

2—Refuge History and Vision



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The topography on the refuge is varied and diverse.

This chapter explains the history, purpose, and special values of the Charles M. Russell and UL Bend National Wildlife Refuges, as well the development of the vision and goals for the CCP planning process. These refuges are part of a complex of refuges managed from the headquarters station in Lewistown, Montana. Because the UL Bend Refuge lies within the boundary area of the Charles M. Russell Refuge, essentially they are managed as one unit even though they were established through different authorities and for different purposes. Several other refuges and a wetland management district are part of the refuge complex but are not part of this CCP.

Each national wildlife refuge is managed to fulfill the mission of the National Wildlife Refuge System, as well as the specific purpose for which that refuge was established. This purpose is the foundation on which to build all refuge programs, from biology and public use to maintenance and facilities. Refuge purposes are found in the legislative acts or administrative orders that authorize either the transfer or acquisition of land for a refuge. An individual refuge

may contain lands that have been acquired under a variety of transfer and acquisition authorities, giving a refuge more than one purpose. This is true for Charles M. Russell National Wildlife Refuge and UL Bend National Wildlife Refuge; table 2 lists the significant land authorizations for the refuges. The objectives and strategies in this CCP (chapter 4) are intended to support the purposes for which both refuges were established.

2.1 ESTABLISHMENT, ACQUISITION, and MANAGEMENT HISTORY

Although the UL Bend National Wildlife Refuge is within the boundary of the Charles M. Russell National Wildlife Refuge, they were established through different authorities as shown in table 2. This section first describes each refuge separately, and then summarizes the existing management of the refuges as one unit.

Table 2. History of significant land authorizations for the Charles M. Russell and UL Bend Refuges, Montana.

<i>Date</i>	<i>Authority</i>	<i>Number</i>	<i>Subject</i>
12/12/1933	Executive Order	6491	Lands withdrawn for Fort Peck Dam (USACE)
05/09/1934	Executive Order	6707	Lands withdrawn for Fort Peck Dam (USACE)
09/11/1934	Executive Order	6841	Lands withdrawn for Fort Peck Dam (USACE)
04/03/1936	Executive Order	7331	Lands withdrawn for Fort Peck Dam (USACE)
12/11/1936	Executive Order	7509	Fort Peck Game Range established; jurisdiction transferred from USACE to what is now the Service; superseded Executive Order 6910 that provided for prevention of injury to public livestock grazing lands through overgrazing and soil deterioration
04/13/1942	Executive Order	9132	Lands withdrawn for Fort Peck Dam (USACE)
02/25/1963	Public Land Order	2951	Name changed to Charles M. Russell National Wildlife Range
03/25/1969	Public Land Order	4588	UL Bend National Wildlife Refuge designated and Executive Order 7509 withdrawn; established by the Migratory Bird Conservation Commission on February 7, 1967
05/15/1970	Public Land Order	4826	Mineral entry withdrawn for UL Bend National Wildlife Refuge
04/25/1975	Public Land Order	5498	Jurisdiction of certain lands transferred to BLM
02/27/1976	Public Law	94–223	Game Range Act transferred administrative status of all game ranges to the Service under the authority of the National Wildlife Refuge System; ended joint management with BLM
10/12/1976	Public Law	94–486	Modification of the Wild and Scenic Rivers Act applied a scenic designation to the river and its bank within Charles M. Russell National Wildlife Range as part of the Upper Missouri River Breaks Wild and Scenic River
10/19/1976	Public Law	94–557	UL Bend Wilderness designated in parts of UL Bend National Wildlife Refuge; size eventually modified to about 20,819 acres
04/25/1978	Public Land Order	5635	Public Land Order 5498 changed name to Charles M. Russell National Wildlife Refuge and clarified administration and management of the refuge under the National Wildlife Refuge System Administration Act of 1966
10/31/1983	Public Law	98–140	Modified the boundary of UL Bend Wilderness Area to exclude 28 acres as designated in Public Law 94–557
09/28/1993	Public Land Order	6997	Mineral estate withdrawn within Charles M. Russell National Wildlife Refuge for 20 years
12/08/1993	Wildlife order	183	General Services Agency transfer of 6,020 acres from USACE to the Service for wildlife conservation

CHARLES M. RUSSELL NATIONAL WILDLIFE REFUGE

Encompassing nearly 1.1 million acres—including Fort Peck Reservoir and UL Bend Refuge—the Charles M. Russell National Wildlife Refuge is the second largest refuge within the lower 48 States. This refuge in north-central Montana extends west about 125 air miles along the Missouri River from Fort Peck Dam to the refuge's western edge at the boundary of the Upper Missouri River Breaks National Monument (BLM administers). The refuge spans six counties: Fergus, Garfield, McCone, Petroleum, Phillips, and Valley. Habitat includes native prairie, forested coulees (ravines), river bot-

toms, and badlands (arid lands dissected by steep, eroded slopes). Wildlife is as diverse as the topography and includes Rocky Mountain elk, mule deer, white-tailed deer, pronghorn, Rocky Mountain bighorn sheep, sharp-tailed grouse, prairie dogs, and more than 236 species of birds (refer to “Appendix G, List of Plant and Animal Species”). A portion of the Missouri River along the refuge's western boundary is part of Upper Missouri River National Wild and Scenic River.

Establishment and Acquisition

In May of 1805, Meriwether Lewis and William Clark first detailed accounts of the abundant wildlife resources they found in the area now known as

Charles M. Russell National Wildlife Refuge during their Corps of Discovery journey of the Missouri River (Moulton 2002). One hundred thirty years later in August 1935, Olaus Murie, a biologist for the Bureau of Biological Survey (now the U.S. Fish and Wildlife Service), traveled to the Fort Peck area to do a biological assessment. He documented his findings in a report about the Fort Peck Migratory Bird Refuge (Murie 1935). Of interest in Murie's comprehensive assessment of the topography, soils, vegetation, wildlife, and grazing, was his notation on sharp-tailed grouse and the importance of shrubs to its distribution and abundance. He estimated that 25,000–40,000 grouse could be sustained on the refuge. Murie observed:

“The sharp-tailed grouse was given careful study since this is the most important bird affected by the plans for the refuge. We found that this is true sharp-tailed range. Of course, as in the case of big game animals, the winter period is the critical one and we studied the factors concerned in this phase of its life history. In the winter, these grouse spend much time in the Missouri River bottoms but live also in the rough breaks, especially at the



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The protection of sharp-tailed grouse was specifically identified in the establishing legislation for the refuge.



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Pronghorn

heads of numerous draws. Their distribution is of course largely determined by the food supply. It is known that in winter they feed extensively on buffalo berry, snowberry, and rosehips.”

In 1936, President Franklin D. Roosevelt established the Fort Peck Game Range through Executive Order 7509. The area was set aside for the preservation of wildlife, specifically sharp-tailed grouse, pronghorn, and other wildlife. Beyond the wildlife priorities, resources are to be made available for domestic livestock providing it is compatible with the uses for which the lands were acquired. The Executive order detailed the purposes of the game range:

“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) sharp-tailed grouse, and one thousand five hundred (1,500) antelope, the primary species, and such non-predatory secondary species in such numbers as may be necessary to maintain a balanced wildlife population, but in no case shall the consumption of the 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 otherwise provided with respect to wildlife, for domestic livestock ... And provided further, That land within the exterior limits of the area herein described ... may be utilized for public grazing purposes only to the extent as may be determined by the said Secretary (Agriculture) to be compatible with the utilization of said lands for the purposes for which they were acquired.”

It is unclear why there was a discrepancy between Murie's estimate for the number of sharp-tailed grouse that could be sustained and what appeared in the Executive order. Chapter 3 has more information about the vegetation and wildlife found on the refuge.

Since 1936, other lands within the refuge have been acquired under a variety of transfer and acquisition authorities or have different designations (see table 2). Today, the Charles M. Russell Refuge (not including the UL Bend Refuge and Fort Peck Reservoir) covers about 916,107 acres, of which 739,097 acres are reserved from the public domain. The Service has sole jurisdiction on about 358,196 acres and secondary jurisdiction on the remainder where USACE has primary jurisdiction. The Federal Government has acquired another 155,969 acres where the Service has primary jurisdiction on 8,574

acres and secondary jurisdiction on the remainder. The remaining acreage has been purchased (13,994 acres), received by donation (139 acres), or is under agreement or lease (6,907 acres) (FWS 2010a).

Refuge Management History

Originally, the secretaries for USDA (The Bureau of Biological Survey, in Agriculture, was the principle precursor agency of the Service) and DOI administered the game range jointly. In comanaging the uplands from 1936 to 1976, the Service and BLM struggled to maintain the lands' value to wildlife while supporting a large number of livestock. With differing agency mandates and missions, the management arrangement functioned poorly (FWS 1986). The Fort Peck Game Range became the Charles M. Russell National Wildlife Range in 1963 (Public Land Order 2951) in recognition of Charlie Russell, the colorful western artist who often portrayed the refuge's landscape in his paintings (see table 2).

Of significant interest in this planning process has been the provision in the Executive order for domestic livestock grazing to occur if it remains compatible with use of the land for the primary purposes. The root of this text can also be found in the Executive orders of other former game ranges. Historically, there were six game ranges set aside by various Executive orders but with similar, or even identical, provisions for livestock grazing: Hart Mountain National Antelope Range (1935), Desert Game Range (1936), Fort Peck Game Range (1936), Sheldon Game Range (1936), Kofa Game Range (1936), and Cabeza Prieta Game Range (1939). Hart Mountain National Antelope Range was changed to the Hart Mountain National Antelope Refuge in 1936, and Desert Game Range was designated as a national wildlife refuge by Congress in 1966 (FWS 2009a).

The administrative status of Fort Peck Game Range (renamed Charles M. Russell National Wildlife Range by Public Land Order 2951 on February 25, 1963) and all remaining game ranges in the Nation—Sheldon Game Range, Cabeza Prieta Game Range, and Kofa Game Range—was changed on February 27, 1976, by the signing of Public Law 94-223 (90 Stat. 199). Commonly called the Game Range Act, this law brought to a close the joint management between the Service and BLM and vested management authority of the game ranges with the Service. Public Land Order 5635 (1978) changed the name of Charles M. Russell National Wildlife Range to Charles M. Russell National Wildlife Refuge and clarified the administration and management of the refuge under the National Wildlife Refuge System Administration Act of 1966, subsequently amended (16 U.S.C. 668dd et seq.) (see table 2). Today, Charles M. Russell National Wildlife Refuge is the only for-

mer game range that still uses livestock grazing to manage habitat (FWS 1994a, FWS and BLM 1996, FWS 2009a, FWS 2011e, and personal communication with staff at Hart Mountain National Antelope Refuge and Sheldon National Wildlife Refuge).

Within the uplands of the refuge lies the Missouri River and the nearly 250,000-acre Fort Peck Reservoir, established by Executive Order 6491 on December 12, 1933. Agreements exist between the Service and USACE for management of areas where the Service has secondary jurisdiction. The Service and USACE cooperatively manage the surrounding edges of the reservoir, and its associated recreational areas.

There are approximately 36,000 acres of State school trust lands managed by DNRC and about 41,000 acres of private inholdings within the refuge (see figure 2 in chapter 1). The Service has an offset fire-protection agreement to allow wildfire protection strategies to be used on State lands. This agreement allows for initial attack and other actions related to the spread of wildfire to comply with DNRC's standards for fire suppression on State lands.

The refuge annual performance plan reports that 250,000 visitors, on average, come to the refuge each year. Containing some of the best elk habitat in Montana, the refuge hosts recreationists not only for hunting, but for fishing, wildlife and landscape photography, wildlife observation, hiking, camping, and much more.

In addition to the UL Bend Wilderness (described in the UL Bend Refuge section below), there are 15 areas of about 155,288 acres (public domain and USACE) proposed for wilderness (DOI 1974b). These 15 separate units along the Missouri River and Fort Peck Reservoir (see figure 41 in chapter 4) are awaiting congressional action on their formal inclusion in the National Wilderness Preservation System. In the meantime, these areas are managed in accordance with the Service's wilderness policy (FWS 2008c). More details about wilderness are in chapter 3, section 3.3, and in appendix F.

UL BEND NATIONAL WILDLIFE REFUGE

UL Bend National Wildlife Refuge is located north of the Missouri River about 50 miles south of Malta, Montana, in Phillips County (see the topographic base map of the refuge in figure 6). Bison, elk, deer, and pronghorn historically used the crossing at this huge bend in the Missouri River, and the abundance of game attracted Native Americans including the Assiniboine, Gros Ventre, and the Blackfeet. Explorer Meriwether Lewis noted the following in his journal on May 21, 1805 (Moulton 2002):

“The Missouri in its course downward makes a sudden and extensive bend toward the south,

Figure 6 follows (two foldout pages)

U.S. Fish & Wildlife Service

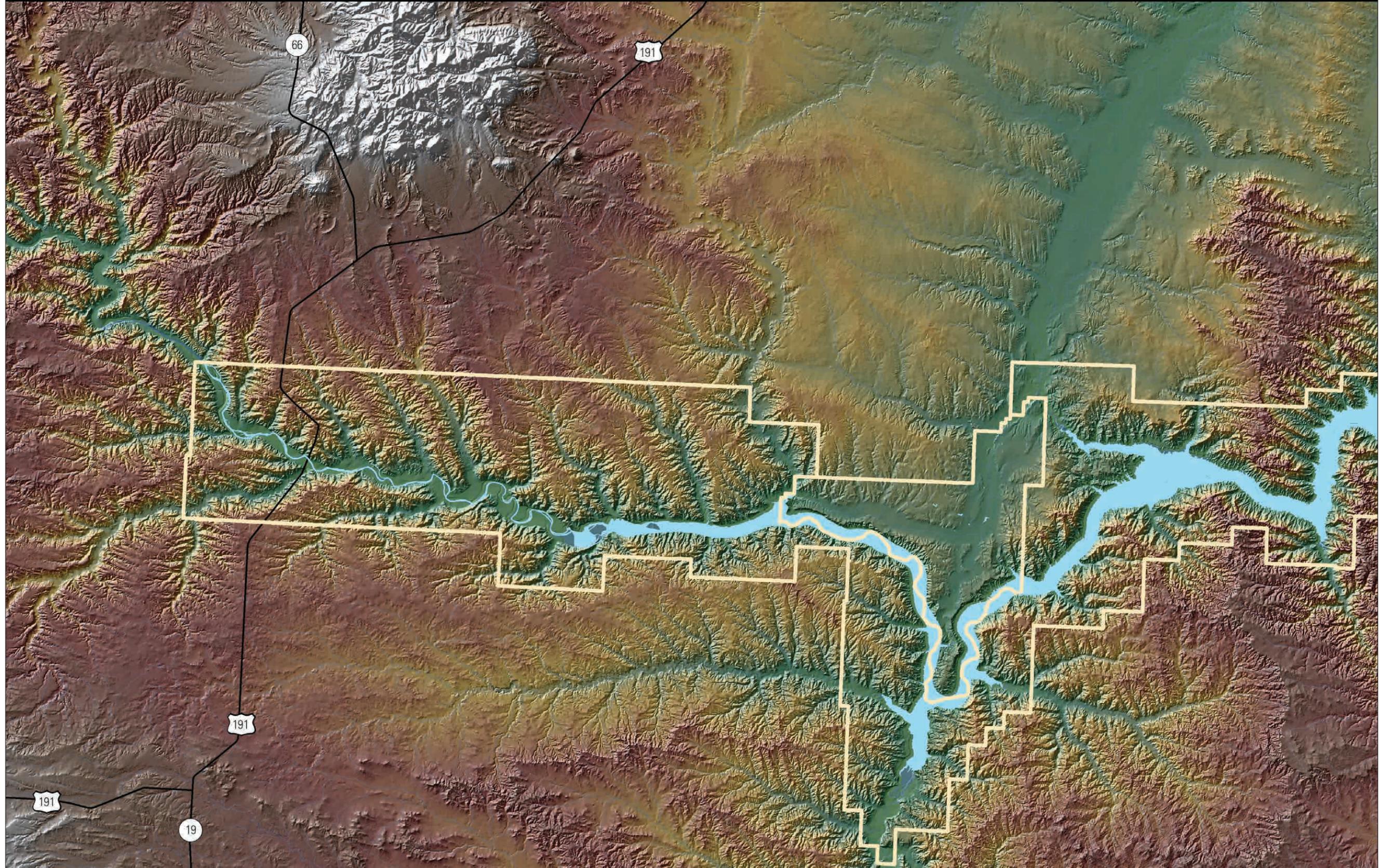


Figure 6. Topographic base map of the Charles M. Russell and UL Bend Refuges, Montana.

Figure 6 (topographic map, west)

U.S. Fish & Wildlife Service

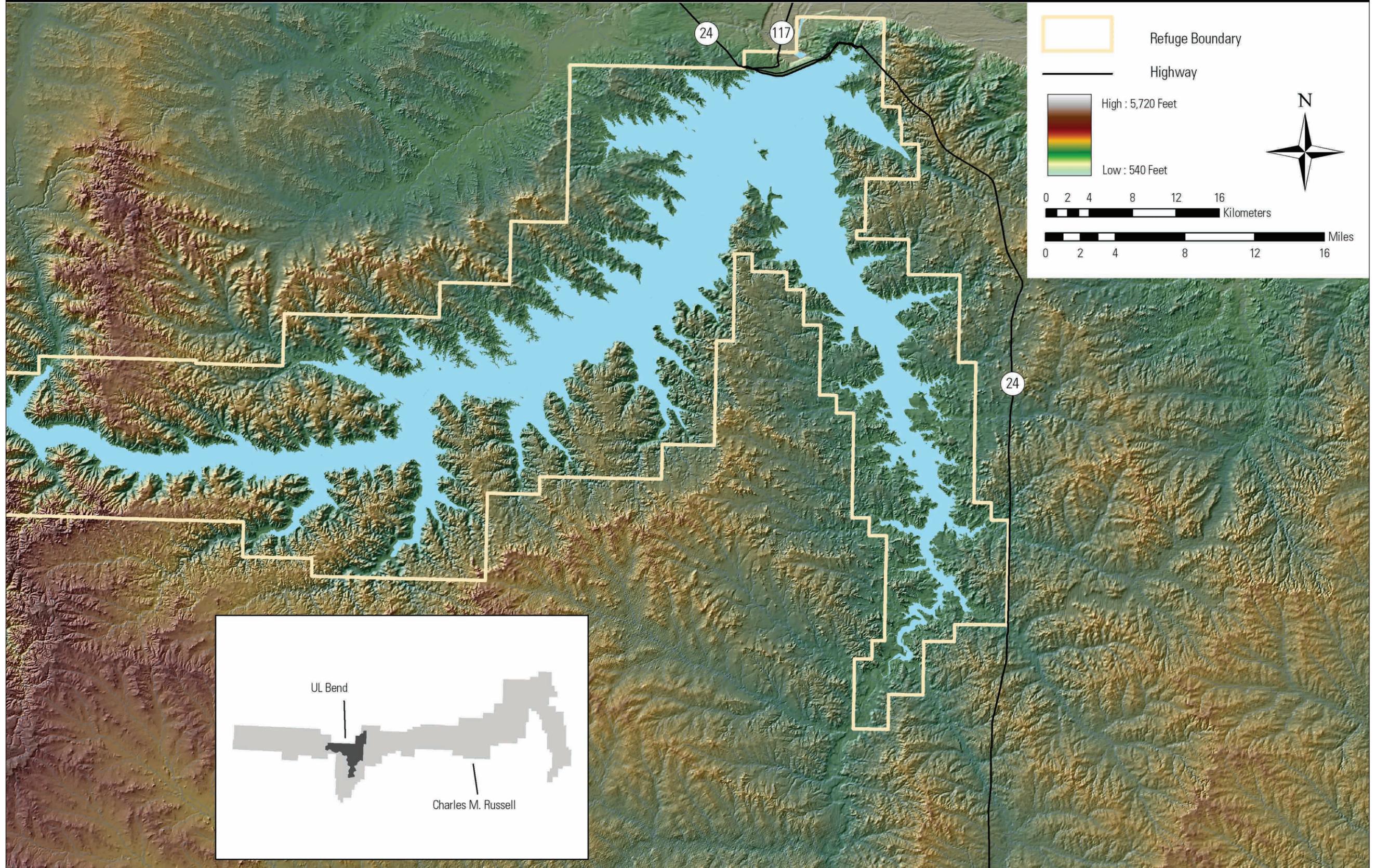


Figure 6 (topographic map, east)



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The bend in the Missouri River at its confluence with the Musselshell River.

to receive the Muscle shell river, the point of country thus formed tho' high is still much lower than that surrounding it, thus forming a valley of wavey country which extends itself for a great distance in a Northerly direction; the soil is fertile, produces a fine turf of low grass and some herbs, also immense quantities of the Prickley pear, without a stick of timber of any description."

In 1896, Oren and Will Bachues established a ranch in the "Big Bend of the Missouri River." The place became known as UL Bend after the ranch's stock brand (DOI 1974c).

Establishment and Acquisition

The refuge was established through the Migratory Bird Conservation Commission on February 7, 1967. On March 25, 1969, Public Land Order 4588 designated the UL Bend National Wildlife Refuge on about 39,456 acres (revoking Executive Order 7509 on those lands). The order defined the refuge's purpose: "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. 715d). Although it was primarily established for the development and management of waterfowl, other wildlife that use refuge habitat includes the endangered black-footed ferret, elk, deer, pronghorn, migratory birds, and other prairie species.

Today, the UL Bend Refuge contains about 56,090 acres (FWS 2010a). Of this land base, 36,615 acres are reserved from public domain, where the Service

has sole or primary jurisdiction on 29,678 acres and secondary jurisdiction on 6,937 acres. About 9,226 acres were acquired by another Federal agency, where the Service has primary jurisdiction on about 1,300 acres and secondary jurisdiction on the remainder. Another 9,688 acres have been purchased, and another 560 acres are under easement or lease (FWS 2010a). Following passage of the Wilderness Act of 1964, there was a wilderness study of public lands (DOI 1974c). In 1976, Public Law 94-557 (90 Stat 2633-4) designated about 20,890 acres in the refuge as the UL Bend Wilderness (see table 2). This acreage was later modified to its current size of about 20,819 acres (see figure 41 in chapter 4). More details about wilderness are in chapter 3, section 3.3, and in appendix F.

Refuge Management History

Early development plans called for the construction of a series of dikes in the interior of the refuge to convert uplands to aquatic habitat for waterfowl. Some attempts were made toward this development, but these were never completed, and the plans were abandoned.

OVERALL MANAGEMENT HISTORY

For nearly 25 years, the Service managed the refuge under a resource management plan developed through an EIS and approved in a record of decision signed April 1986 (FWS 1985, 1986). In addition to identifying specific habitat and wildlife objectives, the record of decision called for a sizeable reduction

in annual livestock grazing. While implementation of the 1986 record of decision helped improve habitat for wildlife, many problems and issues still exist (refer to chapter 3). The refuge has 65 habitat units and one concern is that many of these units are not meeting the habitat objectives set forth in the 1985 EIS. Furthermore, with the passage of the Improvement Act and requirements contained therein, Service management policies specify that secondary economic uses such as livestock grazing are permissible only when prescribed to meet wildlife and habitat objectives. Many of the units were managed through an annual grazing program with a limited prescriptive component.

Due to a host of issues such as drought, climate change, grazing by wildlife and livestock, invasive species, and altered fire regimes, the uplands saw a decline in desirable species such as forbs and shrubs. Some riparian areas are functioning in poor condition, and invasive species are of concern. There were court challenges to the Service's management of the refuge both before and after the 1986 record of decision, and these decisions influenced refuge management as described below.

Schwenke v. Secretary of the Interior, 720 F.2d 571 (Ninth Circuit 1983): The Ninth Circuit Court of Appeals addressed the issue of whether grazing or wildlife conservation had priority of forage resources at the Charles M. Russell Refuge. The lower court had found that conservation and grazing were of coequal priority and that grazing on refuge land should be administered under the Taylor Grazing Act. On appeal, the Ninth Circuit Court held that, under Executive Order 7509, wildlife has a limited priority to the refuge's forage resources. Beyond Executive Order 7509's wildlife population limits (400,000 sharp-tailed grouse, 1,500 pronghorn, and "non-predatory secondary species in such numbers as may be necessary to maintain a balanced wildlife population") wildlife and grazing livestock have coequal priority to the refuge's forage resources. The court also held that amendments to the National Wildlife Refuge Administration Act of 1966 (Public Law 89-669; 80 Stat. 927; codified as amended at 16 U.S.C. Sec. 668dd [1976]) shifted administration of national wildlife refuges from being under the Taylor Grazing Act to the National Wildlife Refuge Administration Act of 1966 (commonly known as the Wildlife Refuge Act).

James Kirkland v. Department of the Interior (1996): The plaintiff (Kirkland) challenged an administrative decision when the Service did not renew his grazing permit. The district court found the Service's decision to be a rational decision and not arbitrary and capricious. A grazing permit is not a property right on the Charles M. Russell Refuge, and grazing is administered under the National Wildlife Refuge

Administration Act of 1966 and not the Taylor Grazing Act. The defendant (DOI [FWS]) repeatedly notified Kirkland of violations of his grazing permit. Kirkland received due process when the Service complied with Title 50 CFR 25.45 and the described appeal process.

Silver Dollar Grazing Association v. U.S. Fish and Wildlife Service, No. 07-35612, (Ninth Circuit, January 13, 2009): The Ninth Circuit Court of Appeals held that the Service may analyze habitat as a proxy for wildlife populations rather than taking an actual inventory of the populations and that the Service's failure to follow monitoring guidelines in a habitat management plan (HMP) was not arbitrary and capricious. The Silver Dollar Grazing Association filed suit against the Service for allegedly violating the National Environmental Policy Act and the Silver Dollar HMP. The grazing association alleged that prescriptive grazing would harm the environment and that initiating prescriptive grazing before conducting a wildlife population survey violated Executive Order 7509. The district court granted summary judgment for the Service, and the Silver Dollar Grazing Association appealed. The Ninth Circuit Court of Appeals dismissed the suit because Silver Dollar failed to provide evidence that prescriptive grazing would harm the environment. Furthermore, without evidence of a specific, personally suffered injury, the grazing association lacked standing to sue.

2.2 SPECIAL VALUES

Refuge qualities are the characteristics and features of the refuge that make it special, valuable for wildlife and people, and worthy of refuge status. Qualities can be unique biological values, as well as something as simple as a quiet place to see a variety of birds and enjoy nature. The following summarizes the qualities that make the Charles M. Russell and UL Bend Refuges unique and valued:

- The refuge encompasses a large landscape containing diverse species that not only occur today but also are historic residents of the land.
- The refuge is part of a large block of undeveloped land that includes adjacent Federal, State, and private lands.
- The UL Bend Refuge contains quality wintering habitat for sage-grouse.
- There is great potential for improving important habitat for sharp-tailed grouse.
- The riparian area corridor through the refuge is one of the last natural free-flowing remnants of the Missouri River where natural processes like flooding and cottonwood regeneration still occur.

- The Missouri River Breaks provide excellent habitat for Rocky Mountain elk and mule deer.
- The refuge supports a premier elk population consisting of good herd population dynamics and good herd structure with diverse age classes.
- The refuge supports the oldest and largest reintroduction effort in Montana for the black-footed ferret population.
- There is a large amount of public land, such as BLM land, within the vicinity and buffering the refuge.
- Multiple wilderness designations provide habitat protection and opportunities to experience the remoteness of the landscape.
- Multiple land designations within and next to the refuge complement the refuge: wild and scenic river designation within the refuge and the adjacent Upper Missouri River Breaks National Monument managed by BLM, UL Bend Wilderness and proposed wilderness, and the Missouri Breaks Back Country Byway.
- The refuge is home to several threatened and endangered species including birds of concern such as the piping plover, mountain plover, and sage-grouse. Other species such as the black-tailed prairie dog and many reptile species are found on the refuge.
- The refuge is host to more than 150 homesteaded river bottoms. There are more than 300 known archaeological sites, mostly Native American.
- There are important paleontological resources associated with the Hell Creek Formation found on the refuge. The refuge also contains fossils from the Early Tertiary Tullock Formation of the Fort Union Group showing the transition from the “Age of Reptiles” to the rise of mammals (Bug Creek).
- The large landscape offers the opportunity for a remote recreational and wildlife experience not available elsewhere.
- The refuge attracts numerous recreationists including Montanans from every county and many out-of-state residents.
- The refuge provides a large outdoor laboratory for potential research and science investigation by graduate students, with the opportunity to provide biological data to refuge staff.
- The refuge offers opportunities for wildland fire research including understanding how fires shape the landscape and affect species.
- There are multiple opportunities to use natural-ignition wildfire for habitat management at the landscape scale.
- With much of the refuge being accessible either within 1 mile of a road or by the river, it allows for ample access. However, due to its remoteness and rugged terrain, the refuge provides many opportunities to experience wilderness and solitude.

2.3 VISION

The vision describes the focus of refuge management and portrays a picture of the refuge in 15 years.

Charles M. Russell National Wildlife Refuge’s expansive badlands, cottonwood river bottoms, old-growth forested coulees, sagebrush steppes, and mixed-grass prairies appear out of the sea that is the northern Great Plains.

Encompassing more than a million acres, the refuge affords visitors solitude, serenity, and unique opportunities to experience natural settings and wildlife similar to what Native Americans and, later, Lewis and Clark observed.

The diversity of plant and animal communities found on the refuge stretch from the high prairie through the rugged breaks, along the Missouri River, and across Fort Peck Reservoir. The refuge is an outstanding example of a functioning, resilient, and intact landscape in an ever-changing West.

Working together with our neighbors and partners, the Service employs adaptive management rooted in science to protect and improve the biological integrity, biological diversity, and environmental health of the refuge’s wildlife and habitat resources.

2.4 GOALS

The Service developed eight goals for the refuge based on the Improvement Act, the refuge purposes, and information developed during planning. The goals direct work toward achieving the vision and purposes of the refuge and outline approaches for managing refuge resources.

GOAL for HABITAT and WILDLIFE MANAGEMENT

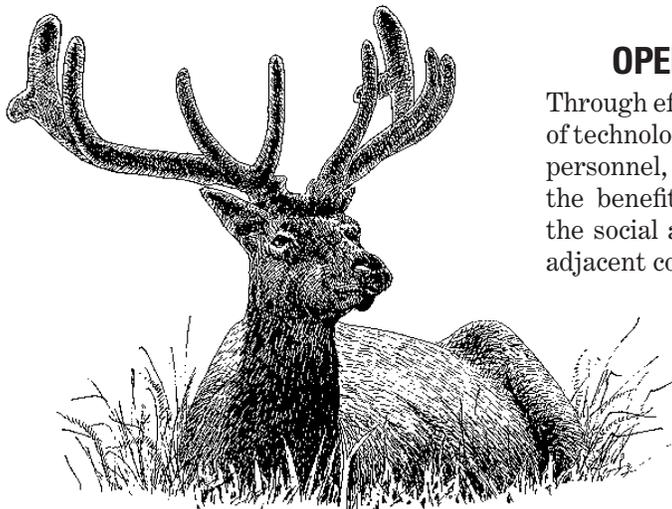
Conserve, restore, and improve the biological integrity, environmental health, and ecological diversity of the refuge's plant and animal communities of the Missouri River Breaks and surrounding prairies to support healthy populations of native plants and wildlife in a changing climate. Working with others, reduce and control the spread of nondesirable, nonnative, invasive plant and aquatic species for the benefit of native communities on and off the refuge.

GOAL for THREATENED and ENDANGERED SPECIES and SPECIES of CONCERN

Contribute to the identification, preservation, and recovery of threatened and endangered species and species of concern that occur, or have historically occurred, in the northern Great Plains.

GOAL for RESEARCH and SCIENCE

Advance the understanding of natural resources, ecological processes, and the effectiveness of management actions in a changing climate in the northern Great Plains through compatible scientific investigations, monitoring, and applied research.



Rocky Mountain Elk

GOAL for FIRE MANAGEMENT

Manage wildland fire using a management response that promotes fire's natural role in shaping the landscape while protecting values at risk.

GOAL for PUBLIC USE and EDUCATION

Provide all visitors quality education, recreation, and outreach opportunities that are appropriate and compatible with the purpose and goals of the refuge and the mission of the Refuge System while maintaining the remote and primitive experience unique to the refuge.

GOAL for WILDERNESS

Conserve, improve, and promote the wilderness character and associated natural processes of designated and proposed wilderness areas and wilderness study areas within the refuge for all generations.

GOAL for CULTURAL and PALEONTOLOGICAL RESOURCES

Identify, value, and preserve the significant paleontological and cultural resources of the refuge to connect refuge staff, visitors, and the community to the area's prehistoric and historic past.

GOAL for REFUGE OPERATIONS and PARTNERSHIPS

Through effective communication and innovative use of technology and resources, the refuge uses funding, personnel, partnerships, and volunteer programs for the benefit of natural resources while recognizing the social and economic connection of the refuge to adjacent communities.

