Chapter Three: Existing Conditions Documentation

CHAPTER 3: EXISTING CONDITIONS DOCUMENTATION

Introduction to Existing Conditions Documentation

This chapter includes written, graphic, and photographic documentation of 2002-2003 existing landscape conditions at Grant-Kohrs Ranch National Historic Site. This documentation is based primarily upon field investigations of the project area and is supplemented by existing conditions documentation contained in the Cultural Landscape Inventories (Amphion 1997 and Shapins 1999 and 2003). A site description and overview of landscape organization for the entire Ranch introduces this chapter and provides a context for the more detailed information that follows. Existing conditions documentation is presented for each of the nine major landscape zones comprising the project area and includes descriptions of existing landscape features, systems, and land-use patterns that are organized by the following landscape characteristics:

- natural systems and features;
- vegetation;
- spatial organization;
- land use;
- constructed water features;
- circulation;
- views and vistas.
- buildings and structures;
- objects and small-scale features; and
- archeological and missing features

The landscape characteristics selected to organize the narrative description of the project area are based upon the NPS Statement of Work and guidance offered in the *Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (1998). National Register Bulletin 30: *Guidelines for Evaluating and Documenting Rural Historic Landscapes* and National Register Bulletin 18: *How to Evaluate and Nominate Designed Historic Landscapes* provided additional guidance.
The existing conditions documentation was undertaken for separate landscape areas owing to the size of the Ranch and complexity of existing features and systems within the study area. The project study area was broken down into the following component landscape areas (see Map 3-1):

- **Home Ranch Complex:** This area includes all landscape features associated with the core complex of the Grant-Kohrs Ranch. It is bounded by the railroad corridor on the east, the riparian corridor of the Clark Fork River on the west, and consists of the Lower Yards, Lower House Yards, Bunkhouse Yards, Johnson Creek Field, West Corrals, and West Feedlots.
- **East Feed Lot/Warren Hereford Ranch**: This area consists of the area east of the railroad corridor, which was developed by Con Warren. It contains the land bordered by the main entry road on the south, the park boundary on the east, the rail corridor on the west, and the south edge of Front Field on the north;
- **Grant-Kohrs Residence:** This consists of the features contained with the domestic landscape immediately surrounding the ranch home built by John Grant, and later, Conrad Kohrs;

- **Warren Residence:** This consists of the features contained with the domestic landscape immediately surrounding the home built by Conrad Warren;
- **Pasture/Hay Field:** This area includes the irrigated and low-lying lands bordering the Clark Fork riparian corridor. It consists of Stuart Field, the Lower Yard Fields, the North Meadows, L-Barn Fields, Western Hay Fields, Olson Fields, as well as the Front Field located to the north of the East Feed Lot.
- **Upland Pasture:** This area includes the land west of the Westside Ditch, and includes Big Gulch, Little Gulch, and Taylor Field, as well as the ranges and hilltops in between. While this area contains both hay fields and pasture land, it is considered a separate component landscape because of its relative sense of isolation from the rest of the ranch.
- **Riparian Area/Woodland:** This area consists of the riparian woodlands found along the Clark Fork River corridor, Johnson Creek, Cottonwood Creek, and the Olson property along the park's northern boundary.
- **Railroad Bed & Barrow Pit/Wetland:** This area consists of the linear railroad corridor and utility lines associated with it. It also includes the depressed wetland areas (barrow pits) bordering the railroad corridor.
- **Development Zone:** This area contains the Visitor Center building, restrooms, curatorial building, and visitor parking lot. A portion of Johnson Creek comprises the southern boundary of this zone.

Existing conditions documentation was collected and integrated from various sources. Overview level documentation of the ranch built upon the previously prepared *Cultural Landscape Inventory* (Draft, 1997) and *Cultural Landscape Analysis* (1987). Documentation for the Grant-Kohrs residence was based primarily upon the Level II Cultural Landscape Inventory (70% Draft, 2003). Documentation for the Warren Residence was derived from the *Conrad and Nellie Warren Residence Historic Structure Report* (Draft, 2001). In addition, a tremendous amount of background information is embedded in the multi-volume *Historic Resource Study, Cultural Resources Statement, and Historic Structure Report* (1979) for the Grant-Kohrs Ranch National Historic Site. These resources, along with the Geographic Information Systems (GIS) mapping data provided by the park, served as base information for identifying landscape resources and their dates of origin. These references were supplemented by field observations conducted during October of 2002 for the purpose of field-checking and supplementing base-map data, as well as for conducting photographic documentation of each component landscape. Park staff was consulted throughout the data collection process to provide supplemental information and answer questions posed by the research team.

Overview of Grant-Kohrs Ranch National Historic Site Existing Conditions
[maps and photographs are found at the end of this chapter]

The Grant-Kohrs National Historic Site is located in the intermountain grassland region of west-central Montana, nestled in Deer Lodge Valley along the Clark Fork of the Columbia River (see Map 3- 2). The valley, which is approximately 50 miles long and 10-15 miles wide, is defined by the Flint Creek Mountain Range to the west and the Continental Divide to the east. While the valley is predominately in private ownership, the mountain ranges are federally owned and managed as the Deer Lodge and Helena National Forests.

The Ranch lies adjacent to, and directly northwest of, the city of Deer Lodge, formerly known as Cottonwood for the water-loving trees that grew along the tributary creek bearing the same name (see Map 3-3). Established in 1860 as a result of John Grant's efforts to entice western settlers into the valley where he located his home ranch, the valley, and later the town, was renamed Deer

Lodge. The name Deer Lodge is said to have originated with the Snake Indian name for a large mound created by hot springs that attracted white-tailed deer. In 1841, this feature was described as "a cone-like butte 30' high with a natural spring coming from the top." [1] This steaming mound was said to resemble an Indian lodge with campfire smoke rising from it.

The Deer Lodge Valley experiences a semi-arid inland mountain climate with average annual high and low temperatures of 56 and 28 degrees respectively. It receives an average of only 10.6 inches of precipitation per year, with most rainfall occurring in the months of May and June.[2] Topography influences and sustains a variety of microclimates within the inter-mountain region, with the higher mountain elevations receiving more precipitation and cooler temperatures; in contrast, the valleys receive less precipitation and warmer temperatures. The standard temperature change with increasing elevation is about -10 degrees Fahrenheit for every 100 feet.[3]

Changes in microclimate impact the native flora and fauna communities found within the larger region and a complex mosaic of vegetation patterns reflect four different elevation zones. The alpine-tundra is the highest and most extreme plant community within the region. It can be found on the highest mountain peaks, such as Deer Lodge Mountain and Mount Powell, which are comprised of mostly rocky slopes with small, low-growing plants that are adapted to rapid growth during the short, cold summers. The subalpine zone extends below the bottom edge of the alpine-tundra zone. Cool temperatures and greater moisture in this area provide good habitat for forests, which consists primarily of dense Engelmann spruce and subalpine fir trees. The montane zone (also known as the Douglas fir zone) acts as a transitional area between the valley bottoms and the steeper terrain. This zone supports the greatest variety of wildflowers, trees and shrubs; Douglas firs and lodgepole pines dominate the forests.[4] Although all three of these zones exist outside of the present-day Grant-Kohrs Ranch, they frame the views from within it, and provide the historic ecological and visual context of the ranching activities that have taken place in the valley over the past 150 years.

The valley floors and benches comprise the lowest elevations and is the zone within which the Grant-Kohrs Ranch National Historic Site is located. The benches are a visually defining feature within the valley and mark the boundary between the wetter, alluvial soils along the riparian zone, and the well-drained loams found in the upper elevations. The historic ranch home built by John Grant was located along the bench on the eastern side of the river.

Collectively known as the grassland zone, this area was historically dominated by native bunchgrass habitat, and comprised of mostly western wheatgrass, bluebunch wheatgrass, bitterroot, phlox, cactus, and Astragalus species.[5] These grasses are what originally attracted John Grant to settle in Deer Lodge Valley and what sustained the cattle that grazed on the open range until the late 19th century. Throughout the 20th century, the valleys of the inter-mountain region lost much of their native vegetation as the open range became overgrazed, and ranchers realized that their livestock needed to be contained to sustain the herd.

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[1] Father DeSmet quoted in: Staff, Grant-Kohrs Ranch NHS, "Resource Management Plan: Grant-Kohrs Ranch National Historic Site" (1986), I-2.
[2] Western Regional Climate Center, "Deer Lodge, Montana: Period of Record Monthly Climate Summary," Available: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mtdeel, (Accessed 3 October 2002).
[3] Linda Kershaw, et al., *Plants of the Rocky Mountains* (converted from degrees Celsius) (Edmonton, Alberta: Lone Pine Publishing, 1998), 13.
[4] "Circle Tour Guide Book" (Published in partnership between the Deer Lodge National Forest, the Louisiana-Pacific Corporation, and the Deer Lodge Chamber of Commerce), 1.
[5] Rocky Mountain Region, National Park Service, *Cultural Landscape Analysis:Grant-Kohrs Ranch National Historic Site* (June 1987), 7.

Natural Systems and Features

Geology and Soils
The underlying geology of the surrounding region is complex (see Map 3-4). The Flint Creek Range to the east of Deer Lodge Valley was formed by Sapphire block, the enormous chunk of the earth's crust that moved 50 miles to the east about 70-75 million years ago. This range consists of sedimentary layers (mostly sandstone) that were folded by the movement of the Sapphire block. Granite magma intrusions form the mountain peaks.[6]

The high valleys of the Flint Creek Range were gouged by glaciers that descended to the elevation of the valley floor. These glaciers left their marks in the deeply carved peaks, sharp ridges, and valleys shaped like deep troughs. Glacial moraine can be found at the mouth of many creeks.[7]

The high benches found in the Deer Lodge Valley are basin fill deposits, and represent the valley floor as it was before the modern streams began to erode their valleys into it sometime between two and three million years ago.[8] Soils on the ranch are generally alluvial in nature, deposited by the Clark Fork River and its tributaries. These soils are typically very deep loams, which are a fertile mixture of sand, clay, and decomposed organic matter (see Map 3-5).

Topography
The topography of the Deer Lodge Valley region varies quite drastically, as elevations of the surrounding mountains rise to almost 9000 feet above sea level in the surrounding Deerlodge National Forest. Mount Powell, the tallest peak in the region at 10,156 feet above sea level, provides a stunning backdrop to valley views and activities (see Map 3-6). Deer Lodge Mountain, which is located directly to the east of Mount Powell, is visually more prominent from the ranch complex and approximates an elevation of 9,170 feet. Because of the proximity to the ranch and its western orientation, the Flint Creek Range, of which Mount Powell and Deer Lodge Mountain are a part, is more visually dominant than the Continental Divide to the east.

Topography changes within the Grant-Kohrs Ranch are less extreme than its surrounding context; elevations of the western foothills rise to over 4600 feet in the hilly southwest area of the Ranch (the upland pasture), and fall to 4460 along the lower portion of the river valley in the northeast corner of the site (a difference of 140 feet). Likewise, slopes range from 35% in the upland pasture, to virtually flat areas in the floodplain. Despite the lack of extremes within the park itself, the subtle changes in elevation significantly impact the use of land, particularly the location of ranch buildings, corrals, feed lots, infrastructure, and domestic functions. The riparian corridor, its adjacent, irrigated meadows and stream tributaries, the benchlands, man-made wetlands, and upland pastures all reflect human adaptations to the natural physiographic conditions.

Hydrology
There are six small tributary creeks and nine natural springs located on the Ranch that feed into the Clark Fork River (see Map 3-6). Spring Creek runs through the northern area of the property; Johnson Creek and its Northern Fork flow through the center of the ranch, and Cottonwood Creek flows through the city of Deer Lodge before traversing along the south boundary of the Ranch complex. No Name Creek, originating from a natural spring near the Ranch complex, traverses

[6] David Alt and Donald W. Hyndman, *Roadside Geology of Montana* (Missoula: Mountain Press Publishing Company, 1986), 166-167.
[7] Alt and Hyndman, 167.
[8] Alt and Hyndman, 168.

through the Lower Yard Fields and North Meadow before joining the Clark Fork. Taylor Creek runs along the southern boundary of the Ranch property, paralleling MTSR 4691. This natural abundance of fresh water, coupled with the natural topography and deep soils discussed earlier, provided the Grant, Kohrs, and Warren families the natural resources needed to support their domestic and ranching activities for over 150 years.

Vegetation

The ranch is comprised of a variety of different plant communities. These include the irrigated hay fields, dry ranges, riparian woodlands, wetlands, and domestic landscapes (see Map 3-7). Variations in plant communities relate to the availability of water (whether natural or irrigated), as well as variations in soil type and cultural influences.

Although areas of native grasses still remain, exotic grass species dominate the meadows and upland areas of the Grant-Kohrs. Major hay grasses found on the ranch consist of smooth brome (Bromus inermis), common timothy (Phleum partense), redtop bentgrass (Agrostis alba), and white clover (Trifolium repens). These grasses are found in fields where irrigation ditches provide the water necessary to sustain their agricultural production.[9]

The predominant pasture grasses consist of Kentucky bluegrass (Poa pratensis), redtop bentgrass, smooth brome, crested wheatgrass (Agropyron cristatum), and white clover. These grasses are generally found on the upland areas of the ranch that are not irrigated with surface ditches. The front fields, hand irrigated with water lines connected to the effluent ponds, also contain these species. Although all of these predominant meadow and pasture grasses are exotic species, a few natives, such as bluebunch wheatgrass, western wheatgrass (Agropyron smithii), and needle-and-thread grass (Stipa comata) can still be found in these areas. This is particularly true within the Upland Pasture area west of the Clark Fork River.[10]

One small area (27 acres) inside the park boundary remains as the only relatively intact piece of native prairie. This area had been fenced, and thus ungrazed for many years. A portion of it was historically used as a barrow pit for the adjacent railroad bed.[11] This parcel contains the native grasses and forbs found in the inter-mountain region.[12]

In contrast to the shrubby vegetation found along the riparian corridor, the cattail-laden wetland, and rolling fields of pasture grasses, the landscapes of the home ranch and the Warren house provide an abundance of domestic plants found no where else on the property. These include tree species such as the pine, spruce, ash, birch, and maple, as well as several other native and non-native shrubs and perennials.

As mentioned earlier, young black cottonwoods dominate the front yard of the home ranch. Juniper, boxelder, ash, willow, and spruce also surround the home. Like the Warren complex, the home ranch has several native and non-native shrubs and perennials in the garden, including

[9] Species and location information derived from Janet Hardin, "Plant Species & Locations, GRKO Database, Final Inventory" (Missoula: University of Montana, Division of Biological Sciences, June 3, 2003).
[10] Species and location information derived from Janet Hardin, "Plant Species & Locations, GRKO Database, Final Inventory" (Missoula: University of Montana, Division of Biological Sciences, June 3, 2003).
[11] Douglas C. McChristian, *Ranchers to Rangers: An Administrative History of the Grant-Kohrs Ranch National Historic Site,* National Park Service: Rocky Mountain Cluster (1977), 80.
[12] Gary J. Ray, "Baseline Plant Inventory of the Grant-Kohrs Ranch: Supplementary to the Floral & Faunal Survey and Toxic Metal Contamination Study of the Grant-Kohrs Ranch National Historic Site" (Missoula: Gordon Environmental Laboratory, University of Montana Botany Department, 1984), 4.

lilacs and barberries. These domestic yards will be described in more detail in the component landscape section of this report.

Spatial Organization

The spatial organization of the Grant-Kohrs Ranch directly represents the day-to-day operations of a working cattle ranch and reflects cultural adaptations to the natural environment, as well as to changes that occurred in the larger physical, technological, and economic context of its 140 year history. At a large scale, the site is organized with the Home Ranch building complex and Warren Hereford Ranch complex at its nucleus, surrounded by fenced pastures and feedlots, which are bounded by the outlying hay fields and rangelands.

The Clark Fork River generally divides the ranch in half, with all the domestic buildings and buildings associated with cattle ranching operations located to its east. The land on the west side of the river consists of pastures and hayfields; the bench land along the western edge of the ranch is very prominent in this area. The northern section of the ranch is dominated by the effluent ponds and wetlands associated with Deer Lodge sewage treatment, while the southern edge is dominated by both hay fields and pastures (refer to Map 3-7).

The Home Ranch complex and the Warren Hereford Ranch complex are separated by the north-south oriented Burlington Northern and Milwaukee railroad lines and the raised track beds, barrow pits, and utility lines. The two ranch complexes are physically linked by two east-west running roads. The southern road, Kohrs-Warren Lane, connects the Home Ranch complex with Business Route 90, and the northern Main Entry Road serves the ranch operations of the Warren and Home Ranch complexes.

The NPS Development Zone, which includes the visitor contact station and restrooms, parking lot, and curatorial storage building is located in the southeast corner of the ranch, bounded by the railroad tracks to the west and Business Route 90 to the east. It is connected to the rest of the ranch by a pedestrian underpass.

Land Use

While the primary land uses within the Grant-Kohrs Ranch continue to be associated with cattle ranching operations, preservation, interpretation, and visitor services are also contemporary uses, (see Map 3-8). Ranching practices depend heavily upon the pastures found in the upland areas to the west and along the Clark Fork River, as well as the irrigated Front Field to the east. Hay fields comprise the lower meadows along the Clark Fork River (which are occasionally used for pasture), the irrigation ditches and flumes which provide water for the fields, and the corrals, loafing sheds, and feed lots found in both the Home Ranch Complex and Warren Hereford Ranch Complex. Most of the interpretative exhibits, archival storage, and visitor services are concentrated in the Development Zone, the Home Ranch Complex, and the Warren Hereford Ranch Complex.

There are several challenges associated with maintaining a “working ranch” in a way that effectively responds to the needs of responsible resource management and public education and interpretation at a National Historic Site. A “working ranch” may be defined as a self-sustaining agricultural business, whose purpose is to generate profit through livestock production. Within the context of this historic site, Grant-Kohrs Ranch is a self-sustaining agricultural showcase,

whose purpose is public education and preservation of historic livestock production. This is an important distinction from a privately-owned ranch.[13]

As articulated in the 1996 draft Animal Use Plan, the challenges associated with this distinction stem from the need to operate in a businesslike manner by incorporating a marketing strategy and making the program economically viable. Proceeds from the cattle sales may support maintenance, interpretation, or other public education endeavors, but only after livestock program objectives are met. Although livestock may be considered as an educational resource for the historic ranch, there may be increasing temptation to rely on the program for ancillary funding in times of lean park budgets. Commercialization has to be guarded against, as it could compromise the educational purpose for the livestock program's existence, and ostensibly, the site's resource preservation mandate as well.[14]

Other challenges are associated with maintaining and interpreting a working cattle ranch. In order to interpret the history of the western US range cattle industry at the ranch, the animals must be as visible and accessible to park visitors as possible, within the necessary constrains of public safety, proper land use, and animal welfare. Second, the interpretive staff has to be involved in livestock feeding and care, consistent with competing division work requirements associated with being NPS employees.[15] Other challenges include mitigating wear and tear on historic features, such as fences and barns, minimizing ranching effects on natural processes, protecting sensitive species of native plants and animals and their habitats—including managing grazing operations so that existing native vegetative communities persist in moving toward the potential native plant communities, minimizing soil erosion, the spread of noxious weeds, and pesticide use, and protecting surface waters from fecal and chemical contamination.[16]

Ranching

In 1996 a draft Animal Use Plan was prepared for the ranch in order to articulate the interpretive role and practical function of livestock management at Grant-Kohrs Ranch. This plan recommended the diversity of livestock breeds, including cattle, horses, and other farm animals, such as poultry, which would reflect the ranching traditions associated with the close of the open range, while facilitating the revenue flow needed to keep the program viable. These recommendations included a 2003 target herd of four longhorn steers, six mixed-breed steers, two Hereford bulls, one Shorthorn bull, one Angus Bull, and 39 cows. The Plan also recommended five Belgian and saddle horses, two breeding mares and one or two colts, as well as three quarter horses and up to five U.S. Forest Service (USFS) horses kept at the park under agreement for use by employees of Deer Lodge/Beaverhead National Forest. As this plan was never finalized or implemented, its recommendations will be evaluated during the development of the treatment plan for this CLR (Part II).

Today the ranch maintains approximately 94 head of cattle, including several breed yearlings born in the spring. Breeds include Hereford, English Shorthorn, Longhorn, and Angus, as well as cross-breeds of the four types. Special use permits for grazing privileges are also issued by the ranch to private individuals on a competitive basis for a fee, based upon Animal Unit Months (AUMs) allocations. In general, one cow and calf equals one animal unit (AU); in the absence of a calf, one cow equals one AU. AUMs are based upon the number of months that they forage. In

[13] "Animal Use Plan," Grant-Kohrs Ranch National Historic Site, 2. (Grant-Kohrs Ranch National Historic Site Archives, Resource Building Files, 1996).
[14] "Animal Use Plan," 2.
[15] "Animal Use Plan," 3.
[16] "Management Goals," Grant Kohrs Ranch National Historic Site, Internal memorandum (Grant-Kohrs Ranch National Historic Site Archives, Resource Management Files, November 1992).

this case, the 94 head of cattle are based upon 1128 AUMs for the calendar year (12 months of forage).[17]

Nine horses are also cared for on the ranch. These include three saddle horses (Quarter horse), two Belgian draft horses, and the five USFS horses on leased pasture. Private horse use is allowed on the ranch. During visitor season, the ranch also usually cares for a few chickens, ducks and turkeys.

The number and breeds of livestock maintained at the ranch is based upon available resources and economic viability. This number fluctuates annually, as does the use of specific pastures for grazing, which occurs 12 months a year. Calving occurs February through April of each year, with breeding taking place between June and August. Pasturing is adaptive and based upon Best Management Practices (BMPs), the needs of the park, and the resources available. Current usage of the individual pastures (i.e. grazing and/or haying) is addressed in detail within the following component landscape sections.

Ranching operations within the Park also include the day to day functions of caring for the livestock, such as saddling and harnessing horses, calving, feeding, watering, vaccinating, branding, maintaining livestock sales records, equipment maintenance, etc.

Agriculture

As a working ranch, the Grant-Kohrs Ranch NHS also continues to cultivate hay on a contract basis within the irrigated fields (the NPS does not cultivate any field crops). In 2002, hay production constituted approximately 418 acres (18 of which were alfalfa).[18] The total tonnage for all hay baled on the ranch was 233 tons (comprising approximately 2,017 bales).[19]

Hay is harvested by local ranchers under contract by the NPS, which generally occurs in July and August of each year. Remaining grass is grazed by Park livestock and occasionally leased as AUMs for private cattle grazing during the fall.[20] Generally, cattle are moved into the meadows after the hay harvest is complete each year and pastured until it becomes necessary to feed them hay in the winter. Pastures and meadows are grazed on a rotation basis, as determined by the rancher, to prevent overgrazing and to protect resources. After several months of grazing, there is an accumulation of dried, hard manure that needs to be broken up so haying machinery in not damaged. This is accomplished by pulling a harrow with a tractor or team of horses over the surface of the meadows.[21]

Fertilization generally occurs in the spring of each year (for selected fields). Generally, each field is fertilized with a commercial fertilizer on a bi-annual basis. This is done under contract. Haying is done with a swather, which cuts the grass and puts it into windows. If the hay becomes wet, it is necessary to turn it a second time with a side-delivery rake hooked onto a tractor. The hay is then baled and hauled off the ranch by the lessee. Any portion retained by the NPS is stacked. To protect the haystacks from cattle, hay panels are brought in the fall and removed

[17] NPS comments, 75% CLR draft review.
[18] Montana Agricultural Statistic Service, Letter to Mr. Ben Bobowski (Grant-Kohrs Ranch National Historic Site Archives, Resource Management files, January 21, 2003).
[19] Internal park statistics, "Custom hay work for summer 2002. Cut, baled, and stacked by Dave Johnson" (Grant-Kohrs Ranch National Historic Site Archives, Resource Management files, no date).
[20] Grant-Kohrs Ranch National Historic Site, "Lease Operations," Internal memorandum to Superintendent (Grant-Kohrs Ranch National Historic Site Archives, Central files, February 14, 1996).
[21] Grant-Kohrs Ranch National Historic Site, "Assessment of Actions Having an Effect on Cultural Resources, Agricultural Practices," Project No. GRKO 95-10 (Grant-Kohrs Ranch National Historic Site Archives, 1995).

again in the spring. They are about 16 feet long and made of 3-4 inch lodgepole pine split rails. Wooden or steel posts are used to secure the panels in the ground.[22]

Interpretation/Preservation
Occurring adjacent to and simultaneously within all these ranching operations are the interpretive uses associated with the National Park Service operations. While interpretative uses are focused within the Home Ranch Complex, specifically the ranch house, bunkhouse, thoroughbred barn, blacksmith shop, buggy shed, dairy, ice house, and granary, which contain interpretive exhibits, the entire complex and surrounding landscape provide context for visitor understanding of historic ranching operations. A variety of interpretive programs are also organized and conducted on the ranch. These include demonstrations of cowboy/ranch hand skills, horse-drawn public interpretive tours, public demonstrations of traditional haying, costumed interpretation, and calving displays.[23] Preservation is ongoing throughout the ranch, as NPS staff work to ensure cultural resources are maintained to the Secretary of Interior standards for Treatment of Historic Properties. This includes maintenance of historic structures, fences, vegetation, and exhibits, as well as the restoration and/or reconstruction of historic features, when necessary.

Visitor Services/Administration/Storage
National Park Service administrative uses are concentrated within the Warren Hereford Ranch complex, which include the Resource Management/Maintenance Office and Maintenance Shop. In 2002, the NPS moved the Grant Kohrs Ranch NHS administrative offices from Deer Lodge to the Warren House. National Park Service visitor services are provided in the Development Zone east of the railroad tracks, as well as within the blacksmith shop, which provides rest room facilities. The NPS also maintains a curatorial storage facility in the Development Zone.
Water Treatment/Effluent Irrigation
Approximately four acres within the ranch boundary are dedicated to sewage treatment. These lands are owned and operated by the City of Deer Lodge (lands were purchased in 1958-59). Uses include four settling ponds and a pump house located in the northern section of the ranch. In 1999 the NPS installed an irrigation system, which consists of irrigation mainlines, risers, and handlines, to irrigate select pasture grasses with water from the settling ponds. More information regarding this system is found under the Constructed Water Features section.

Conservation
Wetlands and riparian areas comprise approximately 20% of the ranch, and include the fenced areas of Clark Fork floodplain, the old sewage lagoon located to the south of the current settling ponds, and the barrow pits located on either side of the railroad corridor. The fenced areas surrounding Johnson and Cottonwood Creeks are also considered riparian habitat.

The NPS currently maintains a scenic easement on 160 acres of land in the northern most section of the park. This easement is intended to protect the ranch's northern viewshed.

Transportation/Utilities
Circa 1879, the Utah Northern Railroad (acquired by the Northern Pacific Railroad Company in 1888) established a line through Deer Lodge. Today, the Burlington Northern Santa Fe Railroad uses this east track, with an average of two trains passing each day. The western track Milwaukee Railroad, built in 1908, ceased operation in 1982. A portion of the tracks remain, as does the graded railroad bed. This line is used to interpret the role of the railroad in ranching operations.

[22] Grant-Kohrs Ranch National Historic Site, "Assessment of Actions Having an Effect on Cultural Resources, Agricultural Practices," Project No. GRKO 95-10 (Grant-Kohrs Ranch National Historic Site Archives, 1995).
[23] Grant-Kohrs Ranch National Historic Site, "1998 Garrison Gold Award," Nomination Form (Grant-Kohrs Ranch National Historic Site Archives, Central files, February 25, 1998).

Pest Control

As part of the Park's ranching operations, the NPS manages beaver and skunk populations on the ranch. While beavers are a native species that occupy an essential ecological niche, they are at times considered pests. In many areas of the ranch their presence is welcomed, or at least tolerated. However, in other areas, the beavers' construction of structures, manipulation of riparian vegetation, burrowing in the waterways, etc., interfere with daily operations of the ranch, disrupt the historic patterns and features of the landscape, and limit the management of a number of other important natural and cultural resources. Some negative effects of these types of beaver activity include flooding of fences and gates, flooding of historic hay fields, dammed irrigation ditches, restriction of cattle grazing and rotation by flooded pastures, alteration of vegetation patterns, overland flow of water across slickens that re-suspend toxic sediments, etc. Recently the NPS has begun to authorize trapping and removal of beaver under a Special Use Permit.[24] Trapping of skunks, which are often found in the outbuildings within the historic district, has also been authorized via a Special Use Permit.[25]

Constructed Water Features

The Grant-Kohrs ranch supports an elaborate irrigation system that was begun in 1896 (see Map 3-9). This system consists of irrigation ditches, diversion dams, pipes, headgates, risers, culverts, pumps, flumes, and hand lines. Overall, this system irrigates over approximately 400 acres of land.

Most of the fields and a few portions of the west feedlots contain irrigation ditches. The system is comprised of primary (or "main") ditches that draw water from natural water sources, such as the Clark Fork River, Cottonwood Creek, Taylor Creek, Johnson Creek, and several unnamed springs.

These ditches generally follow the natural contours of the land and are the primary source of water for smaller irrigation channels that feed off of it. Each ditch includes the head gate or pump, earthen main ditch (which is approximately 18" wide and several feet deep), and appropriation gates. Some of the headgates are constructed with four-inch by four-inch timbers with two-inch lumber staked on edge to divert and regulate the flow of water into ancillary ditches. Other headgates are constructed of concrete with grooves in the side of the concrete for boards to divert and control the flow of water.[26]

Metal and wooden appropriation/distribution gates of various configurations and a series of canvas dams control the distribution of water to various fields.[27] Diversion dams, located every few hundred feet along the way, are composed of rubber impregnated canvas (or a heavy rubber sheet in some cases) attached, as a manuscript is attached on a scroll, to sturdy poles, usually three to four inches in diameter. When flooding is desired in a given area the pole is placed across the ditch and the fabric dropped into the hole, the bottom held by any available nearby stones. The water then rises and spills over the edge or out of vents in the low berm along the ditch cut with a shovel. When not in use, the portable diversion dams are thrown alongside the ditch.[28]

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[24] Natural Resource Management Specialist, "Beaver Control at GRKO," Memorandum (Grant-Kohrs Ranch National Historic Site Archives, Central files, February 2, 1999).
[25] Grant-Kohrs Ranch National Historic Site, "Special Use Permit, Beaver and Skunk Trapping" (Grant-Kohrs Ranch National Historic Site Archives, Central files, March 21, 2003).
[26] Grant-Kohrs Ranch National Historic Site, "Assessment of Actions Having an Effect on Cultural Resources, Agricultural Practices," Project No. GRKO 95-10 (Grant-Kohrs Ranch National Historic Site Archives, 1995).
[27] Shapins Associates, *Grant Kohrs Ranch National Historic Site Cultural Landscape Inventory, Level 0 Park Reconnaissance Survey*, Draft (June 1999), 9.
[28] John Albright, Historic Resources Study and Historic Structure Report Historical Data, Kohrs and Bielenberg Home Ranch, Grant-Kohrs Ranch National Historic Site, Montana (Denver: Denver Service Center, National Park Service, 1977), 157-158.

Secondary ditches (or "laterals") are generally smaller in width, and are dependent upon the primary ditches for their water source. Independent ditches are those that derive their water from a natural water feature, such as a creek or spring, but which do not irrigate any secondary ditches.

There are several main ditches that flow north through the Ranch. These include the Kohrs-Manning Ditch, Westside Ditch, Kohrs Ditch, which is also known as "The Big Ditch," Hartz Ditch, and Johnson Ditch. These constructed water features, including the variety of lateral ditches, head gates, dams, pipes, pumps, flumes, and culverts, will be further described within their corresponding component landscape areas.

Throughout the year, this complex irrigation system must be consistently maintained to ensure operability. Ditches are maintained annually, and cleaned with a tractor and ditcher, and in some areas a backhoe.[29] Although no longer allowed due to protocols outlined in the Wildland Fire Management Plan, spring ditch burning has been proposed as an efficient means to accomplish vegetation removal.[30] Annual cleaning is important to maintain the flow of water by clearing out the dense tufts of grass that take advantage of the wet soil conditions, and which may become clogged with the thick growth. Routine maintenance also involves repairs to ditches, culverts, and headgates, including the replacement or construction of new headgates, culverts, dam backers and canvas dams, when needed.[31] As is the case with other natural resource management and maintenance practices, the park faces challenges in balancing the desire and functionality of new equipment technologies and materials, with the use of traditional technologies and materials historically employed on the ranch.

Constructed water features within the Park also include a handline irrigation system that provides effluent irrigation to Front Field and L-Barn Field. There is also enough line to irrigate the large western corral located in the East Feed Lot. All of the irrigation pipe in this area is completely removable, with the exception of the mainline, which has risers with valve opening elbows. This system, which was installed by the NPS in the mid-1990s, replaced a historic hand line irrigation system installed by Con Warren in ca. 1954.[32]

Circulation

There are several types of circulation systems throughout the Grant-Kohrs Ranch (see Map 3-10). Primary roads connect the core of the Grant-Kohrs Ranch NHS to its larger context. These are comprised of east-west oriented main entry roads connecting the Ranch with Main Street, or U.S. Highway 10, which is also referred to as Business Loop 90. This road provides access to I-90 to the north, and the City of Deer Lodge to the south. There are two entrances to the core of the Ranch from this road. The oldest, referred to in this report as Kohrs-Warren Lane (also known as Warren Lane), is generally centered on axis with the ranch house, and provides access to the Warren residence. A second parallel road to the north, the Main Entry Drive (also referred to as Cattle Drive), services the red barn and larger Warren Herford Ranch complex. This road passes over the railroad tracks, and provides access to the larger Home Ranch complex, the lower

[29] Grant-Kohrs Ranch National Historic Site, "Compliance Review Form, Annual Cleaning of Ditches," Internal park document (Grant-Kohrs Ranch National Historic Site archives, June 4, 2003).
[30] Grant-Kohrs Ranch National Historic Site, "Wildland Fire Management Plan and Environmental Assessment" (On file at the Grant-Kohrs Ranch NHS archives, July 2002).
[31] Grant-Kohrs Ranch National Historic Site, "Spring Ranch Work," Internal park notes (Grant-Kohrs Ranch National Historic Site, Deer Lodge Montana, Resource Management files, no date).
[32] Grant-Kohrs Ranch National Historic Site, "Info on Hand Line," Portion of report prepared to describe impacts associated with installation of hand line system (On file at the Grant-Kohrs Ranch NHS archives, No date).

meadows, and upper pastures to the west. A southern entrance drive (Grant Circle) provides access to the visitor center and parking area.

Secondary roads provide north-south internal access throughout the Ranch, via the primary roads. These include all the dirt and gravel roads around the Home Ranch complex, the gravel county road along the western benchland (Kohrs Ditch Road), the unpaved road along the west edge of the railroad corridor, and the unpaved road paralleling Business Loop 90 on the eastern edge of Front Field. Also included in this category is the unpaved road providing access to the effluent ponds from Business Loop 90 at the northern end of Front Field.

Tertiary roads are those that pass through and provide access to meadows and pasture land. These roads are not well defined (except by culvert locations).

The only formal pedestrian path within the Ranch connects the Development Zone with the ranch home via a pedestrian underpass. This path also connects to the Cottonwood Trail, which provides interpretative signage.

As mentioned earlier, the eastern railroad track remains as a significant circulation feature today, as the Burlington Northern Santa Fe Railroad utilizes this line. As the railroad corridor is elevated above the surrounding grade, the feature serves as a divider between the Warren Hereford Ranch, located to the east, and the Home Ranch Complex, located to the west.

Views and Vistas

Overall, the expansive views and wide-open spaces of Deer Lodge Valley play an important role in establishing the character of Grant-Kohrs Ranch. Flint Creek Range and the distant peaks of Mt. Powell and Deer Lodge Mountain provide a stunning backdrop to the rolling foothills below (see Photo 3-1). It is this range which contributes to the rugged feel and sense of isolation of the Ranch, and the snow-capped peaks of the highest mountains easily remind valley inhabitants of the harsh and unforgiving conditions characteristic of Montana winters.

The openness of the western hills and pastures also contrast vividly with the human-scaled buildings clusters, corrals, and fields that comprise the Home Ranch and Warren Hereford Ranch complexes. These hills also contrast with the flat river benches, rich colors, and fine textures aligning the Clark Fork River and provide the Ranch with a sense of enclosure. All these views are essential components of the open, rugged, and isolated character that defines the physical and cultural context of the Grant-Kohrs Ranch.

Views to the east of the Ranch are defined by the City of Deer Lodge, Business Loop 90, and the modern residential and commercial development located along it (see Photo 3-2). Hillcrest Cemetery to the south, where members of the family are buried, including Kohrs' young son, William, is also visible from many locations on the ranch.

The day to day cattle ranching operations which continue within the Ranch are visual reminders of the historic uses associated with this cultural landscape. Cattle and horses also activate the Ranch and add visual diversity, authenticity, and enrichment to the visitor experience (see Photo 3-3).

Buildings and Structures

The Grant-Kohrs Ranch NHS includes 94 extant structures that are located in two primary clusters: the Kohrs and Bielenberg Home Ranch and the Warren Herford Ranch (see Map 3-11). Most of the structures are directly related to either domestic life on the Ranch, or cattle ranching operations. They represent three distinct phases of development, reflecting the Grant era, Kohrs era, and Warren era.

Ranching related buildings and structures include barns, cow sheds, stock shelters, feed racks and bunkers, feed and hay storage sheds, scales, beef hoists, and squeeze chutes. Several structures are associated with the natural and constructed water features present on the ranch, and include a flume, bridges, and pump houses.

Many structures are related to both ranching operations and domestic daily life, such as the blacksmith shop, granary, dairy, ice house, buggy shed, garage, brooding house, chicken house, and bunkhouse. The Ranch House and the Warren House, as well as some other structures, such as privies, are associated most closely with domestic life. Several of these buildings are now used for interpretive and NPS administrative purposes, while others support contemporary ranching activities. Some buildings, such as the new curatorial storage building, are exclusively used for administrative purposes.

Individual buildings and structures will be further described within their corresponding component landscape areas.

Objects and Small-scale Features

Most of the objects and small-scale features within the Ranch relate to ranching operations, domestic life, or National Park Service interpretation. As stated in the CLI, "the landscape is not rich in pure ornament, but many of these small-scale features depict craftsmanship and proportion that make them more than purely functional. These elements reflect the lives of those who made this ranch their home."[33]

These features include, but are not limited to a variety of fence types, gates, retaining walls, fire hydrants, hose boxes, utility poles, old farm equipment, informational and directional signs, interpretive signs, historic railroad cattle cars, and water troughs.

Fences are the most predominant and character-defining small scale features on the ranch. As a working ranch raising a number of different kinds of animals (at least two separate breeds of cattle and three types of horses at any given time), the ranch has many small enclosures, corrals, or feedlots delineated by fences. Detailed descriptions of these fences, as well as other objects and small-scale features, are included within their corresponding component landscapes.

[33] Amphion, "Grant-Kohrs Ranch National Historic Site, Cultural Landscape Inventory (CLI)," Revised Draft (January 1997), 39.

Archeological & Missing Features

There have been eleven archeological surveys with the Grant-Kohrs Ranch since 1973. During the first study, conducted by Sharrock and Keyser, four prehistoric sites were recorded. All these sites were found to be surface manifestations and probably dated to the Late Prehistoric period. Since the 1973 inventory, 1600 acres have been added to the Ranch. Known sites within these additional acres include four prehistoric and 11 historic archeological sites.

A total of 21 components have been identified in the Grant Kohrs Ranch that can be categorized into seven site types:[34]

- Depression (one site)
- District (one site)
- Dump (nine sites)
- Homestead (one site)
- Mine (one site)
- Open (five sites)
- Unknown (three sites)

Based upon a 1989 survey (Hartley, et al), National Register status was reviewed for four sites. After testing, a determination of "not eligible" was made for three of the four sites identified; the fourth site remains unevaluated as it could not be relocated during the 1989 investigation.[35]

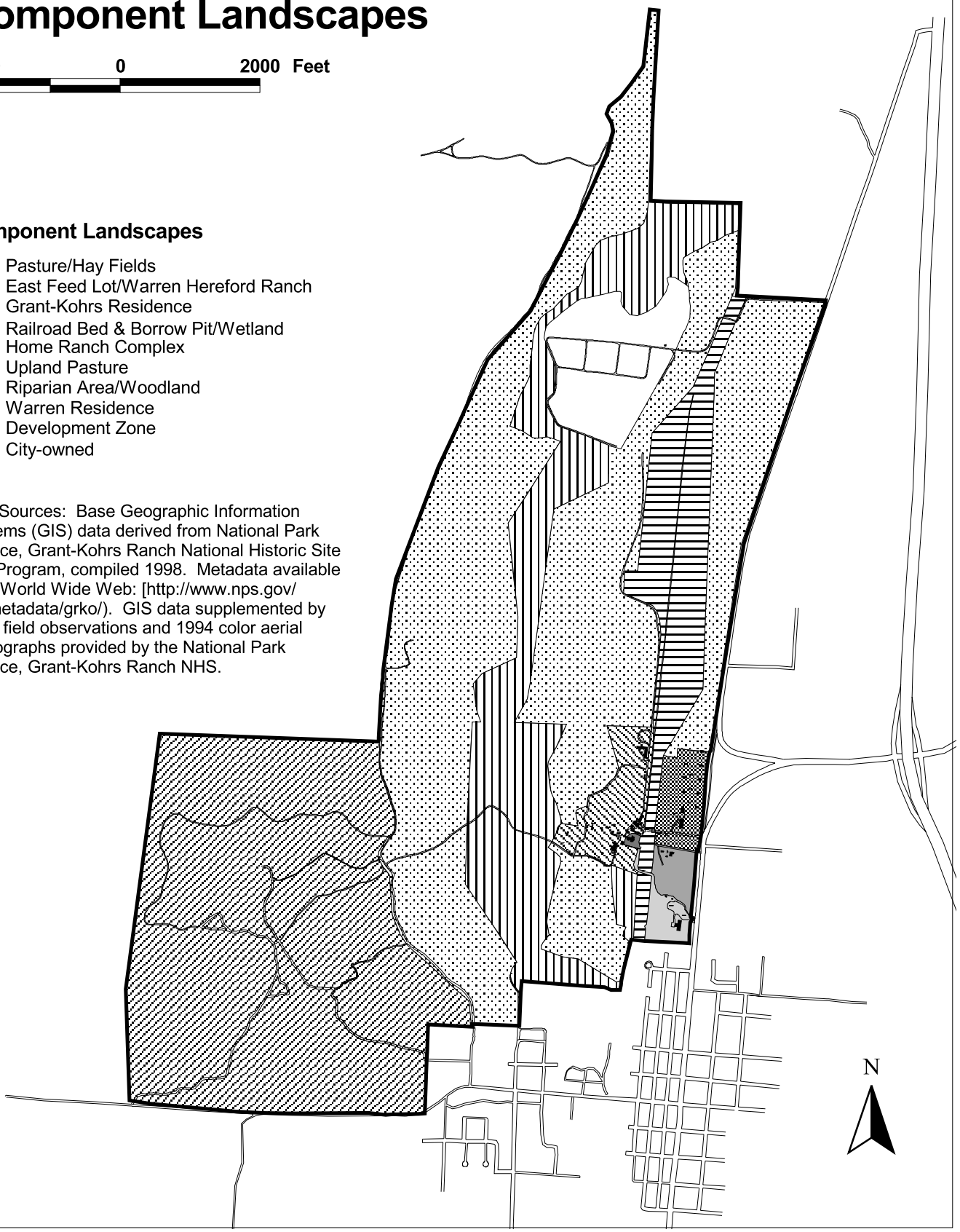
Between June 30 and July 23, 2003, a Class III cultural resource inventory was conducted in an approximately 1600-acre area of study within the Grant-Kohrs Ranch National Historical Site (24PW118). The inventory was conducted by The University of Montana, Department of Anthropology, for the National Park Service. During this inventory, four previously identified prehistoric sites and sixteen previously identified historic sites were revisited and their status updated, and eight previously unidentified historical sites and sixteen isolated historic and prehistoric artefacts and features were located and recorded.[36] Readers should refer to this report for more detailed information on archeological resources within the park. Due to the sensitive nature of these features, specific information regarding their location has been removed from this document.

Missing features are those that were once present on the ranch, but have since been removed, or which are no longer operational in their present form. These features are documented in more detail within each of the component landscapes.

[34] Amphion, 38.
[35] Amphion, 38.
[36] Garvey, S. Raven, Mark A. Carper, and Robert C. O'Boyle, *Grant-Kohrs Ranch National Historic Site: Cultural Resources Inventory* (Prepared by the University of Montana under the supervision of Dr. Thomas Foor and Dr. William Prentiss, December 2003).

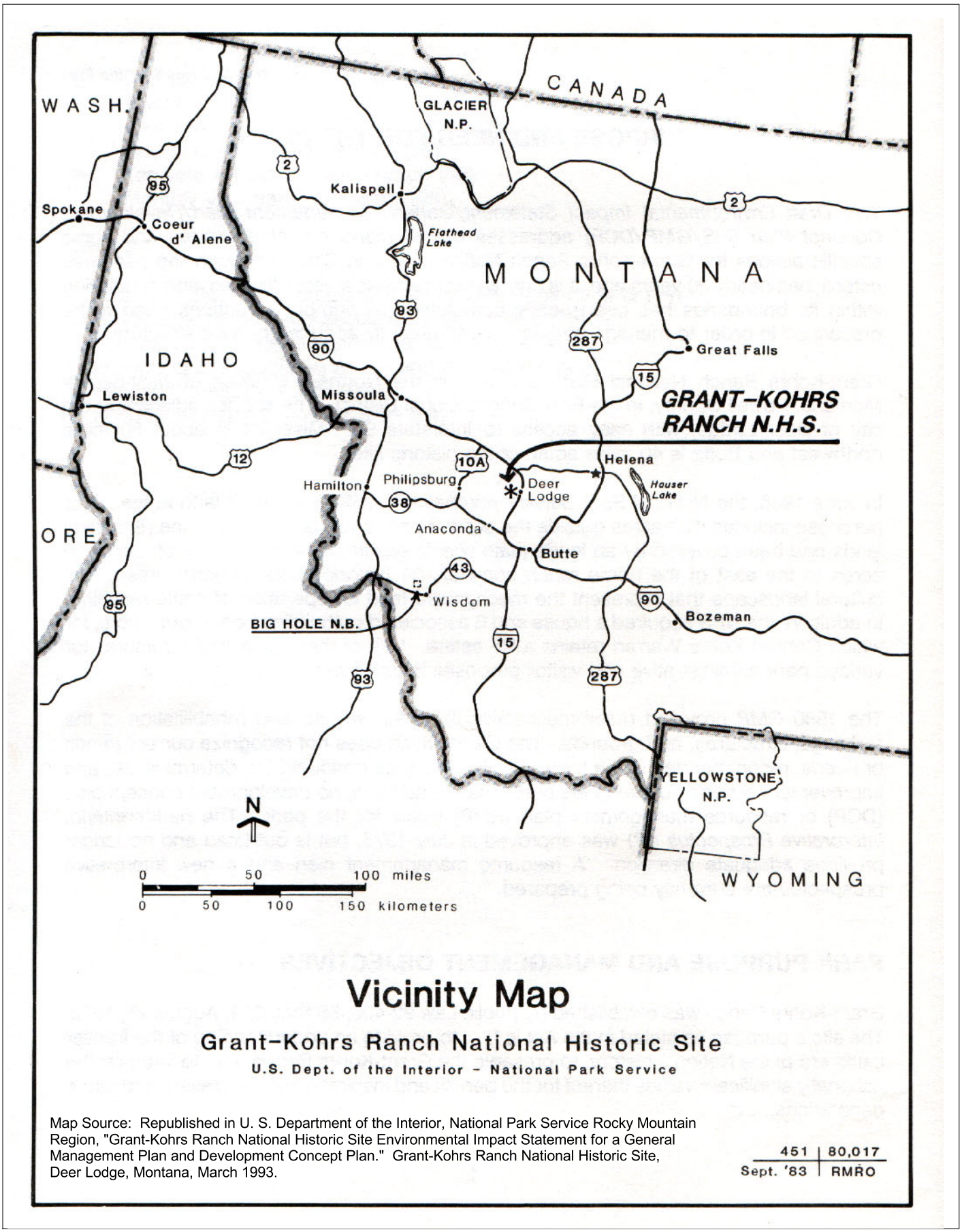
Grant-Kohrs Ranch NHS
Component Landscapes

2000 0 2000 Feet

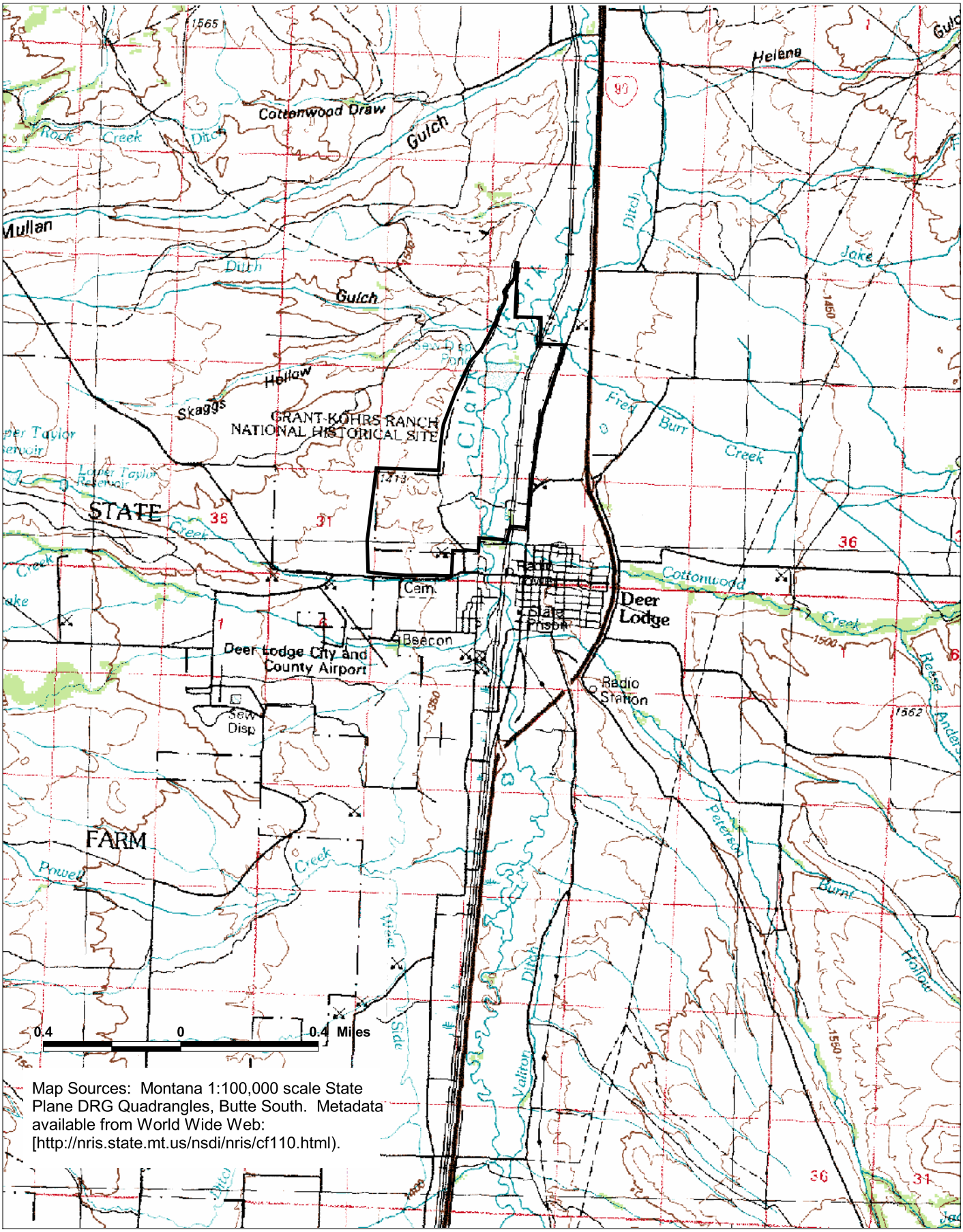


Map Sources: Base Geographic Information Systems (GIS) data derived from National Park Service, Grant-Kohrs Ranch National Historic Site GIS Program, compiled 1998. Metadata available from World Wide Web: [http://www.nps.gov/gis/metadata/grko/). GIS data supplemented by 2002 field observations and 1994 color aerial photographs provided by the National Park Service, Grant-Kohrs Ranch NHS.

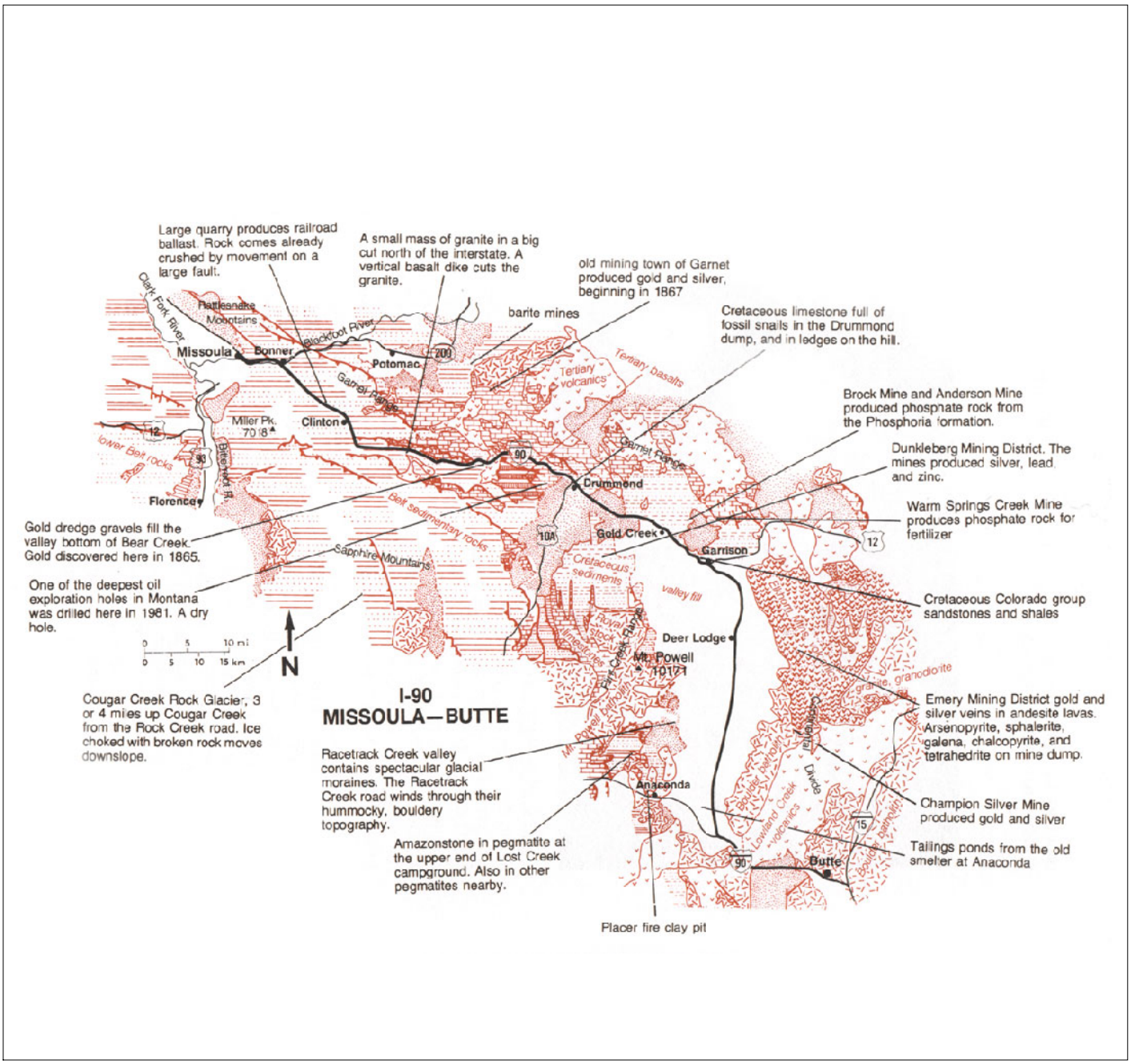
Map 3-1: Component Landscapes



Map 3-2: Vicinity Map



Map 3-3: Location Map



Map 3-4: Regional Geology

Map Source: David Alt and Donald W. Hyndman, Roadside Geology of Montana (Missoula: Mountain Press Publishing Company, 1986), 162.

Grant-Kohrs Ranch NHS
Soils

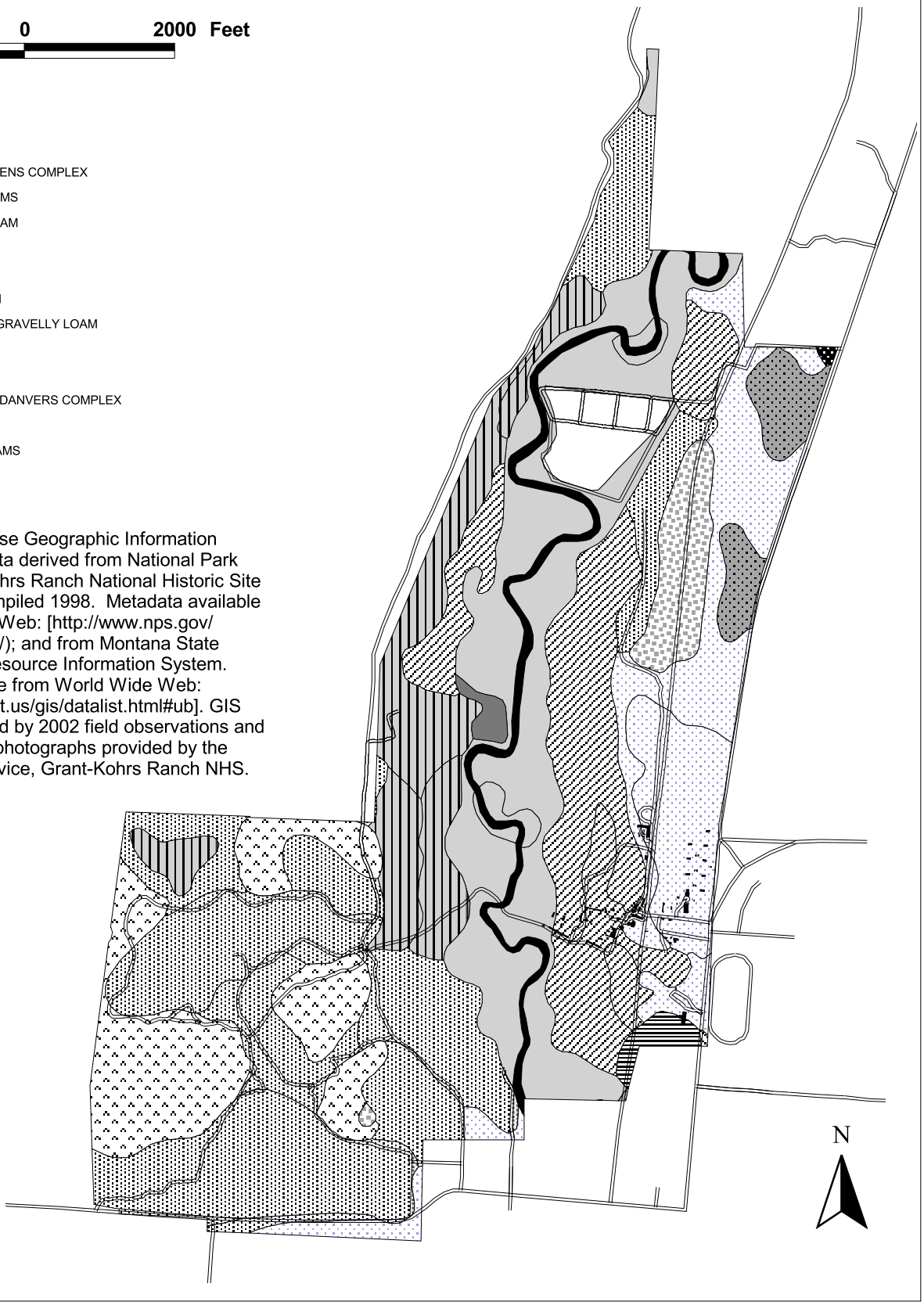
2000 0 2000 Feet

STRUCTURES
ROADS

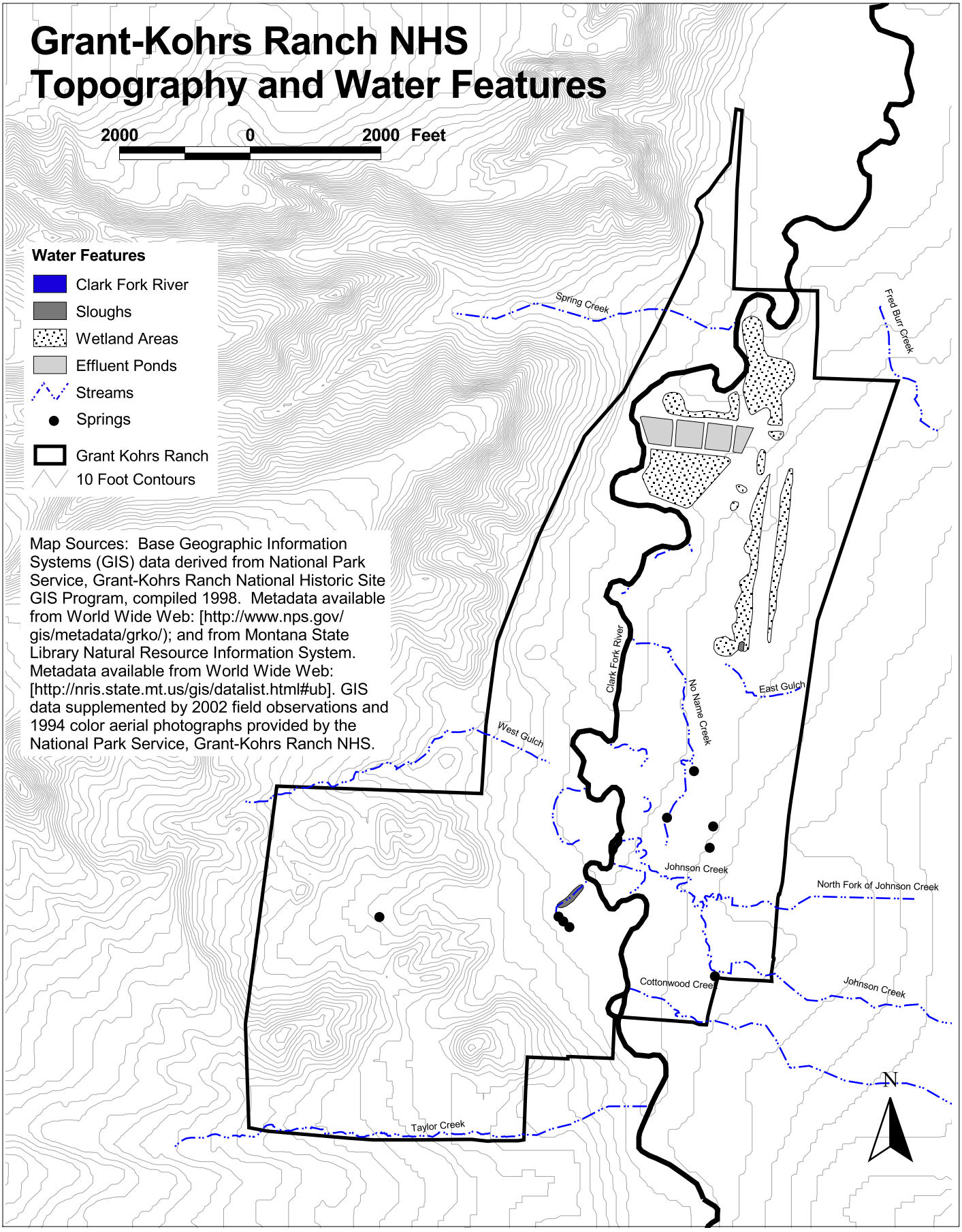
Soils

AQUENTS-SLICKENS COMPLEX
BEAVERELL LOAMS
BOHNLY SILT LOAM
CETRACK LOAM
CON LOAMs
GREGSON LOAM
KLEINSCHMIDT GRAVELLY LOAM
DISTURBED
GRAVELLY PITS
ROY-SHAWMUT-DANVERS COMPLEX
SAYPO LOAM
TETONVIEW LOAMS
VARNEY LOAMS
WATER

Map Sources: Base Geographic Information Systems (GIS) data derived from National Park Service, Grant-Kohrs Ranch National Historic Site GIS Program, compiled 1998. Metadata available from World Wide Web: [http://www.nps.gov/gis/metadata/grko/); and from Montana State Library Natural Resource Information System. Metadata available from World Wide Web: [http://nris.state.mt.us/gis/datalist.html#ub]. GIS data supplemented by 2002 field observations and 1994 color aerial photographs provided by the National Park Service, Grant-Kohrs Ranch NHS.



Map 3-5: Soils



Map 3-6: Topography and Water Features

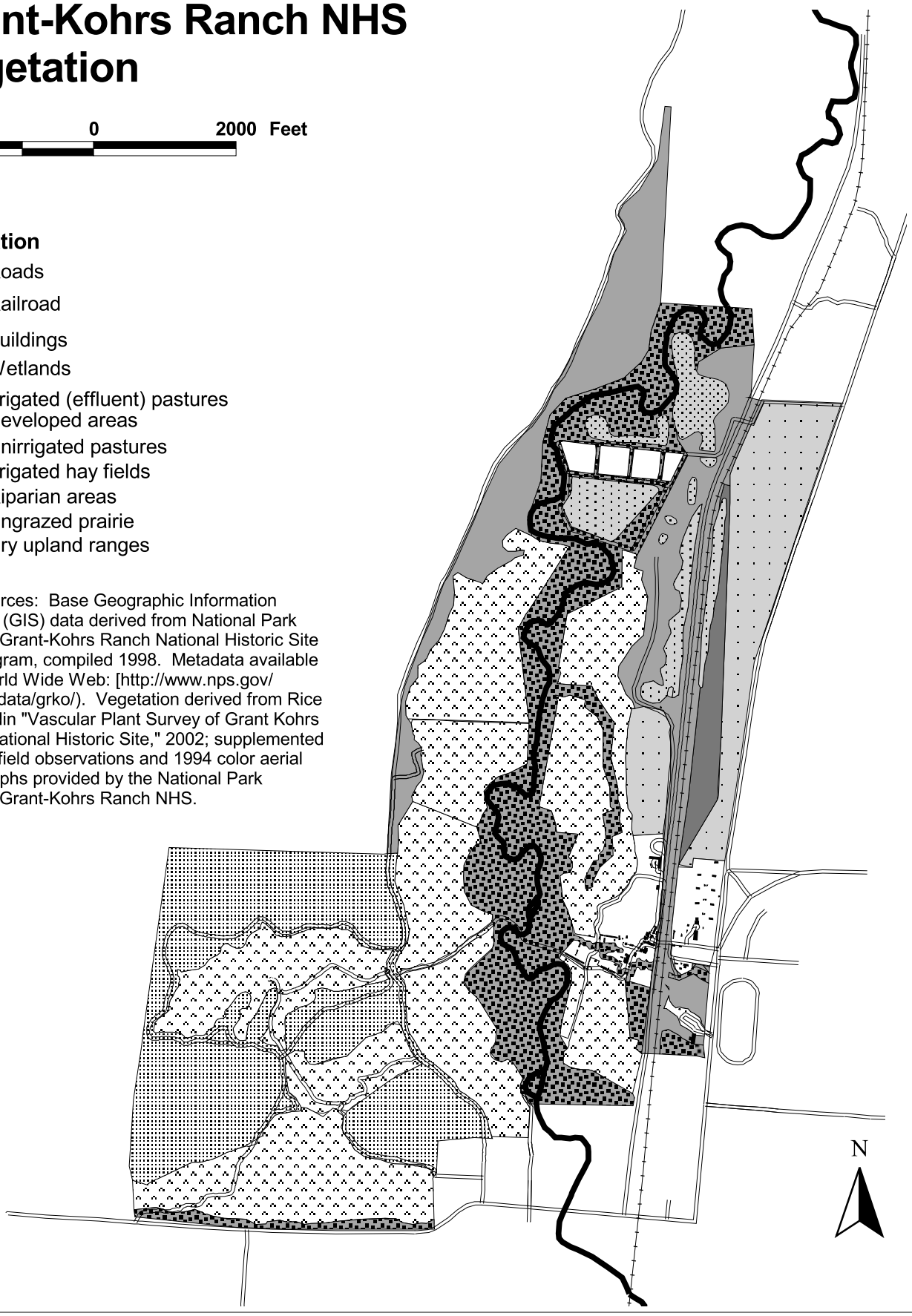
Grant-Kohrs Ranch NHS
Vegetation

2000 0 2000 Feet

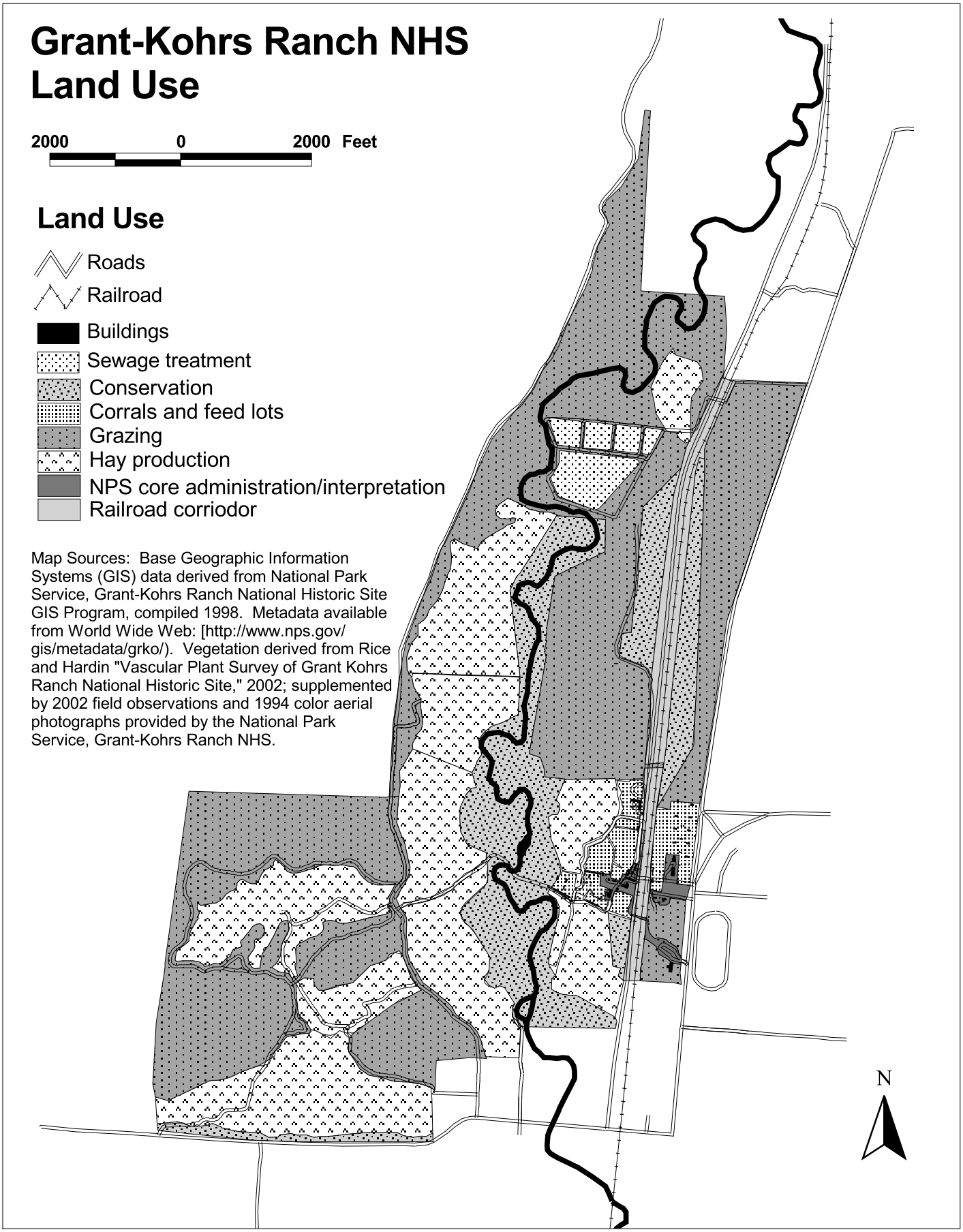
Vegetation

- Roads
- Railroad
- Buildings
- Wetlands
- Irrigated (effluent) pastures
- Developed areas
- Unirrigated pastures
- Irrigated hay fields
- Riparian areas
- Ungrazed prairie
- Dry upland ranges

Map Sources: Base Geographic Information Systems (GIS) data derived from National Park Service, Grant-Kohrs Ranch National Historic Site GIS Program, compiled 1998. Metadata available from World Wide Web: [http://www.nps.gov/gis/metadata/grko/). Vegetation derived from Rice and Hardin "Vascular Plant Survey of Grant Kohrs Ranch National Historic Site," 2002; supplemented by 2002 field observations and 1994 color aerial photographs provided by the National Park Service, Grant-Kohrs Ranch NHS.



Map 3-7: Vegetation



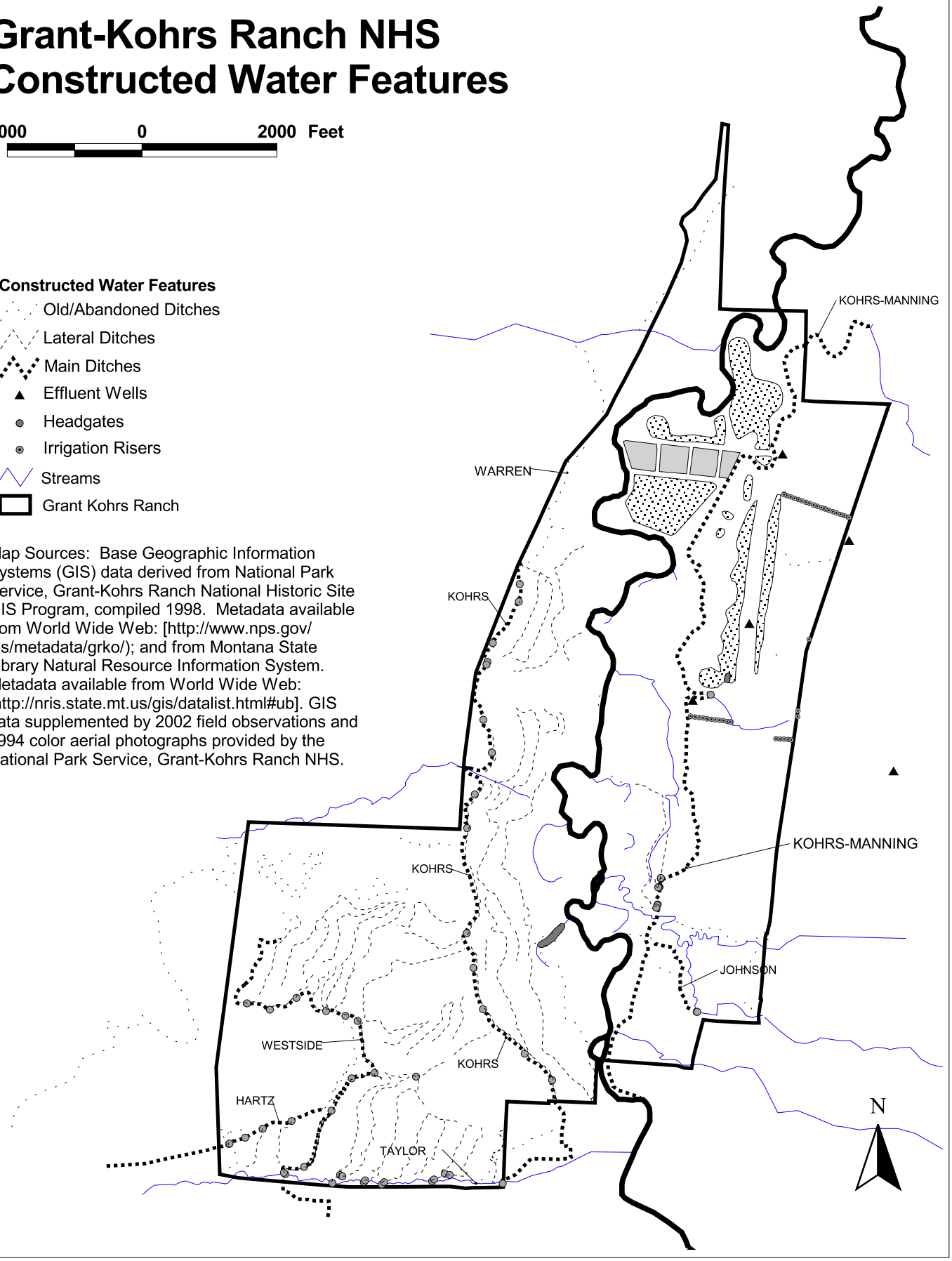
Map 3-8: Land Use

Grant-Kohrs Ranch NHS
Constructed Water Features

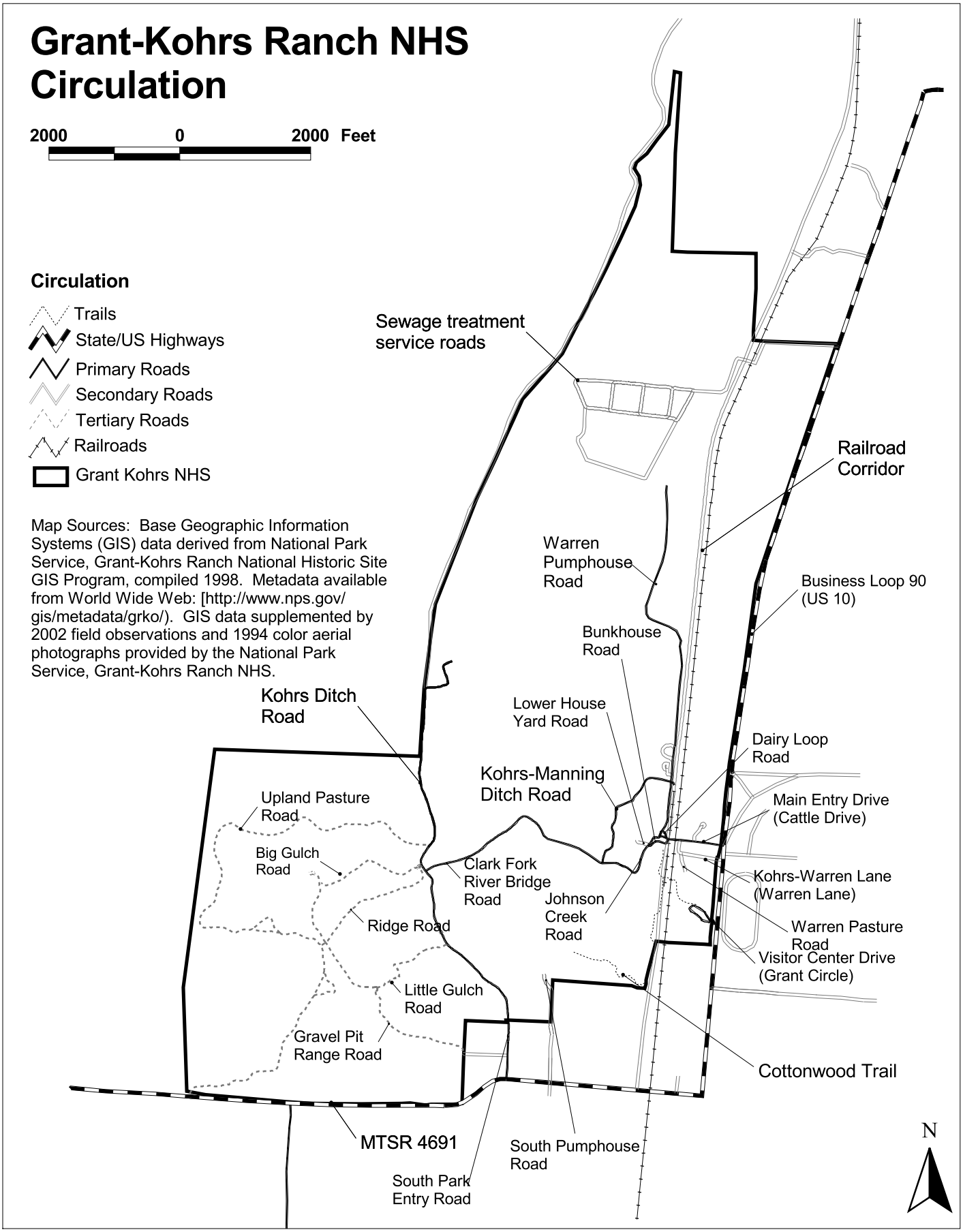
2000 0 2000 Feet

Constructed Water Features
- Old/Abandoned Ditches
- Lateral Ditches
- Main Ditches
- Effluent Wells
- Headgates
- Irrigation Risers
- Streams
- Grant Kohrs Ranch

Map Sources: Base Geographic Information Systems (GIS) data derived from National Park Service, Grant-Kohrs Ranch National Historic Site GIS Program, compiled 1998. Metadata available from World Wide Web: [http://www.nps.gov/gis/metadata/grko/); and from Montana State Library Natural Resource Information System. Metadata available from World Wide Web: [http://nris.state.mt.us/gis/datalist.html#ub]. GIS data supplemented by 2002 field observations and 1994 color aerial photographs provided by the National Park Service, Grant-Kohrs Ranch NHS.



Map 3-9: Constructed Water Features



Map 3-10: Circulation

JMA, October 2002

Photo 3-1 : (Z-23) Flint Creek Range and the distant peaks of Mt. Powell and Deerlodge Mountain provide a stunning backdrop to the rolling foothills below.

JMA, October 2002

Photo 3-2 : (RA-01) Views to the east of the Ranch are defined by the City of Deer Lodge, Business Loop 90, and the modern residential and commercial development located along it.

JMA, October 2002

Photo 3-3 : (U-09) . Cattle and horses also activate the Ranch, adding visual diversity, authenticity, and enrichment to the visitor experience.