Professional and Departmental Activities**

All candidates are expected to participate in professional and Departmental activities. Candidates are expected to regularly attend Departmental and university seminars, to participate in professional development workshops, as available, and to participate in Departmental operations and activities. Graduate students are encouraged to present talks to the public (secondary schools, conservation organizations, etc.) or professional organizations on their thesis research and other topics concerning wildlife ecology or management. Departmental duties assigned to graduate students will include: Helping in the maintenance of laboratories, coordination of the Department's seminar program, leadership in a professional student group (e.g., to the Student Chapter of The Wildlife Society, American Fisheries Society) and other contributions.

### **Course Requirements**

As with undergraduate degrees, course requirements are intended to balance the specific informational requirements of graduate research projects with a wider perspective to be shared by successful students in the Department.

Requirements for degrees include:

- 1) A demonstrated breadth of learning will include topics of Biology and Ecology, Natural Resource Management, and Analytical Tools. This may be satisfied by a) the completion of coursework prior to initiating graduate degree work at the University of Maine (at or above level 300, or approved by graduate coordinator) or b) by course work taken at the University of Maine as part of the degree program (level 400 or above, or as approved by graduate coordinator). A total of 30 credit hours of the following topics are required from a combination of undergraduate and graduate work, however, only the graduate-level course work conducted during the graduate program will count towards the required graduate degree credits (see graduate-level course requirement sections, below).

#### **Ecology and Organismal Biology – 9 credits\* which may include:**

Botany, Ecology, Zoology (Vertebrate or Invertebrate), Anatomy, Physiology, Evolution

**Natural Resource Management – 9 credits\* which may include:**

Habitat Conservation, Resource Economics, Policy, Conservation  
Social Science, Human Ecology

**Analytical Tools – 9 credits\* to include:**

Statistics (3 credit minimum) and additional statistics coursework or courses in Population  
Dynamics, GIS, or Modeling

*\*Note that the listed requirements sum up to 27 credits, thus one topical area will require 12 rather than 9 credits).*

- 2) At least three courses must be taken within the Department of Wildlife, Fisheries, and Conservation Biology (either taught by our faculty or with WLE designator). One of these three courses must be at a 500 level or greater.
- 3) Meeting the minimum course credit requirements for the graduate degree program (specific to MS, MWC and PhD) as described below.

**Research Proposal and Proposal Seminar**

A presentation to the Department of the student's preliminary research plan is required before the first major field season. (Note that for any project involving the use of vertebrates, an approved Institutional Animal Care and Use Committee (IACUC) must be approved before any work begins). This presentation is intended to be informal and serve as a point of discussion for the goals, objectives, and literature of the research topic. The presentation should be about 15-25 minutes long for MS students (followed by 15-25 minutes of discussion) and about 20-30 minutes long for PhD students (followed by 20-30 minutes of discussion).

A written proposal approved by the student's advisory committee is required before research is undertaken (preliminary research excluded) and by the end of the second semester. A final copy must be submitted to the Department Chair for filing with the student's program of study. A timeline for the student's entire program is required as part of the proposal.

**Requirements for the Master of Science Degree in Wildlife Ecology**

**Course Requirements**

A minimum of 30 units of graduate credit are required for the MS degree. A minimum of 20 units of course work (400 level or greater) is required, and of this, at least 12 credits must be derived from courses designated 500 level or above. Thesis credits do not count toward the 20 course credits requirements. Prerequisite course work below the 400 level may not be included as part of the core curriculum of the graduate program. The course work for the Master's program will be selected by the student and the advisor during the first semester of study, subject to approval by the graduate committee. No fewer than 6 credits and no more than 10 credits of the 30 total credits required for an MS degree may be thesis credits.

**Credit Hour Considerations for Graduate Assistants**

Students getting paid by the university as a graduate assistant must be registered for at least six credits for fall and spring, and if they are paid in the summer they need to be registered for at least

one credit. Master's students in their final semester can register for one thesis credit, however, this reduced credit load can be used only once during their tenure while on an assistantship. For example, if an assistantship-supported student anticipates graduating in December the student can register for only one thesis credit in the fall, but if the student does not complete requirements in time for December graduation, then he/she will be required to register for six credits in the semester that they graduate (regardless of whether they are supported by an assistantship during that semester). In this example, the student who missed the December graduation deadlines would graduate in the Spring and be required to pay for six credits in the Spring, because they already took advantage of the "one credit graduation semester" exception. If the student no longer is supported by an assistantship and is not a Maine resident, the charge for the six credits to the student will be assessed at the out-of-state rate. The student should not assume that their advisor will continue to pay for credits when they are not supported by an assistantship.

### **Graduate Committee Composition**

The committee will consist of three or more graduate faculty members, including one from outside the Department. Cooperating faculty who hold a joint appointment in the Department serve as an external member on graduate committees.

### **Thesis Requirement**

The preparation of an original thesis is required for all candidates. The candidate is encouraged to prepare the thesis in the form of one or more papers suitable for publication in a major refereed journal, as opposed to the traditional thesis format. If the traditional format is followed, the candidate will likely be expected to prepare a manuscript for publication that will be reviewed and approved by the advisor. Format requirements (title page, abstract, margins, etc.) for the thesis have been established by the Graduate School.

### **Final Oral Examination**

Upon completion of course work and thesis, a candidate for the MS degree is required to defend the thesis during an oral examination. In addition, the candidate will be examined for general knowledge in the field of wildlife ecology. The final oral examination may not be scheduled until all committee members have read a draft of the thesis and signed the Tentative Thesis Acceptance form. A draft of the thesis must be approved by the advisor before it is distributed to the committee. Additional time prior to the defense may be necessary if significant revisions of the thesis are required by the committee. To facilitate meaningful reading of the thesis, an approved draft of the thesis must be to the committee at least three weeks prior to the date the thesis is due to the Graduate School. (*Note: If any chapters are to be submitted for journal publication prior to thesis completion and defense, it is recommended that committee members be given three weeks for review so that feedback on the chapter may be incorporated prior to journal submission*). Additional time prior to the defense may be necessary if significant revisions of the thesis are required by the committee. Notification of the defense seminar and examination must be circulated through the Department (including WFCB faculty) at least one week before the examination. A copy of the thesis also must be made available to the Department office for review. As part of the examination, a seminar on the research must be presented to the Department preceding the oral defense.

## **Requirements for the Master of Wildlife Conservation Degree**

### **Course Work Requirements**

A minimum of 30 units of graduate credit (Course work and thesis credits) are required for the MWC degree. A minimum of 24 units of Course work (400 level or greater) is required, and of this, at least 12 credits must derive from courses designated 500 level or above. At least three credits and no more than six must be an independent project. Prerequisite Course work below the 400 level may not be included as part of the core curriculum of the graduate program. The Course work for the MWC program will be selected by the student and the advisor during the first semester of study, subject to approval by the graduate committee.

### **Graduate Committee Composition**

The committee will consist of three or more graduate faculty members, including at least one from outside the Department. Cooperating faculty who hold a joint appointment in the Department serve as an external member on graduate committees.

### **Independent Project**

The independent study will be on a topic selected by the student and advisory committee. The submission of a formal report for approval by the advisory committee is required. Though this is not a thesis, it will require significant scholarship and should exhibit the quality of presentation suitable for publication.

### **Final Oral Exam**

Upon completion of Course work and the independent project, a candidate for the MWC degree is required to successfully complete an oral examination on general relevant issues, but emphasizing the topic for the independent study. As part of the examination, a seminar on the independent project must be presented to the Department, usually before the oral defense. To facilitate meaningful reading of the project, an approved draft of the report must be to the committee at least three weeks prior to the exam.

## **Requirements for the PhD Degree in Wildlife Ecology**

### **Scope of the PhD Program**

Candidates for the PhD degree must possess a detailed knowledge of their area of research, a breadth of knowledge of basic biology and ecology, and a comprehensive knowledge of the fields of wildlife biology and management. Furthermore, each candidate must have completed a program of study in a discipline ancillary to wildlife. Evaluation of the PhD candidate with respect to the above objectives will include (1) a comprehensive examination testing the candidate's breadth of general knowledge as well as his/her comprehensive knowledge in the fields of wildlife biology and management, and (2) a final oral defense of the research and research specialty. The ancillary studies requirement may be met through the Course work, or via other opportunities for personal development agreed upon by the student's graduate committee.

### **Credit Hour Requirements**

The credit hour requirement for doctoral students in Wildlife Ecology shall include a minimum of 50 credit hours, which may include a maximum of 30 credit hours from the Master's program. A minimum of 35 credit hours will be in course work, of which 20 hours must be in graduate level

(500/600) courses. Thesis credits do not count toward course credit requirements. At least six credits of thesis are required. PhD students are expected to be engaged in full-time work on their PhD program for a minimum of two full years; most programs last three to five years. Students getting paid by the university as a graduate assistant or fellow need to be registered for at least six credits for fall and spring, and if they are paid in the summer they need to be registered for at least one credit. However, after PhD students pass their Comprehensive Exams, they can register for one credit per semester until they graduate, assuming they meet the total credit hour requirements listed above. If the student no longer is supported by an assistantship and is not a Maine resident, the charge for the credits to the student will be assessed at the out-of-state rate. The student should not assume that their advisor will continue to pay for credits when they are not supported by an assistantship.

### **Graduate Committee Composition**

The candidate will select his/her graduate committee before the end of the second semester of study. The committee will consist of at least five members of the graduate faculty, including at least one from outside the Department. Cooperating faculty who hold a joint appointment in the Department serve as an external member on graduate committees.

### **Comprehensive Examination**

The purpose of the comprehensive exam is to ensure that the candidate is knowledgeable of basic concepts of biology, ecology, and statistics, and has a comprehensive knowledge of wildlife ecology, and can synthesize information and concepts in the disciplines in a coherent and scholarly fashion. In preparation for the comprehensive exam, the candidate can develop (if not previously accomplished) a core of course work to obtain a comprehensive knowledge in areas of concentrated study. In addition, the candidate should develop, in consultation with the graduate committee and other members of the Department, a program of independent study that ensures a breadth of basic knowledge. It is intended that the student will complete the comprehensive exam by the end of the second year of study.

The comprehensive examination will consist both of written and oral sections and usually will be administered following the completion of the Course work and before much of the research has been completed. The comprehensive examination will consist of five written parts, each of which will be administered by a committee member or a designated faculty member assigned to the examining committee. The five parts will cover at least five areas of concentrated study in the disciplines of biology (e.g., vertebrate physiology, animal systematics, environmental biophysics, evolution), ecology (e.g., limnology, population dynamics, biogeography, population genetics), and wildlife ecology (e.g., population biology and dynamics, habitat ecology, social/economic issues, wildlife law and policy). The subject areas will be selected jointly by the candidate and the graduate committee.

The written examination will be completed within a five-day period, and will be followed within two weeks by an oral examination. Upon completion of the oral examination, the committee may rule that either (1) the student has passed the comprehensive exam, or (2) the student will be allowed to retake the exam after addressing deficiencies, or (3) the candidate has failed the exam, and will be dropped from the graduate program. The candidate may retake the comprehensive exam only once, however, the committee may recommend that the student withdraw from the program without retaking the exam. Reexamination may take place no earlier than two months following the initial

examination. A student who fails the second examination attempt will be dismissed from the program.

### **Ancillary Academic Program**

Candidates are required to develop a program to broaden or expand their knowledge in a discipline ancillary to wildlife. However, the Department has expanded this concept to allow study or accomplishment in other disciplines as well. A suitable discipline will be selected by the candidate and approved by the graduate committee. Commitment to this endeavor should equal at least six credit hours, and may be fulfilled by means other than structured Course work. Ancillary disciplines may include foreign languages, chemistry, mathematics, advanced statistics, computer science, cartography, GIS, etc.

### **Teaching Requirement**

Each PhD candidate is required to teach for one semester in an undergraduate course. The requirement may be fulfilled through the acceptance of a teaching assistantship (1/2 time) for one semester, the instruction of a three-hour laboratory section for one semester, or an equivalent teaching assignment as agreed upon by the graduate committee. Demonstration of prior teaching experience may be considered, at the discretion of the student's committee, to meet this requirement.

### **Dissertation**

The guidelines presented for the preparation of the Master's Thesis are applicable to the preparation of the dissertation.

### **Final Oral Examination**

Upon completion of the Course work, comprehensive examination, and dissertation, the PhD candidate will be required to pass an oral defense of the dissertation. The final oral examination may not be scheduled until all committee members have read a draft of the thesis and signed the Tentative Thesis Acceptance form. A draft of the dissertation must be approved by the advisor before it is distributed to the committee. To facilitate meaningful reading of the thesis, an approved draft of the thesis must be to the committee at least three weeks prior to the date the thesis is due to the Graduate School. (*Note: If any chapters are to be submitted for journal publication prior to thesis completion and defense, it is recommended that committee members be given three weeks for review so that feedback on the chapter may be incorporated prior to journal submission*). Additional lead time prior to the defense may be necessary if significant revision of the dissertation is required by the graduate committee. As part of the examination, a seminar on the research for the dissertation must be presented to the Department, usually before the oral defense. Notification of the defense seminar and examination must be circulated through the Department (including WFCB faculty) at least one week before the examination. A copy of the dissertation also must be available to the Department for review. As part of the examination, a seminar on the research must be presented to the Department preceding the oral defense.