

SNAPSHOT ATLAS

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Project Overview

FACTS AT A GLANCE

The Belvoir Ranch Master Plan provides a comprehensive vision which will ultimately result in a framework plan, implementation approach and management strategy for the property. As the City of Cheyenne Parks and Recreation Master Plan points out, Belvoir Ranch is likely to become a Regional Open Space adding significant value to the community.

Planning efforts will focus on open space, recreation and natural values, specific development goals and resource management, and long-range planning implications for the community, while accounting for the various municipal needs that triggered its purchase: water, development and landfill siting.

Emphasis is placed on making this a community driven process to identify and develop the vision and character of the property as we plan for the future and focus on the goals of quality and authenticity.

PLAN PHASES

The final plan will be a component of PlanCheyenne, and the project follows PlanCheyenne's four phases: snapshot, structure, shape, and build:

Snapshot involves collecting, assembling and analyzing relevant background data; assessment of existing conditions; and assessment of project needs, opportunities and constraints to "atlas" the project area and guide development of the master plan. From this effort, we are able to determine the extent to which the Belvoir Ranch can serve the community.

Structure involves development of the vision and preferred character for the site in a multi-day charette workshop, incorporating components introduced in PlanCheyenne. This plan builds upon the initial vision for Belvoir Ranch.

VISION

Belvoir Ranch is a unique and significant piece of Cheyenne's rich cultural heritage and regional open space system. To be responsible stewards of the land, City of Cheyenne and the Board of Public Utilities are seeking to manage it as a sustainable "working landscape" that contributes to the area's economy and its quality of life. The Ranch shall be managed as a community asset and legacy, balancing uses and resources in such a way as to sustain its unique landscape character and heritage, for generations to come.



Overlooking Lone Tree Creek on Belvoir Ranch, Rocky Mountain National Park is in the background.



Cattle Grazing on Belvoir Ranch.

PLAN PHASES (CONT.)

Shape will result in Alternative Land Use Plans for the entire project area incorporating the vision and priorities. The Shape phase of planning affords the community with an analysis of design elements, identified in the Structure phase of planning, critical to improving Cheyenne's quality of life. From the Alternative Land Use Plan discussions, a Preferred Land Use Plan, Policies and planning document will be developed to guide the future direction and development of the project property. The policies developed and adopted will assist with decision-making to support and further the community's vision for the property and their community.

Build will result in Final Master Plan Documents. The build phase will be the identification and development of implementation strategies, tools and action steps to carry out the community's selected direction of the Preferred Land Use Plan.



Overlooking the Big Hole.



Atlas Missile Silos on Belvoir Ranch.



Remnants of historic homesteads along Lone Tree Creek on Belvoir Ranch.

CONTACT:

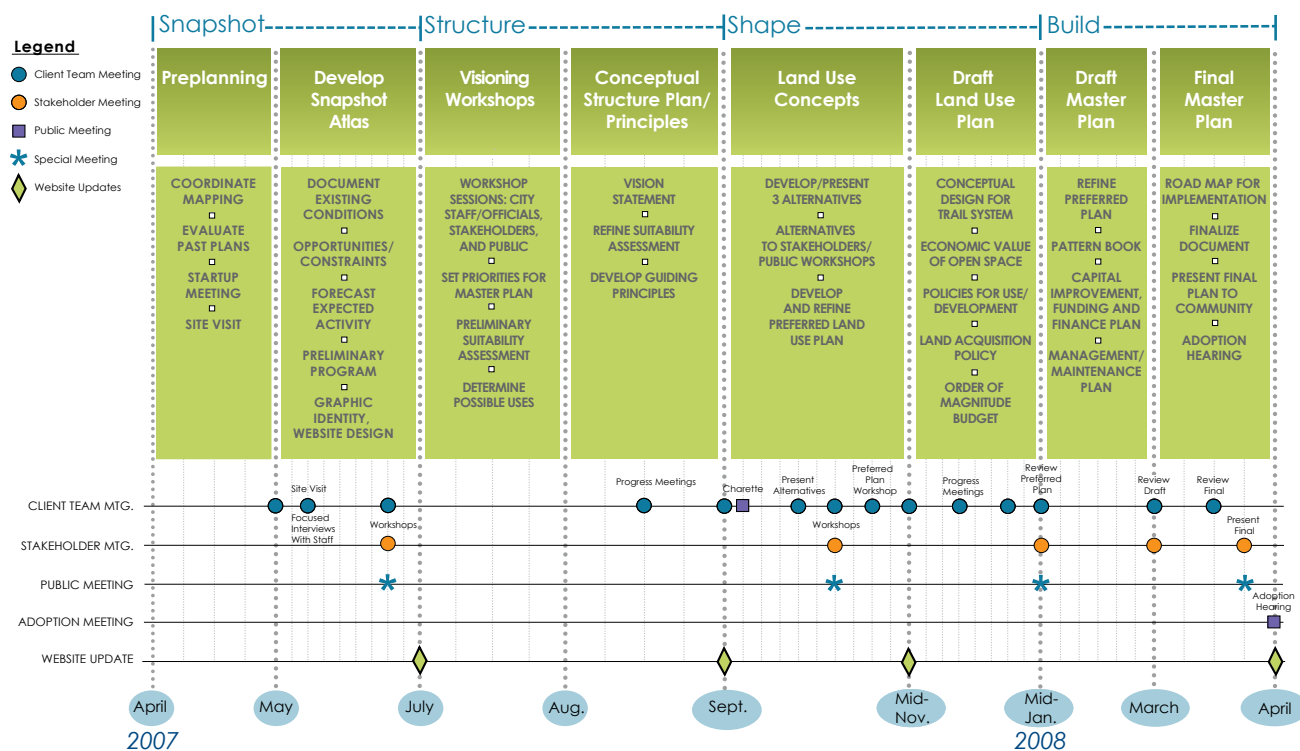
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www.belvoirranch.org

Timeline

PROJECT PROCESS



Legend

-  Client Team Meeting
-  Stakeholder Meeting
-  Public Meeting
-  Special Meeting
-  Website Updates

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Ranch Purchase

OVERVIEW

The area referred to as Belvoir Ranch contains two properties – the historic Belvoir Ranch, and The Big Hole. Together, these areas consist of 18,800 deeded acres and 3,400 acres of land leased from the State of Wyoming. The two properties are currently being studied for their potential to provide water resources, economic benefits, and recreational uses for the City of Cheyenne. The planning process will consider many uses for Belvoir, including wind energy, continued cattle grazing, different types of recreation, and interpretation of the Ranch's history.

BELVOIR RANCH

- The Ranch was purchased by the City of Cheyenne in 2003 as a cooperative effort between the City of Cheyenne's Board of Public Utilities and the City Public Works Landfill Fund.
- The City paid \$5.9 million for over 17,000 deeded acres along with rights to 3,400 acres of land leased from the State of Wyoming.
- Stewardship partners on this purchase include the Laramie County Conservation District and the National Resource Conservation Service.
- Initial uses identified for the site were municipal water resource development, a 640 acre municipal landfill, and recreation activities.

BIG HOLE

- This land was acquired in 2005 for \$525,000 as part of a multi-state open space initiative. It was purchased from The Nature Conservancy, which now holds a conservation easement on the property – one of the first created in the State of Wyoming under new 2005 legislation.
- The Big Hole consists of an 1,800 acre parcel south of Belvoir Ranch and includes 1,000 acres of rim pasture and 800 acres of spectacular canyon scenery at the Wyoming/Colorado border.
- It is part of the regional area identified as the Laramie Foothills/Mountain to Plains Project which is sponsored by Larimer County, the City of Fort Collins, The Nature Conservancy and the Legacy Land Trust. This effort will protect 55,400 acres north of Fort Collins, creating a mountain to plains conservation zone of approximately 140,000 acres.
- The area is home to nesting golden eagles, red-tailed hawks, prairie falcons, mountain lions, black-tailed prairie dogs, elk, antelope and mule-deer.
- The property will most likely remain natural, allowing passive recreational opportunities while protecting fragile ecosystems.
- Management of The Big Hole will happen through a joint management program with Larimer County, Colorado, and The Nature Conservancy.



Belvoir Ranch provides opportunities for municipal water development, a landfill site, city revenue and recreation.

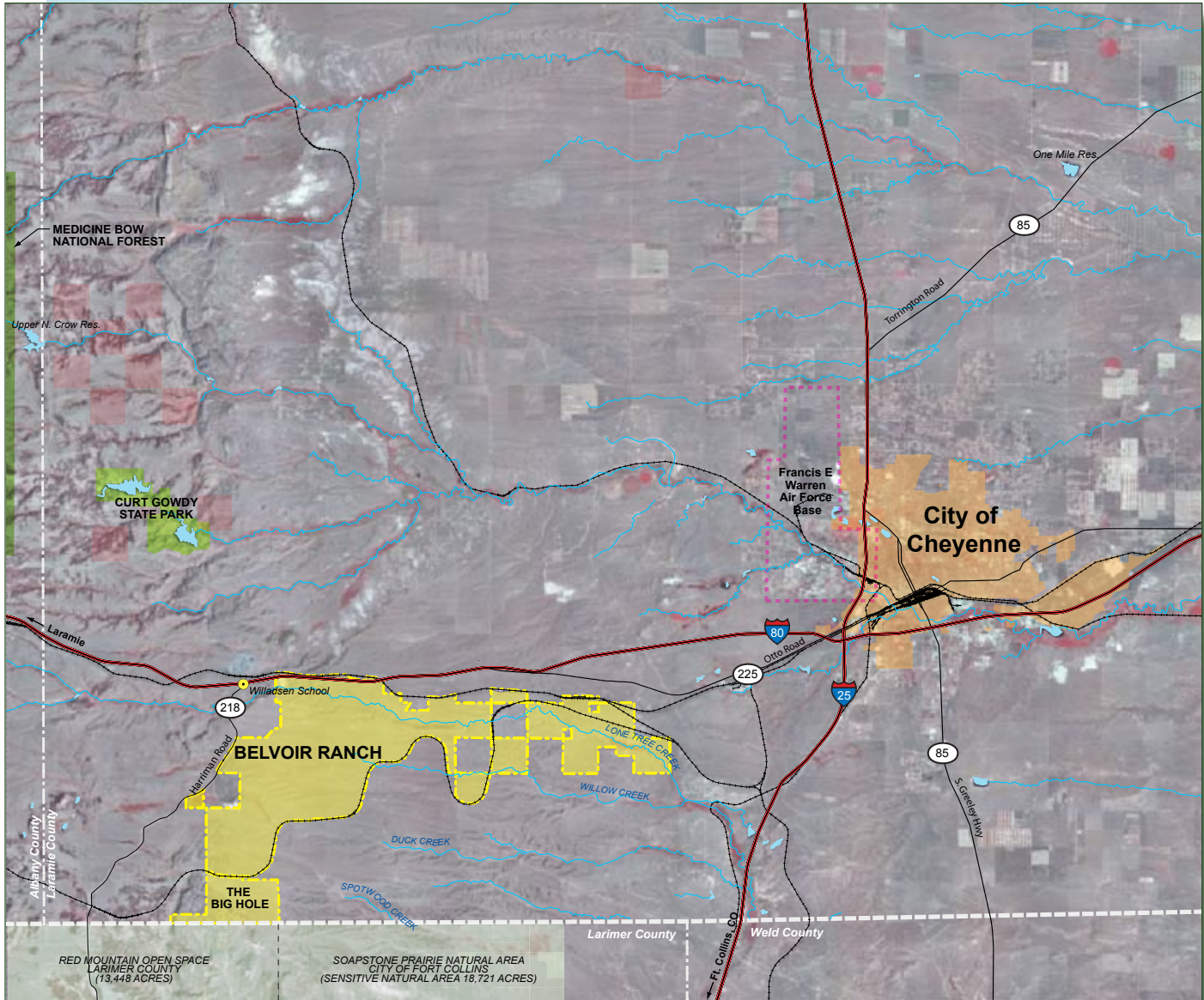


The Big Hole creates continuous open space and potential trail access to Colorado.

TRENDS AND KEY ISSUES

- ✦ A 2005 community survey showed that over 60% of Cheyenne residents would like recreation facilities at Belvoir.
- ✦ The Ranch's history is strongly tied to Cheyenne's history, and has remnants of historic railroad uses, homesteads, and missile silo sites.
- ✦ Belvoir currently covers its management expenses by producing revenue from cattle grazing.

Project Locator Map



History Of The Land

PREHISTORY

Signs of human habitation and use are found throughout the Belvoir Ranch and The Big Hole, as the area was used by both prehistoric and modern peoples. The area surrounding Belvoir Ranch has been used by people since at least 11,000 before current era (BCE). From that time to about 7,000 BCE, the area was known and used by Paleo-Indians. The world-famous Lindenmeier prehistoric site lies just a few miles to the south of the Ranch in Colorado. There are other known prehistoric sites to the west of the Ranch near the railroad station referred to as Harriman, just west and south, and again in Colorado. After the last Ice Age, Utes, Shoshoni, Northern Arapahoe, Northern Cheyenne, and Lakota people used the area around Belvoir as a natural corridor into the mountains west of the Ranch. These peoples maintained summer and winter camps, conducted year-round hunting, and used the land for their spiritual needs.

HOMESTEADING

The Homestead Act of 1862 was passed by the U.S. Congress to provide for the transfer of a quarter-section (160 acres) of free public land to homesteaders. The land belonged to the homesteader at the end of five years if they lived there, built a house, dug a well, plowed ground, and fenced the land.

The area currently referred to as the Belvoir Ranch has evolved over the past approximately 140 years from several smaller homesteads (primarily in the western portion of the Ranch), land once owned by the Union Pacific Railroad (part of their original Patent Grants received when building the Transcontinental Railroad), land leased from the State of Wyoming (just a little over three and a half Sections) and part of the vast holding of the former Warren Livestock Company.

Due to his success in the cattle ranching industry, Francis E. Warren, became a key figure in Cheyenne's history. Several other land owners who originally homesteaded Ranch properties include: Alex Duffey (1885), William Williams (1885), Thomas McGee (1890's), Ora Haley (1910; Haley was the previous owner of approximately 8 Sections), the Neilson Brothers, A.H. Willadsen, Gilchrest, John Bickhold, Hans Wright, and James Hunt. Several of these families still hold land near the Ranch.

THE TRANSCONTINENTAL RAILROAD

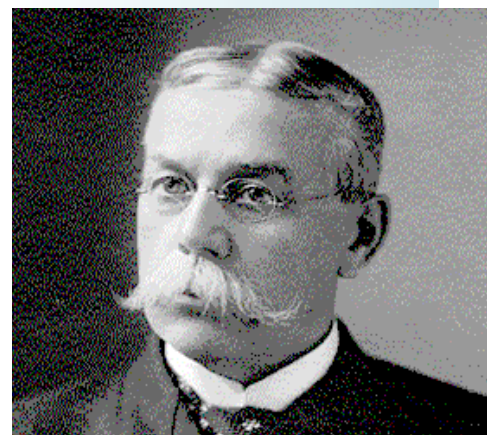
Passage of The Railroad Act in 1862 signified government support for a transcontinental railroad and helped create the Union Pacific Railroad. The route was built in the 1860's to link the railway network of the Eastern United States with California. It was completed on May 10, 1869, and the famous "golden spike" event officially joined the Central Pacific and Union Pacific railroads at Promontory Summit, Utah. The Transcontinental Railroad created a modern, nation-wide transportation network that revolutionized the population and



Remnants of a historic homestead near Williams pasture.



Union Pacific Railroad track laying in Wyoming (photo: Wyoming Tales and Trails.com)



Francis E. Warren (photo: Wyoming State Historic Preservation Office)

TRENDS AND KEY ISSUES

- ★ Missile silos on the Ranch present an opportunity to interpret Cold War history.
- ★ The western side of Belvoir Ranch has several areas in need of surveying for American Indian cultural artifacts.
- ★ Although many homestead sites have been looted, they still provide traces of early settlers.
- ★ The Twin Mountain Wagon Road can still be followed through the Ranch.
- ★ An early railroad pumphouse and other water infrastructure are still existing as remnants of early UPRR history.



Lincoln Highway / I-80

TRANSCONTINENTAL RAILROAD (CONT.)

economy of the American West, making the wagon trains of previous decades obsolete.

As the Union Pacific Railroad crossed the Wyoming Territory, surveyors moved ahead of the line, dividing prospective towns into lots, which in turn were sold to emigrants carried west by the railroad. On July 4, 1867, the railroad's chief engineer, General Grenville M. Dodge, selected a location that would become a division point for the Union Pacific and named it Cheyenne.

By year's end, the new city housed thousands of people and Native American attacks on the new railroad were prevalent. To solve the problem, the Military established forts to protect the railroad and its workers. Wyoming became home to Ft. Russell, Ft. Sanders, Ft. Fred Steele, Ft. Rawlins and Ft. Bridger. Of those forts, only D. A. Russell outside of Cheyenne became permanent, and today is known as F.E. Warren Air Force Base.

Development of the West was greatly influenced by the railroad. Towns such as Cheyenne were needed to provide hotels and eating houses for railroad workers and passengers. Military forts were needed to offer protection and a variety of infrastructure, including roundhouses, windmills and water tanks – required for the steam-powered locomotives. Cheyenne became the meeting place for the large ranchers and their Wyoming Stock Growers Association due to being the seat of the stockyards where cattle were loaded on to the UPRR. At the northern edge of the Belvoir Ranch, Borie, Emkay, Otto and Granite Canon stations offered the infrastructure needed for westward expansion.

LINCOLN HIGHWAY

Early homesteaders arrived by wagon, with the Twin Mountain Wagon Road running the entire length of Belvoir Ranch from east to west. However, the landscape began to change with the introduction of the automobile in the early 1900's.

In 1916, the Lincoln Highway was conceived as America's first transcontinental highway for automobile travel. The route extended from San Francisco to New York, connecting Cheyenne, Corlett Station, Borie Station, Otto Station and Granite Canon as it skirted the Belvoir Ranch properties. The route was not a nationally-funded highway, but instead, was a collection of locally funded and maintained roads put together as a single route marked as the Lincoln Highway.

The Lincoln Highway later became U.S. 30 and today represents much of the route of Interstate 80. In 1926, U.S. 30 extended between Granger, WY and Philadelphia, PA and followed the historic Lincoln Highway for its entire route through Wyoming. Between 1926 and 1972, U.S. 30 had a split route in southwestern Wyoming allowing U.S. 30 to serve northern Utah and southern Idaho. The northern route of U.S. 30 followed modern-day Interstate 86 east from Rupert to American Falls and Pocatello. U.S. 30 decreased in importance with emerging plans for Interstate 80 and the 1956 passage of the Interstate Highway System Act.

KEY FACTS FOR BELVOIR

- Construction of the Wyoming segment of I-80 along the Lincoln Highway route began in November of 1962 and the connection with I-30 was completed in the spring of 1977.
- Ranching history of Belvoir Ranch began in the early 1860's with the Ranch having played host to several early homesteads.
- The Warren Livestock Company was only one of the many holdings of Francis E. Warren, Territorial Governor, brief First State Governor, and U.S. Senator until his death in 1929. The company was founded in 1874. In 1905, then Captain John (Blackjack) Pershing married one of Warren's daughters while he was stationed at Fort D. A. Russell and Warren is said to have given his "Cabin on the Ranch" to his daughter and new son-in-law. This was later to become the Belvoir Ranch House. The area came equipped with fine stables, a horse race track, tennis courts, and the like.
- The name Belvoir is thought to have originated from the Civil War post Fort Belvoir, Virginia, where Warren, who earned a Congressional Medal of Honor, may have been posted. Alternatively, Warren may have taken the name from Belvoir Gardens dating to the Revolutionary War. Belvoir translates as 'good view' in French.
- Warren's headquarters—also known as the "Cabin on the Ranch"—was roughly located at the site of the current Belvoir Ranch headquarters area. It included tennis courts and a horse racetrack.
- During the Cold War, the Air Force constructed several Atlas Missile silos on Belvoir Ranch. These were abandoned several years later, their equipment sold for scrap and the land reverted to its original owners.
- The UPRR used land within the Ranch for steam train service facilities. These trains only held enough water to travel from 10 to 14 miles, so the Borie area had a water tower and UPRR built water supply infrastructure along Lonetree Creek.
- Transportation-wise, the Ranch also held the Twin Mountain Wagon Road which provided a corridor from Camp Carlin to Ft. Sanders - a military camp west of Belvoir Ranch.
- The Twin Mountain Wagon Road continued to Laramie and was used by stagecoaches as well as mule-driven supply wagons. There are two building foundations on the northern side of the Ranch that might have been used for stagecoach or mule-team stops.
- Belvoir Ranch has been sold several times throughout its history but has remained in private control since the early patent grants dating from 1867. Several families that have owned parts of Belvoir over the years still hold land near the Ranch.



"Cabin on the Ranch"



Ruins of Union Pacific Railroad water pump station.



Historic Homestead remnants including windrow of willows.



Twin Mountain Wagon Road looking west.



Historic Union Pacific Railroad Reservoir used for refilling steam engines.



Abandoned missile silos on Belvoir.

KEY DATES AT BELVOIR

- 1862 Homestead Act Passed and Settlers move into area
- 1867 Union Pacific Railroad (UPRR) constructed on northern side of Belvoir Ranch
- 1867 Fort D.A. Russel built to protect UPRR; Twin Mountain Wagon Road in use
- 1867 Camp Carlin built to supply forts and treaty goods
- 1874 Warren Livestock Company formed
- 1890 Camp Carlin abandoned
- 1890's Warren builds "Cabin on the Ranch"
- 1930's Twin Mountain Wagon Road abandoned
- 1930's "Cabin on the Ranch" burns down
- 1954 UPRR builds three-track on southern boundary of Belvoir Ranch
- 1958 Atlas Missile Silos constructed
- 1964 Missile Silos abandoned for newer Minuteman Missile Technology
- 2003 City of Cheyenne Purchases Belvoir Ranch
- 2005 City of Cheyenne Purchases The Big Hole

Regional Ecology

GENERAL HABITAT DESCRIPTION

The dominant habitat type on the Belvoir Ranch is mixed-grass prairie, which composes 86% of the Ranch. Other habitat types present include mountain mahogany (8.7%), irrigated hay fields (2.9%), ponderosa pine (2.5%), and Wyoming big sagebrush (0.09%).

From a landscape perspective, habitat associations on the Belvoir are not unique to the surrounding area. Most of the area between Cheyenne and the Laramie Range, and south to the Colorado border, is short grass prairie, as is the Belvoir (see map below). Mountain mahogany communities on the north side of the Belvoir represent the southern extension of a large tract of this habitat type north of I-80.

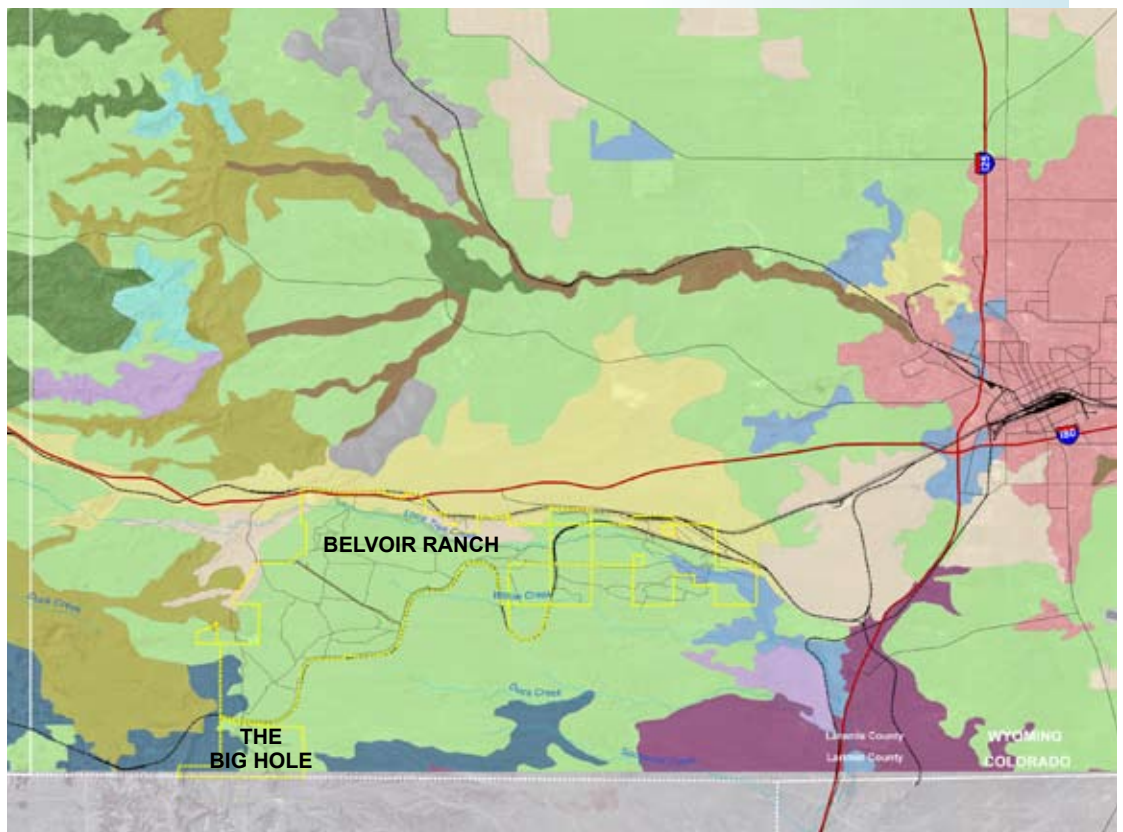
The small area of big sagebrush on the west side of the Belvoir is part of a large band of this habitat type that runs along the east flank of the Laramie Range. The ponderosa pine community in the southwest portion of the Belvoir is an extension of large tracts of this habitat type in Colorado. From a landscape perspective, the most limited habitat type in the region is irrigated hay meadow.



The irrigated hay meadow on the east side of Belvoir Ranch is the most limited habitat type in the region.

Belvoir Ranch Existing Conditions Landuse/Landcover

- Ranch Boundaries
 - Interstate Highway
 - Major Road
 - 2-Track Road
 - Major Creeks
 - Railroads
 - Existing Pipeline
- #### WY GAP Analysis (1996)
- Mixed grass prairie
 - Dry-land crops
 - Xeric upland shrub
 - Irrigated crops
 - Basin exposed rock/soil
 - Wyoming big sagebrush
 - Human settlements
 - Lodgepole pine
 - Short grass prairie
 - Ponderosa pine
 - Forest-dominated riparian
 - Limber pine and woodland
 - Mesic upland shrub



Primary landcover types in the region around the Belvoir Ranch, based on Wyoming GAP Analysis (1996).



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Ranch's Ecology

GENERAL HABITAT DESCRIPTION

The dominant habitat type on the Belvoir Ranch is mixed-grass prairie, which composes 15,727 acres, or 86% of the Ranch. Other habitat types present include xeric shrubs such as mountain mahogany (1,601 acres; 8.7%), irrigated hay fields (537 acres; 2.9%), ponderosa pine (453 acres; 2.5%), and Wyoming big sagebrush (16 acres; 0.09%) (see map on page 14). The Wyoming Gap Analysis project (Wyoming GAP) analyzes the current status of biodiversity within Wyoming, giving land managers and policy makers the tools they need to make better-informed decisions when identifying priority areas for conservation. Wyoming GAP analysis classifies 850 acres of the Belvoir as dry-land crops, however, there are no crops on the Ranch and this area is grassland. Small acreages of riparian areas and wetlands occur, mostly in association with Lone Tree Creek and other streams on the Ranch. The Big Hole is composed of approximately 76% mixed-grass prairie and 24% ponderosa pine (see map on page 14). All major habitat associations on the Belvoir Ranch and Big Hole are common in the region and none are considered unique or sensitive.

RIPARIAN AREAS

Lone Tree, Goose, Willow, Spottlewold, Spotwood, Duck, and Corlett Creeks all flow through the Ranch and feed a few small reservoirs. All of these streams are ephemeral or intermittent, although Lone Tree Creek apparently has flowing water longer than the other streams, due possibly to enhanced flows through pumped groundwater. Riparian vegetation is most developed along Lone Tree Creek and this is the best riparian habitat on the Ranch. Dominant overstory species along Lone Tree Creek include plains cottonwood, narrowleaf cottonwood, sandbar willow, and yellow willow. Other shrubs include snowberry, mountain maple, mountain alder, Wood's rose, currant, and gooseberry. A wide variety of forbs and grasses occur in the riparian corridor. A plant inventory conducted along portions of Lone Tree Creek as part of a survey for Ute ladies'-tresses orchid and Colorado butterfly plant detected 63 species of plants (Johnson 2004). Riparian areas are not as well developed along other streams on the Ranch which generally lack a tree and shrub layer. For example, plant inventories detected 30 species along Goose Creek and only 12 species along Duck Creek, far fewer than occur along Lone Tree Creek.

Riparian areas generally compose less than 5% of the landscape in the arid West but provide habitat for 80% of the birds that live there. Riparian areas are also important habitats for a host of other wildlife and care should be taken to minimize any impacts, especially along Lone Tree Creek's riparian areas. If new road crossings are constructed across any streams in the project area, a permit from the U.S. Army Corps of Engineers will be required. In addition, new road crossings or other impacts to vegetation along Lone Tree Creek would likely require pre-construction surveys for Preble's meadow jumping mouse, Ute ladies'-tresses orchid, and Colorado butterfly plant.



Belvoir Ranch's dominant habitat is mixed-grass prairie.



Lone cottonwood along an intermittent stream bed.



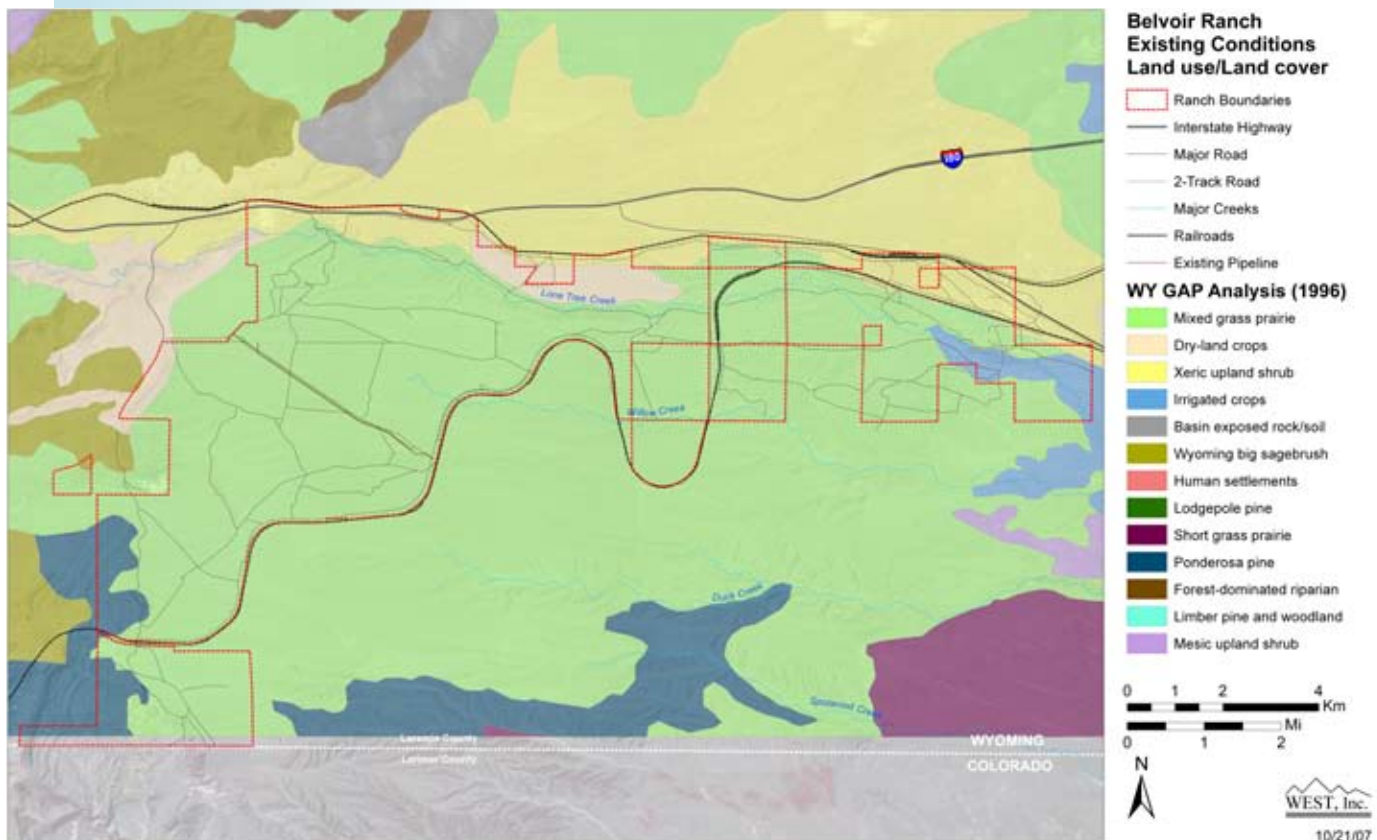
Impacts to wetlands along Lone Tree Creek should be avoided.

TRENDS AND KEY ISSUES

- ✦ Dominant habitat type is mixed-grass prairie.
- ✦ Riparian and wetlands areas provide important bird and wildlife habitat.
- ✦ Intermittent creeks flowing through Belvoir Ranch feed small reservoirs.
- ✦ Lone Tree Creek is the Ranch's best riparian habitat.

WETLANDS

No detailed wetland data is currently available for the Ranch and wetlands have not been mapped at this time. In general, virtually all wetlands on the Belvoir Ranch are associated with the streams; very few are located away from streams and those that are likely are not jurisdictional, meaning they can be impacted without a permit. Avoiding impacts to streams would also result in avoidance of wetland impacts. In general, wetlands are valuable habitats and an attempt to avoid all wetlands should be made when developing plans for roads, trails, facilities and other infrastructure on the Ranch.



Primary landcover types in and around the Belvoir Ranch area, based on Wyoming GAP Analysis (1996).

Big Game

OVERVIEW

Belvoir Ranch is located in yearlong range for white-tailed deer (see map below), winter/yearlong and yearlong range for mule deer (see map, top of page 16), and in winter/yearlong range for pronghorn antelope (see map, bottom of page 16). Yearlong range supports a portion of the population on a year-round basis; winter/yearlong range supports animals year-round, but experiences a significant influx of animals from other areas during the winter. There is crucial winter range for both mule deer and pronghorn north of I-80, but no crucial winter range on the Belvoir Ranch. The Wyoming Game and Fish Department considers crucial winter range the most important big game habitat. The lack of crucial winter range on the Belvoir will significantly reduce the potential for any aspects of the management plan to have a significant impact on big game.

The Belvoir Ranch has been managed as a Hunter Management Area by the Wyoming Game and Fish Department (WGFD) since being acquired by the City. In 2006, the WGFD authorized 50 antelope hunters on the ranch for rifle antelope hunting. Deer hunting was limited to archery only, and there was no limit to the number of archery deer hunters allowed on the ranch.



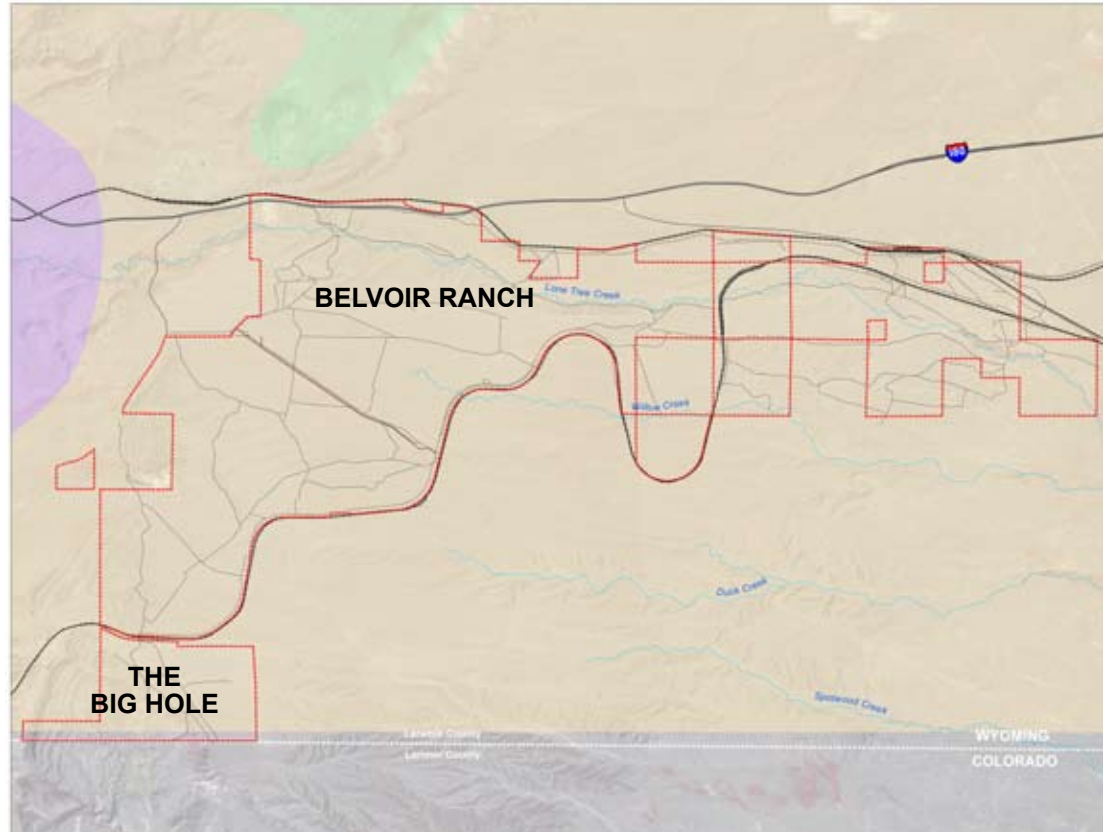
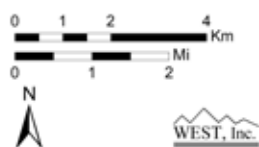
Antelope on Belvoir Ranch.

TRENDS AND KEY ISSUES

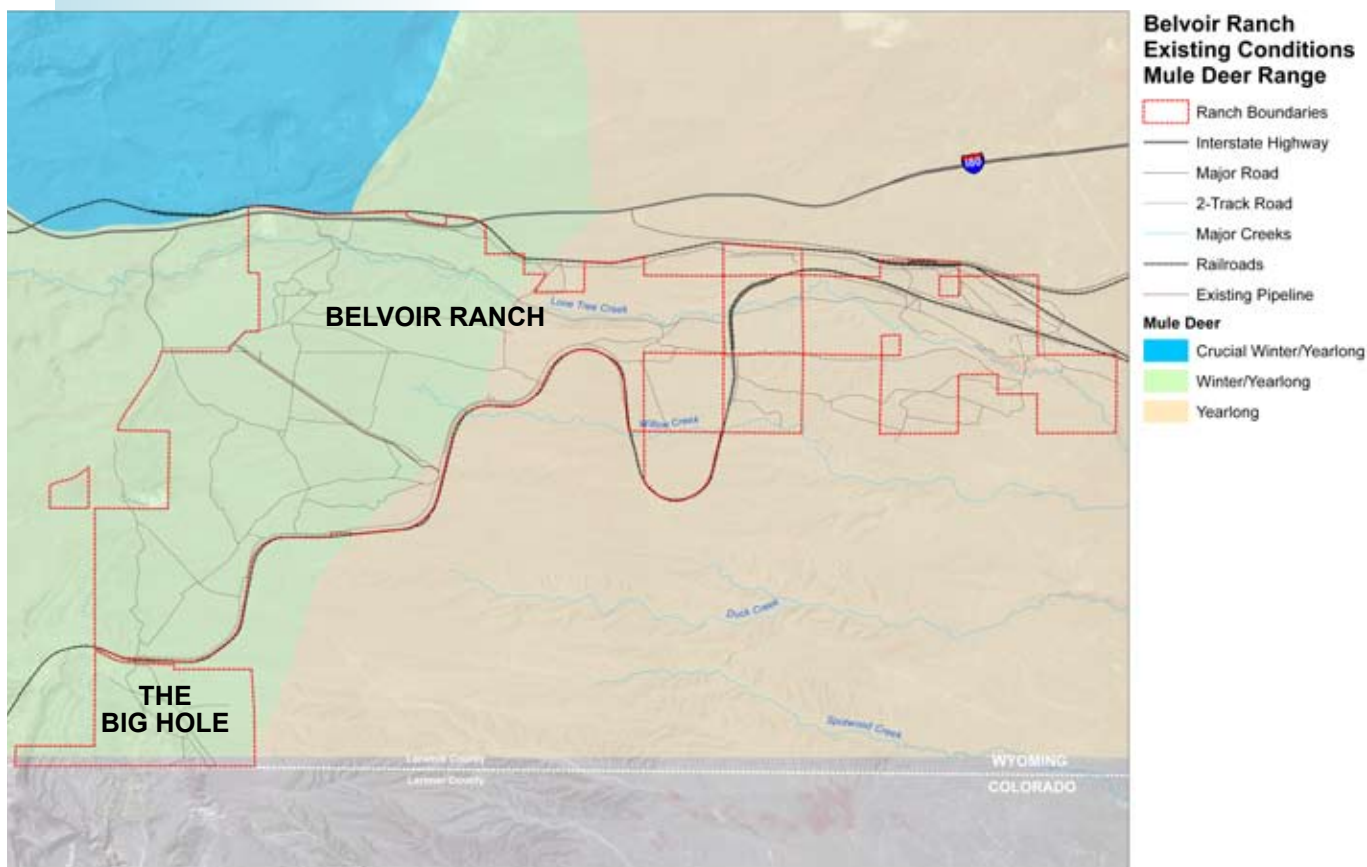
- ✦ No critical winter range exists for white-tailed deer, mule deer or pronghorn antelope on Belvoir Ranch.

Belvoir Ranch Existing Conditions White-tailed Deer Range

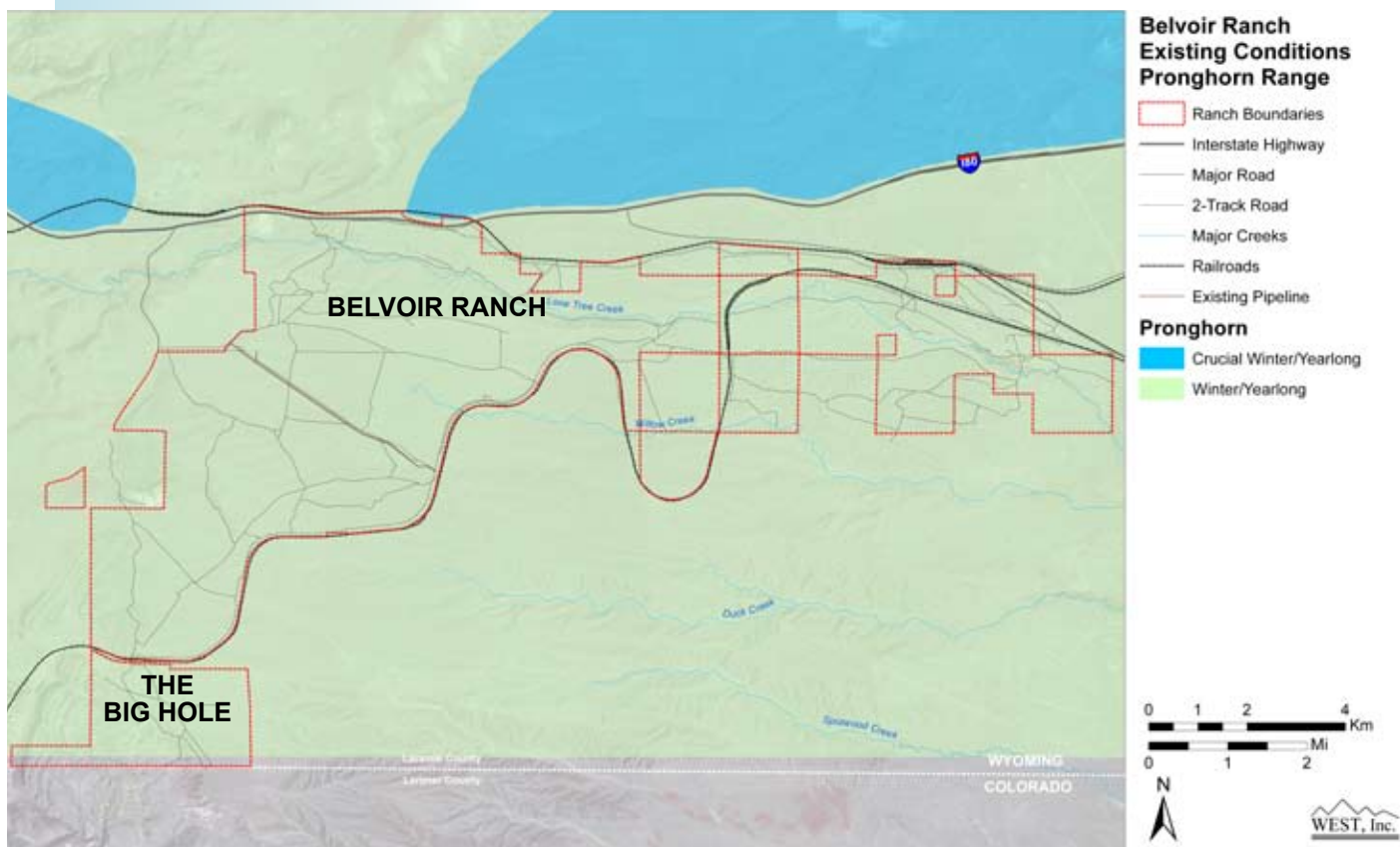
- Ranch Boundaries
- Interstate Highway
- Major Road
- 2-Track Road
- Major Creeks
- Railroads
- Existing Pipeline
- White-tailed Deer**
- Winter/Yearlong
- Yearlong
- Spring/Summer/Fall



White-tailed deer range in the Belvoir Ranch area as defined by Wyoming Department of Fish and Game (WGFD) and updated in 2005.



Mule deer range in the Belvoir Ranch area as defined by WGFD and updated in 2006.



Pronghorn range in the Belvoir Ranch area as defined by WGFD and updated in 2006.

Fisheries

OVERVIEW

Lone Tree Creek passes through the northern portion of the Ranch and is classified as a low production trout area by Wyoming Game and Fish Department. No other streams on the Belvoir are considered to be trout streams. Lone Tree Creek historically supported populations of greenback cutthroat trout, a federally threatened species, which is now thought to be extirpated from Wyoming. Due to low water levels this stream experiences in late summer and fall, when portions of it do not contain water, Lone Tree Creek is unlikely to support significant numbers of game or non-game fish. If sufficient water could be obtained, using well water to maintain Lone Tree Creek as a perennial stream would improve habitat for trout and allow for a recreational fishery to be developed on the Ranch.



Well water could be used to support fish habitat, such as that in this reservoir near the Belvoir Ranch headquarters.

TRENDS AND KEY ISSUES

- ★ Lone Tree Creek is unlikely to support large numbers of game or non-game fish.
- ★ A portion of the Ranch's water could be used to support fish habitat.
- ★ A balance of well water and surface water use for wildlife habitat and municipal drinking water should be determined.

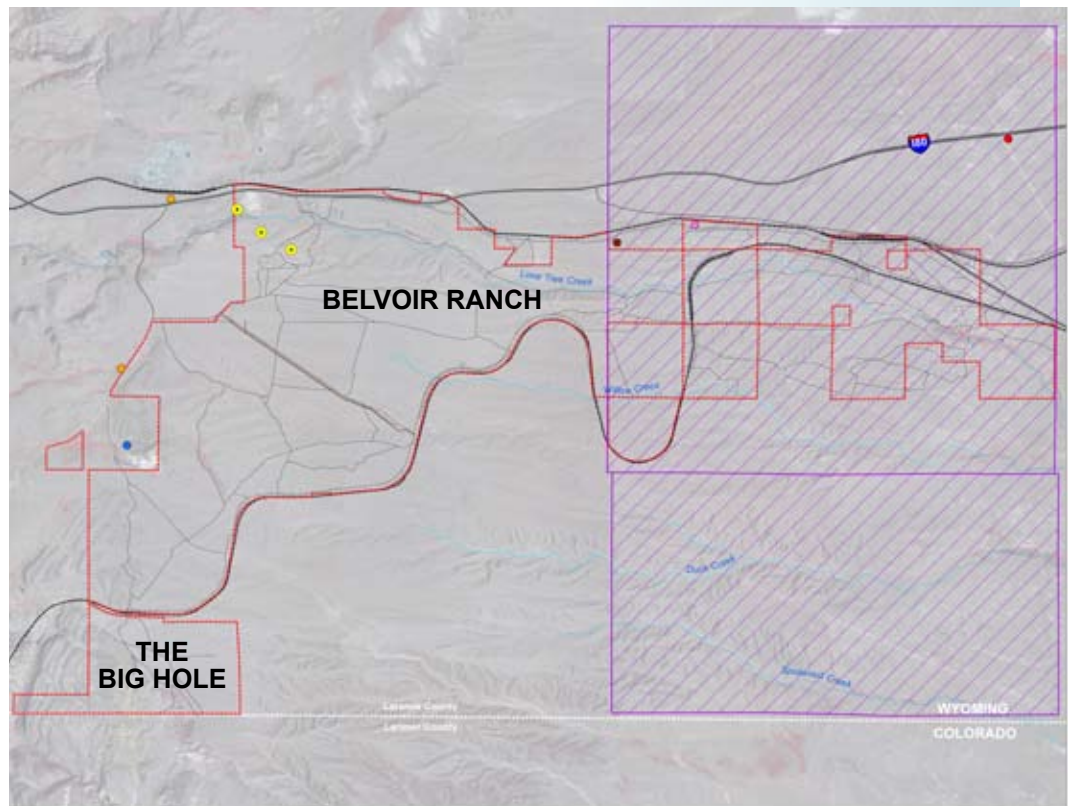


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Sensitive Species

THREATENED AND ENDANGERED SPECIES

According to the U.S. Fish & Wildlife Service, the Belvoir Ranch occurs in the potential range of four federally-listed species: black-footed ferret, Preble's meadow jumping mouse, Ute ladies'-tresses orchid, and Colorado butterfly plant.



Sensitive species in and around the Belvoir Ranch area. All observations except for the golden eagle nest are from the Wyoming Natural Diversity Database (WYNDD). The golden eagle nest was recorded as active in 2004 during a raptor nest survey for the Granite Canyon Quarry.

BLACK-FOOTED FERRET

The black-footed ferret is listed as endangered under the Endangered Species Act (ESA). Black-footed ferrets depend on prairie dog towns for food and shelter; ferrets are rarely found outside of prairie dog colonies and prairie dogs make up to 90% of their diet (Derby and Young 1999). Currently in Wyoming, ferrets are known to exist at the Shirley Basin reintroduction site in Carbon County. No prairie dog towns occur on the Belvoir Ranch; therefore, there is no potential for black-footed ferrets to occur on the Ranch.



Preble's meadow jumping mouse

PREBLE'S MEADOW JUMPING MOUSE

Preble's meadow jumping mouse is listed as threatened under the ESA. Preble's meadow jumping mouse is found in Colorado and southeastern Wyoming and generally occurs in wetlands and riparian areas with shrubs, bushes, trees, and an undergrowth of grasses and forbs. Wyoming Natural Diversity Database (WYNDD) records indicate that Preble's meadow jumping mice were observed or collected in two locations along Harriman Road west of the Belvoir; one near the Harriman Road I-80 interchange approximately 1 mile west of the Ranch in July 2000, and the other immediately adjacent to the Ranch before 1987 (no other documentation available) (see map on page 19). Some habitat suitable for Preble's meadow jumping mouse exists along Lone Tree Creek. Riparian habitat along Lone Tree Creek should be avoided to prevent impacts to this species. If any construction activities occur which may affect Lone Tree Creek (e.g., new road crossings), a trapping survey for Preble's meadow jumping mouse would likely be required to determine presence/absence.



Utes Ladies'-tresses orchid (photo: USFWS)

UTE LADIES'-TRESSES ORCHID

The Ute ladies'-tresses orchid is listed as threatened under the ESA. This orchid grows in wetlands near lakes, springs, or perennial streams between 4,200-7,000 feet in elevation. The species usually occurs in areas with relatively low vegetation (less than 0.5m), and typically in wet meadows or early successional riparian habitats, such as sand bars, with no overstory. Suitable habitat for Ute's ladies'-tresses occurs on the Belvoir Ranch, but no populations are known to occur there. A portion of Lone Tree Creek in Sections 16 and 17 on the Belvoir Ranch was surveyed for the presence of Ute ladies'-tresses on 8 September 2004, as part of the environmental screening conducted for the then proposed access road to a new landfill. No Ute ladies'-tresses orchids were found. If any construction activities occur on the Belvoir that may affect riparian habitat along Lone Tree Creek or other wetlands on the Ranch, surveys for Ute ladies'-tresses would likely be required to document presence or absence.

COLORADO BUTTERFLY PLANT

The Colorado butterfly plant is listed as threatened under the ESA. This species grows in sub-irrigated soils associated with streams in mixed-grass prairie at elevations between 5800 to 6400 feet. One population of Colorado butterfly plant is known to occur on the Belvoir along Lone Tree Creek (see map on page 19; precise location was not provided by WYNDD). Portions of Lone Tree Creek further east of the Belvoir have been designated critical habitat for this species, but there is no critical habitat on the Belvoir itself. This area should not be developed and presence of these plants should not be made known to the public to prevent damage by collectors or trampling.

OTHER SENSITIVE PLANT SPECIES

There are three known Wyoming species of special concern that occur in or near the Belvoir Ranch : *Lomatogonium rotatum* (marsh felwort), *Muhlenbergia montana* (mountain muhly), and *Oenothera howardii* (Howard's evening-primrose) (see map on page 19). Marsh felwort is a forb that grows along lakeshores, flooded meadows, and other wetlands with willow thickets or *Carex simulata* wetlands. It occurs at elevations between 7300 and 8960 ft. The flowering period of marsh felwort is in late summer (August-September) and it has a small, whitish to light blue colored flower. Mountain muhly is a bunchgrass that is of high value for grazing livestock, but it is sensitive to overgrazing and trampling. Howard's evening primrose is a perennial forb with a four-petaled yellow flower.

Also, there twenty known Wyoming species of special concern within 4 miles of Belvoir Ranch: *Astragalus tridactylus* (three-fingered milkvetch), *Aletes humilis* (Larimer aletes), *Argyroschisma fendleri* (Fendler cloak-fern), *Bahia dissecta* (dissected bahia), *Bouteloua simplex* (mat grama), *Carex crawei* (Crawe sedge), *Carex oreocharis* (mountain-loving sedge), *Chenopodium watsonii* (Watson goosefoot), *Delphinium ramosum* (mountain larkspur), *Gentiana affinis* var. *bigelovii* (Bigelow's prairie gentian), *Lithospermum multiflorum* (many-flowered gromwell), *Muhlenbergia torreyi* (ring muhly), *Packera pseud aurea* var. *flavula* (streambank groundsel), *Paronychia jamesii* (James nailwort), *Phacelia alba* (white scorpion-weed), *Phacelia denticulata* (Rocky Mountain phacelia), *Selaginella mutica* (blunt-leaf spike-moss), *Selaginella underwoodii* (Underwood's spike-moss), *Silphium integrifolium* var. *laeve* (rosinweed), and *Symphyotrichum porteri* (Porter's aster). Although not protected by law, due to their rareness, the presence of sensitive plants should be taken into consideration when planning the location of trails, roads and other infrastructure on the Ranch to avoid impacts to these species.

The WYNDD contains records for 31 species of birds, 13 species of mammals, 2 species of amphibians and 2 fish species that either have been documented on the Belvoir or within 4 miles of the Belvoir Ranch. Many of these records are historical and do not reflect the current situation. For example, records of the greenback cutthroat trout within the Belvoir Ranch are over 100 years old.

In addition to the Preble's meadow jumping mouse, the only other animal species of concern recorded very near the project area is the mountain plover (*Charadrius montanus*) (see map on page 19). Records from the mid-1960s indicate a potential breeding area for mountain plovers about 1.6 miles north of the east end of the Belvoir Ranch. The mountain plover is a shorebird that breeds in Wyoming where topography is flat and land cover is very short grass (< 4 in) or bare.



Colorado butterfly plant (photo: USFWS)

TRENDS AND KEY ISSUES

- ★ Colorado butterfly plant, listed as threatened under ESA, is known to occur on Belvoir along Lone Tree Creek.
- ★ Preble's meadow jumping mouse has been identified as occurring along Harriman Road west of the Belvoir Ranch. Suitable habitat for the threatened mouse occurs along Lone Tree Creek.
- ★ Suitable habitat for Ute ladies'-tresses occurs on Belvoir Ranch, however no populations are known to occur there.
- ★ Belvoir is home to many raptor species including a formerly ESA listed golden eagle which nests on Belvoir Ranch.
- ★ There are three known Wyoming species of special concern that occur in or near the Belvoir Ranch.



Bald eagle
(photo: USFWS)

BALD EAGLE

The bald eagle was formerly listed as threatened under the ESA was de-listed in July 2007. The bald eagle is currently protected under Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. Generally, they require areas in the proximity of water for nesting. During winter, areas with abundant, readily available food sources and good roost sites are preferred. Roosts are generally old, large trees where visibility is good and human disturbance is low. In Wyoming, wintering bald eagles are primarily found in open areas near water where they feed on fish and waterfowl. There is no highly suitable nesting or wintering habitat for bald eagles on the Belvoir Ranch. No bald eagles have been recorded on the Ranch in any of the databases searched although there are records for them near the Ranch. Use of the Belvoir by bald eagles is likely limited to the occasional migrant and this species should not affect any aspect of the management plan.



Swainson's Hawk
(photo: peregrine foundation)

RAPTORS

The Migratory Bird Treaty Act was enacted to prevent “take” of migratory birds. In addition to actual killing of individual birds, “take” can also mean to harass or disturb migratory birds. The primary concern over “take” of migratory birds in association with the Belvoir master plan is the potential for construction activities to cause nesting raptors to abandon their nests or young. In general, construction activities are not allowed within ½ mile of active raptor nests from mid-February to the end of August, or until the chicks fledge, which is often prior to the end of August. For eagle and ferruginous hawk nests, the suggested buffer is 1 mile. Therefore, it is important to know where active nests are located so that their presence may be taken into account when planning construction activities. The simplest solution is to delay construction until after the birds have completed nesting that year.

A full inventory of nesting raptors has not been conducted and is not necessary at this stage of the planning process, as the situation will likely change over time. Nesting surveys should be conducted immediately before any construction activities. Raptor species that may nest in the vicinity of the project area include northern harrier, sharp-shinned hawk, Cooper’s hawk, Swainson’s hawk, red-tailed hawk, ferruginous hawk, golden eagle, American kestrel, and prairie falcon. As part of a nesting survey for the Granite Canyon Quarry, an active golden eagle nest was documented on the Belvoir in 2004. This nest is in the northwest corner of the Ranch near I-80 (see map on page 19). Trees and rocky outcrops in the northwest part of the Ranch provide the best raptor nesting habitat, but nests may occur in other portions of the project area where deciduous trees such as cottonwoods occur. In addition to construction activities, other human activity may disrupt nesting raptors. Therefore, consideration should be given to avoid placing trails or other infrastructure near active raptor nests, especially the golden eagle nest known to occur on the Ranch.

SOILS AND GEOLOGY

Soils in the Belvoir Ranch are largely fine- to coarse-loamy soils deposited by alluvial (rivers and stream) and eolian (wind) processes. Several alluvial deposits are characterized as deep; many of the soil types form a shallow or very shallow layer over the underlying bedrock.

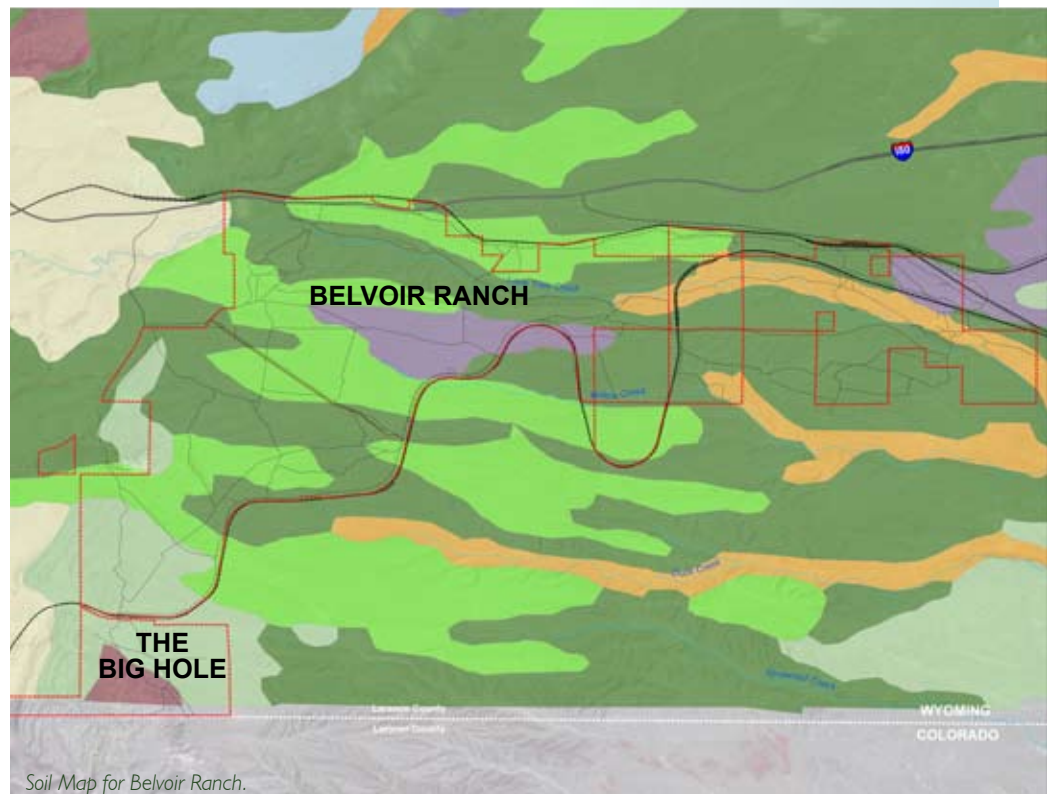
Surface geology reflects the predominant action of water and wind on the landscape. Bench and terrace formations are dissected and eroded. Deposits are of alluvial and eolian origin, and are formed by decomposition of rocks and the effects of landslides. The southern part of the Big Hole area has some exposed bedrock features.

Two soil types dominate the Belvoir Ranch project area: Treon fine sandy loams (44% of the project area) and Merden silty clay loams (37%). Ipson loams (7%), Taluce loams (6%), and Bayard coarse loams (2%) are found in smaller amounts. Four more soil types are found in trace amounts within the project: Ascalon fine loams, Altvan fine loams, Manter coarse loams, and Evanston fine loams.

Treon loams are severely susceptible to water and wind erosion. In contrast, the other main soil type, Merden, is only slightly susceptible to water and wind erosion. All other soil types in the project area exhibit a range of susceptibility to water and wind erosion that falls between that of the Merden and Treon soils. A map of the soils is provided below.



Alluvial deposits on Belvoir.



Soil Map for Belvoir Ranch.



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Current Uses

OVERVIEW

A good catchphrase for Belvoir Ranch is Still the West, because activities that currently take place at the Ranch are typical for those that have historically taken place in the western United States. These include cattle grazing, growing hay, hunting, and energy development. All current uses are shown on the existing conditions map on page 57.

Belvoir Ranch is a 17,000-acre piece of Wyoming history located just southwest of Cheyenne, stretching from west of the city limits to the foothills, from I-80 south to the Colorado border. Originally purchased for municipal water development and a possible landfill site, the Ranch provides the community with abundant possibilities that include energy development and recreational uses.

The Big Hole is just south of Belvoir, which bridges the gap between vast tracts of publicly held land in Colorado and Belvoir Ranch. A management plan developed jointly with Larimer County, Colorado will guide the use of this property.

Development of the Master Plan will be community driven and will identify and create the vision and desired character of the property.

KEY FACTS

- Belvoir Ranch is currently a working cattle ranch, leased to ranchers who bring their livestock in for summer grazing. At peak times, the Ranch may host around 2,000 cattle.
- The Ranch is divided into 27 distinct fenced pastures that allow the Ranch Manager to manage livestock and prevent overgrazing.
- Well-water is used to irrigate hay pastures near the Ranch Headquarters, which provides fodder for spring and fall cattle grazing. Revenue from cattle grazing generally covers the Ranch's management expenses.
- The Ranch headquarters provides an on-site residence for the Ranch Manager as well as a location to store equipment.
- Hunters are allowed limited access to Belvoir Ranch. The Wyoming Game and Fish Department manages the Ranch as the Lone Tree Creek Hunter Management Area. Allowed activities include archery hunting of antelope or deer, and limited firearm hunting of antelope. Hunting season begins in October with bow hunting and ends in November with rifle hunting. Hunting is on a lottery basis managed by the State of Wyoming.
- The City of Cheyenne Board of Public Utilities is currently studying aquifers under the Ranch with the goal of developing the aquifers as a municipal water source; water will likely be piped from wellheads on the Ranch to the City.



Cattle corral along Lone Tree Creek



Pasture sign at East Starmill pasture.



Borie Well #1, one of many artesian wells on the Ranch.

KEY FACTS (CONT.)



Oil and gas wells are found on the eastern end of Belvoir Ranch.



Railroad cars passing on Belvoir's southern end.

- The Ranch contains seasonal and yearlong habitat for a wide variety of wildlife such as antelope, mule deer, elk, many non-game birds, waterfowl, and raptors. No critical winter range exists for white-tailed deer, mule deer or pronghorn antelope on Belvoir Ranch.
- Billboard rental along I-80 provides the City with a small amount of revenue.
- Oil and gas are being pumped in various places on the Ranch with mineral rights owned by several companies – not the City of Cheyenne. The City currently has little control over oil and gas development but would like to develop best management practices for their construction.
- Gas pipelines and a Western Area Power Administration (WAPA) transmission line currently cross through the Ranch.
- Railroad tracks surround the original Belvoir Ranch portion of the site, requiring visitors and cattle alike to enter and progress through the Ranch through several 14 foot culverts that cross under railroad tracks, or at a limited number of on-grade road crossings.

TRENDS AND KEY ISSUES

(From City of Cheyenne 2004 Parks and Recreation Survey)

- ✦ 51% of those surveyed support recreational uses at Belvoir.
- ✦ Top five facilities residents feel Cheyenne's parks lack are walking trails, open space, natural areas, and areas for events such as concerts.
- ✦ For open space residents are most interested in creeks, lakes and ponds, and also scenic views.



Corral on Lone Tree Creek.

Grazing And Pasture Use

OVERVIEW

Cattle ranching is a historic use of Belvoir Ranch that continues today. The City of Cheyenne employs an on-site Ranch Manager to oversee grazing activities and to manage the Ranch's land. Although this is seen as an efficient and economic method of ensuring that the entire ranch doesn't become choked with noxious weeds, in some areas noxious weeds remain a problem. In addition to managing cattle on the deeded 18,800 acres, the Manager also oversees grazing on 3,400 acres of land leased from the State of Wyoming. Much of the Ranch is available for grazing, because the dominant habitat type on Belvoir Ranch is mixed-grass prairie. The Ranch is divided into 27 pastures, ranging widely in size from 34 to 2,047 acres. These are shown on the Existing Conditions map on page 57.

EARLY SEASON GRAZING

In general, cattle are brought onto Belvoir through the Ranch Headquarters, located on the eastern end of the site, which is also known as the East Ranch. Plants in this area are the earliest to break dormancy in the grazing season, which generally begins in late May. In addition, there is a large hay cutting field in this area – known as “The Meadow” – which provides early fodder for cattle. In general, cows are brought onto the Ranch in truckloads of 75 to 78 cows each.

MID TO LATE-SEASON GRAZING

Cattle are grazed in East Ranch pastures until the prairie within the West Ranch area has matured in mid-summer. The West Ranch is defined as the area west of the Union Pacific Railroad tracks that divide the Ranch from north to south. The cows are then moved between pastures in the West Ranch until the end of the grazing season.

Cows are generally removed from the Ranch in October at the corral near the Atlas Missile Silo area. At this point the cows have gained enough weight – typically 200 pounds over the season – that the number that can be carried in a single truckload has decreased to around 63. During the first two weeks in October, between 12 and 18 trucks leave the Ranch each day along Harriman Road. Future use planning will need to take transportation routes and frequency into account.

In late October, the Meadow provides the only viable pasture areas for a small amount of cattle. These cattle provide organic matter for this area, in the form of manure, which enriches the soil for the following year's crop. The Ranch has begun to augment this with inorganic fertilizer. These cattle are then moved to feed lots.



Cattle grazing leases currently provide income on the property.



Culverts for cattle crossing under the railroad are used to move cattle through the site.



Hay cutting meadow near the Ranch house.

TRENDS AND KEY ISSUES

- ★ Fencing will be required to separate grazing from other uses.
- ★ Noxious weed management on Belvoir includes aerial and ground spraying with broadleaf herbicides.
- ★ Location of program elements should be designed to minimize the spread of noxious weeds.



A stock tank in a corral.



One of the corrals on Belvoir Ranch.

PASTURE MANAGEMENT

Grazing on Belvoir Ranch is managed to ensure that pastures remain healthy and are not overgrazed, while also producing maximum returns. In general, cattle stay on each pasture for one week, and then are moved to another pasture with taller, fresher grass. Additionally, pastures are on a two year rotation, being grazed for two years and then left fallow for one year. The Ranch currently uses a stocking rate of one Animal Unit Month (AUM), or one mature 1,000 pound cow and her suckling calf per 1,000 pounds of dry matter per month. Generally, this means that the number of cattle does not exceed 2,000 at any one time on Belvoir Ranch.

To manage noxious weeds and maximize the amount of forage grass, certain areas of Belvoir Ranch are sprayed with herbicides. Weeds that can be a problem on Belvoir include larkspur, leafy spurge, dalmation toad flax, Canadian thistle, vipers bugloss, and cheat grass. The Ranch spends around \$24,000 annually to aerial or tractor-spray herbicide over 1,200 acres. In addition, the Ranch is partnering with Wyoming Game and Fish to control the one to two-thousand acres of cheat grass around and east of the Atlas Missile Silos. Some areas of the Ranch have been completely emptied of noxious weeds, such as The Meadow. These areas provide prime fodder for cattle, and represent a significant investment in effort and money.

RANCH MANAGEMENT CONSIDERATIONS

Historically, *herding* cattle was accomplished on horseback, and rope was used to capture cattle. However, herding is now done using Off-Highway Vehicles and tranquilizer dart guns are used to subdue individual cows. Because of this, recreational OHV use could possibly disrupt cattle herds and cattle ranching operations, as the cows now associate the presence of these vehicles with movement between pastures. As a result, the cattle run from the OHV and lose weight which reduces revenue.

Many miles of *fence* must be maintained within the Ranch, and the lack of busy public roads within the Ranch make this activity fairly easy. Moving cows between pastures and grazing areas is relatively simple and the amount of fencing required to manage cows is minimized. Adding a paved road for the landfill through the Ranch would require additional fencing for safety reasons and may result in more complicated movement patterns for cattle herds unless carefully designed.

Water for cattle is provided by a network of wells and springs that are then piped to stock tanks that dot the landscape of Belvoir Ranch. This is necessary because much of the Ranch is dry—especially later in the summer. Although some of the wells are artesian, some of them require a gas-powered pump to bring water to the surface.

Grazing fees are based on two factors: the time the cattle are kept on the Ranch, and also the amount of weight gained while on the Ranch. Generally, the Ranch collects about \$120,000 annually in grazing fees, which usually covers the yearly expenses to manage the Ranch.

Water Development

OVERVIEW

The City of Cheyenne Board of Public Utilities (BOPU) provides the municipal water supply for the City of Cheyenne including some areas outside the City, such as South Cheyenne Water & Sewer District and F.E. Warren AFB. BOPU was a major funder of the Belvoir Ranch purchase, to gain access to groundwater in order to expand the City's water supply and make it less vulnerable to future droughts and impacts caused by climate change.

CITY'S WATER NEEDS

Production from BOPU's existing municipal water wells—which represents 25% of the current water supply—is declining, most likely because of the region's recent several-year drought. Surface water supplies have also declined, with 2003 reservoir levels dropping below 50% of capacity and exposing the City's vulnerability to extended drought. One of the BOPU's responses to this situation has been to promote reduced demand by adopting a Wise Water Use Plan and comprehensive water conservation program.

However, to meet future population growth needs as well as to make the water supply more drought-resistant, BOPU must expand the municipal water supply. Development of unexplored groundwater resources at Belvoir Ranch will help accomplish both goals, and early tests show groundwater in aquifers beneath the Ranch. BOPU is currently not developing surface water at Belvoir Ranch, because of the limited flow of surface water through the Ranch.

BELVOIR GROUNDWATER STUDIES

BOPU has conducted several studies at Belvoir Ranch since 2003, and currently has three major hydrogeologic studies of groundwater resources underway. The goal of these studies is to determine the amount of water that can be sustainably withdrawn from the Ranch's aquifers without reducing their capacity to produce water. The results of the current studies could be available in mid-2008, and BOPU will make decisions about how to develop Belvoir's ground water supply.

WATER CONTAMINATION

Water in the uppermost aquifer on Belvoir Ranch has been contaminated with Trichloroethene (TCE). TCE was a solvent used at the former, F.E. Warren Atlas "D" Missile Site 4 located on the west side of the Belvoir Ranch. The Army Corp of Engineers is currently assessing the extent of the contamination. BOPU will use an appropriate treatment method to accomplish removal of TCE from the water supply prior to pumping it into the municipal water supply.



Monitoring wells are located throughout the Ranch, to help BOPU study how water development is affecting the aquifers.



Kennedy well house. This well is located in the Williams Pasture, on the Ranch's northwest corner.



Artesian test well at Borie Reservoir near Ranch Manager's Complex.

TRENDS AND KEY ISSUES

- ★ Cheyenne's water demand is projected to grow 60% by 2050, from today's 18,460 acre feet to 29,468 acre feet.
- ★ Belvoir's groundwater could be a drought-resistant water source assisting in meeting summertime peak-demand.
- ★ BOPU's current studies of groundwater pumping and its effects on aquifers underneath Belvoir Ranch should be complete by mid-2008.

WATER AND RECREATION

BOPU's mission is to “develop, maintain and protect Cheyenne’s water, wastewater and water reclamation resources and assets ensuring that regulatory requirements are met in order to provide the utmost benefit for the community’s investment.” This means that the primary use of water developed on the Ranch will be for water for the City of Cheyenne.

Water will most likely be piped directly from wellheads to a process facility to remove the TCE. This will minimize water evaporation while it travels, and maximize the amount of water provided from the Ranch. No above-ground storage tanks or other forms of above-ground water conveyance are currently planned. However, if a need for water to create or enhance recreation activities is identified during the development of the Belvoir Ranch Master Plan, BOPU could consider redirecting some of the water developed on the Ranch to those uses, so long as the recreational use did not detract from the City goal to develop the water on the Ranch for municipal drinking water needs.



The Borie Reservoir is currently fed by a BOPU artesian test well (see previous page).

Landfill Project

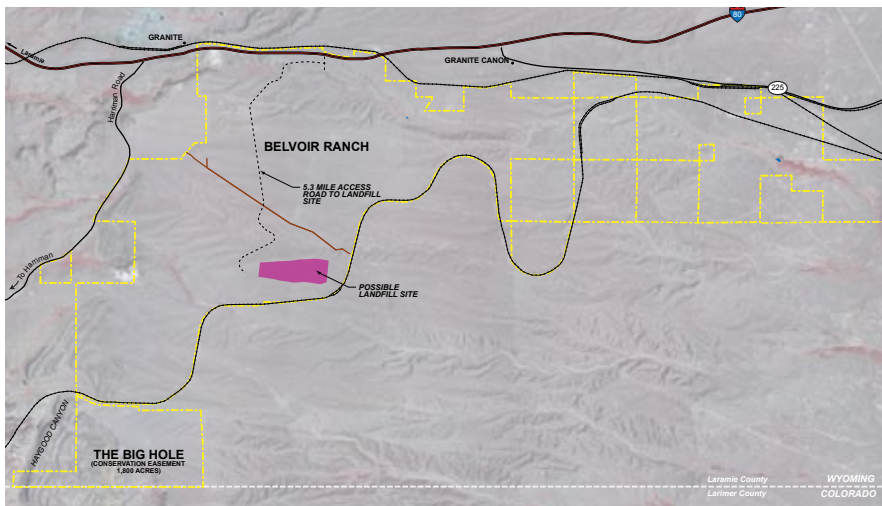
OVERVIEW

In addition to municipal water exploration, Belvoir Ranch was originally purchased for use as a possible City of Cheyenne landfill site. The City needs a new landfill because the current landfill is projected to be filled to capacity by 2011. At the time the Ranch was purchased, it was the City's best option for a landfill site because it met all regulatory requirements. The property also had a willing seller. Furthermore, Belvoir would provide a good location because the landfill could be located away from a major drainageway.

The proposed location would allow the City to fill the upper reaches of a small drainageway and avoid digging deeply to create the landfill. Most likely, it would blend with the existing land and not be constructed higher than surrounding ridgelines. Additionally, the site would not be visible from many areas including Interstate 80. Proposed access to the landfill would be from the Warren exit off Interstate 80, with a 5.3 mile road from the exit to the landfill. The landfill is expected to utilize up to 600 acres.

Since the Belvoir Ranch purchase, the City has investigated several other options: hauling trash to an existing landfill in Ault, Colorado; creating waste to energy at the existing landfill; or expanding the existing landfill either vertically or laterally. The Wyoming Department of Environmental Quality has given tentative approval for the City to expand its current landfill. The preferred option is to create a waste-to-energy option at the existing landfill site. The conversion of waste to electricity is currently being implemented in 87 cities in the United States.

In early 2005, the City estimated that it would cost \$22.4 million to construct a landfill at Belvoir. The costs include: \$6 million to close the old landfill, \$7 million to build a new landfill, and \$4 million to construct the access road across Belvoir. Because of cost issues, Belvoir is not currently the highest ranked alternative for a landfill site.



Proposed landfill site

TRENDS AND KEY ISSUES

- ★ A nine mile road will have to be constructed to access the landfill site.
- ★ The proposed site is not in a major drainageway and would not be visible from many areas including I-80.
- ★ Landfill Construction Cost Estimate in 2005 include:
 - Closing existing landfill - \$6 million
 - Building new landfill - \$7 million
 - Constructing new road to landfill - \$4 million
 - Total - \$22.4 million

Proposed landfill site



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Utilities

OVERVIEW

One municipal water transmission line runs through the site for a short distance near the Merrick No. 1 from existing wells just north of the Belvoir Ranch well to the Sherard Water Treatment Facility. Additional transmission lines from wells transport water for livestock use throughout the site.

Oil wells are located on the eastern end of the site. Oil from these wells is transported off site by trucks rather than transmission lines.

Currently, two natural gas, high-pressure, pipelines, run through the project site. These transmission lines run from the corner of the Granite Ranch Subdivision southeasterly to the Union Pacific Railroad right of way. Both pipelines are located in 50-foot easements. One line is owned by Entrega Gas Pipeline and the other is owned by Overland Pass Pipeline; a third high-pressure natural gas pipeline is anticipated in the future. These pipelines are interstate transmission lines used to convey natural gas from locations in southwestern Wyoming to processing and storage in other states.

A Western Area Power Administration (WAPA) overhead transmission line crosses through the project site. This transmission line runs generally east-west near the southwest portion of the Belvoir Ranch.



Existing WAPA transmission line running east-west on the southwestern half of the Ranch.



Natural gas pipeline running through Belvoir Ranch.



Existing oil wells on the eastern end of Belvoir Ranch.



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Wind Energy Development

WIND ENERGY POTENTIAL

The wind resource at Belvoir Ranch is classified by the National Renewable Energy Lab as between class 4 and 6 (“good” to “outstanding”) for wind power production. Class 7 (“superb”) is the highest classification. The City of Cheyenne has identified an area that could be leased for wind energy development as shown in the map below. This area was initially chosen because of its close proximity to a Western Area Power Administration transmission line corridor.

Windpower generation facilities would most likely be located on the west side of the Belvoir Ranch where elevations are higher and prominent ridge lines likely have the best wind potential (see map below). This location is close to existent access roads. A golden eagle nest located about 1.6 miles north of the wind generation lease area (see map on page 19, Sensitive Species) may render the northern part of the wind lease area less than ideal for development. The Ranch will continue to be evaluated more in-depth to optimize opportunities to capture wind energy as well as to minimize impacts on scenic viewsheds.

GENERAL CONSIDERATIONS

Approximately 10 megawatts (MW) can be placed on a section of land. Wind turbines are usually spaced 5 to 10 rotor diameters apart. The spacing criteria allow approximately twelve 750-kilowatt (kW) turbines or six 1.5-MW turbines on a section of land. Developers usually place the turbines as close together as possible to reduce the costs for wire and roads, but they do not want to create wake losses by placing the turbines too close together.

Wind turbines operate within a specific range of wind speeds to both protect the equipment and maximize its usable life. A typical operating sequence is as follows:

When the wind speed reaches the *cut-in speed* of the turbine (usually around 10 mph), the turbine blades will spin up to operating speed, usually around 14 to 29 rpm (varies by turbine model), and start generating electricity. As the wind speed increases, the generator output increases. When the wind speed increases to the *rated wind speed* (usually around 30 to 35 mph), the generator will output its nameplate-rated capacity (i.e. a 750-kW turbine would now output 750 kW). As the wind speed continues to increase, the generator output will remain at the rated capacity (i.e. 750 kW) until the wind reaches the *cut-out speed* (usually around 55 to 65 mph). At this wind speed, the turbine will deploy its tip-brakes and then apply its disk brake, stopping the blades in a few revolutions. It will then rotate itself 90 degrees out of the wind and park itself. If the wind speed drops to a level below the *cut-out speed* for a sufficient length of time, the turbine will point itself back into the wind, release the brake, and resume power production.

A limitation is that electricity from wind power cannot be stored. Supplemental sources are needed for times when turbines are not operating.



Ponnequin Wind Farm south of Cheyenne.

TRENDS AND KEY ISSUES

- ✦ Wind farms are becoming a common form of energy development in the region.
- ✦ The City of Cheyenne has leased land at its current landfill for a 30 megawatt wind farm. Electricity produced will be sold to Cheyenne Light, Fuel & Power.
- ✦ Colorado State University is planning to develop a wind farm with between 65 and 200 MW of capacity at its 11,000-acre Maxwell Ranch property southwest of Belvoir Ranch.
- ✦ Wind energy provides a hedge against the price of electricity generated using fossil fuels.
- ✦ Belvoir Ranch lies in one of the few outstanding areas in Wyoming for producing wind energy.
- ✦ Transmission line availability will play a key role in deciding whether to develop a wind farm at Belvoir Ranch.

ECONOMIC BENEFITS

- ★ 20-70 jobs created during construction per 50 MW (less for new projects)
- ★ 3-10 permanent operations/maintenance jobs created per 50 MW
- ★ Contracts for the local construction and service industry

ENVIRONMENTAL BENEFITS

- ★ Renewable energy source
- ★ Reduced carbon dioxide CO₂ and sulfur dioxide SO₂ emissions
- ★ Uses less land than other energy sources

WINDPOWER ECONOMICS

To develop a wind farm, approximately \$1.5 to \$20 million of investment is needed per MW of installed capacity. A 1.5-MW wind turbine will produce approximately 4 to 5 million kWh per year—enough to power about 500 homes. At \$0.06/kWh, the turbine would earn \$275,000 per year in gross revenue. To take advantage of economies of scale, wind power facilities should be in excess of 20 MW—or two sections of land.

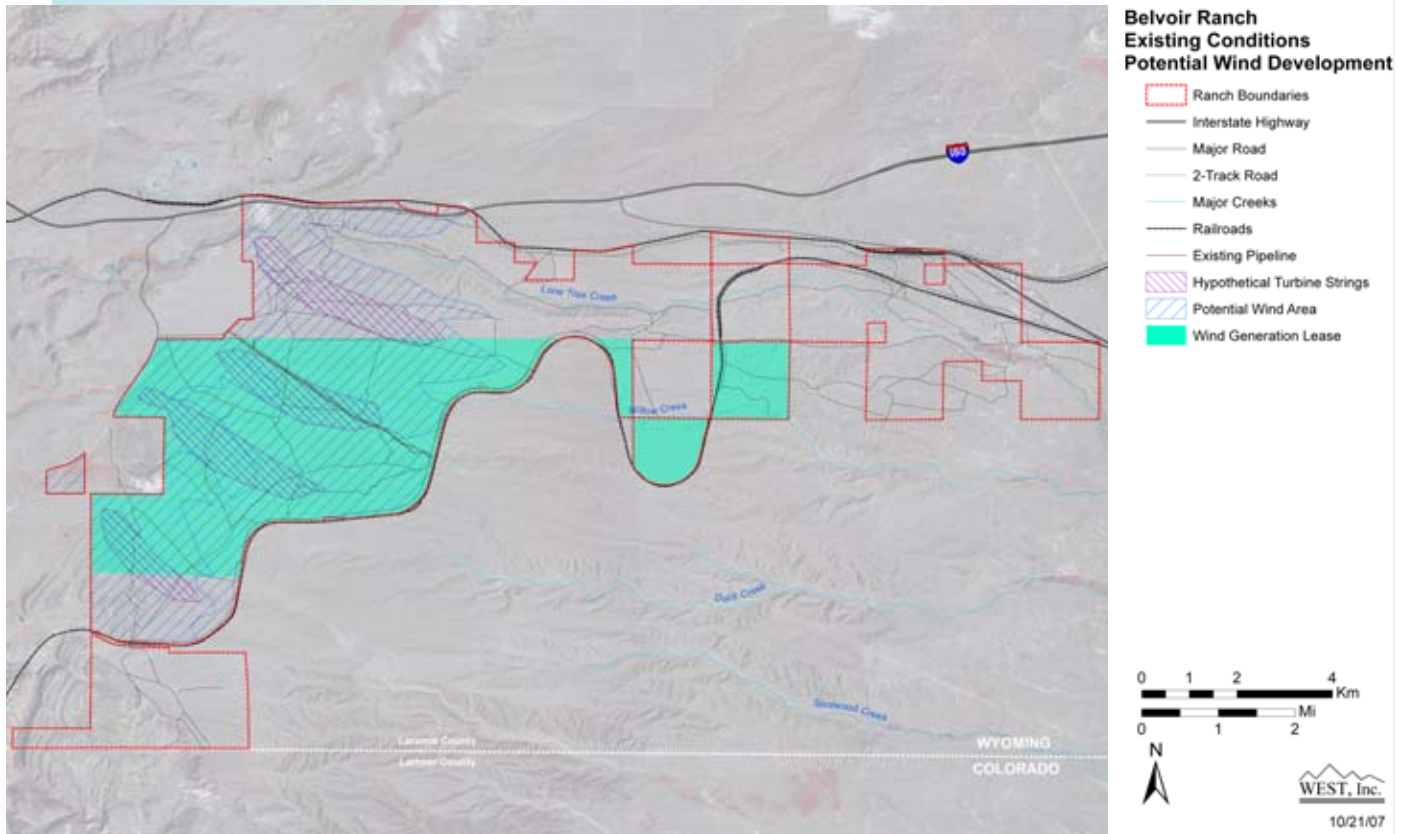
The City's recent lease agreement for a wind farm at the City landfill is expected to generate \$7,000 to \$14,000 per year per turbine. Larger 2.1MW turbines are planned.

Wind farms are usually financed and owned by private investors, and built on leased land. Based on wind projects in southern Minnesota and northern Iowa, landowners can expect to receive annual land-lease payments ranging from \$2,000 to more than \$4,000 per turbine. The payments typically represent from 2% to 4% of the annual gross revenue of the turbine.

Sources:

U.S. Department of Energy, Wind Powering America program (www.windpoweringamerica.gov).

Raabe, Steve. "CSU Planning Its Own Wind Farm." *Denver Post* 29 Mar. 2007. Business Section.



Potential areas for wind power development in the Belvoir Ranch based on areas with highest elevation and topography where wind potential is likely to be the highest.

Environmental Contaminants

TRICHLOROETHYLENE

The primary environmental contaminant known to occur on the Belvoir Ranch is trichloroethylene (TCE). TCE is a colorless liquid with a somewhat sweet odor and a sweet, burning taste. It was used mainly as a solvent at the missile sites and is believed to be the source of the contamination on Belvoir Ranch. TCE can remain in ground water for long periods, and the TCE currently on the Belvoir is limited to the groundwater. TCE quickly evaporates from surface water, and does not build up significantly in plants or animals. There is little hazard for recreational users of the Belvoir to be affected by TCE. If groundwater facilities are developed, for instance at a campground, the water would need to be tested and treated to make sure that TCE is removed. Other sources of surface contamination may be present due to spills along the railroad track or spills or leaks near oil production facilities. These areas will not likely be accessible to the public which should minimize the potential for concern.

At this time, no other environmental contaminants are known within Belvoir Ranch, though there is some possibility of the presence of other contaminants due to the historical presence of missile silos, railroads, and interstate trucking activities in the area.



Missile silo operations may have been the source of TCE contamination at Belvoir Ranch.



The Army Corps of Engineers has drilled monitoring wells in an effort to map the TCE groundwater plume at Belvoir.

TRENDS AND KEY ISSUES

- ✦ TCE quickly evaporates from surface water, so it is commonly found as a vapor in the air.
- ✦ Trichloroethylene may stick to particles in ground water, eventually settling in the bottom sediment where it may remain for a long time.
- ✦ Common contamination from TCE includes breathing, drinking, and skin contact.



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Regional Land Use

OVERVIEW

Belvoir Ranch is surrounded mainly by private land and several parcels of State of Wyoming land that is leased for grazing. In addition, there are large tracts of publicly owned open space to the south, the Medicine Bow National Forest to the northwest, and Curt Gowdy State Park to the north (see regional context map on page 55). The City of Cheyenne is the largest population center in the area, with a 2000 population of 74,160 people in 27,785 households. However, the Cheyenne area is growing rapidly and could gain up to 59,000 new people by 2030.

Land surrounding Belvoir Ranch has an agricultural character, and is predominantly used for grazing (see land ownership map on page 58). However, population growth is resulting in the area's agricultural lands to be converted to subdivisions, which fragments these lands and their scenic views. Spillover from Colorado's front-range development could increase population growth pressures in the region, and speed land conversions. Without the scenic views, agricultural land, and wildlife habitat that open spaces provide, the current quality of life in Wyoming could decline (as identified in the 2001 Laramie County Comprehensive Plan, page 50).

LAND USE CONSIDERATIONS

- Much of the land surrounding Belvoir Ranch is held in large ownerships, meaning parcels greater than 640 acres. These larger land tracts are less likely to be subdivided into rural residential subdivisions as long as their ranch operations remain viable.
- Land uses preferred by Laramie County around Belvoir Ranch are "Very Low Density Rural/Agricultural," and include ranching, farming, residential lots greater than 35 acres, agricultural commercial, agricultural industrial, parks/recreation/open space and schools.
- A Rural Center has been identified by Laramie County at Harriman Road and I-80. This area will likely have limited convenience commercial and public services to serve the immediate residents, including farmers and ranchers. Often these centers have a gas station and limited grocery services.

WIND FARMS

Wind farms are becoming more common in the region around Cheyenne, and are a product of the region's reliable winds. Turbines of the Ponnequin Wind Farm, located just south of the Wyoming border, can be seen from Belvoir Ranch. Considered a medium-size farm, this 1,400-acre Xcel Energy-owned facility generates up to 30 megawatts of electricity from 44 wind turbines.

More recently, the City of Cheyenne has leased land at its landfill on Happy Jack Road to Tierra Energy. The company will install wind turbines that produce up to 30 megawatts of electricity. The facility is planned to be operational in 2008, selling its power to Cheyenne Light, Fuel & Power.



Haygood Canyon is located west of Belvoir with very low density rural/agricultural use.



View of the Ranch compound in the foreground and Rocky Mountain National Park in the distance.



View of Ponnequin Wind Farm from Belvoir Ranch.



Vedauwoo located northwest of Belvoir Ranch
(photo: Vedauwoo.org)



Curt Gowdy State Park located north of
Belvoir Ranch

PUBLIC LAND OWNERSHIP

Larimer County Open Space (Colorado)

Just to the south of the Belvoir Ranch and The Big Hole is an area collectively known as the Laramie Foothills, where several large open space purchases have been made to protect more than 55,000 acres of ecologically and culturally significant landscapes. The Red Mountain Open Space and Soapstone Prairie Natural Area are contiguous to The Big Hole. Both properties are anticipated to open to the public in mid-2009, with management plans under development through 2007.

Curt Gowdy State Park

Six miles north of Belvoir Ranch is Curt Gowdy State Park, which features a richly varied landscape centered around Granite and Crystal reservoirs. The park includes Hynds Lodge, a National Register listed building that is open to groups on a reservation basis. It also includes an amphitheater available for concerts, theater and many other cultural activities. Both reservoirs provide sport fishing—including boat fishing—and are stocked by the Wyoming Game and Fish Department. The Park also provides drinking water and a dump station for recreational vehicles from May 1 to October 31.

Medicine Bow National Forest

Northwest of Belvoir Ranch is the 55,000 acre Pole Mountain district of the Medicine Bow National Forest. This forest provides year-round recreation opportunities for thousands of people, as well as habitat for a variety of wildlife. Recreation uses include OHV use on designated Forest Service roads, picnicking, dispersed camping, hunting, fishing, rock climbing, horseback-riding, mountain biking, hiking, cross-country skiing, and snowshoeing.

Developed facilities include campgrounds, individual and group picnic areas, and a gazebo for picnics/weddings. Vedauwoo is a popular rock climbing site within the forest and includes a day-use picnic area and an overnight campground. Pole Mountain is the eastern-most unit of the 2.9 million acre Medicine Bow-Routt National Forest, occupying north central Colorado to central Wyoming.

Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP)

The ARP encompasses 1.5 million acres in north central Colorado, and includes short grass prairie east of I-25. The ARP extends over a wide range of terrain, with many types of motorized and non-motorized recreational uses.

Rocky Mountain National Park

Rocky Mountain National Park provides a potential, but distant, regional connection for trails that originate at Belvoir Ranch. The Park is 80 miles (by vehicle) southwest of Cheyenne. Recreation resources include five drive-in campgrounds, over 200 backcountry campsites, 359 miles of trails, 150 lakes, and 450 miles of streams. Popular activities include biking, picnicking, horseback riding, hiking, backpacking, fishing, climbing and mountaineering, snowshoeing, cross country skiing, bird-watching, wildlife-viewing and ranger-led programs.

TRENDS AND KEY ISSUES

- ★ The area's population growth is projected to increase by 59,000 by the year 2030.
- ★ A Rural Center was identified in the 2001 Laramie County Comprehensive Plan at Harriman Road and I-80, where a gas station and convenience store may serve residents.
- ★ Wind farms are becoming a common form of energy development in Wyoming.

See Related Maps:

- ★ Regional Open Space
- ★ Regional Context

Railroads

HISTORY

In 1869, the railroad across the now Belvoir property was built as part of the country's first Transcontinental Railroad - a modern alternative to wagon trains for westward expansion from the Eastern United States to California. Sherman was the original high point on the transcontinental line at 8,247 feet above sea level. The climb between Cheyenne and Laramie is thus known as Sherman Hill, increasing in elevation 2,201 feet over 32 miles.

Today, three tracks cover this area as part of the Laramie Subdivision of Union Pacific Railroad (UPRR). Main Lines 1 and 2 parallel Interstate 80 across the northern edge of the Belvoir Ranch. Track 3, built in 1953 and located as much as seven miles to the south, is used primarily by westbound trains carrying heavier loads. This "Three Track" forms the southern boundary of the Ranch property, with The Big Hole located south of the tracks.

SITE IMPACTS

As it crosses the Ranch properties, the UPRR impacts the movement of animals, vehicles and people. Crossing opportunities and constraints for the two rail alignments are summarized as follows:

	Number of Road/Railroad Crossings on Belvoir Ranch		
	Overpasses	Tunnels/Culverts	At-Grade
Main Line 1&2	1	0	2
Three Track	0	9 (+2 closed)	3

In general, the policy of the railroad and Department of Transportation is to try and minimize the number of at-grade crossings in favor of tunnels and bridges that eliminate potential conflicts between users.



A Union Pacific train as it crosses Belvoir Ranch.

Union Pacific Railroad (UPRR) Facts at a Glance

- ★ The Transcontinental Railroad, built in the 1860's to link the railway network of the Eastern United States with California, played a key role in the history of Cheyenne, the F. E. Warren Air Force Base and the Belvoir Ranch.
- ★ The Union Pacific has played such a large part in the development of Wyoming that many citizens refer to the railroad as "Uncle Pete."
- ★ Today, Union Pacific's transcontinental main line across southern Wyoming hosts 60-90 trains a day.
- ★ UPRR hauls more coal than any other commodity - much to and from Wyoming's Powder River Basin, the single largest source of coal mined in the U.S.
- ★ UPRR also moves soda ash, mined in the Green River area, to domestic and international markets for use in making glass, paint and other products.



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Trails

EXISTING TRAIL TYPES

Several types of paths can be found on the Ranch. Some offer potential for future recreational use; others will not be sustainable with increased traffic, or they may create conflicts with ranch operations if open for public access. Locations and types of trails forming the existing circulation network are mapped on page 59.

- **Game Trails** are routes that animals have used over the years to provide access to water and short cuts across the land. Many follow natural features like Lone Tree Creek and are logical corridors for formalized trail designation near points of interest on the Ranch.

Others that traverse steep slopes and follow the fall line (the most direct path down a hillside) will need to be rerouted to better follow the contour of the landscape and minimize potential water erosion impacts that will come with increased foot and hoof traffic.

- **The Twin Mountain Wagon Road** is a historic remnant of the route homesteading wagon trains followed from Cheyenne westward. This barely visible trail would require and offer opportunity for historical interpretative signing along the route.

- **Firebreaks** are cuts in the land plowed by City crews to reduce danger of fire sparked by passing trains. They are located immediately parallel to the Union Pacific right-of-way and often cut across steep grades, thus are not suitable for development as recreational facilities.

- **“Two Tracks”** represent internal roads used by the Ranch to access the various pastures and move cattle between areas. Infrequent vehicle use on these routes creates two “tracks” of limited vegetative growth that can be seen from a distance.

These facilities feel like trails traversing the landscape, but gates located between pastures must remain closed when cattle are grazing. If opened up to hikers, bikers or equestrians, the existing “two track” circulation system will need to remain available for shared use by ranch vehicles for land management and cattle operations. Also, if providing public access across the Ranch a combination of gates and cattle guards may be needed.

- **Graded Roads** are the most frequently used internal circulation routes by management vehicles. Unpaved, but often graded and surfaced with crushed rock, some segments of these roads may warrant a parallel trail or shoulder provided for non-motorized use.

In general, walking or riding on these facilities will not provide users with the full sense of an Old West experience out on the open range. The Belvoir Ranch Master Plan will look further into the feasibility of using these roads for sight-seeing or keeping them restricted to ranch and City vehicles only.



Example of game trailing.



A firebreak plowed down a steep grade parallel to the Union Pacific Railroad.



Typical Belvoir Ranch “two-track” through gate between pastures.



Graded ranch road for vehicular use.



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Roadways

HISTORY

Following a similar route as the Transcontinental Railroad across Wyoming, the Lincoln Highway brought the nation's first transcontinental roadway through Cheyenne and across Belvoir Ranch. Today, Otto Road and portions of Interstate 80 follow the route of the original historic highway. Large ranch tracts comprise much of the surrounding rural Wyoming landscape, with few local roadways intersecting this primary east/west corridor.



A view west on Otto Road, which extends into Cheyenne and turns into W. Lincolnway

SITE ACCESS

I-80 creates a barrier across the northern edge of Belvoir Ranch, with only the Warren Interchange providing the potential for direct access into the site. In general, vehicular entry to Belvoir Ranch is limited to six points, as identified on the Transportation Map on page 59 and described following:

- **#1: Borie Fields** (Section 23) - Accessible off of Otto Road, which has full interchange at I-80. The overpass over the main UP line was built as private access for Warren Livestock ranch/oil access and would need to be retrofitted or replaced if opened for general public use.
- **#2: Borie** (Section 15) - Accessible off of Otto Road, with full interchange at I-80. At-grade railroad crossing with up to six tracks to cross in this location.
- **#3: Warren Exit** (Section 15/16) - Full interchange off I-80. Truck parking provided on north side of I-80; no development (roads or other) present on south side of the interchange.
- **#4: Missile Site** (Section 19) - Paved drive on ranch lands to missile site. Accessible off of Harriman Road, which has full interchange at I-80.
- **#5: Rock Quarry** (Section 36) - Ranch road accessible off of Harriman Road, which has full interchange at I-80, will require easement across state property.
- **#6: Haygood Canyon** (Section 14) - Gravel road access through private property to Harriman Road.
- **Additional railroad culverts** (southern edge) - Several internal graded and "two-track" roads also provide access to cross onto adjacent private lands to the south of Belvoir Ranch using culverts under the third UPRR line. However, the nearest public road to the south is the Soapstone Ranch Road near the Wyoming/Colorado state line, accessible from the I-25 Terry Ranch Road exit to the I-25 Service Road.

Roadway Facts at a Glance

- ★ **I-80:** A federal interstate highway carrying 27,500 vehicles per day. Former route of U.S. 30 and the Lincoln Highway, which was America's first transcontinental route for automobile travel.
- ★ **Otto Road:** State Highway 225 carries approximately 1,500 vehicles per day. The route has paved shoulders from Cheyenne to the nitrate plant, making it the most logical route for experienced (type A) road bicyclists to use to access Belvoir Ranch.
- ★ **Harriman Road:** Wyoming State Highway 218, a two-lane paved road carrying less than 1,000 vehicles per day, with limited access in winter.
- ★ **Missile Base Access:** Paved roads on site built by the Air Force to access its missile silos.



Existing Borie Fields access bridge over the UPRR Overland Route.



Example road/trail culvert under the UPRR Three Track.



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Connected Open Space

THE BIG HOLE

Traveling southwest across the rolling mixed-grass prairie found on the Ranch, one arrives at a large depression in the landscape. Appropriately named The Big Hole, this landform was created when loamy soils eroded to form a basin of exposed residuum, bedrock and glaciated bedrock.

With its panoramic views and vividly colored canyon walls, the Big Hole is a unique open space destination that will be sought out by recreational users of the Ranch and surrounding properties. The 1,800-acre property directly links Belvoir Ranch with significant open space tracts in Colorado, providing opportunities to create a regional trail network. Although Colorado owns the bottom and South Rim of the Big Hole, the property is part of a larger ecological system that knows no boundaries and will thus require coordinated planning and management with multiple agencies in Colorado.

In 2005, the Wyoming Legislature passed the Uniform Conservation Easement Act (UCEA). One of the first properties to take advantage of the UCEA in Wyoming, the Big Hole is permanently protected from development by conservation easement — a restriction placed on specified land uses to protect natural, productive or cultural resources.

The Big Hole

- ★ The Big Hole is a unique land formation that drops approximately 400 feet in elevation from rim to streambed, located just north of the Wyoming/Colorado border.
- ★ Purchased by City of Cheyenne in 2005 for \$525,000 from The Nature Conservancy.
- ★ Includes 1,000 acres of upland pasture and 800 acres of the basin rim.
- ★ The Big Hole will be preserved by one of the first conservation easements under the Wyoming enabling legislation of 2005.



Panoramic view of The Big Hole

The conservation easement for the Big Hole states that rights to change use, subdivide, or develop the property are restricted. Items expressly prohibited in the easement include: public vehicular access, the construction of roads or vehicle trails, the establishment of a landfill, and the construction or placement of any buildings or wind-powered electricity generators. Non-motorized, passive recreational activities including hiking, wildlife viewing, horseback riding, cross-country skiing, biking, fishing, and hunting are consistent with the Easement as long as they are in accordance with stated Conservation Values.

- ★ Conservation easements allow passive recreational opportunities while protecting fragile ecosystems by keeping the property in its natural state with no development permitted.



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Connected Open Space

THE REGIONAL PICTURE

Just to the south of the Belvoir Ranch and Big Hole is an area collectively known as the Laramie Foothills, where several large open space purchases have been made to protect more than 55,000 acres of ecologically and culturally magnificent landscapes.

As illustrated on the following page, several large tracts have been acquired through the Mountains to Plains Project — a collaborative land protection effort between willing landowners, Larimer County Open Lands Program, the City of Fort Collins Natural Areas Program, The Nature Conservancy, Legacy Land Trust and Great Outdoors Colorado.

The majority of this land was purchased for landscape-scale ecological preservation. Public access in Colorado will be limited to the two northernmost properties — Red Mountain Open Space and the Soapstone Prairie Natural Area. These two areas are located contiguous to The Big Hole. Both properties are anticipated to open to the public in mid-2009, with management plans under development through 2007.

Potential connections in Wyoming include Curt Gowdy State Park and Medicine Bow National Forest, both located northwest of Belvoir Ranch. Medicine Bow and Curt Gowdy are both popular regional mountain biking destinations, and motorized use is allowed in designated areas of Medicine Bow.

The Belvoir Ranch and Big Hole master planning process presents the opportunity to coordinate trail development across multiple areas to ensure connections and access to regional destinations. Draft routing of the northern portion of trail systems proposed for both of the Colorado properties are shown on the transportation map on page 59. Preliminary planning has not yet identified which types of trail user groups will be accommodated.

Source: City of Fort Collins Natural Areas Program and Larimer County Open Lands Program

Red Mountain Open Space

- ★ A 13,448-acre open space tract to the immediate south of Belvoir Ranch, extending to 15 miles north of Fort Collins.
- ★ Owned and managed by Larimer County, CO. Public access is anticipated in 2009.

Soapstone Prairie

- ★ Encompasses 18,721 acres of open space at the Colorado border, immediately east of the Red Mountain Open Space.
- ★ A management plan for the property is currently under development by the City of Fort Collins Natural Areas Program.



Medicine Bow National Forest



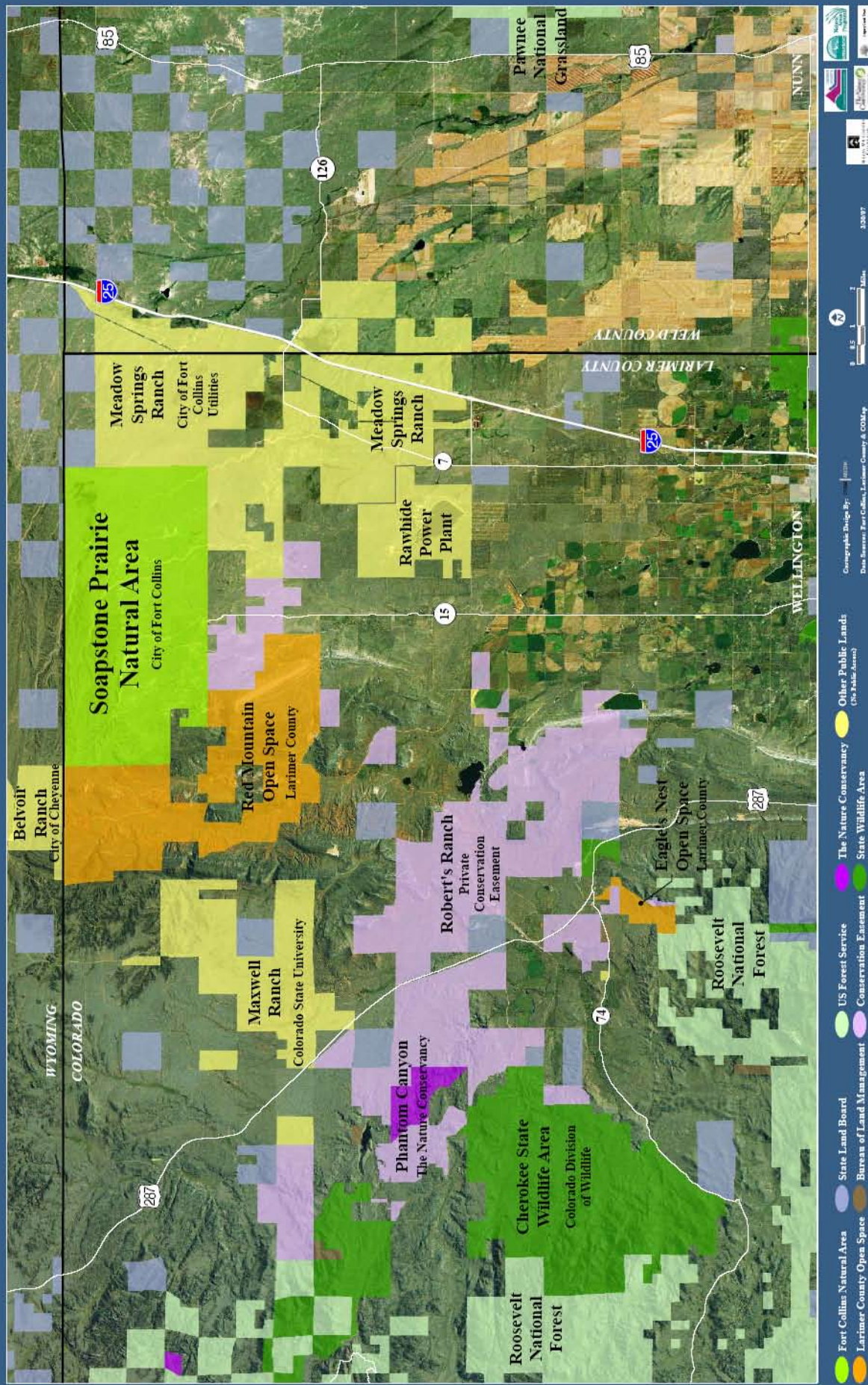
Soapstone Prairie Natural Area



Red Mountain Open Space

The Laramie Foothills

Mountains to Plains Project



Source: City of Fort Collins Natural Areas Program and Laramie County Open Lands Program

Connected Open Space

GREATER CHEYENNE GREENWAY

Making additional connections northeast of Belvoir Ranch to the Greater Cheyenne Greenway system may further expand the potential to create a large, interconnected regional trail network. This existing 21-mile trail network consists of ten-foot wide concrete paths with two-foot shoulders on either side to accommodate a variety of recreational uses including walking, biking, skating, wheelchair cruising and running.

The Cheyenne City limits are located approximately 5.5 miles to the northeast of the Belvoir Ranch property. Three potential routes are being explored to make this connection. These are depicted on the Greater Cheyenne Greenway map on page 52 and summarized in the following:

- **The Crow Creek Greenway Extension**, which is currently in the planning stages from MLK Park to Freedom Elementary. Connection south from Happy Jack Road will be needed, most likely along Round Top Road south to Otto Road.
- **On-Street Bike Route** proposed along W. Lincolnway with a segment of shared use trail to be constructed on the northside of the road to connect to the terminus of the existing Crow Creek Greenway at Martin Luther King Park. Bicycle accommodation would need to be continued west on Otto Road - most likely as a paved shoulder facility or parallel bike path.
- **A Proposed Clear Creek Greenway** to be a new pathway to head west from Clear Creek Park through the I-80/I-25 interchange and run along the south side of Interstate 80.

As planning moves forward for the Belvoir Ranch Master Plan, each of these routes and other potential alternatives will be more fully explored to link with proposed trails on site. Likewise, different types of trail users and their needs will also be considered when exploring potential regional linkages. Issues warranting specific attention include:

- Transitions between different trail surfaces (e.g. concrete path vs. natural surface trail)
- Most appropriate facility type (on-road vs. designated path) for connections based on distance, traffic volumes, and potential users
- Restriction on travel modes - i.e. horses.
- Careful planning of so trails don't deadend



Greenway System Facts

- ✦ A 21-mile system of accessible concrete trails that connects parks and neighborhoods throughout the city.
- ✦ Begun in 1990 by a grassroots group called the Crow Creek Greenway Committee.
- ✦ In 1996, as a direct result of the greenway, Cheyenne was named a "Trail Town USA" by the National Park Service and the American Hiking Society.

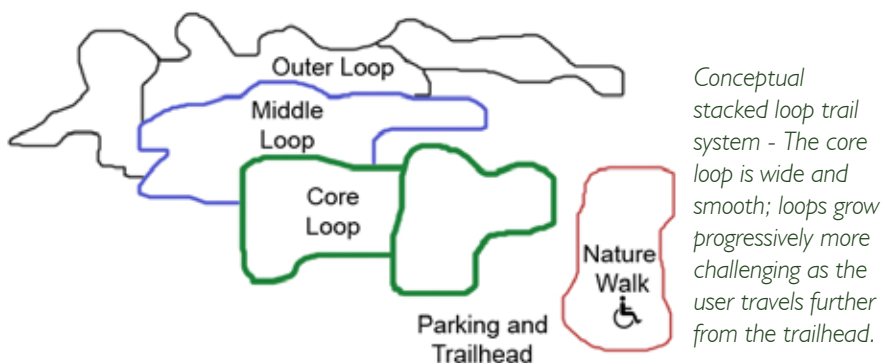


- ✦ Today, the greenway is funded through the 1991 Capital Facilities Tax and 2003 Special Purpose Tax, with supplemental support from federal, state and private grants, donations and local fund-raising efforts.

Trail User Groups

OVERVIEW

Several groups of trail users can be accommodated on the Belvoir Ranch Open Space areas. These non-motorized user groups are generally compatible, given appropriate trail usage and facility design guidelines; however, each type of trail user has different needs. Each user type should be considered when creating a trail system that can function individually or as a larger network. Loop trail systems offer users variety, and stacked loops in particular make optimal use of available land while accommodating multiple types of users. An example of a stacked loop trail system is shown in the figure below:



BICYCLISTS

There are three main types of bicyclists to consider when planning bicycle and trail facilities. Bicyclists can be classified by skill, experience, fitness level, and preferred riding surface.

- **TYPE "A" BICYCLISTS** are experienced riders who typically travel at speeds of 15-20 mph. These users often ride for commuting, fitness, or training purposes and are capable of long trips. Type "A" Bicyclists are comfortable and experienced riding in traffic and often prefer to use roadways.
- **TYPE "B/C" BICYCLISTS** include children and inexperienced adults. These riders typically travel at speeds of 5-15 mph, with an average trip length of 2.5 miles. Basic and child bicyclists are usually uncomfortable operating in traffic and prefer to use separated or designated bicycle facilities.
- **MOUNTAIN BIKERS** favor off-road bicycling, although grade and surface preferences vary widely with skill level. These users travel at speeds of 5-25 mph, with ride lengths varying considerably based on experience and fitness levels. Surface and grade preferences vary predictably by skill level, although a preference for scenic, undulating routes is shared among most users.

These user type considerations are important both for designing facilities within the Ranch and planning for non-motorized access to the site. For example, while Type "A" Bicyclists may be comfortable riding on the road to reach the Ranch, Type "B/C" Bicyclists would prefer or require a separate, designated bicycle facility.



Type "A" Bicyclists are comfortable riding on the road and are capable of longer rides.



Type "B/C" Bicyclists typically prefer designated, off-road bicycle facilities.



Mountain bikers typically seek out single track trails and varied terrain.



Hikers on a multi-day trip carrying packs and camping gear.



Trails with a gentle grade and even surface provide recreational opportunities for families, the elderly, and individuals with disabilities.



Trail surface is an important design consideration; horses can compact and/or displace trail surfaces.

HIKERS

Hikers typically travel at speeds of 2-4 mph, covering between half a mile and 25 miles per day, depending on skill and fitness levels. The quality of the experience is important to hikers, and varying landscapes and scenic vistas are strongly preferred.

Different types of trails should be designed to accommodate various user types. Three potential types of hikes to provide include:

- **SHORT, GENTLE GRADE HIKES** with a wide, smooth tread, suitable for inexperienced hikers, families with children, and the elderly. Trails may be ADA accessible, provide environmental education or interpretive signage, and include amenities such as water fountains, restrooms, and benches.
- **DAY HIKES** over varied terrain, typically lasting several hours. Hikers using these trails typically carry day packs.
- **MULTI-DAY HIKES** require provisions (e.g. camp sites and possibly water sources) for hikers and backpackers passing through the Ranch on a regional hiking trip.

EQUESTRIANS

Equestrians can be divided into two main user types based on skill and experience:

- **NOVICE EQUESTRIANS** are inexperienced riders, typically riding with a guide. These users travel at speeds of 1-2 mph, usually for no more than two hours.
- **CROSS-COUNTRY EQUESTRIANS** are typically more experienced, have their own horses, and do not require guides. These riders usually travel at speeds of 3-5 mph and cover 20-25 miles per day.

Trail surface is an important consideration when designing facilities that will be used by equestrians. Horses create compaction and displacement of trail surfaces, especially at faster paces, so a durable tread is needed. Many horses and equestrians dislike steep or rocky surfaces.



