

Natural Resources OPM Qualification Standards

All Information gathered from www.opm.gov under the Natural Resources Management and Biological Sciences Group, 0400. This is intended to be a reference guide for Natural Resource Management, Rangeland Ecology and Forestry students in the Department of Forest and Rangeland Stewardship at Colorado State University.

What are qualification standards?

Qualification Standards are a description of the minimum requirements necessary to perform work of a particular occupation successfully and safely. These minimum requirements may include specific job-related work experience, education, medical or physical standards, training, security, and/or licensure. They are not designed to rank candidates, identify the best qualified for a particular position, or substitute for an analysis of an applicant's knowledge, skills, and abilities/competencies.

Table of Content

OPM Standard	Number	Page
General Natural Resources Management and Biological Sciences	0401	.....1
Ecologist	0408	.....2
Zoology	0410	.....2
Botany	0430	.....3
Plant Pathology	0434	.....4
Plant Physiology	0435	.....4
Rangeland Management	0454	.....4
Soil Conservation	0457	.....6
Forestry	0460	.....7
Soil Science	0470	.....8
Fish and Wildlife Administration	0480	.....9
Fish Biology	0482	.....10
Wildlife Refuge Management	0485	.....11
Wildlife Biology	0486	.....12

General Natural Resources Management and Biological Science, 0401

This series covers positions that manage, supervise, lead, or perform professional research, or scientific work in biology, agriculture, or natural resources management that is not classifiable to another more specific professional series in the Natural Resources Management and Biological Sciences Group, 0400.

Occupational Information

This is a general series for the 0400 job family. Work within this series involves professional work in more than one series, or in the 0400 group not covered by a specific series.

Basic Requirements

1. **Degree:** biological sciences, agriculture, natural resource management, chemistry, or related disciplines appropriate to the position.

or

2. **Combination of education and experience:** Courses equivalent to a major, as shown in A above, plus appropriate experience or additional education.

Ecologist, 0408

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work involving the study of the relationships of organisms with each other, with their physical and chemical environments, and with society.

Occupational Information

Ecologists may study the distribution and density of organisms that live in ecosystems. Studying changes in the distribution and density before and after specific human activities enables ecologists to model the ecosystem impacts of human activities. Factors in ecology studies include:

- quantitative attributes of population, such as population density, birth rate, spatial distribution, age structure, and resource demands;
- the structure and interactions of populations of species in a community;
- environment factors, such as tide pools, salt marshes, grasslands, deciduous forests, rangelands, deserts, vernal pools, and fens, and the interactions between them;
- pesticide testing and control;
- energy sources; and
- air and water quality and flows in urban areas.

Ecologists provide advice on matters, such as:

- the effect of construction and land manipulation on wetlands, forests, rangelands, estuaries, riparian communities, and aquatic communities;
- implementing legal standards and other requirements in the most ecologically sound manner;
- compliance with natural resources management policies and practices; and
- adjusting forest management procedures and range grazing practices to promote productivity and re-growth

Basic Requirements

Degree: biology, or a related field of science underlying ecological research that included at least 30 semester hours in basic and applied biological sciences. These hours must have included at least 9 semester hours in ecology, and 12 semester hours in physical and mathematical sciences.

Zoology, 0410

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work involving animal classification, structure, behavior, ecology, parasitological phenomena, evolution, and life history.

Occupational Information

Zoology involves studying or applying knowledge of animal life. Studies may involve the biology, life cycles, and habits of animals and the interactions of animals, plants, and parasites. Zoologists may work in the field and or in a laboratory. In the field, they observe the environment in which a species or group of species lives and they may acquire specimens. In the laboratory, zoologists may study, preserve, and dissect specimens, or study various aspects of animal and plant parasites. Work frequently requires a thorough knowledge of the biology of the plant or animal host and intermediate hosts. For example, before zoologists can resolve a problem of parasitology, they first develop a method of reproducing intermediate hosts in quantity in the laboratory.

Basic Requirements

1. **Degree:** zoology; or a related discipline or field of science that included at least 20 semester hours in zoology and related animal sciences.

or

2. **Combination of education and experience:** courses equivalent to a major in zoology, or in a related discipline that included course work as shown in A above, plus appropriate experience or additional education.

Botany, 0430

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work that involves the study of plant life. Work involves studying plant taxonomy, morphology, ecology, and ethnobotany.

Occupational Information

Botany work ranges from studying the composition and arrangement of the structure of the deoxyribonucleic acid (DNA) molecule in the nucleus of a plant cell, to investigating and analyzing complex ecosystems and their effect on humans and the environment. Work includes studying the:

- chemical and physical natures of the materials and processes of plant cells;
- organization of cells into tissues and tissues into organs;
- history of plant life;
- relationship of plants to all phases of their environment; and
- industrial and agricultural applications of plants.

Traditionally, botany is divided into two main specialties:

- Plant Taxonomy – classifying members of the plant kingdom by name and description, and arranging them according to their natural relationships into species, genera, families, and orders; and
- Plant Morphology – describing the form and structure of plants and tracing underlying similarities in form among various plant groups.

Plant morphology includes the study of:

- Anatomy – internal structures;
- Cytology – cell structures;
- Embryology – individual development; and
- Morphogenesis – the factors determining form and structure.

Two other common botany specialties are plant ecology and plant geography. Plant ecology is concerned with the relationship between plants and environment, and structural and functional modifications resulting from changes in the environment. Plant geography is concerned with the geographical distribution of plants and the factors that determine this distribution.

Basic Requirements

1. **Degree:** botany; or basic plant science that included at least 24 semester hours in botany.

or

2. **Combination of education and experience:** courses equivalent to a major in botany or basic plant science that included at least 24 semester hours in botany, as shown in A above, plus appropriate experience or additional education.

For positions dealing with the study of fungi, or with basic mycological relationships, the course work in botany must have included at least 6 semester hours in mycology.

Plant Pathology, 0434

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work that involves the study, cause, nature, prevalence, severity, and control of plant diseases.

Occupational Information

Plant pathology work involves:

- investigating the cause, nature, prevalence, and severity of parasitic, nonparasitic, and viral diseases attacking plants;
- conducting experiments in, and establishing methods for, preventing and controlling plant diseases; or
- studying relationships of plant diseases to practices involved in propagating, planting, cultivating, transporting, and storing plants and plant products.

Basic Requirements

Degree: plant pathology; or a related scientific discipline that included at least 20 semester hours in basic botany or plant science, and 10 semester hours in plant pathology.

Evaluation of Education: courses in botany, plant physiology, plant taxonomy, plant pathology, agronomy, forestry, horticulture, or similar subjects may be used to meet the 20-semester-hour requirement in basic botany or plant science. To meet the specific 10-semester-hour requirement in plant pathology, the courses must have been in plant pathology, or have dealt with specific subject matter areas of plant pathology such as those concerned with viruses, fungal or bacterial diseases, host-plant relationships, biotic or chemical controls, environmental or physiological diseases, parasitic diseases, etc.

Plant Physiology, 0435

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work that involves the study of plant growth, nutrition, respiration, and reproduction.

Occupational Information

Plant physiology work involves studying the internal plant functions and processes, such as assimilation, photosynthesis, translocation, or transpiration and the influence of environmental factors, such as humidity, water, light, mineral nutrients, and temperature on these functions and processes.

Basic Requirements

Degree: botany or plant physiology; or a related scientific discipline that included at least 10 semester hours in plant physiology.

Evaluation of Education: The 10-semester-hour requirement in plant physiology is specific. Course work is qualifying if it dealt with plant physiology, some phase of plant physiology, or methods and techniques applied in plant physiology work. Other course work in borderline areas should be evaluated on the basis of content.

Rangeland Management, 0454

This series covers positions that manage, supervise, lead, or perform professional or scientific work that involves conserving, developing, and managing rangelands. Rangelands are public or private lands on which the native plants are predominantly grasses, grass-like plants, herbs, or shrubs.

Occupational Information

Rangeland management involves analyzing and protecting natural resources, developing programs and standards for rangeland use and preservation, and advising officials and landowners on rangeland management practices. Rangelands include grasslands, savannas, shrub lands, riparian properties, pastures, hay lands, deserts, tundra, alpine communities, coastal marshes, and wet meadows.

Rangeland management has a large ecological component. Rangeland management specialists provide technical recommendations on managing public and private rangelands for ecological improvement consistent with objectives set forth in land use planning documents. They manage rangelands and their various resources to meet the present and future needs of the public. Resources include vegetation, soil, water, timber, minerals, wildlife habitats, historic and prehistoric resources, wilderness, scenery, open space, and a rural way of life. Use of rangelands include:

- livestock grazing, wildlife habitat, recreation, water, timber production, and mineral development;
- producing forage for domestic and wild grazing animals, including wild horses and burros;
- protecting threatened and endangered plant and wildlife species; and
- various recreational activities.

Rangeland management specialists prepare both short- and long-range land use plans in consultation with Federal and non-Federal agencies and the public. The plans provide an in-depth analysis of the environmental, economic, and social effects of each proposed alternative action. Plans are subject to detailed scrutiny by Federal agencies and various public interests, including diverse interest groups that often have diametrically opposed goals and objectives. Other rangeland management specialist responsibilities include:

- developing conservation plans, designing technical surveys, and supervising construction;
- developing contractual agreements between agencies and private landowners and/or contractors;
- submitting reports to Congress;
- protecting cultural resources; and
- working with Federal, state, and local conservation agencies.

To carry out their responsibilities, rangeland management specialists apply knowledge of sciences, such as plant, animal, and soil sciences; watershed, habitat, and wildlife management; ecology; animal husbandry; economics; hydrology; agronomy; soil conservation and management; livestock management; recreation management; and forestry.

Basic Requirements

1. **Degree:** range management; or a related discipline that included at least 42 semester hours in a combination of the plant, animal, and soil sciences, and natural resources management, as follows:
 - *Range Management* -- At least 18 semester hours of course work in range management, including courses in such areas as basic principles of range management, range plants, range ecology, range inventories and studies, range improvements, and ranch or rangeland planning.
 - *Directly Related Plant, Animal, and Soil Sciences* -- At least 15 semester hours of directly related courses in the plant, animal, and soil sciences, including at least one course in each of these three scientific areas, i.e., plant, animal, and soil sciences. Courses in such areas as plant taxonomy, plant physiology, plant ecology, animal nutrition, livestock production, and soil morphology or soil classification are acceptable.
 - *Related Resource Management Studies* -- At least 9 semester hours of course work in related resource management subjects, including courses in such areas as wildlife management, watershed management, natural resource or agricultural economics, forestry, agronomy, forages, and outdoor recreation management.

or

2. **Combination of education and experience:** at least 42 semester hours of course work in the combination of plant, animal, and soil sciences and natural resources management shown in A above, plus appropriate experience or additional education.

Soil Conservation, 0457

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work involving conserving soil, water, and related environmental resources to achieve sound land use.

Occupational Information

Soil and water conservation depend on a harmonious relationship between soil, water, plant, and animal resources. Soil conservation work involves:

- advising landowners about planned treatment of their property and how treatment can preserve, improve, and protect soil capabilities;
 - providing assistance to land users through a conservation or water oversight district:
 - planning terraces, ponds, and earthen dams;
 - selecting cropping methods to reduce erosion;
 - designing windbreaks for center pivot irrigation;
 - developing pasture and hay land conservation plans;
 - identifying flood plains and aquifers for local government units;
 - developing conservation measures to reduce pollutants reaching waterways;
 - persuading landowners to adopt conservation tillage cultivation methods that reduce soil loss, due to wind erosion and reduce energy costs; and
 - assisting landowners in managing habitats for a variety of wildlife including game, waterfowl, and fish, which also leads to conserving soil and enhancing water quality.
-
- Many soil conservationists directly advise and assist conservation organizations, private land owners, and conservation district members as they deliberate, discuss, plan, and carry out soil and water conservation policies, programs, and local activities.

Basic Requirements

1. **Degree:** soil conservation or related agricultural or natural resource discipline such as agronomy, soil science, forestry, agricultural education, or agricultural engineering. The study must have included 30 semester hours in a natural resource or agricultural field, including at least 12 semester hours in a combination of soils and crops or plant science. Of the 12 semester hours, a minimum of 3 semester hours must have been in soils and 3 semester hours in crops or plant science.

or

2. **Combination of education and experience:** at least 30 semester hours in one or more of the disciplines as shown in A above, including at least 12 semester hours in a combination of soils and crops or plant science, plus appropriate experience or additional education. Of the 12 semester hours, a minimum of 3 semester hours must have been in soils and 3 semester hours in crops or plant science.

Evaluation of Education: Education that provided specialized knowledge and skills in soil and water conservation is more valuable than education that imparted broad but general knowledge and skills. Courses in soil fertility, soil chemistry, soil genesis, plant physiology, plant science, and field crops are examples of specialized courses that contribute towards meeting the required 12 semester hours as described above. Courses in the physical sciences or engineering such as geology, civil engineering, and hydrology also meet the soils, crops, or plant science course requirements where such courses included a complete introduction to the physical, chemical, and biological properties of soils.

Evaluation of Experience: Experience that included the application of techniques, principles, and methods from a variety of agricultural and natural resource fields is appropriate, given the interdisciplinary character of the soil conservation occupation. For example, experience gained in a specialized field such as soil science, forestry, or agronomy is as fully acceptable as experience directly obtained in soil conservation work

Forestry, 0460

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work involving developing, producing, conserving, and utilizing the natural resources of forests and associated lands.

Occupational Information

Forestry involves managing forestlands and grazing areas, timber production, soil conservation, preservation of wildlife habitats, watershed protection, and development of recreational opportunities. Foresters oversee, develop, and protect Federally-owned or managed forests and associated lands, including national forests, Indian reservations, military installations, and public domain lands. Work involves:

- inventorying, planning, evaluating, and managing forest resources, including timber, soil, land, water, wildlife and fish habitats, minerals, forage, and outdoor recreation;
- protecting resources against fire, insects, disease, floods, and erosion;
- evaluating, managing, and protecting forest lands and properties;
- interpreting and communicating legislation about forest land management;
- applying principles of sustained yield management to forest resources, wetlands, water and soil quality, and wildlife conservation, to protect forested lands during timber harvesting operations; and
- developing new, improved, or more economic scientific methods, practices, or techniques necessary to perform such work.

Foresters also are concerned with:

- cooperating with and providing technical assistance to states, individual landowners, Indian tribal governing bodies, and organized groups;
- conducting basic and applied research on managing timber, forest watersheds, and other related resources;
- appraising forest lands, properties, and resources for acquisition, taxation, sale, exchange, or other purposes, including determining depreciation and depletion rates of forest resources;
- evaluating policy issues and environmental regulations that affect many forestry-related activities; and
- recommending policies and programs to keep the nation's forest lands, both public and private, fully productive for the purposes intended under enabling legislation

Basic Requirements

1. **Degree:** forestry; or a related subject-matter field that included a total of at least 30 semester hours in any combination of biological, physical, or mathematical sciences or engineering, of which at least 24 semester hours of course work were in forestry. The curriculum must have been sufficiently diversified to include courses in each of the following areas:
 - *Management of Renewable Resources* -- study of the science and art of managing renewable resources to attain desired results. Examples of creditable courses in this area include silviculture, forest management operations, timber management, wildland fire science or fire management, utilization of forest resources, forest regulation, recreational land management, watershed management, and wildlife or range habitat management.
 - *Forest Biology* -- study of the classification, distribution, characteristics, and identification of forest vegetation, and the interrelationships of living organisms to the forest environment. Examples of creditable courses in this area include dendrology, forest

ecology, silvics, forest genetics, wood structure and properties, forest soils, forest entomology, and forest pathology.

- *Forest Resource Measurements and Inventory* -- sampling, inventory, measurement, and analysis techniques as applied to a variety of forest resources. Examples of creditable courses include forest biometrics, forest mensuration, forest valuation, statistical analysis of forest resource data, renewable natural resources inventories and analysis, and photogrammetry or remote sensing.

or

2. **Combination of education and experience:** courses equivalent to a major in forestry, or at least 30 semester hours in any combination of biological, physical, or mathematical sciences or engineering, of which at least 24 semester hours were in forestry. The requirements for diversification of the 24 semester hours in forestry are the same as shown in A above, plus appropriate experience or additional education.

Applicants for *Forester (Administration)* or *Research Forester (Administration)* must have completed either the requirements described in A or B above; or the minimum educational requirements established for other forestry-related professional disciplines, e.g., Range Conservationist, GS-454; Soil Scientist, GS-470; Wildlife Biologist, GS-486; Geologist, GS-1350; Landscape Architect, GS-807; Hydrologist, GS-1315; or the full 4-year college requirements described for All Professional Engineering Positions, GS-800, *provided* that the basic professional training was supplemented by a sufficient amount of professional experience gained in a forestry work situation. The supplemental experience must have been gained in a work situation where the program or project required the joint application of full professional knowledge of forestry and the related professions in the solving of highly technical and complex problems; where the work was largely concerned with the planning, developmental, and administrative phases of multiple-use, forest land management programs; or with the carrying out of related research or special projects of a similar nature.

Soil Science, 0470

This series covers positions that manage, supervise, lead or perform professional, research, or scientific work that involves investigating soils, managing soil, adapting soils for alternative uses, and soil genesis, preservation, geography, classification, and morphology

Occupational Information

Soil science involves improving soil use, productivity, and management, and selecting soils for various uses. The science realizes these objectives by studying how geological, biological, hydrological, climatological, and physical science factors:

- interact to govern the uses to which the soil can be put;
- modify and change the soil and its stability or capability; and
- cause changes in soil characteristics.

Soil scientists apply the principles of sciences, such as physics, chemistry, biology, geology, climatology, mathematics, and physiography, and the concepts, principles, and techniques of soil science to do their work. They study the chemical, physical, biological, and mineralogical properties and processes of soils and their relationships to climatic, physiographic, and biologic influences as they relate to plant or crop growth. Also, they study responses of various soil types to fertilizers, tillage practices, and crop rotation to ensure environmental quality and effective land use.

Soil scientists research, map, classify, and advise on soil productivity, quality, and suitability for use in public and private management, planning, and land use activities. They may also prepare, update, and deliver digital soil survey products; perform on-site detailed soil engineering tabulations; maintain soil information and interpretations; and perform detailed soil sampling for laboratory analysis and characterization.

Soil scientists provide soil and rangeland management specialists, agronomists, geologists, foresters, and others with specialized information on soils and guidelines. They may consult with technical personnel working on construction projects to inform them about the effects of, and solutions to, soil problems. In addition, they work with the public, and with state and local government users of the soil information, such as community planners and tax assessors. Some soil scientists may specialize in one or both of the following functional areas based on the needs of the employing agency:

- the National Cooperative Soil Survey, which classifies and maps soils based on studying and measuring their significant characteristics, and explains the implications of soil data for farming, engineering, ranching, natural resources management, and other purposes; and/or
- special purpose investigations of specific soil problems, planning for a specific soil use, or developing new soil management practices for particular soils in a problem area.

Basic Requirements

1. **Degree:** soil science or a closely related discipline that included 30 semester hours or equivalent in biological, physical, or earth science, with a minimum of 15 semester hours in such subjects as soil genesis, pedology, soil chemistry, soil physics, and soil fertility.

or

2. **Combination of education and experience:** courses equivalent to a major in soil science or a related discipline that included at least 30 semester hours in the biological, physical, or earth sciences. At least 15 of these semester hours must have been in the areas specified in A above, plus appropriate experience or additional education.

Fish and Wildlife Administration, 0480

This series covers positions that supervise, lead, or perform professional or scientific work that involves administering, directing, or exercising technical control over programs, regulatory activities, projects, and/or operations of fishery resources, fish and wildlife resources, and/or their habitats.

Occupational Information

Work involves conserving, enhancing, and protecting fish, wildlife, and plants, and their habitats.

Responsibilities include advocacy and leadership in administering and managing fish and wildlife resources as required by legislation. Work involves activities, such as:

- directing and/or formulating policies, plans, standards, and procedures for comprehensive fish and wildlife conservation and restoration programs;
- coordinating grants-in-aid for fish and wildlife programs;
- establishing, maintaining, and nurturing relationships with non-agency partners, such as state agencies, conservation organizations, other Federal agencies, and fishing, hunting, boating industries;
- negotiating with state fish and wildlife officials on activities allowable under Federal natural resources programs;
- providing expertise to assure compliance with laws, regulations, policies, and Executive orders applicable to natural resources programs and activities;
- interpreting and implementing legislation and legal decisions impacting natural resources practices and programs;
- advising agency officials on complex scientific, political, and economic natural resources issues; and
- auditing Federal grant programs to determine continuing fund eligibility.

Basic Requirements

- A. **Degree:** Biological sciences, agriculture, natural resource management, chemistry, or related disciplines appropriate to the position.

or

- B. **Combination of education and experience:** Courses equivalent to a major, or at least 30 semester hours in courses, as shown in A above, plus appropriate experience or additional education.

or

- C. **Experience:** Four years of experience that demonstrated that the applicant acquired knowledge and understanding of one or more of the biological sciences, agriculture, natural resource management, or related disciplines equivalent to that which would have been acquired through completion of a 4-year course of study as described in A above.

Fish Biology, 0482

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work that involves preserving, conserving, propagating, and managing fish and other aquatic species populations and their habitats for ecological purposes and to benefit the public.

Occupational Information

Fish biology involves work ranging from directly managing fish resources to studying and analyzing fish life history, behavior, habitat requirements, classification, and economic implications. Managing fish resources involves:

- assessing and mitigating environmental and human impacts on the survival and growth of aquatic species and their habitats;
- operating physical plants, including sophisticated systems and equipment;
- analyzing and planning physical facilities and methods to regulate resources for secure sustained optimum yields and species long-term survival and contribution to ecosystem functions; and
- coordinating management programs with other natural resources activities, such as forest management, range management, and land use planning.

The fish biologist considers the conservation, culture, nutrition, fish health, and habitat restoration of fish and other aquatic species (crabs, shrimp, or oysters) in the context of their role in the ecosystems. Research work may involve studying various ecological systems in relation to the health, growth, and well-being of fish resources. Research work includes:

- conducting surveys, designing and implementing restoration plans, and developing recovery plans and other fish management plans;
- preparing reports of results and findings;
- identifying and protecting aquatic habitats and associated and interconnected uplands that contribute to stream and lake habitat quality;
- developing and implementing techniques and methodologies for culturing fish (for example, hatchery operations), and dealing with fish health issues;
- studying habitat requirements and the effects of environmental contaminants, parasites, and diseases on aquatic species; and/or
- understanding and resolving issues related to introducing contaminants into the environment.

Basic Requirements

Nonresearch Positions:

1. **Degree:** major in biological science that included:
 - At least 6 semester hours in aquatic subjects such as limnology, ichthyology, fishery biology, aquatic botany, aquatic fauna, oceanography, fish culture, or related courses in the field of fishery biology; and
 - At least 12 semester hours in the animal sciences in such subjects as general zoology, vertebrate zoology, comparative anatomy, physiology, entomology, parasitology, ecology, cellular biology, genetics, or research in these fields. (Excess course work in aquatic subjects may be used to meet this requirement when appropriate.)

or

2. **Combination of education and experience:** courses equivalent to a major in biological science (i.e., at least 30 semester hours), of which a minimum of 6 semester hours were in aquatic subjects and 12 semester hours were in the animal sciences, as shown in A above, plus appropriate experience or additional education.

Research Positions: Applicants must show that they have a degree with major study in biology, zoology, or biological oceanography that included at least 30 semester hours in biological and aquatic science and 15 semester hours in the physical and mathematical sciences. This course work must have included:

- At least 15 semester hours of preparatory training in zoology beyond introductory biology or zoology in such courses as invertebrate zoology, comparative anatomy, histology, physiology, embryology, advanced vertebrate zoology, genetics, entomology, and parasitology; and
- At least 6 semester hours of training applicable to fishery biology in such subjects as fishery biology, ichthyology, limnology, oceanography, algology, planktonology, marine or fresh water ecology, invertebrate ecology, principles of fishery population dynamics, or related course work in the field of fishery biology; and
- At least 15 semester hours of training in any combination of two or more of the following: chemistry, physics, mathematics, or statistics.

Wildlife Refuge Management, 0485

This series covers positions that manage, administer, supervise, lead, or scientifically operate Federally-owned or managed lands and waters designated as national wildlife refuges. Work involves establishing, conserving, protecting, restoring, and enhancing wildlife species and their required habitat, and/or conserving and managing fishery and wildlife resources.

Occupational Information

Work involves developing, enhancing, protecting, and maintaining land and habitat for a variety of species within the confines of a national wildlife refuge system. The variety, depth, and difficulty of programs differ among refuges in terms of species involved, required protection, public use, commercial interests, water supply, and interests of other Federal agencies, and state and local governments. National wildlife refuges vary in size, topography, geographic location, climate and other characteristics. Physical characteristics include arctic tundra, desert, bog and marshlands, estuarine, coastline, wetlands, and uplands. Refuges may have sharply defined borders or be amorphous in shape. They may be pristine, or contain inhabited communities and historical landmarks. The work involves:

- planning land, water, and habitat management;
- administering, supervising, and managing fish and wildlife public relations activities;
- managing public, commercial, industrial, and agrarian land use;
- preserving, restoring, and enhancing populations of endangered or threatened species of animals and plants;
- perpetuating migratory and residential bird resources;

- preserving a natural diversity and abundance of fauna and flora;
- providing the public with an understanding and appreciation of fish and wildlife ecology;
- providing the public with recreational opportunities, such as nature trails, hunting, fishing, and observation;
- studying the characteristics and behavior of species;
- evaluating the adequacy of habitats to support wildlife needs;
- evaluating administration practices for one species relative to its impact on other species and their habitats;
- identifying and applying disease control and containment methods;
- ensuring that public uses are authorized, compatible with the purposes for which a refuge was established, and prevent adverse impact on wildlife species and national historic sites;
- contracting for business operations and issuing permits for economic uses of resources, such as farming, mineral exploration and extraction, and power production;
- reconciling biological program compatibility with other needs and activities in surrounding communities; and
- assessing the impact of agricultural and commercial activities or military operations on nearby managed property.

Administrative aspects of the work may require an understanding of the basic principles, concepts, and techniques of budgeting, contracting and procurement, personnel, records management, and property management.

Basic Requirements

1. **Degree:** zoology, wildlife management, or an appropriate field of biology that included at least 9 semester hours in zoology; 6 semester hours in such wildlife courses as mammalogy, ornithology, animal ecology, or wildlife management; and 3 semester hours in botany, and 3 semester hours in conservation biology.

or

2. **Combination of education and experience:** courses equivalent to a major in one of the fields described in A above that included at least 9 semester hours in zoology; 6 semester hours in such wildlife courses as mammalogy, ornithology, animal ecology, or wildlife management; and 3 semester hours in botany, and 3 semester hours in conservation biology, plus appropriate experience or additional education.

Wildlife Biology, 0485

This series covers positions that manage, supervise, lead, or perform professional, research, or scientific work that involves conserving, propagating, managing, protecting, and administering wildlife species.

Occupational Information

Wildlife biology involves dealing with the ecology, behavior, and conservation of wild animals and coordinating wildlife management programs with other natural resources activities, such as land use planning and forest and range management. Management work includes:

- developing and managing wildlife programs on Federally-owned or managed lands, such as national parks, national forests, wildlife refuges, Indian reservations, military installations, wetlands, big game and desert ranges, and other lands in the public domain;
- developing and implementing cooperative programs with and providing technical assistance to states, private landowners, Alaskan Native and Indian tribal governing bodies, and special interest groups concerned with protection and proper management of wildlife and wildlife habitats;
- assessing and conducting wildlife management transactions, such as acquiring, selling, leasing, or exchanging lands, easements, and other resources;

- preparing, evaluating, and conducting biological analyses of land and water resources projects and Federal permit applications to ensure compliance with appropriate law and to mitigate adverse impacts on resources; and
- reviewing state and Federal proposals for funding wildlife resources projects to determine if planned objectives warrant Federal funding and meet wildlife resources needs in accordance with applicable laws and regulations.

Research work involves proposing, designing, and conducting studies to determine:

- population status, trends, and problems of wildlife species;
- disease control specifications;
- endangered or threatened species protection and consultation requirements;
- planned habitat management actions and evaluation procedures;
- population enhancement programs; and
- environmental contaminant specifications.

Basic Requirements

Nonresearch positions:

1. **Degree:** biological science that included:
 - At least 9 semester hours in such wildlife subjects as mammalogy, ornithology, animal ecology, wildlife management, or research courses in the field of wildlife biology; and
 - At least 12 semester hours in zoology in such subjects as general zoology, invertebrate zoology, vertebrate zoology, comparative anatomy, physiology, genetics, ecology, cellular biology, parasitology, entomology, or research courses in such subjects (Excess courses in wildlife biology may be used to meet the zoology requirements where appropriate.); and
 - At least 9 semester hours in botany or the related plant sciences.

or

2. **Combination of education and experience:** equivalent to a major in biological science (i.e., at least 30 semester hours), with at least 9 semester hours in wildlife subjects, 12 semester hours in zoology, and 9 semester hours in botany or related plant science, as shown in A above, plus appropriate experience or additional education.

Research positions: Degree with major in wildlife biology, zoology, or botany that included at least 30 semester hours of course work in biological science and 15 semester hours in the physical, mathematical, and earth sciences. This course work must have included:

- At least 9 semester hours of training applicable to wildlife biology in such subjects as mammalogy, ornithology, animal ecology, wildlife management, principles of population dynamics, or related course work in the field of wildlife biology; and
- At least 12 semester hours in zoological subjects such as invertebrate zoology, vertebrate zoology, comparative anatomy of the vertebrates, embryology, animal physiology, entomology, herpetology, parasitology, and genetics; and
- At least 9 semester hours in the field of botany and related plant science; and
- At least 15 semester hours of training in any combination of two or more of the following: chemistry, physics, mathematics, statistics, soils, and/or geology.