

# Glossary

- accessible**—Pertaining to physical access to areas and activities for people of different abilities, especially those with physical impairments.
- active management**—The direct manipulation of habitats or wildlife populations to achieve specific objectives. Actions could include planting food plots, managing water levels, prescribed grazing or fire, or wildlife relocations.
- adaptive resource management**—The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities; a process that uses feedback from research, monitoring, and evaluation of management actions to support or modify objectives and strategies at all planning levels; a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in management plan. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.
- Administration Act**—National Wildlife Refuge System Administration Act of 1966.
- alternative**—A reasonable way to solve an identified problem or satisfy the stated need (40 CFR 1500.2); one of several different means of accomplishing refuge purposes and goals and contributing to the Refuge System mission (The Fish and Wildlife Service Manual, 602 FW 1.5).
- amphibian**—A class of cold-blooded vertebrates including frogs, toads, or salamanders.
- annual**—A plant that flowers and dies within 1 year of germination.
- appropriate management response**—The response to a wildfire based on an evaluation of risks to firefighter and public safety, the circumstances under which a fire occurs, including weather and fuel conditions, natural and cultural resource management objectives, protection priorities, and values to be protected.
- appropriate use**—A proposed or existing uses on national wildlife refuges that meet at least one of the following: is a wildlife-dependent recreational use; contributes to fulfilling refuge purposes, the Refuge System mission, or goals and objectives outline in a CCP; and the refuge manager has evaluated the use and found it to be appropriate.
- ATV**—All-terrain vehicle.
- baseline**—A set of critical observations, data, or information used for comparison or a control.
- biological control**—The use of organisms or viruses to control invasive plants or other pests.
- biological diversity**, also **biodiversity**—The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (The Fish and Wildlife Service Manual, 052 FW 1.12B). The National Wildlife Refuge System's focus is on indigenous species, biotic communities, and ecological processes.
- biological integrity**—Biotic composition, structure, and function at genetic, organism, and community levels.
- biotic**—Pertaining to life or living organisms; caused, produced by, or comprising living organisms.
- Bureau of Land Management (BLM)**—A Federal agency that was established in 1946 through consolidation of the General Land Office and U.S. Grazing Service. The agency has a multiple-use mandate is responsible for a variety of programs for managing and conserving surface and subsurface mineral estates, mostly in the western United States.
- canopy**—A layer of foliage, generally the uppermost layer, in a vegetative stand; midlevel or understory vegetation in multilayered stands. Canopy closure (also canopy cover) is an estimate of the amount of overhead vegetative cover.
- CCP**—See comprehensive conservation plan.
- CFR**—See Code of Federal Regulations.
- cervid**—All members of the family Cervidae and hybrids, including deer, elk, moose, caribous, reindeer, and related species.
- CFR**—See Code of Federal Regulations.
- cfs**—Cubic feet per second.
- Code of Federal Regulations (CFR)**—The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government. Each volume of the CFR is updated once each calendar year.
- compatibility determination**—See compatible use.
- compatible use**—A wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the director of the U.S. Fish and Wildlife Service, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge (The Fish and Wildlife Service Manual, 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations or limits necessary to ensure compatibility.

**comprehensive conservation plan (CCP)**—A document that describes the desired future conditions of the refuge and provides long-range guidance and management direction for the refuge manager to accomplish the purposes of the refuge, contribute to the mission of the Refuge System, and to meet other relevant mandates (The Fish and Wildlife Service Manual, 602 FW 1.5).

**concern**—See issue.

**conservation district**—Organized in the 1930s as a response to the severe erosion problems, a district is often a political subdivision of a State. Funding comes from assessments levied on real property within the boundaries of the district. It assists citizens in conserving renewable natural resources.

**conspecific**—An individual belonging to the same species as another.

**cool-season grasses**—Grasses that begin growth earlier in the season and often become dormant in the summer. These grasses will germinate at lower temperatures. Examples of cool-season grasses at the refuge are western wheatgrass, needle and thread, and green needlegrass.

**county road**—In general, means any public highway opened, established, constructed, maintained, abandoned in accordance with State law.

**cover, also cover type, canopy cover**—Present vegetation of an area.

**cultural resources**—The remains of sites, structures, or objects used by people in the past.

**depredation**—Destruction or consumption of eggs, broods, or individual wildlife due to a predatory animal; damage inflicted on agricultural crops or ornamental plants by wildlife.

**drawdown**—The act of manipulating water levels in an impoundment to allow for the natural drying-out cycle of a wetland.

**EA**—See environmental assessment.

**ecological resilience**—The ability to absorb disturbances, to be changed, and then to reorganize and still have the same identity, that is, retain the same basic structure and ways of functioning. A resilient system is forgiving of external shocks; a disturbance is unlikely to affect the whole. A resilient habitat: (1) sustains many species of plants and animals and a highly variable structural composition; (2) is asymmetric; (3) exemplifies biological integrity, biological diversity, and environmental health; and (4) adapts to climate change.

**ecosystem**—A dynamic and interrelating complex of plant and animal communities and their associated nonliving environment; a biological community, together with its environment, functioning as a unit. For administrative purposes, the Service has designated 53 ecosystems covering the United States and its possessions. These ecosystems gen-

erally correspond with watershed boundaries and their sizes and ecological complexity vary.

**ecosystem resilience**—See ecological resilience.

**EIS**—Environmental impact statement.

**endangered species, Federal**—A plant or animal species listed under the Endangered Species Act of 1973, as amended, that is in danger of extinction throughout all or a significant portion of its range.

**endangered species, State**—A plant or animal species in danger of becoming extinct or extirpated in a particular State within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.

**endemic species**—Plants or animals that occur naturally in a certain region and whose distribution is relatively limited to a particular locality.

**environmental assessment**—A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action and alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

**environmental health**—Composition, structure, and functioning of soil, water, air, and other abiotic features.

**EPA**—Environmental Protection Agency.

**extinction**—The complete disappearance of a species from the earth; no longer existing.

**extirpation**—The extinction of a population; complete eradication of a species within a specified area.

**fauna**—All the vertebrate and invertebrate animals of an area.

**Federal trust resource**—A trust is something managed by one entity for another who holds the ownership. The Service holds in trust many natural resources for the people of the United States as a result of Federal acts and treaties. Examples are species listed under the Endangered Species Act, migratory birds protected by international treaties, and native plant or wildlife species found on a national wildlife refuge.

**Federal trust species**—All species where the Federal Government has primary jurisdiction including federally endangered or threatened species, migratory birds, anadromous fish, and certain marine mammals.

**fire refugia**—Those places within the landscape that due to size, soils, or topography do not burn as often, as intensely, or at all with frequent light ground fire. In landscapes with frequent fire return intervals, respect for fire refugia is essential for protection of fire intolerant plant species.

**flora**—All the plant species of an area.

- FMP**—Fire management plan.
- forb**—A broad-leaved, herbaceous plant; a seed-producing annual, biennial, or perennial plant that does not develop persistent woody tissue but dies down at the end of the growing season.
- fragmentation**—The alteration of a large block of habitat that creates isolated patches of the original habitat that are interspersed with a variety of other habitat types; the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.
- “friends group”**—Any formal organization whose mission is to support the goals and purposes of its associated refuge and the National Wildlife Refuge Association overall; “friends” organizations and cooperative and interpretive associations.
- FTE**—A full-time equivalent; one or more job positions with tours of duty that, when combined, equate to one person employed for the standard Government work-year.
- FWS**—See U.S. Fish and Wildlife Service.
- geocaching**—A high-technology scavenger hunt in which objects are hidden at secret outdoor locations for participants to find using Global Positioning System positions posted on the Internet.
- geographic information system (GIS)**—A computer system capable of storing and manipulating spatial data; a set of computer hardware and software for analyzing and displaying spatially referenced features (such as points, lines and polygons) with nongeographic attributes such as species and age.
- GIS**—See geographic information system.
- goal**—Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (The Fish and Wildlife Service Manual, 620 FW 1.5).
- grassland tract**—A contiguous area of grassland without fragmentation.
- CFR**—See Code of Federal Regulations.
- Global Positioning System (GPS)**—A navigational system involving satellites that allows a user with a receiver to determine precise coordinates for their location on the earth’s surface.
- GS**—General Schedule (pay rate schedule for certain Federal positions).
- habitat**—Suite of existing environmental conditions required by an organism for survival and reproduction; the place where an organism typically lives and grows.
- habitat disturbance**—Significant alteration of habitat structure or composition; may be natural (for example, wildfire) or human-caused events (for example, timber harvest and disking).
- habitat management plan (HMP)**—A step-down plan to a comprehensive conservation plan that identifies in detail how the objectives and strategies for upland, riparian, river bottoms, and the shoreline will be carried out.
- habitat type, also vegetation type, cover type**—A land classification system based on the concept of distinct plant associations.
- HDP**—See height density plot.
- height density plot (HDP)**—methods used to record the height of visual obstruction of plant cover. A measuring pole is observed at points along a line transect from a set distance and angle. It provides information on the adequacy of nesting cover for sharp-tailed grouse.
- herbivory**—Grazing of grass and other plants by any animal.
- heterogeneity**—diversity or dissimilar species within a landscape
- HMP**—See habitat management plan.
- HUA**—Hydrologic unit area.
- hunnable**—A species that can be hunted on the refuge in accordance with Federal and State regulations.
- impoundment**—A body of water created by collection and confinement within a series of levees or dikes, creating separate management units although not always independent of one another.
- Improvement Act**—National Wildlife Refuge System Improvement Act of 1997.
- indigenous**—Originating or occurring naturally in a particular place.
- inholding**—Non-Service land owned by private, other agency, or other group landowners that is within the boundary of a national wildlife refuge.
- integrated pest management**—Methods of managing undesirable species such as invasive plants; education, prevention, physical or mechanical methods of control, biological control, responsible chemical use, and cultural methods.
- introduced species**—A species present in an area due to intentional or unintentional escape, release, dissemination, or placement into an ecosystem as a result of human activity.
- invasive plant, also noxious weed**—A species that is nonnative to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.
- invertebrates**—An animal that lacks an internal skeleton or backbone such as insects, butterflies, and aquatic species like snails.
- inviolate sanctuary**—A place of refuge or protection where animals and birds may not be hunted.
- issue**—Any unsettled matter that requires a management decision; for example, a Service initiative, opportunity, resource management problem, a threat to the resources of the unit, conflict in uses, public concern, or the presence of an undesirable resource condition (The Fish and Wildlife Service Manual, 602 FW 1.5).

**lentic**—Still water wetlands. These wetlands occur in basins and lack a defined channel and floodplain. Examples include perennial, intermittent bodies of water like lakes, reservoirs, stock ponds.

**long-distance animal movement**—The ability of a wildlife species to move greater distances in search of forage without fences.

**lotic**—Flowing water wetlands are associated with rivers, streams and drainage ways. These riparian wetlands contain a defined channel and floodplain.

**management alternative**—See alternative.

**migration**—Regular extensive, seasonal movements of birds between their breeding regions and their wintering regions; to pass usually periodically from one region or climate to another for feeding or breeding.

**migratory birds**—Birds which follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

**mission**—Succinct statement of purpose and/or reason for being.

**mitigation**—Measure designed to counteract an environmental impact or to make an impact less severe.

**mixed-grass prairie**—A transition zone between the tall-grass prairie and the short-grass prairie dominated by grasses of medium height that are approximately 2–4 feet tall. Soils are not as rich as the tall-grass prairie and moisture levels are less.

**monitoring**—The process of collecting information to track changes of selected parameters over time.

**national wildlife refuge**—A designated area of land, water, or an interest in land or water within the National Wildlife Refuge System, but does not include coordination areas; a complete listing of all units of the Refuge System is in the current “Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service.”

**National Wildlife Refuge System (Refuge System)**—Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife including species threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas.

**National Wildlife Refuge System Improvement Act of 1997 (Improvement Act)**—Sets the mission and the administrative policy for all refuges in the National Wildlife Refuge System; defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education,

and interpretation); establishes a formal process for determining appropriateness and compatibility; establish the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; requires a comprehensive conservation plan for each refuge by the year 2012. This act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

**native species**—A species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

**Neotropical migrant**—A bird species that breeds north of the United States and Mexican border and winters primarily south of this border.

**nest success**—The percentage of nests that successfully hatch one or more eggs of the total number of nests initiated in an area.

**nongovernmental organization**—Any group that is not comprised of Federal, State, tribal, county, city, town, local, or other governmental entities.

**noxious weed, also invasive plant**—Any living stage (including seeds and reproductive parts) of a parasitic or other plant of a kind that is of foreign origin (new to or not widely prevalent in the United States) and can directly or indirectly injure crops, other useful plants, livestock, poultry, other interests of agriculture, including irrigation, navigation, fish and wildlife resources, or public health. According to the Federal Noxious Weed Act (Public Law 93-639), a noxious weed (such as invasive plant) is one that causes disease or has adverse effects on humans or the human environment and, therefore, is detrimental to the agriculture and commerce of the United States and to public health.

**NRCS**—Natural Resources Conservation Service of the U.S. Department of Agriculture.

**NWR**—National wildlife refuge.

**objective**—An objective is a concise target statement of what will be achieved, how much will be achieved, when and where it will be achieved, and who is responsible for the work; derived from goals and provide the basis for determining management strategies. Objectives should be attainable and time-specific and should be stated quantitatively to the extent possible. If objectives cannot be stated quantitatively, they may be stated qualitatively (The Fish and Wildlife Service Manual, 602 FW 1.5).

**passive management**—This management approach allows for natural processes such as fire, grazing, and flooding to occur with little human assistance or funding, which conserves limited funds while increasing the likelihood of self-sustaining communities.

- patch**—An area distinct from that around it; an area distinguished from its surroundings by environmental conditions.
- patch burning**—The use of prescribed fire each year in a different location or patch within a larger unfenced landscape. With an ecology-driven purpose, patch burning has high potential to increase biodiversity and wildlife habitat. This management practice creates a mosaic of heavily grazed and lightly grazed areas that provide a diverse vegetative structure and increase diversity in the same grazing unit.
- perennial**—Lasting or active through the year or through many years; a plant species that has a life span of more than 2 years.
- plant community**—An assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soil, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community, such as ponderosa pine or bunchgrass.
- prescribed fire**—Any fire ignited by management actions to meet specific objectives. These objectives could be hazardous fuels reduction, habitat or wildlife oriented, or other objectives in the prescribed fire burn plan.
- prescriptive grazing**—To designate or order the use as a remedy through a written direction to achieve a desired outcome.
- priority public use**—One of six uses authorized by the National Wildlife Refuge System Improvement Act of 1997 to have priority if found to be compatible with a refuge's purposes. This includes hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.
- properly functioning condition**—Qualitative method for assessing the condition of riparian-wetland areas. It describes both the assessment and the conditions of the wetland area. It evaluates how well the physical processes are functioning through use of a checklist.
- proposed action**—The alternative proposed to best achieve the purpose, vision, and goals of a refuge (contributes to the Refuge System mission, addresses the significant issues, and is consistent with principles of sound fish and wildlife management).
- public**—Individuals, organizations, and groups; officials of Federal, State, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in Service issues and those who do or do not realize that Service decisions may affect them.
- public domain**—Lands that were not under private or State ownership during the 18th and 19th centuries in the United States, as the country was expanding. These lands were obtained from the 13 colonies, Native American tribes, or purchases from other counties. The domain was controlled by the Federal Government and sold to States or private interests through the General Land Office which would eventually become the Bureau of Land Management.
- public involvement**—A process that offers affected and interested individuals and organizations an opportunity to become informed about, and to express their opinions on, Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.
- purpose of the refuge**—The purpose of a refuge is specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing authorization or expanding a refuge, a refuge unit, or a refuge subunit (The Fish and Wildlife Service Manual, 602 FW 1.5).
- pyric herbivory**—Grazing promoted through fire. The fire-grazing interaction is critical in maintaining heterogeneity (dissimilar species resulting in variety) of grassland ecosystems.
- raptor**—A carnivorous bird such as a hawk, a falcon, or a vulture that feeds wholly or chiefly on meat taken by hunting or on carrion (dead carcasses).
- R.S. 2477**—Revised Statute 2477. Section 2477 of the Revised Statutes emerged from Section 8 of the Mining Act of 1866 which provided right of ways for the construction of highways over public lands, not reserved for public uses. It was repealed on October 21, 1976 under the Federal Land Policy and Management Act.
- refuge purpose**—See purpose of the refuge.
- Refuge System**—See National Wildlife Refuge System.
- refuge use**—Any activity on a refuge, except administrative or law enforcement activity, carried out by or under the direction of an authorized Service employee.
- resident species**—A species inhabiting a given locality throughout the year; nonmigratory species.
- resilience**—The ability to absorb disturbances, to be changed and then to reorganize and still have the same identity (retain the same basic structure and ways of functioning).
- rest**—Free from biological, mechanical, or chemical manipulation, in reference to refuge lands.
- restoration**—Management emphasis designed to move ecosystems to desired conditions and processes, such as healthy upland habitats and aquatic systems.

**Riparian and Wetland Research Program**—A program through the University of Montana’s Department of Forestry that the Service contracted with in 1999–2000 to look at water quality on the refuge.

**riparian area or riparian zone**—An area or habitat that is transitional from terrestrial to aquatic ecosystems including streams, lakes, wet areas, and adjacent plant communities and their associated soils that have free water at or near the surface; an area whose components are directly or indirectly attributed to the influence of water; of or relating to a river; specifically applied to ecology, “riparian” describes the land immediately adjoining and directly influenced by streams. For example, riparian vegetation includes all plant life growing on the land adjoining a stream and directly influenced by the stream.

**SAMMS**—See Service Asset Maintenance Management System.

**scoping**—The process of obtaining information from the public for input into the planning process.

**seasonally flooded**—Surface water is present for extended periods in the growing season, but is absent by the end of the season in most years.

**sediment**—Material deposited by water, wind, and glaciers.

**sentinel plant species**—Plant species that vanish first when the ecological processes that occur within an ecosystem are out of balance (refer to appendix F).

**Service**—See U.S. Fish and Wildlife Service.

**Service Asset Maintenance Management System (SAMMS)**—A national database which contains the unfunded maintenance needs of each refuge; projects include those required to maintain existing equipment and buildings, correct safety deficiencies for the implementation of approved plans, and meet goals, objectives, and legal mandates.

**shorebird**—Any of a suborder (Charadrii) of birds such as a plover or a snipe that frequent the seashore or mud flat areas.

**spatial**—Relating to, occupying, or having the character of space.

**special status species**—Plants or animals that have been identified through Federal law, State law, or agency policy as requiring special protection of monitoring. Examples include federally listed endangered, threatened, proposed, or candidate species; State-listed endangered, threatened, candidate, or monitor species; Service’s species of management concern; or species identified by the Partners in Flight Program as being of extreme or moderately high conservation concern.

**special use permit**—A permit for special authorization from the refuge manager required for any refuge service, facility, privilege, or product of the soil provided at refuge expense and not usually available to the public through authorizations in

Title 50 CFR or other public regulations (Refuge Manual, 5 RM 17.6).

**species of concern**—Those plant and animal species, while not falling under the definition of special status species, that are of management interest by virtue of being Federal trust species such as migratory birds, important game species, or significant keystone species; species that have documented or apparent populations declines, small or restricted populations, or dependence on restricted or vulnerable habitats.

**step-down management plan**—A plan that provides the details necessary to implement management strategies identified in the comprehensive conservation plan (The Fish and Wildlife Service Manual, 602 FW 1.5).

**strategy**—A specific action, tool, or technique or combination of actions, tools, and techniques used to meet unit objectives (The Fish and Wildlife Service Manual, 602 FW 1.5).

**threatened species, Federal**—Species listed under the Endangered Species Act of 1973, as amended, that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

**threatened species, State**—A plant or animal species likely to become endangered in a particular State within the near future if factors contributing to population decline or habitat degradation or loss continue.

**travel corridor**—A landscape feature that facilitates the biologically effective transport of animals between larger patches of habitat dedicated to conservation functions. Such corridors may facilitate several kinds of traffic including frequent foraging movement, seasonal migration, or the once in a lifetime dispersal of juvenile animals. These are transition habitats and need not contain all the habitat elements required for long-term survival or reproduction of its migrants.

**trust resource**—See Federal trust resource.

**trust species**—See Federal trust species.

**ungulate**—A hoofed mammal such as horses, cattle, deer, pronghorn, and bighorn sheep.

**U.S. Army Corps of Engineers (USACE)**—The Federal agency whose mission is to provide vital public engineering services in peace and war to strengthen the Nation’s security, energize the economy, and reduce risks from disasters.

**USDA**—U.S. Department of Agriculture.

**U.S. Fish and Wildlife Service (Service, USFWS, FWS)**—The principal Federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service manages the 93-million-acre National Wildlife Refuge System comprised of more than 530 national wildlife refuges

and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological service field stations, the agency enforces Federal wildlife laws, manages migratory bird populations, restores national significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal aid program that distributes millions of dollars in excise taxes on fishing and hunting equipment to State wildlife agencies.

**USFWS**—See U.S. Fish and Wildlife Service.

**U.S. Geological Survey (USGS)**—A Federal agency whose mission is to provide reliable scientific information to describe and understand the earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

**USGS**—See U.S. Geological Survey.

**UWA**—Unified watershed assessment.

**viability**—Ability to survive and developing adequately. For a plant, the ability to survive and bear fruits or seeds without being fenced.

**vision statement**—A concise statement of the desired future condition of the planning unit, based primarily on the Refuge System mission, specific refuge purposes, and other relevant mandates (The Fish and Wildlife Service Manual, 602 FW 1.5).

**visual obstruction**—Pertaining to the density of a plant community; the height of vegetation that blocks the view of predators and conspecifics to a nest.

**waterfowl**—A category of birds that includes ducks, geese, and swans.

**watershed**—The region draining into a river, a river system, or a body of water.

**wetland management district**—Land that the Refuge System acquires with Federal Duck Stamp funds for restoration and management primarily as prairie wetland habitat critical to waterfowl and other wetland birds.

**WG**—Wage grade schedule (pay rate schedule for certain Federal positions).

**wildfire**—Any nonstructure fire that occurs in the wildland including prescribed fire.

**wildfire implementation plan**—A progressively developed assessment and operational management plan that documents the analysis and describes the response for a wildfire.

**wildland fire**—Any nonstructure fire that occurs in the wildland including wildfire and prescribed fire.

**wildland-urban interface**—The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland and vegetative fuels.

**wilderness review**—The process used to identify and recommend for congressional designation Refuge System lands and waters that merit inclusion in the National Wilderness Preservation System. It is a required element of a CCP and includes three phases: inventory, study, and recommendation.

**wilderness study area (WSA)**—An area being considered for wilderness designation. These are identified and established through the inventory component of a wilderness review.

**wildlife-dependent recreational use**—Use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, environmental education, or interpretation. The National Wildlife Refuge System Improvement Act of 1997 specifies that these are the six priority public uses of the Refuge System.

**woodland**—Open stands of trees with crowns not usually touching, generally forming 25–60 percent cover.



# Appendix A

## List of Preparers and Contributors

This document is the result of the extensive, collaborative, and enthusiastic efforts by the members of the planning team, cooperating agencies, and other Service or agency contributors listed below.

### U.S. Fish and Wildlife Service Staff on Planning Team

<i>Name</i>	<i>Agency/Position</i>	<i>Education and Experience</i>	<i>Contribution</i>
Laurie Shannon	Planning team leader, region 6, Lakewood, Colorado	B.S. recreation resources management; 27 years	Project coordination, organization, writing and review
Barron Crawford	Project leader, Charles M. Russell National Wildlife Refuge, Lewistown, Montana	B.S. and M.S. wildlife and fisheries science; 18 years	Project oversight, writing and review
Bill Berg	Deputy project leader, Charles M. Russell National Wildlife Refuge	B.S. wildlife management and zoology; 29 years	Writing, review, and Common Sense coordinator
Trina Brennan	Wildlife refuge specialist, Charles M. Russell National Wildlife Refuge	B.S. fisheries and wildlife management; 5 years	Assist in project coordination, organization and writing
Matt Derosier	Sand Creek Field Station manager, Charles M. Russell National Wildlife Refuge	B.S. wildlife management; 21 years	Writing and review
JoAnn Dullum	Wildlife biologist, Charles M. Russell National Wildlife Refuge	B.S. zoology, M.S. wildlife biology; 15 years	Writing and review
Mike Granger	Fire management officer, Charles M. Russell National Wildlife Refuge	B.S., M.S. wildlife biology; 25 years	Writing and review
Paula Gouse	Fort Peck wildlife refuge specialist, Charles M. Russell National Wildlife Refuge	B.S. biology; 13 years	Writing and review
Dan Harrell	Habitat biologist, Charles M. Russell National Wildlife Refuge	B.S. fish and wildlife management; 18 years	Writing and review
Nathan Hawkaluk	Jordan Field Station manager, Charles M. Russell National Wildlife Refuge	B.S. fish and wildlife management; 7 years	Writing and review
Aaron Johnson	Fort Peck Field Station manager, Charles M. Russell National Wildlife Refuge	B.S. wildlife management; 12 years	Writing and review
Neil Kadrmas	Wildlife biologist, Charles M. Russell National Wildlife Refuge	B.S., M.S. wildlife and fisheries science; 5 years	Writing and review
Danielle Kepford	Realty specialist, Charles M. Russell National Wildlife Refuge	B.S. wildlife and fisheries sciences; 10 years	Realty and land acquisition review

**U.S. Fish and Wildlife Service Staff on Planning Team**

<i>Name</i>	<i>Agency/Position</i>	<i>Education and Experience</i>	<i>Contribution</i>
Randy Matchett	Senior wildlife biologist, Charles M. Russell National Wildlife Refuge	B.S., M.S. wildlife biology; 27 years	Writing and review
Beverly Roedner Skinner	Administration, Charles M. Russell National Wildlife Refuge	B.S., M.S. wildlife management; B.S. agriculture/horticulture; teacher certificate (science for grades 5–12); 20 years	Writing and review
Bob Skinner	Habitat biologist, Charles M. Russell National Wildlife Refuge	B.S. zoology, M.S. wildlife management, Ph.D. wildlife management; 30 years	Writing and review

**Cooperating Agency Members**

<i>Name</i>	<i>Agency/Position</i>	<i>Education and Experience</i>	<i>Contribution*</i>
Rich Adams	BLM HiLine district field manager, Malta, Montana	B.S. range and forest management; 31 years	Planning team member
Gary Benes	BLM district manager, Central Montana, Lewistown, Montana	B.A. geography and history, B.S. natural resource conservation	Planning team member
John Daggett	USACE operations project manager, Fort Peck, Montana	B.S. civil engineering; 20 years at Fort Peck	Planning team member
Lee Iverson	Petroleum County commissioner, Winnett, Montana	B.S. animal husbandry; 12 years	Planning team member
Vicki Marquis	Missouri River Conservation District Council coordinator, Great Falls, Montana	B.A. chemistry; 5 years on council	Planning team member
Darin McMurry	USACE lake manager, Fort Peck, Montana	B.S. wildlife science; 23 years	Planning team member
Chris Pileski**	DNRC, Eastern Land Office, acting area manager, Miles City, Montana	B.S. forestry; 14 years	Planning team member
Lesley Robinson	Phillips County commissioner, Malta, Montana	5 years	Planning team member
Clive Rooney	DNRC, Northeastern Land Office, area manager, Lewistown, Montana	B.A. business administration; 20 years	Planning team member
Tom Stivers	MFWP, wildlife biologist, Lewistown, Montana	B.S. wildlife biology, M.S. fish and wildlife management; 30 years	Planning team member
Mark Sullivan	MFWP, region 6 wildlife program manager, Glasgow, Montana	B.S. biology, M.S. fish and wildlife management; 20 years	Planning team member

*\*Primary representative of respective agency at meetings; participated on planning team; helped identify issues; provided input on alternatives, objectives, and strategies; reviewed planning documents; and provided information as requested.*

*\*\*Replaced Rick Strohmeyer.*

**Other Service or Agency Contributors**

<i>Name</i>	<i>Agency/Position</i>	<i>Contribution</i>
John Chaffin	Attorney advisor, Department of the Interior, Office of the Solicitor	Legal advisor to the Service
Rick Coleman	Assistant regional director, region 6, Lakewood, Colorado	Refuge System policy guidance
Mark Ely	Region 6, division of refuge planning, GIS specialist, Lakewood, Colorado	GIS map preparation for document
Patti Fielder	Hydrologist, region 6, Lakewood, Colorado	Assistance with writing water resources section
Jackie Fox	Biological science technician, Charles M. Russell National Wildlife Refuge	Assistance with document preparation
Shannon Heath	Outdoor recreation planner, division of visitor education and services, Helena, Montana	Assistance with developing public use objectives and overview of visitor services
Wayne King	Region 6 wildlife biologist, Lakewood, Colorado	Review of region 6 fish and wildlife priorities
Dean Rundle	Region 6, refuge supervisor (Montana, Wyoming, Utah, Colorado), Lakewood, Colorado	Refuge System policy guidance
Michael Spratt	(Retired) chief, division of refuge planning, Lakewood, CO	Planning guidance
Meg Van Ness	Region 6 archaeologist, Lakewood, Colorado	Assistance with cultural resources objectives
Brant Loflin	Archaeologist	Assistance with cultural resources and paleontology information

**Other Consultants**

<i>Name</i>	<i>Agency/Position</i>	<i>Contribution</i>
Roxanne Bash	Federal Highways Administration, Western Federal Lands Office, Washington	Assistance with transportation planning
Jessica Clement	Colorado State University, Fort Collins, Colorado	Assistance in facilitation of public use objectives workshop
George Fekaris	Federal Highways Administration, Western Lands Office, Washington	Assistance with transportation planning
Lynne Koontz Ph.D.	Economist, USGS, Fort Collins Science Center, Colorado	Analysis of socioeconomic impacts
Mimi Mather	Shapins-Belt Collins, Boulder, Colorado	Facilitation of planning team and public meetings; assistance with document preparation
Bill Mangle	ERO Resources, natural resources planner, Denver, Colorado	Assistance with analysis and research for reasonably foreseeable activities and cumulative impacts, and other environmental analysis documentation
Natalie Sexton	USGS, Fort Collins Science Center, Colorado	Facilitation and assistance with public use objectives and analysis of socioeconomic impacts
Rick Schroeder	(Retired) USGS, Fort Collins Science Center, Colorado	Assistance with vision and goals; provided input on writing biological objectives

Many other individuals also provided invaluable assistance with the preparation of this CCP. The Service acknowledges the efforts of the following individuals and groups towards the completion of this plan. The diversity, talent, and knowledge contributed dramatically improved the vision and completeness of this document.

- Mark Albers, BLM, field manager, Malta, Montana
- Mary Bloom, BLM, assistant field manager, Miles City, Montana
- Clayton Christensen, Charles M. Russell National Wildlife Refuge
- John Esperance, (retired) region 6, planning branch chief
- Jim Forsythe, Charles M. Russell National Wildlife Refuge
- Jody Jones, Charles M. Russell National Wildlife Refuge
- Kim Greenwood, region 6 tribal liaison
- Glenn Guenther, Charles M. Russell National Wildlife Refuge
- Pat Gunderson, MFWP, Glasgow, Montana
- Brian Haugen, Charles M. Russell National Wildlife Refuge
- Bob King, Charles M. Russell National Wildlife Refuge
- Chris King, Petroleum County commissioner, Winnett, Montana
- Gerry Majerus, BLM, Lewistown, Montana
- Paul Pallas, Charles M. Russell National Wildlife Refuge
- Carl Seilstad, Fergus County commissioner, Lewistown, Montana
- Scott Haight, BLM, assistant field manager, Lewistown, Montana
- Margaret Raper, BLM field manager, Miles City, Montana
- Dale Tribby, BLM, Miles City, Montana
- Asuka Ishizaki, formerly with USGS, Fort Collins Science Center, Colorado
- Dr. John Ritten Ph.D. University of Wyoming; assisted USGS (Fort Collins Science Center, Colorado) in socioeconomic analysis

# Appendix B

## *Public Involvement Summary*

Following the guidance found in the National Environmental Policy Act, the Improvement Act, and the Service's planning policy, the planning team has made sure all that all interested groups and the public have had an opportunity to be involved in the planning process. The term "stakeholder" is commonly used to refer to individual citizens; organizations; businesses; Native American tribes; Federal, State, and local governmental agencies; and others who have expressed an interest in the issues and outcomes of the planning process.

### **B.1 Public Scoping Activities**

The formal scoping period began on December 4, 2007, with the publication of a notice of intent in the Federal Register (FR-23467). The notice of intent notified the public of the Service's intent to begin the CCP and EIS process and solicited public comments.

#### **OUTREACH ACTIVITIES**

Early in the preplanning phase and before publication of the notice of intent in the Federal Register, the Service outlined a process that would be inclusive of diverse stakeholder interests and would involve a range of activities for keeping the public informed and ensure meaningful public input. This process was summarized in a planning update titled Public Involvement Summary (FWS 2007a) and posted to the project website. The full report titled "Charles M. Russell National Wildlife Refuge Public Involvement Process" was included as an appendix in the scoping report (FWS 2008c), which was posted on the project's website. Throughout scoping, the planning team used various methods to solicit guidance and feedback from interested groups and the public. These methods included a variety of outreach materials, public meetings, cooperating agency meetings, briefings and presentations, as well as personal conversations, letters, email and telephone calls.

#### **Planning Updates**

A planning update (Issue 1, January 2008) (FWS 2007a) was mailed to the initial mailing list of 625 people and businesses prior to the first round of public meetings. The planning update, together with the earlier Planning Involvement Summary (FWS 2007a),

outlined the planning process, draft vision and goals for the CCP, and dates, times and locations of the public scoping meetings. Refuge staff handed out the updates at various local agency meetings. The planning update distribution list consisted of individuals, agencies, and organizations who had previously expressed an interest in refuge activities. Following the close of the public comment period for scoping, Planning Update, Issue 2, May 2008 (FWS 2007a) was mailed and posted to the planning website. This update summarized the comments and key findings from scoping.

#### **Press Release**

A press release announcing the planning process and notifying the public of the schedule and location of the public meetings was sent to nearly 270 media organizations throughout Montana including congressional offices, other Federal and State agency offices, and tribal agencies. A number of news articles featured the planning process in several newspapers, radio, TV and online publications prior to the meetings. The Service distributed a second press release when one of the meetings (Bozeman) had to be rescheduled due to inclement weather.

#### **Paid Advertisements**

The Service placed paid advertisements in nine newspapers to publicize the project and invite the public to the scoping meetings. The advertisements, 3.75 inches × 6 inches, were placed in the Billings Gazette (January 24), Bozeman Daily Chronicle (January 24), Great Falls Tribune (January 24), Circle Banner (January 17), Glasgow Courier, Glendive Ranger Review (January 17), Jordan Tribune (January 25), Lewiston News-Argus (January 16), and Phillips County News (January 16).

#### **Project Website**

The Service established a project website <<http://www.fws.gov/cmr/planning>> in January 2008 (FWS 2007a). From the website, interested groups and the public could learn about meetings, download documents, get their name added to the project mailing list, and provide comments.

#### **Public Scoping Meetings**

Approximately 210 people attended one of seven public scoping meetings across Montana from January 29–February 21, 2008 in Great Falls, Fort Peck, Malta, Lewistown, Jordan, Billings, and Bozeman. The planning team listened to many ideas and concerns that

were expressed and answered questions from a variety of interested groups and the public. The initial comment period was scheduled to end on February 4, 2008, but was extended to February 29, 2008.

Following a brief welcome and introduction, Service staff made a 15-minute presentation that outlined the following points:

- Description of the Service and the purpose of the Refuge System
- Key points of the legislation establishing the Charles M. Russell and UL Bend refuges
- CCP and EIS process
- Project schedule

The remainder of the meeting was broken up into two components: (1) a question and answer session; and (2) an opportunity for participants to make official public comments.

## **SCOPING SUMMARY and UPDATE**

During the comment period for scoping, the Service received 23,867 (FWS 2008c) written responses in the form of letters, emails, or from the handout sheet provided at the public meeting. Twenty-three organizations submitted comments.

Following the comment period, the planning team prepared a scoping report summarizing the scoping phase. Copies of the report were provided to the cooperating agencies and posted to the project website. The comments were placed into a spreadsheet and included in the scoping report. Additionally, the team summarized the key activities in a second planning update (Issue 2, January 2008) (FWS 2007a), which was mailed out to the entire mailing list and posted to the project website.

The comments were consolidated into seven significant topics of concern with a number of subtopics. The seven primary topics are: habitat and wildlife, public uses and access wilderness, socioeconomic issues, water resources, adjacent lands and partnerships and cultural values, traditions, and resources. These are addressed in more detail in chapter 1.

---

## **B.2 Cooperating Agencies and Tribal Coordination**

In accordance with the Service's planning policy (FWS 2000b), the preplanning and scoping process began with formal notification to Native American tribes and other Federal and State agencies with a land management interest and inviting them to participate as cooperating agencies and members of the planning team.

## **NATIVE AMERICAN TRIBES**

The Service sent letters of notification about the planning process including an invitation to participate on the planning team to the following tribes: Arapahoe Business Council, Chippewa Cree Tribe, Crow Tribal Council, Fort Belknap Tribal Council, Fort Peck Tribal Council, and Northern Cheyenne Tribe. In July 2009, the Service reached out again to several of the closest tribes to the refuge, Fort Peck and Fort Belknap and made arrangements for a formal briefing and consultation (July 8-9, 2009).

## **FEDERAL, STATE, and LOCAL AGENCIES**

In addition to notifying the tribes, the Service sent letters about the planning process including an invitation to participate on the planning team to the following agencies: USACE, BLM, MFWP, and DNRC. The Service sent notification letters to the Montana State Historic Preservation Office and to the six counties (Fergus, Petroleum, Garfield, McCone, Phillips, and Valley). In September 2007, Service staff met with representatives from the conservation districts and the counties to inform them of the CCP and EIS process and discuss the project.

As a result, the Service received formal letters requesting cooperating agency status from the six counties, the Garfield County Conservation District, and the Missouri River Conservation District Council. The Service granted the six counties cooperating agency status. Two representatives attended planning team meetings on behalf of all the counties. Additionally, the Service granted the six conservation districts that surround the refuge cooperating agency status, allowing for one representative to attend meetings on behalf of all the conservation districts.

In summary, the cooperating agencies included USACE, BLM, MFWP, DNRC, Fergus, Petroleum, Garfield, McCone, Phillips, and Valley Counties, and the Missouri River Conservation Districts. A memorandum of understanding was signed by all the agencies, and the signed document was posted to the planning website (FWS 2007a).

---

## **B.3 Planning Team Meetings**

In November 2007, the planning team met with the Federal and State agencies. Following the addition of the counties and Missouri River Conservation Districts as cooperating agencies, in April 2008 the entire planning team met twice. The first meeting occurred April 15 for bringing all the cooperating agencies together, as several agencies had been

added since the first meeting in the fall of 2007. Key topics included developing of the Memorandum of Understanding, discussion of the Scoping Report, the upcoming alternatives development workshop, and a preliminary discussion about alternative scenarios.

A second meeting occurred when the refuge staff met for a three-day alternatives workshop, which included representation from most of the cooperating agencies involved in the project. At this workshop preliminary alternative concepts were further developed. Some agency representatives chose instead to participate in a two-day briefing held June 17-18, 2008 to discuss the concepts that had been further refined and to go out onto the refuge to discuss specific issues. For this meeting, the Service mailed all of the cooperating agencies a copy of the revised draft alternatives table prior to the meeting. The cooperating agencies offered substantial input and feedback on the initial draft alternatives during the June briefing including written comments that were submitted by McCone County. The Service incorporated many of those comments and concerns prior to publishing the entire alternatives chart for the public on the website in early August.

In early January and February 2009, the planning team met twice to develop preliminary objectives and strategies for all the alternatives. In May of 2009, the Service held another planning team meeting, which included all the county commissioners for the purposes of discussing roads and the accuracy of the data the Service had acquired to date.

The Service provided the cooperating agencies with copies of the internal review document in April 2010. Following a 5-week review period, the Service met with the cooperating agencies in June 2010 to discuss the significant issues identified during their review. Before release of the public draft, the Service met again with the cooperating agencies to advise them of any significant changes to the document.

## ALTERNATIVES DEVELOPMENT

The Service considers alternatives development as part of an iterative process in the development of the Draft CCP and EIS (FWS 2000b). This phase of the project began in spring 2008, and public input ended in late fall 2008. Following input by the cooperating agencies and the public on the draft alternatives, detailed objectives and strategies for all the alternatives were developed in early 2009 with input by the cooperating agencies.

## OUTREACH ACTIVITIES

In August 2008, the planning team presented four draft alternatives to the public, including a no-action

alternative. One alternative (D) was identified as the proposed action. The Service's planning policy (FWS 2000b) requires that one alternative be identified as the draft proposed action. It is the alternative that the Service believes best fulfills the refuge purpose, mission, vision, and goals of the National Wildlife Refuge System. At this stage, the alternatives were described as conceptual approaches or themes including the type of management actions that would occur under each approach. For a planning process such as for the Charles M. Russell and UL Bend refuges, where an EIS is being prepared, the Service often solicits feedback on the draft alternatives prior to full development of them. While not required under the National Environmental Policy Act, this allows the public an opportunity to provide input earlier into the alternatives process. It also gives the refuge staff a chance to talk about what they would like to achieve. The Service does not select a preferred alternative until the preparation and publication of the final CCP and EIS.

## Planning Updates

Planning Update, Issue 3, August 2008 was mailed or handed out in the refuge headquarters to over 720 persons and businesses during the comment period with most of the updates mailed the week of August 4, 2008 (FWS 2007a). This planning update outlined the initial draft alternatives developed by the planning team and provided the dates, times, and locations of the public workshops. The distribution list consisted of individuals, agencies, and organizations who had previously expressed an interest in refuge activities. In addition, the planning update was handed out at the meetings.

The Service followed up with another update (Planning Update, Issue 4, January 2009), which summarized what had been learned during the comment period. Both updates and a more detailed summary of comments were posted on the project website.

## Press Release

On August 18, the Service issued a press release notifying the public of the schedule and location of the public meetings to nearly 270 media organizations throughout Montana including congressional offices, other Federal and State agency offices, and tribal agencies. A number of news articles about the planning process appeared in a number of newspapers, radio, TV, and online publications prior to the meetings.

## Paid Advertisements

The Service placed paid advertisements in nine newspapers to announce the 2008 meetings. The advertisements, 3.75 inches by 6 inches, were placed in the

Billings Gazette (August 21), Bozeman Daily Chronicle (August 21), Great Falls Tribune (August 18), Circle Banner (August 21), Glasgow Courier, Glendive Ranger Review (August 20–21), Jordan Tribune (August 20–21), Lewiston News-Argus (August 20), and Phillips County News (August 20).

### **Public Workshop Meetings**

One hundred and eighty-eight people attended one or more of the seven workshops from September 2-17, 2008, in Lewistown, Jordan, Malta, Glasgow, Billings, Bozeman, and Great Falls.

Following a brief welcome and introduction, the project leader made a short presentation highlighting:

- Project schedule
- Mission of the National Wildlife Refuge System, purposes of the refuge
- Process for alternatives development
- Definitions of reasonable alternatives, alternative concepts, objectives and strategies, and definition of proposed action versus preferred alternative (not until end of project)
- Overview of the alternatives
- Common issues

Following the presentation, the planning team used the remainder of the meeting to solicit feedback on the alternatives. For the first four meetings (Lewistown, Glasgow, Malta, and Jordan) participants broke into small working groups and rotated every 20-25 minutes through a discussion specific to each alternative. During the second week of meetings, audiences were small (average 15-25 people), and the Service held the discussions as one group. For all meetings, refuge staff presented information about each of the alternatives, and participants were asked to provide feedback and ask questions.

The Service did not use a public hearing format for public testimony, as the intent of the workshop format was to facilitate smaller group discussions during this phase of the project. Many participants liked this format, but others raised concerns in their written comments about not having an opportunity to provide scoping comments in a legal hearing format. The Service appreciates any feedback including criticism regarding the format used for meetings. A hearing format will be used for the meetings on the draft CCP and EIS. The Service has fully followed the requirements set forth in the National Environmental Policy Act in addition to departmental and bureau policies during the scoping process.

### **Other Meetings with Individuals and Groups**

When asked, refuge staff provided briefings and status updates to stakeholder groups including the Con-

servation Districts, the Wilderness Society, World Wildlife Fund, Ranchers Stewardship Alliance, Montana Association of State Grazing Districts, Kalispell Sportsmen group, Gallatin Wildlife Association, and others.

The Service held several seminars during the development of the draft CCP and EIS to provide information about the Service's plans to use prescribed fire and grazing to meet the objectives of the draft CCP. These seminars included presentations by Dr. Sam Fuhlendorf and Dr. Cecil Frost, who assisted the Service in developing information for the analysis in the draft CCP and EIS. Many Federal, State, and local agencies, conservation organizations, and members of the public attended one or more of these sessions.

Other one-on-one discussions, briefings, and field trips occurred throughout the planning process. Service representatives engaged in many conversations with individuals that called or stopped by the refuge offices.

---

## **B.4 Comment Period**

The Service accepted comments from early August 2008 through October 31, 2008, but also informed the public that comments were welcome throughout the development and writing of the Draft CCP and EIS until the formal comment period on the Draft CCP and EIS ended. The Service established an ending date for comments on the draft alternatives to use the information learned to fully develop each alternative with detailed objectives and strategies that would form the basis of the environmental analysis. The Service received one written request from the Six County Fort Peck Road Group, a group formed earlier by the six counties adjacent to the refuge, to extend the deadline for submitting comments on the draft alternatives. The Service denied the request and reiterated that comments were welcome past the October 31st deadline, but that the process needed to move forward, and sufficient time had been provided for review of the preliminary draft alternatives. The Service made all of its information available to the public in early August 2008, providing the public over 60 days to provide input. In addition, representatives of the cooperating agencies provided input into the alternatives concepts during several meetings held in April and June of 2008, and during the development of objectives and strategies in early 2009. Members of the Six County Fort Peck Road Group (a group made up of county commissioners to address roads) were also given an opportunity to participate in a meeting that specifically addressed roads in May 2009.

## METHODS for COMMENT COLLECTION and ANALYSIS

The Service's primary objective in providing the public an early opportunity to review the alternatives was to gather additional input prior to writing the objectives and strategies and conducting the environmental analysis. All comments, questions, or issues, whether from written submissions or recorded at the public meetings were organized by topic into a spreadsheet and coded for organizational purposes. The planning team made every effort to document all issues, questions, and concerns. Regardless of whether comments and questions were general in nature or about specific points of concern, they were identified.

All comments were considered to be of equal importance. While the planning team valued the comments made in support or opposition to a specific alternative or issue, the team also was seeking feedback on the range of alternatives, whether there were other reasonable alternatives that should be included in the analysis, and whether any of the alternatives should be changed in some way.

## NUMBER and SOURCE of COMMENTS RECEIVED

During the course of the comment period, the planning team received hundreds of questions and comments during the seven public meetings held across Montana and nearly 300 written responses in the form of letters, emails, and from the handout sheet provided at the public meetings. Twenty-six agencies and organizations submitted comments; the breakdown of type and number of comments follows:

<i>Type of Comment</i>	<i>Number of Comments</i>
Public meetings	hundreds
Form letters	123
Individuals letters, emails, questionnaires	134
Agency, organizations (included two legal letters)	27

There were two distinct form-type letters. While similar in content, one was generated from the Garfield County Conservation District and sent to livestock owners and published in at least some of the local papers. Nine people submitted a second form-type letter, and while the affiliation is not known, most came from the Glasgow area. The key issues identified in both form letters were: importance of livestock grazing and general opposition to prescriptive grazing, opposition to wildlife reintroduction, opposition to removal of interior fencing, support

for more water development in upland areas and maintenance of current structures, desire for access for recreation, fire suppression, and livestock management, and the concern that Payment in Lieu of Tax payments are too low and don't represent fair market value, proposed wilderness units need to be reevaluated, wildlife needs to be kept on the refuge, the refuge needs to increase predator control, the refuge is the largest source of invasive plants, and fire suppression should be increased and prescribed fire should not be pursued.

An action alert by the Montana Wilderness Association generated many individual letters and emails. The key issues were: support for alternative D, support for reducing the 700-mile road network or limiting off-road travel, support for wilderness values particularly the proposed wilderness units, restricting livestock grazing where it is needed to maintain wildlife habitat and support for prescriptive grazing, removing obsolete fencing and letting wildlife move more freely, banning hot-season grazing in the river bottoms and limiting livestock grazing in riparian areas.

In addition, many other individuals and organizations voiced their concerns about other topics. Examples included concerns about boat access and types of boats, and hunting and general recreational access or the type of expertise the Service was using in the preparation of the CCP and EIS.

## SUMMARY of COMMENTS

Commenters expressed highly varied opinions in support of or opposition to a range of topics including alternative preferences, habitat and wildlife management, prescriptive livestock grazing, wilderness, wildlife reintroductions, public access, roads, commercial recreation, interior fencing, water development, and prescribed fire. A detailed summary of the comments was posted on the project website and another planning update (Planning Update Issue 4) was mailed to the mailing list (FWS 2007a).

## B.5 Changes to the Draft Alternatives

From a review of all of the comments, no new significant topics or issues were identified that had not been identified during scoping (refer to chapter 1). All of the action alternatives were clarified or refined in some way as a result of the comments. Suggestions for alternative approaches that were not carried forward in the analysis are discussed in chapter 3.

## **B.6 List of Entities Receiving the Draft CCP and EIS**

The following Federal and State agencies, along with nonprofit organizations, grazing or outfitting permittees, or other businesses that were on the project mailing list received copies of the Draft CCP and EIS. All interested groups and the public on the project mailing list (800+ names) received a copy of Planning Update, Issue 5, which summarized the contents of the Draft CCP and EIS, announced the locations and times of the public hearings, and provided information on how to obtain a copy of the CCP and EIS, including downloading it from the project website.

### **FEDERAL ELECTED OFFICIALS**

- U.S. House of Representatives, Montana Representative Dennis Rehberg
- U.S. Senate, Montana Senator Max Baucus
- U.S. Senate, Montana Senator Jon Tester

### **FEDERAL AGENCIES**

- Army Corps of Engineers, Fort Peck
- Bureau of Land Management, Field Offices—Lewistown, Malta, Miles City; Montana State Office—Billings
- Department of Agriculture, Natural Resource Conservation Service, Bozeman, Montana; Forest Service, Rocky Mountain Research Station, Ogden, Utah
- Environmental Protection Agency, Helena, Montana
- Federal Highways Administration, Western Lands Office, Vancouver, Washington
- U.S. Fish and Wildlife Service—region 6 programs, Denver, Colorado, Invasive Strike Team—Great Falls, Ecological Services—Helena, Montana, region 9—Washington D.C.
- National Park Service, Lewis and Clark National Trail, Omaha, Nebraska, regional office—Denver, Colorado

### **TRIBES and TRIBAL ORGANIZATIONS**

- Arapaho Business Council
- Assiniboine and Gros Ventre Tribes (Fort Belknap)
- Assiniboine and Sioux Tribes (Fort Peck)
- Chippewa Cree Tribe
- Northern Cheyenne Tribe
- Crow Tribe

### **MONTANA ELECTED OFFICIALS**

- Governor Brian Schweitzer
- Representative Ed Butcher
- Representative Dave Kastin
- Representative Wayne Stahl
- Senator Jim Peterson
- Senator John Brenden
- Senator Johnathan Windy Boy

### **MONTANA STATE AGENCIES**

- Department of Fish, Wildlife, and Parks, director—Helena, Montana, region 4—Great Falls, Lewistown Area Resource Office, region 6—Glasgow, region 7—Miles City, State Wildlife Grants—Great Falls
- Department of Natural Resources, director—Helena, Montana, Lewistown, Miles City,
- Department of Transportation, Lewistown
- Montana Historical Society and Preservation Office
- Natural Heritage Program, Helena

### **COUNTY and LOCAL GOVERNMENTS and AGENCIES**

- Fergus County Commissioners
- Garfield County Commissioners
- McCone County Commissioners
- Petroleum County Commissioners
- Phillip County Commissioners
- Valley County Commissioners
- Missouri River Council of Conservation Districts—Great Falls; Fergus County Conservation District, Garfield County Conservation District, McCone County Conservation Districts, Petroleum County Conservation District, Phillips County Conservation District, Valley County Conservation District

### **ORGANIZATIONS and EDUCATIONAL INSTITUTIONS**

- American Bird Conservancy, The Plains, Virginia
- American Prairie Foundation, Bozeman, Montana
- National Audubon Society—New York, Washington D.C.; Montana Audubon—Helena, Montana; Upper Missouri Breaks Audubon—Great Falls, Yellowstone Valley Audubon—Bozeman, Montana
- Defenders of Wildlife, Bozeman, Montana, Missoula, Montana, Washington D.C.
- Denver Museum of Nature and Science, Curator of Vertebrate Paleontology, Denver, Colorado
- Department of Natural Resource Ecology and Management, Iowa State University, Iowa

- Ducks Unlimited, Memphis, Tennessee
- Environmental Defense Center for Conservation Incentives, Boulder, Colorado
- Fort Peck Lake Association, Fort Peck, Montana
- Foundation for North American Wild Sheep, Cody, Wyoming
- Friends of the Missouri River Breaks, Lewistown, Montana
- Gallatin Wildlife Association, Bozeman, Montana
- Hellgate Hunters and Anglers, Missoula, Montana
- Izaak Conservation League, Gaithersburg, Maryland
- Maryland Ornithological Society, Ellicott City, Maryland
- Missouri River County, Wolf Point, Montana
- Montana Farm Bureau, Bozeman, Montana
- Montana Mountain Bike Alliance, Bozeman, Montana
- Montana Petroleum Association, Helena, Montana
- Montana Trail Vehicle Riders Association, Great Falls, Montana
- Montana Trappers Association, Winnett, Montana
- Montana Wildlife Federation, Helena, Montana
- Montana Wilderness Association, Great Falls, Helena, Montana
- Montana Wildlands Association, Central and Eastern Association, Lewistown and Billings, Montana
- Mule Deer Foundation, Eastern, Bismarck, North Dakota
- Museum of the Rockies, Montana State University, Bozeman, Montana
- National Trappers Association, New Martinsville, West Virginia
- National Wildlife Federation, Reston, Virginia, Northern Rockies Project Office—Missoula, Montana
- National Wildlife Refuge Association, Washington D.C.
- Nature Conservancy, Matador Ranch, Dodson, Montana
- Our Montana, Inc., Billings, Montana
- Ranchers Stewardship Alliance, Malta, Montana
- Sierra Club, San Francisco, California
- The Wilderness Society, Bozeman, Washington D.C.
- University of Montana, Missoula, Montana
- U.S. Humane Society, Washington D.C.
- Walleyes Unlimited of Montana, Big Sandy, Montana; Crooked Creek Chapter, Malta, Montana
- Western Watersheds Project, Inc., Mendon, Utah
- Wild Sheep Foundation, Montana Chapter
- Wildlife Conservation Society, Bozeman Montana
- World Wildlife Fund, Bozeman, Montana
- Yellowstone Buffalo Foundation, Bozeman, Montana

## PUBLIC LIBRARIES

- Colorado State University, Morgan Library, Fort Collins, Colorado
- Garfield County Library, Jordan Montana
- Glasgow Library, Glasgow, Montana
- Great Falls Public Library, Great Falls, Montana
- Lewistown Public Library, Lewistown, Montana
- McCone County Library, Circle, Montana
- Montana State University Libraries—Billings, Bozeman, Havre, Montana
- Phillips County Library, Malta, Montana
- Petroleum County Library, Winnett, Montana
- U.S. Fish and Wildlife Service, National Conservation Training Center Library, Shepherdstown, West Virginia



# Appendix C

## *Draft Compatibility Determinations*

---

### C.1 Uses

- Recreational hunting
- Recreational fishing
- Wildlife observation, photography, environmental education, and interpretation
- Camping
- Geocaching
- Guided hunting (outfitting)
- All-terrain vehicle and snowmobile use
- Prescriptive grazing
- Research

---

### C.2 Refuge Names

- Charles M. Russell National Wildlife Refuge
- UL Bend National Wildlife Refuge

---

### C.3 Establishing and Acquisition Authorities

The following laws and executive order established the refuges and authorized acquisition of refuge lands.

#### **CHARLES M. RUSSELL NATIONAL WILDLIFE REFUGE**

- Executive Order 7509, dated December 11, 1936
- Refuge Recreation Act
- Bankhead-Jones Farm Tenant Act
- Migratory Bird Conservation Act of 1929

#### **UL BEND NATIONAL WILDLIFE REFUGE**

- Fish and Wildlife Coordination Act
- Migratory Bird Conservation Act
- Fish and Wildlife Act 1956
- Refuge Administration Act
- Wilderness Act Legislation

---

### C.4 Refuge Purposes

Each refuge was established for specific purposes, as described below.

#### **CHARLES M. RUSSELL NATIONAL WILDLIFE REFUGE**

- “For the conservation and development of natural wildlife resources and for the protection and improvement of public grazing lands and natural forage resources: Provided, That nothing herein contained shall restrict prospecting, locating, developing, mining, entering, leasing, or patenting the mineral resources of the lands under the applicable laws: ... Provided, however, That the natural forage resources therein shall be first utilized for the purpose of sustaining in a healthy condition a maximum of four hundred thousand (400,000) sharptail grouse, and one thousand five hundred (1,500) antelope, the primary species, and such nonpredatory secondary species in such numbers as may be necessary to maintain a balanced wildlife population, but in no case shall the consumption of forage by the combined population of the wildlife species be allowed to increase the burden of the range dedicated to the primary species: Provided further, That all the forage resources within this range or preserve shall be available, except as herein provided with respect to wildlife, for domestic livestock.” (Executive Order 7509, dated December 11, 1936)
- “Shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon.” (16 U.S.C. 664, Fish and Wildlife Coordination Act)
- “Suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species” (16 U.S.C. 460k-1), “the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors.” (16 U.S.C. 460k-2, Refuge Recreation Act [16 U.S.C. 460k-460k-4], as amended)

- “Purposes of a land-conservation and land-utilization program.” (7 U.S.C. 1011, Bankhead-Jones Farm Tenant Act)
- “Particular value in carrying out the national migratory bird management program.” (16 U.S.C. 667b, An Act Authorizing the Transfer of Certain Real Property for Wildlife)
- “Conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans.” (16 U.S.C. 668dd [a] [2], National Wildlife Refuge System Administration Act)
- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. 715d, Migratory Bird Conservation Act)

## UL BEND NATIONAL WILDLIFE REFUGE

- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d, Migratory Bird Conservation Act), “reserved for the UL Bend National Wildlife Refuge” (Public Land Order 4588, dated March 25, 1969), “for the protection of lands for migratory waterfowl management.” (Public Land Order 4826, dated May 15, 1970)
- “Shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon.” (16 U.S.C. § 664, Fish and Wildlife Coordination Act)
- “Particular value in carrying out the national migratory bird management program.” (16 U.S.C. § 667b, An Act Authorizing the Transfer of Certain Real Property for Wildlife)
- “For the development, advancement, management, conservation, and protection of fish and wildlife resources.” (16 U.S.C. § 742f [a] [4])
- “For the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude.” (16 U.S.C. § 742f [b] [1], Fish and Wildlife Act of 1956)
- “Conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans.” (16 U.S.C. § 668dd [a] [2], National Wildlife Refuge System Administration Act)
- “To secure for the American people of present and future generations the benefits of an enduring resource of wilderness ... wilderness areas ... shall be administered for the use and enjoyment of the American people in such manner as would

leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.” (16 U.S.C. 1131, Wilderness Act)

## NATIONAL WILDLIFE REFUGE SYSTEM MISSION

The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

## C.5 Description of Use: Recreational Hunting

The Charles M. Russell National Wildlife Refuge recreational hunting program allows for the take of elk, pronghorn, white-tail and mule deer, waterfowl (ducks and geese), upland game birds (turkey, ring-necked pheasant, mourning dove, sage-grouse, sharp-tailed grouse, Hungarian partridge) and coyotes. Season dates, limits, and harvest methods are generally consistent with State regulations, with the exception of mule deer and coyotes. Both have refuge-specific restrictions at the time of publishing. Specific regulations are available to the public at our website at [www.fws.gov/cmr](http://www.fws.gov/cmr) or any office of the refuge (Lewistown, Sand Creek, Jordan, and Fort Peck).

In 2009, there was an estimated 103,000 hunter visits on the refuge, which is about 41 percent of the annual visitation for the refuge (annual visitation is about 250,350). The refuge is one of the most notable areas in the State of Montana for big game hunting. The refuge staff observes a small number of waterfowl and upland bird hunters each year. Recreational hunting is one of the six wildlife-dependent recreational uses on the refuge. The use of hunting is a tool used by the refuge system to control wildlife populations to maintain biological diversity and mimic natural processes that are missing or diminished.

Hunting takes place refuge-wide with the exception of administrative areas, closed areas (Slippery Ann Elk View Area), and recreational areas. Dual collateral refuge officers and currently one full-time refuge officer monitor hunters and their take. Especially during the big game rifle season when use on the refuge reaches its peak, refuge officers work in coordination with other Federal officers and State game wardens to ensure the use of safe and legal hunting practices.

## AVAILABILITY of RESOURCES

Adequate resources are available to manage the existing hunting program at the current level of participation. The current road system provides access for hunters onto the refuge for hunting. Most refuge roads become impassible with only a minimal amount of precipitation. During the hunting season, this may cause clustering of hunters in localized, accessible areas of the refuge.

Increased use of the river as a motorway for access has provided many the opportunity for solitude and a primitive and unconfined hunt. This allows for access to resources that cannot be attained via the road system or easily on foot. Several wilderness units are only accessible on foot or via the Missouri River.

Aerial big game surveys are used during the year to establish counts and population statistics on elk, mule deer, white-tailed deer, and pronghorn. These monitoring survey's assist in the overall health of the populations, which could be used to establish limits or expand the hunting program. To assist in enforcement on the refuge all four of the dual-function officers participate in a weekend rotation conducting law enforcement duties. The refuge currently has only one full-time officer. Additional needs are addressed in the comprehensive conservation plan (CCP).

A refuge hunting regulation brochure is available to inform the public of hunting opportunities, refuge regulations, and safety precautions. Maps are also available which show the location of roads, recreation areas, and those areas closed to hunting.

## ANTICIPATED IMPACTS of the USE

Temporary disturbance would exist to wildlife near the activity. Animals surplus to populations would be removed by hunting. A temporary decrease in populations of wildlife might help ensure that carrying capacity (especially for big game species) is not exceeded. Closed areas would provide some sanctuary for game and nongame species, minimize conflicts between hunters and other visitors, and provide a safety zone around communities and administrative areas. The harvest of these species would be compensatory mortality, with minimal impact to the overall health of their populations.

Temporary impacts to the habitat are expected due to the use of camping grounds, tree stands, and possible illegal off road travel. To mitigate the possible impacts, the refuge has established camping areas providing parking and vault toilets. We also enforce a pack-in, pack-out policy encouraging folks to remove their trash.

## PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public

meetings held during the CCP process, and formal public review of this compatibility determination as part of the draft CCP and EIS for the refuge.

## DETERMINATION

Recreational public hunting and those commercial outfitters retaining special use permits are compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, recreational hunting can occur on the refuge if the following stipulations are met:

1. Hunting is prohibited in all administrative sites, closed areas, and recreational areas.
2. Target shooting with firearms is prohibited at all times on the refuge.
3. Collection of antlers, artifacts, and fossils is prohibited.
4. All boats, trailers, and ATVs must be properly licensed from the State of origin. In addition, all ATVs must be street legal, which requires brake lights and rear mirror in addition to licensing.
5. All vehicles, including ATVs are only allowed on open, numbered roads.
6. Nonmotorized game carriers are allowed on the refuge except on the UL Bend Wilderness.
7. The use of firewood is allowed for those dead and downed trees. No live cutting is permitted.

**Justification.** Recreational public hunting is a historical wildlife-dependent use of the refuge complex, and is designated as one of the priority public uses as specified in the Refuge Improvement Act of 1997. Infrastructure is already in place to support hunting programs, and current personnel levels and funding are adequate. Special regulations are in place to minimize negative impacts to the refuges and associated wildlife. Montana State law further controls hunter activities. Hunting is a legitimate wildlife management tool that can be used to control wildlife populations. Hunting harvests a small percentage of the renewable resources, which is in accordance with wildlife management objectives and principals.

**Mandatory 15-year reevaluation date:** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

---

## C.6 Description of Use: Recreational Fishing

The refuge allows public recreational fishing in accordance with the State fishing regulations and seasons,

and in coordination with refuge and United States Army Corp of Engineers regulations. The uses covered in the determination would be fishing on refuge reservoirs, fishing on the Missouri River, fishing on the Fort Peck Lake as well as the use of such areas as boat ramps, parking areas, fishing areas, and the use of other structures maintained to facilitate the refuge's fishing program.

During the months that ice fishing is available, ice houses are permitted on the Fort Peck Reservoir December 1 to March 31. The owner's name and address must be attached to the outside wall of the structure.

In 2009, the refuge had more than 60,000 visitors for recreational fishing. Lake trout, salmon, bass and upriver paddle fish are some of the more popular species sought after. Recreation fishing is allowed throughout the year, however access is variable based on road conditions. Licensed vehicles and licensed all terrain vehicles are allowed on refuge numbered routes and the ice surface of Fort Peck Lake. Snowmobiles are only allowed to travel on the surface of Fort Peck Lake. Travel off Fort Peck Lake and numbered routes is not allowed with any vehicle (i.e., travel along the shoreline).

## AVAILABILITY of RESOURCES

Anglers use the existing network of roads to access the river, lake, and various reservoirs of the refuge for fishing. There are twelve locations for launching boats; however, with the water level fluctuation of the Fort Peck Reservoir some boat ramps may be inaccessible to the water. The refuge complex has adequate administrative and management staff to maintain its fishing program.

Annual funding is needed for seasonal workforce salary and for supplies to maintain fishing facilities (including mowing, painting, and repairing facilities, litter pickup, restroom cleaning supplies, and periodic pumping costs of vaulted toilets). Funding is needed for law enforcement staff salaries, fuel costs, repairs, and maintenance of patrol vehicles, and associated costs to support the law enforcement program. Routine law enforcement patrols occur year-round. The refuge is currently hiring an additional law enforcement officer at the Fort Peck Field Station and a portion of their duties would be to patrol recreational fishing on the refuge.

## ANTICIPATED IMPACTS of the USE

The anticipated impacts of recreational fishing are considered minimal. Recreational fishing is one of the six wildlife-dependent priority public uses identified by Service policy. These uses are encouraged when compatible with refuge purposes. The distur-

bance is expected to be limited in scope and duration. All motor vehicle use is restricted to numbered routes and parking areas, which reduces disturbance to wildlife. The vast size of the nearly 250,000-acre Fort Peck Reservoir allows for a large number of anglers and an opportunity for solitude.

The CCP's proposed action (alternative D) recommends establishing clear access for ice fishing. This recommendation could assist in diverting potential violators from disturbing shoreline and upland habitat to access the ice for fishing. Anglers occasionally violate regulations; however, these incidents usually have only minor impacts to fish populations or refuge resources.

## PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public meetings held during the CCP process, and formal public review of this compatibility determination as part of the draft CCP and EIS for the refuge.

## DETERMINATION

Recreational public fishing is compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, recreational fishing can occur on the refuge if the following stipulations are met:

1. This use must be conducted in accordance with State and Federal regulations, and applicable special refuge regulations published.
2. Travel is only permitted on numbered routes with licensed motor vehicles.
3. Travel is permitted on the surface of Fort Peck Reservoir with licensed motor vehicles and snowmobiles.
4. Shoreline travel is not permitted on the refuge.

**Justification.** Recreational fishing is a historical wildlife-dependent use at Charles M. Russell National Wildlife Refuge and is one of the priority public uses as specified in the Refuge Improvement Act of 1997. Infrastructure is already in place to facilitate this activity. Current personnel levels and funding resources are adequate. Special refuge regulations are in place to minimize negative impacts to refuge habitat and wildlife.

**Mandatory 15-year reevaluation date:** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

## C.7 Description of Use: Wildlife Observation, Photography, Environmental Education, and Interpretation

Currently, public use on the refuge accounts for nearly 87,100 visitors. This includes participants in wildlife observation, wildlife photography, environmental education, interpretation and other recreational participants. These activities may take place on foot, bicycle, automobile, motorized boat, canoe, horse, cross-county skis and snowshoes. The refuge complex is open from dawn to dusk, and entry into closed areas is allowed through a special use permit and special conditions that are evaluated on a case-by-case basis.

With four of the above accounted uses being one of the six priority public uses of the Refuge System, these uses are to be encouraged when found to be compatible with the refuge purpose.

Refuge staff would assist in activities when available. Organized groups, such as schools, scouts, and 4-H organizations, may have instructors or leaders who would use refuge habitat and facilities to conduct compatible programs. Ages of participants range from preschool to college and beyond.

### AVAILABILITY of RESOURCES

The refuge provides outstanding opportunities for the above uses due to the abundance of deer, elk, eagles, prairie dogs, and other unique species that people find interesting. The opportunity for solitude and premier landscape views are numerous across the entire refuge.

The CCP's proposed action (alternative D) recommends expanding interpretation and environmental education, and maintaining wildlife observation programs and facilities. The interpretation and environmental education programs would emphasize the principles of natural plant and animal communities and ecological processes and restoration.

Implementing improvements or expanding public use opportunities would be addressed in future step-down management plans and through future funding requests. Program expansion would require increased funding for operations and maintenance. When funding is not adequate to operate and maintain programs, they would be reduced in scope or discontinued. Information kiosks, interpretive signs, and other infrastructure are in place for the present level of public use activities.

### ANTICIPATED IMPACTS of the USE

The disturbance of wildlife is considered a minimal impact of public use. The disturbance is considered

temporary and local, such as running off feeding deer and elk or the flushing of upland bird species. The benefits of educating the public and providing for a quality outdoor recreational experience are considered to outweigh the potential impacts of disturbing wildlife and the associated habitat.

### PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public meetings held during the CCP process, and formal public review of this compatibility determination as part of the draft CCP and EIS for the refuge.

### DETERMINATION

Wildlife observation, photography, environmental education, and interpretation is compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, wildlife observation, photography, environmental education, and interpretation can occur on the refuge if the following stipulations are met:

1. Managers would monitor use patterns and densities and make adjustments in timing, location, and duration as needed to limit disturbance.
2. Use would be directed to public use facilities (both existing and in the future) or those areas appropriate for the use, which would not be within sensitive areas.
3. Observation areas would continue to provide wildlife information and safe areas for the public to pull the main roadway for view and photography.

**Justification.** Public use for wildlife observation, photography, environmental education, and interpretation is a historical wildlife-dependent use of the refuge. These activities are designated as priority public uses as specified in the Refuge Improvement Act of 1997. Special regulations are in place to minimize negative impacts to the refuges and associated wildlife. The proposed action (alternative D) for the refuge CCP would support the addition of two outdoor recreation specialists to assist in the area of public use. Disturbance to wildlife is limited by the size and remote nature of large parts of the refuge. Disturbance is also generally short-term and only temporarily displaces wildlife and the adjacent wildlife habitat.

**Mandatory 15-year reevaluation date:** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

## C.8 Description of Use: Camping

Camping is defined as erecting a tent or shelter, preparing a sleeping bag or other bedding material for use, parking of a motor vehicle or camper trailer fit for occupancy. The use of camping on the refuge is not considered one of the wildlife-dependent uses established in the National Wildlife Refuge System Improvement Act of 1997, but it facilitates the use of all six uses considered wildlife-dependent. Due to the remote location of the refuge, it is necessary for the health and safety of those who are recreating on the refuge to be allowed to establish a location to camp. This use is being proposed due to the remote location of the refuge and as a necessary convenience when taking into consideration the health and safety of the recreationists using the refuge.

The refuge currently has 21 established camping areas. While camping is allowed refuge-wide, these areas contain facilities that are not available everywhere. Driving off-road to establish a campsite is only allowed within 100 yards of a numbered route. Driving off-road for all other purposes is prohibited. Camping is allowed to occur at all times on the refuge. Most of the camping occurs during open hunting seasons in August through most of November. Most camping takes place within 100 yards of a numbered route and ranges in facilities such as a tent of natural or synthetic material or a camper trailer with minimal modern conveniences.

### AVAILABILITY of RESOURCES

**Resources involved in the administration and management of the use:** Resources involved in the use of camping on the refuge would include law enforcement officers to ensure compliance with refuge regulations, maintenance of facilities available for recreationists and camping, and funding to produce refuge brochures explaining refuge regulations and mapping locations.

**Maintenance costs, special equipment, facilities, or improvements necessary to support the use:** Maintenance of current vault toilets and hardened campsites is minimal and although funding is not optimum, personnel is available to allow this use at current levels.

**Offsetting revenues:** The refuge does not currently charge a fee or require a permit for camping.

### ANTICIPATED IMPACTS of the USE

**Short-term impacts:** There would be localized disturbance of vegetation in the area where camping facilities are set-up. Other uses such as setting up a campfire and general use of the area around the campsite would have an impact on the vegetation and cause a disturbance to wildlife in the area. Due to the refuge

limit of camping for a maximum of 14 days within any 30-day period, these impacts are short term and expected to recover back to a natural state with little to no restoration conducted by refuge staff.

**Long-term impacts:** Due to the high number of campers during the hunting season, certain locations on the refuge receive a higher concentration of users. These areas have consistent use and require longer to recover back to a natural state. In these areas not only is the refuge vegetation and wildlife heavily impacted, but refuge regulation violations can be high as well. During fishing and hunting season, it is more common to find violations due to dogs off leash, intoxication, illegal drugs, illegal firearm use, human waste, littering, disturbances to other users, and noise violations. This increase in refuge violations has become a recurring expense on the refuge law enforcement.

**Cumulative impacts:** While certain times of year and locations receive a greater number of users and a higher potential for long-term impacts, the use of camping on the refuge is deemed to have a greater benefit to the public by supporting wildlife-dependent uses on the refuge.

### PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public meetings held during the CCP process, and formal public review of this compatibility determination as part of the draft CCP and EIS for the refuge.

### DETERMINATION

Camping is compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, camping can occur on the refuge if the following stipulations are met:

1. Except where designated as closed, camping (other than backpacking) must take place within 100 yards of the waters of the Missouri River and Fort Peck Reservoir or within 100 yards of refuge numbered roads that are designated as open.
2. All camping is limited to 14 days within any 30-day period. Any property, including camping equipment, boats, trailers, and other personal property left unattended for a period in excess of 72 hours is subject to removal.
3. Use of dead and downed wood for campfires is allowed on the refuge. Removal of live limbs and trees is prohibited.
4. Actively promote the pack-in/pack-out policy for trash removal and campsite restoration.

- Continue to enforce public use regulations protecting the habitat and limiting the disturbance to other refuge visitors.

**Justification.** Currently, all six of the wildlife-dependent uses are used on the refuge. Due to the remote location of the refuge, lodging establishments are non-existent. For the health and safety of those who are utilizing the resources of the refuge and taking part in recreational activities, camping is necessary. The time at which camping on the refuge is at its peak is not considered to be a critical period for wildlife on the refuge. In the fall during hunting season, all wildlife has produced young of the year and migratory bird species have completed nesting. The size of the refuge and difficulty of public access to certain locations provides alternative areas for disturbed wildlife.

While regulation violations and disturbance to other visitors can locally be a problem, with the cooperation of State and local law enforcement the workload is minimized. Due to the primitive nature of camping sites throughout the refuge and the existence of very few facilities, maintenance needs are minimal.

Given the above, camping does not materially interfere with the purposes of the refuge or the mission of the Refuge System.

**Mandatory 15-year reevaluation date:** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

---

## C.9 Description of Use: Geocaching

Traditional geocaching (the burying, placement or removal of a physical cache) is generally not an appropriate use for national wildlife refuges in accordance with Service and Department of the Interior regulations and policies. However, other forms of geocaching have emerged that do not require burying, placing, or removing objects. Some of the most current types are Virtual Geocaching, Letterboxing, Earthcaching, Trail Link, and GPS Adventures. Geocaching is not a priority public use; however, certain types of geocaching may offer benefits to support our educational and interpretive programs and to learn more about our visitors.

The use of geocaching would be allowed refuge-wide with the exception of closed areas. Those participating in geocaching would be responsible for following all rules and regulations required of all refuge users. Geocaching would be allowed year round with the understanding that access to the refuge during the winter months is highly variable and most likely very limited. Refuge roads are often impassible due to the drifting of snow, and most roads are not maintained in the winter sea-

son. The refuge would evaluate the type of geocaching requested and how it benefits environmental education and interpretation. In accordance with refuge policy, refuge users are prohibited from disturbing archaeological resources, removing refuge resources such as plants, artifacts, and sheds, and abandoning property.

Geocaching has become a rapidly growing outdoor recreational activity. While traditional geocaching, which consists of burying or placing of a physical cache, would cause damage to the wildlife habitat, other forms of geocaching facilitates environmental education and interpretation, which are both wildlife-dependent priority public uses. By allowing geocaching to take place on the refuge, we are providing the opportunity for those who take part in the recreational activity to view wildlife and wildlife habitat.

### AVAILABILITY of RESOURCES

**Resources involved in the administration and management of the use:** The issuance of special use permits to those wanting to participate in geocaching on the refuge would be an additional administrative resource involved. The level of need for special use permits for geocaching is not known at this time. Depending on the number of user groups, it may be that the current level of refuge resources is sufficient, or it may show that there is a greater than anticipated interest and additional resources are necessary.

**Special equipment, facilities, or improvements necessary to support the use:** The refuge is not responsible for providing any additional equipment necessary to conduct this recreational use. The current refuge facilities that support refuge visitors are considered sufficient for the expected number of users.

**Maintenance costs:** The maintenance of general recreational facilities is not expected to significantly increase due to the use of geocaching on the refuge.

**Monitoring costs:** The increase in unfamiliar monitoring techniques using websites and additional monitoring methods with the frequently changing technological activities would require additional administrative resources. Websites that track geocaches and allow for a central location for users to communicate can also be used if there is an unapproved cache or abuse of the use on the refuge by disabling the proposed activity from its web pages and alerting its users of the inappropriate use.

**Offsetting revenues:** None.

### ANTICIPATED IMPACTS of the USE

**Short-term impacts:** The disturbance of wildlife, trampling of vegetation, and potential littering are all considered to be a minimal impact of public use. The prohibited practice of removing or leaving a cache on the

refuge would be considered to negatively impact the refuge resources, but by monitoring the use and communicating the rules and regulations, the benefits of educating the public and providing for a quality outdoor recreational experience are considered to outweigh the potential impacts.

**Long-term impacts:** There are no long-term impacts foreseen with the use of geocaching. By complying with refuge rules and regulations for this use, the long-term impacts are considered minimal to nonexistent.

**Cumulative impacts:** The potential short-term and long-term impacts are considered to be minimal the use of geocaching on the refuge is considered to have a positive impact by facilitating environmental education, interpretation, and wildlife observation.

## PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public meetings held during the CCP process, and formal public review of this compatibility determination as part of the draft CCP and EIS for the refuge.

## DETERMINATION

Geocaching is compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, geocaching can occur on the refuge if the following stipulations are met:

1. All refuge recreationists are responsible for knowing and following all refuge regulations.
2. The removal of refuge resources is prohibited. That includes, but is not limited to: the illegal take of wildlife, vegetation, archeological resources, antler sheds, and geological resources.
3. The burial of caches on the refuge is prohibited.
4. The abandonment or leaving of a cache on the refuge is prohibited.
5. Caches that deface public or private property, whether a natural or constructed object, to provide a hiding place, a clue or a logging method are prohibited.

**Justification.** The use of geocaching on the refuge is determined to be compatible with the refuge purpose and the mission of the Service. It allows an opportunity for the public to take part in wildlife observation, wildlife photography, environmental education, and interpretation, which are all considered priority public uses. With recreationists adhering to refuge regulations, it would minimize the impacts to the wildlife and wildlife habitat. By allowing the use of

this rapidly growing activity, the refuge is providing the opportunity for the American public, not currently aware of the Refuge System's conservation mission, to be environmentally educated and involved in conservation.

**Mandatory 15-year Reevaluation Date.** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

## C.10 Description of Use: Guided Hunting (Outfitting)

The refuge would authorize commercial hunting guide operations within the refuge, and regulate such use through the implementation of a hunting guide program and issuance of special use permits with conditions. This activity provides recreational opportunity for hunters who desire a successful, quality experience, but who may lack the necessary equipment, skills, or knowledge to hunt within the expansive Missouri River, Missouri River Breaks, and the rugged country the refuge encompasses. While guided hunts are not specifically identified as a priority public use, hunting is a priority public use.

Guided hunting operates under the same regulations as the public hunting. The use is allowed refuge-wide with the exception of closed areas, recreational areas, and administrative sites. There are currently 11 special use permits issued to outfitters on the refuge to conduct guided hunts. These 11 are spread throughout the entire refuge. Guided hunts are under the same Federal and State regulations and must adhere to the same limits, season dates, and wildlife-specific regulations. All guided hunts take place during the big game hunting seasons starting with bow season in late August through the general rifle season in November.

The refuge has consistently issued special use permits and established special conditions in addition to the Service's general conditions for special use permits. Refuge law enforcement would be responsible for regulating the use and any compliance issues that arise. Each outfitter would receive an outfitter identification card for operations on the refuge. The permits are valid only within the Charles M. Russell National Wildlife Refuge and UL Bend National Wildlife Refuge executive order boundaries. Including Service lands and United States Army Corps of Engineers (USACE) lands. All refuge outfitters must keep a log of use, and when requested by a refuge officer, State warden, or special agent, shall provide for inspection, current outfitter records as specified by 8.39.703 (Outfitters Records) of Chapter 39—Montana Administrative Rules.

Based on the existing client demand for guide services, a significant number of the hunting public is

willing to pay for the expertise and local knowledge provided by guides. To increase the chance of the public having a successful and quality hunting experience, the use of guides is a necessary approach due to the remote location and vast area of land.

## AVAILABILITY of RESOURCES

**Resources involved in the administration and management of the use:** The use of refuge law enforcement in cooperation with other Federal, State, and local officers during the hunting season is no greater due to guided hunts than with the public hunters. The issuance of special use permits takes time and effort of refuge staff with costs for printing the permits, issuing ID cards, and retaining records. The current staff is capable of issuing permits and managing the guided hunting program on the refuge.

**Special equipment, facilities, or improvements necessary to support the use:** The current equipment and facilities are adequate to meet the needs of the guided hunting program and the current participation levels.

**Maintenance costs:** As with the public hunting program, maintenance of vault toilets and camping facilities is necessary during peak recreation times of the year. Starting in August with big game bow hunting through the end of the big game rifle season in November, maintenance of recreation areas, vault toilets, camping areas, and general use of the refuge is necessary.

**Monitoring costs:** The cost of law enforcement, both full-time, dual collateral, other Federal, State, and local officers, is at its highest during the fall hunting season. The addition of a full-time refuge officer on the east end of the refuge would assist in the heavy burden during this time of year. All other needs are addressed in the comprehensive conservation plan.

**Offsetting revenues:** The current fee for an outfitting permit on the refuge is \$250.00. This fee is retained by the refuge to use as discretionary funding whether to provide overtime for employees or to maintain and enhance current refuge facilities.

## ANTICIPATED IMPACTS of the USE

**Short-term impacts:** It is anticipated that the disturbance of guided hunting would not be measurably greater than the disturbance from the general hunting public.

Temporary disturbance would exist to wildlife near the activity. Animals surplus to populations would be removed by hunting. A temporary decrease in populations of wildlife might help ensure that carrying capacity (especially for big game species) is not exceeded. Closed areas would provide some sanctuary for game and nongame species, minimize conflicts between hunters and other visitors, and provide a

safety zone around communities and administrative areas. The harvest of these species would be compensatory mortality, with minimal impact to the overall health of their populations.

Temporary impacts to the habitat are expected due to the use of camping grounds, tree stands, and possible illegal off road travel. To mitigate the possible impacts, the refuge has established camping areas providing parking and vault toilets. We also enforce a pack-in, pack-out policy encouraging folks to remove their trash.

**Long-term impacts:** The primary concern regarding commercial guided hunting activities is the potential for conflict between guided activities and other refuge users, particularly unguided hunters. Based on experiences on this refuge and on other national wildlife refuges, commercial guiding operations can increase user conflicts. An important part of this issue is public perception that hunting guides and clients have an advantage of equipment and technique and are taking game that would otherwise be available to regular hunters. Guides, since they are running a business, may also be viewed as more aggressive compared to unguided hunters. The State and refuge regulations should assist in easing the tensions between guided hunters and the public hunters. However, this conflict between hunters could be considered a potential long-term impact.

**Cumulative impacts:** Guide operations may increase use of some refuge facilities such as boat ramps, campsites, and other facilities frequented by general user groups. With the dispersal of outfitters throughout the entire refuge from one end to the other, this increase would not be significant compared to the overall use.

## PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public meetings held during the CCP process, and formal public review of this compatibility determination as part of the draft CCP and EIS for the refuge.

## DETERMINATION

Guided hunting (outfitting) is compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, guided hunting (outfitting) can occur on the refuge if the following stipulations are met:

1. Regulations that apply to recreational users would apply. See refuge guide map and information (revised 2004).

2. Outfitters and their licensed guides must have in their possession an outfitter ID card for the Charles M. Russell refuge while operating on the refuge.
3. Charles M. Russell refuge outfitter permits are valid only on lands administered by the Service within the boundary of the Charles M. Russell and UL Bend refuges (including USACE lands within the refuge).
4. Charles M. Russell refuge outfitter permits do not give exclusive use of any area.
5. All violations of refuge regulations, special conditions of an outfitter permit, MFWP statutes, or Board of Outfitters Rules by a Charles M. Russell refuge outfitter, licensed guide, client, or a violation occurring in the presence of an outfitter or guide must be reported to the appropriate official immediately. Failure to report violations would be grounds for cancellation of the permit.
6. Permitted outfitters may not use licensed outfitters as guides.
7. Outfitters must meet State of Montana minimum insurance requirements. In addition, the policy shall (1) name the United States Government as co-insured, (2) specify that the insurance company shall have no right of subrogation against the United States of America, and (3) the permittee shall indemnify the United States. A current certificate of insurance must be provided to the refuge's Lewistown office.
8. All refuge outfitters on request of a refuge officer, State warden or special agent, shall provide for inspection, current outfitter records as specified by 8.39.703 (Outfitters Records) of Chapter 39-Montana Administrative Rules.
9. Refuge outfitters are not allowed to use aircraft for locating game on the refuge.
10. Outfitter logs, along with hunter use days are required to be turned into Charles M. Russell National Wildlife Refuge, P.O. Box 110, Lewistown, Montana 59457, by December 31 of each year. Failure to submit logs would be grounds for cancellation of the following year's permit.
11. Violation of any permit special conditions may be grounds for cancellation.
12. Outfitters who wish to retain their refuge permit and remain inactive with the State of Montana license requirements, must pay the \$250 permit fee. Outfitters would be allowed to renew their permit with the Charles M. Russell refuge for 2 years while remaining inactive with the State. If at the beginning of a third year, an outfitter is still inactive with the State, he or she would not be offered an opportunity to renew with the refuge.

**Justification.** With the current regulations specific to guided hunting, and the spatial distribution of the outfitters, allowing guided hunting on the refuge would not materially interfere with or detract from the purposes of the refuge or the mission of the Refuge System. By allowing guided hunts on the refuge, it would provide an opportunity for those hunters looking to have a quality hunting experience and a greater chance of a successful hunt by using the knowledge, skills and abilities of those with local experience and the necessary equipment.

**Mandatory 15-year reevaluation date.** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

---

## C.11 Description of Use:

### All-terrain Vehicles and Snowmobiles

This applies to the proposed use and the restriction of use on the refuge uplands, Fort Peck Lake, and the Missouri River. Snowmobile use occurs during the winter season and is only allowed across the Fort Peck Lake. It is prohibited along the Missouri River and across the refuge uplands including all roads. All-terrain vehicle (ATV) use occurs year-round and is allowed over the Fort Peck Lake during the winter season and on refuge numbered roads. ATV use is prohibited off road on the refuge uplands and along the Missouri River. Neither use is deemed a priority public use according to the National Wildlife Refuge System Administration Act of 1997.

As the table below depicts, ATV use would be allowed on refuge numbered routes and the Fort Peck Lake. Snowmobile access is only allowed over the Fort Peck Lake. Neither use is allowed along the Missouri River nor can either use take place off road over the refuge uplands.

<i>Vehicle Type</i>	<i>Fort Peck Lake</i>	<i>Missouri River</i>	<i>Refuge Roads</i>
Snowmobile	Allowed	Prohibited	Prohibited
ATV	Allowed	Prohibited	Allowed

Use locations that are both allowed and/or prohibited by the use of snowmobiles and ATVs.

ATV use occurs year-round on refuge numbered routes and during the winter months over the Fort Peck Lake. Snowmobile use is only allowed over the Fort Peck Lake during the winter season when ice and snow are present. ATVs are required to use refuge roads, the Fort Peck Lake ice during winter months, and all must be street legal. Montana residents must have a metal license plate and all operators must possess the proper driver's license.

Nonresident operators who wish to operate their ATV on the refuge should contact the refuge office regarding proper licensing requirements. Snowmobiles and their operators need to comply with State licensing requirements.

Due to the remote area in and around the refuge, the use of smaller and more navigable motorized vehicles is necessary to access or disperse access for wildlife dependent recreation. Snowmobiles and ATVs are both used to access the large Fort Peck Lake for ice fishing opportunities away from the main access points. ATVs on the refuge are used during hunting season and general access year-round.

## AVAILABILITY of RESOURCES

**Resources involved in the administration and management of the use:** The main cost of these uses is going to be the time and effort of regulating the use. With one full-time law enforcement officer and four dual collateral officers to cover the 1.1 million-acre refuge are considered a marginal number of resources at best given the sheer size of the refuge and the number of users. Other Federal, State, and local law enforcement officers may assist, as they are available.

**Special equipment, facilities, or improvements necessary to support the use:** Additional equipment and facilities are not necessary to monitor the use within the refuge and Fort Peck Lake.

**Maintenance costs:** The most obvious maintenance cost is to the road system and to the vehicles used by refuge staff for patrolling the uses on the refuge.

**Monitoring costs:** The cost of monitoring the use of the refuge is the most expensive cost we incur. Either by plane or by vehicle, the cost of gas and staff time is significant. Due to the remote location and inaccessibility of certain areas, traversing the refuge is extremely time consuming and a fast reaction to a refuge violation could take hours.

**Offsetting revenues:** The refuge does not currently charge a fee for the use of the road system, or for access.

## ANTICIPATED IMPACTS of the USE

**Short-term impacts:** Snowmobiling has little to no resource impact given the season of use and regulation confining snowmobiles to ice covered waters. Snowmobiles do generate noise that may disturb other users in the area. ATV use has little to no resource impacts as well given that ATV use is restricted to refuge numbered routes and to ice covered waters. As with snowmobiles, ATVs generate a disturbance due to noise that may disturb wildlife as well as other users within the area. Neither is considered to have an impact on the refuge habitat, as both are restricted to roads and the ice.

**Long-term impacts:** There are no long-term impacts associated with the use of ATVs and snowmobiles due to the use restrictions. The refuge roads are already disturbed areas of the refuge, and the long-term impacts to the Fort Peck Lake are considered nonexistent.

**Cumulative impacts:** The greatest impact overall would be the disturbance to other users in the area with the use of ATVs and snowmobiles. The noise generated from both snowmobiles and ATVs could disturb those who are viewing wildlife, hiking, snowshoeing, cross-country skiing, fishing, and hunters pursuing game.

## PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public meetings held during the CCP process, and formal public review of this compatibility determination as part of the draft CCP and EIS for the refuge.

## DETERMINATION

The use of ATVs and snowmobiles is compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, the use of ATVs and snowmobiles can occur on the refuge if the following stipulations are met:

1. All appropriate State and Federal ATV and snowmobile regulations apply.
2. ATVs belonging to Montana residents must be street legal and have a metal license plate. Operators must also possess the proper driver's license. Nonresident ATV owners who wish to operate their ATVs on the refuge should contact the refuge staff regarding licensing requirements. Anyone intending to operate an ATV on the refuge should contact the refuge staff to ensure the ATV meets the necessary requirements for legal use.
3. ATVs are required to stay on refuge numbered routes or over the ice on Fort Peck Lake.
4. Snowmobiles are only allowed use on the Fort Peck Lake.
5. Operation of ATVs, as well as all motor vehicles, off road is illegal.

**Justification.** Although there is a minor disturbance to wildlife and other refuge users, the use of snowmobiles and ATVs allows for greater access and more dispersed access benefiting wildlife-dependent public uses. It increases access into areas that may not be accessible with traditional motor vehicles or on foot. While both generate a noise disturbance, those who are looking for a solitude and quiet recreational

experience have many opportunities elsewhere on the refuge. Disturbed wildlife also has many opportunities to retreat to a less disturbed area.

With stipulations in place, recreational snowmobiling and ATV use, given the location and season of most use and the physical nature and size of the refuge, does not materially interfere with or detract from the conservation purposes of the refuge.

**Mandatory 15-year reevaluation date.** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

---

## C.12 Description of Use: Prescriptive Grazing

Prescriptive grazing is the controlled removal of vegetation using various livestock as a habitat management tool to achieve specific habitat conditions to benefit wildlife species. The Service employees the strategy of adaptive management in the development of habitat management plans. Adaptive management is defined as a process that uses feedback from refuge research and monitoring and evaluation of management actions to support or modify objectives and strategies at all planning levels.

Prescriptive grazing is used to improve or maintain the health and vigor of selected plant(s) and to maintain a stable and desired plant community, provide or maintain food, cover, and shelter for animals of concern, maintain or improve water quality and quantity and reduce accelerated soil erosion and maintain or improve soil condition for susceptibility of the resource.

The proposed use is to implement prescriptive grazing across the refuge to meet wildlife and habitat objectives as identified in various management plans. Currently about 30 percent of refuge lands are enrolled in a prescriptive grazing management plan. Most habitat units with annual grazing programs are not meeting residual grass cover for priority species. The use would be implemented across the refuges where the Service has control over the use. For example, habitat units that are fenced from common pastures would be the first units enrolled into prescriptive grazing. Habitat units that are not fenced from private or other government-owned lands would be managed under existing management plans.

The use would be conducted according to approved habitat management plans to meet specific wildlife and/or habitat objectives. Use could occur during any season depending on the specific objectives to be achieved. Prescriptive grazing would be administered through issuance of a special use permit. Permittees would be selected using the criteria identified in the Refuge Manual. Habitat manage-

ment plans would identify season of use, number of animals and length of time to achieve the management objectives.

A critical step in developing an effective and ecologically sound prescriptive grazing program is establishing criteria by which the prescription's implementation and effectiveness will be measured. By collecting quantitative data over time, one is better equipped to detect trends toward or away from the desired effects of grazing treatments. Furthermore, monitoring during grazing treatments will help to determine whether grazing treatments are applied at the appropriate season, duration, frequency, and intensity to meet specific wildlife and habitat objectives.

This use is being proposed to move from an annual grazing program to a prescriptive grazing program to meet specific wildlife and habitat management objectives. Currently habitat surveys indicate that most grazed habitat units are not meeting the 70 percent residual grass cover as specified in the 1986 EIS. Residual grass cover is important for several grassland nesting birds. In addition to the grass cover, new monitoring for highly palatable, first to decline forbs and shrubs (sentinel plants) are declining and being eliminated due to overuse and lack of natural ecological processes. These plants are extremely important to numerous wildlife species, especially birds and pollinators. The Great Plains have evolved over time through ecological disturbances like fire and grazing. These disturbances can be described as "pulse" and "press." A pulse occurrence occurs sporadically but still occurs, whereas a press disturbance is constant (Frost 2008). Like fire, originally, ungulate grazing (herbivory) was a pulse disturbance. Prior to 1882, there were many years with periods of abandonment by wild ungulates where less grazing took place due to its interaction with fire. Since 1882, it has become a press (constant) disturbance because of fences and fire control. As a result, highly palatable species (particularly shrubs and forbs such as chokecherry and white prairieclover) have dramatically declined. These species evolved with and are highly adapted to grazing when combined with several-year periods of abandonment for recovery. Palatable shrubs require several years to grow from seed to seed bearing maturity and are alive above ground (or vulnerable to damage from grazing) 12 months of the year. Present-day livestock grazing systems typically only rest pastures for 1 entire year or less from livestock use (with no rest from wild ungulate use). A prescriptive grazing program would allow the refuge to fulfill the intent of the Game Range Act of 1976 and the National Wildlife Refuge System Improvement Act of 1997.

### AVAILABILITY of RESOURCES

**Resources involved in the administration and management of the use:** Refuge staff would continue to monitor permittees for violations of permit conditions

and trespass. Biologists and station managers would monitor habitat conditions using current HDP and sentinel plant species.

**Special equipment, facilities, or improvements necessary to support the use:** The refuge would continue to monitor grazing activities using ground surveys and aerial counts. New permanent or temporary fences would be needed to be constructed to implement prescriptive grazing on common pastures. Temporary water developments may be necessary to facilitate prescriptive grazing in some habitat units to meet habitat objectives.

**Maintenance costs:** Maintenance costs could be reduced due to the reduction in interior fences necessary to manage prescriptive grazing program according to CCP alternatives. There may be additional costs with the construction and maintenance of boundary fences, which would be constructed anyway to manage livestock in common pastures.

**Monitoring costs:** refuge personnel currently spend approximately 25 to 35 percent of their time issuing permits, monitoring for trespass livestock and habitat conditions. The refuge monitors livestock trespass via fixed wing aircraft that costs \$140 per hour with a monthly fixed cost of \$770.

**Offsetting revenues:** The refuge receives approximately \$60,000 in 6860 (grazing) funds per year; however, these funds are being reduced each year due to the increase in oil and gas development on other refuges. Refuges receive a percentage of the amount of revenue that is generated from commercial activities on refuges. It is expected the revenue generated by grazing on the refuge would continue to decline over the years. These funds do not cover current expenses incurred managing current grazing program and probably would not cover the costs of implementing the prescriptive grazing program.

## ANTICIPATED IMPACTS of the USE

**Short-term impacts:** Short-term impacts would include loss of vegetative cover, which could result in increased soil erosion. Highly palatable forbs and shrubs would be heavily impacted by grazing affecting a large number of wildlife species from pollinators to big game. However, the benefit would be to the wildlife species that require short cover such as prairie dogs, mountain plovers, and McCown's longspur and grazing ungulates (elk and deer) that would graze the fresh growth of grasses. Prescriptive grazing can reduce invasive species and reduce fuels in sage-grouse habitat. In weed-infested areas, grazing must be carefully managed to reduce rather than increase invasive plant establishment and spread. Ecologically based grazing prescriptions pay careful attention to positively directing plant community change, not

just removing the weedy species (Sheley et al. 1996). Moving from annual grazing to prescriptive grazing could have an impact on some current permittees from an economic standpoint. Prescriptive grazing would be implemented over time and with input from current permittees to lessen potential financial impacts. Permittees that are able to meet refuge needs may benefit financially by taking advantage of increased grazing opportunities.

**Long-term impacts:** The habitats of the refuge evolved with a pulse fire/grazing interaction (pyric herbivory). As fires burned across the landscape, grazing ungulates grazed less selective on all plant species and thus highly palatable shrubs and forbs benefited from less grazing pressure. This interaction resulted in highly resilient systems that have a great diversity of species that promote heterogeneity and ecological integrity. Restoring this historical process would promote healthy habitats that promote biodiversity and resiliency to climate change.

**Cumulative impacts:** Changes in grazing management would likely reduce the availability of grazing land in the region. However, since the refuge supplies less than 1 percent of all AUMs in the region, the cumulative effect of implementing prescriptive grazing, when combined with other land management changes would be negligible.

## PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public meetings held during the CCP process, and formal public review of this compatibility determination as part of the draft CCP and EIS for the refuge.

## DETERMINATION

Prescriptive grazing is compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, prescriptive grazing can occur on the refuge if the following stipulations are met:

1. Habitat management plans would be developed with specific wildlife and habitat objectives.
2. Prescriptive grazing would be one of the tools used to meet these objectives.

**Justification.** Sharp-tailed grouse, pronghorn, sage-grouse, large ungulates, and other wildlife species need a diversity of and abundant group of plants for food and cover all year. Refuge monitoring has indicated that several highly palatable forbs and shrubs are declining due to the natural fire-grazing interaction being out of balance. Prescriptive grazing and

other adaptive management strategies would permit flexibility necessary for the restoration of these important plant species. Prescriptive grazing is a valuable management tool that supports refuge objectives.

**Mandatory 15-year reevaluation date.** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

## C.13 Description of Use: Research

The refuge allows research on a variety of biological, physical, archeological, and social issues and concerns to address refuge management information needs or other issues not related to refuge management. Studies are conducted by Federal, State, and private entities, including the U.S. Geological Survey, State agencies, State and private universities, and independent researchers and contractors.

Research is allowed refuge-wide and is addressed on a case-by-case basis for the need and potential impacts. The exact locations of the studies would be determined by the focus of the study. Research requests would be considered during all times of the year and on a case-by-case basis. Due to the difficulty in accessing the refuge lands during the winter months, studies at that time may be more heavily scrutinized as to their biological need and benefit. The location of the study may have an impact on when the use would be conducted, especially if it is during a specific hunting season.

Researchers would be required to submit a written proposal that outlines the methods, materials, timing, and justification for proposed projects. These proposals would be reviewed by refuge staff to assess the appropriateness of the research for the refuge, environmental impacts, assure that the projects do not interfere with the other resource operations, and provide suggested modifications to the project to avoid disruptions to refuge wildlife and operations. A special use permit is issued to those whose requests are deemed valid and necessary. The refuge staff would be responsible for monitoring their use and that it is appropriate and consistent with the terms and conditions in their special use permit.

Research on the refuge is allowed as a symbiotic relationship between the refuge research needs and the need for the requesting agency and individual to complete the research. The Service encourages and supports research and management studies on refuge lands that would improve and strengthen decisions on managing natural resources. All research requests would be evaluated on the refuge need and be in the best interest of wildlife and sound biological information.

## AVAILABILITY of RESOURCES

**Resources involved in the administration and management of the use:** The refuge currently uses the existing staff to issue special use permits and to monitor researchers. Current staff resources are deemed adequate to manage issuing permits and monitoring the researchers for compliance at the existing levels.

**Special equipment, facilities, or improvements necessary to support the use:** The research group or individual would be responsible for supplying their own equipment necessary to complete the study.

**Maintenance costs:** There are no foreseen maintenance costs with allowing research studies on the refuge.

**Monitoring costs:** The current refuge staff is adequate to monitor the research completed by non-Service personnel. Research studies in excess of available refuge resources would not be allowed.

**Offsetting revenues:** The refuge does not charge a fee to conduct research studies on the refuge.

## ANTICIPATED IMPACTS of the USE

**Short-term impacts:** Research activities have the potential to impact and disturb wildlife through observation, capture/release techniques, and banding or marking. The access of multiple research sites several times in a short period may noticeably disturb vegetation either by walking, trampling, or by the use of a motor vehicle. Efforts to capture wildlife may cause not only disturbance, but also injury or even death. The energy costs of disturbance may be appreciable in terms of disruption of feeding, displacement from preferred habitat, and the added energy expended to avoid the disturbance of the research being conducted.

**Long-term impacts:** There are no anticipated long-term impacts with the approval of research studies on the refuge.

**Cumulative impacts:** With most of the research taking place on the refuge during the summer months, the compilation of several studies may be excessive disturbance on refuge resources. Even with this, no cumulative impacts are expected due to the ability of the refuge manager to control the location and timing of all research studies conducted. The size of the refuge is also considered to be such that the tolerance of several studies on the wildlife and habitat is high.

## PUBLIC REVIEW and COMMENT

Public review and comment would be solicited through posting of notices at the refuge, notices in local newspapers and the Federal Register, public meetings held during the CCP process, and formal public review

of this compatibility determination as part of the draft CCP and EIS for the refuge.

## DETERMINATION

Research is compatible.

**Stipulations necessary to ensure compatibility.** To ensure compatibility with refuge purposes and the mission of the National Wildlife Refuge System, research can occur on the refuge if the following stipulations are met:

1. Prior to conducting investigations, researchers would obtain special use permits from the refuge that make specific stipulations related to when, where, and how the research would be conducted. Managers retain the option to prohibit research on the refuge that does not contribute to the purpose of the refuge or the mission of the Refuge System.
2. Researchers must possess all applicable State and Federal permits for the capture and possession of protected species, and for conducting all other regulated activities.
3. Research activities would be monitored to assure compliance with permit conditions and assess impacts.
4. If proposed research methods would impact or potentially impact complex resources (habitat or wildlife), it must be demonstrated that the research is necessary (i.e., critical to survival of a species, would enhance restoration activities of native species, would help in control of invasive species or provide valuable information that would guide future complex activities), and the researcher must identify the issues in advance of the impact.
5. Researchers must clearly mark posts, equipment platforms, fencing material, and other equipment left unattended so it does not pose a hazard. Such

items shall be removed as soon as practicable on completion of the research.

6. Cultural and archeological surveys would be coordinated with the Regional Historical Preservation Officer and the appropriate State Historic Preservation Officer to assure compliance with the Archeological Resource Protection Act.
7. All research activities would be performed in accordance with the stipulations in this determination and the stipulations within the specific special use permit.
8. Researchers would submit a final report concerning refuge research to the refuge manager.

**Justification.** Research is compatible with the mission of the Service and the purpose of the refuge. Research studies on the refuge can be used to manage trust resource responsibilities of the Service by providing information on a sound scientific basis. Research conducted on biological, physical, archeological and social components of the refuge provide a means to analyze management actions, impacts from internal and outside forces, and ongoing natural processes within the refuge ecosystems. Research provides scientific evidence used to make management decisions and ensure the refuge is managed as intended during establishment by Congress.

Negative short-term impacts caused during the research activities would be minimized with the stipulations above and are not considered significant in nature. Conducting research studies on the refuge would not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purpose for which the refuge was established.

**Mandatory 15-year reevaluation date.** (The year of evaluation will be inserted here in the final CCP, based on the date the regional director approves the final CCP.)

---

## Signature

(to be determined) *Date*  
 Project Leader  
 Charles M. Russell National Wildlife Refuge Complex  
 Lewistown, Montana

---

## Concurrence

Richard A. Coleman, Ph.D. *Date*  
 Assistant Regional Director  
 National Wildlife Refuge System  
 U.S. Fish and Wildlife Service  
 Mountain-Prairie Region  
 Lakewood, Colorado



# Appendix D

## *Key Legislation and Policy*

This appendix briefly describes the guidance for the National Wildlife Refuge System and other policies and key legislation that guide the management of Charles M. Russell National Wildlife Refuge Complex.

### D.1 National Wildlife Refuge System

The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. (National Wildlife Refuge System Improvement Act of 1997.)

#### Goals

- To fulfill our statutory duty to achieve refuge purpose(s) and further the System mission.
- Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered.
- Perpetuate migratory bird, interjurisdictional fish, and marine mammal populations.
- Conserve a diversity of fish, wildlife, and plants.
- Conserve and restore, where appropriate, representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems.
- To foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with safe, high quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

#### Guiding Principles

There are four guiding principles for management and public use of the Refuge System established by Executive Order 12996 (1996):

- **Public Use**—The Refuge System provides important opportunities for compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

- **Habitat**—Fish and wildlife will not prosper without high quality habitat, and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.
- **Partnerships**—America's sportsmen and women were the first partners who insisted on protecting valuable wildlife habitat within wildlife refuges. Conservation partnerships with other Federal agencies, State agencies, tribes, organizations, industry, and the public can make significant contributions to the growth and management of the Refuge System.
- **Public Involvement**—The public should be given a full and open opportunity to participate in decisions regarding acquisition and management of our national wildlife refuges.

### D.2 Other Legal and Policy Guidance

Management actions on national wildlife refuges are constrained by many mandates including laws and executive orders. The more common regulations that affect refuge management are listed below.

**American Indian Religious Freedom Act (1978)**—Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

**Americans with Disabilities Act (1992)**—Prohibits discrimination in public accommodations and services.

**Antiquities Act (1906)**—Authorizes the scientific investigation of antiquities on Federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

**Archaeological and Historic Preservation Act (1974)**—Directs the preservation of historic and archaeological data in Federal construction projects.

**Archaeological Resources Protection Act (1979), as amended**—Protects materials of archaeological interest from unauthorized removal or destruction and requires Federal managers to develop plans and schedules to locate archaeological resources.

**Architectural Barriers Act (1968)**—Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

**Bald and Golden Eagle Protection Act (1940)**—Provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds.

**Bankhead-Jones Farm Tenant Act (1937)**—Some early refuges and hatcheries were established under the authority of this Act that required the Secretary of Agriculture to develop a program of land conservation and use.

**Clean Air Act (1970, amended 1990)**—Restricts the amount of pollutants that can be emitted into the air. Designated wilderness areas including UL Bend National Wildlife Refuge have the highest standards (class I) for pollution and visibility and air quality is monitored at the refuge.

**Clean Water Act (1977)**—Requires consultation with the U.S. Army Corps of Engineers (404 permits) for major wetland modifications.

**Data Quality Act (2001)**—Requires Government agencies to ensure and maximize the quality, objectivity, utility, and dissemination of information by Federal agencies.

**Emergency Wetlands Resources Act (1986)**—Promotes wetland conservation for the public benefit to help fulfill international obligations in various migratory bird treaties and conventions. The act authorizes the purchase of wetlands from Land and Water Conservation Fund monies.

**Endangered Species Act (1973)**—Requires Federal agencies to carry out programs for the conservation of endangered and threatened species.

**Enhancement Act (2000)**—Authorized the Secretary of Army, working with the Secretary of Interior, to identify cabin sides suitable for conveyance to current lessees. The funds received will be used for acquiring other lands with greater wildlife and other public value for the refuge.

**Executive Order 7509 (1936)**—Establishes the Fort Peck Game Range for the conservation and development of natural wildlife resources and for the protection and improvement of public grazing lands and natural forage resources. In 1963, it was renamed the Charles M. Russell National Wildlife Range (Public Land Order 2951).

**Executive Order 11988 (1977)**—Requires Federal agencies to provide leadership and take action to reduce the risk of flood loss, minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

**Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System (1996)**—Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the Refuge System.

**Executive Order 13007, Indian Sacred Sites (1996)**—Directs Federal land management and other agencies to accommodate access to and ceremonial uses of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

**Executive Order 13352, Cooperative Conservation (2004)**—Directs Federal agencies to implement laws relating to the environment and natural resources in a manner that promotes cooperative conservation with an emphasis on appropriate inclusion of local participation in Federal decisionmaking in accordance with respective agency missions and policies.

**Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation (2007)**—Directs Federal land management and other agencies to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

**Federal Noxious Weed Act (1990)**—Requires the use of integrated management systems to control or contain undesirable plant species and an interdisciplinary approach with the cooperation of other Federal and State agencies.

**Federal Records Act (1950)**—Requires the preservation of evidence of the Government's organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

**Fish and Wildlife Coordination Act (1958)**—Allows the U.S. Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

**Game Range Act (1976)**—Public Law 94-223 transferred the management of all game ranges to the sole authority of National Wildlife Refuge System. This included Charles M. Russell Game Range and in 1978, the refuge was renamed Charles M. Russell National Wildlife Refuge (Public Land Order 5635).

**Migratory Bird Conservation Act (1929)**—Establishes procedures for acquisition by purchase, rental, or gifts of areas approved by the Migratory Bird Conservation Commission.

**Migratory Bird Hunting and Conservation Stamp Act (1934)**—Authorizes the opening of part of a refuge to waterfowl hunting.

**Migratory Bird Treaty Act (1918)**—Designates the protection of migratory birds as a Federal responsibility;

and enables the setting of seasons and other regulations, including the closing of areas, Federal or non-Federal, to the hunting of migratory birds.

**Native American Policy (1994)**—Articulates the general principles that guide the Service’s government-to-government relationship to Native American Governments in the conservation of fish and wildlife resources.

**National Environmental Policy Act (1969)**—Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate this Act with other planning requirements, and prepare appropriate documents to facilitate better environmental decisionmaking. [From the Code of Federal Regulations (CFR), 40 CFR 1500]

**National Historic Preservation Act (1966), as amended**—Establishes as policy that the Federal Government is to provide leadership in the preservation of the Nation’s prehistoric and historical resources.

**National Trails System Act (1968)**—Established a national trails system, including provisions for national historic trails that follow as closely as possible the original trails or routes of travel of national historic significance.

**National Wildlife Refuge System Administration Act (1966)**—Defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge, provided such use is compatible with the major purposes for which the refuge was established.

**National Wildlife Refuge System Improvement Act of 1997**—Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System; mandates comprehensive conservation planning for all units of the Refuge System.

**Native American Graves Protection and Repatriation Act (1990)**—Requires Federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

**Paleontological Resources Preservation Act of 2009**—Requires the Secretary of Interior and Agriculture to manage and protect paleontological resources on Federal land using scientific principles and expertise.

**Public Land Order (4588)**—Establishment of UL Bend National Wildlife Refuge and revocation of Executive Order, 7509 on these lands.

**Public Law (94-557) of 1976**—Designation of wilderness areas within the National Wildlife Refuge System including portions of UL Bend National Wildlife Refuge.

**Refuge Recreation Act (1962)**—Allows the use of refuges for recreation when such uses are compatible with the refuge’s primary purposes and when sufficient funds are available to manage the uses.

**Rehabilitation Act (1973)**—Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the Federal Government to ensure that any person can participate in any program.

**Rivers and Harbors Act (1899)**—Section 10 of this Act requires the authorization of U.S. Army Corps of Engineers prior to any work in, on, over, or under navigable waters of the United States.

**Volunteer and Community Partnership Enhancement Act (1998)**—Encourages the use of volunteers to assist in the management of refuges within the Refuge System; facilitates partnerships between the Refuge System and non-Federal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of the resources; and encourages donations and other contributions.

**Wild and Scenic Rivers Act (1968)**—Set aside certain rivers in the Nation to be preserved in free-flowing condition among other provisions. This included portions along the western boundary of the Refuge, which is part of the Upper Missouri National Wild and Scenic River most of which flows through the Upper Missouri Breaks National Monument (BLM). The Act was modified in 1976 by Public Law 94-486 to apply the scenic designation to the river and its bed for the portion that flows through the refuge.

**Wilderness Act (1964)**—The Act (Public Law 88-577) [16 U.S.C.1131–6] defines wilderness as “A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.” Approximately 20,819 acres within UL Bend National Wildlife Refuge are designated as wilderness, and approximately 176,140 acres within Charles M. Russell NWR are proposed for inclusion in the National Wilderness Preservation System, and is managed as if were designated wilderness.



# Appendix E

## Wilderness Review and Summary

As guided by the Wilderness Stewardship Policy (FWS 2008d) that provides an overview and foundation for implementing the Wilderness Act and the National Wildlife Refuge System Administration Act of 1966, as amended (Improvement Act), the Service is reviewing and updating existing lands within Charles M. Russell National Wildlife Refuge for current wilderness potential.

### E.1 Background

The Improvement Act directs the Secretary to complete a comprehensive conservation plan (CCP) for every unit, or group of related units, of the Refuge System. As part of this process, the Service is required to conduct a wilderness review concurrent with the development of the CCP, with a summary of the review incorporated into the plan (FWS 2000c). All lands and waters of the Refuge System outside of Alaska and not currently designated wilderness are subject to the review including proposed wilderness reevaluation to determine if it remains viable wilderness.

With the passage of The Wilderness Act of September 3, 1964 (Public Law 88-577), the Secretary of Interior was required to review every roadless area of 5,000 acres or more and every roadless island, regardless of size, within the National Wildlife Refuge System within 10 years after the effective date of the Act, and report to the President of the United States his recommendations as to the suitability or unsuitability of each such area or island for preservation as wilderness.

On May 3, 1974, the Directors of the Bureau of Sport Fisheries and Wildlife (Service) and the Bureau of Land Management (BLM) released a draft environmental impact statement for 13 proposed wilderness units within Charles M. Russell National Wildlife Refuge. During the process, five separate public hearings were held on the proposals in Malta, Miles City, Billings, Denver, and Jordan between May 20 and May 29, 1974. The comment period was extended until June 28, 1974 to allow for additional written comments on the proposed wilderness units. A total of 283 individuals attended the five hearings with 101 statements read into the record. The complete proposal recommended 176,140 acres of proposed wilderness within 13 separate units. The individual units proposed are identified in table A.

**Table A. Original 13 proposed wilderness units for the Charles M. Russell and UL Bend refuges.**

<i>Area</i>	<i>Proposed Unit</i>	<i>Acres</i>
1	Antelope Creek	5,390
2	Mickey Butte	17,880
3	Burnt Lodge	26,520
4	Sage Creek	10,790
5	Sheep Creek	13,080
6	West Hell Creek	13,480
7	Snow Creek	6,760
8	Billy Creek	11,900
9	Seven Blackfoot	28,500
10	Lost Creek	11,500
11	Alkali Creek	7,990
12	Crooked Creek	14,340
13	Fort Musselshell	8,010
	Total	176,140

Pursuant to House Document No. 93-403, part 35 dated December 4, 1974, changes were made to the original 13 proposed wilderness units due to a portion of its surface lands not being withdrawn from mineral entry, and the unknown stature of the minerals within the proposed areas. In addition to the need for a mineral survey, the excluded lands were also considered replete with constructed improvements needed for wildlife management or grazing purposes. It was then recommended that 155,288 acres of the Charles M. Russell National Wildlife Refuge retain their pristine character through the protection as proposed wilderness units (note: the proposal that went forward to Congress identified 155,388 acres but the actual acreage added up to 155,288 acres and this is considered to be legal acreage). The 155,288 acres was divided between 15 units as shown in table B.

With advances in technology, the Service has since refined all of the proposed wilderness units and entered them into a geographical information system (GIS). Through the minimization of errors and correction of boundaries, the acreage the Service recognizes today as proposed wilderness units is closer to 158,619 acres. Following this wilderness review, the final recommendations would incorporate the more current acreage. Below is a complete description of each

area currently managed as proposed wilderness. As directed by Congress, the Service is required to manage all proposed wilderness units for their wilderness characteristics including closure of roads, minimum tool usage, and providing the public with solitude or a primitive and unconfined type of recreation.

**Table B. Current proposed wilderness units for the Charles M. Russell and UL Bend refuges.**

<i>Area</i>	<i>Proposed Unit</i>	<i>Acres</i>
1	East Seven Blackfoot	11,744
2	Mickey Butte	16,893
3	Burnt Lodge	21,576
4	Billy Creek	10,916
5	West Seven Blackfoot	6,456
6	Antelope Creek	5,062
7	West Hell Creek	11,896
8	Fort Musselshell	8,303
9	Sheep Creek	11,784
10	West Beauchamp	6,736
11	Wagon Coulee	10,480
12	Alkali Creek	6,592
13	Crooked Creek	6,842
14	East Hell Creek	14,744
15	East Beauchamp	5,264
Total		155,288

With advances in technology, the Service has since refined all of the proposed wilderness units and entered them into a geographical information system (GIS). Through the minimization of errors and correction of boundaries, the acreage the Service recognizes today as proposed wilderness units is closer to 158,619 acres. Following this wilderness review, the final recommendations would incorporate the more current acreage. Below is a complete description of each area currently managed as proposed wilderness. As directed by Congress, the Service is required to manage all proposed wilderness units for their wilderness characteristics including closure of roads, minimum tool usage, and providing the public with solitude or a primitive and unconfined type of recreation.

## E.2 Current Proposed Wilderness

The map for alternative A (figure 7) in chapter 3 and the wilderness map (figure A) in this appendix show the locations of the proposed wilderness units. The

areas (numbered 1–21) are areas excluded from consideration (see table G).

### 1. East Seven Blackfoot—11,744 acres

The BLM Wilderness Study Area surrounds the southern boundary of this unit. This unit, like the Billy Creek Unit and West Seven Blackfoot Unit is extremely rugged with high ridges and numerous side drainages and coulees. Slaymaker Ridge is the most notable physical feature, running north and south in the middle of the proposed wilderness unit. Vegetation types are forested areas in limited amounts, grassy benches, and sagebrush and greasewood flats. Much of the land is barren due to the soils, slope, and topography.

### 2. Mickey Butte—16,893 acres

The Mickey Butte Unit is situated on the east side of the UL Bend National Wildlife Refuge, contiguous with the UL Bend Wilderness. This unit is characterized by high bluffs on the northwest side yielding to steep, rugged coulees draining the area to the east and southeast. The coulees are relatively short as they rise to the bluffs. Forested areas become sparser in this area compared to the western portion of the refuge, with grasses, sagebrush, and greasewood increasing in percentage of ground cover.

### 3. Burnt Lodge—21,576 acres

The Burnt Lodge Unit is one of the most rugged and scenic areas within the Missouri River Breaks. The area varies from rolling Bear Paw shale hills in the west to the extremely rugged eastern portion, which is an extension of the Larb Hills. Scattered patches of Ponderosa Pine and Juniper dominate the north slopes and high bench lands. Grasses, sagebrush and greasewood predominate in the area west of Killed Woman Creek. Currently the northern boundary of this unit is met with a BLM wilderness study area adjacent to the refuge proposed wilderness unit.

### 4. Billy Creek—10,916 acres

This unit is extremely rugged with short, steep-sided drainages. Much of the area is inaccessible to livestock with grasses, sagebrush, and greasewood dominating the vegetation. Forested areas are isolated and occur only where soil, slope, and aspects are conducive to their growth.

### 5. West Seven Blackfoot—6,456 acres

The BLM Wilderness Study Area surrounds the southern boundary of this unit. The West Seven Blackfoot proposed wilderness unit is similar in comparison to the East Seven Blackfoot. A long high ridge running west to east and paralleling the reservoir dominates the proposed wilderness unit landscape. Vegetation is similar to adjacent proposed wilderness units, with a higher presence of forested areas on the north facing aspect of the ridge.

# **INSERT 11x17**

## **Figure A**

**BLANK 11x17**  
back of Figure A

## 6. Antelope Creek—5,062 acres

This area is forested with long and geologically well-developed drainages. The bordering ridges are steep and relatively narrow-crested. It is located in the very Northwest corner of the refuge contiguous to the Upper Missouri River National Monument Wilderness Study Area administered by the BLM.

## 7. West Hell Creek—11,896 acres

This proposed wilderness unit is physically a transition between the badlands to the east and the Missouri River Breaks to the west. Forested areas are somewhat more plentiful in this unit than in the area east of Hell creek, but the landscape is still dominated by grass, sagebrush and other shrubs.

## 8. Fort Musselshell Unit—8,303 acres

There are major drainages that run parallel to Fort Peck Reservoir in this unit instead of being perpendicular as in most areas. The slopes are well vegetated with conifers, grass, sagebrush and other shrubs.

## 9. Sheep Creek—11,784 acres

This unit is situated between Cracker Creek Bay and Gilbert Creek Bay west of the Sage Creek Wilderness Unit. The topography contains an inconsistent erosion pattern. Grass with some sagebrush and other shrubs dominate the landscape. Trees are virtually absent in this unit.

It should be noted that some lands within this unit have been identified as having wilderness characteristics but for several reasons (private inholding and/or private roads), it provides difficult management challenges and wilderness complications. With the acquisition of private lands, Sheep Creek proposed wilderness unit would then be free of encumbrances and at that point would make for an improved proposed wilderness unit, and this option has been identified in several alternatives.

## 10. West Beauchamp Creek—6,736 acres

This unit is comprised of three short coulees between ridges that start from CK ridge and proceed in a southeasterly direction, ending at the Missouri River. These coulees are characterized by scattered stands of Ponderosa pine and Juniper, and the ridge tops by sagebrush shrub type mixed with western and bluebunch-wheatgrass grassland.

## 11. Wagon Coulee—10,480 acres

This unit comprises much of the most rugged portions of the south facing aspect of Harper's Ridge. It

contains the lower 2 miles of the Cabin Coulee Drainage and an approximately 2-mile section of the middle reaches of Carpenter Creek. The coulees within the unit contain nice stands of Ponderosa pine with the ridge tops consisting of primarily grass and scattered sage.

## 12. Alkali Creek—6,592 acres

The terrain is characterized by short drainages producing a jumbled appearance. Slopes are well forested and due to the northern exposure, well vegetated with grasses, sagebrush and other shrubs. There are 4 miles of improved trails that will be closed and allowed to revert.

## 13. Crooked Creek—6,842 acres

Drainages are relatively short in this unit with well-forested side slopes. Away from the reservoir, the forest is interspersed with small grassy parklands.

## 14. East Hell Creek—14,744 acres

This proposed wilderness unit is similar physically to the West Hell Creek proposed wilderness unit. Landscapes include grassy, flat ridge tops or mesas, gentle rolling breaks, and numerous steep drainages and canyons nearer the lake. Vegetation is typical of the Missouri River Breaks and the refuge with a mix of forested areas and juniper patches, grasslands, and sagebrush flats.

## 15. East Beauchamp Creek—5,264 acres

This unit is comprised of the lower reaches of the Beauchamp Creek drainage, which is a 20-mile-long watershed. A wide intermittent drainage, at this point has the potential for excellent riparian habitat. Secondary side coulees are characterized by ponderosa pine and juniper.

## Evaluation of Proposed Units Against Wilderness Criteria

In addition to the descriptions above, the Service evaluated the existing wilderness units to determine if they still meet the wilderness criteria identified in the Wilderness Act and Service guidelines on wilderness (refer to table C). A checkmark (✓) generally indicates the area still meets the wilderness criteria and a dash (—) indicates that it does not completely meet the wilderness criteria. Nearly all the existing proposed wilderness units still meet most of the wilderness criteria. However, several of the wilderness units have private or State lands within or adjacent to the refuge, which makes it difficult to close roads.

**Table C. Evaluation of how well the current proposed wilderness units for the Charles M. Russell and UL Bend refuges meet wilderness criteria.**

Wilderness Criteria	Wilderness Unit Number*														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Size greater than 5,000 acres	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Connects to other wilderness study areas or wilderness	√	√	√	√	√	√	√	√	—	√	—	√	√	—	√
Natural and scenic conditions maintained	√	√	√	√	√	√	√	√	—	—	√	√	√	—	—
Quality plants and wildlife	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Quality water and air	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Natural night skies and soundscapes	√	√	√	√	√	√	√	√	√	√	√	√	√	—	√
Retains primeval character	√	√	√	√	√	√	√	√	—	√	√	√	√	—	√
Serves as benchmark for research	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Retains human wilderness values	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

√ Meets the criteria

— Does not or marginally meets the criteria

\*Wilderness unit numbers:

Unit 3—The BLM Wilderness Study Area abuts the northern boundary. Old road closure disappointed locals.

Unit 9—Private/State inholding negatively affects wilderness characteristics. Would have excellent proposed wilderness unit potential if private land is acquired.

Unit 10—Surrounded by refuge road 201, which is a main refuge artery.

Unit 14—Contains two private inholding within and adjacent to proposed wilderness unit

Unit 15—State inholding, refuge road 201 separates west from east Beauchamp Creek

Units 9 and 14—Across the bay from each other but not physically connected.

---

## E.3 Wilderness Changes Under Alternatives in the Draft CCP and EIS

The Service is evaluating four alternatives in this CCP and EIS for managing wilderness on the refuge (refer to the wilderness analysis under section 5.7 in chapter 5 for a full discussion of the effects). Prior to any changes being designated, the recommendations made in this CCP will be reviewed by the U.S. Fish and Wildlife Service, the Secretary of the Interior, and Congress. Currently, all new potential new wilderness lands within this review are considered wilderness study areas. On the approval and recommendation of the Secretary of the Interior, those approved lands will be known as proposed wilderness. An act of Congress is required for all proposed wilderness units to then become designated wilderness. As a provision to all lands becoming proposed wilderness, a minimum tool requirement would be completed. Currently game carts are allowed in the proposed wilderness units, and this would be common to all alternatives. The UL Bend Wilderness would still prohibit the use of game carts within the wilderness. For a complete list of definitions related to this review, refer to the end of this appendix. The Bureau of Land Management (BLM) currently manages several wilderness study areas adjacent to the refuge (see figure 7, map of the no-action alternative A, in chapter 3). These areas were taken into consideration in reviewing refuge lands that contain wilderness characteristics and potential areas that could be suited for wilderness proposal and designation. In three general areas along the refuge boundary, there are either BLM wilderness study areas or the Upper Missouri River Breaks National Monument. These protected areas provide crucial unobstructed corridors for wildlife migration in central Montana. The changes being considered in the CCP and EIS are described below.

### Alternative A

Alternative A is the no-action alternative, and there would be no additions or subtractions to the acreages of proposed wilderness units (see figure 7, map of alternative A, in chapter 3 and figure A).

### Alternative B

The Service is considering ten proposed additions to current wilderness units for alternative B. This will expand current wilderness units and allow for management on a large landscape scale. There would be a net increase of 25,037 acres. There would be no loss of proposed wilderness acres in any of the 15 proposed wilderness units. The additions are shown in table D and in figure 8 (map of alternative B) in chapter 3.

### Alternative C

This alternative looks to expand wildlife-dependent recreational opportunities and economic uses while protecting wildlife populations and their habitat. In an effort to open up lands for additional uses and easier access, in addition to existing road access for private or State lands, this alternative proposes a reduction of 35,881 currently proposed wilderness acres as shown in table E and figure 9 (map of alternative C) in chapter 3.

### Alternative D

This alternative has an emphasis on promoting natural ecological process with minimal management to promote the biological diversity, biological integrity, and environmental health. Through this alternative the Service would expand six proposed wilderness units and eliminate two complete wilderness units. This will allow more efficient management of large landscapes and remove more costly management in areas where there are inholdings or complex management. There is a net loss of 8,185 acres as shown in table F (see figure 10, map of alternative D, in chapter 3).

**Table D. Additions to proposed wilderness units at the Charles M. Russell and UL Bend refuges under CCP alternative B.**

Area	Proposed Unit Name	Acres	Added Acres	Total Acres
1	East Seven Blackfoot	11,744	0	11,744
2	Mickey Butte G	16,893 0	0 550	17,443 0
3	Burnt Lodge	21,576	0	21,576
4	Billy Creek	10,916	0	10,916
5	West Seven Blackfoot	6,456	0	6,456
6	Antelope Creek A	5,062 0	0 1,836	6,898 0
7	West Hell Creek J	11,896 0	0 641	12,537 0
8	Fort Musselshell	8,303	0	8,303
9	Sheep Creek I	11,784 0	0 5,726	17,510 0
10	West Beauchamp B	6,736 0	0 359	7,095 0
11	Wagon Coulee H	10,480 0	0 4,843	15,323 0
12	Alkali Creek E, F	6,592 0	0 2,687	9,279 0
13	Crooked Creek C, D	6,842 0	0 8,394	15,236 0
14	East Hell Creek	14,744	0	14,744
15	East Beauchamp	5,264	0	5,264
Total		155,288	25,037*	180,324

\*Rounded acreage.

**Table E. Reductions to proposed wilderness units at the Charles M. Russell and UL Bend refuges under CCP alternative C.**

Area	Proposed Unit Name	Acres	Reduced Acres	Total Acres
1	East Seven Blackfoot	11,744	0	11,744
2	Mickey Butte	16,893	0	16,893
3	Burnt Lodge CC	21,576 0	0 9,137	12,439 0
4	Billy Creek	10,916	0	10,916
5	West Seven Blackfoot	6,456	0	6,456
6	Antelope Creek	5,062	0	5,062
7	West Hell Creek	11,896	0	11,896
8	Fort Musselshell	8,303	0	8,303
9	Sheep Creek	11,784	0	11,784
10	West Beauchamp BB	6,736 0	0 6,736	0 0
11	Wagon Coulee	10,480	0	10,480
12	Alkali Creek	6,592	0	6,592
13	Crooked Creek	6,842	0	6,842
14	East Hell Creek DD	14,744 0	0 14,744	0 0
15	East Beauchamp AA	5,264 0	0 5,264	0 0
Total		155,288	35,881	119,407

**Table F. Reductions and additions to proposed wilderness units at the Charles M. Russell and UL Bend refuges under CCP alternative D.**

<i>Area</i>	<i>Proposed Unit Name</i>	<i>Acres</i>	<i>Reduced Acres</i>	<i>Added Acres</i>	<i>Total Acres</i>
1	East Seven Blackfoot	11,744	0	0	11,744
2	Mickey Butte	16,893	0	0	16,893
3	Burnt Lodge	21,576	0	0	21,576
4	Billy Creek	10,916	0	0	10,916
5	West Seven Blackfoot	6,456	0	0	6,456
6	Antelope Creek	5,062	0	0	6,898
A		0	0	1,836	0
7	West Hell Creek	11,896	0	0	12,537
J		0	0	641	0
8	Fort Musselshell	8,303	0	0	8,303
9	Sheep Creek	11,784	0	0	17,510
I		0	0	5,726	0
10	West Beauchamp	6,736	0	0	0
AA		0	6,736	0	0
11	Wagon Coulee	10,480	0	0	15,323
H		0	0	4,843	0
12	Alkali Creek	6,592	0	0	9,279
E, F		0	0	2,687	0
13	Crooked Creek	6,842	0	0	9,668
D		0	0	2,826	0
14	East Hell Creek	14,744	0	0	0
DD		0	14,744	0	0
15	East Beauchamp	5,264	0	0	0
AA		0	5,264	0	0
Total		155,288	26,744	18,559	128,544

## E.4 Wilderness Exclusions

On an evaluation of existing lands on the refuge, a number of lands are not being considered for proposed wilderness designation at this time. If the land status changes or some other factor changes, then they could be considered in the future. Table G describes those areas that are currently not being considered for proposed wilderness designation, based on four wilderness criteria:

1. Generally appear to have been affected primarily by the forces of nature with the imprint of man substantially unnoticeable.
2. Has outstanding opportunities for solitude or a primitive and unconfined type of recreation.
3. Has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition.
4. May also contain ecological, geological, or other features of scientific or historical value.

**Table G. Areas excluded from consideration for wilderness designation at the Charles M. Russell and UL Bend refuges.**

<i>Exclusion Area*</i>	<i>Physical Boundary Description</i>	<i>Acres</i>	<i>Justification</i>
1	North and west: Antelope Creek proposed wilderness unit and the proposed addition (A) South: river East: Highway 191	4,606	This unit lies directly within the Highway 191 corridor leaving little to no opportunity for solitude or a primitive and unconfined type recreation; less than 5,000 acres
2	North: refuge boundary South: river West: Highway 191 East: refuge road 851 south to refuge road 202 to the river	41,948	Within this portion of the refuge is the auto tour route visited by 10,000 vehicles each year. The Slippery Ann elk view area also resides in this portion of the refuge, which is heavily visited each fall by visitors looking to view elk.
3	North: refuge boundary South: river West: refuge road 851 south to refuge road 202 to the river East: A portion of the refuge boundary, State section in T R section, refuge road 201 and then the southern boundary of the West Beauchamp proposed wilderness unit	66,449	This exclusion is a heavily recreated area during the hunting season. Portions of road 201, the main artery along the North side of the refuge, traverse through this region. In addition, there are four State sections and three privately owned tracts.
4	North and east: refuge boundary West: East Beauchamp proposed wilderness unit South: UL Bend National Wildlife Refuge boundary	1,348	This sliver of land is not large enough to be considered on its own, nor does it contain any ecological, geological, or other features of scientific or historic value.
5	North and west: refuge boundary South: UL Bend National Wildlife Refuge boundary and the river East: Burnt Lodge proposed wilderness unit boundary	21,061	Within this exclusion lies Forchette Creek Recreation Area, which receives visitation by hunters and recreationists year-round. This land is intersected by five roads and contains three State parcels.
6	North: refuge boundary West: Burnt Lodge proposed wilderness unit boundary South and east: Timber Creek/ Missouri River as it meanders off the refuge to the north	833	This sliver of land is not large enough to be considered on its own, nor does it contain any ecological, geological, or other features of scientific or historic value.
7	North: river West and south: refuge boundary East: Highway 191	18,913	This exclusion is interspersed with privately owned land, two State sections, and four refuge roads. It is also along the Highway 191 corridor that prohibits from providing solitude or primitive and unconfined type of recreation.
8	North: river West: Highway 191 South: refuge boundary East: Fort Musselshell proposed wilderness unit	32,929	Including the eastern side of highway 191 S of the river, this area too does not provide solitude or primitive and unconfined type of recreation. It also contains the Sand Creek Field Station, multiple privately owned tracts, three State sections, and a portion of the main artery traversing the S side of the refuge.

**Table G. Areas excluded from consideration for wilderness designation at the Charles M. Russell and UL Bend refuges.**

<i>Exclusion Area*</i>	<i>Physical Boundary Description</i>	<i>Acres</i>	<i>Justification</i>
9	North and east: river South: refuge road 315 and proposed CCP addition to the Crooked Creek proposed wilderness units (C) West and south: refuge boundary	12,560	There are two private inholdings, two State sections and several refuge roads within this unit of wilderness consideration. These encumbrances, along with a lack of significant ecological, geological, or other features, justify this section as currently not meeting the wilderness criteria.
10	North: Crooked Creek drainage and refuge road 411 West: refuge boundary South: refuge road 103 to a point where it intersects with Crooked Creek	4,046	Within this area is the Crooked Creek Recreation Area managed by USACE. It is a heavily recreated area and thus would not be suitable wilderness habitat.
11	North: Township line 18N South and west: refuge boundary East: the Musselshell River as it meanders off the refuge	1,773	This area is less than the recommended 5,000-acre minimum for a wilderness, and does not contain any ecological, geological, or other feature of scientific, educational, scenic, or historical value to classify as wilderness on its own.
12	North and west: Musselshell River as it enters the refuge and joins the Missouri River South: refuge boundary East: the boundary of the West Seven Black-foot proposed wilderness unit	48,301	There are multiple privately own parcels within this portion of the refuge. Between the multiple refuge roads and the privately owned lands, there is not enough of the refuge to be considered for its wilderness characteristics.
13	North: Missouri River coming through the refuge at the southern boundary of the West Hell Creek proposed wilderness unit and through the hell Creek Bay to the southern boundary of the East Hell Creek proposed wilderness unit South and east: refuge boundary	32,359	Within this exclusion is the Hell Creek Recreation Area, which consists of a campground, marina, boat ramp, and multiple private inholdings. The area is noticeably affected by the presences of people, and does not provide the best opportunity for a primitive and unconfined type of recreation.
14	North: Fort Peck Reservoir and that portion of the refuge south of Sheep Creek proposed wilderness unit to refuge road 357 East: refuge road 357 South: refuge boundary West: township line running north and south known as R38E.	8,225	Within this exclusion, there is a single private inholding and five refuge roads. It holds potential for providing a wilderness experience; however, due to the private inholding and the open refuge roads, this area is not considered suitable during this period of review.
15	North: Fort Peck Reservoir and that portion also known as the Big Dry Arm West: West Gilbert Creek drainage as it meanders off of the refuge South: refuge boundary East: that portion of the refuge that meanders from the Fort Peck Reservoir south to the Big Dry Arm and Big Dry Creek as it meanders off the refuge in T20N R42E	48,835	This long and narrow strip of refuge lands contains multiple roads and multiple private inholdings. With the combination of inholdings and roads, there is not a single 5,000-acre block of land. The Rock Creek Recreation Area is also within this block of land. It consists of multiple privately owned cabin sites and recreational lands.

**Table G. Areas excluded from consideration for wilderness designation at the Charles M. Russell and UL Bend refuges.**

<i>Exclusion Area*</i>	<i>Physical Boundary Description</i>	<i>Acres</i>	<i>Justification</i>
16	<p>This exclusion starts where exclusion #15 ends.</p> <p>West: from the Big Dry Creek as it exits the refuge and following the east shoreline North all the way to the Fort Peck Reservoir until it meets Duck Creek road on the north side of the Fort Peck Reservoir</p> <p>East: starting from that point where the refuge boundary meets Big Dry Creek meandering off the refuge, and following the refuge boundary east and north around the Big Dry Arm and the north side of the Fort Peck Reservoir until it meets Duck Creek road</p>	57,446	Like exclusion #15, this long and narrow strip of land is riddled with multiple roads and private inholdings. Several USACE recreation areas and multiple State owned sections are in this area. With the presence of the recreation areas, scattered private inholdings, and meandering roads, this area is not considered to meet the wilderness criteria.
17	<p>North: refuge boundary</p> <p>East: Duck Creek road</p> <p>South: Fort Peck Reservoir</p> <p>West: refuge road 331 from the point at which it enters the refuge to the Fort Peck Reservoir</p>	45,494	This unit contains four partial or full State sections and multiple private inholdings. There is an open refuge road along each ridge and several that meander throughout. While it has been primarily untouched by humans, with the frequency of the refuge roads, it does not provide a single block of land of sufficient size meeting the wilderness criteria.
18	<p>North: refuge boundary</p> <p>East: refuge road 331 from the point at which it enters the refuge to the Fort Peck Reservoir</p> <p>South: Fort Peck Reservoir</p> <p>West: refuge road 327 from the point at which it enters the refuge to the Fort Peck Reservoir (also the boundary of Wagon Coulee proposed wilderness unit)</p>	36,666	Currently, this area contains both private inholdings and numerous refuge roads. While this is important habitat, with the encumbrances mentioned it is not suitable wilderness.
19	<p>North: refuge boundary</p> <p>East: Wagon Coulee proposed wilderness unit</p> <p>South: Fort Peck Reservoir</p> <p>East: Timber Creek and road 339 as it meanders off the refuge</p>	23,560	This unit contains the Bone Trail Boat Ramp along with multiple private inholdings. Due to the amount of inholdings and the recreational facilities, this area is considered to have extreme human impacts and does not meet the required wilderness criteria.
20	Islands within the Missouri River	Unknown	This unit consists of the Missouri River and the multitude of islands both permanent and those appearing and disappearing with the rise and fall of the river levels.
21	UL Bend National Wildlife Refuge—All land that is currently not part of UL Bend Wilderness		A network of roads crosses through the center of the UL Bend refuge. Due to these roads and their public use, these areas would not be suitable for wilderness proposal.

\*The exclusion numbers correspond to figure A above.

## E.5 UL Bend Wilderness

Although the UL Bend Wilderness is not part of this review, information about its designation is provided. There are no new lands within the UL Bend refuge being considered for wilderness designation (refer to exclusion area 21 in table G).

Observed on May 21, 1809 by Lewis and Clark, as evidenced by their journals, was the Missouri River in its course making a sudden downward and extensive bend to receive the Musselshell River. Known today as the UL Bend National Wildlife Refuge, this portion of the refuge located at its very southern tip, is composed to 17,909 acres of designated wilderness. An additional 2,984 acres of designated wilderness are located in the very northwest corner of the refuge. In May 1974, the Service submitted 20,893 acres for inclusion as proposed wilderness units. On October 19, 1976, Congress passed Public Law 94-557 designating 20,890 acres as UL Bend Wilderness. Currently, the UL Bend Wilderness consists of 20,819 due to a subtraction in acres allowing for lake access (FWS 2008a).

The first wilderness study conducted for the UL Bend refuge was in 1974. The primary objectives for the refuge were to provide nesting, resting and feeding habitat for ducks, geese, swans, and other migratory birds. Other objectives included the protection of rare and endangered wildlife species, promoting and preserving diversity and healthy abundance of all wildlife, and providing compatible levels of wildlife-dependent recreation. Today, the UL Bend refuge is home to the black-footed ferret reintroduction effort. The refuge provides a large expansive location for large acreage, black-tailed prairie dog colonies, a keystone species that the ferrets heavily depend on. Providing a steady source of water are the many impoundments and pools of water gathered throughout the refuge. The bearpaw shale that makes up the main soil-type in the area is composed of dark gray, clayey shale and includes thin beds of bentonite. This type of soil provides a good seal for water with little percolation into the lower layers of loam allowing wetlands to develop. These wetlands are ideal for migrating waterfowl and resident wildlife.

## E.6 Definitions

Several definitions are used in this wilderness review.

**Wilderness Definition and Criteria.** The definition of wilderness is in section 2(c) of the Wilderness Act: “A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an

area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and that (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value.”

**Designated Wilderness.** An area designated in legislation and administered as part of the National Wilderness Preservation System).

**Proposed Wilderness.** An area of the Refuge System that the Secretary of the Interior (Secretary) has recommended to the President for inclusion in the National Wilderness Preservation System. The President then transmits the wilderness proposal to Congress. Once the Secretary transmits the recommendation to the President, the Service considers the area proposed wilderness and will manage it as designated wilderness.

**Recommended Wilderness.** An area of the Refuge System that the Director of the Service has recommended to the Secretary through the Assistant Secretary for Fish, Wildlife, and Parks for inclusion in the National Wilderness Preservation System.

**Wilderness Review.** The inventory, study, and decision making process the Service uses to determine whether to recommend Refuge System lands and waters for wilderness designation.

**Wilderness Study Area.** An area the Service is considering for wilderness designation. The Service identifies and establishes wilderness study areas through the inventory component of a wilderness review. The study areas include all areas that are still undergoing the review process, areas for which a final determination of suitability and recommendation for wilderness designation in the record of decision for the CCP and EIS is pending, and areas recommended for wilderness designation in a final CCP and awaiting approval by the Director. The Service considers areas recommended by the Director “recommended wilderness.”

**Wilderness Values.** Wilderness values are biophysical (ecosystems, scenery, and natural processes), psychological (opportunity for solitude or primitive and unconfined recreation), symbolic (national and natural remnants of American cultural and evolutionary heritage), and spiritual (sense of connection with nature and values beyond one’s self).



# Appendix F

## List of Plant and Animal Species

This appendix contains the common and scientific names of plants, amphibians, reptiles, fish, birds, and mammals of the Charles M. Russell National Wildlife Refuge and UL Bend National Wildlife Refuge.

### Sentinel Plant Species

Sentinel plants are those species that vanish first when the ecological processes that occur within an ecosystem are out of balance. The following sentinel plant species occur on the upland plains and draws and north slopes on the Charles M. Russell National Wildlife Refuge and UL Bend National Wildlife Refuge.

#### SHRUBS AND TREES

rubber rabbitbrush, *Chrysothamnus nauseosus* spp. *nauseosus*  
green rubber rabbitbrush, *Chrysothamnus nauseosus* spp. *graveolens*  
saltbush, *Atriplex aptera*  
winterfat, *Krascheninnikovia lanata*  
silver buffaloberry, *Shepherdia argentea*  
chokecherry, *Prunus virginiana*  
boxelder, *Acer negundo*  
green ash, *Fraxinus pennsylvanica*  
plains cottonwood, *Populus deltoides*  
redosier dogwood, *Cornus stolonifera*  
golden current, *Ribes aureum*  
aspen, *Populus tremuloides*

#### WARM-SEASON FORBS

purple coneflower, *Echinacea angustifolia*  
stiff sunflower, *Helianthus pauciflorus*  
dotted gayfeather, *Liatris punctata*  
white prairieclover, *Dalea candida*  
purple prairieclover, *Dalea purpurea*  
Maximilian sunflower, *Helianthus maximiliani*

### Plant List

Scientific Name	Common Name
<b>Aceraceae</b>	<b>Maple Family</b>
<i>Acer negundo</i>	box elder
<b>Agavaceae</b>	<b>Century-plant Family</b>
<i>Yucca glauca</i>	soapweed yucca
<b>Alismataceae</b>	<b>Water Plantain Family</b>
<i>Alisma gramineum</i>	narrowleaf water plantain
<i>A. triviale</i>	northern water plantain
<i>Sagittaria cuneata</i>	arumleaf arrowhead
<i>S. latifolia</i>	bulltongue arrowhead
<b>Amaranthaceae</b>	<b>Amaranth Family</b>
<i>Amaranthus albus</i>	prostrate pigweed
<i>A. arenicola</i>	sandhill amaranth
<i>A. blitoides</i>	mat amaranth

<i>Scientific Name</i>	<i>Common Name</i>
<i>A. californicus</i>	California amaranth
<i>A. retroflexus</i>	redroot amaranth
<b>Anacardiaceae</b>	<b>Sumac Family</b>
<i>Rhus trilobata</i>	skunkbush
<i>Toxicodendron rydbergii</i>	western poison ivy
<b>Apaceae</b>	<b>Carrot Family</b>
<i>Cymopterus acaulis</i>	plains spring parsley
<i>Heracleum sphondylium</i>	eltrot
<i>Lomatium foeniculaceum</i>	dessert biscuitroot
<i>Musineon divaricatum</i>	wild parsley
<i>Osmorhiza longistylis</i>	longstyle sweetroot
<i>Sium suave</i>	hemlock waterparsnip
<b>Apocynaceae</b>	<b>Dogbane Family</b>
<i>Apocynum cannabinum</i>	Indianhemp
<b>Asclepiadaceae</b>	<b>Milkweed Family</b>
<i>Asclepias speciosa</i>	showy milkweed
<i>A. verticillata</i>	whorled milkweed
<b>Asteraceae</b>	<b>Aster Family</b>
<i>Achillea millefolium</i>	common yarrow
<i>Acroptilon repens</i>	hardheads
<i>Agoseris glauca</i>	pale agoseris
<i>Ambrosia artemisifolia</i>	annual ragweed
<i>Antennaria dimorpha</i>	low pussytoes
<i>A. microphylla</i>	littleleaf pussytoes
<i>A. neglecta</i>	field pussytoes
<i>A. parvifolia</i>	small-leaf pussytoes
<i>A. rosea</i>	rosy pussytoes
<i>Arctium lappa</i>	greater burdock
<i>Arnica sororia</i>	twin arnica
<i>Artemisia absinthium</i>	absinthium
<i>A. biennis</i>	biennial wormwood
<i>A. campestris</i>	field sagewort
<i>A. cana</i>	silver sagebrush
<i>A. dracuncululus</i>	tarragon
<i>A. frigida</i>	prairie sagewort
<i>A. longifolia</i>	longleaf wormwood
<i>A. ludoviciana</i>	white sagebrush
<i>A. tridentata wyomingensis</i>	Wyoming big sage
<i>Aster brachyactis</i>	aster brachyactis
<i>A. falcatus</i>	white prairie aster
<i>Bidens cernua</i>	nodding beggartick
<i>B. frondosa</i>	devil's beggartick
<i>Brickellia eupatoroides</i>	false boneset
<i>Centaurea stoebe</i>	spotted knapweed
<i>Chaenactis douglasii</i>	Douglas' dustymaiden
<i>Chrysothamnus viscidiflorus</i>	yellow rabbitbrush
<i>Cirsium arvense</i>	Canadian thistle
<i>C. flodmanii</i>	Flodman's thistle
<i>C. undulatum</i>	wavyleaf thistle
<i>C. vulgare</i>	bull thistle
<i>Conzya canadensis</i>	Canadian horseweed
<i>Crepis atribarba</i>	largeflower hawksweed
<i>C. occidentalis</i>	largeflower hawksweed
<i>C. runcinata</i>	fiddleleaf hawksweed
<i>Cyclachaena xanthifolia</i>	giant sumpweed
<i>Dyssodia papposa</i>	field marigold

Scientific Name	Common Name
<i>Echinacea angustifolia</i>	blacksamson echinaceae
<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>glabrata</i>	rubber rabbitbrush
<i>E. nauseosa</i> ssp. <i>nauseosa</i> var. <i>nauseosa</i>	rubber rabbitbrush
<i>Erigeron caespitosus</i>	tufted fleabane
<i>E. compositus</i>	cutleaf daisy
<i>E. corymbosus</i>	longleaf fleabane
<i>E. ochroleucus</i>	buff fleabane
<i>E. pumilus</i>	shaggy fleabane
<i>E. strigosus</i>	prairie fleabane
<i>Gallardia aristata</i>	common gallardia
<i>Gnaphalium palustre</i>	western marsh cudweed
<i>Grindelia squarrosa</i>	curlycup gumweed
<i>Gutierrezia sarothrae</i>	broom snakeweed
<i>Helenium autumnale</i>	common sneezeweed
<i>Helianthus annuus</i>	common sunflower
<i>H. maximiliani</i>	Maximilian sunflower
<i>H. pauciflorous</i>	stiff sunflower
<i>H. petiolaris</i>	prairie sunflower
<i>Heterotheca villosa</i>	hairy false golden aster
<i>Hieracium umbellatum</i>	narrowleaf hawkweed
<i>Hymenopappus polycephalus</i>	manyhead hymenopappus
<i>Hymenoxys richardsonii</i>	pingue rubberweed
<i>Iva axillaris</i>	poverty weed
<i>Lactuca tatarica</i>	blue lettuce
<i>Lactuca punctata</i>	dotted blazing star
<i>Lygodesmia juncea</i>	rush skeletonplant
<i>Machaeranthera canescens</i>	hoary tansyaster
<i>M. grindelioides</i>	rayless tansyaster
<i>M. pinnatifida</i>	lacy tansyaster
<i>M. tanacetifolia</i>	tansyleaf tansyaster
<i>Microseris nutans</i>	nodding microceris
<i>Nothocalais cuspidata</i>	sharp-point prairie-dandelion
<i>Packera cana</i>	wolly groundsel
<i>Picradeniopsis oppositifolia</i>	opposite leaf bahia
<i>Ratibida columnifera</i>	upright prairie coneflower
<i>Senecio integerrimus</i>	lambstongue ragwort
<i>S. serra</i>	tall ragwort
<i>Solidago canadensis</i>	Canada goldenrod
<i>S. missouriensis</i>	Missouri goldenrod
<i>S. mollis</i>	velvety goldenrod
<i>S. rigida</i>	stiff goldenrod
<i>Sonchus arvensis</i> ssp. <i>uliginosus</i>	moist sowthistle
<i>S. oleraceus</i>	common sawthistle
<i>Stenotus acaulis</i>	stemless mock goldenweed
<i>Stephanomeria runcinata</i>	desert wirelettuce
<i>Symphiotrichum ericoides</i> var. <i>pansum</i>	manyflowered aster
<i>S. laeve</i>	smooth blue aster
<i>Taraxacum laevigatum</i>	rock dandelion
<i>T. officinale</i>	common dandelion
<i>Townsendia exscupa</i>	stemless Townsend daisy
<i>Townsendia hookeri</i>	Hooker's Townsend daisy
<i>Tragopogon dubius</i>	yellow salsify
<i>Xanthium strumarium</i>	rough cocklebur
<b>Boraginaceae</b>	<b>Borage Family</b>
<i>Cryptantha celosioides</i>	buttecandle
<i>Cryptantha spiculifera</i>	Snake River cryptantha

<i>Scientific Name</i>	<i>Common Name</i>
<i>Hackelia deflexa</i>	nodding stickseed
<i>Lappula redowskii</i>	flatspine stickseed
<i>L. squarrosa</i>	European stickseed
<i>Lithospermum incisum</i>	narrowleaf stoneseed
<i>Plagiobothrys leptocladus</i>	finebranched popcorn flower
<b>Brassicaceae</b>	<b>Mustard Family</b>
<i>Alyssum desertorum</i>	desert madwort
<i>Arabis hirsuta</i>	hairy rockcress
<i>A. holboellii</i>	Holboell's rockcress
<i>Armoracia rusticans</i>	horseradish
<i>Camelina microcarpa</i>	littlepod false flax
<i>Cardaria draba</i>	whitetop
<i>Chorispora tenella</i>	crossflower
<i>Conringia orientalis</i>	hare's ear mustard
<i>Descurainia richardsonii</i>	mountain tansy mustard
<i>Draba albertina</i>	slender draba
<i>D. nemorosa</i>	woodland draba
<i>D. reptans</i>	Carolina draba
<i>Erysimum asperum</i>	western wallflower
<i>E. inconspicuum</i>	shy wallflower
<i>E. cheiranthoides</i> L.	wormseed wallflower
<i>Hesperis matronalis</i>	dames rocket
<i>Lepidium densiflorum</i>	common pepperweed
<i>L. perfoliatum</i>	clasping pepperweed
<i>Lesquerella alpina</i>	alpine bladderpod
<i>L. ludoviciana</i>	foothill bladderpod
<i>Physaria didymocarpa</i>	common twinpod
<i>Rorippa sinuata</i>	spreading yellowcress
<i>Sisymbrium altissimum</i>	tall tumbleweed mustard
<i>Thelypodium paniculatum</i>	northwestern thelypody
<i>Thlaspi arvense</i>	field pennycress
<b>Callitricheae</b>	<b>Water-starwort Family</b>
<i>Callitriche hermaphroditica</i>	northern water-starwort
<b>Campanulaceae</b>	<b>Bellflower Family</b>
<i>Campanula rotundifolia</i>	bluebell bellflower
<i>Triodanis leptocarpa</i>	slimpod Venus looking glass
<b>Capparidaceae</b>	<b>Caper Family</b>
<i>Cleome serrulata</i>	Rocky Mountain beeplant
<i>Polanisia dodecandra</i> spp. <i>trachysperma</i>	sandyseed clammyweed
<b>Caprifoliaceae</b>	<b>Honeysuckle Family</b>
<i>Symphoricarpos albus</i>	common snowberry
<i>S. occidentalis</i>	western snowberry
<b>Caryophyllaceae</b>	<b>Pink Family</b>
<i>Arenaria lateriflora</i>	bluntleaf sandwort
<i>Cerastium arvense</i>	field chickweed
<i>C. nutans</i>	nodding chickweed
<i>Paronychia sessiliflora</i>	creeping nailwort
<i>Silene latifolia</i>	bladder campion
<i>S. menziesii</i>	Menzies' campion
<i>S. oregana</i>	Oregon silene
<b>Cactaceae</b>	<b>Cactus Family</b>
<i>Coryphantha missouriensis</i>	Missouri pincushion
<i>C. vivipara</i>	purple pincushion
<i>Opuntia fragilis</i>	brittle prickly pear
<i>O. poluacantha</i>	plains prickly pear

Scientific Name	Common Name
<b>Chenopodiaceae</b>	<b>Goosefoot Family</b>
<i>Atriplex argentea</i>	silverscale saltbush
<i>A. canescens</i>	fourwing saltbush
<i>A. confertifolia</i>	shadescale saltbush
<i>A. gardneri</i>	Gardner's saltbush
<i>A. patula</i>	spear saltbush
<i>A. powellii</i>	Powell's saltbush
<i>A. rosea</i>	tumbling saltbush
<i>Bassia scoparia</i>	burning bush
<i>Chenopodium album</i>	lambsquarter
<i>C. atrovirens</i>	pinyon goosefoot
<i>C. desiccatum</i>	aridland goosefoot
<i>C. fremontii</i>	Fremont's goosefoot
<i>C. glaucum</i>	oakleaf goosefoot
<i>C. leptophyllum</i>	narrowleaf goosefoot
<i>C. pratericola</i>	desert goosefoot
<i>C. rubrum</i>	red goosefoot
<i>C. subglabrum</i>	smooth goosefoot
<i>Endolepis diocicia</i>	Suckley's endolepis
<i>Krascheninnikovia lanata</i>	winterfat
<i>Monolepis nuttalliana</i>	Nuttall's povertyweed
<i>Salicornia rubra</i>	red swapfire
<i>Salsola tragus</i>	prickly Russian thistle
<i>Sarcobatus vermiculatus</i>	greasewood
<i>Suaeda calceoliformis</i>	Pursh seepweed
<i>Suaeda moquinii</i>	Mojave seablite
<b>Commelinaceae</b>	<b>Spiderwort Family</b>
<i>Tradescantia occidentalis</i>	prairie spiderwort
<b>Convolvulaceae</b>	<b>Morning Glory Family</b>
<i>Calystegia sepium</i>	hedge false bindweed
<i>Convolvulus arvensis</i>	field bindweed
<i>Cornaceae</i>	dogwood
<i>Cornus siricea</i> spp. <i>siricea</i>	redosier dogwood
<b>Cupressaceae</b>	<b>Cypress Family</b>
<i>Juniperus communis</i>	common juniper
<i>J. horizontalis</i>	creeping juniper
<i>J. scopulorum</i>	Rocky Mountain juniper
<i>J. scopulorum</i> × <i>horizontalis</i>	hybrid of creeping and Rocky Mountain junipers
<b>Cyperaceae</b>	<b>Sedge Family</b>
<i>Carex brevior</i>	shortbreak sedge
<i>C. douglasii</i>	Douglas sedge
<i>C. duriusula</i>	needleleaf
<i>C. filifolia</i>	threadleaf sedge
<i>C. hoodii</i>	Hood's sedge
<i>C. lanuginosa</i>	American willyfruit sedge
<i>C. pensylvanica</i>	Pennsylvania sedge
<i>C. rossii</i> Boott.	Ross' sedge
<i>C. sprengelii</i>	Sprengel's sedge
<i>C. vulpinoidea</i>	fox sedge
<i>C. xerantica</i>	whitescale sedge
<i>Eleocharis acicularis</i>	needle spikerush
<i>E. palustris</i>	common spikerush
<i>Schoenoplectus acutus</i>	hardstem bulrush
<i>S. americanus</i>	chairmaker's bulrush
<i>S. maritimus</i>	cosmopolitan bulrush
<i>S. tabernaemontani</i>	softstem bulrush

<i>Scientific Name</i>	<i>Common Name</i>
<b>Dryopteridaceae</b>	<b>Wood Fern Family</b>
<i>Cystopteris fragilis</i>	brittle bladder fern
<i>Woodsia oregana</i>	Oregon cliff fern
<b>Elaeagnaceae</b>	<b>Oleaster Family</b>
<i>Elaeagnus angustifolia</i>	Russian olive
<i>E. communtata</i>	silverberry
<i>Shepherdia argentea</i>	silver buffaloberry
<b>Elatinaceae</b>	<b>Waterwort Family</b>
<i>Elatine triandra</i>	threestamen waterwort
<b>Equisetaceae</b>	<b>Horsetail Family</b>
<i>Equisetum arvense</i>	field horsetails
<i>E. hyemale</i>	scouringrush horsetails
<i>E. laevigatum</i>	smooth horsetail
<i>E. variegatum</i>	variegated scouringrush
<b>Euphorbiaceae</b>	<b>Spurge Family</b>
<i>Euphorbia brachycera</i>	horned spurge
<i>Euphorbia esula</i>	leafy spurge
<i>Euphorbia glyptosperma</i>	ribseed sandmat
<i>Euphorbia serpyllifolia</i>	thymeleaf sandmat
<i>Euphorbia spathulata</i>	water spurge
<b>Fabaceae</b>	<b>Legume Family</b>
<i>Astragalus agrestis</i>	purple vetch
<i>A. bisulcatus</i>	two grooved milkvetch
<i>A. canadensis</i>	Canadian milkvetch
<i>A. crassicarpus</i>	groundplum milkvetch
<i>A. flexuosus</i>	flexile milkvetch
<i>A. geyeri</i>	Geyer's milkvetch
<i>A. gilviflorus</i>	plains milkvetch
<i>A. gracilis</i>	slender milkvetch
<i>A. grummondii</i>	Drummonds milkvetch
<i>A. kentrophyta</i>	spiny milkvetch
<i>A. laxmanni</i> var. <i>robustior</i>	prairie milkvetch
<i>A. lentiginosus</i>	freckled milkvetch
<i>A. lotiflorus</i>	lotus milkvetch
<i>A. purshii</i>	woolypod milkvetch
<i>A. spatulatus</i>	tufted milkvetch
<i>Caragana arborescens</i>	Siberian peashrub
<i>Dalea candida</i>	white prairie clover
<i>D. purpurea</i>	purple prairie clover
<i>Glycyrrhiza lepidota</i>	American licorice
<i>Lupinus argenteus</i>	silvery lupine
<i>L. pusillus</i>	rusty lupine
<i>Medicago lupulina</i>	black medrich
<i>M. sativa</i>	alfalfa
<i>Melilotus officinalis</i>	yellow sweetclover
<i>Oxytropis besseyi</i>	Bessey's locoweed
<i>O. lambertii</i>	purple locoweed
<i>O. monticola</i>	yellow flower locoweed
<i>O. sericea</i>	white locoweed
<i>Pediomelum argophyllum</i>	silverleaf breadroot
<i>P. esculentum</i>	large indian breadroot
<i>P. lanceolatum</i>	lemon scurfpea
<i>P. tenuiflorum</i>	slimflower scurfpea
<i>Thermopsis rhombifolia</i>	prairie thermopsis
<i>Trifolium hybridum</i>	alsike hybridum

Scientific Name	Common Name
<i>Trifolium repens</i>	white clover
<i>Vicia americana</i>	American vetch
<b>Geraniaceae</b>	<b>Geranium Family</b>
<i>Geranium carolinianum</i>	Carolina geranium
<b>Grossulariaceae</b>	<b>Currant Family</b>
<i>Ribes americanum</i>	American black currant
<i>R. aureum</i>	golden currant
<i>R. cereum</i>	wax currant
<i>R. setosum</i>	inland gooseberry
<i>R. viscosissimum</i>	sticky currant
<b>Haloragidaceae</b>	<b>Water Milfoil Family</b>
<i>Myriophyllum spicatum</i>	Eurasian water milfoil
<i>Hydrophyllaceae</i>	waterleaf
<i>Ellisia nyctelea</i>	Aunt Lucy
<i>Nemophila breviflora</i>	basin nemophila
<i>Phacelia linearis</i>	threadleaf phacelia
<i>P. thermalis</i>	heated phacelic
<b>Iridaceae</b>	<b>Iris Family</b>
<i>Sisyrinchium montanum</i>	strict blue-eyed grass
<b>Juncaceae</b>	<b>Rush Family</b>
<i>Juncus balticus</i>	Baltic rush
<i>J. bufonius</i>	toad rush
<i>J. interior</i>	inland rush
<i>J. tenuis</i>	Poverty rush
<i>J. torreyi</i>	Torrey's rush
<b>Juncaginaceae</b>	<b>Arrow-Grass Family</b>
<i>Triglochin concinnum</i>	slender arrowgrass
<b>Lamiaceae</b>	<b>Mint Family</b>
<i>Dracocephalum parviflorum</i>	American dragonhead
<i>Hedeona drummondii</i>	Drummond's false pennyroyal
<i>Hedeona hispida</i>	false penny royal
<i>Lycopus asper</i>	rough bungleweed
<i>Mentha arvensis</i>	wild mint
<i>Monarda fistulosa</i>	wild bermont (beebulm)
<i>Nepeta cataria</i>	catnip
<b>Lemnaceae</b>	<b>Duckweed Family</b>
<i>Lemna minor</i>	common duckweed
<b>Liliaceae</b>	<b>Lily Family</b>
<i>Allium textile</i>	textile onion
<i>Asparagus officinalis</i>	garden asparagus
<i>Calochortus nuttallii</i>	sego lily
<i>Fritillaria pudica</i>	yellow fritillary
<i>Maianthemum stellatum</i>	starry false lily of the valley
<i>Prosartes trachycarpa</i>	rough fruit fairybells
<i>Smilax herbacea</i>	smooth carrionflower
<i>Zigadenus venenosus</i>	meadow deathcamas
<b>Linaceae</b>	<b>Flax Family</b>
<i>Linum lewisii</i>	Lewis flax
<i>L. rigidum</i>	stiffstem flax
<b>Loasaceae</b>	<b>Loasa Family</b>
<i>Mentzelia albicaulis</i>	whitestem blazingstar
<i>M. decapetala</i>	ten petal blazingstar
<i>M. laevicaulis</i>	smooth stemmed blazingstar
<b>Malvaceae</b>	<b>Mallow Family</b>
<i>Malva parviflora</i>	cheeseweed mallow
<i>Sphaeralcea coccinea</i>	scarlet gold mallow

<i>Scientific Name</i>	<i>Common Name</i>
<b>Najadaceae</b> <i>Najas guadalupensis</i>	<b>Water-nymph Family</b> southern waternymph
<b>Nyctaginaceae</b> <i>Mirabilis linearis</i>	<b>Four o'clock Family</b> narrowleaf four o'clock
<b>Oleaceae</b> <i>Fraxinus pennsylvanica</i>	<b>Olive Family</b> green ash
<b>Onagraceae</b> <i>Calylophus serrulatus</i> <i>Epilobium angustifolium</i> <i>E. ciliatum</i> <i>E. pbrachycarpum</i> <i>E. pygmaeum</i> <i>Gaura coccineae</i> <i>Oenothera albicaulis</i> <i>O. biennis</i> <i>O. cespitosa</i> <i>O. flava</i> <i>O. nuttllii</i> <i>O. villosa</i>	<b>Evening Primrose Family</b> yellow sundrops fireweed fringed willow herb tall annual willowherb smooth spike primrose scarlet beeblossom whitest evening primrose common evening primrose gumbo evening primrose yellow evening primrose Nuttall's evening primrose hairy evening primrose
<b>Orbanchaceae</b> <i>Orobanche fasciculata</i> <i>O. ludoviciana</i>	<b>Broomrape Family</b> clustered broomrape Louisiana broomrape
<b>Pinaceae</b> <i>Pinus flexis</i> <i>Pinus ponderosa</i> <i>Pseudotsuga menziesii</i>	<b>Pine Family</b> limber pine ponderosa pine Douglas-fir
<b>Plantaginaceae</b> <i>Plantago aristata</i> <i>P. elongata</i> <i>P. lanceolata</i> <i>P. major</i> <i>P. patagonica</i>	<b>Plantain Family</b> largebracted plantain prairie plantain narrow leaf plantain common plantain hairy plantain (Indian wheat)
<b>Poaceae</b> <i>Achnatherum hymenoides</i> <i>Agropyron cristatum</i> <i>Agrostis sabra</i> <i>Agrostit stolonifera</i> <i>Andropogon hallii</i> <i>Avena sativa</i> <i>Beckmannia syzigachne</i> <i>Bouteloua dactyloides</i> <i>B. gracilis</i> <i>Bromus arvensis</i> <i>B. carinatus</i> <i>B. ciliatus</i> <i>B. commutatus</i> <i>B. inermis</i> <i>B. inermis</i> spp. <i>pumpellianus</i> <i>B. tectorum</i> <i>Calamagrostis canadensis</i> <i>C. montanensis</i> <i>Calamovilfa longifolia</i> <i>Dactylis glomerata</i> <i>Danthonia unispicata</i> <i>Distichlis stricta</i>	<b>Grass Family</b> indian ricegrass crested wheatgrass rough bentgrass creeping bentgrass sand bluestem common oat American sloughgrass buffalo grass blue grama field brome (Japanese brome) California brome fringed brome bald brome smooth brome Pumpelly's brome cheatgrass bluejoint plains reedgrass prairie sandreed orchardgrass onespike danthonia saltgrass

Scientific Name	Common Name
<i>Echinochloa crus-galli</i>	barnyard grass
<i>Elymus canadensis</i>	Canada wildrye
<i>E. elymoides</i>	squirreltail
<i>E. lanceolatus</i>	thickspike wheatgrass
<i>E. repens</i>	quackgrass
<i>E. trachycaulum</i>	slender wheatgrass
<i>Eragrostis cilianensis</i>	stinkgrass
<i>E. pectinacea</i>	tufted lovegrass
<i>Festuca rubra</i>	red fescue
<i>Glyceria striata</i>	fowl mannagrass
<i>Hesperostipa comatga</i>	needle and thread
<i>Hordeum jubatum</i>	foxtail barley
<i>H. pusillum</i>	little barley
<i>Koeleria macrantha</i>	prairie Junegrass
<i>Leymus triticoides</i>	heartless wildrye
<i>Muhlenbergia asperifolia</i>	scratchgrass
<i>M. cuspidata</i>	plains muhly
<i>Munroa squarrosa</i>	false buffalo grass
<i>Nassella viridula</i>	green needlegrass
<i>Panicum cappillare</i>	witchgrass
<i>Pascopyrum smithii</i>	western wheatgrass
<i>Phalaris arundinaceae</i>	reed canarygrass
<i>Phleum pratense</i>	timothy
<i>Piptatherum micrantha</i>	littleseed ricegrass
<i>Poa annua</i>	annual bluegrass
<i>P. arida</i>	plains bluegrass
<i>P. bulbosa</i>	bulbous bluegrass
<i>P. compressa</i>	Canada bluegrass
<i>P. cusickii</i>	Cusick's bluegrass
<i>P. palustris</i>	fowl bluegrass
<i>P. pratensis</i>	Kentucky bluegrass
<i>P. secunda</i>	Sandberg bluegrass
<i>Polypogon monspeliensis</i>	annual rabbit's foot grass
<i>Pseudoroegneria spicata</i>	bluebunch wheatgrass
<i>Puccinellia nuttalliana</i>	Nuttall's alkali grass
<i>Schedonnardus paniculatus</i>	tumble grass
<i>Schizachyrium scoparium</i>	little bluestem
<i>Setaria viridis</i>	green bristlegrass
<i>Spartina gracilis</i>	alkali cordgrass
<i>Sporobolus airoides</i>	alkali sacaton
<i>S. cryptandrus</i>	sand dropseed
<i>Thinopyrum intermedium</i>	intermediate wheatgrass
<i>Torreyochloa pallida</i>	pale false mannagrass
<i>Triticum aestivum</i>	common wheat
<i>Vulpia octoflora</i>	sixweeks fescue
<b>Polemoniaceae</b>	<b>Phlox Family</b>
<i>Collomia linearis</i>	tiny trumpet
<i>Microsteris gracilis</i>	slender phlox
<i>Phlox alyssifolia</i>	alyssumleaf phlox
<i>P. hoodii</i>	spiny phlox
<b>Polygalaceae</b>	<b>Milkwort Family</b>
<i>Polygala alba</i>	white milkwort
<i>P. verticillata</i>	whorled milkwort
<i>Polygonaceae</i>	buckwheat
<i>Eriogonum annuum</i>	annual buckwheat

<i>Scientific Name</i>	<i>Common Name</i>
<i>E. cernuum</i>	nodding buckwheat
<i>E. flavum</i>	alpine golden buckwheat
<i>E. ovalifolium</i>	cusion buckwheat
<i>E. pauciflorum</i>	few flower buckwheat
<i>Polygonum aviculare</i>	prostate knotweed
<i>P. convolvulus</i>	black bindweed
<i>P. erectum</i>	erect knotweed
<i>P. lapathifolium</i>	curlytop knotweed
<i>P. punctatum</i>	dotted smartweed
<i>P. ramosissimum</i>	bushy knotweed
<i>Rumex acetosella</i>	common sheep sorrel
<i>R. aquaticus</i>	western dock
<i>R. crispus</i>	curly dock
<i>R. maritimus</i>	golden dock
<i>R. salicifolius</i>	willow dock
<i>R. venosus</i>	veiny dock
<b>Portulacaceae</b>	<b>Purslane Family</b>
<i>Claytonia perfoliata</i>	miner's lettuce
<i>Portulaca oleracea</i>	little hogweed
<b>Potamogetonaceae</b>	<b>Pondweed Family</b>
<i>Potamogeton diversifolius</i>	waterthread pondweed
<i>P. foliosus</i>	leafy pondweed
<i>P. praelongus</i>	whitesteam pondweed
<i>P. pusillus</i>	small pondweed
<i>Stuckenia pectinat</i>	sago pondweed
<b>Primulaceae</b>	<b>Primrose Family</b>
<i>Androsace filiformis</i>	filiformis rockjasmine
<i>A. occidentalis</i>	western rockjasmine
<b>Ranunculaceae</b>	<b>Buttercup Family</b>
<i>Anemone cylindrica</i>	candle anemone
<i>A. multifida</i>	Pacific anemone
<i>Clematis ligusticifolia</i>	western white clematis
<i>Delphinium bicolor</i>	little larkspur
<i>Pulsatilla patenes</i>	cutleaf anemone
<i>Ranunculus aquatilis</i>	white water crowfoot
<i>R. cymbalaria</i>	alkali buttercup
<i>R. glaberrimus</i>	sagebrush buttercup
<i>R. macounii</i>	Macoun's buttercup
<i>R. sceleratus</i>	cursed buttercup
<i>Thalictrum venulosum</i>	veiny meadow-rue
<b>Rosaceae</b>	<b>Rose Family</b>
<i>Amelanchier alnifolia</i>	Saskatoon serviceberry
<i>Crataegus chrysocarpa</i>	fineberry hawthorn
<i>Fragaria virginiana</i>	Virginia strawberry
<i>Geum aleppicum</i>	yellow avens
<i>G. triflorum</i>	prairie smoke
<i>Potentilla anserina</i>	silverweed cinquefoil
<i>P. arguta</i>	tall cinquefoil
<i>P. biennis</i>	biennial cinquefoil
<i>P. gracilis</i>	slender cinquefoil
<i>P. paradoxa</i>	paradox cinquefoil
<i>P. pensylvanica</i>	Pennsylvania cinquefoil
<i>Prunus virginiana</i>	chokecherry
<i>Rosa acicularis</i> spp. <i>sayi</i>	prickly rose

Scientific Name	Common Name
<i>R. arkansana</i>	prairie rose
<i>R. woodsii</i>	Wood's rose
<b>Rubiaceae</b>	<b>Bedstraw Family</b>
<i>Galium aparine</i>	stickywilly (catchweed bedstraw)
<i>G. boreale</i>	northern bedstraw
<i>G. trifidum</i>	threepetal bedstraw
<b>Salicaceae</b>	<b>Willow Family</b>
<i>Populus deltoides</i>	eastern cottonwood
<i>P. tremuloides</i>	quaking aspen
<i>P. balsamifera</i>	balsam poplar
<i>Salix amygdaloides</i>	peachleaf willow
<i>S. bebbiana</i>	Bebb willow
<i>S. exigua</i>	narrowleaf willow
<i>S. fragilis</i>	crack willow
<i>S. lasiandra</i>	Pacific willow
<i>S. lutea</i>	yellow willow
<b>Santalaceae</b>	<b>Sandalwood Family</b>
<i>Comandra umbellata</i>	bastard toadflax
<b>Saxifragaceae</b>	<b>Saxifrag Family</b>
<i>Heuchera parvifolia</i>	littleleaf alumroot
<b>Scrophulariaceae</b>	<b>Figwort Family</b>
<i>Bacopa rotundifolia</i>	disk waterhyssop
<i>Besseyia wyomingensis</i>	Wyoming besseyia
<i>Castilleja sessiliflora</i>	downy paintedcup
<i>Collinsia parviflora</i>	maiden blue eyed Mary
<i>Limosella aquatica</i>	water mudwort
<i>Orthocarpus leteus</i>	yellow owl's clover
<i>Penstemon albidus</i>	white penstemon
<i>P. nitidus</i>	waxleaf penstemon
<i>Veronica anagallis-aquatica</i>	water speedwell
<i>V. pergrina</i>	neckweed
<b>Selaginellaceae</b>	<b>Spikemoss Family</b>
<i>Selaginella densa</i>	lesser spikemoss
<b>Solanaceae</b>	<b>Potatoe Family</b>
<i>Solanum rostratum</i>	buffalo nightshade
<i>S. triflorum</i>	cutleaf nightshade
<b>Tamaricaceae</b>	<b>Tamarisk Family</b>
<i>Tamarix chinensis</i>	five stamen tamarisk (saltcedar)
<b>Typhaceae</b>	<b>Cattail Family</b>
<i>Typha latifolia</i>	broadleaf cattail
<b>Urticeae</b>	<b>Nettle Family</b>
<i>Parietaria pennsylvanica</i>	Pennsylvania
<i>Urtica dioica</i>	stinging nettle
<b>Verbenaceae</b>	<b>Verbena Family</b>
<i>Verbena bracteata</i>	bigbract verbena
<b>Violaceae</b>	<b>Violet Family</b>
<i>Viola adunca</i>	hookedsur violet
<i>V. canadensis</i>	Canadian white violet
<i>V. nephrophylla</i>	northern bog violet
<i>V. nuttallii</i>	smooth stemmed blazing star
<b>Vitaceae</b>	<b>Grape Family</b>
<i>Parthenocissus inserta</i>	Virginia creeper
Zannichelliaceae	horned pondweed family
<i>Zigadenus venenosus</i>	meadow deathcamas

# Animal List

## BUTTERFLIES

Source: Big Sky Institute.

Scientific Name	Common Name
<b>Nymphalidae</b>	<b>Brush-footed Butterflies</b>
<b>Limnithidinae</b>	<b>Admirals and Relatives</b>
<i>Limnitis arthemis</i>	red-spotted purple
<i>L. archippus</i>	viceroys
<i>L. weidemeyerii</i>	Weidemeyer's admiral
<i>L. arthemis arthemis</i>	white admiral
<b>Heliconiinae</b>	<b>Longwings</b>
<i>Speyeria aphrodite</i>	Aphrodite fritillary
<i>S. callippe</i>	callippe fritillary
<i>S. coronis</i>	coronis fritillary
<i>S. edwardsii</i>	Edwards' fritillary
<i>S. egleis</i>	great basin fritillary
<i>S. cybele</i>	great spangled fritillary
<i>S. hydasphe</i>	hydasphe fritillary
<i>S. mormonia</i>	Mormon fritillary
<i>S. hesperis</i>	northwestern fritillary
<i>S. zerene</i>	Zerene fritillary
<i>Boloria bellona</i>	meadow fritillary
<i>B. selene</i>	silver-bordered fritillary
<i>Euptoieta claudia</i>	variegated fritillary
<b>Nymphalinae</b>	<b>True Brush-foots</b>
<i>Nymphalis vaualbum</i>	Compton tortoiseshell
<i>N. antiopa</i>	mourning cloak
<i>Euphydryas editha</i>	Edith's checkerspot
<i>E. gillettii</i>	Gillette's checkerspot
<i>E. chalcedona</i>	variable checkerspot
<i>Phycoides pulchellus</i>	field crescent
<i>P. cocyta</i>	northern crescent
<i>P. pallid</i>	pale crescent
<i>P. tharos</i>	pearl crescent
<i>P. batesii</i>	tawny crescent
<i>Chlosyne gorgone</i>	Gorgone checkerspot
<i>C. palla</i>	northern checkerspot
<i>C. acastus</i>	sagebrush checkerspot
<i>Polygonia progne</i>	gray comma
<i>P. faunus</i>	green comma
<i>P. gracilis</i>	hoary comma
<i>P. satyrus</i>	satyr comma
<i>Aglais milberti</i>	Milbert's tortoiseshell
<i>Vanessa cardui</i>	painted lady
<i>V. atalanta</i>	red admiral
<i>V. annabella</i>	west coast lady
<b>Riodinidae</b>	<b>Metalmarks</b>
<i>Apodemia mormo</i>	Mormon metalmark
<b>Parnassiinae</b>	<b>Parnassians</b>
<i>Parnassian smintheus</i>	Rocky Mountain parnassian
<b>Papilioninae</b>	<b>Swallowtails</b>
<i>Papilio zelicaon</i>	anise swallowtail
<i>P. canadensis</i>	Canadian tiger swallowtail
<i>P. machaon</i>	old world swallowtail
<i>P. eurymedon</i>	pale swallowtail

Scientific Name	Common Name
<i>P. multicaudata</i>	two-tailed swallowtail
<i>P. rutulus</i>	western tiger swallowtail

## AMPHIBIANS and REPTILES

<b>Ambystomatidae</b> <i>Ambistoma tigrinum</i>	<b>Mole Salamanders</b> tiger salamander
<b>Hylidae</b> <i>Pseudacris triseriata</i>	<b>Chorus Frogs</b> western chorus frog
<b>Ranidae</b> <i>Rana pipiens</i>	<b>True Frogs</b> northern leopard frog
<b>Bufo</b> <i>Bufo woodhousei</i> <i>B. cognatus</i>	<b>True Toads</b> Woodhouse's toad Great Plains toad
<b>Scaphiopodidae</b> <i>Scaphiopus bombifrons</i>	<b>Spadefoots</b> plains spadefoot
<b>Chelydridae</b> <i>Chelydra serpentina</i>	<b>Snapping Turtles</b> snapping turtle
<b>Emydidae</b> <i>Chrysemys picta</i>	<b>Pond Turtles</b> painted turtle
<b>Trionychidae</b> <i>Trionyx spiniferus</i>	<b>Softshell Turtles</b> spiny softshell
<b>Colubridae</b> <i>Coluber constrictor</i> <i>Thamnophis elegans</i> <i>T. radix</i> <i>T. sirtalis</i> <i>Lampropeltis triangulum</i> <i>Pituophis catenifer</i> <i>Heterodon nasicus</i>	<b>Colubrid Snakes</b> racer terrestrial garter snake plains garter snake common garter snake milk snake gopher snake or bull snake western hog-nosed snake
<b>Viperidae</b> <i>Crotalus viridus</i>	<b>Vipers</b> prairie rattlesnake

## FISHES

Sources: *Fishes of Montana* (Brown); *Fishery Survey of the Streams of Charles M. Russell National Wildlife Refuge, Montana* (Bramblett and Zale).

<b>Acipenseridae</b> <i>Scaphirhynchus albus</i> (N) <i>S. platyrhynchus</i> (N)	<b>Sturgeons</b> pallid sturgeon shovelnose sturgeon
<b>Polyodontidae</b> <i>Polyodon spathula</i>	<b>Paddlefishes</b> paddlefish
<b>Lepisosteidae</b> <i>Lepisosteus platostomus</i>	<b>Gars</b> shortnose gar
<b>Hiodontidae</b> <i>Hiodon alosoides</i>	<b>Mooneyes</b> goldeneye
<b>Salmonidae</b> <i>Oncorhynchus mykiss</i> <i>Salmo trutta</i> <i>Salvelinus namaycush</i> <i>Coregonus artedii</i>	<b>Trout</b> rainbow trout brown trout lake trout cisco
<b>Cyprinidae</b> <i>Hybognathus hankinsoni</i> <i>H. placitus</i> <i>H. argyritis</i> <i>Cyprinus carpio</i>	<b>Minnows</b> brassy minnow plains minnow western silvery minnow common carp

Scientific Name	Common Name
<i>Notropis atherinoides</i>	emerald shiner
<i>Pimephales promelas</i>	fathead minnow
<i>Hybopsis gracilis</i>	flathead chub
<i>Couesius plumbeus</i>	lake chub
<i>Rhynchithys cataractae</i>	longnose dace
<i>Phoxinus eos</i>	northern redbelly dace
<i>P. eos</i> × <i>P. neogaeus</i>	northern redbelly dace × finescale dace
<i>Notropis hudsonius</i>	spottail shiner
<i>N. ludibundus</i>	sand shiner
<i>Semotilus atromaculatus</i>	creek chub
<i>Macrhybopsis gelida</i>	sturgeon chub
<i>M. meeki</i>	sicklefin chub
<b>Castostomidae</b>	<b>Suckers</b>
<i>Catostomus catostomus</i>	longnose sucker
<i>C. commersoni</i>	white sucker
<i>Carpoides carpio</i>	river carpsucker
<i>Cycleptus elongate</i>	blue sucker
<i>Ictiobus bubalus</i>	smallmouth buffalo
<i>I. cyprinellus</i>	bigmouth buffalo
<i>Moxostoma macrolepidotum</i>	shorthead redhorse
<b>Ictaluridae</b>	<b>Bullheads/Catfishes</b>
<i>Ictalurus melas</i>	black bullhead
<i>I. punctatus</i>	channel catfish
<i>Noturus flavus</i>	stonecat
<b>Esocidae</b>	<b>Pikes/Pickerels</b>
<i>Esox lucius</i>	northern pike
<b>Gadidae</b>	<b>Burbot</b>
<i>Lota lota</i>	burbot
<b>Gasterosteidae</b>	<b>Sticklebacks</b>
<i>Culaea inconstans</i>	brook stickleback
<b>Centrarchidae</b>	<b>Sunfishes</b>
<i>Pomoxis nigromaculatus</i>	black crappie
<i>P. annularis</i>	white crappie
<i>Lepomis cyanellus</i>	green sunfish
<i>L. macrochirus</i>	bluegill
<i>Micropterus salmoides</i>	largemouth bass
<b>Percidae</b>	<b>Perches</b>
<i>Etheostoma exile</i>	Iowa darter
<i>Stizostedion canadense</i>	sauger
<i>S. vitreum</i>	walleye
<i>Perca flavescens</i>	yellow perch
<b>Sciaenidae</b>	<b>Drums</b>
<i>Aplodinotus grunniens</i>	freshwater drum
<b>Fundulidae</b>	<b>Killfishes</b>
<i>Fundulus zebrinus</i>	plains killfish

## Scientific Name

## Common Name

**BIRDS**

Of the bird species recorded, there are the following:

- 5 introduced species
- 1 extinct species
- 2 extirpated species
- 125 breeding species
- 2 federally endangered species
- 2 federally threatened species

The order of birds below follows the American Ornithologists' Union checklist of Northern American birds (2000).

\* indicates a documented breeding record

# indicates a migratory nongame bird species of management concern in the United States (FWS 1995)

**Gaviidae**

*Gavia immer*  
*G. stellata*  
*G. pacifica*  
*G. adamsii*

**Loons**

common loon#  
red-throated loon  
Pacific loon  
yellow-billed loon

**Podicipedidae**

*Podilymbus podiceps*  
*Podiceps auritus*  
*P. grisegena*  
*P. nigricollis*  
*Aechmophorus occidentalis*  
*A. clarkia*

**Grebes**

pied-billed grebe\*  
horned grebe\*  
red-necked grebe  
eared grebe\*  
western grebe\*  
Clark's grebe\*

**Pelicanidae**

*Pelecanus erythrorhynchos*

**Pelicans**

American white pelican\*

**Phalacrocoracidae**

*Phalacrocorax auritus*

**Cormorants**

double-crested cormorant\*

**Ardeidae**

*Botaurus lentiginosus*  
*Ardea herodias*  
*A. alba*  
*Egretta thula*  
*Nycticorax nycticorax*

**Bitterns/Herons/Egrets**

American bittern\*#  
great blue heron\*  
great egret  
snowy egret  
black-crowned night heron

**Threskiornithidae**

*Plegadis chihi*

**Ibises/Spoonbills**

white-faced ibis

**Cathartidae**

*Cathartes aura*

**New World Vultures**

turkey vulture

**Anatidae**

*Anser albifrons*  
*Chen caerulescens*  
*C. rossii*  
*Branta canadensis*  
*Cygnus columbianus*  
*Aix sponsa*  
*Anas strepera*  
*A. americana*  
*A. rubripes*  
*A. platyrhynchos*  
*A. discors*  
*A. cyanoptera*  
*A. clypeata*  
*A. acuta*  
*A. crecca*

**Swans/Geese/Ducks**

greater white-fronted goose  
snow goose  
Ross' goose  
Canada goose\*  
tundra swan  
wood duck  
gadwall\*  
American wigeon\*  
American black duck  
mallard\*  
blue-winged teal\*  
cinnamon teal\*  
northern shoveler\*  
northern pintail\*  
green-winged teal\*

<i>Scientific Name</i>	<i>Common Name</i>
<i>Aythya valisineria</i>	canvasback*
<i>A. americana</i>	redhead*
<i>A. collaris</i>	ring-necked duck*
<i>A. affinis</i>	lesser scaup*
<i>Melanitta fusca</i>	white-winged scoter
<i>Clangula hyemalis</i>	long-tailed duck
<i>Bucephala albeola</i>	bufflehead*
<i>B. clangula</i>	common goldeneye
<i>B. islandica</i>	Barrow's goldeneye
<i>Lophodytes cucullatus</i>	hooded merganser
<i>Mergus merganser</i>	common merganser
<i>M. serrator</i>	red-breasted merganser
<i>Oxyura jamaicensis</i>	ruddy duck*
<b>Accipitridae</b>	<b>Osprey/Kites/Hawks/Eagles</b>
<i>Pandion halliaetus</i>	osprey
<i>Haliaeetus leucocephalus</i>	bald eagle (threatened)
<i>Circus cyaneus</i>	northern harrier
<i>Accipiter striatus</i>	sharp-shinned hawk
<i>A. cooperii</i>	Cooper's hawk
<i>A. gentilis</i>	northern goshawk
<i>Buteo platypterus</i>	broad-winged hawk
<i>B. swainsoni</i>	Swainson's hawk
<i>B. jamaicensis</i>	red-tailed hawk*
<i>B. regalis</i>	ferruginous hawk
<i>B. lagopus</i>	rough-legged hawk
<i>Aquila chrysaetos</i>	golden eagle*
<b>Falconidae</b>	<b>Falcons/Caracaras</b>
<i>Falco sparverius</i>	American kestrel
<i>F. columbarius</i>	merlin
<i>F. rusticolus</i>	gyrfalcon
<i>F. peregrinus</i>	peregrine falcon
<i>F. mexicanus</i>	prairie falcon
<b>Phasianidae</b>	<b>Gallinaceous birds</b>
<i>Perdix perdix</i>	gray partridge (introduced)
<i>Phasianus colchicus</i>	ring-necked pheasant (introduced)
<i>Centrocercus urophasianus</i>	greater sage-grouse
<i>Tympanuchus phasianellus</i>	sharp-tailed grouse
<i>Meleagris gallopavo</i>	wild turkey
<b>Rallidae</b>	<b>Rails</b>
<i>Rallus limicola</i>	Virginia rail
<i>Porzana carolina</i>	sora
<i>Fulica americana</i>	American coot
<b>Gruidae</b>	<b>Cranes</b>
<i>Grus canadensis</i>	sandhill crane
<b>Charadriidae</b>	<b>Plovers</b>
<i>Pluvialis squatarola</i>	black-bellied plover
<i>P. dominica</i>	American golden-plover
<i>Charadrius semipalmatus</i>	semipalmated plover
<i>C. melodus</i>	piping plover (threatened)
<i>C. vociferous</i>	killdeer
<i>C. montanus</i>	mountain plover
<b>Recurvirostridae</b>	<b>Stilts/Avocets</b>
<i>Himantopus mexicanus</i>	black-necked stilt
<i>Recurvirostra americana</i>	American avocet

Scientific Name	Common Name
<b>Scolopacidae</b>	<b>Sandpipers/Phalaropes</b>
<i>Tringa melanoleuca</i>	greater yellowlegs
<i>T. flavipes</i>	lesser yellowlegs
<i>T. solitaria</i>	solitary sandpiper
<i>Actitis macularius</i>	spotted sandpiper
<i>Catoptrophorus semipalmatus</i>	willet
<i>Artramia longicauda</i>	upland sandpiper
<i>Numenius borealis</i>	Eskimo curlew (extirpated)
<i>N. phaeopus</i>	whimbrel
<i>N. americanus</i>	long-billed curlew
<i>Limosa fedoa</i>	marbled godwit
<i>Arenaria interpres</i>	ruddy turnstone
<i>Calidris alba</i>	sanderling
<i>C. pusilla</i>	semipalmated sandpiper
<i>C. mauri</i>	western sandpiper
<i>C. minutilla</i>	least sandpiper
<i>C. fuscicollis</i>	white-rumped sandpiper
<i>C. bairdii</i>	Baird's sandpiper
<i>C. melanotos</i>	pectoral sandpiper
<i>C. alpine</i>	dunlin
<i>C. himantopus</i>	stilt sandpiper
<i>Limnodromus scolopaceus</i>	long-billed dowitcher
<i>Phalaropus tricolor</i>	Wilson's phalarope
<i>P. lobatus</i>	red-necked phalarope
<i>Tryngites subruficollis</i>	buff-breasted sandpiper
<i>Gallinago delicata</i>	Wilson's snipe
<b>Laridae</b>	<b>Gulls/Terns/Jaegers</b>
<i>Larus pipixcan</i>	Franklin's gull
<i>L. philadelphia</i>	Bonaparte's gull
<i>L. delawarensis</i>	ring-billed gull
<i>L. californicus</i>	California gull
<i>L. thayeri</i>	Thayer's gull
<i>L. hyperboreus</i>	glaucous gull
<i>L. canus</i>	mew gull
<i>L. argentatus</i>	herring gull
<i>L. glaucescens</i>	glaucous-winged gull
<i>L. marinus</i>	great black-backed gull
<i>Sterna caspia</i>	Caspian tern
<i>S. hirundo</i>	common tern
<i>S. forsteri</i>	Forster's tern
<i>S. antillarum</i>	least tern (endangered)
<i>Chlidonias niger</i>	black tern
<i>Xema sabini</i>	Sabine's gull
<i>Rissa tridactyla</i>	black-legged kittiwake
<i>Stercorarius pomarinus</i>	pomarine jaeger
<b>Columbidae</b>	<b>Pigeons/Doves</b>
<i>Columba livia</i>	rock dove (introduced)
<i>C. fasciata</i>	band-tailed pigeon
<i>Zenaida macroura</i>	mourning dove
<i>Ectopistes migratorius</i>	passenger pigeon (extinct)
<b>Cuculidae</b>	<b>Cuckoos/Anis</b>
<i>Coccyzus erythrophthalmus</i>	black-billed cuckoo
<b>Strigidae</b>	<b>Owls</b>
<i>Bubo virginianus</i>	great horned owl
<i>Nyctea scandiaca</i>	snowy owl

<i>Scientific Name</i>	<i>Common Name</i>
<i>Surnia ulula</i>	northern hawk-owl
<i>Athene cunicularia</i>	burrowing owl
<i>Asio otus</i>	long-eared owl
<i>A. flammeus</i>	short-eared owl
<i>Glaucidium gnoma</i>	northern pygmy-owl
<i>Aegolius acadicus</i>	northern saw-whet owl
<b>Caprimulgidae</b>	<b>Goatsuckers/Allies</b>
<i>Chordeiles minor</i>	common nighthawk
<i>Phalaenoptilus nuttallii</i>	common poorwill
<b>Apodidae</b>	<b>Swifts</b>
<i>Chaetura pelagica</i>	chimney swift
<i>Aeronautes saxatalis</i>	white-throated swift
<b>Trochilidae</b>	<b>Hummingbirds</b>
<i>Archilochus colubris</i>	ruby-throated hummingbird
<i>Selasphorus rufus</i>	rufous hummingbird
<b>Alcedinidae</b>	<b>Kingfishers</b>
<i>Ceryle alcyon</i>	belted kingfisher
<b>Picidae</b>	<b>Woodpeckers</b>
<i>Melanerpes erythrocephalus</i>	red-headed woodpecker
<i>Picoides pubescens</i>	downy woodpecker
<i>P. villosus</i>	hairy woodpecker
<i>Colaptes auratus</i>	northern flicker
<i>Sphyrapicus nuchalis</i>	red-naped sapsucker
<b>Tyrannidae</b>	<b>New World Flycatchers</b>
<i>Contopus sordidulus</i>	western wood-pewee
<i>Empidonax traillii</i>	willow flycatcher
<i>E. minimus</i>	least flycatcher
<i>E. oberholseri</i>	dusky flycatcher
<i>Sayornis saya</i>	Say's phoebe
<i>Tyrannus verticalis</i>	western kingbird
<i>T. tyrannus</i>	eastern kingbird
<i>T. vociferans</i>	Cassin's kingbird
<b>Laniidae</b>	<b>Shrikes</b>
<i>Lanius ludovicianus</i>	loggerhead shrike
<i>L. excubitor</i>	northern shrike
<b>Vireonidae</b>	<b>Vireos</b>
<i>Vireo gilvus</i>	warbling vireo
<i>V. philadelphicus</i>	Philadelphia vireo
<i>V. olivaceus</i>	red-eyed vireo
<b>Corvidae</b>	<b>Crows/Jays/Magpies</b>
<i>Cyanocitta cristata</i>	blue jay
<i>Pica hudsonia</i>	black-billed magpie
<i>Corvus brachyrhynchos</i>	American crow
<i>C. corax</i>	common raven
<i>Gymnorhinus cyanocephalus</i>	pinyon jay
<i>Nucifraga columbiana</i>	Clark's nutcracker
<b>Alaudidae</b>	<b>Larks</b>
<i>Eremophila alpestris</i>	horned lark
<b>Hirundinidae</b>	<b>Swallows</b>
<i>Tachycineta bicolor</i>	tree swallow
<i>Stelgidopteryx serripennis</i>	northern rough-winged swallow
<i>Riparia riparia</i>	bank swallow
<i>Petrochelidon pyrrhonota</i>	cliff swallow
<i>Hirundo rustica</i>	barn swallow
<i>Tachycineta thalassina</i>	violet-green swallow

<i>Scientific Name</i>	<i>Common Name</i>
<b>Paridae</b> <i>Poecile atricapilla</i> <i>P. gambeli</i>	<b>Chickadees/Titmice</b> black-capped chickadee* mountain chickadee
<b>Sittidae</b> <i>Sitta canadensis</i> <i>S. carolinensis</i>	<b>Nuthatches</b> red-breasted nuthatch white-breasted nuthatch
<b>Certhiidae</b> <i>Certhia americana</i>	<b>Creepers</b> brown creeper
<b>Troglodytidae</b> <i>Troglodytes aedon</i> <i>Cistothorus palustris</i> <i>Salpinctes obsoletus</i>	<b>Wrens</b> house wren marsh wren rock wren
<b>Cinclidae</b> <i>Cinclus mexicanus</i>	<b>Dippers</b> American dipper
<b>Regulidae</b> <i>Regulus satrapa</i> <i>R. calendula</i>	<b>Kinglets</b> golden-crowned kinglet ruby-crowned kinglet
<b>Turdidae</b> <i>Sialia sialis</i> <i>S. currocooides</i> <i>Myadestes townsendi</i> <i>Ctharus fuscescens</i> <i>C. minimus</i> <i>C. ustulatus</i> <i>C. guttatus</i> <i>Turdus migratorius</i>	<b>Thrushes</b> eastern bluebird mountain bluebird Townsend's solitaire veery gray-cheeked thrush Swainson's thrush hermit thrush American robin
<b>Mimidae</b> <i>Dumetella carolinensis</i> <i>Toxostoma rufum</i> <i>Mimus polyglottos</i> <i>Oreoscoptes montanus</i>	<b>Mockingbirds/Thrashers/Allies</b> gray catbird brown thrasher northern mockingbird sage thrasher
<b>Sturnidae</b> <i>Sturnus vulgaris</i>	<b>Starlings</b> European starling (introduced)
<b>Motacillidae</b> <i>Anthus ruescens</i> <i>A. spragueii</i>	<b>Wagtails/Pipits</b> American (water) pipit Sprague's pipit
<b>Bombycillidae</b> <i>Bombycilla garrulus</i> <i>B. cedrorum</i>	<b>Waxwings</b> Bohemian waxwing cedar waxwing
<b>Parulidae</b> <i>Vermivora peregrina</i> <i>V. celata</i> <i>Dendroica petechia</i> <i>D. magnolia</i> <i>D. tigrina</i> <i>D. coronata</i> <i>D. townsendi</i> <i>D. palmarum</i> <i>D. striata</i> <i>Mniotilta varia</i> <i>Setophaga ruticilla</i> <i>Seiurus aurocapillus</i> <i>S. noveboracensis</i> <i>Oporornis tolmiei</i> <i>Geothlypis trichas</i>	<b>New World Warblers</b> Tennessee warbler orange-crowned warbler yellow warbler magnolia warbler Cape May warbler yellow-rumped warbler Townsend's warbler palm warbler blackpoll warbler black-and-white warbler American redstart ovenbird northern waterthrush MacGillivray's warbler common yellowthroat

<i>Scientific Name</i>	<i>Common Name</i>
<i>Wilsonia pusilla</i>	Wilson's warbler
<i>W. canadensis</i>	Canada warbler
<i>Icteria virens</i>	yellow-breasted chat
<b>Thraupidae</b>	<b>Tanagers</b>
<i>Piranga ludoviciana</i>	western tanager
<b>Emberizidae</b>	<b>Buntings/Seedeaters</b>
<i>Pipilo maculatus</i>	spotted towhee
<i>Spizella arborea</i>	American tree sparrow
<i>S. passerina</i>	chipping sparrow
<i>S. pallida</i>	clay-colored sparrow
<i>S. breweri</i>	Brewer's sparrow
<i>S. pusilla</i>	field sparrow
<i>Poocetes gramineus</i>	vesper sparrow
<i>Chondestes grammacus</i>	lark sparrow
<i>Calamospiza melanocorys</i>	lark bunting
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Ammodramus savannarum</i>	grasshopper sparrow
<i>A. bairdii</i>	Baird's sparrow
<i>Melospiza melodia</i>	song sparrow
<i>M. lincolnii</i>	Lincoln's sparrow
<i>Zonotrichia alicollis</i>	white-throated sparrow
<i>Z. querula</i>	Harris' sparrow
<i>Z. leucophrys</i>	white-crowned sparrow
<i>Junco hyemalis</i>	dark-eyed junco
<i>Calcarius mccownii</i>	McCown's longspur
<i>C. lapponicus</i>	Lapland longspur
<i>C. ornatus</i>	chestnut-collared longspur
<i>Plectrophenax nivalis</i>	snow bunting
<i>Pipilo chlorurus</i>	green-tailed towhee
<i>Melospiza georiana</i>	swamp sparrow
<i>Zonotrichia atricapilla</i>	golden-crowned sparrow
<b>Cardinalidae</b>	<b>Saltators/Cardinals/Allies</b>
<i>Pheucticus ludovicianus</i>	rose-breasted grosbeak
<i>P. melanocephalus</i>	black-headed grosbeak
<i>Passerina amoena</i>	Lazuli bunting
<i>Cardinalis cardinalis</i>	northern cardinal
<i>Passerina cyanea</i>	indigo bunting
<b>Icteridae</b>	<b>Blackbirds/Orioles</b>
<i>Dolichonyx oryzivorus</i>	bobolink*
<i>Agelaius phoeniceus</i>	red-winged blackbird*
<i>Sturnella neglecta</i>	western meadowlark*
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird*
<i>Euphagus carolinus</i>	rusty blackbird
<i>E. cyanocephalus</i>	Brewer's blackbird*
<i>Quiscalus quiscula</i>	common grackle*
<i>Molothrus ater</i>	brown-headed cowbird*
<i>Icterus spurius</i>	orchard oriole*
<i>I. galbula</i>	Baltimore oriole*
<i>I. bullockii</i>	Bullock's oriole
<b>Fringillidae</b>	<b>Finches/Crossbills</b>
<i>Pinicola enucleator</i>	pine grosbeak
<i>Carduelis flammea</i>	common redpoll
<i>C. hornemanni</i>	hoary redpoll
<i>C. pinus</i>	pine siskin
<i>C. tristis</i>	American goldfinch

Scientific Name	Common Name
<i>Leucosticte tephrocotis</i>	gray-crowned rosy-finch
<i>Pinicola enucleator</i>	pine grosbeak
<i>Loxia curvirostra</i>	red crossbill
<i>L. leucoptera</i>	white-winged crossbill
<i>Coccothraustes vespertinus</i>	evening grosbeak
<b>Passeridae</b>	<b>Old World Sparrows</b>
<i>Passer domesticus</i>	house sparrow (introduced)

## MAMMALS

Sources: Peterson Field Guides—Mammals (Burt and Grossenheider), A Guide To Montana Mammals (Hoffman and Pattie), The Wild Mammals of Montana (Foresman), Montana Natural Heritage Program.

<b>Soricidae</b>	<b>Shrews</b>
<i>Sorex cinereus</i>	cinereus (masked) shrew*
<i>S. merriami</i>	Merriam's shrew
<i>S. haydeni</i>	Hayden's shrew (R)
<i>S. monticolus</i>	montane shrew
<b>Vespertilionidae</b>	<b>Vesper Bats</b>
<i>Myotis evotis</i>	long-eared myotis
<i>M. lucifugus</i>	little brown myotis*
<i>M. ciliolabrum</i>	western small-footed myotis
<i>M. thysanodes</i>	fringed myotis
<i>M. volans</i>	long-legged myotis
<i>Lasiurus borealis</i>	eastern red bat
<i>L. cinereus</i>	hoary bat
<i>Lasionycteris noctivagans</i>	silver-haired bat
<i>Eptesicus fuscus</i>	big brown bat
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat
<b>Leporidae</b>	<b>Hares/Rabbits</b>
<i>Sylvilagus nuttalli</i>	mountain cottontail
<i>S. audubonii</i>	desert cottontail
<i>Lepus townsendii</i>	white-tailed jackrabbit*#
<b>Sciuridae</b>	<b>Squirrels</b>
<i>Tamias minimus</i>	least chipmunk
<i>T. amoenus</i>	yellow-pine chipmunk
<i>T. ruficaudus</i>	red-tailed chipmunk
<i>Spermophilus richardsonii</i>	Richardson's ground squirrel*#
<i>S. tridecemlineatus</i>	thirteen-lined ground squirrel*#
<i>Cynomys ludovicianus</i>	black-tailed prairie dog
<i>Marmota flaviventris</i>	yellowbelly marmot (R)
<b>Geomyidae</b>	<b>Pocket Gophers</b>
<i>Thomomys talpoides</i>	northern pocket gopher*#
<b>Heteromyidae</b>	<b>Pocket Mice/Kangaroo Rats</b>
<i>Perognathus fasciatus</i>	olive-backed pocket mouse*#
<i>Dipodomys ordii</i>	Ord's kangaroo rat
<b>Castoridae</b>	<b>Beavers</b>
<i>Castor canadensis</i>	American beaver*
<b>Muridae</b>	<b>Mice/Voles/Rats/Lemmings</b>
<i>Reithrodontomys megalotis</i>	western harvest mouse
<i>Peromyscus leucopus</i>	white-footed mouse
<i>P. maniculatus</i>	deer mouse*#
<i>Onychomys leucogaster</i>	northern grasshopper mouse*#
<i>Neotoma cinerea</i>	bushy-tailed woodrat
<i>Mus musculus</i>	house mouse*
<i>Microtus ochrogaster</i>	prairie vole*

<i>Scientific Name</i>	<i>Common Name</i>
<i>Lemmiscus curtatus</i>	sagebrush vole*
<i>Ondatra zibethicus</i>	common muskrat*#
<i>Microtus longicaudus</i>	long-tailed vole
<b>Dipodidae</b>	<b>Jumping Mice</b>
<i>Zapus princeps</i>	western jumping mouse(#?)
<b>Erethizontidae</b>	<b>New World Porcupines</b>
<i>Erethizon dorsatum</i>	common porcupine*
<b>Canidae</b>	<b>Wolves/Coyotes/Foxes</b>
<i>Canis latrans</i>	coyote*#
<i>C. lupus</i>	gray wolf*# (extirpated)
<i>Vulpes velox</i>	swift fox*#
<i>V. vulpes</i>	red fox*
<b>Ursidae</b>	<b>Bears</b>
<i>Ursus americanus</i>	black bear*
<i>U. arctos</i>	grizzly (brown) bear* (extirpated)
<b>Procyonidae</b>	<b>Raccoons</b>
<i>Procyon lotor</i>	raccoon*
<b>Mustelidae</b>	<b>Weasels</b>
<i>Mustela frenata</i>	long-tailed weasel*#
<i>M. nigripes</i>	black-footed ferret
<i>M. nivalis</i>	least weasel*
<i>M. vison</i>	American mink*
<i>M. ermine</i>	short-tailed weasel
<i>Gulo gulo</i>	wolverine*
<i>Taxidea taxus</i>	American badger*#
<i>Lontra canadensis</i>	northern river otter
<b>Mephitidae</b>	<b>Skunks</b>
<i>Mephitis mephitis</i>	striped skunk*#
<b>Felidae</b>	<b>Cats</b>
<i>Felis catus</i>	feral cat* (introduced)
<i>Lynx rufus</i>	bobcat*
<i>Puma concolor</i>	mountain lion
<b>Cervidae</b>	<b>Deer/Moose/Elk</b>
<i>Cervus elephus</i>	Wapiti (elk)*
<i>Odocoileus hemionus</i>	mule deer*
<i>O. virginianus</i>	white-tailed deer*
<i>Alces alces</i>	moose
<b>Antilocapridae</b>	<b>Pronghorns</b>
<i>Antilocapra americana</i>	pronghorn*#
<b>Bovidae</b>	<b>Bison/Goat/Sheep</b>
<i>Bos bison</i>	American bison (extirpated)
<i>B. taurus</i>	domestic cattle
<i>Ovis canadensis</i>	bighorn sheep

# Bibliography

- Alfonso, James M. 1991. South fork of Rock Creek riparian habitat. Rehabilitation project summary. U. S. Fish and Wildlife Service internal memo. Unpublished.
- American Bird Conservancy. 2009. Threats to birds—introduced species. Downloaded from <<http://www.abcbirds.org/conservationissues/threats/invasives.html>> accessed February 2010.
- American Ornithologists' Union. 2000. American Ornithologists' Union checklist of Northern American birds, (7th ed. 1998; 42nd supplement 2000).
- American Prairie Foundation. 2008. American Prairie Foundation Annual Report. <[http://www.americanprairie.org/about/annual\\_reports/Annual\\_Report\\_2008.pdf](http://www.americanprairie.org/about/annual_reports/Annual_Report_2008.pdf)>
- Ames, Charles R. 1977. Wildlife Conflicts in Riparian Management: Grazing. In Importance, Preservation and Management of Riparian Habitat: A Symposium. Tucson, Arizona. General Technical Report RM-43. USDA Forest Service Rocky Mountain Forest and Range Experiment Station. Fort Collins, Colorado. 49–51.
- Anderson, Stanley, H. Managing our Natural Resources. 1985. Charles E. Merrill Publishing Co. Columbus, Ohio. 156 p.
- Anderson, R.C. 1990. The historic role of fire in the North American grassland. Pages 8–18 in S.L. Collins and L.L. Wallace, editors. Fire in North American tallgrass prairies. University of Oklahoma Press. Norman, Oklahoma.
- Atkinson, Shirley J.; Dood, Arnold R. 2006. Montana interior least tern management plan. Montana Fish, Wildlife and Parks, Bozeman, Montana. 47 p.
- . 2006. Montana piping plover management plan. Montana Department of Fish, Wildlife and Parks, Bozeman, Montana. 78 p.
- Auble, G.T.; Scott, M.L. 1998. Fluvial disturbance patches and cottonwood recruitment along the upper Missouri River, MT. *Wetlands* 18:546–56.
- Auble, G.T., Scott, M.L.; Frazier, J.; Krause, C.; Merigliano, M. 2005. Cottonwood in the Missouri Breaks National Monument. U.S. Geological Survey, Biological Resources Discipline, Fact Sheet 2005–3132. 4 p.
- Bailey, Joseph K.; Schweitzer, Jennifer A.; Whitham, Thomas G. 2001. Salt Cedar negatively Affects Biodiversity of Aquatic Macroinvertebrates. *Wetlands* 21(3):442–7.
- Battazzo, A.M. 2007. Winter survival and habitat use by female greater sage-grouse in South Phillips County, Montana 2004–2006. M.S. Thesis. University of Montana, Missoula, USA.
- Big Sky Institute. MSU–Bozeman.
- Bureau of Economic Analysis. 2008. U.S. Department of Commerce. Regional Economic Information System, [www.bea.gov](http://www.bea.gov), last accessed December 2009.
- . 2009. U.S. Department of Commerce, Regional Economic Information System, <<http://www.bea.gov/regional/reis/default.cfm?selTable=CA25>>, last accessed December 2009.
- Belsky, A.J.; Matzke, A.; Uselman, S. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. *Journal of Soil and Water Conservation* 54:419–31.
- Bender-Keigley, Janet. 2008. Landowners' Guide to Eastern Montana Wetlands and Grasslands. Montana Watercourse: <http://www.mtwatercourse.org/Publications/Publications.htm>.
- Bengston, David N. 1994. Changing Forest Values and Ecosystem Management. *Society and Natural Resources* 7:515–33.
- Biggins, Dean E.; Godbey, Jerry L.; Gage, Kenneth L.; Carter, Leon G.; Montenieri, John A. 2010. Flea control improves survival of three species of prairie dogs (*Cynomys*): evidence for enzootic plague? *Vector-borne and Zoonotic Diseases* 10(1):17–26.
- Black, Scott Hoffman; Hodges, Nathan; Vaughan, Mace; Shepherd, Matthew. 2007. Pollinators in natural areas: a primer on habitat management. The Xerces Society for Invertebrate Conservation. 8 p.
- Bock, Carl E. [unknown date] Birds and Bovines: Effects of Livestock grazing on birds in the West. Downloaded from <[http://www.publiclandsranching.org/htmlres/wr\\_birds\\_bovines/htm](http://www.publiclandsranching.org/htmlres/wr_birds_bovines/htm)> accessed on August 31, 2009. 4 p.
- Bock, Carl E.; Saab, V.A.; Rich, T.D.; Dobkin, D.S. 1993. Effects of Livestock Grazing on Neotropical Migratory Landbirds in Western North America. Rocky Mountain Forest and Range Experiment Station, U.S. Dept. of Agriculture, Forest Service.
- Boughton, John and Lynelle Peteson. 2007. Fort Peck: National Register eligibility of 13 archaeological sites in Phillips County, Montana. Report produced by Ethnoscience, Incorporated, Billings, Montana. Report produced for the U.S. Army Corps of Engineers, Omaha. Contract number W(9128F–06–0185). 370 p.
- Bovee, K.; Scott, M.L. 2002. Implications of flood pulse restoration for *Pupulus* regeneration on the upper Missouri River. *River Research and Applications* 18:287–98.
- Bragg, T.B; Steuter, A.A. 1995. Mixed Prairie of the North American Great Plains: Transactions, 60th of the North American Wildlife and Natural Resource Conference. 60:335–48.

- Bramblett, Robert G.; Zale, Alexander V. 1999. Fishery Survey of the Streams of the Charles M. Russell National Wildlife Refuge, Montana. Montana Cooperative Fishery Research Unit, USGS, Montana State University, Bozeman, Montana. 40 p.
- . 2000. The Ichthyofauna of Small Streams on the Charles M. Russell National Wildlife Refuge, Montana. *Intermountain Journal of Sciences* 6(2):57–67.
- Bramblett, Robert G.; Jones-Wuellner, Melissa A.; Guy, Christopher S.; Zale, Alexander V. 2004. Annual Report 2004. Montana Prairie Riparian Native Species Study. Montana Cooperative Fisheries Unit, Montana State University, Bozeman. 50 p.
- Brennan, Leonard A.; Kuvlesky, William P., Jr. 2005. North American Grassland Birds: An Unfolding Conservation Crisis? *Journal of Wildlife Management* 69(1):1–13.
- Briske, D.D.; Fuhlendorf, S.D.; Smeins, F.E. 2005. State-and-transition models, thresholds, and rangeland health: A synthesis of ecological concepts and perspectives. *Rangeland Ecology and Management* 58:1–10.
- Briske, D.D.; Derner, J.D.; Brown, J.R. [et al.]. 2008. Rotational grazing on Rangelands: Reconciliation of perception and experimental evidence. *Rangeland Ecology and Management* 61:3–17.
- Brooks, Matthew L.; D'Antonio, Carla D.; Richardson, David M. [et al.]. 2004. Effects of Invasive Alien Plants on Fire Regimes. *BioScience* 54(7):677–88.
- Brown, Stephen; Hickey, Catherine; Gill, B.; Gorman, L.; Gratto, C.; Haig, S.; Harrington, B.; Hunter, C.; Morrison, G.; Page, G.; Sanzenbacher, P.; Skagen, S.; Warnock, N. 2000. National Shorebird Conservation Assessment: Shorebird Conservation Status, Conservation Units, Population Estimates, Population Targets, and Species Prioritization. U.S. Shorebird Conservation Plan.
- Brown, Stephen; Hickey, C.; Harrington, B.; Gill, B. 2001. The U.S. Shorebird Conservation Plan, 2nd ed. Manomet Center for Conservation Sciences, Manomet, MA.
- Brumley, John. 2006. Nemont Telephone Cooperatives 2006 Dagmar, Glentanna and Larslan Exchanges: Cultural Resources Inventory. Prepared for Nemont Telephone Cooperative by Ethos Consultants. On file at the Montana Archaeological Society, Helena.
- Brunson, Mark; Gilbert, Lael. 2003. Recreationist responses to livestock grazing in a new national monument. *Journal of Range Management*. 56:570–6.
- [BLM] Bureau of Land Management. 2008a. U.S. Department of Interior. Proposed Resource Management Plan and Final Environmental Impact Statement. Upper Missouri River Breaks National Monument. 1466 p.
- . 2008. Record of Decision and approved Resource Management Plan. Upper Missouri River Breaks National Monument.
- Burt, William H.; Grossenheider, Richard P. Peterson Field Guides—Mammals.
- Callaway, Ragan M.; Walker, Lawrence R. 1997. Competition and Facilitation: A Synthetic Approach to Interactions in Plant Communities. *Ecology* 78(7):1958–65.
- Carlson, Charles. 1993. Second Survey of Birdlife in Two Coulees Near Bobcat Creek on The C.M. Russell National Wildlife Refuge.
- Carver, Erin; Caudill, James. 2007. Banking on nature 2006: The economic benefits to local communities of national wildlife refuge visitation. Washington D.C.: U.S. Department of the Interior, Fish and Wildlife Service, Division of economics. 382 p.
- Chaikina, Natalia A.; Ruckstuhl, Kathreen, E. 2006. The Effect of Cattle Grazing on Native Ungulates: The Good, the Bad, and the Ugly. *Rangelands* 28(3):8–14.
- Chapman, Erik W.; Ribic, Christine A. 2002. The impact of buffer strips and stream-side grazing on small mammals in southwestern Wisconsin. *Agriculture, Ecosystems and Environment* 88(1):49–59.
- Churchwell, Roy T.; Davis, Craig A.; Fuhlendorf, Samuel D.; Engle, David M. 2007. Effects of Patch-Burn Management on Dickcissel Nest Success in a Tallgrass prairie. *The Journal of Wildlife Management* 72(7):1596–603.
- Cid, Silvia M.; Detling, James K.; Whicker, April D.; Brizuela, Miguel A. 1991. Vegetational responses of a mixed-grass prairie site following exclusion of prairie dogs and bison. *Journal of Range Management* 44(2):100–5.
- Coe, Priscella K.; Johnson, Bruce K.; Kern, John W.; Findholt, Scott L.; Kie, John G.; Wisdom, Michael J. March 2001. Responses of Elk and Mule Deer to Cattle in Summer. *Journal of Range Management*. 54:A51–A76.
- Cole, David N.; Landers, Peter B. 1996. Threats to Wilderness Ecosystems: Impacts and Research Needs. *Ecological Applications* 6(1):168–84.
- Colorado Division of Wildlife. 2007. A guide to wildlife viewing and photography blinds. Creating facilities to connect people with nature featuring blinds from the western United States. 43 p.
- Colorado State Parks. 1998. Native Plant Revegetation Guide for Colorado. Caring for the Land Series. Volume III. <<http://parks.state.co.us/NR/rdonlyres/00A97125-2219-4E68-A28F-6CC62300D43A/0/revegetation.pdf>> accessed February 9, 2010. 269 p.
- Cook, Bradley J.; Ehrhart, R.C.; Hansen, Paul L.; Parker, Tom; Thompson, Bill. 1996. Riparian and wetland ecological health. Evaluation of selected

- streams on the Charles M. Russell National Wildlife Refuge. Riparian and Wetland Research Program. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana. 38 p.
- Cousins, Sara A.O.; Lindborg, Regina. 2004. Assessing changes in plant distribution patterns: indicator species versus plant functional types. *Ecological Indicators*. 4:17–27.
- Cunningham, Mary Ann; Johnson, Douglas H. 2006. Proximate and landscape factors influence grassland bird distributions. *Ecological Applications* 16(3):1062–75.
- Cushman, Samuel A.; McKelvey, Kevin S.; Flather, Curtis H.; McGarigal, Kevin. 2008. Do forest community types provide a sufficient basis to evaluate biological diversity? *Front. Ecol. Environ.* 6(1):13–7.
- Davis, Les; Stallcop, Emmett. 1965. The Keaster Site (24PH401): A Stratified Bison Kill Occupation in the Missouri Breaks Area of North Central Montana. Memoir No. 2. Report produced by the Montana Archaeological Society.
- Davis, Stephen K; Dunan, David C. 1999. Grassland song bird abundance in native and crested wheatgrass pastures of southern Saskatchewan. *Ecology and Conservation of grassland birds of the western hemisphere: proceedings of a conference*. Tulsa, Oklahoma, October 1995. 19:211–8.
- Davy, Douglas. Historic properties survey of selected areas at Fort Peck Lake, Montana. Report prepared for the U.S. Corps of Engineers. Produced by EBASCO Environmental, Sacramento, California. On file at the U.S. Army Corps of Engineers, Omaha, Nebraska.
- Dechant, J.A.; Sondreal, M.L.; Johnson, D.H.; Igl, L.D.; Goldade, C.M.; Nenneman, M.P.; Euliss, B.R. 1998 (revised 2003). Effects of management practices on grassland birds: Mountain Plover. Northern Prairie Wildlife Research Center, Jamestown, ND. 15 p.
- Defenders of Wildlife. 2008. Keeping every cog and wheel. Reforming and improving the National Wildlife Refuge System Washington D.C. 30 p.
- DeLuca, T.H.; Nilsson, M.C.; Zackrisson, O. 2002. Nitrogen mineralization and phenol accumulation along a fire chronosequence in northern Sweden. *Oecologia*. 133(2):206–14.
- DeLuca, T.H.; MacKenzie, M.D.; Gundale, M.J.; Holben, W.E. 2006a. Wildfire-produced charcoal directly influences nitrogen cycling in ponderosa pine forests. *Soil Sci. Soc. AM. J.* 70:448–53.
- DeLuca, Thomas H.; Sala, Anna. 2006b. Frequent fire alters nitrogen transformations in ponderosa pine stands of the inland Northwest. *Ecology* 87(10).
- DeLuca, Thomas H; Aplet, Gregory H. 2008. Charcoal and Carbon Storage in forest soils of the Rocky Mountain West. *Frontiers in Ecology and Environment* 6(1):18–24.
- Destination Lewistown, Montana. <http://www.destinationlewisstownmontana.com/wp/community-resources/economic-development-opportunities/>, last accessed December 2009.
- Dhol, Sukvinder; Horton, Jean; Jones, Robert E. 1994. 1994 Non-waterfowl evaluation of Manitoba's North American Waterfowl Management Plan. Wildlife Branch, Manitoba Department of Natural Resources. 12 p.
- Dickson, Tom. 2008. Drawing a Line—Club members participating in the Sportsman User Value Mapping Project are saying “Don’t develop where we hunt and fish.” *Montana Outdoors*. September–October 2008:28–31.
- DiTomaso, Joseph M. 2000. Invasive weeds in rangelands: Species, impacts, and management. *Weed Science* 48:255–65.
- Dixon, M.D.; Johnson, W.C.; Scott, M.L.; Bowen, D. 2009. Annual Report—Missouri River Cottonwood Study. USACE internal report.
- Donaldson, G.M.; Hyslop, C.; Morrison, R.I.G.; Dickson, H.L.; Davidson, I. 2000. Canadian Shorebird Conservation Plan. Canadian Wildlife Service. 34 p.
- Douglass, K.S.; Hamann, S.J.; Joslin, G. 1999. Vegetation, Soils, and Water. Pages 9.1–9.11 in G. Joslin and H. Youmans, coordinators. Effects of recreation on Rocky Mountain wildlife: A Review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society. 307 p.
- Douglass, Richard J. 1984. The use of rodents in monitoring ecological impacts of oil shale development in the Piceance Basin, Colorado. P. 70–75. IN: R.L. Comer (ed), Issues and technology in the management of impacted western wildlife. Thorne Ecological Institute, Boulder, Colorado.
- Douglass, Dr. Rick; Hughes, Kevin. 2003. Montana Tech 2002 Hantavirus longitudinal study: Summary of data collected from the Charles M. Russell National Wildlife Refuge. Montana Tech University. 13 p.
- Dryer, Mark P.; Sandvol, Alan J. 1993. Pallid Sturgeon (*Scaphirhynchus albus*) Recovery Plan. Prepared by Pallid Sturgeon Recovery Team for the Department of the Interior, United States Fish and Wildlife Service, Region 6. 64 p.
- Duff, D. A. 1983. Livestock grazing impacts on aquatic habitat in Big Creek, Utah. In Proceedings of the Workshop on Livestock and Wildlife–Fisheries Relationships in the Great Basin. Sparks, Nevada. Special Publication 33901. USDA Forest Service Pacific Southwest Forest and Range Experiment Station, Berkeley, CA. 129–42.
- Duffield, J.; Neher, C. 2002. The Prairie Foundation: Socioeconomic impacts on Valley and Philips

- Counties. Prepared for The Prairie Foundation by Bioeconomics, Inc.
- Dullum, Jo Ann L.D.; Foresman, Kerry R; Matchett, Marc R. 2005. Efficacy of translocations for restoring populations of black-tailed prairie dogs. *Wildlife Society Bulletin* 33(3):842–50.
- Ecological Solutions Group, LLC. 2009. Internal Report on Lotic Wetland Health Assessment Survey. Charles M. Russell National Wildlife Refuge.
- . 2010. U.S. Lotic Wetland Health Assessment for Large River Systems. Downloaded from <<http://www.ecologicalsolutionsgroup.com>>. Accessed May 2010.
- Economic Research Service. 2009. U.S. Department of Agriculture. <<http://www.ers.usda.gov/>>
- Egan, A.F.; Luloff, A.E. 2000. The Exurbanization of America's Forests: Research in Rural Social Sciences. *Journal of Forestry* 98(3):26–30.
- Ehrhart, Robert C.; Hansen, Paul L. 1997. Effective cattle management in riparian zones: a field survey and literature review. Montana BLM Riparian Technical Bulletin No. 3 USDI Bureau of Land Management, Montana State Office, Billings, Montana. 47 p.
- Ellison, Lincoln. 1960. Influence of Grazing on Plant Succession of Rangelands. *Botanical Review* 26(1):1–78.
- Fairfield, George M. 1968. Chestnut-Collared Longspur. Life Histories of North American Cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies. [unknown volume] 1635–52.
- Fandrich, Blain and Lynelle Peterson. 2005. A traditional cultural property study Fort Peck Lake, Montana. Report produced by Ethnoscience, Incorporated, Billings Montana. Report produced for the U.S. Corps of Engineers, Omaha.
- FaunaWest Wildlife Consultants. 1996. An analysis of riparian habitat on the Charles M. Russell National Wildlife Refuge in relation to birds and small mammals. Report prepared for CMR.
- Fernandez-Cornejo, J. 2007. Off-Farm Income, Technology Adoption, and Farm Economic Performance. Economic Research Service, U.S. Department of Agriculture, Economic Research Report No. 36, <http://www.ers.usda.gov/publications/err36/err36.pdf>, retrieved September 24, 2008.
- Fire Executive Council. 2009. Guidance for Implementation of Federal Wildland Fire Management Policy. Washington D.C.: U.S. Department of Agriculture and U.S. Department of the Interior. 20 p. <<http://www.nifc.gov/policies/guidance/GIF-WFMP.pdf>> Accessed February 3, 2010.
- Fitch, L; Adams, B.W. 1998. Can Cows and Fish Co-exist? *Canadian Journal of Plant Sciences*. 78:191–8.
- Fleischner, Thomas L. 1994. Ecological Costs of Livestock Grazing in Western North America. *Conservation Biology* 8(3):629–44.
- Foreman, Richard T. T.; Alexander, Lauren E. 1998. Roads and their major ecological effect. *Annual Review of Ecology and Systematics*. 29:207–31 (C2).
- Foresman, Kerry R. 2001. The Wild Mammals of Montana. Special Publication 12. The American Society of Mammalogists. 278 p.
- Forest Encyclopedia Network. 2009. Direct Effects of Fire and Immediate Animal Responses. Downloaded from <<http://www.forestencyclopedia.net/p/p700/view>> accessed February 2010.
- Frank, D.A.; McNaughton, S.J. 1991. Stability increases with diversity in plant communities: empirical evidence from the 1988 Yellowstone drought. *Oikos* 1(3):360–2.
- Freese, C.; Montanye D.; Dabrowska, K. 2009. New Directions for the Prairie Economy: Connecting Conservation and Rural Development in the northern Great Plains. World Wildlife Fund, August.
- Frost, Cecil. 1998. Presettlement fire frequency regimes of the United States: a first approximation. Pages 70–81 in Teresa L. Pruden and Leonard A. Brennan (eds.). Fire in ecosystem management: shifting the paradigm from suppression to prescription. Tall Timbers Fire Ecology Conference Proceeding, No. 20. Tall Timbers Research Station, Tallahassee, FL.
- Frost, Cecil. 2008. Natural Fire Regimes and Pre-European Settlement Vegetation of the Charles M. Russell National Wildlife Refuge. Report prepared for Charles M. Russell NWR. 87 p.
- Fuhlendorf, Samuel D.; Engle, David M. 2001. Restoring Heterogeneity on Rangelands: Ecosystem Management Based on Evolutionary Grazing Patterns. *Bioscience* 51(8):625–32.
- Fuhlendorf, S. D.; Engle, D. M. 2004. Application of the fire-grazing interaction to restore a shifting mosaic on tallgrass prairie. *Journal of Applied Ecology* 41:604–14.
- Fuhlendorf, Samuel D; Harrell, Wade C.; Engle, David M. [et al.] 2006. Should heterogeneity be the basis for conservation? Grassland bird response to fire and grazing. *Ecological Applications* 16(5):1706–16.
- Fuhlendorf, Samuel D.; Engle, David M.; Kerby, Jay; Hamilton, Robert. 2008. Pyric herbivory: rewilding landscapes through the recoupling of fire and grazing. *Conservation Biology*. 23(3):588–98.
- Gaines, M.S.; Diffendorfer, J.E.; Tamarin, R.H.; Whittam, T.S. 1997. The effect of habitat fragmentation on the genetic structure of small mammal populations. *Journal of Heredity* 88:294–304.
- Gardner, William M. 1996. Missouri River pallid sturgeon inventory. Montana Fish Wildlife and Parks. Report F-78-R-2. Helena. 25 p.
- . 2003. Statewide Fisheries Investigations. Middle Missouri River Fisheries Evaluations.

- Project Number F-113-R5. Montana Fish Wildlife and Parks. 58 p.
- Gerrity, P. C.; Guy, C. S.; Gardner, W. M. 2006. Juvenile pallid sturgeon are piscivorous: a call for conserving native cyprinids. *Transactions of the American Fisheries Society* 135:604-9.
- Gerrity, Paul C.; Guy, C.S., Christopher S.; Gardner, William M. 2008. Habitat Use of Juvenile Pallid Sturgeon and Shovelnose Sturgeon with Implications for Water-Level Management in a Downstream Reservoir. *North American Journal of Fisheries Management* 28:832-43.
- Gibson, R.S.; Bosch, O.J.H. 1996. Indicator species for the interpretation of vegetation condition in the St. Bathans area, Central Otago, New Zealand. *New Zealand Journal of Ecology*. 20(2):163-72.
- Gould, William. 1998. Sturgeon chub. American Fisheries Society website.
- Grace, James B., Smith, M.D.; Grace, S.L.; Collins, S.L.; Stohlgren, T.J. 2001. Interactions between fire and invasive plants in temperate grasslands of North America. K.E.M. Gallery and T.P. Wilson (eds). *Proceedings of the Invasive Species Workshop: the role of fire in the control and spread of invasive species. Fire Conference 2000: the first national conference on fire ecology, prevention and management. Misc. Publication No. 11, Tall Timbers Research Station, Tallahassee, FL: 40-65.*
- Graetz, Rick and Suzanne. 2003. Charles M. Russell National Wildlife Refuge. Booklet prepared by Northern Rockies Publishing. Prepared for the National Wildlife Refuge Centennial. On file at the refuge headquarters, Lewistown, Montana.
- Great Falls Tribune. 2009a. Wildlife refuge grazing deal sought. By Karl Puckett. July 8, 2009.
- . 2009b. Bids received for groups' offer of money for grazing land. By Karl Puckett. August 21, 2009.
- Grisak, Grant. 1998. Sicklefing chub. Montana Cooperative Fisheries Research Unit, American Fisheries Society website.
- Gruell, George E. 1983. Fire and vegetative trends in the Northern Rockies: interpretations from 1871-1982 photographs. Gen. Tech. Rep. INT-158. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 117 p.
- Gruenert, J.C. 1999. Second Job Entrepreneurs. *Occupational Outlook Quarterly*, Fall.
- Guliano, William. M.; Homyack, Joshua D. 2004. Short-term grazing exclusion effects on riparian small mammal communities. *J. Range Management*. 57:346-50.
- Gunderson, Lance C. 2000. Ecological resilience—in theory and application. *Annu. Rev. Ecol. Syst.* 31:425-39.
- Gunderson, Lance H.; Holling, C.S. (editors). 2002. *Panarchy*. Island Press. 507 p.
- Hamann, B.; Johnston, H.; McClelland, P.; Johnson, S.; Kelly, L.; Gobielle, J. 1999. Birds. In: Joslin, G., Youmans, H. (coordinators), *Effects of Recreation on Rocky Mountain Wildlife, A Review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society, Montana, USA, pp. 3.1-3.34.*
- Hansen, L.J.; Biringer, J.L.; Hoffman, J.R. (editors). 2003. *Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems*. 246 pages. Downloaded from [http://www.panda.org/about\\_our\\_earth/all\\_publications/?8678/BUYING-TIME-A-Users-Manual-for-Building-Resistance-and-Resilience-to-Climatic-Change-in-Natural-Systems](http://www.panda.org/about_our_earth/all_publications/?8678/BUYING-TIME-A-Users-Manual-for-Building-Resistance-and-Resilience-to-Climatic-Change-in-Natural-Systems) Accessed March 17, 2010.
- Hansen, Paul L. 1992. Developing a riparian-wetland grazing management plan. Montana Riparian and Wetland Association, Montana Forestry And Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana. 10 p.
- Hansen, Paul. 1989. Inventory Classification and Management of Riparian Sites in the Upper Missouri National Wild and Scenic River. Montana Riparian Association, School of Forestry, University of Montana. Missoula, Montana.
- Hansen, P.L.; Chadde, S.W.; Pfister, R.D. 1988. Riparian Dominance Types of Montana. Miscellaneous Publication No. 49, Montana Forest and Conservation Experiment Stations School of Forestry, University of Montana, Missoula, Montana.
- Hansen, Paul; Cook, Brad; Ehrhart, Robert; Thompson, Bill. 1993. The development of a riparian and wetland ecological health evaluation form for Charles M. Russell National Wildlife Refuge—its applicability for Montana. Presented at the 1993 Annual Montana Riparian and Wetland Association Workshop. Montana Riparian-Wetland Association Draft Report. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana. 147 p.
- Hansen, Paul; Pfister, Robert; Boggs, Keith; Cook, Brad; Joy, John; Hinckley, Dan. 1995. Classification and management of Montana's riparian and wetland sites. Montana Riparian and Wetland Association, Montana Forestry and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana. 646 p.
- Hansen, Paul L.; Thompson, William H.; Ehrhart, Robert C.; Hinckley, Dan K.; Haglan, Bill; Rice, Karen. 2000. Development of methodologies to evaluate the health of riparian and wetland area. In: *Proceedings of the Fifth International Symposium of Fish Physiology, Toxicology, and Water Quality, November 10-13, 1998, Hong Kong, China.* Vance Thurston, Editor. EPA/6000/R-00/015. United States Environmental Protection Agency,

- Office of Research and Development, Washington, D.C., USA. 300 p.
- Harmon, Will. [ed]. 1999. Best Management Practices for Grazing Montana. Environmental Protection Agency R6 and Department of Natural Resources and Conservation. 28 p.
- Havlick, David G. 2002. No place distant: roads and motorized recreation on America's public lands. Island Press, Washington D.C. 297 p.
- Heller, Nicole E.; Zavaleta, E.S. 2009. Biodiversity management in the face of climate change: A review of 22 years of recommendations. *Biological Conservation* 142:14–32.
- Hendricks, P., S.; Currier, Lenard, C.; Maxell, B. 2007. Filling the distribution gaps for small mammals in Montana. A report to the USDI Bureau of Land Management, Montana State Office. Montana Natural Heritage Program, Helena, Montana. 17 p.
- Hendricks, Paul, S. Lenard, C. Currier, J. Johnson. 2005. Bat Use of Highway Bridges in South-Central Montana. Report to Montana Department of Transportation. Montana Natural Heritage Program, Helena. 31 p.
- Hendricks, Paul, B.A. Maxell S. Lenard. 2006. Land Mollusk Surveys on USFS Northern Region Lands. A report to the USDA Forest Service, Northern Region. Montana Natural Heritage Program, Helena, Montana. 11 p.
- Higgins, K. F. 1986. Interpretation and compendium of historical fire accounts in the northern Great Plains. U.S. Fish and Wildlife Service, Resource Publication 161.
- Hoff, v. S.K.; Blaustein, A.R.; McDiarmid, R.W.; Altig, R. 1999. Behavior: interactions and their consequences. Pages 215–39 in R.W. McDiarmid and R. Altig, editors. *Tadpoles: the biology of anuran larvae*. University of Chicago Press, Chicago.
- Hoffman and Pattie. A Guide To Montana Mammals.
- Hoffmann, Robert S.; Wright, Phillip L.; Newby, Fletcher E. 1969. Distribution of some mammals in Montana. I. Mammals other than bats. *Journal of Mammalogy* 50(3):579–604.
- Holling, C.S. 1973. Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics* 4:1–23.
- Holloway, O'Brien; Chadwick, Amy; Hansen, Paul L. 2001. Lower Musselshell River Study. Environmental Protection Agency/Montana Department of Environmental Quality 319 grant project June 1999–May 2001. Riparian and Wetland Research Program, School of Forestry, University of Montana, Missoula, Montana.
- Holloway, Gillian L; Barclay, Robert M.R. 2000. Importance of prairie riparian zones to bats in Southeastern Alberta. *Ecoscience* 7(2):115–22.
- Holmes, Brian E.; Foresman, Kerry, R.; Matchett, Marc.R. 2006. No evidence of persistent *Yersinia pestis* infection at prairie dog colonies in north-central Montana. *Journal of Wildlife Diseases* 42:164–9.
- Hoogland, John L. 1995. The black-tailed prairie dog: social life of a burrowing mammal. *Wildlife behavior and ecology*. 562 p.
- Hoitsma Ecological, Inc. 2006. Telegraph Creek riparian habitat restoration project: phase III-final report and recommendations. Prepared for U.S. Fish and Wildlife Service, World Wildlife Fund, and American Prairie Foundation. 43 p.
- Howe, Henry F. 1994. Managing Species Diversity in Tallgrass prairie: Assumptions and Implications. *Conservation Biology* 8(3):691–704.
- Howe, Marshall; Bart, J.; Brown S.; Elphick, C.; Gill, R.; Harrington, B.; Hickey, C.; Morrison, G.; Skagen, S.; Wamock, N. eds. 2000. *A Comprehensive Monitoring Program for North American Shorebirds*. Manomet Center for Conservation Sciences. <http://www.Manomet.org/USSCP/files.htm>.
- Hubbard, John P. 1977. Importance of riparian ecosystems: biotic considerations. In importance, preservation and management of riparian habitat: A symposium. Tucson, Arizona. General Technical Report RM-43. USDA Forest Service Rocky Mountain Forest and Range Experiment Station. Fort Collins, Colorado pp. 49–51.
- Hurteau, M., North, M. 2009. Fuel treatment effects on tree-based forest carbon storage and emissions under modeled wildfire scenarios. *Frontiers in Ecology and the Environment* 7(8):409–14.
- Johnson, Douglas H. 2001. Habitat fragmentation effects on birds in grasslands and wetlands: a critique of our knowledge. [Internet] Jamestown, ND: Great Plains Research 11(2):211–213. Northern Prairie Wildlife Research Center Online. <<http://www.npwrc.usgs.gov/resource/birds/hab-frag/index.htm> > [accessed January 15, 2010].
- Johnson, J. 2004. The State of the Land—Analysis of Land Use Change in Montana and the Three Regions. [www.mt.gov](http://www.mt.gov), last accessed October 2009.
- Johnson, Douglas.H.; Igl, Lawrence .D. 2001. Area requirements of grassland birds: a regional perspective. *The Auk* 118:24–34.
- Johnson, Laura C; Wallace, George N.; Mitchell, John E. 1997. Visitor perception of livestock grazing in five U.S. Wilderness Areas. A preliminary assessment. *International Journal of Wilderness* 3(2):14–20.
- Johnson, R. Roy; Haight, Lois T.; Simpson, James M. 1977. Endangered Species vs. endangered habitats: A Concept. In importance, preservation and management of riparian habitat: a symposium. Tucson, Arizona. General Technical Report RM-43.

- Joslin, G.; Youmans, H. coordinators. 1999. Effects of recreation on Rocky Mountain wildlife: A Review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society. 307 p.
- Kantrud, H.A.; Higgins, K.F. 1992. Nest and nest site characteristics of some ground-nesting non-passerine birds of northern grasslands. *Prairie Naturalist* 24:67–84.
- Karl, Thomas R.; Jerry M. Melillo, and Thomas Peterson, (eds.). 2009. Global Climate Change Impacts in the United States. U.S. Global Change Research Program. Cambridge University Press. 196 p. <http://www.globalchange.gov/>
- Kauffman, J. Boone; Krueger, W.C. 1984. Livestock impacts on riparian ecosystems and streamside management implications. *Journal of Range Management* 37(5):430–38.
- Kauffman, J. Boone; Beschta, R.L.; Otting, N.; Lytjen, D. 1997. An Ecological Perspective of Riparian and Stream Restoration in the Western United States. *Fisheries* 22(5):12–24.
- Keane, R.E.; Arno, S.F.; Brown, J.K. 1990. Simulating Cumulative Fire Effects in Ponderosa Pine/Douglas-Fir Forests. *Ecology* 71(1):189–203.
- Kemmimck, E. 2002. Our way of life special report: We are three. *Montana Standard*, November 17, 2002. Accessed July 18, 2008. <<http://www.mtstandard.com/articles/2002/11/17/specialreports/export47716.txt>>
- Kennedy, Theodore A.; Naeem, Shahid; Howe, Katherine M.; Knops, Johannes M.H.; Tilman, David; Reich, Peter. 2002. Biodiversity as a barrier to ecological invasion. *Nature* 417:636–8.
- Kerkvliet, J. 2008. An Economic Profile of Montana in 2008. The Wilderness Society, November.
- Knopf, Fritz L. 1994. Avian Assemblages on Altered Grasslands. *Studies in Avian Biology* 15:247–57.
- Knowles, Pamela R. 1981. Habitat selection, home range size, and movements of bobcats in north-central Montana. M.S. Thesis, University of Montana, Missoula.
- Knowles, Craig; Knowles, Pamela. 1994. Bird species composition and abundance in two riparian areas with differing grazing histories on the Charles M. Russell National Wildlife Refuge. 26 p.
- Knowles, Craig J. 1985. Observations on prairie dog dispersal in Montana. *Prairie Nat.* 17(1):33–40.
- Knowles, Craig J.; Knowles, P.R. 1994. A review of black-tailed prairie dog literature in relation to rangelands administered by the Custer National Forest. 98 p.
- Knowles, Craig J.; Knowles, Pamela R. 1995. Presettlement wildlife and habitat of Montana: An overview. Jamestown, ND: Northern Prairie Wildlife Research Center Online. <http://www.npwrc.usgs.gov/resource/habitat/presettl/index.htm> (Version 16JUL97).
- Knowles, Craig; Campbell, Bruce R. 1982. Distribution of elk and cattle in a rest-rotation grazing system. Pages 47–60 in J. M. Peek and P. D. Dalke, eds. Proc. wildlife-livestock relationships symposium. Univ. Idaho For., Wildlife and Range Experimental Station., Moscow, Idaho.
- Kotliar, Natasha B. 2000. Application of the New Keystone-Species Concept to Prairie Dogs: How well Does It work? *Conservation Biology* 14(6): 1715–21.
- Krueger, D.J. 1993. Effects of land use practices on Western riparian ecosystems. Pages 321–330 in Status and management of Neotropical migratory birds, D. M. Finch and P. W. Stangel (Eds). Gen. Tech. Rep. RM–229, Fort Collins, Colorado. USDA Forest Service, Rocky Mountain Forest and Range Experiment station. 422 p.
- Lambert, J. Daniel.; Hodgman, Thomas .P.; Laurent, Edward, J.; Brewer, Gwenda L.; Iliff, Marshall J.; Dettmers, Randy. 2009. The Northeast Bird Monitoring Handbook. American Bird Conservancy. The Plains, Virginia. 32 p.
- Landsberg, Jill.; Crowley, Gabriel. 2004. Monitoring rangeland biodiversity: plants as indicators. *Australian Ecology* 29:59–77.
- Larson, Diane L.; Anderson, Patrick J.; Newton, Wesley. 2001. Alien Plant Invasion in Mixed-grass Prairie: Effects of Vegetation Type and Anthropogenic Disturbance. *Ecological Applications* 11(1):128–41.
- Lausen, Cori L.; Barclay, Robert M. R.; 2002. Roosting behavior and roost selection of female big brow bats (*Eptesicus fuscus*) roosting in rock crevices in southeastern Alberta. *Canadian Journal of Zoology* 80(6):1069–76.
- Leonard, Steve; Kinch, Gene; Elsbernd, Van; Borman, Mike Dr.; Swanson, Sherman. 1997. Riparian Area Management. Grazing Management for Riparian-Wetland Areas. Technical Reference 1737–14. U.S. Dept of the Interior, Bureau of Land Management, Natural Applied Resource Sciences Center.
- Leopold, Aldo; Sows, Lyle K.; Spencer, David L. 1947. A survey of over-populated deer ranges in the United States. *Journal of Wildlife Management* 11(2):162–77.
- Leopold, A.S.; Cain, S.A.; Cottam, C.M.; Gabrielson, I.N. Kimball, T.L. 1963. Wildlife Management in the National Parks: The Leopold Report. Advisory board on wildlife management appoint by Secretary of the Interior Udall. Downloaded from <[http://www.nps.gov/history/history/online\\_books/leopold/leopold.htm](http://www.nps.gov/history/history/online_books/leopold/leopold.htm)> accessed March 2010.
- Lesica, Peter; Miles, Scott. 2004. Ecological strategies for managing tamarisk on the C.M. Russell

- National Wildlife Refuge, Montana, USA. Biological Conservation 119(4):535–43.
- Leung, Yu-Fai; Marion, Jeffery L. 2000. Recreation Impacts and Management in Wilderness: A State-of-Knowledge Review. USDA Forest Service Proceedings RMRS-P-15-Vol-5.
- Lewistown Area Chamber of Commerce, <http://www.lewistownchamber.com/>. Accessed October 2009.
- Licht, Daniel S.; Millsbaugh, Joshua J.; Kunkel, Kyran, E. [et al]. 2010. Using small populations of wolves for ecosystem restoration and stewardship. *Bioscience* 60(2):147–53.
- Liljebblad, Adam; Borrie, William T. 2006. Trust in wildland fire and fuel management systems. *International Journal of Wilderness* 12(1):39–43
- Lindmeier, John P. 1960. Plover, Rail and Godwit Nesting on Study Area in Mahnomon County, Minnesota. *The Flicker* 32(1):5–9.
- Loflin, Brant. 2008. Site form for site 24PH1015. On file at the Montana Historical Society, Helena, Montana.
- Logan, Brian D. 2001. Avian Community Composition and Nesting Productivity Relative to Cattle Grazing in North-central Montana. 66 p.
- Louv, Richard. 2005. Last child in the woods: saving our children from nature deficit disorder. Chapel Hill, NC: Aloquin. 323 p.
- Luna, Carmen. 2002. Bowdoin National Wildlife Refuge. Site Description, What Species, Research and Management Activities, Information Relating to WHSRN, Locally Involved Communities, Bibliography. 11 p.
- Lyon L.J.; Huff, Mark H.; Hooper, Robert G.; Telfer, Edmund S.; Schreiner, David Scott; Smith, Jane Kapler. 2000 Wildland Fire in Ecosystems. Effects of Fire on Fauna. downloaded from <[www.fs.fed.us/rmrs/pubs/rmrs\\_gtr042\\_6.pdf](http://www.fs.fed.us/rmrs/pubs/rmrs_gtr042_6.pdf)> Accessed March 2010.
- Mackey, Dennis. 1992. Planting shrubs and trees along the South Fork of Rock Creek. U. S. Fish and Wildlife Service internal memo. Unpublished.
- Mackie, Richard J. 1970. Range Ecology and Relations of Mule Deer, Elk, and Cattle in the Missouri River Breaks, Montana. *Wildlife Monographs* 20:3–79.
- Maestas, J.D.; Knight, R.L.; Gilgert, W.C. 2001. Biodiversity and Land-Use Change in the American Mountain West. *The Geographical Review*, 91(3):509–24.
- Maher, William, J. 1974. Ecology of Pomarine, Parasitic and Long-tailed Jaegers in northern Alaska. *Pac. Coast Avifauna* 37.
- Malone, Michael; Roeder, Richard; Lang, William. 1976. *Montana A History of Two Centuries*. University of Washington Press.
- Manfredo, Michael J. 2002. editor. Wildlife viewing: a management handbook. In: Manfredo, Michael J., Pierce, Cynthia, Vaske, Jerry J., and Whittaker, Doug; An experience-based approach to planning and management for wildlife-viewing recreation. Oregon State University Press. 70–91, chapter 5.
- Markitecture. 2007. A Disciplined Approach to Developing Agritourism and Marketing the Consumer Opportunities: Initial Research Findings. Prepared for The Rural Landscape Institute, July.
- Matchett, M.R.; Biggins, D.E.; Carlson, V.; Powell, B.; Rocke, T. 2009. Enzootic plague reduces black-footed ferret (*Mustela nigripes*) survival in Montana. *J Vector-borne Zoonotic Dis.*; (in press).
- Maxell, Bryce; Hokit, Grant. 1999. Amphibians and Reptiles. In: *Effects of Recreation on Rocky Mountain Wildlife: A Review for Montana*, coord. G. Joslin and J. Youmans 2:1–29. Montana Chapter of The Wildlife Society, Committee on Effects of Recreation on Wildlife.
- Meehan, William R.; Platts, William S. 1978. Live-stock grazing and the aquatic environment. *Journal of Soil and Water Conservation*. 33(6):274–78.
- Merrell, D.J. 1970. Migration and gene dispersal in *Rana pipiens*. *American Zoologist* 10:47–52.
- Merrell, D. J. 1977. Life history of the leopard frog, *Rana pipiens*, in Minnesota. Occasional Paper Number 15. Bell Museum of Natural History. University of Minnesota, Minneapolis, Minnesota, USA.
- Milchunas, D.G.; Noy-Meir, I. 2002. Grazing refuges: external avoidance of herbivory and plant diversity. *Oikos*. 99:113–30.
- Miles, Scott. 1996. Rock Creek and Siparyann Creek Woody Riparian Vegetation and Cross Section Monitoring. USDI Fish and Wildlife Service and USDOJ Bureau of Land Management.
- Miller, Scott; Knight, Richard. 1998. Influence of recreational trails on breeding bird communities. Downloaded from <[www.bouldercolorado.gov/files/.../pdf.../4428\\_Miller\\_Scott\\_Influence.pdf](http://www.bouldercolorado.gov/files/.../pdf.../4428_Miller_Scott_Influence.pdf)> accessed February 2010.
- Mills, L. Scott. 2007. Conservation of wildlife populations: demography, genetics, and management. Blackwell Publishing Company.
- Minnesota IMPLAN Group, Inc. 2007, IMPLAN data files: [www.implan.com](http://www.implan.com).
- Mitchell John E.; Wallace, George N.; Wells, Marcella D. 1996. Visitor perceptions about cattle grazing on National Forest land. *Journal of Range Management*. 49:81–86.
- Moehrenschrager, A.; Moehrenschrager, C. 2001. Census of Swift Fox (*Vulpes velox*) in Canada and Northern Montana: 2000–2001. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Report No. 24. Edmonton, AB. 21 p.
- Montana Department of Commerce. 2008. Census and Economic Resources, <<http://commerce.mt>.

- gov/censusresources.asp>. Accessed December 2009.
- Montana Dept of Environmental Quality. 2001. Lower Musselshell TMDL Planning Area Decision Document.
- Montana Department of Labor and Industry. 2009. State and County Economic Fliers. <<http://www.ourfactyourfuture.org/cgi/databrowsing/?PAGEID=4&SUBID=273>>. Accessed December 2009.
- Montana Department of Natural Resources and Conservation. 2007. Annual Review 2007. Oil and Gas Conservation Division.
- [MFWP] Montana Fish, Wildlife and Parks. 1979. Northeast Montana fisheries study: Inventory and survey of waters of the project area. Montana Fish, Wildlife and Park, Helena. 18 p.
- . 1981. Northeast Montana fisheries study: Inventory and survey of waters of the project area. Montana Fish, Wildlife and Parks, Helena.
- . 2001. Adaptive Harvest Management.
- . 2002. Helena Montana: Fort Peck Reservoir fisheries management plan 2002–2012. 21 p. Downloaded from <<http://fwp.mt.gov/content/Get-Item.aspx?id=31385>> accessed 30 October 2009.
- . 2004. Montana Statewide elk management plan. Helena, Montana. 404 p. Downloaded from <<http://fwp.mt.gov/hunting/elkplan.html>>. Accessed 27 November, 2009>.
- . 2005. Montana comprehensive fish and wildlife conservation strategy, 2005. Helena Montana: Montana Fish, Wildlife, and Parks. 658 p. Downloaded from <<http://fwp.mt.gov/specieshabitat/strategy/default.html>> accessed 21 September 2009.
- . 2006a. A guide to building and managing private fish ponds in Montana. Helena Montana: 34p. Downloaded from <http://fwp.mt.gov/content/Get-Item.aspx?id=19293>> accessed 30 October 2009.
- . 2006b. Final Fish, Wildlife and Parks Region 6 Prairie Dog Abundance and Distribution Objectives Plan. Region 6 Prairie Dog Advisory Board. 20 p.
- . 2008a. The road ahead: Strategic plans. [Internet] <<http://fwp.mt.gov/doingBusiness/insidefwp/aboutUs.html>> accessed 21 October 2009.
- . 2008b. Montana Statewide Comprehensive Outdoor Recreation Plan, 2008 to 2012. January.
- . 2009a. Bighorn sheep conservation strategy. [Internet]. Downloaded from <<http://fwp.mt.gov/wildlife/conservation/bighorn.html>> accessed 15 October 2009.
- . 2009b. Harvest and Hunting Reports. [Internet] Downloaded from <<http://fwp.mt.gov/hunting/planahunt/harvestReports.html>>
- . 2009c. Paddelfishing. [Internet]. <[http://fwp.mt.gov/fishingmontana/brochure\\_paddelfish.html](http://fwp.mt.gov/fishingmontana/brochure_paddelfish.html)> accessed 22 October 2009.
- . 2009d. Recreation and Tourism. [Internet]. <http://fwp.mt.gov/doingBusiness/reference/montanaChallenge/reports/tourism.html>> accessed 1 January 2010.
- . 2009e. Wolf conservation program. [Internet]. Downloaded from <<http://fwp.mt.gov/wildthings/wolf/default.html>> Accessed October 2009.
- . 2005–2006. Statewide Fisheries Investigations. Middle Missouri River Fisheries Evaluations. Project Number F–113–R7 & R8. Montana Fish Wildlife and Parks. 65 p.
- . 2009. Pallid Sturgeon recovery program for the Upper Missouri River. Montana Fish Wildlife and Parks. September 2009. 2 p.
- . Prairie dog conservation plan.
- Montana Forest and Conservation Experiment Station. 1996a. Appendix A: Key to riparian and wetland sites of the Charles M. Russell National Wildlife Refuge (Descriptions of habitat types and major seral community types of the CMR NWR, Montana). In: Riparian and wetland ecological health evaluation of selected streams on the Charles M. Russell National Wildlife Refuge. Riparian and Wetland Research Program. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana.
- Montana Natural Heritage Program. 2008. Species Of Concern. Location: <http://nhp.nris.mt.gov/SpeciesOfConcern/Default.aspx>.
- Montana Natural Heritage Program and Montana Fish Wildlife and Parks. 2009. Montana Animal Species of Concern. Helena, Montana: Montana Natural Heritage Program and Montana Department of Fish Wildlife and Parks. 17 p.
- Montana Partners In Flight. Draft 2000. Montana Bird Conservation Plan Version 1.0. Location: [http://www.partnersinflight.org/bcps/plan/pl\\_mt\\_10.pdf](http://www.partnersinflight.org/bcps/plan/pl_mt_10.pdf). 288 p.
- Montana Prairie Dog Working Group. 2002. Conservation Plan for Black-tailed and White-tailed prairie dogs in Montana. January 2002. 51 p.
- Montana Steering Committee Intermountain West Joint Venture. 2005. Coordinated Implementation Plan for Bird Conservation in the Western Montana Location: <http://iwjv.org/Images/MTPlan2005.pdf>. 58 p.
- More, Thomas A., J.R. Averill, T.H. Stevens. 1996. Values and Economics in Environmental Management: A Perspective and Critique. *Journal of Environmental Management* 48:397–406.
- Moulton, Gary E. 2002. The definitive journals of Lewis and Clark. 3404 p. Downloaded from <<http://lewisandclarkjournals.unl.edu/index.html>> accessed 6 October 2009.
- Moynahan, B.J. 2004. Landscape-scale factors affecting population dynamics of greater sage-grouse (*Centrocercus urophasianus*) in north-central Montana, 2001–2004. Dissertation. University of Montana, Missoula, USA.

- Moynahan, B.J.; Lindberg, C.; Thomas, J.W. 2006a. Factors contributing to process variance in annual survival of female greater sage-grouse in North-central Montana. *Ecol. App.* 16(44):1529–38.
- Moynahan, B.J.; Lindberg, M.S., Rotella, J.J.; Thomas, J.W. 2006b. Factors affecting nest survival of greater sage-grouse in North-central Montana. *J. Wildl. Manage.* 71(6):1773–83.
- mt.gov (Montana's Official State Website). 2008a. Montana Field Guide. Baird's Sparrow—*Ammodramus bairdii*. Retrieved on September 19, 2008 from [http://FieldGuide.mt.gov/detail\\_ABPBXA0010.aspx](http://FieldGuide.mt.gov/detail_ABPBXA0010.aspx).
- . 2008b. Montana Field Guide. Brewers Sparrow—*Spizella breweri*. Retrieved on September 19, 2008 from [http://fieldguide.mt.gov/detail\\_ABPBX94040.aspx](http://fieldguide.mt.gov/detail_ABPBX94040.aspx).
- . 2008c. Montana Field Guide. Lark Bunting—*Calamospiza melanocorys*. Retrieved on September 19, 2008, from [http://FieldGuide.mt.gov/detail\\_ABPBX98010.aspx](http://FieldGuide.mt.gov/detail_ABPBX98010.aspx).
- . 2008d. Montana Field Guide. Burrowing Owl—*Athene cucularia*. Retrieved on September 19, 2008, from [http://FieldGuide.mt.gov/detail\\_ABNSB10010.aspx](http://FieldGuide.mt.gov/detail_ABNSB10010.aspx).
- . [year unknown]. Montana Animal Field Guide Species Ranking Status. Accessed 9/19/2008 <http://fieldguide.mt.gov/statusCodes.aspx>.
- . 2010. Montana Field Guide. Greater Sage-Grouse—*Centrocercus urophasianus*. Retrieved on January 26, 2010, from [http://FieldGuide.mt.gov/detail\\_ABNLC12010.aspx](http://FieldGuide.mt.gov/detail_ABNLC12010.aspx).
- Murie, O. J. 1935. Report on the Fort Peck migratory bird refuge. Report on file at Charles M. Russell National Wildlife Refuge Headquarters, Lewistown, Montana.
- Murphy, Robert. 2008. Fire is for the birds in Northern Mixed-grass Prairie. *Fire Science Brief* 9:1–6 ([www.firescience.gov](http://www.firescience.gov))
- Myers, L. H. 1981. Grazing on Stream Riparian Habitats in Southwestern Montana. Proceedings of the Montana Chapter of The Wildlife Society, Great Falls, Montana.
- Mysterud, Atle. 2006. The concept of overgrazing and its role in management of large herbivores. *Wildlife Biology* 12:129–41.
- National Association of Counties, <[www.naco.org](http://www.naco.org)>, last accessed October 2009.
- National Audubon Society. 2009 Important Bird Areas. <<http://iba.audubon.org/iba/profileReport.do?siteId=2934&navSite=search&pagerOffset=0&page=1>>
- National Park Service. 2008. Glacier National Park fact sheet. Downloaded from <<http://www.nps.gov/glac/parknews/fact-sheet.htm>> accessed January 2010.
- National Wildlife Federation. 2010. Fact Sheet: Grazing Retirement Auction on the C.M. Russell National Wildlife Refuge. <<http://www.nwf-wcr.org/PDFs/NWF-CMR-FactSheet.pdf>>. Accessed February 22, 2010.
- The Nature Conservancy. 2007. Prairie Birds in Peril: Nature Conservancy launches major effort to protect prairie bird habitat. Location: <<http://www.nature.org/wherework/northamerica/states/montana/news/news620.html>>
- NatureServe. 2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0 NatureServe, Arlington, Virginia. Available: <<http://www.natureserve.org/explorer>> Accessed September 19, 2008).
- Naugle, David.E.; Aldridge, Cameron.L.; Walker, Brett L. [et al.] 2004. West Nile virus: pending crisis for greater sage-grouse. *Ecology Letters* 7:704–13.
- Naugle, David, E.; Aldridge, Cameron L.; Walker, Brett L. [et al.] 2005. West Nile virus and sage-grouse: What more have we learned? *Wildlife Society Bulletin* 33(2):616–23.
- Needham, Robert G. 1978. Northeastern Montana Fisheries Investigation. Montana Department of Fish and Game Fisheries Division. Project No. F-11-R-25, Job No. I-a. 12 p.
- Needham, Robert G.; Gilge, Kent W. 1980. Northeast Montana fisheries study: Inventory and survey of waters of the project area. Montana Fish, Wildlife and Parks, Helena.
- Neppl, Travis. 1997. Riparian and wetland ecological health evaluations for Duck Creek and Brown Pass Coulee, Charles M. Russell National Wildlife Refuge. 15 p.
- Nolt, D. 2008. Revamping the Charles M. Russell Wildlife Refuge Conservation Plan. New West Bozeman. February 22.
- Norberg, Jon; Cumming, Graeme S. (editors). 2008. Complexity theory for a sustainable future. Columbia University Press. 315 p.
- Norman C. Wheeler and Associates. 2008. Newsletter. [www.newwheeler.com](http://www.newwheeler.com), accessed October 2008.
- North American Bird Conservation Initiative, U.S. Committee, 2009. The State of the Birds, United States of America, 2009. U.S. Department of Interior: Washington, D.C. 36 p.
- Noss, Reed F. 1991. Sustainability and Wilderness. *Conservation Biology* 5(1):120–2.
- [NRCG] Northern Rockies Coordinating Group. 2008. [Internet]. Appropriate management response summary for the northern Rockies.
- [NRCS] U.S. Department of Agriculture. Natural Resource Conservation Service. October 1999. Grassland Birds. Fish and Wildlife Habitat Management Leaflet Number 8.

- . 2003 edition. *Grazing Lands Technology Institute: National range and pasture handbook*. Downloaded from <<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17734.wba>>. accessed 23 October, 2009.
- . 2005. *Farm Pond Ecosystem*. May 2005. Fish and Wildlife Habitat Management Leaflet Number 29.
- . 2009. *Ecological Site Descriptions*. [Internet]. Downloaded from <<http://www.mt.nrcs.usda.gov>> accessed October 2009.
- NPA Data Services, Inc. 2007. *2007 Regional Economic Projections Series*. Census and Economic Information Center, Montana Dept. of Commerce.
- Ohmart, Robert, D. 1996. Historical and present impacts of livestock grazing on fish and wildlife resource in Western riparian habitats. In: PR Krausman (ed.), *Rangeland Wildlife Soc. For Range Manage.*, Denver Colorado. 245–79.
- Olson, D.; Lindall, S. 2000. *IMPLAN Professional*. Version 2.0 MIG, Inc., Stillwater, Minnesota.
- Olson, R.; Hansen, J.; Whitson, T.; Johnson, K. 1994. Tebuthiuron to enhance rangeland diversity. *Rangelands* 16(5):197–201.
- Oring, Lew; Harrington, J.W.; Brown, S.; Hickey, C. eds. 2000. *National Shorebird Research Needs: A Proposal for a National Research Program and Example High Priority Research Topics*. Manomet Center for Conservation Sciences. <<http://www.Manomet.org/USSCP/files.htm>>
- Oschell, C.; Nickerson, N. 2006a. *Niche News: Missouri River Country Traveler Characteristics*, <<http://www.itrr.umt.edu/NicheNews06/MissouriRiverCountryChar.pdf>> Accessed December 2009.
- . 2006b. *Niche News: Russell Country Traveler Characteristics*. <<http://www.itrr.umt.edu/NicheNews06/RussellCountryChar.pdf>> Accessed December 2009.
- Owens, R.A.; Myres, M.T. 1973. Effects of agriculture upon populations of native passerine birds of an Alberta fescue grassland. *Canadian Journal of Zoology* 51:697–713.
- Paige, Christine. 2008. *A landowner's guide to wildlife friendly fences*. Landowner/Wildlife Resource Program, Montana Fish, Wildlife and Parks, Helena, Montana. 44 p.
- Park, John A. 1998. *Site form for 24GF419*. Produced by the Bureau of Land Management Lewistown. Available from the Montana Historical Society, Helena, Montana.
- Parker, Thomas G.; Hansen, Paul L. 1996. *Riparian and Wetland Ecological Health Evaluation of East Slippery Ann Habitat Unit (#2) and Germaine Coulee Habitat Unit (#55)* Charles M. Russell National Wildlife Refuge. Contract Completion Report for USDOI Fish and Wildlife Service, Cooperative Agreement Number 14-48-0006-95-939, Modification No. 2. Riparian and Wetland Research Program. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana. 96 p.
- Parrett, Charles; Johnson, D.R. 2004. *Methods for estimating flood frequency in Montana based on data through water year 1998*: U.S. Geological Survey Water-Resources Investigations Report 03-4308. 101 p.
- Parrett, Charles; Omang, R.J.; Hull, J.A. 1983. *Mean annual runoff and peak flow estimates based on channel geometry of streams in northeastern and western Montana*: U.S. Geological Survey Water-Resources Investigations Report 83-4046. 53 p.
- Pauli, Jonathan N.; Buskirk, Steven W. 2007. Risk-disturbance overrides density dependence in a hunted colonial rodent, the black tailed prairie dog *Cynomys ludovicianus*. *Journal of Applied Ecology* 44:1219–30.
- Pearman, Myrna. 2005. *Mountain bluebird trail monitoring guide*. Red Deer River Naturalists. Alberta, Canada.
- Pilliod, D.S.; Wind, Elke (editors). 2008. *Habitat management guidelines for amphibians and reptiles of the Northwestern United States and Western Canada*. Partners in amphibian and reptile conservation, Technical Publication HMG-4, Birmingham, AL. 139 p.
- Platts, William S.; Wagstaff, Fred J. 1984. *Fencing to Control Livestock Grazing on Riparian Habitats Along Streams: Is It a Viable Alternative?* *North American Journal of Fisheries Management* 4:266–72.
- Poff, N. Leroy; Allan, J.D.; Bain, M.B.; Karr, J.R.; Prestegard, K.L.; Richter, B.D.; Sparks, R.E.; Stromberg, J.C. 1997. *BioScience* 47(11):769–84.
- Pool, Duane B.; Austin, J.E. 2006. *Migratory Bird Management for the Northern Great Plains Joint Venture: Implementation Plan*. Gen. Tech. Rep. TC-01. Bismarck, ND: Northern Great Plains Joint Venture. 171 p.
- Price, Jeff; Glick, Patricia. 2002. *The bird watchers guide to global warming*. National Wildlife Federation and American Bird Conservancy. 34 p.
- Rademaker, L.; Nickerson, N. 2006. *Niche News: 2005 Nonresident Traveler Characteristics*, Institute for Tourism and Recreation Research, The University of Montana: Missoula, Montana, <<http://www.itrr.umt.edu/NicheNews06/2005TravChar.pdf>>, last accessed December 2009.
- Ranchers Stewardship Alliance. 2008. <<http://www.ranchersstewardshipalliance.org/index.asp>>.
- Rasker, R. 2006. *An Exploration into the Impact of Industrial Development versus Conservation on Western Public Lands*. *Society and Natural Resources* 19:191–207.
- Rasker, R.; Hansen, A. 2000. *Natural Amenities and Population Growth in the Greater Yellowstone Region*. *Human Ecology Review* (2):30–40.

- Red Lodge Clearinghouse. 2008. Matador Ranch Grass Bank. retrieved July 15, 2008. <[http://rlch.org/index2.php?option=com\\_content&do\\_pdf=1&id=223](http://rlch.org/index2.php?option=com_content&do_pdf=1&id=223)>.
- Resilience Alliance. 2007. Assessing and managing resilience in social-ecological systems: a practitioners workbook. <http://resiliencealliance.com/> 84 p.
- Riley, Scott A.; Wilkinson, Kim M. 2007. Roadside Revegetation: A New Frontier for Native Plant Growers. National Proceedings: Forest and Conservation Nursery Associations—2006. Proc. RMRS-P-50. In: Riley, L.E.; Dumroese, R.K.; Landis, T.D., tech. coords. 2007. National proceedings: Forest and Conservation Nursery Associations—2006. Proc. RMRS-P-50. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. <<http://www.rngr.net/nurseries/publications/proceedings>>
- Rorabaugh, J.C. 2005. *Rana pipiens* Schreber, 1782, Northern leopard frog. Pages 570–7 in M.J. Lannoo (ed), Amphibian Declines: The Conservation Status of United States Species. University of California Press, Berkeley.
- Rosgen, Dave. 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, Colorado.
- Rossenberg, Daniel, K.; Noon, Barry, R.; Meslow, E.Charles. 1997. Biological corridors: form, function, and efficacy. *BioScience* 47:677–87.
- Rowe, H. I.; Bartlett, E. T. 2001. Development and Federal grazing policy impacts on two Colorado counties: A comparative study. in A.L. Torell, E.T. Bartlett, and R. Larranaga, editors. New Mexico State University Agricultural Experiment Station, Las Cruces, NM.
- Rudzitis, G. 1999. Amenities Increasingly Draw People to the Rural West. *Rural Development Perspectives* 14(2):9–13.
- Rudzitis, G.; Johansen, H. 1989. Migration to Western Wilderness Counties: Causes and Consequences. *Western Wildlands* 15:19–23.
- Ruebelmann, George, N. 1982. An archaeological study of the Lewistown BLM District. Report produced by BLM staff. On file at the BLM Headquarters, Lewistown, Montana.
- Salant, P.; Dillman, D.; Carley, L. 1997. Who's Moving into the Nonmetropolitan Counties? Evidence from Washington State. Pullman, WA: Social and Economic Sciences Research Center, Washington State University.
- Samson, Fred; Knopf, F. 1994. Prairie Conservation in North America. *BioScience* 44 (6):418–421
- Sanderson, H. Reed; Meganck, Richard A.; Gibbs, Kenneth C. 1986. Range management and scenic beauty as perceived by dispersed recreationists. *Journal of Range Management* 39(5):464–9.
- Sando, Steven, K.; Morgan, Timothy, J.; Dutton, DeAnn, M.; McCarthy, Peter, M. 2009. Estimation of streamflow characteristics for Charles M. Russell National Wildlife Refuge, northeastern Montana: U.S. Geological Survey Scientific Investigations Report. 2009–5009. 60 p.
- Sauls, H.S. 2006. The role of selective foraging and cecal microflora in sage-grouse nutritional ecology. M.S. Thesis. University of Montana, Missoula.
- Scott, Michael L.; Auble, Gregor T.; Friedman, Jonathan M. [et al.]. 1993. Flow Recommendations for Maintaining Riparian Vegetation Along the Upper Missouri River, Montana. Prepared for Montana Power Co. and US Bureau of Reclamation. National Biological Survey. National Ecology Research Center. Fort Collins, Colorado. 43 p.
- Scott, Michael L.; Auble, Gregor T.; Friedman, Jonathan M. 1994. Impacts of Dams and High Flows Along the Upper Missouri River, Montana. Prepared for Montana Power Co. Inc. National Biological Survey. Midcontinent Ecological Science Center. Fort Collins, Colorado. 19 p.
- Scott, M. L.; Auble, G.T.; Friedman, J.M. 1997. Flood dependency of cottonwood establishment along the Missouri River, Montana, USA. *Ecological Applications* 7:677–90.
- Scott, M. L.; Auble, G.T. 2002. Conservation and restoration of semi-arid riparian forests: a case study from the upper Missouri River, Montana, USA. Pages 145–90 in *Flood Pulsing and Wetland Restoration in North America*, B. Middleton, (ed.), John Wiley and Sons, Inc.
- Shackford, John S. 1996. The importance of shade to breeding Mountain Plovers. *Bulletin of the Oklahoma Ornithological Society* 29(3):17–24.
- Schultz, James Willard. 1902. *Floating on the Missouri*. Riverbend Publishing, Helena Montana. 135 p.
- Sheley, R.L.; Svejcar, T.J.; Maxwell, B.D. 1996. A theoretical framework for developing successional weed management strategies on rangeland. *Weed Technology* 7:766–73.
- Short, Jeffrey J.; Knight, J.E. 2003. Fall grazing affects big game forage on rough fescue grasslands. *Journal of Range Management* 28(3):213–7.
- Silva, M. 2001. Abundance, diversity, and community structure of small mammals in forest fragments in Prince Edward Island National Park, Canada. *Canadian Journal Of Zoology* 79:2063–71.
- Sipe, Gene. 1993. Tree and Shrub Planting—1993. U.S. Fish and Wildlife Service internal memo. Unpublished.
- Skaar, P.D.; (revised by: D Skaar, D. Flath, L.S. Thompson). 1985. Montana Bird Distribution. Montana Academy of Sciences Supplement to the Proceedings Volume 44.
- Skagen, Susan K.; Knopf, F.L. 1994. Migrating Shorebirds and Habitat Dynamics at a Prairie Wetland Complex. *Wilson Bul.* 106 (1):91–105.

- Smith, B.E. 2003. Conservation Assessment for the Northern Leopard Frog in the Black Hills National Forest, South Dakota and Wyoming.
- Smucker, Kristina M.; Hutto, Richard L.; Steele, Brian M. 2005. Changes in bird abundance after wildfire: importance of fire severity and time since fire. *Ecological Applications* 15(5):1535–49.
- Stewart, E. Ray; Reese, Scott A.; Ultsch, Gordon R. 2004. The physiology of Hibernation in Canadian Leopard Frogs (*Rana pipiens*) and Bullfrogs (*Rana catesbeiana*). *Physiological and Biochemical Zoology* 77 (1):65–73.
- Stewart, I.T., D.R. Cayan, and M.D. Dettinger. 2004. Changes in snowmelt runoff timing in western North America under a “business as usual” climate change scenario. *Climate Change* 62:217–32.
- Stewart, Joanne, E. 2007. An analysis of Bat Activity Patterns Along a Prairie Riparian Corridor in Eastern Montana at Multiple Spatial Scales. MS Thesis. University of Denver. 148 p.
- Stewart, Kelley M., R. Terry Bowyer, John G. Kie, Norman J. Cimon, and Bruce K. Johnson. 2002. Temporospatial Distributions of Elk, Mule Deer, and Cattle: Resource Partitioning and Competitive Displacement. *Journal of Mammalogy* 83(1): 229–44.
- Stewart, Robert E. 1975. Breeding birds of North Dakota. [Internet]. Version 06JUL2000. Fargo, ND: Tri-College Center for Environmental Studies. Jamestown, ND: Northern Prairie Wildlife Research Center online. <<http://www.npwrc.usgs.gov/resource/birds/bbofnd/biog.htm>> 295 p.
- Stynes, D. 1998. Guidelines for Measuring Visitor Spending. Department of Park, Recreation and Tourism Resources, Michigan State University.
- Swetnam, T.W.; Betancourt, J.L. 1990. Fire-Southern oscillation relations in the southwestern United States. *Science* 249:1017–20.
- Takats, Lisa D.; Francis, Charles M.; Holroyd, Geoffrey L. [et al]. 2001 Guidelines for Nocturnal Owl Monitoring in North America. Beaverhill Bird Observatory and Bird Studies Canada, Edmonton, Alberta. 32 p.
- Taylor, Audrey R.; Knight, R.L. 2003. Wildlife Responses to Recreation and Associated Visitor Perceptions. *Ecological Applications* 13(4):951–963.
- Taylor, D.; Coupal, R.; Foulke, T.; Rashford, B.; Olson D. 2008. An economic profile of the Bridger-Teton National Forest. University of Wyoming, Department of Agricultural and Applied Economics.
- Taylor, Daniel, A.R.; Tuttle, Merlin D. 2007. “Water For Wildlife”. A Handbook for Ranchers and Range Managers. Bat Conservation International <<http://www.batcon.org/pdfs/water/bciwaterforwildlife.pdf>> 20 p.
- Teel, T. L.; Dayer, A.A.; Manfredo, M.J.; Bright, A.D. 2005. Wildlife Values in the West. Project Report No.58 for the Western Association of Fish and Wildlife Agencies, Department of Human Dimensions in Natural Resources, Colorado State University.
- Tewksbury, Joshua J.; Black, Anne E.; Nur, Nadav [et al.]. 2002. Effects of Anthropogenic fragmentation and livestock grazing on western riparian bird communities. *Studies in Avian Biology* 25: 158–202.
- Thackeray, L. 2006. Land buys by nonprofit conservation groups concern locals. *Billings Gazette*, February 27, 2006. Accessed July 29, 2008, [www.billingsgazette.net/articles/2006/02/27/news/state/50-locals.tx](http://www.billingsgazette.net/articles/2006/02/27/news/state/50-locals.tx).
- Thomas, Jack W.; Maser, Chris; Rodiek, John E. 1979. Wildlife habitats in managed rangelands—The Great Basin of Southeastern Oregon riparian zones. USDA Forest Service General Technical Report PNW–80, 18 pp. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.
- Thompson, William H.; Ehart, Robert C.; Hansen, Paul L.; Parker, Thomas G.; Haglan, William C. 1998. Assessing health of a Riparian Site. American Water Resources Association. Proceedings: Specialty Conference on Rangeland Management and Water Resources. 13 p.
- Thompson, William H.; Hansen, Paul L. 1999. Lotic Health Assessment of Selected Streams on the Charles M. Russell National Wildlife Refuge. Contract Completion Report for USDI Fish and Wildlife Service, Cooperative Agreement Number 14–48–0006–95–939, Modification No. 2. Riparian and Wetland Research Program. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana. 35 p.
- Tilden, Freeman. 1957. Interpreting our heritage. Chapel Hill NC: University of North Carolina Press. 3–10. Chapter 1.
- Travel Montana. <http://www.travelmt.com/>. Accessed December 2009.
- Truett, Joe C; Dullum, Jo Ann L.D.; Matchett, Marc R; Owens, Edward; Seery, David. 2001. Translocating prairie dogs: A Review. *Wildlife Society Bulletin* 29(3):863–72.
- U.S. Bureau of Reclamation, Montana Department of Natural Resources and Conservation, Upper Musselshell Water Users Association, and Deadmans Basin Water Users Association, 1998, Musselshell River Basin Water Management Study: Lewistown, Montana, Department of Natural Resources and Conservation.
- U.S. Census Bureau. 2007. State and County QuickFacts. U.S. Census Bureau, <http://quickfacts.census.gov/qfd/index.html>. Accessed October 2009.
- . 2009. USA Counties. U.S. Census Bureau, <http://censtats.census.gov/usa/usa.shtml>. Accessed October 2009.

- [USDA] U.S. Department of Agriculture, National Agricultural Statistics Service Statistics Board. 2008. Grazing Fee Rates for Cattle by Selected States and Regions for 2008. <[http://usda.mannlib.cornell.edu/usda/nass/AgriPric//2000s/2008/AgriPric-01-31-2008\\_revision.pdf](http://usda.mannlib.cornell.edu/usda/nass/AgriPric//2000s/2008/AgriPric-01-31-2008_revision.pdf)>
- [USFWS] U.S. Department of Agriculture. U.S. Forest Service. 2003. Missoula Montana: Backcountry road maintenance and weed management. 26 p. <<http://www.fs.fed.us/invasivespecies/document/BackcountryRdMtceWeed.pdf>> accessed 28 October 2009.
- . 2009. Fire and Aviation Management. Fire Management. [Internet] <<http://www.fs.fed.us/fire/management/index.html>> Accessed March 2010.
- [USACE] U.S. Department of Army. Army Corps of Engineers. 1987. A half century and holding. District News volume 11, no. 2, summer 1987, special edition. On file with the U.S. Corps of Engineers, Fort Peck, Montana.
- . 1995. Seaplane landing plan. <[https://www.nwo.usace.army.mil/html/Lake\\_Proj/Seaplane/SeaplanePlan.htm](https://www.nwo.usace.army.mil/html/Lake_Proj/Seaplane/SeaplanePlan.htm)> Accessed 13 November 2009.
- . 2004. Environmental Assessment Implementation of the Charles M. Russell National Wildlife Refuge Enhancement Act of 2000. US Army Corps of Engineers, Omaha District. US Fish and Wildlife Service, Mountain-Prairie Region September 2004. 60 p.
- . 2008. Fort Peck Dam/Fort Peck Lake Master Plan. Northwestern Division. Downloaded from <<https://www.nwo.usace.army.mil/masterplans/>> accessed 2 December 2009.
- . 2009a. Fort Peck brochure. [Internet]. 4 p. Downloaded from <[https://www.nwo.usace.army.mil/html/Lake\\_Proj/brochures/FP\\_brochure.pdf](https://www.nwo.usace.army.mil/html/Lake_Proj/brochures/FP_brochure.pdf)> accessed 3 February 2010.
- . 2009b. Missouri River Recovery Program. Missouri River ecosystem restoration plan and environmental impact statement (in draft). [Internet]. <<http://www.moriverrecovery.org>>
- . 2009c. September 2009 monthly visitation data for Fort Peck Dam and Lake. Internal report provided by Darin McMurry June 2010.
- U.S. Department of Energy. 1999. Office of Fossil Energy and Office of Science Report. Carbon Sequestration Research and Development. <[http://www.fossil.energy.gov/programs/sequestration/publications/1999\\_rdreport/](http://www.fossil.energy.gov/programs/sequestration/publications/1999_rdreport/)>
- [DOI] U.S. Department of the Interior. 1974a. U.S. Department of Interior. Bureau of Sport Fisheries and Wildlife and Bureau of Land Management. Washington, D.C.: Draft Environmental Impact Statement. DES 74–54. Proposed Charles M. Russell National Wildlife Range Wilderness Area. 136 p.
- . 1974b. Washington, D.C.: Report on proposed recommendations from Draft Environmental Impact Statement as forwarded to Congress. DES 74–54. Proposed Charles M. Russell National Wildlife Range Wilderness Area. 65 p.
- . 1974c. Washington, D.C.: Charles M. Russell National Wildlife Range, Montana. Wilderness study summary. 21 p.
- . 2001. Secretarial Order 3226. Evaluating Climate change impacts in Management Planning. 1 p.
- . 2008a. Bison conservation initiative. Downloaded from <<http://www.doi.gov/initiatives/bison/Bison%20Bridge%20Page%20DOI%20Bison%20Conservation%20Initiative%20framework.pdf>>. accessed October 2009.
- . 2008b. An Analysis of Climate Change Impacts and Options Relevant to the Department of the Interior's Managed Lands and Waters. Department of the Interior Task Force on Climate Change. Report of the Subcommittee on Land and Water Management. [http://www.usgs.gov/global\\_change/doi\\_taskforce.asp](http://www.usgs.gov/global_change/doi_taskforce.asp).
- . 2009. Secretarial Order 3289. Addressing the impacts of climate change on America's water, land, and other natural and cultural resources. 4 p. Downloaded from <<http://www.doi.gov/climatechange/SecOrder3289.pdf>> accessed 22 September 2009.
- U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.
- U.S. Department of State. 2010. Draft Environmental Impact Statement for the Keystone XL Oil Pipeline Project. Applicant for a Presidential Permit: TransCanada Keystone Pipeline, LP. <<http://www.keystonepipeline-xl.state.gov/clientsite/keystonexl.nsf?Open>> April 16, 2010.
- [FWS] United States Fish and Wildlife Service, Department of the Interior. 1982. Washington, D.C.: 6 RM 9. Grazing and haying management. In Fish and Wildlife Service Policy Manual.
- . 1985. Final Environmental Impact Statement. Washington D.C.: Management of Charles M. Russell National Wildlife Refuge. 453 p.
- . 1986. Record of Decision on Final Environmental Impact Statement. Management of Charles M. Russell National Wildlife Refuge. 5 p.
- . 1994. Stocking Guidelines and Management Strategies for Ponds and Small Impoundments. Prepared by the U. S. Fish and Wildlife Service, Office of Fisheries and Wildlife Assistance. Valentine, Nebraska. March, 1994. 5 p.
- . 1996. A History. Charles M. Russell National Wildlife Refuge Montana. U.S. Department of the Interior. United States Fish and Wildlife Service. On file at the Charles M. Russell NWR, Lewistown, Montana.
- . 1999a. Fulfilling the promise: the National Wildlife Refuge System. Arlington, VA. 94 p.

- . 1999b. National Policy Issuance #99-01, June 15, 1999. [http://www.fws.gov/policy/npi99\\_01.html](http://www.fws.gov/policy/npi99_01.html) accessed 1/25/10.
- . 1994. Stocking Guidelines and Management Strategies for Ponds and Small Impoundments. Prepared by the U.S. Fish and Wildlife Service, Office of Fisheries and Wildlife Assistance. Valentine, Nebraska. March, 1994. 5 p.
- . 2000a. Compatibility. 603 FW2. In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2000b. Prescribed Fire Management. 621FW3. In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2000c. Refuge Planning Overview. 602 FW 1. In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2001. Biological Integrity, Diversity, and Environmental Health. 601 FW 3. In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2003. Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. Location: <http://www.fws.gov/mountain-prairie/species/birds/>
- . 2004a. A Blueprint for the Future of Migratory Birds. Location: <http://migratorybirds.fws.gov/mbstratplan/mbstratplan.htm>
- . 2004b. National Wildlife Refuge System wildland fire management program strategic plan 2003-2010. 6 p. [Internet]. Downloaded from <http://www.fws.gov/fire/downloads/fwsfirestrategicplan.pdf> accessed October 2009.
- . 2004c. Environmental Assessment: Implementation of the Charles M. Russell National Wildlife Refuge Enhancement Act of 2000. September 2004.
- . 2005. Finding of No Significant Impact. Implementation of the Charles M. Russell National Wildlife Refuge Enhancement Act of 2000. July 25, 2005.
- . 2006a. Post 2005 hunting season mule deer and elk survey summary. Report on file at Refuge. 18 p.
- . 2006b. Service Responsibilities to Protect Migratory Birds. 720FW2 In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2006c. Wildlife-Dependent Recreation. 605FW1. In Fish and Wildlife Service Policy Manual. Washington D.C.
- . 2006d. Environmental Education. 605FW6. In Fish and Wildlife Service Policy Manual. Washington D.C.
- . 2006e. Recreational Fishing. 605FW3. In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2006f. Hunting. 605FW2. In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2006g. Interpretation. 605FW7. In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2007a. Charles M. Russell National Wildlife Refuge planning website. [Intranet]. <http://www.fws.gov/cmrr/planning> accessed February 10, 2010.
- . 2007b. Chronic wasting disease management on the Charles M. Russell National Wildlife Refuge Complex, Montana. Environmental Assessment. 13 p. Downloaded from [http://www.fws.gov/cmrr/PDF\\_Files/CMRNWR\\_CWD\\_EA\\_061307.pdf](http://www.fws.gov/cmrr/PDF_Files/CMRNWR_CWD_EA_061307.pdf) accessed 30 October 2009.
- . 2007c. Invasive Species Program. National Wildlife Refuge System Fiscal Year 2007 Update. Downloaded from [http://www.fws.gov/invasives/pdfs/InvasiveSpeciesProgram\\_2007\\_revised.pdf](http://www.fws.gov/invasives/pdfs/InvasiveSpeciesProgram_2007_revised.pdf) accessed February 3, 2010.
- . 2007d. National Bald Eagle Management Guidelines. Helena, Montana Ecological Services, U.S. Fish and Wildlife Service.
- . 2008a. Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service as of September 30, 2008. Washington, D.C. 46 p.
- . 2008b. Partners for Fish and Wildlife Program in Montana. [Internet]. <http://www.fws.gov/mountain-prairie/pfw/montana/> accessed 27 August 2009.
- . 2008c. Scoping report for Charles M. Russell and UL Bend National Wildlife Refuges. Downloaded from [http://www.fws.gov/cmrr/planning/Scopingrpt\\_4\\_18\\_08.pdf](http://www.fws.gov/cmrr/planning/Scopingrpt_4_18_08.pdf) Accessed 02 November 2009.
- . 2008d. Wilderness Stewardship Planning. 610 FW 3. In Fish and Wildlife Service Policy Manual. Washington, D.C.
- . 2008e. Volunteers. [Internet]. Downloaded from [http://www.fws.gov/volunteers/pdfs/2008\\_VolunteerAndFriendsReport\\_072909\\_Final.pdf](http://www.fws.gov/volunteers/pdfs/2008_VolunteerAndFriendsReport_072909_Final.pdf)
- . 2008f. 2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation. March.
- . 2009a. Joint Ventures. [Internet]. Downloaded from <http://www.fws.gov/mountain-prairie/nawm/> accessed 22 September 2009.
- . 2009b. Let's Go Outside. [Internet]. <http://www.fws.gov/letsgooutside> accessed 30 October 2009.
- . 2009c. Mountain-Prairie. [Intranet]. <http://www.fws.gov/mountain-prairie/mt1.html> accessed 02 September 2009.
- . 2009d. Refuge Revenue Sharing Database. 2008. Realty Division. Downloaded from [http://www.fws.gov/refuges/realty/RRS/RevenueSharing\\_Index.cfm](http://www.fws.gov/refuges/realty/RRS/RevenueSharing_Index.cfm) accessed September 2009.
- . 2009e. Refuge System. [Internet]. <http://www.fws.gov/refuges> accessed 02 September 2009.
- . 2009f. Rising to the Challenge. Washington D.C.: Strategic plan for responding to accelerating climate change. In Draft September 2009. Downloaded from <http://www.fws.gov/home/cli>

- matechange/pdf/CCDraftStratPlan92209.pdf> accessed 22 September 2009.
- . 2009g. Wildlife and Sport Fish Restoration Program. [Intranet]. <[http://wsfrprograms.fws.gov/Subpages/GrantPrograms/SFR/SFR\\_Accomplishments.htm](http://wsfrprograms.fws.gov/Subpages/GrantPrograms/SFR/SFR_Accomplishments.htm)> Accessed 30 July 2009.
- . 2009h. Visitor Services Standards: A Handbook for evaluating visitor services programs. Draft. August 2009. 78 p.
- . 2009i. Charles M. Russell National Wildlife Refuge. [www.fws.gov/cmrl/](http://www.fws.gov/cmrl/), last accessed October 2009.
- . 2010. Timeline of the American Bison. [www.fws.gov/bisonrange/timeline.htm/](http://www.fws.gov/bisonrange/timeline.htm/), Accessed June 2010.
- U.S. Fish and Wildlife Service and Bureau of Land Management. 2005a. Rock Creek Cottonwood and Cross Section Monitoring. USDI Fish and Wildlife Service an USDOJ Bureau of Land Management. 120 p.
- . 2005b. Supplement to Rock Creek Cottonwood and Cross Section Monitoring. USDI Fish and Wildlife Service an USDOJ Bureau of Land Management. 50 p.
- Van Dyke, F. 2003. Conservation Biology: foundations, concepts, applications (2nd Edition). McGraw-Hill. United States.
- Van Tassell, Larry W.; Richardson, James W. 1998. Impacts of Federal Grazing Reductions on Wyoming Ranches. In: Stubble Height and Utilization Measurements: Uses and Misuses. Western Regional Research Publication, Oregon State Agricultural Experiment Station, Oregon State Univ. Bull. 682, May 1998, 50–6.
- Van Vuren, Dirk. Comparative ecology of Bison and Cattle in the Henry Mountains, Utah. Proceedings of the Wildlife-Livestock relationships symposium. Coeur d' Alene, Idaho April 20–22, 1981. Published by Forest, Wildlife and Range Experiment Station. University of Idaho, Moscow, Idaho, 449–57.
- Vavra, Martin; Sheehy, D.P. 1996. Improving Elk Habitat Characteristics with Livestock Grazing. *Rangelands* 18(5):182–5.
- Vias, A.C. 1999. Jobs Follow People in the Rural Rocky Mountain West. *Rural Development Perspectives*, 14(2):14–23.
- Vickery, Peter D.; Herkert, James R.; Knopf, Fritz L. 1999. Grassland Birds: An Overview of Threats and Recommended Management Strategies. IN Bonney, Rick, David N. Pashley, Robert J. Cooper, and Larry Niles, eds. 1999. Strategies for Bird Conservation: The Partners in Flight Planning Process. Cornell Lab of Ornithology. <<http://birds.cornell.edu/pifcapemay>>
- Vickery, P.D.; Blanco, D.E.; Lopez-Lanus, B. 2008. Conservation Plan for the Upland Sandpiper (*Bartramia longicauda*), Version 1.0. Manomet Center for Conservation Sciences, Manomet, Massachusetts.
- Vinkey, Ray S.; Schwartz, M.K.; McKelvey, K.S. [et al] 2006. When Reintroductions are Augmentations: The Genetic Legacy of Fishers (*Martes pennanti*) in Montana. *Journal of Mammalogy* 87(2):265–71.
- Vodehnal, W.L.; Hauffer, J.B., Compilers. 2007. A grassland conservation plan for prairie grouse. North American Grouse Partnership. Fruita, Colorado.
- Wagner, Robbin. 1996. Memorandum to Bill Haglan. Rock Creek Fish Collections. March 30, 1999. 1 p.
- Walcheck, Kenneth C. 1970. Nesting Bird Ecology of Four Plant Communities in the Missouri River Breaks, Montana. *The Wilson Bulletin* 82(4):370–382.
- Walker, Brian; Salt, David. 2006. Resilience thinking. Island Press. 174 p.
- Watts Robert C.; Eichhorn, L.C. 1981. Changes in the Birds of Central Montana. *Proc. Montana Academy of Science* 40:31–40.
- Werner, J. Kirwin; Mawell, Bryce A.; Hendricks, Paul; Flath, Dennis L. 2004. Amphibians and Reptiles of Montana. Missoula, Montana: Mountain Press Publishing Company. 262 p.
- Western Hemisphere Shorebird Reserve Network. 2007. U.S. Shorebird Conservation Plan. Location: <<http://www.whsrn.org/shorebirds/status.html>>
- The Wilderness Society. 2009. Evaluation of accessibility and visibility of roads on the Charles M. Russell NWR. On file at the Charles M. Russell NWR.
- The WILD Foundation. 2006. Int. Journal of Wilderness 2006–Trust in Wildland Fire and fuel management Decisions–April 2006, vol. 12, no. 1, The WILD Foundation.
- Wildland Fire Associates. 2005. Charles M. Russell National Wildlife Refuge Wildland Fuels Assessment. Prepared for the United States Fish and Wildlife Service, Mountain Prairie Region, Denver, Colorado. 40 p.
- Willmore, Ille. 1990. Homesteading and Homesteaders. In: Homestead Shacks Over Buffalo Tracks: A History of Northeastern Fergus County By Roy History Committee. Color World Printer Bozeman Montana. 516 p.
- Wilson, Don E.; Ruff, Sue. 1999. The Smithsonian Book of North American Mammals. Smithsonian Institute. American Society of Mammalogists. 750 p.
- Wilson, S.D.; Belcher, J.W. 1989. Plant and bird communities of native prairie and introduced

- Eurasian vegetation in Manitoba, Canada. *Conservation Biology* 3(1):39–44.
- Williams, Eugene. 1991. *Riparian Rehabilitation*, UL Bend NWR. U.S. Fish and Wildlife Service internal report. Unpublished.
- Williams, J. E.; Johnson, J.E.; Hendrickson, D.A. [et al]. 1989. Fishes of North America endangered, threatened, or of special concern: 1989. *Fisheries* 14(6):3–20.
- Wood, Garvey. 1977. Wild and Scenic River historical archaeological investigation. Report submitted to the Bureau of Land Management, Lewistown Field Office. Gar Wood and Associates, Loma, Montana.
- Wright, H.A.; Neuenschwander, L.F.; Britton, C.M. 1979. The role and use of fire in sagebrush-grass and pinyon-juniper plant communities. A state-of-the-art review. USDA Forest Service Intermountain Forest and Range Exp. Sta. General Tech Rep. INT-58.
- Wright, Henry A.; Bailey, Arthur W. 1982. *Fire Ecology*. United States and Southern Canada. John Wiley and Sons, Inc.
- Wyman, S.; Bailey, D.; Borman, M. [et al]. 2006. Riparian area management: Grazing management processes and strategies for riparian-wetland areas. Technical Reference 1737–20. BLM/ST/ST-06/002+1737. U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center, Denver, Colorado. 105 p.
- Young, D.J.; Martin, L. 2003. Moving In or Moving Out?: Migration Patterns Vary by Age and Region. *Montana Business Quarterly*, Winter.
- Young, Jock A.; Hoffland, John R.; Hutto, Richard L. 2001. Birds and vegetation structure in tall-willow riparian communities of central Montana. Avian Science Center, Division of Biological Sciences, University of Montana, Missoula, Montana. downloaded from <[http://avianscience.dbs.umt.edu/projects/documents/Willow2001\\_Report.pdf](http://avianscience.dbs.umt.edu/projects/documents/Willow2001_Report.pdf)> accessed on February 16, 2010.
- Young, Jock; Cilimburg, A.; Noson, A.; Hutto, R.; Casey, D. 2006. A Plan for Coordinated All-Bird Monitoring in Montana. Montana CBM Steering Committee. Missoula, Montana.

