

Forestry

Bachelor of Science in Forestry

Forest Operations and Applied Restoration Option

In addition to special degree requirements listed previously, the students selecting the Forest Operations and Applied Restoration option must complete the following required courses or their equivalent, if transferred from another college or university. Transference and equivalency will be determined by the University and College of Forestry and Conservation. Electives may be taken at any time, keeping in mind these requirements as well as the University's General Education requirements for graduation.

First Year	Credits
CHMY 121N (CHEM 151N) Introduction to General Chemistry	3
WRIT 101 (ENEX 101) College Writing I	3
M 151 (MATH 121) Precalculus	4
BIOL 120N General Botany (including lab)	3
M 162 (MATH 150) Applied Calculus	4
PHYS 111N and PHYS 113N Fundamentals of Physics I and Fundamentals of Physics I Lab	5
ECNS 201S (ECON 111S) Introduction to Microeconomics	3
FOR 180 Careers in Natural Resources or RSCN 121 Nature of Montana	2
FOR 200 Natural Resources Measurements Camp	2
Electives and General Education	4
Second Year	Credits
FOR 235 Problem Solving for Forest Operations	4
FOR 201 Forest Biometrics	3
FOR 210N Introductory Soils	3
WRIT 222 (FOR 220) Technical Approaches to Writing	2
FOR 241 Dendrology	3
FOR 250 Geographic Information System Practicum	2
FOR 265 Elements of Ecological Restoration	3
Nature and Society Elective	3
Electives and General Education	3
Third and Fourth Years	Credits
FOR 302 Forest Mensuration	3
FOR 320 Forest Economics	3
FOR 330 Forest Ecology	3
FOR 385 Watershed Hydrology	3
FOR 340 Forest Products Manufacturing	2
FOR 341 Timber Harvesting and Forest Roads	3
FOR 347 Multiple Resource Silviculture	3
FOR 351 Photogrammetry and Remote Sensing	3
FOR 422 Natural Resources Policy & Administration	3
FOR 435 Advanced Timber Harvesting and Forest Roads	5
FOR 436 Forest Operations Evaluation and Project Planning	3
FOR 437 Forest Operations and Applied Restoration Capstone	3
FOR 455 Riparian Ecology and Management	3
Electives and General Education	22
The following courses satisfy the nature and society elective requirement:	
EVST 167H Nature and Society	3
EVST 225 Community and Environment	3
EVST 327E Environmental Ethics I	3

Forest Resources Management Option

In addition to special degree requirements listed previously, the students selecting the Forest Resources Management option must complete the following required courses or their equivalent, if transferred from another college or university. Transference and equivalency will be determined by the University and College of Forestry and Conservation. Electives may be taken at any time, keeping in mind these requirements as well as the University's General Education requirements for graduation.

First Year	Credits
BIOL 120N General Botany	3
CHMY 121N (CHEM 151N) Introduction to General Chemistry	3
COMM 111A Introduction to Public Speaking or DRAM 111A Acting for Non-Majors	3
ECNS 201S (ECON 111S) Introduction to Microeconomics	3
WRIT 101 (ENEX) 101 Composition	3
M 151 (MATH 121) Precalculus	4
M 162 (MATH 150) Applied Calculus	4
Electives and General Education	5
Second Year	Credit
FOR 201 Forest Biometrics	3
WRIT 222 (FOR 220) Technical Approaches to Writing	2
FOR 210N Introductory Soils	3
FOR 240 Tree Biology	2
FOR 241N Dendrology	3
FOR 250 Geographic Information System Practicum	2
Social Science Restricted Elective(Select one course from the following list)	
SOCI/EVST 225 Community and Environment	3
EVST 167 nature and Society	3
RSCN 370 Wildland Conservation Policy and Governance	3
Management Applications Restricted Elective (Select at least five credits from the following list)	
FOR 230 Fire Management	2
FOR 232 Forest Insects and Diseases	2
FOR 360 Range Management	3
RECM 217S Wildland Recreation Management	3
FOR 275 Wildlife Conservation	2
Electives and General Education	4
Third and Fourth Years	Credits
FOR 302 Forest Mensuration	3
FOR 320 Forest Economics	3
FOR 330 Forest Ecology	3
FOR 340 Forest Products Manufacturing	2
FOR 341 Timber Harvesting and Forest Roads	3
FOR 347 Multiple Resource Silviculture	3
FOR 351 Photogrammetry and Remote Sensing	3
FOR 385 Watershed Hydrology	3
FOR 422 Natural Resource Policy	3
FOR 440 Timber Management I	3
FOR 481 Forest Planning	3
Professional Electives	15
Electives and General Education	26
Professional Electives: Students must select at least five courses among the three areas of emphasis listed below so that at least 15 total professional elective credits are included in the degree program.	
Biophysical Sciences (select at least one course)	
WBIO 373 Wildlife Techniques	2
WBIO 370 Wildlife Habitat Conservation & Management	3
FOR 332 Forest Entomology	3
FOR 342 Wood Anatomy, Properties and Identification	3
BIOL 316 Plant Form and Function	5
BIOL 350 Rocky Mountain Flora	3
BiOL 444 Plant Physiology	4
BIOL 223 Genetics and Evolution	4
PHYS 111N and PHYS 113N Fundamentals of Physics I and Fundamentals of Physics I Lab	5
FOR 430 Forest Meteorology	3
FOR 350 Geographic Information Systems and Applications	3
Management Applications (select at least one course)	

	2
FOR 360 Range Management*	3
RECM 217S Wildland Recreation Management*	3
FOR 455 Riparian Ecology and Management	3
FOR 307 Forest Vegetation Management Models	3
FOR 447 Advanced Silviculture	3
FOR 331 Wildland Fuel Management	3
FOR 485 Watershed Management	3
FOR 441 Timber Management II	3
FOR 480 Forest and Rangeland Area Planning and Design	3
RECM 310 Natural Resources Interpretation	3
Policy and Social Sciences (select at least one course)	
SOC/EVST 225 Community and Environment*	3
EVST 167 Nature and Society*	3
FOR 423 Montana Wilderness Policy and Politics	3
FOR 424 Community Forestry and Conservation	3
FOR 379 Collaboration in Natural Resources Decisions	3
FOR 475 Sociology of the Environment and Development	3
FOR 425 natural Resource and Environmental Economics	3
RSCN 370 Wildland Conservation Policy and Governance*	3
RECM 481 Recreation Behavior	3
RECM 482W Wilderness and Protected Area Management	3
RECM 485 Recreation Planning	3

***If these courses are selected as restricted electives they may not be used to fulfill professional electives**

Range Resources Management Option

In addition to special degree requirements listed previously, students electing the range resources management option must complete the following required courses, or their equivalent if transferred from another college or university. Transference and equivalency will be determined by the University and College of Forestry and Conservation. Electives may be taken at appropriate times, keeping in mind these requirements as well as the University's General Education requirements for graduation.

First Year	Credits
BIOL 120N General Botany	3
CHMY 121N (CHEM 151) Introduction to General Chemistry	3
COMM 111A Introduction to Public Speaking	3
ECNS 201S (ECON 111S) Introduction to Microeconomics	3
WRIT 101 (ENEX 101) Composition	3
GEOG 102N Introduction to Physical Geography	3
M 151 (MATH 121) Precalculus	4
M 162 (MATH 150) Applied Calculus	4
Summer	Credits
FOR 200 Natural Resources Measurements Camp	2
Second Year	Credits
BIOL 350 Rocky Mountain Flora	3
FOR 201 Forest Biometrics	3
FOR 210N Introductory Soils	3
WRIT 222 (FOR 220) Technical Approaches to Writing	2
FOR 230 Forest Fire Management	2
FOR 275 Wildlife Conservation	2
Electives and General Education	10-16

Third and Fourth Years: FOR 320, 330, 351, 360, 361, 362, 385, 410, 455, 460, 461, 462, 463, 480.

Courses

U = for undergraduate credit only, UG = for undergraduate or graduate credit, G = for graduate credit. R after the credit indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Forestry (FOR)

U 140 Introduction to Urban Forestry 2 cr. Offered spring. An introduction to urban forestry principles and practices. Benefits of the urban forest. Topics covered include plant species selection, site design, site assessment, planting, watering, fertilization, insects and diseases, pruning and tree care, inventory of property values, and community forestry development.

U 180 Careers in Natural Resources 2 cr. Offered autumn and spring. Same as WBIO 180 and RECM 180. Subject matter and fields of study within natural resources management. Topics include forestry, wildlife biology, range, water, recreation management, forest products production, and other opportunities for careers in natural resources.

U 195 Special Topics Variable cr. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 196 Independent Study Variable cr. (R-3) Offered every term. Prereq., consent of instr. Problems course designed to allow individual research at the undergraduate level.

U 200 Natural Resources Measurements Camp 2 cr. Offered summer. Intensive two-week resident camp at the Lubrecht Experimental Forest. Introduction to the common measurements and skills used in identifying, quantifying, and understanding natural resources.

U 201 Forest Biometrics 3 cr. Offered autumn. Prereq., M 115 (MATH 117) or M 151 (MATH 121) or equivalent. Introduction to probability and statistical methods for forestry and environmental sciences covering natural resource applications of common probability distributions, data analysis, hypothesis testing, and regression.

U 210N Introductory Soils 3 cr. Offered autumn and spring. Prereq., CHEM 151N. An introduction to the chemical, physical, biological and morphological properties of soils.

U WRIT 222 (FOR 220) Technical Approaches to Writing 2 cr. Offered every term. Emphasis on strategy, style and tone in effective technical prose. Traditions of technical writing and how to adopt a wide range of tones and styles in writing various technical documents to diverse audiences. Focus on more effective technical sentences, paragraphs and larger writing components. Assignments include analyses, summaries, employment documents, research reports, case studies and editing/revision exercises.

U 230 Forest Fire Management 2 cr. Offered spring. Presuppression and suppression of fire and the uses of fire in management practices. Fire weather, the measurement of fire weather, the factors that influence fire behavior, and fire management decisions.

U 232 Forest Insects and Diseases 2 cr. Offered spring. Identification, significance of and remedies for insect infestations and infectious and non-infectious diseases of forests and forest products.

U235 Problem Solving for Forest Operations 4 cr. Offered autumn. Prereq., MATH 150, PHYS 121, GEOS 100N strongly recommended. Introduction to problem solving including the fundamentals of statics and mechanics of materials presented in the context of forest operations.

U 240 Tree Biology 2 cr. Offered autumn and spring. Suggested coreq., FOR 241N. The physical and biological requirements for the growth and development of trees. Discussions of: identification, classification, range, and economic importance of the major tree species of North America.

U 241N Dendrology 3 cr. Offered autumn and spring. Prereq., BIOL 120N; suggested coreq., FOR 240. Methods and techniques for identifying the major families of North American trees, based on gross morphological and anatomical features. Building and use of identification keys.

U 250 Geographic Information System Practicum 2 cr. Offered every term. A practical introduction to the use of geographic information systems for storing, retrieving, analyzing and displaying spatial data.

U 265 Elements of Ecological Restoration 3 cr. Offered autumn. Prereq., one course in the ecological or biological sciences. Overview of the natural and social science elements of ecological restoration, including the ecological foundations of restoration, restoration goals and practices in terrestrial and aquatic habitats, philosophical and ethical challenges involved, and current restoration initiatives in Montana and the United States. Includes Saturday field trips.

U 275 Wildlife Conservation 2 cr. Offered spring. Prereq., sophomore standing or consent of instr. Principles of animal ecology and framework of wildlife administration as a basis for the conservation of wild birds and animals, and biodiversity. For non-wildlife biology majors.

U 295 Special Topics Variable cr. (R-6) Offered intermittently. Experimental offerings of visiting professors; new courses or one-time offerings of current topics.

U 296 Independent Study Variable cr. (R-3) Offered every term. Prereq., consent of instr. Individual research at the undergraduate level.

U 302 Forest Mensuration 3 cr. Offered spring. Prereq., FOR 201. The theory and practice of timber inventory and growth projection, including field measurements, sampling procedures, statistical methods, inventory compilation, and stand growth simulation under specified

management prescriptions. Stand growth under specified management prescriptions.

UG 307 Forest Vegetation Management Models 3 cr. (R-6) Offered autumn. Prereq., FOR 202 or consent of instr. Hands on experience in applying the common simulation models used by forest managers in forecasting the development of forest vegetation. Includes elements of model building and evaluation.

U 311 Field Studies in Ecological and Human Communities 2-3 cr. (R-12) Offered every term. Prereq., consent of instr. Via extended backcountry travel, experiential examination of the structure and function of the ecosystems occurring within the course area. Also investigates the relationship of those ecosystems with the people that manage, live, and work in the area. Offered by the Wild Rockies Field Institute.

UG 320 Forest and Environmental Economics 3 cr. Offered autumn and spring. Prereq., M 162 (MATH 150); ECNS 201S (ECON 111S). Economic techniques to support decision making about the allocation of scarce resources, and management of forests for timber and other ecosystem services.

UG 330 Forest Ecology 3 cr. Offered autumn and spring. Same as RSCN 330. Prereq., BIOL 120N or BIOL 108N, 109N; prereq. or coreq., FOR 210N. Examination of physical and biological factors affecting forest structure, composition, and function, including biodiversity, disturbance, and nutrient cycling. Field labs throughout Northern Rockies including developing skills in field observation, data interpretation and problem solving.

UG 331 Wildland Fuel Management 3 cr. Offered autumn. Prereq., FOR 230 or equiv. Fire ecology, western vegetation types; planning for prescribed use of fire; fuel management objectives and techniques: mechanical, chemical, prescribed fire; smoke management considerations.

UG 332 Forest Entomology 3 cr. Offered intermittently. Prereq., FOR 232. Classification, identification, life cycles, and control of insects which injure forests and forest products.

U 335 Environmental Entomology 3 cr. Offered autumn. Prereq., BIOL 108 or equivalent. An introduction to the importance of insects in ecosystem function and process, and their use in ecological monitoring as indicators of ecological change, degradation, and the efficacy of ecological restoration efforts. Will also cover effects of climate change and biological invasions in the context of both pest and beneficial insect species.

UG 340 Forest Products Manufacturing 2 cr. Offered autumn. Prereq., junior standing or consent of instr. Survey of the manufacture of wood-based products generated from timber harvest. Laboratory field trips to several local manufacturing facilities.

U 341 Timber Harvesting and Forest Roads 3 cr. Offered spring. Prereq., FOR 200. An overview of harvesting system capabilities and selection for multiple resource objectives. Fundamentals of forest road management. Best management practices as they apply to forest operations in Montana and the western United States.

UG 342 Wood Anatomy, Properties and Identification 3 cr. Offered spring. Prereq., BIOL 120N or FOR 240, 241N. Lecture and laboratory investigation of the structure, identification and physical and mechanical properties of the commercial tree species of North America.

U 345 Sustaining Human Society and the Natural Environment 3-6 cr. Offered Winter and Summer. Same as RECM 345. These field-based, experiential classes focus on the environmental and conservation concerns, as well as the modern and traditional cultures, of Australia, New Zealand, or Fiji.

UG 347 Multiple Resource Silviculture 3 cr. Offered autumn and spring. Prereq., FOR 330 or BIOL 340 or equiv. An introduction to the concepts and application of silvicultural techniques to forest ecosystems to meet multiple resource objectives.

U350 Geographic Information Systems and Applications 3 cr. Offered autumn. Prereq. or coreq., FOR 250. Introduction to the basic concepts and techniques of computerized spatial data management and analysis systems and application to natural resource management.

UG 351 Photogrammetry and Remote Sensing 3 cr. Offered spring. Prereq., MATH 121. The theory and application of photo- and electro-optical remote sensing for mapping resources and developing information systems.

UG 360 Range Management 3 cr. Offered autumn and spring. Same as RSCN 360. Prereq., junior standing or consent of instr. An introduction to rangelands and their management, grazing influences, class of animal, grazing capacity, control of livestock distribution, improvements, competition and interrelationships with wildlife. Laboratory exercises to gain on-site experience on topics and concepts presented in lectures.

U 361 Range Forage Plants 3 cr. Offered autumn. Same as RSCN 361. Prereq., FOR 360 and BIOL 165N. Description, identification, forage value and ecology of forage plants of the western United States; important weed species, management of grazing lands, and the relationship of ecophysiology and morphology to grazing response.

U 362 Range Livestock Production 3 cr. Offered spring odd numbered years. Same as RSCN 362. Prereq., FOR 360 or consent of instr. An introduction to livestock production in natural systems and the role of livestock production in the world food situation; emphasizes selection, production and management principles of beef cattle systems.

U 365 Foundations of Restoration Ecology 3 cr. Primary ecological theories that inform the practice of ecological restoration. Topics include the dynamic nature of ecological systems, ecophysiological constraints on plant responses, biodiversity and ecosystem functioning, population dynamics and metapopulation theory, and statistical issues and study design.

UG 379 Collaboration in Natural Resources Decisions 3 cr. Offered intermittently. Same as EVST and RSCN 379. Political and social processes affecting natural resource decisions. Examination of cases of multi-party collaboration in forestry, range, and watershed management issues..

U 385 Watershed Hydrology 3 cr. Offered autumn and spring. Same as RSCN 385. An introduction to physical and biological controls over water movement and storage in the environment, and how those controls are affected by land management practices.

U 386 Watershed Hydrology Laboratory 1 cr. Offered autumn and spring. Coreq., FOR 385 or consent of instr. An introduction to basic watershed measurement and analysis techniques. Lab exercises designed around the use of spreadsheets and computer graphics.

U 395 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 396 Independent Study 1-3 cr. (R-10) Offered every term. Prereq., consent of instr. Individual study or research problems.

U 398 Internship Variable cr. Offered every term. Prereq., consent of department. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

U 404 Wilderness in the American Context 4 cr. Same as RECM 404. An expansive treatment of the history of the wilderness preservation movement in the United States. Introduction to the successive influences of philosophy, science, art and politics on society's relationship with wilderness. Discussion of the Wilderness Act of 1964.

U 405 Management of the Wilderness Resource 4 cr. Same as RECM 405. An ecology-based treatment of wilderness management. Brief overview of fundamental ecological principles followed by an examination of their specific and often unique applications to wilderness ecosystems. Presentation of basic wilderness management principles and guidelines. Discussion of nonconforming wilderness uses.

U 406 Wilderness Management Planning 3 cr. Same as RECM 406. Exploration of basic planning theory, concepts, effective plan writing, and the characteristics of successful planning and implementation. In-depth treatment of the Limits of Acceptable Change planning framework. Comparison and evaluation of the different planning approaches used by the four wilderness managing agencies.

U 407 Managing Recreation Resources in Wilderness 3 cr. Same as RECM 407. Examination of strategies to management recreation in a wilderness setting. Addresses management of visitor use and experiences, measuring and monitoring biophysical and social impacts, effective education and interpretation, and law enforcement.

UG 408 Global Biogeochemical Cycles 3 cr. Offered spring odd numbered years. Same as BIOL/GEO/CCS 407. Exploration of how variations in the availability or utilization of critical Earth elements influences the atmosphere, the oceans, and the terrestrial biosphere including the natural and agricultural ecosystems on which we depend.

UG 410 Soil Morphology, Genesis and Classification 3 cr. Offered spring odd-numbered years. Prereq., FOR 210N. The morphological characteristics of soils, how the horizons formed and an introduction to the Soil Taxonomy classification system used in this country. Field trips will be included.

UG 415 Environmental Soil Science 3 cr. Offered intermittently. Prereq., FOR 210N. A detailed analysis of how natural and anthropogenic disturbances influence soil processes and how those processes in turn influence our environment. Specific topic areas include nutrient cycling, water quality, xenobiotic compounds, metal contamination, and the remediation of contaminated soils.

UG 422 Natural Resources Policy and Administration 3 cr. Offered autumn and spring. Same as RSCN 422. Policy formation in the United States and a survey of the major resource policies interpreted in their historical and political contexts.

UG 424 Community Forestry and Conservation 3 cr. Offered spring. Same as SOC 424 and RSCN 424. A review of agroforestry, community forestry, and opportunities and constraints to the use of trees in rural development and protected areas management.

UG 425 Natural Resource and Environmental Economics 3 cr. Offered spring. Prereq., Math 150, and at least one of ECON 111, FOR 225, and FOR 320. Introduction to analytical approaches for economic analysis of management of non-renewable resources, fisheries, forests, threatened and endangered species, and the atmosphere.

UG 430 Forest Meteorology 3 cr. Offered autumn odd numbered years. Prereq., Consent of instr. A brief introduction to synoptic and mesoscale meteorology, followed by more intense study of physics in the forest environment: transfers of heat, light and momentum and their influences on plant structure, function, productivity and survival.

UG 435 Advanced Timber Harvesting and Forest Road 5 cr. Offered autumn. Prereqs., FOR 235, 347, 340, 351; Coreq., FOR 436. This course covers the fundamentals of logging feasibility and cost analyses of various timber harvesting systems including the characteristics

and performance of ground vehicles, cable and aerial systems; cost factors and cost analysis procedures; safety issues; and environmental impacts of harvesting systems as well as forest road location, surveying, design, construction and maintenance, and management of existing road systems.

UG 436 Forest Operations Evaluation and Project Planning 3 cr. Offered autumn. Prereq., FOR 320. Coreq., FOR 436. This course introduces sensitivity analysis; break-even analysis; risk analysis; multistage sequential analysis; multiattribute analysis; project planning; and contracting.

UG 437 Forest Operations and Applied Restoration Capstone 3 cr. Offered spring. Prereq., FOR 385, 435, EVST 167. FOR 230 and 360 strongly recommended. Principles of ecological restoration and techniques for implementing restoration strategies for terrestrial and aquatic systems.

UG 440 Timber Management I 3 cr. Offered autumn. Prereq., FOR 302, 336, 341. The management and manipulation of the timber resource on private lands to reach multiple objectives, with a focus on the planning of forest operations.

UG 441 Timber Management II 3 cr. Offered spring. Prereq., FOR 440 the immediately preceding autumn semester. The management and manipulation of the timber resource on private lands to reach multiple objectives, with a focus on the administration of forest operations.

UG 442 Technical Processing of Wood Products 5 cr. Offered spring. Prereq., FOR 340 and 342. Lecture, discussion, laboratory manufacture, and evaluation of solid and composite wood products. Exercises include lumber manufacture and drying at College's sawmill; plywood, laminated beam manufacture and strength testing; particle board and flakeboard manufacture and testing.

U 444 Integrative Ecology Restoration 3 cr. Lectures and field trips address key aspects of restoration planning on terrestrial sites (including use of native plant materials and plant-soil bioregulation) and in aquatic systems (including hydrologic and geomorphic components of project design and fish and invertebrate monitoring). Students are required to develop and submit a restoration plan for their final project.

U 445 Ecological Restoration Practicum 3-6 cr. Real-world experience in the practice of ecological restoration. Students will design and implement aspects of a restoration plan for a CFC-maintained property, private entity, nonprofit group, management agency, or other sponsor.

UG 447 Advanced Silviculture 3 cr. Offered autumn. Prereq., FOR 347. Examination of silvicultural topics such as regeneration practices, thinning/stand density concepts, and silvicultural systems at an advanced level.

UG 455 Riparian Ecology and Management 3 cr. Offered spring. Same as RSCN 455. Coreq. or prereq., FOR 385 and one introductory ecology course or consent of instr.. Importance of riparian/wetland areas and the complexities associated with their management for short and long term benefits.

UG 460 Range Inventory and Analysis 3 cr. Offered autumn. Same as RSCN 460. Prereq., FOR 360 and one course in statistics. Methods of measuring range and shrub-land vegetation at individual and community level for determining plant composition, changes following treatments, and carrying capacity of range livestock and native ungulates.

UG 461 Animal Nutrition 3 cr. Offered spring. Prereq., FOR 360 or consent of instr. Elements of animal nutrition, physiology of ruminant nutrition, nutritional characteristics of forage plants related to nutrition requirements of livestock and wildlife, and nutritional strategies of free-roaming animals.

UG 462 Range Ecology 3 cr. Offered spring. Same as RSCN 462. Prereq., FOR 360 and one course in plant ecology. Applied ecology of rangeland uses by various biota, synecological response to grazing, fire, herbicides, fertilizers and mechanical treatments, structural and functional responses of grassland systems to disturbance.

UG 463 Range Improvement 3 cr. Offered autumn. Same as RSCN 463. Prereq., FOR 360. Methods of improving rangelands, including grazing systems, control of weeds, controlled burning, seeding, fertilization and mechanical soil treatments.

UG 465 Restoration Ecology 3 cr. Offered spring. Prereq., senior standing and a course in ecology. Same as EVST 465. Philosophy and practice of restoring damaged ecosystems. Restoration planning including improvement of degraded soils, site preparation for revegetation, and case studies.

UG 475 Sociology of Environment and Development 3 cr. Offered annually. Same as RSCN 475. Examines key social forces that influence how individuals, groups and nation-states understand and live within their bio-physical environments, especially policies and processes relating to development, corporate capitalism, globalization, culture, class and other forms of power and social relations. Pays close attention to ways both indigenous and introduced resource use and management practices (including conservation) variably impact people of different races, classes, genders, cultures and livelihood practices.

U 476 Managing Recreation Resources in Wilderness 3 cr. Same as RECM 476. Examination of strategies to management recreation in a wilderness setting. Addresses management of visitor use and experiences, measuring and monitoring biophysical and social impacts, effective education and interpretation, and law enforcement.

UG 480 Forest and Rangeland Area Planning and Design 3 cr. Offered autumn. Prereq., senior standing, WBIO 370, RECM 310, FOR 347 or FOR 360; senior or graduate standing; or consent of instr. A multidisciplinary planning team approach to developing detailed, site-specific resource management planning for units of forest and rangeland at the area or watershed level. Includes use of geographic information systems, computer modeling, and linear programming.

UG 481 Forest Planning 3 cr. Offered spring. Prereq., FOR 422 or consent of instr. Integrated multiple use planning at the forest-wide level: defining multi-resource management goals, generating management alternatives, projecting outcomes, assessing environmental impacts, and implementing preferred option.

UG 485 Watershed Management 3 cr. Offered autumn. Same as RSCN 485. Prereq., FOR 385 or consent of instr. Effects of land management practices on water and sediment yields from wildland watersheds. Introduction to statistical methods in hydrology. Introduction to water yield and sediment modeling techniques.

U 494 Seminar in Ecological Restoration 1 cr. This seminar provides a forum for students to share the results of restoration projects conducted through FOR 445, Ecological Restoration Practicum. Each student will lead at least one seminar during the semester.

UG 495 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 496 Independent Study 1-3 cr. (R-10) Offered every term. Prereq., consent of instr. Individual study or research problems.

U 497 Senior Thesis 3 cr. Offered autumn and spring. Prereq., senior standing and consent of instr. Preparation of a major paper based on study or research in a field selected according to the needs and objectives of the student.

UG 498 Internship Variable cr. Offered every term. Prereq., consent of instr. Extended classroom experience which provides practical application of classroom learning during placements off-campus. Prior approval must be obtained from faculty advisor and Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

G 500 Forest Growth and Yield 3 cr. Offered spring. Prereq., FOR 202 or consent of instr. Offered alternate years. Theory and methods for projecting quantitative measures of tree and stand growth over time; includes analysis of computer growth and yield models used in the region.

G 501 Research Methods 3 cr. Offered autumn. Prereq., a course in statistics or consent of instr. The nature of scientific research, planning research projects, organization and presentation of research results. Emphasis on the development of study plans for specific research projects.

G 503 GIS: Methods and Applications I 3 cr. Offered autumn. Prereq., consent of instr. Introduction to the theory and development of statistical gradient and predictive distribution models in the resource and conservation sciences. Course will develop climatic, edaphic, biophysical, and inventory data sources for use in predictive distribution modeling. Survey of multiple modeling approaches, limitations and assumptions, and applications in the resource and conservation fields. Emphasis on the integration of GIS and raster analysis methods with spatial and non-spatial statistical techniques.

G 504 GIS: Methods and Applications II 3 cr. Offered spring. Prereq., FOR 503. Continuation of 503.

UG 505 Sampling Methods 3 cr. Offered spring. Prereq., FOR 201 or equiv.; consent of instr. Fundamentals of statistical sampling emphasizing natural and environmental resource applications. Principles of inferences and alternative estimators are studied in the context of simple random, systematic, unequal probability, stratified, and 3P/Poisson designs. Variable radius plot sampling, line intersect sampling, and other probability proportional to size designs used in forest and ecological inventories are also covered.

G 508 Modeling Forest Dynamics 3 cr. Offered autumn odd numbered years. Prereq., FOR 500 and some experience with statistical methods and a programming language. Introduction to the construction of simulation models for forecasting change in forest vegetation. Survey of alternative modeling approaches followed by construction of a simulator. Includes specification of conceptual model, statistical analysis of data, and programming a working simulator.

G 511 Soil Chemistry 3 cr. Offered spring odd-numbered years. Prereq., FOR 210N, 330. A series of lectures on soil chemistry in the beginning of the semester, emphasizing water and nutrient movement, followed by a series of laboratory and lecture classes on soil chemistry, emphasizing data interpretation and problem solving.

G 513 Natural Resource Dispute Resolution 3 cr. Offered spring. Same as LAW 613 and EVST 513. Provides a conceptual framework for understanding the history of ideas that have shaped the policies, institutions, and strategies used to resolve natural resource and other public policy conflicts in the American West. Focus on natural resource and environmental dispute resolution.

G 520 Forest Resource Economics 3 cr. Offered autumn. Prereq., FOR 320 or equiv., an upper-division or graduate level course in microeconomics, and consent of instr. The demand for, and supply of, commodity products from the forest, including characteristics of demand for stumpage, logs and processed products, forest management and harvesting decisions, and the supply of stumpage, intermediate and processed products.

G 532 Forest Ecosystem Analysis 3 cr. Offered autumn. Prereq., FOR 330 or equiv. Current research on important processes in forest

ecosystems, including carbon, water and nutrient cycles, with emphasis on recent computer simulation models.

G 533 Use of Fire in Wildland Management 3 cr. Offered autumn even-numbered years. Prereq., consent of instr. Western fire ecology and the planned use of fire. Wildlife, range and forestry applications of prescribed fire. Seminars and discussions; research applications.

G 545 Silviculture Research 1 cr. (R-6) Offered intermittently. Prereq., graduate standing and consent of instr.; prereq. or coreq., FOR 347 or equiv. Reading and discussion of scientific literature related to silvicultural practice and science. Different topic each semester. Students become familiar with silviculture literature, develop skills for scrutinizing scientific literature, and examine silvicultural topics in detail.

G 547 Forest Vegetation Dynamics 3 cr. Offered autumn. Prereq., consent of instr. Role of disturbances, plant interactions, tree architecture, and structure on forest stand development. Laboratory provides experience with vegetation development reconstruction. Discusses even-aged, uneven-aged, single- and mixed-species stand development as well as landscape linkages.

G 548 Forest Stand Dynamics and Culture 1 cr. Offered intermittently. Prereq., FOR 347 or equiv. One-week continuing education course designed to present emerging concepts in stand dynamics and stand culture to practicing silviculturists. Topics include even- and uneven-aged stand dynamics and density control, fire management, fertilization, and stand health.

G 551 Digital Image Processing 4 cr. Offered autumn even numbered years. Prereq., FOR 351 or equiv. and consent of instr. Fundamentals of electro-optical digital remote sensors, data compilation, preprocessing, and pattern recognition.

G 560 American Wilderness Philosophy and Policy 4 cr. Same as RECM 560. History of the American Wilderness idea and associated policies, including the Wilderness Act and implementing regulations. Current management challenges also covered.

G 561 Managing Wilderness Ecosystems 4 cr. Same as RECM 562. Current research, theory, and management approaches to recreation management in wilderness, including monitoring and management of visitor impacts and experiences.

G 562 Managing Recreation Resources in Wilderness Settings 3 cr. Same as RECM 562. Current research, theory, and management approaches to recreation management in wilderness, including monitoring and management of visitor impacts and experiences.

G 563 Wilderness Planning: Theory, Management Frameworks, and Application 4 cr. Same as RECM 563. Planning theory and effective plan development, including principles and practices of public involvement. Includes examination of primary planning frameworks.

G 565 Advanced Problems in Restoration Ecology 3 cr. Offered autumn. Same as RSCN 565. Prereq., graduate standing and consent of instructor. This is a student-driven course that explores current topics in the theory and practice of restoration. Students will develop and implement a collaborative research project related to a current problem in restoration ecology or ecological restoration.

G 570 Political Ecology 3 cr. Same as RSCN 570. Graduate seminar on key theories, issues and literature in the subfield of Political Ecology, an interdisciplinary environmental social science approach which integrates how political, economic, cultural and ecological processes interact and shape society nature relations. Case examples are drawn from both the North and South.

G 571 International Conservation and Development 1-3 cr. (R-2) Offered fall and spring. Prereq., graduate standing and consent of instructor. Critical review of selected international natural resource development, conservation and management approaches and experiences.

G 579 Advanced Natural Resources Conflict Resolution 3 cr. (R-4) Offered autumn. Same as EVST 579 and LAW 679. Prereq., FOR 513 or consent of instr. Current topics in theory and practice. Development and discussion of research topics. Topics vary.

G 582 Tropical Ecosystems and Management 3 cr. Offered spring. Prereq., graduate standing or consent of instr. Introduction to tropical forests and agroecosystems, and a critical examination of their management and conservation within the context of ecological, socioeconomic and political change.

G 586 Snow Hydrology 3 cr. Offered spring. Prereq., graduate standing or consent of instr. The physics of snow formation, distribution and ablation. Snow and forest management in the subalpine zone.

G 594 Graduate Seminar in Forestry 1 cr. (R-3) Offered autumn and spring. Prereq., graduate standing. Presentation by students, staff and visitors of issues and topics in their fields.

G 595 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

G 596 Independent Study 1-3 cr. (R-10) Offered every term. Prereq., consent of instr. Individual study or research problems.

G 598 Internship Variable cr. (R-15) Offered every term. Prereq., consent of instr. Extended classroom experience which provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office.

G 599 Professional Paper Variable cr. (R-15) Offered autumn and spring. Preparation of Master of Ecosystem Management professional

paper.

G 622 Advanced Problems in Environmental Policy 3 cr. Offered Spring even-number years. Examines environmental policy problems and contemporary issues in environmental policy, law, and administration. Policy tools, concepts and research resources introduced. Numerous problems, themes, and issues in environmental policy analyzed. Readings-based seminar; students lead most reviews and discussions.

G 697 Graduate Research Variable cr. (R-15) Offered every term. Independent graduate research in forest management, wood science, soils, wildlife management, silviculture, recreation and other topic areas.

G 699 Thesis Variable cr. (R-15) Offered every term. Preparation of thesis/dissertation.

Recreation Management

- [Special Degree Requirements](#)
- [Courses](#)

The B.S. in Recreation Management degree is designed to prepare students for professional positions developing and managing nature-based recreation experiences and park resources for public land management agencies, nonprofit organizations, and the nature-based tourism industry. Students pursuing this degree must choose between an option in Recreation Resources Management or Nature-Based Tourism. The Recreation Resources Management option provides the educational background necessary for evaluating and managing wild lands to protect their recreational, heritage, and ecological values. The Nature-Based Tourism option is designed to combine an understanding of social, cultural, political, environmental, and economic contexts surrounding tourism in a natural resource setting. All students learn the processes and conceptual skills needed to determine alternative management strategies, make management decisions, and carry out management programs. Included are courses leading to an understanding of the basic ecological characteristics of recreational lands. Students also take courses dealing with human behavior and management. Emphasis is placed on presenting problems that would be encountered while managing national parks and forests, state and regional parks, wilderness areas, and other recreation resources of international and national significance. The degree and Recreation Resources Management option are accredited by the National Recreation and Parks Association and the American Association for Leisure and Recreation.

Special Degree Requirements

Students pursuing the B.S. in Recreation Management degree complete the following courses (or their equivalent if transferred from another college or university). Transfer credits and course equivalency will be determined by the University and the College of Forestry and Conservation. In addition, students are required to take a practicum in recreation management, RECM 460. This is a work-learning experience that involves at least 10 weeks full-time employment in a professional work environment. RECM 460 has a prerequisite of 400 previous hours of relevant work experience. Electives may be taken at any time, keeping in mind these courses as well as the University's General Education requirements for graduation. See also the graduation requirements for the College of Forestry and Conservation listed previously in the catalog.

Recreation Resources Management Option

	First Year	Credits
RECM 110S Introduction to Recreation Management		3
RECM 180 Introduction to Natural Resources Issues or WBI0 105N Wildlife and People or RSCN 121 S Nature of Montana		2-3
WRIT 101 (ENEX 101) Composition		3
BIOL 108N Diversity of Life or BIOL 121N Introductory Ecology		3
PSYX 100S (PSYC 100S) Introduction to Psychology		4
CHMY 121N (CHEM 151N) Intro to General Chemistry		3
M 115 (MATH 117) Probability and Linear Mathematics		3
Electives and General Education		9
	Summer	Credits
FOR 200 Natural Resources Measurements Camp		2
	Second Year	Credits
FOR 210N Introduction to Soils		3
RECM 210 Nature-Based Tourism		3
RECM 230 Programming in Recreation		3
STAT 216 (MATH 241) Statistics, FOR 201 Forest Biometrics or SOCI 202 Social Statistics		3-4
RECM 217S Wildland Recreation Management		3
WRIT 222 (FOR 220) Technical Approaches to Writing		2
ECNS 201S (ECON 111S) Principles of Microeconomics		3
FOR 250 Geographic Information System Practicum		2

COMM 111A Public Speaking	3
Electives and General Education	3
Third Year	Credits
FOR 330 Forest Ecology or 462 Range Ecology	3
RECM 380 Recreation Administration and Leadership	4
FOR 385 Watershed Hydrology	3
RECM 300 Recreation Behavior	3
RECM 310 Natural Resources Interpretation	3
RECM 450 Pre-practicum Professional Preparation	1
FOR 422 Natural Resource Policy or WBIO 410 Wildlife Biology and Biopolitics	3
Electives and General Education	9
Summer	Credits
RECM 460 Practicum in Recreation	6-9
Fourth Year	Credits
RECM 482 Wilderness and Protected Area Managements	3
RECM 484 Field Techniques	3
RECM 485 Recreation Planning	4
FOR 422 Natural Resource Policy OR WBIO 410 Wildlife Biology and Biopolitics	3
Electives and General Education	9-14

Nature-Based Tourism Option

First Year	Credits
RECM 110S Introduction to Recreation Management	3
RECM 180 Introduction to Natural Resources Issues or WBIO 105N Wildlife and People or RSCN 121 S Nature of Montana	2-3
WRIT 101 (ENEX 101) Composition	3
BIOL 108N Diversity of Life or BIOL 121N Introductory Ecology	3
SOCI 101S (SOC 110S) Principles of Sociology	3
ECNS 201S (ECON 111S) Principles of Microeconomics	3
CHMY 121N (CHEM 151N) Intro to General Chemistry	3
M 115 (MATH 117) Probability and Linear Mathematics	3
Electives and General Education	6
Summer	Credits
FOR 200 Natural Resources Measurements Camp	2
Second Year	Credits
FOR 210N Introduction to Soils	3
RECM 210 Nature-Based Tourism	3
RECM 230 Programming in Recreation	3
STAT 216 (MATH 241) Statistics, FOR 201 Forest Biometrics or SOCI 202 Social Statistics	3-4
SOCI 202 (SOC 202) Social Statistics	3
RECM 217S Wildland Recreation Management	3
WRIT 222 (FOR 220) Technical Approaches to Writing	2
ACTG 201 (ACCT 201) Principles of Financial Accounting	3
COMM 111A Public Speaking	3
Electives and General Education	6
Third Year	Credits
FOR 330 Forest Ecology or 462 Range Ecology	3
MKTG 360 Marketing Principles	3
RECM 380 Recreation Administration and Leadership	4
RECM 300 Recreation Behavior	3
RECM 310 Natural Resources Interpretation	3
RECM 450 Pre-practicum Professional Preparation	1
Electives and General Education	12
Summer	Credits
RECM 460 Practicum in Recreation	6-9
Fourth Year	Credits

RECM 451 Tourism and Sustainability	3
RECM 483 Commercial Recreation, Marketing, and Tourism	3
RECM 484 Field Techniques	3
FOR 475 Sociology of Environment and Development	3
FOR 422 Natural Resource Policy OR WBIO 410 Wildlife Biology and Biopolitics	3
MKTG 362 Consumer Behavior	3
FOR 379 Collaboration in Natural Resource Decisions	3
Electives and General Education	3-7

Courses

U=for undergraduate credit only, UG= for undergraduate or graduate credit, G=for graduate credit. R after the credit indicates the course may be repeated for credit to maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Recreation Management (RECM)

U 110S Introduction to Parks, Recreation and Tourism 3 cr. Offered autumn and spring. The basic motivations and socio-economic determinants of recreation needs and preferences. History of the development of the resources base, trends in user participation, classification of recreation lands, recreation opportunities and needs, management objectives, economics of outdoor recreation, and definitions of leisure and recreation.

U 180 Careers in Natural Resources 2 cr. Offered autumn and spring. Same as FOR 180, WBIO 180. Subject matter and fields of study within natural resources management. Topics include forestry, wildlife biology, range, water, recreation management, forest products production and other areas of opportunity for students seeking careers in natural resources.

U 195 Special Topics Variable cr. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 210 Nature-Based Tourism 3 cr. Offered autumn. Introduction to the tourism and commercial recreation industries. Provides initial link between the natural environment and business operations. Combination of introductory business philosophies, economics, and natural resource management into a framework for future reference and course work.

U 217 Wildland Recreation Management 3 cr. Offered autumn and spring. Prereq., RECM 110S or option in forest resources management. The management of land as an environment for outdoor recreation. Understanding the relationship between the visitor, resource base and management policies. Recreation planning on multiple use forest lands, parks, wilderness areas and private lands.

U 230 Programming in Recreation 3 cr. Offered autumn. Prereq., RECM 110S. Principles of program planning for organized offerings in recreation. Selection, adaptation and evaluation of activities.

U 295 Special Topics Variable cr. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 300 Recreation Behavior 3 cr. Offered autumn. Prereq., RECM 217. This course provides an understanding of recreation behavior in wildland and nature-based tourism oriented settings. Students will learn about theories/conceptual frameworks from social and environmental psychology and their application to visitor management issues in the wildland recreation and nature-base tourism fields.

U 310 Natural and Cultural Resources Interpretation 3 cr. Offered spring. Prereq., one biology course; one public speaking course. Principles, concepts, techniques essential to providing high quality interpretive programs in natural or cultural history.

U 345 Sustaining Human Society and the Natural Environment 3 cr. Offered Winter and Summer. Same as FOR 345. These field-based, experiential classes focus on the environmental and conservation concerns, as well as the modern and traditional cultures, of Australia, New Zealand, or Fiji.

UG 371 Wilderness Issues Lecture Series 1 cr. (R-3) Offered spring. Same as EVST 371 and RSCN 371. Explores current issues in wilderness preservation, management and research.

UG 380 Recreation Administration and Leadership 4 cr. Offered spring. Prereq., RECM 110S, 217 and 230 or consent of instr. Personnel, leadership, finance, facilities, programs and public relations. Coordination with youth serving institutions, government agencies, and private or commercial organizations.

U 395 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, new courses, or one-time offerings of current topics.

U 396 Independent Study 1-6 cr. (R-6) Offered every term.

U 398 Internship Variable cr. Offered every term. Prereq., consent of instr. Extended classroom experience which provides practical

application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

U 404 Wilderness in the American Context 4 cr. Same as FOR 404. Same as FOR 404. An expansive treatment of the history of the wilderness preservation movement in the United States. Introduction to the successive influences of philosophy, science, art and politics on society's relationship with wilderness. Discussion of the Wilderness Act of 1964.

U 405 Management of the Wilderness Resource 4 cr. Same as FOR 405. An ecology-based treatment of wilderness management. Brief overview of fundamental ecological principles followed by an examination of their specific and often unique applications to wilderness ecosystems. Presentation of basic wilderness management principles and guidelines. Discussion of nonconforming wilderness uses.

U 406 Wilderness Management Planning 3 cr. Same as FOR 406. Exploration of basic planning theory, concepts, effective plan writing, and the characteristics of successful planning and implementation. In-depth treatment of the Limits of Acceptable Change planning framework. Comparison and evaluation of the different planning approaches used by the four wilderness managing agencies.

U 407 Managing Recreation Resources in Wilderness 3 cr. Same as FOR 407. Examination of strategies to management recreation in a wilderness setting. Addresses management of visitor use and experiences, measuring and monitoring biophysical and social impacts, effective education and interpretation, and law enforcement.

U 450 Pre-Practicum Professional Preparation 1 cr. Offered autumn. A pre-practicum class to provide orientation for the practicum, RECM 460, in recreation management.

U 451 Tourism and Sustainability 3 cr. Offered spring. Prereq., RECM 210 and 217. Theories and conceptual models are applied to analyzing relationships between the integration of planning theories to sustainability concepts.

UG 460 Practicum in Recreation 1-15 cr. (R-15) Offered every term. Prereq., RECM 380, senior standing, and consent of instr. Supervised pre-professional practice in approved recreation management agencies.

UG 481 Managing Wildland Resources and Visitors 4 cr. Offered autumn. Prereq., RECM 217. Balancing the needs of people for recreation with the impact of recreational use.

UG 482 Wilderness and Protected Area Management 3 cr. Offered autumn. Prereq., RECM 217, 370. Examination of the origin, evolution, and application of the park concept on state, federal, and international levels. Evaluation of legislation, philosophy, and policy leading to consideration of goals, objectives, and strategies for park management.

UG 483 Commercial Recreation, Marketing and Tourism 3 cr. Offered autumn. Prereq., RECM 217. Interactions between wildland recreation areas and the private sector are reviewed. Linkages between natural resources and the tourism industry are discussed. Principles of marketing for the private sector within this context are presented.

U 484 Recreation Management Field Techniques 3 cr. Offered autumn. Prereq., FOR 210, 330. Field measurement and management techniques critical in recreation management. Includes measurement of recreation impacts on biophysical and social attributes of recreational settings.

UG 485 Recreation Planning 4 cr. Prereq., RECM 217. Offered autumn. Needs of recreation opportunities and response to those needs through planning, demand assessment and resource analysis.

U 493 Omnibus Variable cr. (R-10) Offered intermittently. Independent work under the University omnibus option. See index.

UG 495 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, new courses or one-time offerings of current topics.

U 496 Independent Study Variable cr. (R-6) Offered every term. Prereq., consent of instr. Individual study of research problems.

U 497 Senior Thesis 1-3 cr. (R-3) Offered autumn and spring.

UG 498 Internship Variable cr. Offered autumn and spring. Prereq., consent of instr. Extended classroom learning during placements off campus. Prior approval must be obtained from faculty advisor and Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

G 500 Recreation Research Methods 3 cr. Offered spring odd-numbered years. Prereq., one course in statistics. Methods used in recreation research.

G 560 American Wilderness Philosophy and Policy 4 cr. Same as FOR 560. History of the American Wilderness idea and associated policies, including the Wilderness Act and implementing regulations. Current management challenges also covered.

G 561 Managing Wilderness Ecosystems 4 cr. Same as FOR 561. Ecosystem science and policies and management practices related to managing specific resources, such as air, wildlife, and water, within wilderness. Management of non-conforming uses is also covered.

G 562 Managing Recreation Resources in Wilderness 3 cr. Same as FOR 562. Current research, theory, and management approaches to recreation management in wilderness, including monitoring and management of visitor impacts and experiences.

G 563 Wilderness Planning: Theory, Management Frameworks, and Application 4 cr. Same as FOR 563. Planning theory and effective plan development, including principles and practices of public involvement. Includes examination of primary planning frameworks.

G 565 Advanced Problems in Restoration Ecology 3 cr. Offered autumn. Same as FOR 565. Prereq., graduate standing and consent of instructor. This is a student-driven course that explores current topics in the theory and practice of restoration. Students will develop and implement a collaborative research project related to a current problem in restoration ecology or ecological restoration.

G 594 Graduate Seminar in Recreation 1 cr. (R-3) Offered autumn and spring. Prereq., graduate standing. Presentations by students, staff and guest speakers of issues and topics in their fields.

G 595 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, new courses, or one-time offerings of current topics.

G 596 Independent Study Variable cr. (R-10) Offered every term. Prereq., consent of instr. Individual study or research problems.

G 597 Research Variable cr. (R-12) Offered every term. Prereq., graduate standing. Independent graduate research in recreation management.

G 598 Internship Variable cr. (R-12) Offered every term. Prereq., consent of instr. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from faculty advisor and Internship Services office.

G 599 Professional Paper Variable cr. (R-15) Offered every term. Preparation of professional paper.

G 697 Research 1-15 cr. (R-15) Offered every term.

G 699 Thesis Variable cr. (R-15) Offered every term. Prereq., graduate standing. Preparation of thesis.

Resource Conservation

Bachelor of Science in Resource Conservation

In addition to special degree requirements listed previously, students selecting the Bachelor of Science in Resource Conservation should contact their advisors to approve curriculum. The challenging and rapidly evolving field of environmental conservation requires broad training and the ability to integrate and communicate across disciplines. Resource Conservation is an interdepartmental undergraduate major that prepares students for the diverse opportunities that now exist in environmental conservation, natural resource management and efforts to build more sustainable livelihoods and communities. Students can choose a more structured area of study to prepare for graduate work in the natural sciences, such as ecology, hydrology, or soils, or emphasize emerging sub-disciplines such as fire ecology and adaptive strategies for climate change. Students can also integrate across disciplines and focus on natural resource policy, wilderness studies, community forestry, or international conservation. Example of possible program in the conservation option:

Conservation Option

3 Communication Courses:

- 1 oral (COMM 111 or DRAM 111)
- WRIT 222 (FOR 220) Tech Writing (or transfer equivalent)
- Upper-division writing (also required for GER)

3 Quantitative Courses:

- 1 Statistics course from the following: M 121 (MATH 111), M 122 (MATH 112), M 151 (MATH 121), M 162 (MATH 150), or M 115 (MATH 117)
- 1 statistics course from the following: STAT 216 (MATH 241), SOCI 202 (SOC 202), FOR 201
- 1 course of either GIS or math (Math of above not already taken or FOR 250)

FOR 200- Camp

CHMY 121 (CHEM 151)

1 general biology course from the following: BIOL 108, 110, 120, 121, or transfer equivalent

1 soils course (FOR 210)

1 ecology course from the following: FOR 330, BIOL 340, RSCN 462, or transfer equivalent

1 policy course from the following: FOR 422, RSCN 370, WBIO 410, or transfer equivalent

Student have to take at least 36 traditional letter-graded credits within the College - and courses with the FOR, RECM, RSCN, or WBIO prefix will work.

Terrestrial Sciences Option

The terrestrial sciences option is designed to provide students with a solid scientific foundation in the biological and physical science aspects of terrestrial conservation. The curriculum consists of a required core of science classes and an individualized curriculum of upper-division science courses chosen by the student in consultation with a faculty advisor. The curriculum must include at least 12 credits in forestry or wildlife biology at the upper-division level in addition to those specified below. This is an ideal option for those students who want to specialize their undergraduate education in areas such as forest ecology, hydrology, forest soils, biometrics, fire, or remote sensing.

Courses

U = for undergraduate credit only, UG = for undergraduate or graduate credit, G = for graduate credit. R after the credit indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Resource Conservation (RSCN)

U 170N International Environmental Change 3 cr. Offered spring. An introduction to natural and anthropogenic environmental change from ancient to contemporary times. Exploration of the historical role and importance of ecological disturbance on the development and maintenance of terrestrial ecosystems around the world. Introduction to fields of study available in the College of Forestry and Conservation.

U 121S Nature of Montana 3 cr. Offered fall. An exploration of the major natural resource management issues facing the people of Montana and the social processes to manage environmental conflicts. Provides an introduction to the function of ecological systems and the impacts of human uses on the environment and looks at strategies for addressing global climate change, ex-urban population growth, and protecting environmental quality.

U 210N Introductory Soils 3 cr. Offered autumn and spring. Same as FOR 210N. Prereq., CHEM 151N. An introduction to the chemical, physical, biological and morphological properties of soils.

U 271N Issues in Wilderness Ecology 3 cr. Offered spring. A study of forestry and wildlife issues which affect the maintenance of wilderness integrity. Topics include: global climate changes; management of wildfires, cattle grazing and noxious weeds; game management; threatened and endangered species, including grizzly bears, wolves, bird and fish species.

U 273 Wilderness and Civilization Field Studies Variable 1-3 cr. (R-6) (R-6) Offered autumn and spring. Field studies in ecology and conservation. Includes natural history, field journaling, ecological monitoring, protected area management, and community conservation. One-day trips as well as extended backcountry trips. Part of the Wilderness and Civilization program.

U 274 Yellowstone Studies 1 cr. Offered spring. Ecological and sociopolitical perspectives on the greater Yellowstone ecosystem. Topics include winter ecology, biodiversity conservation, national park planning and management, winter recreation, fire, and wildlife. Field course in the Yellowstone area.

U 321 Field Studies of Energy Systems in Montana 2-3 cr. Offered Summer. Via an extended bicycle tour of Montana, students examine a variety of energy developments and their environmental, social, and economic implications.

UG 330 Forest Ecology 3 cr. Offered autumn and spring. Same as FOR 330. Prereq., BIOL 120N or BIOL 108N, 109N; prereq. or coreq., FOR 210N. Examination of physical and biological factors affecting forest structure, composition, and function, including biodiversity, disturbance, and nutrient cycling. Field labs throughout Northern Rockies including developing skills in field observation, data interpretation and problem solving.

U 345 Watershed Dynamics 3 cr. Coreq. EVST 391, EVST 392, RSCN 346, EVST 291. Offered each autumn by Northwest Connections. Via hands on application in rural Montana, students investigate watershed function; introductory stream hydrology and morphology; and fish, amphibian and aquatic furbearer habitat characteristics. The course also explores impacts of road building, timber harvest, and watershed fragmentation on watershed and stream function, fish habitat, and fish populations.

U 346 Forests and Communities 3 cr. Coreq., EVST 391, EVST 392, RSCN 345, EVST 291. Offered each autumn by Northwest Connections. Via backcountry travel and hands on field application in rural Montana, students will be immersed in the ecology of forested ecosystems in Northwest Montana, including plant succession, fire ecology, soil science and wildlife ecology.

UG 360 Range Management 3 cr. Offered autumn and spring. Same as FOR 360. Prereq., junior standing or consent of instr. An introduction to rangelands and their management, grazing influences, class of animal, grazing capacity, control of livestock distribution, improvements, competition and interrelationships with wildlife. Laboratory exercises to gain on-site experience on topics and concepts

presented in lectures.

U 361 Range Forage Plants 3 cr. Offered autumn. Same as FOR 361. Prereq., FOR 360 and BIOL 165N. Description, identification, forage value and ecology of forage plants of the western United States; important weed species, management of grazing lands, and the relationship of ecophysiology and morphology to grazing response.

U 362 Range Livestock Production 3 cr. Offered spring odd numbered years. Same as FOR 362. Prereq., FOR 360 or consent of instr. An introduction to livestock production in natural systems and the role of livestock production in the world food situation; emphasizes selection, production and management principles of beef cattle systems.

UG 370S Wildland Conservation Policy and Governance 3 cr. Offered autumn and spring. Examination of the historical, philosophical, and legislative background for development and management of our national system of wilderness areas, wild and scenic rivers, trails, and national parks; their place in our social structure.

UG 371 Wilderness Issues Lecture Series 1 cr. (R-3) Offered spring. Same as EVST 371 and FOR 371. Explores current issues in wilderness preservation, management and research.

U 373 Wilderness and Civilization 3 cr. (R-6) Offered autumn and spring. Social and cultural perspectives on the wilderness idea and wildland practices. Course topics include history of wilderness and the wilderness movement, various philosophical viewpoints on wilderness, protected area management issues, and how wilderness fits into larger landscapes and societies.

UG 380S Environmental Conservation 3 cr. Offered autumn. Prereq., junior standing. The interrelationships of resource conservation problems and programs; management and conservation in the context of an expanding economy

U 385 Watershed Hydrology 3 cr. Offered autumn and spring. Same as FOR 385. An introduction to physical and biological controls over water movement and storage in the environment, and how those controls are affected by land management practices.

U 398 Internship Variable cr. Offered every term. Prereq., consent of department. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

UG 403 Contemporary Tribal Resource Issues 3 cr. Same as NAS 403. Acquaints students with contemporary tribal resource management and environmental policies.

UG 422 Natural Resources Policy and Administration 3 cr. Offered autumn and spring. Same as FOR 422. Policy formation in the United States and a survey of the major resource policies interpreted in their historical and political contexts.

U 423 Montana Wilderness Policy and Politics 2 cr. Examination of congressional legislative processes and congressional efforts concerning wilderness and roadless public lands management, particularly in Montana. Consideration of economic, social and political factors affecting how congress and the executive branch determine the fate of roadless lands.

UG 424 Community Forestry and Conservation 3 cr. Offered spring. Same as SOC 424 and FOR 424. A review of agroforestry, community forestry, and opportunities and constraints to the use of trees in rural development and protected areas management.

UG 449 Climate Change Ethics and Policy 3 cr. Offered Spring. Same as EVST 449 and CSS 449. This course focuses on the ethical dimensions of climate change policy. It will cover the following major topics: (1) climate change, personal and collective responsibilities, (2) ethics, climate change and scientific uncertainty, (3) distributive justice and international climate change negotiations, (4) intergenerational justice and climate change policy.

UG 455 Riparian Ecology and Management 3 cr. Offered spring. Same as FOR 455. Coreq. or prereq., FOR 385 and one introductory ecology course or consent of instr.. Importance of riparian/wetland areas and the complexities associated with their management for short and long term benefits.

UG 460 Range Inventory and Analysis 3 cr. Offered autumn. Same as FOR 460. Prereq., FOR 360 and one course in statistics. Methods of measuring range and shrub-land vegetation at individual and community level for determining plant composition, changes following treatments, and carrying capacity of range livestock and native ungulates.

UG 462 Range Ecology 3 cr. Offered spring. Same as FOR 462. Prereq., FOR/RSCN 360 and one course in plant ecology. Applied ecology of rangeland uses by various biota, synecological response to grazing, fire, herbicides, fertilizers and mechanical treatments, structural and functional responses of grassland systems to disturbance.

UG 463 Range Improvement 3 cr. Offered autumn. Same as FOR 463. Prereq., FOR/RSCN 360. Methods of improving rangelands, including grazing systems, control of weeds, controlled burning, seeding, fertilization and mechanical soil treatments.

UG 475 Sociology of Environment and Development 3 cr. Offered annually. Same as FOR 475. Examines key social forces that influence how individuals, groups and nation-states understand and live within their bio-physical environments, especially policies and processes relating to development, corporate capitalism, globalization, culture, class and other forms of power and social relations. Pays close attention to ways both indigenous and introduced resource use and management practices (including conservation) variably impact

people of different races, classes, genders, cultures and livelihood practices.

UG 485 Watershed Management 3 cr. Offered autumn. Same as FOR 485. Prereq., FOR/RSCN 385 or consent of instr. Effects of land management practices on water and sediment yields from wildland watersheds. Introduction to statistical methods in hydrology. Introduction to water yield and sediment modeling techniques.

G 565 Advanced Problems in Restoration Ecology 3 cr. Offered autumn. Same as FOR 565. Prereq., graduate standing and consent of instructor. This is a student-driven course that explores current topics in the theory and practice of restoration. Students will develop and implement a collaborative research project related to a current problem in restoration ecology or ecological restoration.

G 570 Political Ecology 3 cr. Same as FOR 570. Graduate seminar on key theories, issues and literature in the subfield of Political Ecology, an interdisciplinary environmental social science approach which integrates how political, economic, cultural and ecological processes interact and shape society nature relations. Case examples are drawn from both the North and South.

G 571 International Resource Management 1-3 cr. Yearlong course. Students register for one credit autumn semester and one credit spring semester. Final grade assigned at end of the year. Prereq., graduate standing and consent of instr. Critical review of selected international natural resource development, conservation and management approaches and experiences.

Wildlife Biology

- [Special Degree Requirements](#)
- [Requirements for a Minor](#)
- [Courses](#)

Daniel H. Pletscher, Professor, Wildlife Biology Director

Wildlife Biology is the study of wild animals, their habitats, and their conservation. The Bachelor of Science in Wildlife Biology degree constitutes the preprofessional training for future employment in wildlife biology and management, and provides an excellent background in general ecology. The educational requirements for certification by The Wildlife Society can be met within the framework of the undergraduate program.

While employment opportunities do exist in wildlife conservation for students with the baccalaureate degree, many students plan to continue their education through the master's degree to qualify for wildlife management or research positions.

Three optional curricula are offered in the Wildlife Biology Program: terrestrial, aquatic, and honors. All three options follow the same schedule of courses for the freshman and most of the sophomore year, then pursue different curricula for the last two years. Each leads to a B.S. in Wildlife Biology. The University is well-suited for instruction in wildlife biology because of the excellent opportunities for field instruction and research, and the presence of such facilities as the Lubrecht Experimental Forest, Yellow Bay Biological Station at Flathead Lake, the Montana Forest and Conservation Experiment Station, the Montana Cooperative Wildlife Research Unit, and the Theodore Roosevelt Memorial and Bandy ranches.

High School Preparation: In addition to general University admission requirements, the student should elect four years of mathematics and three years of science, including biology, chemistry and physics.

Special Degree Requirements

Refer to graduation requirements listed previously in the catalog. See index.

The Upper-division Writing Expectation must be met by successfully completing BIOL 341 and two courses selected from BIOL 304, 306, 316, 366, WBIO 408, 470, 497 (senior thesis).

The student must complete the requirements for one of the options indicated below. A reading knowledge of a modern foreign language is suggested for students electing preparation for graduate work leading to a doctorate.

To obtain the B.S. in Wildlife Biology, the student must have a 2.5 grade point average or higher in all courses taken at The University of Montana.

Suggested sequence subject to frequent change. Some courses are offered more than one semester/year.

Terrestrial and Aquatic Options

	First Year	Credits
BIOL 110N Principles of Biology		4
CHMY 121N (CHEM 151N) Introduction to General Chemistry		3
CHMY 123N (CHEM 152N) Introduction to Organic and Biochem		3
CHMY 124N (CHEM 154N) Introduction Organic & Biochem Laboratory		2
WRIT 101 (ENEX 101) College Writing I		3

WBIO 180 Careers in Natural Resources		2
M 162 (MATH 150) Applied Calculus		4
Electives and General Education		8-14
	Summer	Credits
Experiential Learning (For a list of options, see the Wildlife Biology Office.)		2

	Second Year	Credits
BIOL 221 Cell and Molecular Biology		4
BIOL 223 Genetics and Evolution		4
BIOL 350* Rocky Mountain Flora		3
COMM 111A Introduction to Public Speaking		3
STAT 216 (MATH 241) Statistics or WBIO 240 Introduction to Biostatistics		3-4
WRIT 222 (FOR 220) Technical Approach to Writing or WBIO 245 Science Writing or WRIT 201 (ENEX 200) College Writing II		2-3
Electives and General Education		11-15
*BIOL 350 is not required for the Aquatic option		

Terrestrial Option

Third Year	Credits
Two of the following:	
BIOL 304 Ornithology	4
BIOL 306 Mammalogy	4
BIOL 308 Biology and Management of Fishes	4
And one of the following	
FOR 347 Multiple Resource Silviculture	3
FOR 360 Range Management	3
And	
BIOL 340 Ecology	3
BIOL 341 Ecology Lab	2
WBIO 370 Wildlife Habitat Conservation	3
Electives and General Education	8-14

Fourth Year	Credits
WBIO 446 Wildlife Physiological Ecology	3
WBIO 470 Conservation of Wildlife Populations	3
WBIO 494 Senior Seminar	1
WBIO 480 The Upshot: Applied Wildlife Management	3
And one of the following	
WBIO 410 Wildlife Policy and Biopolitics	3
WBIO 475 Case Histories in Conservation Policy	3
FOR 422 Natural Resources Policy and Administration	3
Electives and General Education	16-22

Aquatic Option

Third Year	Credits
BIOL 308 Biology and Management of Fishes	4
BIOL 340 Ecology	3
BIOL 341 Ecology Lab	2
BIOL 366 Freshwater Ecology	5
BIOL 400-401 General Parasitology and Laboratory OR	
BIOL 406 Insect Behavior and Evolution OR	4
BIOL 410 Insect Biology	
WBIO 446 Wildlife Physiological Ecology	3
Electives and General Education	5-11
Fourth Year	
Credits	
WBIO 494 Senior Seminar	1

BIOL 316 Plant Form and Function	5
WBIO 408 Advanced Fisheries Science	3
FOR 385 Watershed Hydrology	3
WBIO 480 The Upshot: Applied Wildlife Management	3
And one of the following	
WBIO 410 Wildlife Policy and Biopolitics	3
FOR 422 Natural Resource Policy and Administration	3
WBIO 475 Case Histories in Conservation Policy	3
Electives and General Education	12-18

Wildlife Biology Honors Emphasis

The honors curriculum is designed particularly for students with strong academic records who intend to do graduate work. Entrance into this emphasis is open only to students who, at the beginning of the junior year of the wildlife biology program, have a grade-point average of 3.5 or above and who petition the faculty for entrance.

Honors students must complete either WBIO 370, 470 and 494 (terrestrial option) or BIOL 308, 366 and WBIO 494 (aquatic option). Honors students are encouraged to enroll also in WBIO 497 Senior Thesis. The balance of the coursework for the junior and senior years will be developed in consultation with the honors student's faculty advisor and committee appointed by the director of the wildlife biology program.

All students in the honors emphasis are required to meet with their faculty advisor prior to autumn semester registration of their junior and senior years to work out their course schedules.

Requirements for a Minor

To earn a minor in wildlife biology, the student must successfully complete the following coursework: BIOL 108N, 109N, 201N, 350; FOR 275; FOR 330 or 360; WBIO 105, 180.

Courses

U = for undergraduate credit only, UG = for undergraduate or graduate credit, G = for graduate credit. R after the credit indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Wildlife Biology (WBIO)

U 105N Wildlife and People 3 cr. Offered autumn. Intended for non-wildlife majors. Interactions of wildlife and people in today's society.

U 170 Fish Interest Group 1 cr. Offered autumn. Discussion section for incoming students who do not qualify for freshman interest group in Wildlife Biology.

U 171 Wildlife Interest Group 1 cr. Offered autumn. Discussion section for incoming students who do not qualify for freshman interest group in Wildlife Biology.

U 180 Careers in Natural Resources 2 cr. Offered autumn and spring. Same as FOR 180, RECM 180. Subject matter and fields of study within natural resources management. Topics include forestry, wildlife biology, range, water, recreation management, forest products production and other areas of opportunity for students seeking careers in natural resources.

U 195 Special Topics Variable cr. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 240 Introduction to Biostatistics (Honors) 3 cr. Offered autumn even-numbered years. Prereq., calculus and consent of instr. Same as BIOL 240. Introduction to statistical ecology: distributions, hypothesis testing, and fitting models to data with emphasis on problems in ecological sampling.

U 245 Science Writing 3 cr. Offered spring. Prereq., WRIT 101 (ENEX 101) or equiv. Discussion of different types of science writing and focus on methods to achieve more fluent prose. Includes material on logic, inference, and developing arguments that rely on data.

U 295 Special Topics Variable cr. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

UG 370 Wildlife Habitat Conservation and Management 3 cr. Offered autumn and spring. Prereq., junior standing in wildlife biology, an ecology class, or consent of instr. Application of principles of wildlife biology to conservation and management of wild bird and mammal habitats including field applications.

UG 373 Wildlife Techniques 2 cr. Offered spring. Prereq., any statistics course; one 300-level ecology or wildlife biology course. Lab and field oriented class in commonly-used wildlife research and management techniques.

U 374 Hunter Check Stations 1 cr. (R-2) Offered autumn. Students learn techniques for determining species, age and sex of game animals, then work 3-5 days as volunteers at hunter check stations operated by management agencies.

U 395 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 396 Independent Study 1-6 cr. (R-6) Offered every term.

U 398 Internship Variable cr. Offered every term. Prereq., consent of department. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

UG 408 Advanced Fisheries Science 3 cr. Offered spring. Prereq., WBIO/BIOL 308. Quantitative analysis and interpretation of fish populations and community data for use in management. Selection, application and evaluation of management techniques.

UG 410 Wildlife Policy and Biopolitics 3 cr. Offered autumn. Overview of the laws affecting wildlife and how those laws are initiated, implemented, and enforced; impact of politics, interest groups, and agency jurisdictions.

UG 441 Field Methods in Fishery Biology and Management 1-4 cr. Offered autumn and spring. Prereq., BIOL 308 or 357; consent of instr. Same as BIOL 415. Internship with practicing biologists to learn techniques for evaluating and managing aquatic habitats and fish populations.

UG 446 Wildlife Physiological Ecology 3 cr. Offered spring. Same as BIOL 446. Prereq., BIOL 221, 223 and 340. How physiological and biochemical processes in animals influence behavior and ecology. Application of physiological approaches to wildlife conservation such as assessment of animal health, nutritional condition, and physiological performance.

UG 460 International Wildlife Conservation Issues 2 cr. Offered spring. Prereq., a course in wildlife biology and/or conservation biology. Review of major international wildlife conservation issues with emphasis on the social context of the issues and applied solutions.

UG 470 Conservation of Wildlife Populations 3 cr. Offered autumn and spring. Prereq., 300-level animal ecology class and senior standing. Application of population ecology principles and theory to the conservation and management of wildlife populations.

UG 472 Wildlife Handling and Chemical Immobilization 2 cr. Offered spring. Field techniques associated with wildlife capture and handling. Ethical and legal issues, field organization, animal care and handling, chemical immobilization, veterinary emergencies and human safety.

UG 475 Case Histories in Conservation Policy 3 cr. Offered spring. Prereq., senior or graduate standing in conservation major or consent of instr. Understanding development and primary aspects of conservation policy. Exercises in policy analysis as individuals and in team efforts.

UG 480 The Upshot: Applied Wildlife Management 3 cr. Offered spring. Designed for students to apply their knowledge in the development of wildlife management planning.

UG 494 Senior Wildlife Seminar 1 cr. Offered autumn and spring. Prereq., senior standing in wildlife biology or consent of instr. Analysis and discussion led by students of current topics in wildlife biology.

UG 495 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, new courses, or one-time offerings of current topics.

U 496 Independent Study Variable cr. (R-10) Offered every term. Prereq., consent of instr. Original investigations or problems not related to student's thesis.

U 497 Senior Thesis 1-3 cr. (R-6) Offered autumn and spring. Prereq., consent of instr.; senior standing. Preparation of major paper based on study or research of a topic selected with an advisor according to needs and objectives of student.

U 498 Internship 1-6 cr. Offered every term. Prereq., consent of department. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

G 540 Research Design 3 cr. Offered spring odd-numbered years. Prereq., introductory statistics course or consent of instr. Examination of study designs for experiments, quasiexperiments, observational studies, and sampling surveys with an emphasis on application.

G 542 Current Issues in Biometrics 1 cr. (R-3) Offered every term. Prereq., introductory statistics course or consent of instr. Exploration of current topics in biometrics through discussions, student presentations, and analysis.

G 560 Wildlife Landscape Ecology 3 cr. Offered spring. Examination of how various spatial and temporal scales influence wildlife and their habitats.

G 562 Wildlife Habitat Modeling 3 cr. Offered autumn, odd years. Prereq., consent of instr. A survey of theory and applications in the study of resource selection by animals.

G 570 Applied Population Ecology 3 cr. Offered spring even-numbered years. Prereq., courses in ecology, statistics, and calculus. Application of advanced population ecology tools and concepts to the evaluation of human perturbations on wildlife populations. Topics include methods to detect declining trends, the interacting components of population viability analysis, and identification of strategies to reverse declines.

G 572 Model Selection and Inference 3 cr. Offered autumn odd-numbered years. Prereq., one semester of 400-level statistics/biometry or consent of instr. Comparison and overview of statistical approaches commonly used in applied ecology, including frequentist/ANOVA models, information theoretic and Bayesian methods.

G 575 Frontiers in Conservation Research 2 cr. (R-6) Offered autumn. Prereq., upper-level course in conservation genetics or populations genetics. Same as BIOL 575. Exploration of current topics in conservation biology with emphasis on genetic issues in conservation.

G 576 Ecological Modeling and Analysis 2-3 cr. Offered every term. Prereq., consent of instr. Investigation of mathematical and statistical problems in ecology and wildlife biology. Specific material each semester is determined by student interest.

G 580 Readings in Population Dynamics 1 cr. (R-6) Offered autumn and spring. Prereq., consent of instr. Discussion of recent papers on interface of population dynamics, ecological interactions, and wildlife management.

G 594 Graduate Seminar in Wildlife Biology 1 cr. (R-3) Offered autumn and spring. Prereq., graduate standing in wildlife biology or consent of instr. Analysis of selected problems in wildlife biology and conservation.

G 595 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

G 596 Independent Study Variable cr. (R-10) Offered every term. Prereq., graduate standing and consent of instr. Original investigations or problems not related to student's thesis.

G 597 Research Variable cr. Offered every term. Prereq., graduate standing in wildlife biology or consent of instr. Graded pass/not pass only.

G 599 Professional Paper Variable cr. (R-6) Offered every term. Prereq., graduate standing in wildlife biology and consent of instr. Professional paper written in the area of the student's major interest based on either primary or secondary research. Subject matter must be approved by graduate committee. Graded pass/not pass only.

G 697 Research 1-15 cr. (R-15) Offered every term.

G 699 Thesis Variable cr. (R-10) Offered every term. Prereq., graduate standing in wildlife biology. Preparation of thesis.

Wilderness Studies

Laurie Yung (Assistant Professor) Director of Wilderness Institute

Students who successfully complete the requirements of the Wilderness and Civilization Program are eligible for the Wilderness Studies minor. Wilderness and Civilization is an interdisciplinary campus and field-based program. Each year, 25 students investigate wildland conservation and the human-nature relationship through the lenses of policy, ecology, art, Native American Studies, and literature. Wilderness and Civilization combines the strengths of classroom and field learning, interactive classes, innovative faculty, and applied learning through internships. Field trips include extended backcountry trips as well as shorter field trips examining ecology, environmental issues, land use, and natural history. Wilderness and Civilization offers students the opportunity to explore contemporary conservation debates, make connections between disciplines, and learn how to work for positive change.

Wilderness and Civilization is an undergraduate, immersion program geared toward sophomore-, junior-, and senior-level students in any major. Students take a 16-17.0 credits of campus and field-based courses during the fall, and then continue in the spring with an art course, an internship, a 1.0 credit field course, and a 1.0 credit lecture series. The Wilderness and Civilization program is administered by the Wilderness Institute of the College of Forestry and Conservation. The program is offered in collaboration with the College of Arts and Sciences, the School of Fine Arts, and the Davidson Honors College.

Students must apply for admission to the Wilderness and Civilization program, which is limited to 25 students each year. Applicants must have a cumulative GPA of 3.0 or higher for all college and university work. Applications are due by April 1 and are available at the Wilderness Institute, University Hall 303.

Requirements for a Minor in Wilderness Studies

To earn a minor in wilderness studies the student must successfully complete the Wilderness and Civilization program and the course requirements below (23-24.0 credits).

Course # and Description	Credits
RSCN 373 Wilderness and Civilization	3
LIT 373 (ENLT 371) Literature and the Environment/Honors	3
RSCN 271N Wilderness Ecology/Honors	3
NAS 303E Ecological Perspectives of Native Americans	3
ART 324A Environmental Drawing Seminar	3
RSCN 273 Wilderness and Civilization Field Studies	3
RSCN 398 Internship: Wildlands Community Project	2
RECM 371 Wilderness Lecture Series and RSCN 370S Wildland Conservation Policy and Governance or RSCN 423 Montana Wilderness Policy and Politics	3
Total	23-24

Requirements for minors in Wildland Restoration and Wildlife Biology are listed within their majors section of the catalog.

Faculty

Professors

Donald J. Bedunah, Ph.D., Texas Tech University, 1982

Jill M. Belsky, Ph.D., Cornell University, 1991

William T. Borrie, Ph.D., Virginia Polytechnic Institute and State University, 1995

Perry J. Brown, Ph.D., Utah State University, 1971 (Dean)

James A. Burchfield, Ph.D., University of Michigan, 1991 (Associate Dean)

Edwin J. Burke, Ph.D., Colorado State University, 1978

Thomas H. DeLuca, Ph.D., Iowa State University, 1993

Carl Fiedler, Ph.D., University of Minnesota, 1990 (Research)

Wayne A. Freimund, Ph.D., University of Minnesota, 1993 (Chair of Society and Conservation)

Paul Krausman, Ph.D., University of California-Santa Cruz, 1993

L. Scott Mills, Ph.D., University of California, Santa Cruz, 1993

Norma Nickerson, Ph.D., University of Utah, 1989 (Research)

Daniel H. Pletscher, Ph.D., Yale University, 1982 (Director, Wildlife Biology Program)

Donald F. Potts, Ph.D., State University of New York, 1979

Lloyd Queen, Ph.D., University of Nebraska, Lincoln, 1988

Steven W. Running, Ph.D., Colorado State University, 1979

Stephen F. Siebert, Ph.D., Cornell University, 1990

Diana Six, Ph.D., University of California, Riverside, 1997

Ronald H. Wakimoto, Ph.D., University of California, 1978
(Chair of Society and Conservation)

Scott Woods, Ph.D., Colorado State University, 2001

Associate Professors

Donald J. Bedunah, Ph.D., Texas Tech University, 1982

Jill M. Belsky, Ph.D., Cornell University, 1991

William T. Borrie, Ph.D., Virginia Polytechnic Institute and
State University, 1995

Perry J. Brown, Ph.D., Utah State University, 1971 (Dean)

James A. Burchfield, Ph.D., University of Michigan, 1991
(Associate Dean)

Edwin J. Burke, Ph.D., Colorado State University, 1978

Thomas H. DeLuca, Ph.D., Iowa State University, 1993

Carl Fiedler, Ph.D., University of Minnesota, 1990 (Research)

Wayne A. Freimund, Ph.D., University of Minnesota, 1993
(Chair of Society and Conservation)

Paul Krausman, Ph.D., University of California-Santa Cruz,
1993

L. Scott Mills, Ph.D., University of California, Santa Cruz,
1993

Norma Nickerson, Ph.D., University of Utah, 1989 (Research)

Daniel H. Pletscher, Ph.D., Yale University, 1982 (Director, Wildlife Biology Program)

Donald F. Potts, Ph.D., State University of New York, 1979

LLoyd Queen, Ph.D., University of Nebraska, Lincoln, 1988

Steven W. Running, Ph.D., Colorado State University, 1979

Stephen F. Siebert, Ph.D., Cornell University, 1990

Diana Six, Ph.D., University of California, Riverside, 1997

Ronald H. Wakimoto, Ph.D., University of California, 1978
(Chair of Society and Conservation)

Scott Woods, Ph.D., Colorado State University, 2001

Assistant Professors

David Affleck, Ph.D., Yale University, 2006

Keith Bosak, Ph.D., University of Georgia (Athens), 2006

Woodam Chung, Ph.D., Oregon State University, 2002

Cory Cleveland, Ph.D., University of Colorado-Boulder, 2001

Solomon Dobrowski, Ph.D., University of California (Davis),
2005

Elizabeth D. Dodson, Ph.D., Oregon State University, 2004

Mark Hebblewhite, Ph.D., University of Alberta, 2006

Cara Nelson, Ph.D., University of Washington, 2004

Carl Seielstad, Ph.D., University of Montana, 2003

Tyron Venn, Ph.D., University of Queensland, 2004

Laurie Yung, Ph.D., University of Montana, 2003

Adjunct Faculty

Research Professors

Carol Brewer, Ph.D., University of Wyoming, 1993

Thomas DeLuca, Ph.D., Iowa State University, 1993

Michael Mitchell, Ph.D., North Carolina State University, 1995

Anna Sala, Ph.D., University of Barcelona, 1992

Research Associate Professors

Rich Harris, Ph.D., University of Montana, 1993

John Kimble, Ph.D., Oregon State University, 1995

Peter Kolb, Ph.D., University of Idaho, 1996

Christopher Sevheen, Ph.D., University of Montana, 1981

Research Assistant Professors

James Riddering, Ph.D., University of Montana, 2004

Kathy Tonnessen, Ph.D., University of California-Berkley, 1982

Emeritus Professors

David H. Jackson, Ph.D., University of Washington, 1975

Alan McQuillan, Ph.D., University of Montana, 1981

Stephen F. McCool, Ph.D., University of Minnesota, 1970

Thomas J. Nimlos, Ph.D., University of Wisconsin, 1959

Robert D. Pfister, Ph.D., Washington State University, 1972

Robert R. Ream, Ph.D., University of Wisconsin, 1963

Robert W. Steele, Ph.D., Colorado State University, 1975

Jack Ward Thomas, Ph.D., University of Massachusetts, 1972

Hans R. Zuuring, Ph.D., Iowa State University, 1975 (Chair of Forest Management)

Wildland Restoration

Bachelor of Science in Wildland Restoration

In addition to special degree requirements listed previously, the students selecting the Bachelor of Science in Wildland Restoration must complete the following required courses or their equivalent, if transferred from another college or university. Transference and equivalency will be determined by the University and College of Forestry and Conservation. Electives may be taken at any time, keeping in mind these

requirements as well as the University's General Education requirements for graduation.

Wildland Restoration (Aquatic Option)

First Year	Credits
WRIT 101 (ENEX 101) Composition	3
BIOL 110 Principles of Biology	4
GEO 101/102 (GEOS 100N/101N) General Geology/Lab	3
COMM 111A Intro to Public Speaking	3
CHMY 121N (CHEM 151N) Introduction to General Chemistry	3
CHMY 123 (CHEM 152N) Introduction to Organic and Biological Chemistry	3
M 171 (MATH 152) Calculus I	4
FOR/RECM/WBIO 180 Careers in Natural Resources	2
FOR 200 Natural Resources Measurements Camp	2
Electives and General Education	3

Second Year	Credits
M 172 (MATH 153) Calculus II	4
FOR 201 Forest Biometrics or WBIO 240 Intro to Biostatistics or STAT 216 (MATH 241) Statistics	3
FOR 265 Elements of Ecological Restoration	3
WRIT 222 (FOR 220) Technical Approaches to Writing	2
PHYS 121N Fundamentals of Physics with Calculus or PHYS 221N Fundamentals of Physics	5
BIOL 221 Cell and Molecular Biology	4
BIOL 223 Genetics and Evolution	4
Electives and General Education	5

Third and Fourth Year	Credits
FOR 385 Watershed Hydrology	3
BIOL 366 Freshwater Ecology	5
FOR 365 Foundation of Restoration Ecology	3
FOR 445 Ecological Restoration Practicum	3-6
FOR 422 Natural Resource Policy & Administration	3
FOR 444 Integrative Ecology Restoration	3
FOR 494 Seminar in Ecological Restoration I	3

Rest/Aquatic Electives - At least nine credits must be completed from the following: Credits

BIOL 308 Biology and Management of Fishes	4
FOR 455 Riparian Ecology and Management	3
FOR 485 Watershed Management	3
GEOS 460 Process Geomorphology	4
GEOS 431 Environmental Geochemistry	3
FOR 250 GIS Practicum	2
FOR 210N Soils	3
GEO 250 River Systems	3
GEO 420 Hydrogeology	3

Rest/Aquatic Electives - At least nine credits must be completed from the following: Credits

ECNS 433 Environmental Economics	3
FOR 320 Forest Environmental Economics	3
FOR 379 Collaboration in Natural Resource Decisions	3
FOR 475 Sociology of Environment and Development	3
FOR/RSCN 449 Climate Change Ethics and Policy	3

Wild Land Restoration (Terrestrial Option)

First Year	Credits
WRIT 101 (ENEX 101) Composition	3
BIOL 110 Principles of Biology	4
BIOL 120 General Botany	3
COMM 111A Intro to Public Speaking	3
CHMY 121N (CHEM 151N) Introduction to General and Inorganic Chemistry	3