110 Conservation and Management of Ecosystems
Fall, Spring. 3(3-0) Tier I writing requirement
Aims to understand the principles of ecosystem management and conservation. Field trips are required.

287 Introduction to Conservation, Recreation and Environmental Enforcement
Fall. 1(1-0) Tier I writing requirement
Scope, history, and application of conservation, recreation, and environmental law enforcement at the federal, state, and local levels. Integration of professional policing, resource management, and public lands. Career opportunities.

293 Undergraduate Seminar in Fisheries and Wildlife Conservation
Fall, Spring. 1(0-2) Tier I writing requirement
Professional development and discussion of current case studies to prepare students for a career in Fisheries and Wildlife.

358 Streams to Gulf: Environmental Change in America’s Deep South
Summer. 3(3-0) Tier I writing requirement
A study away course of anthropogenic impacts, habitat alteration, and environmental policy in surrounding water.

101 Fundamentals of Fisheries and Wildlife Ecology and Management
Fall. 20(0-4) FW 101 or concurrently R: Open to undergraduate students in the Fisheries and Wildlife major or the Lyman Briggs Fisheries and Wildlife Coordinate major.
Natural history and ecology of primary terrestrial, wetland, and aquatic ecosystems. Species and communities in Michigan and the United States. Species identification in various ecosystem types. Impacts of disturbances on ecosystems. Field trips required.

101L Fundamentals of Fisheries and Wildlife Ecology and Management Lab
Fall. 20(0-4) FW 101 or concurrently R: Open to undergraduate students in the Fisheries and Wildlife major or the Lyman Briggs Fisheries and Wildlife Coordinate major.
Natural history and ecology of primary terrestrial, wetland, and aquatic ecosystems. Species and communities in Michigan and the United States. Species identification in various ecosystem types. Impacts of disturbances on ecosystems. Field trips required.

110 Conservation and Management of Marine Resources
Spring. 3(3-0) Tier I writing requirement
Marine environment, resource distribution, and human impacts on selected marine commercial fisheries. Conflicts in management goals between government and industry. Management goals and techniques in preserving and conserving marine resource biodiversity.

181 Introduction to Science, Technology, the Environment and Public Policy
Fall. 3(3-0) Tier I writing requirement
Relation of science and technology to ethics and public policy. Environmental law and public policy. Managing fish, water and wildlife resources at state, national, and international levels. Science and technology in developing countries. Impacts of military technology on environmental policy.

207 Great Lakes: Biology and Management
Spring. 3(3-0) Tier I writing requirement
Living aquatic resources of the Great Lakes, environmental history, and biological resources and their management. Policy issues.

224 Introduction to Probability and Statistics for Ecologists
Spring. 3(2-2) Tier I writing requirement
Probability and statistics with computer applications for the analysis, interpretation and presentation of ecological data. Data analysis, probability models, random variables, estimation, confidence intervals, test of hypotheses, and simple linear regression with applications to ecology.

238 Introductory Fisheries and Wildlife Field Experience
Summer of odd years. 3(1-4) Tier I writing requirement
Summer of odd years. 3(1-4) Tier I writing requirement
Field trips required.

278 Introduction to Conservation, Recreation and Environmental Enforcement
Fall. 1(1-0) Tier I writing requirement
Scope, history, and application of conservation, recreation, and environmental law enforcement at the federal, state, and local levels. Integration of traditional policing, resource management, and public lands. Career opportunities.

293 Undergraduate Seminar in Fisheries and Wildlife Conservation
Fall, Spring. 1(0-2) Tier I writing requirement
Professional development and discussion of current case studies to prepare students for a career in Fisheries and Wildlife.

358 Streams to Gulf: Environmental Change in America’s Deep South
Summer. 3(3-0) Tier I writing requirement
A study away course of anthropogenic impacts, habitat alteration, and environmental policy in surrounding water.

364 Ecological Problem Solving
Fall, Spring. 3(2-2) Tier I writing requirement
Application of ecological concepts and models to problems in natural resource and ecosystem management.

368 Zoo Animal Biology and Conservation
Summer. 3(3-0) Tier I writing requirement
Captive animal biology including illustrated examples of care, behavioral welfare and conservation work.

369 Introduction to Zoo and Aquarium Science
Spring. 3(3-0) Tier I writing requirement
Fundamentals of zoo and aquarium operations including research, interpretation, design, nutrition, captive breeding, conservation, ethics and management.
Diseases of fish and wildlife species. Disease detection and diagnosis. Ecological and epidemiological analysis and management of major classes of wildlife diseases. Threatened and endangered species, game species, and fish and wildlife species that serve as vectors or reservoirs of human and domestic animal diseases.

Principles of Fish and Wildlife Disease Laboratory
Fall of odd years. 1(0-3) Interdepartmental with Large Animal Clinical Sciences. Administered by Fisheries and Wildlife. P: (BS 162 and BS 172) or (BS 162H and BS 192H) or LB 144 RB: Additional course work in ecology, zoology, microbiology or environmental science. R: Open to juniors or seniors or graduate students in the College of Agriculture and Natural Resources or in the College of Natural Science or in the College of Veterinary Medicine or approval of department.

Population Analysis and Management
Fall of even years. 3(3-0) Interdepartmental with Agriculture, Animal Sciences, and Crop Science. Administered by Fisheries and Wildlife. P: IBIO 355 or concurrently. R: Open to juniors or seniors of graduate students. Tools for diagnosis and assessment of disease in fish and wildlife populations.

Ecophysiology and Toxicology of Fishes
Spring of odd years. 3(3-0) P: (BS 161 or LB 145 or BS 181H) and (BS 162 or LB 144 or BS 182H) and completion of Tier I writing requirement R: Not open to freshmen or sophomores.

Human Dimensions of Fisheries and Wildlife Management (W)
Fall. 3(2-2) P: (IBIO 355) and completion of Tier I writing requirement. R: Open to juniors or seniors or approval of department. Sociological implications of public policy and planning processes in fisheries and wildlife management.

Integrated Communications for the Fisheries and Wildlife Professional
Fall. 3(3-0) P: Completion of Tier I writing requirement. R: Open to juniors or seniors or graduate students.

Conservation Ethics
Spring. 3(3-0) P: Completion of Tier I Writing Requirement RB: Additional coursework in ecology, natural resources, philosophy, or environmental sciences. R: Open to juniors or seniors or graduate students. Ethical concepts and arguments underlying natural resource issues.

Restoration Ecology
Fall of odd years. 3(2-2) Interdepartmental with Biosystems Engineering and Integrative Biology and Plant Biology. Administered by Plant Biology. P: FOR 404 or PLB 441 or IBIO 355 RB: CSS 210 or BE 230 Principles of ecological restoration of disturbed or damaged ecosystems. Design, implementation, and presentation of restoration plans. Field trips required.

Conservation Biology
Spring. 3(3-0) Interdepartmental with Integrative Biology. Administered by Fisheries and Wildlife. P: IBIO 355 or FOR 404 or PLB 441 and completion of Tier I writing requirement. Ecological theories and methodologies to manage species, communities and genetic diversity on a local and global scale.

Biodiversity Conservation Policy and Practice
Spring of even years. 3(3-0) Interdepartmental with James Madison College. Administered by Fisheries and Wildlife. P: Completion of Tier I Writing Requirement RB: ((EC 201 or concurrently) or (EC 202 or concurrently) or (EC 251H or concurrently) or (EC 252H or concurrently) and an interest in Conservation Biology Social, economic, and policy considerations. Approaches to conserve biodiversity.

Innovations for Conservation
Spring. 4(4-0) P: WRA 101 R: Open to sophomores or juniors or seniors. Principles of applied conservation practice. Innovations, implementation, and evaluation of solutions for global problems in conservations.

Wildlife Policy
Spring of odd years. 3(2-2) RB: IBIO 355 and FW 364: R: Not open to freshmen or sophomores or approval of department. Controversial issues in wildlife policy. Science and political analysis drawing on ecology, economics, sociology. Argument analysis.

Wildlife Policy – Study Away
Spring of odd years. 1(0-3) P: FW 449 or concurrently or approval of department; application required R: Not open to freshmen or sophomores. Onsite examination of controversial issues in wildlife policy. Field trip required.

International Environmental Law and Policy
Spring. 3(3-0) Interdepartmental with James Madison College. Administered by James Madison College. RB: FW 181 Overview of concepts, actors, norms, laws, and institutions related to international environmental policy. Case studies on current global environmental issues.

Watershed Concepts
Fall, Spring. Summer. 3(3-0) Interdepartmental with Agricultural Engineering and Crop and Soil Sciences and Forestry. Administered by Agricultural Engineering. RB: Organic Chemistry SA: ESA 452, RD 452, CSUS 452 Watershed hydrology and management. The hydrologic cycle, water quality, aquatic ecosystems, and social systems. Laws and institutions for managing water resources.

Environmental Hydroylogy for Watershed Management
Spring of odd years. 3(3-0) P: (MTH 124 or MTH 132 or LB 118) and (PHY 183 or concurrently) or (PHY 231 or concurrently) RB: IBIO 355 or concurrently

Green Roofs and Walls
Fall. 2(2) Interdepartmental with Geography and Horticulture and Planning, Design and Construction. Administered by Horticulture. P: HRT 203 or FW 101 or GEO 206 or PDC 120 or EGGR 100 R: Open to juniors or seniors or graduate students.

Wildlife Disease Ecology
Spring of even years. 3(3-0) Interdepartmental with Large Animal Clinical Sciences. Administered by Fisheries and Wildlife. P: IBIO 355 or approval of department RB: (FW 423) or additional course work in integrative biology, microbiology and environmental sciences. R: Not open to freshmen or sophomores or approval of department. Role of wildlife disease in ecological interactions. Factors underlying pathogen emergence. Disease modeling. Conservation medicine.

Natural Resource Policy
Spring. 3(3-0) Interdepartmental with Environmental Studies and Agriscience and Forestry. Administered by Forestry. R: Not open to freshmen or sophomores.

Natural resources policy-making in the context of scientific, environmental, social, and legal-institutional factors. Historical evolution of policies and case studies of contemporary policy issues.
Ichthyology
Spring. 4(3-3) Interdepartmental with Integrative Biology. Administered by Fisheries and Wildlife. P: (BS 162 and BS 172) or (BS 182H and BS 182H) or LB 144) and Completion of Tier I Writing Requirement

Limnology
Spring. 3(3-0) Interdepartmental with Integrative Biology. Administered by Fisheries and Wildlife. P: (CEM 141 or LB 171) and IBIO 355
Ecology of lakes with emphasis on interacting physical, chemical, and biological factors affecting their structure and function.

Field and Laboratory Techniques for Aquatic Studies
Fall. 3(2-3) Interdepartmental with Integrative Biology. Administered by Fisheries and Wildlife. P: (FW 101L or FW 238) and completion of Tier I writing requirement SA: FW 470 Field and laboratory techniques for the investigation and analysis of lake and stream ecosystems and their biota. Field trips required.

Fisheries Management
Spring. 3(2-2) P: IBIO 355 and (FW 364 or concurrently) or approval of department Quantitative analysis of fish populations. Case study of ecological interactions linking fish to aquatic ecosystems and the challenge of balancing multiple human values in managing fisheries resources.

International Studies in Fisheries and Wildlife
Fall, Spring. Summer. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. RB: IBIO 355 R: Approval of department; application required.
Fisheries and wildlife ecology and management study in regions beyond the United States. Ecological, economic, social, and cultural influences on fisheries and wildlife resources.

Global Issues in Fisheries and Wildlife
Spring of even years. 3(3-0) Interdepartmental with James Madison College. Administered by Fisheries and Wildlife. P: Completion of Tier I Writing Requirement RB: EC 201 or EC 202 or EC 251H or EC 252H R: Open to juniors or seniors and graduate students.
Global issues and their impacts on implications for the management of fisheries and wildlife resources.

Seminar in Zoo and Aquarium Science
Fall. Spring. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course. Interdepartmental with Community Sustainability and Integrative Biology and Landscape Architecture. Administered by Integrative Biology. R: Approval of department. SA: ZOL 489
Scientific writing and oral presentations related to zoo and aquarium studies.

Independent Study in Fisheries and Wildlife
Fall, Spring. Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: BS 162 R: Not open to freshmen or sophomores. Supervised individual research and study in fisheries and wildlife.

Special Topics in Fisheries and Wildlife
Fall, Spring. Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Not open to freshmen or sophomores. Selected topics of current interest and importance in fisheries and wildlife.

Interdisciplinary Studies in Conservation Medicine
Spring. 4(4-0) Spring: Abroad. Interdepartmental with Integrative Biology. Administered by Integrative Biology. P: (BS 161 and BS 162) or (BS 181H and BS 182H) or (LB 144 and LB 145) R: Approval of department Interdisciplinary studies focused on "health" as defined by the interactions of animal health, ecosystem health, and human health, viewed through the lens of human culture in an off-campus, multicultural setting.

Advanced Research Applications in Conservation Medicine
Spring. 4(0-12) Spring: Abroad. Interdepartmental with Integrative Biology. Administered by Integrative Biology. P: (BS 161 and BS 162) or (BS 181H and BS 182H) or (LB 144 and LB 145) R: Approval of department.
Field and laboratory techniques for assessing and monitoring biodiversity and health of humans, animals, and ecosystems in an off-campus, multicultural setting. Tools and techniques will be drawn from ecology, microbiology, molecular biology, genetics, histopathology, bioinformatics and statistics.

Professional Internship in Fisheries and Wildlife
Fall, Spring. Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. A student may earn a maximum of 6 credits in all enrollments for any or all of these courses: ABM 493, AEE 493, ANR 493, ANS 493, CMP 493, CSS 493, CSUS 493, EEP 493, FIM 493, FSC 493, FW 493, HRT 493, PKG 493, and PLP 493. P: FW 101 and FW 101L R: Approval of department; application required. Supervised professional experiences in agencies and businesses related to fisheries and wildlife professions.

Internship in Zoo and Aquarium Science
Fall, Spring. Summer. 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. Interdepartmental with Integrative Biology and Landscape Architecture. Administered by Integrative Biology. R: Open to juniors or seniors. Approval of department. SA: ZOL 498 Application of ecological experience in a zoo or aquarium setting outside the university.
FW—Fisheries and Wildlife

840 Landscape Ecology
Spring of odd years. 3(2-2) RB: Knowledge or course work in the natural sciences, particularly ecological concepts, as well as exposure to GIS and data analysis. Ecological patterns and processes. Spatial variation in landscapes at multiple scales as affected by natural causes and human activity. Landscape ecology in natural resource decision-making and management.

845 Environmental Risk Perception and Decision-Making
Spring of odd years. 3(3-0) Interdepartmental with Criminal Justice and Environmental Science and Policy. Administered by Criminal Justice. R: Open to master's students or doctoral students in the School of Criminal Justice or in the Department of Fisheries and Wildlife or approval of school. Theoretical underpinnings of individual decision-making and risk perception processes. Case studies of the interplay of risk perception and decision-making in an environmental and or criminological context.

846 Corporate Environmental Crime and Risk
Spring of even years. 3(3-0) Interdepartmental with Criminal Justice and Environmental Science and Policy. Administered by Criminal Justice. R: Open to master's students or doctoral students in the Department of Fisheries and Wildlife or in the School of Criminal Justice or approval of school. Theoretical accounts and multiple interventions relevant to corporate environmental crime and risk. Use of "Smart Regulation" principles to design interventions to match specific problems.

847 Global Risks, Conservation, and Criminology
Fall. 3(3-0) Interdepartmental with Criminal Justice and Environmental Science and Policy. Administered by Criminal Justice. R: Open to graduate students or approval of school. Theories, actors, characteristics and legal instruments associated with risk, conservation, and criminology related to globalization. Current case studies in criminological conservation.

849 Applied Bayesian Inference using Monte Carlo Methods for Quantitative Biologists
Fall of even years. 3(2-2) Interdepartmental with Animal Science and Statistics and Probability. Administered by Fisheries and Wildlife. RB: (STT 814 and IBIO 851) or equivalent courses. R: Not open to undergraduate students. Applications of Bayesian inference using software in quantitative biology and genetics. Hierarchical and non-hierarchical models. Model checking, model selection and model comparison. Markov chain Monte Carlo methods.

854 Uncertainty in Natural Resource Management
Spring of odd years. 3(2-2) RB: IBIO 355 Methods and challenges associated with accounting for uncertainty in natural resource decision making. Decision analysis, structured decision making, and adaptive management.

858 Gender, Justice and Environmental Change: Issues and Concepts
Fall. 3(3-0) Interdepartmental with Anthropology and Criminal Justice and Community Sustainability and Forestry and Geography and Sociology and Women's Studies. Administered by Community Sustainability. RB: Background in social science, environmental science, or natural resources. Issues and concepts related to gender, ecology, and environmental studies. Key debates and theoretical approaches to addressing environmental issues from a gender and social justice perspective. Gender and environment issues and processes from a global perspective.

859 Gender, Justice, and Environmental Change: Methods and Application
Spring. 3(3-0) Interdepartmental with Anthropology and Community Sustainability and Forestry and Geography and Sociology and Women's Studies. Administered by Anthropology. RB: Background in social science, environmental science, or natural sources. Methods and case studies related to gender, ecology, and environmental studies. Methodological and fieldwork issues from a feminist perspective in international and intercultural contexts. Qualitative and quantitative methods for integrating social and environmental data.

863 Wildlife Disease Ecology
Spring of even years. 3(3-0) Interdepartmental with Integrative Biology and Large Animal Clinical Sciences. Administered by Fisheries and Wildlife. RB: Additional course work in ecology, zoology, microbiology and environmental sciences. R: Open to graduate students. Not open to students with credit in FW 463. Role of wildlife disease in ecological interactions, factors underlying pathogen emergence, mathematical modeling of infectious diseases, conservation medicine.

866 Water Policy and Management
Fall of odd years. 3(3-0) RB: Familiarity with biological and ecological science and environmental policy issues. SA: FW 468 Environmental policy issues associated with the use, management, and protection of water resources and aquatic ecosystems. Case studies in water science and management.

869 Community and Conservation
Fall of even years, Summer of even years. 3 credits. Interdepartmental with Resource Development and Sociology. Administered by Sociology. RB: Social Science methods, social science theory and environmental coursework. Use of experiential, participatory, field-based mode of inquiry to develop understanding of social and cultural issues associated with conservation. Understanding of different social positions and perspectives.

870 Spatial Ecology
Fall. 3(2-2) Interdepartmental with Forestry. Administered by Forestry. RB: (ZOL 851 or concurrently) or Equivalent Science of understanding and predicting ecological patterns in space.

876 Advanced Fish Ecology
Fall of odd years. 3(2-2) RB: (IBIO 355, FW 471 and FW 479) or Ecology, Biology of Fish (Ichthyology), and Fish Management R: Open to graduate students or approval of department. Advanced ecology of fishes in freshwater and marine ecosystems.

877 Fish Population Dynamics
Spring of even years. 4(3-2) RB: Course in Ecology and Statistics. Quantitative analysis of fish populations. Evaluation, causes, and impacts of the rates of change in survival, growth, reproduction, and recruitment for fish populations and their yield.

885 Leadership in Natural Resources and Environmental Management
Fall of odd years. 3(3-0) Interdepartmental with Forestry. Administered by Fisheries and Wildlife. Theory and practice of leadership in natural resource and environmental management. Integration across disciplinary and jurisdictional divisions.

891 Advanced Topics
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. In-depth study of advanced topics in fisheries and wildlife.

893 Seminar in Fisheries and Wildlife
Fall, Spring. 1(1-0) A student may earn a maximum of 15 credits in all enrollments for this course. Study and research in advanced problems and current developments in fisheries and wildlife.

894 Principles and Perspectives in Fisheries and Wildlife
Fall. 2(2-0) R: Open to graduate students in the Department of Fisheries and Wildlife or approval of department. Multidisciplinary investigation, management, exploitation and conservation of fisheries and wildlife species, their habitats, and effects on human society.

895 Practice of Fisheries and Wildlife Outreach and Engagement
Spring. 2(2-0) R: Open to graduate students in the Department of Fisheries and Wildlife or approval of department. Participatory approaches used in managing natural resources. Science communication, outreach, and engagement skills.

898 Master's Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open only to graduate students in the Fisheries and Wildlife major. Master's degree Plan B research paper.

899 Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to graduate students in the Fisheries and Wildlife major. Master's thesis research.
999  Doctoral Dissertation Research
     Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open to doctoral students in the Department of Fisheries and Wildlife.

Doctoral dissertation research.