Graduate programs of study and research lead to the MS and PhD degrees in Wildlife and Fisheries Sciences. These programs prepare students for careers with academic institutions, governmental agencies and private business/industry. Studies in environmental conservation and education are available to those students interested in preparing themselves for public service in a number of fields other than research and management. The non-thesis Master of Wildlife Science and Master of Natural Resource Development degree programs are designed to give students broad academic training combined with practical experience, to develop problem-solving and management skills. The MS (thesis option) and PhD degrees require a strong background in the basic and applied agricultural and life sciences, particularly as they relate to whole-organism biological systems. The latter two degrees involve intensive research, and the resulting thesis or dissertation must demonstrate a superior knowledge and understanding of the subject area.

Graduate study in the Department of Wildlife and Fisheries Sciences normally requires some breadth in several disciplines, which differ among courses of study and are dependent on candidate background. The academic program of study is tailored to the background and educational goals of each degree candidate in consultation with his or her Graduate Advisory Committee. There are no foreign language requirements for any of the department’s graduate degree programs, unless set by the student’s Advisory Committee or the University.

Research activities in the department involve vertebrates, invertebrates, plants and natural-resource systems, and span the broad fields of wildlife ecology and management, fisheries ecology and management, aquaculture, biodiversity and systematics, conservation education/ museum science and the human dimensions of wildlife and fisheries resource management. Research in these fields is supported by disciplinary expertise in aut- and synecology, evolutionary biology, resource sociology, animal behavior, physiology, animal diseases and parasitology, bioenergetics, nutrition, genetics, and systems analysis and modeling. Although much of the research program is without geographic bounds, the more site-specific aspects of the program focus on Texas, Mexico and the neotropics.

Facilities for research and graduate education include over forty laboratories with modern and sophisticated scientific instrumentation; an NSF-sponsored Center for Biosystematics and Biodiversity; the Biodiversity Research and Teaching Collections, which is among the largest collections of animals and genetic tissues in the New World; the Marine Mammal Research Facilities at Galveston; and an Aquacultural Research and Teaching Facility (laboratory and ponds) devoted to study of fish and invertebrate production for food and sport fishing. Field studies may be conducted at the Texas A&M University System’s off-campus research and extension centers. Texas A&M is a member of the Archbold Tropical Research Center on the Caribbean island of Dominica. Graduate students are eligible to apply for usage of laboratory and field facilities at both of these locations.

Some faculty members in the Department of Wildlife and Fisheries Sciences have appointments on the intercollegiate faculties of Genetics, Ecology, Nutrition and Toxicology; graduate students are eligible to seek degrees in those areas. The department also encourages interdisciplinary research efforts with other departments, and within the Institutes of Marine Life Sciences and Renewable Natural Resources.

The Department of Wildlife and Fisheries Sciences has a residency requirement for all MS and PhD students. Master of Science students must complete, on the campus at College Station, 9 credit hours during one semester. Students who enter the doctoral degree programs with baccalaureate degrees must spend four semesters, of 9 hours each, on the campus at College Station. Students who hold master’s degrees when they enter doctoral degree programs must spend two semesters, of 9 hours each, in resident study on the campus. A semester may be fall, spring, a 10-week summer semester, or two 5-week summer terms. Full-time staff members of the University or of closely affiliated organizations stationed on the campus at College Station may fulfill residency requirements by completion of less-than-full course loads. Any exception to these rules must be approved in writing by the department head and the Office of Graduate and Professional Studies.

Faculty

Adams, Clark, Professor
Wildlife & Fisheries Sciences
PhD, University of Nebraska, 1973

Conway, Kevin, Assistant Professor
Wildlife & Fisheries Sciences
PhD, Saint Louis University, 2010

Dewitt, Thomas, Associate Professor
Wildlife & Fisheries Sciences
PhD, State University of New York at Binghamton, 1996

Dronen, Norman, Professor
Wildlife & Fisheries Sciences
PhD, New Mexico State University, 1974

Fitzgerald, Lee, Professor
Wildlife & Fisheries Sciences
PhD, University of New Mexico, 1993

Fujiwara, Masami, Associate Professor
Wildlife & Fisheries Sciences
PhD, Massachusetts Institute of Technology, 2002

Gatlin, Delbert, Professor
Wildlife & Fisheries Sciences
PhD, Mississippi State University, 1983

Gelwick, Frances, Associate Professor
Wildlife & Fisheries Sciences
PhD, University of Oklahoma, 1995

Grant, William, Professor
Wildlife & Fisheries Sciences
PhD, Colorado State University, 1974

Hibblitts, Toby, Lecturer
Wildlife & Fisheries Sciences
PhD, University of the Witwatersrand, 2006

http://wfsc.tamu.edu

Head: M. P. Masser

Graduate Advisor: A. Dottavio
Hurtado Clavijo, Assistant Professor
Wildlife & Fisheries Sciences
PHD, Rutgers, 2002

Lacher, Thomas, Professor
Wildlife & Fisheries Sciences
PHD, University of Pittsburgh, 1980

Lawrence, Addison, Professor
Wildlife & Fisheries Sciences
PHD, University of Missouri, 1962

Light, Jessica, Associate Professor
Wildlife & Fisheries Sciences
PHD, Louisiana State University, 2005

Lopez, Roel, Professor
Wildlife & Fisheries Sciences
PHD, Texas A&M University, 2001

Masser, Michael, Professor
Wildlife & Fisheries Sciences
PHD, Texas A&M University, 1986

Mateos, Mariana, Associate Professor
Wildlife & Fisheries Sciences
PHD, Rutgers University, 2002

Mora-Zacarias, Miguel, Professor
Wildlife & Fisheries Sciences
PHD, University of California, Davis, 1990

Morrison, Mike, Professor
Wildlife & Fisheries Sciences
PHD, Oregon State University, 1982

Neill, William, Senior Research Scientist
Wildlife & Fisheries Sciences
PHD, University of Wisconsin, 1971

Packard, Jane, Associate Professor
Wildlife & Fisheries Sciences
PHD, University of Minnesota, 1980

Peterson, Markus, Professor
Wildlife & Fisheries Sciences
PHD, Texas A&M University, 1994

Peterson, Tarla, Professor
Wildlife & Fisheries Sciences
PHD, Washington State University, 1986

Roelke, Daniel, Professor
Wildlife & Fisheries Sciences
PHD, Texas A&M University, 1997

Silvy, Nova, Professor
Wildlife & Fisheries Sciences
PHD, Southern Illinois University, 1975

Voelker, Gary, Associate Professor
Wildlife & Fisheries Sciences
PHD, University of Washington, 1998

Winemiller, Kirk, Professor
Wildlife & Fisheries Sciences
PHD, University of Texas, 1987

**Masters**
- Master of Natural Resources Development in Natural Resources Development
- Master of Science in Wildlife and Fisheries Sciences
- Master of Wildlife Science in Wildlife Science

**Doctoral**
- Doctor of Philosophy in Wildlife and Fisheries Sciences

**Courses**

**WFSC 602 Field Herpetology**
Credit 1. 3 Lab Hours.
Field work involving collection and preservation of herpetological specimens; natural history, ecological relations.
Prerequisites: Graduate classification.*

**WFSC 603 History of Ecological Thought and Conservation Practice**
Credits 3. 3 Lecture Hours.
Survey of the philosophical roots and evolution of ecological thought and conservation practice; emphasis on theoretical foundations, seminal concepts, classic papers, and historic trends.
Prerequisites: Course in general ecology and graduate classification or instructor approval.

**WFSC 604 Ecological Modeling**
Credits 3. 3 Lecture Hours.
Philosophical basis, theoretical framework, and practical application of systems analysis and simulation within the context of ecology and natural resource management; emphasis placed on development, evaluation and use of simulation models by students.
Prerequisite: Approval of instructor.

**WFSC 605 Community Ecology**
Credits 3. 3 Lecture Hours.
Overview and in-depth knowledge of community ecology; historical development; current issues, methodologies, and practical applications in natural resource management, biological conservation, agriculture, and human health; practice critical thinking, communication skills, and professionalism.
Prerequisite: Graduate classification.

**WFSC 607 Environmental Conflict Management**
Credits 3. 3 Lecture Hours.
Understand environmental conflict systemically, understand how communication contributes to environmental conflict and develop increased capacity as managers of environmental conflict.
Prerequisite: Graduate classification or approval of instructor.

**WFSC 608 Public Participation in Conservation Policy**
Credits 3. 3 Lecture Hours.
Students will have the opportunity to become familiar with and critique theories and constructs as well as strategies and techniques for enhancing public participation in environmental conservation policy.
Prerequisite: Graduate classification or approval of instructor.
WFSC 609 Wildlife Research Methods
Credits 3. 3 Lecture Hours.
Research methods for ecology and conservation; become familiar with the philosophy of natural science and develop skill in study design, grantsmanship, presentation techniques, critical evaluation of others' work, and publication in refereed journals.
Prerequisites: Courses in general ecology and statistics and graduate classification or approval of instructor.

WFSC 610 Evolutionary Ecology
Credits 3. 3 Lecture Hours.
Survey the development of paradigms in evolutionary ecology; incorporates phylogenies into comparative analysis and macroecology; evaluates the roles of historical and local processes in determining species diversity.
Prerequisite: Graduate classification.

WFSC 611 Estuarine Ecology
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Principles governing the relationships of estuarine organisms to their environment; productivity, adaptations to environment, community structure and factors affecting the distribution and abundance of biota.
Prerequisite: Invertebrate zoology and ichthyology or approval of instructor.

WFSC 612 Behavioral Ecology
Credits 3. 3 Lecture Hours.
Integration of animal behavior with ecological and evolutionary principles; includes mating, predation, foraging ecology, social behavior, game theory and behavioral genetics; emphasis on quantification of behavior and strategy modeling.
Prerequisites: Undergraduate ecology course; graduate classification.

WFSC 613 Animal Ecology
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Concepts of animal ecology which emerge at various levels or organization; the ecosystem, the community, the population and the individual; laboratories emphasis on the quantitative analysis of field data and the simulation of population dynamics.
Prerequisite: Graduate classification or approval of instructor.*

WFSC 614 Animal Ecology
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Survey of the control, ontogeny, function and natural selection of behavior in a variety of vertebrate and invertebrate species; interaction between the organism and its environment with regard to the mechanisms and adaptive significance of behavior; evolution of anti-predator, feeding, reproductive and cooperative traits.
Prerequisites: BIOL 112 or equivalent; graduate classification.

WFSC 615 Wildlife Study Design and Analysis
Credits 3. 3 Lecture Hours.
Fundamental and advanced aspects of study design applicable to terrestrial animals; analysis and review of the scientific literature related to study design; and the development of study design for written and oral presentations.
Prerequisite: Graduate classification or approval of instructor.

WFSC 616 Wetland Ecology and Pollution
Credits 3. 3 Lecture Hours.
Principles, models and methods for analysis of population dynamics; analysis of contemporary research emphasizing theory and its uses in evaluation and management of animal populations. Laboratory emphasizes mathematical, statistical and computer modeling of population phenomena.

WFSC 617 Biology of Fishes
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Fishes' physiological and morphological adaptations for life in aquatic systems; physiological and behavioral responses of fish to environments; molecular, cellular, and physiological mechanisms discussed in an evolutionary context that emphasizes the ontogeny of adaptive responses among vertebrates from basic biochemical and biophysical constraints.
Prerequisite: Graduate classification or approval of instructor.

WFSC 618 Vertebrate Ethology
Credits 4. 3 Lecture Hours. 2 Lab Hours.
Mechanisms and control of vertebrate behavior in an ecological context, as shaped by natural selection; classical and current theories regarding the genetic basis, development, specialized sensory systems and organization of responses in changing environment; laboratory emphasizes observational skills and quantitative analysis of behavior occurring in natural settings.*
WFSC 635 Urban Wildlife and Fisheries
Credits 3.3 Lecture Hours.
Urban wildlife and fisheries trains students to establish and maintain diverse, self-sustaining urban wildlife and fish populations at levels in harmony with ecological, social, and economic values of the human community and to develop optimal levels of public appreciation and use of urban wildlife and fish resources and associated habitats.
Prerequisite: Graduate classification or approval of instructor.

WFSC 636 Wildlife Habitat Management
Credits 3.3 Lecture Hours.
Designed to acquaint with major land use practices on lands that produce wildlife, how these influences wildlife production and alterations or manipulations of habitat used to achieve specific wildlife management goals.
Prerequisite: Graduate classification or approval of instructor.*

WFSC 638 Techniques of Wildlife Management
Credits 3.2 Lecture Hours. 3 Lab Hours.
Techniques available to directly and indirectly manipulate wild animal populations to achieve balance between socioeconomic and aesthetic values.
Prerequisite: Graduate classification or approval of instructor.*

WFSC 639 Wildlife Ecotoxicology
Credits 3.3 Lecture Hours.
Distribution, fate, and effects of environmental pollutants on wildlife behavior and reproduction. Global distribution of pollutants and effects on near and remote ecosystems. Field studies, biomarkers, stable isotope and various techniques for evaluating pollutant hazards on wildlife.
Prerequisites: Courses in CHEM and BICH and graduate classification or approval of instructor.

WFSC 640 Human Dimensions of Wildlife and Fisheries Management
Credits 3.3 Lecture Hours.
Theory and applications for considering human dimensions in an integrated approach to wildlife and fisheries management; a social science perspective with emphasis to diversity of human values, role of constituency groups, wildlife and fisheries policy development, conflict management, management decision-making, research methods and management case studies.

WFSC 641 Sustainable Military Land Management
Credits 3.3 Lecture Hours.
Overview of the Department of Defense (DOD) lands within a temporal, geographic, and environmental context and perspective; major policies/laws impacting military land use and areas critical to mission sustainment; management strategies important to sustaining installations and ranges.
Prerequisite: Graduate classification or approval of instructor.

WFSC 642 Field Military Land Management
Credit 1.0 Lecture Hours. 2 Lab Hours.
Review of land management practices and challenges on military and adjacent private lands through field visits of select military installations. Field trips required during Spring Semester.
Prerequisite: Graduate classification or approval of instructor. Previous or concurrent registration in WFSC 636 is strongly encouraged.

WFSC 643 Geospatial Technology in Military Land Management
Credits 3.3 Lecture Hours.
Tools for visualizing, creating, managing and analyzing geographic data on military lands and outside areas critical to mission sustainment; familiarization with ArcMap and ArcCatalog in military-related land management scenarios.
Prerequisites: Graduate classification or approval of instructor; previous experience with ArcMap and ArcCatalog helpful.

WFSC 644 Quantitative Phylogenetics
Credits 3.2 Lecture Hours. 1 Lab Hour.
Designed to provide the theory and tools required for inference of phylogenetic (evolutionary) relationships among biological taxa using various types of comparative data including morphological characters, biochemical and molecular characters, and DNA sequences; hands-on analysis of data using contemporary tools.
Prerequisites: ENTO 601 or approval of instructor.
Cross Listing: ENTO 606 and GENE 606.

WFSC 647/NUTR 647 Nutritional Biochemistry of Fishes
Credits 3.3 Lecture Hours.
Principles of nutritional biochemistry including nutrient metabolism and biochemical energetics with special emphasis on finfish and shell fish.
Prerequisite: BICH 410 or equivalent.
Cross Listing: NUTR 647/WFSC 647.

WFSC 648/GENE 648 Molecular Evolution
Credits 3.2 Lecture Hours. 1 Lab Hour.
Theory and tools used in the analysis of molecular evolutionary patterns of DNA and protein sequences; format combines lecture presentations by instructor discussion of relevant scientific literature, computer exercises, preparation of research proposal or independent research project, and practice in peer-review process.
Prerequisite: Basic courses in general Genetics and Evolution.
Cross Listing: GENE 648/WFSC 648.

WFSC 649 Principles of Fisheries Management
Credits 4.3 Lecture Hours. 3 Lab Hours.
Basic knowledge of ichthyology, biology of fishes and limnology related to applied aspects of freshwater and marine fishery science; management techniques applicable to streams, ponds, reservoirs, estuaries and the oceans.
Prerequisite: Graduate classification.

WFSC 654 Amazon Field School
Credits 4.4 Lecture Hours.
Investigation of social and ecological complexities of biodiversity conservation in tropical ecosystems; biological and social science approaches to evaluate causes, consequences and solutions to biodiversity loss through ecology, culture and governance.
Cross Listing: RPTS 654 and VMTI 604.

WFSC 655/RPTS 655 Applied Biodiversity Science I
Credits 3.3 Lecture Hours.
Applied Biodiversity Science. Students will study in the areas of Conservation genetics, metapopulations, landscape ecology, and ecosystem management.
Prerequisite(s): Graduate classification.
Cross Listing: RPTS 655/WFSC 655.

WFSC 670 Excel Biometry
Credits 3.3 Lecture Hours.
Rational and mathematics behind upper level biometrical methods; construct spreadsheets and analyze a common data set; topics include multiple regressions, principle components analysis, multivariate analysis of variance and others.
Prerequisites: Graduate classification; STAT 651 or equivalent.

WFSC 681 Seminar
Credit 1.1 Lecture Hour.
Important current developments in wildlife or fisheries fields with special reference to literature. Students may register up to but no more than two sections of this course in the same semester.
WFSC 684 Professional Internship
Credits 1 to 16. 1 to 16 Other Hours.
On-the-job training in fields of wildlife and fisheries sciences.
**Prerequisite:** Graduate classification in Wildlife and Fisheries Sciences.

WFSC 685 Directed Studies
Credits 1 to 6. 1 to 6 Other Hours.
Individual study and research on selected problem approved by instructor and graduate advisor.
**Prerequisite:** Approved proposal.

WFSC 689 Special Topics in...
Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours.
Special topics in wildlife ecology, fisheries ecology, vertebrate systematics, evolutionary biology of vertebrates and conservation education. May be repeated for credit.*

WFSC 691 Research
Credits 1 to 23. 1 to 23 Other Hours.
Original research on selected wildlife and/or fisheries problem to be used in thesis or dissertation.