

GRADUATE STUDENT HANDBOOK

DEPARTMENT
OF
FISH, WILDLIFE AND CONSERVATION ECOLOGY
AT
NEW MEXICO STATE UNIVERSITY



UPDATED SPRING 2023

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GRADUATE STUDY IN
FISH, WILDLIFE AND CONSERVATION ECOLOGY
NEW MEXICO STATE UNIVERSITY



INTRODUCTION

The Department offers graduate work leading to the Master of Science degree with a major in Fish, Wildlife and Conservation Ecology. The graduate program is designed to prepare students for work in research, teaching, extension and management of our natural resources. Graduates from the program often seek employment with various state and federal government agencies, the private sector, or continue with a doctorate degree. Faculty in the Department of Fish, Wildlife and Conservation Ecology also advise graduate students in other departments on campus.

Opportunities for both laboratory and field research abound in our modern facilities, on over 90,000 acres of University-owned land in the Chihuahuan Desert outside Las Cruces, and in the millions of acres of state and federally owned lands encompassing alpine meadows, extensive forests and grasslands, and diverse desert landscapes across New Mexico. The New Mexico Cooperative Fish and Wildlife Research Unit, associated with the Department since 1988, are members of the Graduate College and offer training and support for graduate students.

With a diversified faculty working in a broad range of terrestrial and aquatic systems, prospective students have excellent opportunities to explore a wide variety of subdisciplines in fish and wildlife sciences. Research programs in the Department include conservation biology and genetics, ecology and management, especially that related to both birds and to large and small mammals, mesocarnivore biology, biogeography, ecological modeling and statistical inference, decision analysis, aquatic ecology and fisheries management, disease ecology, wetlands management, wildlife-habitat relationships, and spatial modeling. The human dimension of fisheries and wildlife management is an important consideration within all subdisciplines of study. An individualized, flexible program of study involving graduate courses available across campus is developed for each student with course work and research designed to complement the background, interests, needs and abilities of each student.

Graduate assistantships are available through both teaching and funded research projects. Check out our website to learn more about our faculty and programs (<https://fwce.nmsu.edu/>)

GRADUATE STUDENT HANDBOOK – FISH, WILDLIFE AND CONSERVATION ECOLOGY, NEW
MEXICO STATE UNIVERSITY

The purpose of this handbook is to highlight the major expectations, program requirements, policies, and resources for graduate students in the M.S. program in the Department of Fish, Wildlife and Conservation Ecology. The intent is not to duplicate every university, graduate school, and college policy that might be applicable to graduate students. Therefore, the handbook should not be considered to be a comprehensive source of information on all university policies, procedures and requirements. Graduate students are expected to read and be familiar with the graduate school forms, requirements and policies, as well as those of the university and college. It is also the expectation of the graduate program committee that graduate students should be capable of seeking out information outside of the handbook and beyond those sources listed below.

Graduate School

<https://gradschool.nmsu.edu/>

<https://gradschool.nmsu.edu/ga-and-union/Graduate%20Assistant%20Resources.html>

Graduate Catalog

<https://catalogs.nmsu.edu/nmsu/>

Graduate Assistant Handbook (employment requirements)

https://gradschool.nmsu.edu/Current%20Students/current-student-forms/Graduate_Assistant_Handbook.pdf

NMSU System Academic Regulations and Policies

<https://catalogs.nmsu.edu/nmsu/regulations-policies/>

NMSU Administrative Rules and Procedures

<https://arp.nmsu.edu/>

Resources Available for Students:

There are various ESRI products available to students including: ArcGIS Online, ArcPro, Survey 123, Adobe Creative Cloud, and Adobe Acrobat.

If interested in getting the software for any of these products email Justin Krynitz (krynitzj@nmsu.edu). And if you need additional help installing these programs you can contact ACES IT for assistance.

Software Contact:

Justin Krynitz

Software License & Compliance Specialist

ICT Technology Support Center

New Mexico State University

Phone: 575-646-7786

Email: krynitzj@nmsu.edu

GRADUATE FACULTY

- Wiebke J. Boeing**, Professor (Ph.D. 2002, Louisiana State University) Aquatic ecology
- Kenneth G. Boykin**, Research Professor Emeritus (Ph.D. 2006, New Mexico State University) Spatial ecology and conservation
- James W. Cain III**, Affiliate Professor and Assistant Unit Leader-Wildlife, New Mexico Cooperative Fish and Wildlife Research Unit (Ph.D. 2006, University of Arizona) Large mammal ecology, wildlife-habitat relationships, foraging ecology, conservation and management
- Colleen A. Caldwell**, Affiliate Professor and Unit Leader-Fisheries, New Mexico Cooperative Fish and Wildlife Research Unit (Ph.D. 1988, University of Tennessee) Fish physiology, native fish conservation, and eco-toxicology
- David E. Cowley**, Professor Emeritus (Ph.D. 1987, University of Wisconsin – Madison) Aquatic conservation ecology, conservation genetics
- Martha J. Desmond**, Professor (Ph.D. 1997, University of Nebraska) Avian ecology, conservation biology and genetics
- Jennifer K. Frey**, College Professor (Ph.D. 1994, University of New Mexico) Ecology and conservation of mammals
- Fitsum Abadi Gebreselassie**, Assistant Professor (Ph.D. 2010, University of Bern, Switzerland) Integrated population modeling, capture-recapture models, population dynamics
- Jay V. Gedir**, Senior Research Scientist (Ph.D. 1999, University of Alberta) Vertebrate population dynamics, large mammal ecology and management, and reintroduction and conservation ecology
- Matthew E. Gompper**, Professor and Department Head (Ph.D. 1994, University of Tennessee) Mammal ecology, conservation and management, wildlife disease ecology, and interactions of domestic and wild animals.
- Zachary B. Klein**, Assistant Professor (Ph.D. 2019, University of Idaho) Fisheries management, fish conservation, and fish ecology.
- Theresa M. Laverty**, Assistant Professor (Ph.D. 2019, Colorado State University) Vertebrate population and community ecology, conservation biology, social-ecological systems
- Abigail J. Lawson**, Affiliate Assistant Professor and Assistant Unit Leader-Wildlife New Mexico Cooperative Fish and Wildlife Research Unit (Ph.D. 2019, Clemson University) Quantitative ecology, decision analysis, threatened and endangered species, gamebird and waterfowl ecology
- Kasey C. Pregler**, Assistant Professor and Assistant Unit Leader-Fisheries New Mexico Cooperative Fish and Wildlife Research Unit (Ph.D. 2019, Colorado State University) Quantitative ecology, conservation genetics, environmental drivers of population dynamics, conservation of imperiled fishes
- Rossana M. Sallenave**, College Associate Professor (Ph.D. 1994, University of Guelph) Aquatic ecology and environmental toxicology
- Raul Valdez**, Professor Emeritus (Ph.D. 1970, Texas A&M University) Ungulate ecology, behavior, and taxonomy

FINANCIAL ASSISTANCE

Teaching, Grading and Research Assistantships

The program has a limited number of teaching and research assistantships to support graduate students. Every effort is made to grant financial support to those students who seek it; however, because assistantships are limited in number, not all requests for financial assistance can be met.

Graduate assistantship salaries vary by level (I, II, and III), which is determined by previous education and level of completion of the degree program. For complete information on assistantship salaries see:

<https://gradschool.nmsu.edu/>

https://gradschool.nmsu.edu/ga-and-union/grad-assistant-forms/Guidelines_on_Employment_of_Graduate_Assistants%20Jan%202023.pdf

<https://hr.nmsu.edu/general-resources/employment1/salary.html>

Also, a waiver of the out-of-state tuition rate is provided to non-resident graduate students supported on assistantships during their first year in the program. All graduate students are strongly encouraged to fulfill the residency requirements as outlined here: <https://records.nmsu.edu/students/residency.html>
https://records.nmsu.edu/_files/sro-forms/Petition%20for%20NM%20Resident%20Tuition%20Rate.pdf

Students may be offered a teaching, grading or research assistantship. A 0.25 FTE assistantship requires an average of 10 hours/week of work, whereas a 0.5 FTE requires an average of 20 hours/week. Assistantships are intended to provide some financial support in exchange for students contributing to the research and or teaching mission of the university while pursuing a graduate degree. Students are not being paid to work on the thesis or dissertation research or to earn a graduate degree, but rather to assist with teaching courses or contributing towards meeting the goals of a research project.

Offers of assistantships will specify start and end dates. Duration of appointment letters will vary depending on source of funding, type of assistantship and major professor. Renewal of assistantships is contingent upon satisfactory performance (both academic and work performance on assistantship) and will be at the discretion of the Department Head (teaching or grading assistantships) or major professor (research assistantships).

The total cumulative duration of any assistantships is determined at the discretion of the Department Head in the case of teaching or grading assistantships or the major professor in the case of research assistantships derived from external funding secured by the major professor.

Assignment of Duties for Assistantships

Students supported on assistantships are obligated to meet and prioritize their assigned assistantship duties.

Course assignments for teaching assistantships are made by the Department Head. Specific duties will be assigned by the instructor of the course to which the TA is assigned.

Duties for research assistantships are assigned by the major professor who secured the external funding. These duties may or may not align with the thesis or dissertation research. Work on the thesis or dissertation is on the student's own time (i.e., beyond the assistantship's weekly time commitment). Activities such as coursework, proposal writing, emails, administrative tasks, networking, service or professional development generally do not count towards assistantship duties.

Health Insurance

NMSU does not currently offer a graduate student health insurance plan for domestic students. Health insurance plans in New Mexico can be found at: <https://www.healthcare.gov/> and or <https://www.bewellnm.com/>

The health center at NMSU offers services to full time graduate students

<https://wellness.nmsu.edu/index.html>

Establishing New Mexico residence will also allow for reduced health insurance premium rates for non-international students on the New Mexico Health Insurance Exchange: <https://www.bewellnm.com/>

International students should contact International Student and Scholar Services (<https://iss.nmsu.edu/>) for information on health insurance requirements and plans <https://iss.nmsu.edu/current-students/health-insurance.html>

Financial Aid and Scholarships

Information on available scholarships within the Department can be found at:

<https://fwce.nmsu.edu/scholarships/scholarships.html>

Information on student loans and other types of financial assistance is available from the Financial Aid Office: <https://fa.nmsu.edu/>

Graduate School: <http://gradschool.nmsu.edu/>

Additionally, there are a number of scholarships available to graduate students. Information on the requirements and deadlines of these awards can be found here:

<https://gradschool.nmsu.edu/Current%20Students/Awards%20and%20Funding.html>

PROFESSIONAL CONDUCT EXPECTATIONS AND GRIEVANCE PROCEDURES

All faculty, staff, students, technicians and volunteers associated with FWCE or projects conducted by FWCE faculty are expected to conduct themselves in a professional manner, including when involved in activities wherein the student is identified as affiliated with FWCE. The Department has a zero-tolerance policy for discrimination and sexual harassment.

Graduate Student Complaint Procedures

NMSU has a multitude of mechanisms for addressing concerns and for resolving problems students may encounter. Should a student have a concern, the department suggests the following procedure for resolution, although other approaches for addressing concerns are available (<https://studentlife.nmsu.edu/studentassistanceservices/index.html>).

1. Students are encouraged to first consult with their major professor and or graduate supervisory committee.
2. If the major professor is unable to resolve the problem or if the concern is with regard to the conduct of the major professor, the student is encouraged to meet with the Department Head.
3. If the complaint cannot be resolved at the departmental level, the student should contact the graduate school or other relevant offices at NMSU for assistance and resolution. (<https://studentlife.nmsu.edu/studentassistanceservices/index.html>).

Cases of sexual harassment or discrimination may be elevated directly to the Office of Institutional Equity (<https://equity.nmsu.edu/>). The Department Head requests that they be notified of any complaint or issue, however students do have the option to file confidential complaints with the Office of Institutional Equity if desired.

Student grievances pertaining to the employment/assistantship terms and conditions covered under the Graduate Student Union Collective Bargaining Agreement should follow procedures outlined in the UE & NMSU Collective Bargaining Agreement (<https://gradschool.nmsu.edu/ga-and-union/collective-bargaining-agreement.html>)

**ROLE OF SPONSORS FOR STUDENTS ENTERING THE GRADUATE
PROGRAM IN FISH, WILDLIFE AND CONSERVATION ECOLOGY**

Faculty members who sponsor the admission of students into the graduate program assume the following responsibilities:

- 1) Faculty must be willing to serve as the major professor for all students they sponsor. The student must be aware that if the major professor's expectations are not met, then the major professor has the right to recuse themselves as the student's advisor. Requests for changing major professors will be handled on a case-by-case basis and must go through the Departmental Head and the graduate student's supervisory committee. Changing major professors is not encouraged, but it is permitted, depending on the individual circumstances as reviewed by the Department Head and graduate student's supervisory committee. Except in cases of extenuating circumstances, any change in major professor is generally expected to occur early in the first year of graduate study. Furthermore, except in cases of extenuating circumstances, if a graduate student changes major professor, the original major professor and the department as a whole are not obligated to continue financial support of the student or their research project. Additionally, except under extenuating circumstances, the original major professor maintains the right to allow or disallow the use of data collected by the students and staff supported by the research grants/contracts (see also point 5 below). In the event of a change of major professor, the new major professor is responsible for the financial support of the student and their research project. Changing to a new major professor will usually result in the development of a new topic for the graduate student thesis research.
- 2) Faculty are responsible for identifying a source of funding for the graduate student prior to admission of the student into the program.
- 3) Faculty are responsible for the initial orientation of their new students.
- 4) Faculty are responsible for monitoring the progress of graduate students to ensure that timely progress is being made towards completion of the M.S. program.
- 5) Per NMSU policy, only faculty members (and some regular employees) can serve as Principal Investigator(s) (PI) on research projects. The PI is the individual responsible for securing research funding and is responsible for project leadership, including but not limited to scientific, technical, and legal aspects of research projects (<https://arp.nmsu.edu/11-20/>). As such, students working on a thesis project should recognize the oversight role of the PI (typically the major professor), and except under extenuating circumstances, must abide by the guidance of the major professor.

**RESPONSIBILITIES AND EXPECTATIONS OF GRADUATE STUDENTS IN
FISH, WILDLIFE AND CONSERVATION ECOLOGY**

All graduate students admitted to the M.S. program in the Department shall:

- 1) Observe and maintain the highest academic, ethical, and professional standards of conduct (<https://arp.nmsu.edu/5-10/>). Any student found guilty of academic misconduct shall be subject to disciplinary action, including dismissal from the program and university. Academic misconduct includes but is not limited to cheating or knowingly assisting another student in committing an act of cheating or other forms of academic dishonesty; plagiarism, which includes but is not necessarily limited to submitting materials as one's own work when such work has been prepared by another person or copied from another person. You must cite all sources of information. Copying of material, whether parts of sentences, whole sentences, paragraphs or entire articles all constitute plagiarism and will result in further disciplinary action. Even in the absence of university-level discipline for violations of the code of academic conduct, the student's major professor can, at their sole discretion, recuse themselves from serving as the major professor; this will likely result in loss of financial and research support and access to research data collected under the grant or contract obtained by the major professor.
- 2) Follow all university, college, and departmental policies and procedures on the proper use of facilities, vehicles, and research equipment. Failure to follow departmental policies and procedures may result in restrictions in use of facilities, vehicles, and research equipment.
- 3) Conduct themselves in a manner that reflects positively on the University, College, and Department including but not limited to when on campus, driving a university vehicle or in the field at research sites. Students represent the University, Department and their major professor and should behave accordingly.
- 4) Adhere to all stipulations in all state and federal research permits, including NMSU IACUC and/or IRB permits. In most cases, the PI/major professor obtains all research permits and graduate students act as a subpermittee. The PI is ultimately responsible for ensuring that there are no permit violations. Permit violations can result in the loss of permits and can seriously impact current and future research. If the graduate student violates the stipulations of any institutional, state or federal permit, disciplinary action can include removal of the student from the research permit, removal from the research project, major professor recusal from the student's committee (see 1 this section), and or student removal from the program.
- 5) Be responsible for making sure that all graduate school forms are completed by the required deadlines. See graduate school website for deadlines and forms (<https://gradschool.nmsu.edu/>)
- 6) Students who are supported as teaching or research assistants are NMSU employees and are directly supervised by their major professor who secured the funding for the research assistantship or the Department Head and course instructors in the case of teaching assistantships. Hence, in most cases graduate students have both a student-mentor and an employee-supervisor relationship with their major professor. Students supported on teaching assistantships are obligated to meet assigned teaching needs and to prioritize these duties.

- 7) During their first semester, students should discuss required training with their major professor to ensure that all university health and safety requirements are met. Commonly required training includes: Employee Safety, Hazardous Communication, Animal Worker Safety, and Defensive Driving. Other training requirements may also be needed depending on the research activities engaged in by the student.
- 8) During their first semester, students are expected to meet with their major professor and discuss an agreement surrounding data ownership and publication rights. In general, students do not own the data nor do the students have use/publication rights for data if the grant or contract was secured by their original major professor. All data ownership remains with the major professor securing the contract or grant, the university and the granting agency. Data ownership does not reside with the student if the original grant or contract was funded through a proposal developed without the student's involvement or prior to the student's arrival at NMSU. In certain circumstances, data ownership may extend to the student. If data ownership is to be extended to the student, an agreement regarding data ownership must be agreed to in writing. The agreement should clearly stipulate who owns the data and who has the right to publish using the data. If a student changes major professors, except in extenuating circumstances, any negotiations surrounding data ownership are void. In the event of voided negotiations, the student relinquishes their right to the use and or publication rights for data collected under a grant or contract. Please see section 9c for information regarding data ownership following a change of major professor.
- 9) All students have the right to change major professors during their course of study, but before making this decision they should recognize that they should:
 - a) Have a discussion, preferably before accepting a graduate position, with their major professor on their expectations of graduate students. In most instances, problems can be avoided by knowing what is expected of you as a graduate student.
 - b) Find a new major professor before severing ties with their original major professor; other faculty members in the department are not obligated to serve as a major professor for students wishing to change major professors.
 - c) Recognize that they do not have the right to the use the data and or publication rights for data collected under a grant or contract secured by their original major professor. All data ownership remain with the major professor securing the contract or grant, with NMSU, and with the granting agency, not with the student. In the instance that a student changes their major professor, any negotiations surrounding data ownership are void. The student is expected to negotiate an agreement surrounding data ownership and publication rights with their new major professor during their first semester with that professor.
 - d) Recognize that they are not entitled to the continued support or equipment provided by their original major professor or the department. The decision on the use of such support resides with the principal investigator of the grant or contract and the university per university policy.

- 10) New Mexico State University has explicit policies on maintaining academic good standing. Students who do not maintain the minimum 3.0 GPA, which is the minimum standard set by the Graduate School, or who fail to adequately progress through the graduate program, as determined by their graduate supervisory committee, may be subject to disciplinary action. Students will have to clearly demonstrate correction of past infractions and future progress if they wish to continue. The student will be given an opportunity to demonstrate improvement, but if the student fails to meet the expectation of their graduate supervisory committee, the major professor can then take steps to recuse and halt any potential financial support. In these cases, students are not entitled to continued financial support from the major professor or department or access to the data collected while employed as a research assistant under the original major professor's research funding.

DEGREE REQUIREMENTS

1) General

University requirements stipulate a minimum of 30 semester hours for a Master's degree. Of those credits, at least 15 must be in courses numbered 500 or above and at least 15 must be for work in the major field – these courses are generally wildlife and fisheries courses, but appropriate courses from other programs such as biology, chemistry, molecular biology, statistics and range management, may be appropriate. Those programs involving a thesis may use 4 to 6 credits of thesis (FWCE 599) toward their degree program.

University requirements are that all students who are employed on teaching or research assistantships are required to register for a minimum of 9 credit hours during each spring and fall semester throughout the course of their degree program or as long as they are employed as a TA or RA, including after all required coursework has been completed. Students defending their thesis during the summer, will be required to register for at least 1 Thesis credit (FWCE 599) during the summer session in which they defend their thesis.

2) Supervisory Committee and Program of Study

The graduate student supervisory committee will normally be established prior to the student's second semester in graduate school. The committee minimally consists of three members, including one from outside the Department who serves as the representative for the Dean of the Graduate School. Students electing to take a minor are required to complete the required number of credit hours stipulated by the department awarding the minor (generally 9 to 14 credits). Students should contact the department awarding the minor to determine specific credit hour and course requirements. To receive the minor, the student must plan ahead to include a committee member from the minor department and demonstrate knowledge of the minor field in their final exam. The supervisory committee is to serve as a collective source of advice and mentoring for the student, not strictly an examining committee. The committee's responsibility is to review and approve the student's research proposal and course of study, provide guidance in the design and execution of the research project, critique the thesis, and participate in the thesis defense. The committee typically meets with the student within the first or second semester to review and approve the research proposal. The student should meet with their supervisory committee at least once per academic year after the proposal has been accepted by the committee. However, the major professor or the student can request additional meetings; the potential need for flexibility in this general approach is also recognized.

The program of study form should be filed before completion of the first year (<https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html>). Thus, this form will usually be filed at the end of the student's second semester, in consultation with the major professor and the supervisory committee. For students completing the thesis option, the thesis research proposal should be submitted with the program of study to the supervisory committee prior to submission of the form to the graduate school.

3) Course Requirements

The following courses are required for all students:

- Per graduate school policy, courses that are used to address deficiencies or satisfy prerequisites for graduate-level coursework cannot be counted as requirements for a Master's degree.

- Students must take coursework from a variety of faculty. Students may not take more than half of the minimum credits required for a master’s degree with the same professor, excluding thesis credits.
- Students are required to have a minimum of 6 total credits of Quantitative Foundations.
- Students without a strong statistics background are encouraged to enroll in A ST 505. The decision will be left to the A ST faculty to determine if student has sufficient background to skip A ST 505 and move on to other A ST courses (i.e., 506, 507, 509). However A ST prerequisites may still be enforced rigidly by A ST faculty. The onus to get a waiver/override for A ST prerequisites is on the student.
- A minimum of 3 courses (9-12 credits) from ecological concepts, organismal biology, ecological techniques (eligible courses listed below)
- Independent Study (4-12 credits) from the Independent Study category (eligible courses listed below)
- In addition, courses taught as special topics (FWCE 535) may apply to the Quantitative Foundations or Ecological Concepts, Organismal Biology, Ecological Techniques with approval from the supervisory committee and Department Head.
- The lists below show typical courses that meet minimum Departmental and Graduate School course requirements for the Master’s degree, as determined by the faculty and Department Head. For more details on requirements from the Graduate School, see the section in the Graduate Catalog entitled “The Master’s Degree.”

Quantitative Foundations: Eligible courses

- A ST 505, Statistical Inference I 4 cr
- A ST 506, Statistical Inference II 3 cr
- A ST 507, Advanced Regression 3 cr
- A ST 509, Statistical Models for Complex Data Structures 3 cr
- A ST 540, Predictive Analytics 3 cr
- A ST 555, Applied Multivariate Analysis 3 cr
- A ST 567, Applied Linear Models I 3 cr
- A ST 568, Applied Linear Models II 3 cr
- A ST 550, Special Topics 1-4 cr
- FWCE 457, Ecological Biometry or BIOL 455 Biometry 3 cr
- FWCE 509, Population Ecology 3 cr
- GEOG 585, Advanced Spatial Analysis 3 cr

(Other courses may be eligible with consent of the advisory committee)

Ecological Concepts, Organismal Biology, Ecological Techniques: Eligible courses

- BIOL 467, Evolution 3 cr
- BIOL 484, Animal Communications 3 cr
- BIOL 489, Genetic Aspects of Population Biology 3 cr
- BIOL 568, Communities and Ecosystems 3 cr
- BIOL 587, Behavioral and Evolutionary Ecology 3 cr
- BIOL 488, Conservation Genetics 3 cr.
- FWCE 559, Aquatic Ecology 4 cr
- FWCE 540, Wildlife-habitat Relationships 3 cr
- GEOG 557, Fundamentals of Biogeography 3 cr
- FWCE 530, Large Mammal Ecology, Management, and Conservation 3 cr
- FWCE 536, Advanced Avian Ecology 3 cr
- FWCE 567, Herpetology 4 cr
- FWCE 582, Ichthyology 4 cr
- FWCE 464, Management of Aquatic and Terrestrial Systems 3 cr
- FWCE 557, Fisheries Management and Analysis 4 cr
- FWCE 535, Special Topics (as approved by committee) 3-6 cr
- FWCE 537, Wildlife Damage Management 3 cr
- FWCE 571, GIS for Natural Resources 4 cr
- FWCE 580, Advanced Management of Aquatic Systems 3 cr
- GEOG 521, GIS Applications and Modeling 3 cr
- RGSC 452, Vegetation Measurements for Rangeland Assessment 4 cr
- RGSC 485/585. Land Cover Analysis for Natural Resources 3 cr
- RGSC 518, Watershed Methods and Management 3 cr

**Other courses may be eligible to fulfill course requirements with consent of the advisory committee and department head.

Independent Study: Eligible courses

- FWCE 548, Graduate Problems up to 6 cr

- FWCE 598, Special Research Programs up to 6 cr
- FWCE 599, Thesis 4-6 cr

4) Thesis option

The thesis is intended to provide evidence of scholarship and original research, and should be publishable in a peer-reviewed scientific journal. Master's programs involving a thesis require no more than 6 and no fewer than 4 credits of thesis (FWCE 599). Additional thesis credits can be taken to maintain continuous enrollment or meet the 9 credit hour enrollment requirement, but only a maximum of 6 thesis credits will be counted towards degree requirements.

5) Non-Thesis Option

Selected students are admitted into this program based on discussions among the student, major professor, and Department Head at the time the student enters the graduate program or by the end of the first semester. Students electing the non-thesis option must do so in consultation with their major professor, and must notify the Department Head and Chair of the Graduate Admissions and Progress Committee.

Non-thesis students are required to complete a non-thesis project and have a non-thesis defense examination.

Minimum of 34 total credits if FWCE 558 is 4 credits; 36 total if FWCE 558 is 6 credits.

Non-thesis course requirements

- A ST 505, Statistical Inference, 4 credits
- FWCE 515, Seminar, 1 credit
- FWCE 558, Non-thesis Project, 4-6 credits
- FWCE 548 and/or 598, 0-6 credits
- Other formal courses numbered 450 and above except FWCE 548, 558, 595, 598, 599, as well as some courses offered in other departments. Qualifying courses will be determined at the discretion of the student's advisory committee.
- TOTAL CREDITS 34-36 credits minimum

SUMMARY OF GRADUATE STUDENT PROGRAM AND REVIEW

By the end of the first semester, the graduate student and advisor should complete the Program of Study Form (<https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html>). This form is a tentative summary of the student's coursework and serves as a guide to ensure departmental and supervisory committee requirements are met. Prior to or during the second semester, the graduate student supervisory committee should be established and convene to discuss the student's proposed course of study, to review and accept the student's research proposal.

Each spring, the Department distributes the Graduate Student Review form (Appendix B). These forms are to be filled out by the student and signed by their major professor. The forms are returned to the Department Head for review. The intent of the form is to ensure the student is meeting the required milestones toward completion of their research program.

GRADUATE LEVEL COURSES CURRENTLY OFFERED BY THE DEPARTMENT OF FISH, WILDLIFE AND CONSERVATION ECOLOGY

FWCE 457. Ecological Biometry 3 cr

Use of ecological data to test scientific hypotheses. Stochastic and statistical models for environmental data, data visualization, likelihood-based and information-based model selection. Emphasis on open-source software tools. Prerequisite(s): MATH 142G or 191G, A ST 311, FWCE 301.

FWCE 464. Management of Aquatic and Terrestrial Systems 3 cr

Theory and case study of managing social-ecological systems for resilience. Prerequisites: FWCE 301 or BIOL 301, FWCE 330 or concurrent registration, FWCE 459 recommended, senior-standing or graduate student.

FWCE 470. The Natural History Museum in Modern Society 3 cr

Introduction to the role of natural history museums in modern society, including basic research, public education, service, and applied research in biodiversity conservation. Emphasis on experiential learning. Includes paper discussions, activities, required full-day Friday field trips, and a term project. Prerequisites: BIOL 111G and BIOL 111GL.

FWCE 472. Wildlife Museum Internship 1-6 cr

Substantial directed work experience in various functions of the wildlife natural history museum developed by the student in consultation with the faculty curator. Internships may involve aspects of collection development and management, public education programs, or other related museum activities. Internship must be approved by the faculty curator. Prerequisites: BIOL 111G and BIOL 111GL and consent of instructor.

FWCE 509. Population Ecology 3 cr

Quantitative analysis of vital statistics and mechanisms promoting stability in wild populations. Theory and application of life tables and population models.

FWCE 515. Graduate Seminar 1 cr

Current topics. May be repeated once for credit.

FWCE 530. Large Mammal Ecology, Management and Conservation 3 cr

This course will cover aspects of large mammal ecology, management and conservation including aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics.

FWCE 535. Special Topics 1-4 cr

Specific subjects to be announced in the *Schedule of Classes*. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

FWCE 537. Wildlife Damage Management 3 cr

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Students are responsible for all requirements for FWCE 437 plus additional work.

FWCE 540. Wildlife-habitat Relationships 3 cr

Aspects of animal behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter- and intra-specific interactions on habitat selection, and habitat quality.

FWCE 547. Wildlife Law, Policy, and Administration 3 cr

Types and forms of law and policy that collectively serve to referee, organize, and establish the norms of human interaction with the natural world, with emphasis on specific State and Federal statutes. The course examines multiple foci, including why laws exist, what they are intended to accomplish, where they come from, what forms they take, and how they evolve.

FWCE 548. Graduate Problems 1-3 cr

Individual studies in fishery or wildlife science and represents guided, graduate-level coursework that are tailored to a small number of students. These classes should be given a subtitle. No more than 6 credits of this course count toward the degree. Not available to non-thesis students.

FWCE 557. Fisheries Management and Analysis 4 cr

Principles and applications of fisheries management to include sampling methodology, population dynamics, estimation of abundance, growth, recruitment and mortality. Prerequisites: ASTAT 311. Senior-standing or graduate student.

FWCE 558. Non-thesis Project var. cr

Individual study of a nonscientific nature. No more than 6 credits toward a degree. Available only to non-thesis students.

FWCE 559. Aquatic Ecology

Plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems.

FWCE 567. Herpetology 4 cr

Origin, evolution, behavior and ecology of reptiles and amphibians.

FWCE 571. GIS for Natural Resource Scientists 4 cr

Practical GIS class for students with little or no GIS experience. Class focuses on (i) learning to use industry-standard software and (ii) applications in natural resource management.

FWCE 582. Ichthyology 4 cr

Classification, morphology, identification, life history, and ecology of fishes.

FWCE 598. Special Research Programs 1-3 cr

Individual investigations, either analytical or experimental and represents time spent on a project that is not covered under thesis research. Maximum of 3 credits per semester. No more than 6 credits of this course count towards degree requirements. Not available to students in the non-thesis program.

FWCE 599. Master's Thesis variable credits

Thesis. This includes any work directly related to the thesis, including proposal writing, data collection and thesis writing.

**REQUIREMENTS FOR A GRADUATE MINOR IN FISH, WILDLIFE AND
CONSERVATION ECOLOGY**

Required course (3 credits):

FWCE 509. Population Ecology 3 cr

Required elective (at least 3 credits from one of the following):

FWCE 459. Aquatic Ecology 4 cr

FWCE 547. Wildlife Law, Policy and Administration 3 cr

Elective (3 credits from any of the remaining 500-level graduate courses with a FWCE prefix).

APPENDIX A - THE GRADUATE SCHOOL PROCESS

STEPS FOR COMPLETING THE MASTER OF SCIENCE DEGREE IN THE DEPARTMENT OF FISH, WILDLIFE AND CONSERVATION ECOLOGY

1. Prior to arrival, the student should contact the Department Administrative Assistant (575-646-2245) to discuss acceptable documents for verification of work eligibility and completion of forms. In compliance with E-Verify, one of your documents, must include a photo.
2. Complete all required training as specified by the major professor during the first semester. Note that some specific TA or RA duties might require immediate completion of some training.
3. Graduate Student's First Milestone: By the end of the first semester, the graduate student and their major professor should complete a draft of the graduate school Program of Study Form (<https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html>). This form is a tentative summary of the student's coursework and performs as a guide to ensure Departmental and supervisory committee requirements are met.
4. Graduate Student's Second Milestone: Near the end of the first semester, the student and their major professor should meet to establish the supervisory committee to discuss the student's proposed course of study and to review and accept the student's research proposal. In addition, students who were admitted with course work deficiencies must develop a plan in conjunction with the major professor and the committee to make up the deficiencies. The final Program of Study form needs to be completed and submitted to the graduate school before the student completes 12 credit hours.

Once the program of study form has been submitted, any changes to the program of study require the submission of program of study change form available at the graduate school: <https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html>

5. Each spring, the Departmental Graduate Program Committee distributes the Graduate Student Review Form (Appendix B). These forms are to be filled out by the student, signed by the major professor, supervisory committee members and returned to the Graduate Program Committee.
6. Graduate Student's Third and Fourth Milestones: Research Defense and Graduation. Deadlines for Graduating in the Spring and Fall are published each year by the Graduate School and should be obtained by graduate students. These deadlines describe when the *Final Examination Form* and the *Graduate School Application for Degree Form* (<https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html>) should be submitted to the Graduate School. Deadlines are also provided for when the examining committee must be convened for the defense as well as when copies of the thesis must be submitted to the graduate editor for final editing at: <https://gradschool.nmsu.edu/index.html>. Note that it is possible for a student to fail an exam or have the potential to re-take the exam provided the committee has made a determination to adjourn.

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7. Graduate Student's Fifth Milestone: In order to graduate and participate in the commencement ceremony, the thesis must be submitted to the Graduate School for final approval by the required deadline. Deadlines are posted by the Graduate School.

APPENDIX B – DEPARTMENTAL GRADUATE STUDENT REVIEW FORM

See next page.

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 FISH, WILDLIFE & CONSERVATION ECOLOGY
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Departmental Graduate Student Review Form
 Department of Fish, Wildlife and Conservation Ecology

NAME:	SEMESTER ADMITTED:
MAJOR PROFESSOR:	EXPECTED SEMESTER TO FINISH:

Coursework since last review:

Course	Semester	Grade

Deficiencies:

Deficiency	Action Taken

Committee:

Date Committee Formed: _____

Committee Members: _____

Date of most recent committee meeting: _____

Date Degree Plan approved by Committee _____

Date Application for Admission to Candidacy filed _____

Progress toward degree:

- | | |
|--|--|
| <input type="checkbox"/> Proposal written and accepted
<input type="checkbox"/> Plan approved to make up course work deficiencies (if applicable).
<input type="checkbox"/> Data collection plan
<input type="checkbox"/> Data collection completed | <input type="checkbox"/> Thesis initiated
<input type="checkbox"/> Proposal reviewed and approved by committee
<input type="checkbox"/> Data collection initiated
<input type="checkbox"/> Data analysis completed
Anticipated date of Thesis completion _____ |
|--|--|

Anticipated Financial Support (list projected source of support and anticipated needs for support):

Advisor's signature: _____

Student's signature: _____

Advisory Committee signatures _____

Review Committee: progress acceptable; no action required program adjustments required

Recommended action
