Heritage Resources

Introduction

In the early twentieth century, the public began to recognize that heritage resources (items modified by humans over 50 years old; i.e., stone artifacts, tepee rings, wagon roads, and turn of the century mining and homestead cabins) were an important aspect of our country's history and cultural values, that these resources are nonrenewable, and that they should be protected for future generations. A series of federal laws were enacted to protect heritage resources on federal lands from damage or loss due to federal programs and/or federally funded or permitted activities.

Legal and Administrative Framework

Antiquities Act of 1906 – This act protects historic or prehistoric remains or any object of antiquity on federal lands and applies to both cultural and paleontological resources. It imposes criminal penalties for unauthorized destruction or appropriation of antiquities without a permit.

National Historic Preservation Act (NHPA) of 1966 – This act protects historic and archaeological values during the planning and implementation of federal projects (CFR 36 800 and CFR 36 60). The law requires the following: (1) location and identification of cultural resources during the planning phase of a project, (2) a determination of "significance" (based on scientific archaeological values) for potentially affected resources, and (3) provisions for mitigation of any significant sites that may be affected.

Preservation of Historical and Archaeological Data Act of 1974 – This act requires federal agencies to collect, protect, and preserve historic and archaeological data, as the results the agencies' undertakings/actions.

Federal Land Policy and Management Act of 1976 Section 102(8) – This act requires that "public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource and archeological values; that, where appropriate will preserve and protect certain public lands in their natural condition …" This law applies to cultural and paleontological resources.

American Indian Religious Freedom Act of 1978 (AIRFA) – This act protects American Indian rights to exercise traditional religions including access to sites and freedom to worship through ceremonial and traditional rites.

Archaeological Resources Protection Act (ARPA) of 1979 – This act imposes civil penalties for the unauthorized excavation, removal, damage, alteration, or defacement of archaeological resources.

Native American Grave Protection and Repatriation Act 0f 1990 (NAGPRA) – American Indian burials and sacred items are protected by this act. If human remains or objects of cultural

patrimony are discovered, this law requires consultation with the Indian tribe most closely related to the individual. The tribe then determines the appropriate treatment of the remains. This may include repatriation or scientific study and curation at a university.

Uniform Rules and Regulations (16 U.S.C.G 432-433) – These regulations coincide with the Antiquities Act of 1906. They give the Secretary of Agriculture "jurisdiction over ruins, archaeological sites, historic and prehistoric monuments and structures, objects of antiquity, historic landmarks, and other objects of historic or scientific interest" on the National Forest System lands. These regulations also apply to paleontological resources.

Code of Federal Regulations (CFR) 36 CFR 261.9 (g), (h) – This regulation prohibits excavating, digging or injuring/damaging in any way prehistoric and/or historic heritage resources, structure, site, artifact, or property and removing any prehistoric and/or historic heritage resource, structure, site, artifact, or property.

Executive Order 13007 (1997) – This order directs federal agencies to accommodate access to and ceremonial use of American Indian sacred sites by tribal religious practitioners, to avoid adversely affecting the physical integrity of such sacred sites, and, where appropriate, to maintain the confidentiality of sacred sites.

Resource Protection Measures

The National Historic Preservation Act outlines protection measures for heritage resources. Prior to any undertaking, as defined in 36 CFR 800, all heritage resources are located, and, in consultation with the State Historic Preservation Office (SHPO), are evaluated for their potential to be placed on the National Register of Historic Places. Those sites determined to be eligible are identified as "historic properties." The SHPO and, in some cases, the Advisory Council on Historic Preservation must be informed of potential adverse effects to any historic property. If an adverse effect is determined though consultation with SHPO, an agreement on mitigating the adverse effects must occur through additional consultation with SHPO and the Advisory Council, before any project may take place.

AFFECTED ENVIRONMENT

Over 300 intensive Class III heritage resource inventories have been completed on the Bighorn National Forest. Approximately 97,524 acres (9% of Forest) have been examined. The following table summarizes the type and number of sites inventoried and their eligibility for inclusion in the National Register of Historic Places (NRHP).

Table HR- 1. Inventoried heritage resource sites on the Bighorn National Forest.

Type of Site	Number of Sites	Percent of Total Sites
Prehistoric	859	59
Historic	586	40
Other	19	1

Type of Site	Number of Sites	Percent of Total Sites
Total	1,464	
Sites/portions of sites eligible for NRHP	531	36
Non-eligible sites	535	37
Sites lacking information to determine if eligible for NRHP	398	27

The Forest has a large variety of heritage resource types. The types are differentiated by the two time periods in which they occurred: prehistoric and historic. Prehistoric (approximately 11,500 to 250 years before present) resources include trails, plant processing, tool stone quarries, tepee ring and open camps, stone alignments, rock shelters, animal processing, and ceremonial sites. Historic resources include road/trails, mines, tie hack camps, tie flumes and ponds, burials, trash dumps, cow camps, dams, recreational cabins, and Forest Service administration sites.

Site size can vary greatly. Sites can be less than a few feet in diameter and consist of a few stone chips or a few tin cans. Other sites can cover 300 acres or more and contain thousands of artifacts. Sites associated with roads may be several miles long.

The only area of the Forest that lacks heritage resource inventory is the Cloud Peak Wilderness. Due to its designation, the wilderness is literally unexplored at present from the standpoint of heritage resources. However, heritage resource inventories will be conducted in the wilderness in conjunction with future term grazing permit renewals.

Ten Historic Districts were identified by the heritage resource specialist, and were considered during the development of alternatives and plan direction. The following table shows Historic Districts on the Bighorn National Forest that were defined during the geographic area analysis conducted.

Table HR- 2. Historic Districts on the Bighorn National Forest.

Historic District	Size (Acres)	Property Types Found	Year Identified	Estimated Date of Management Plan
Medicine Wheel	20,802	Ceremonial, Open Camps, Trails, Quarry	1988	1996
Twin Buttes	5,512	Trail, Short-term Camps, Geological	1989	No Date
Hunt Mountain	18,058	Ceremonial, Tepee Ring Villages, Trail, Lithic Scatters	1999	2006
Sheep Mountain	22,436	Trails, Tepee Ring Villages, Open Camps, Ceremonial	1991	2006
Riley Point	20,430	Ceremonial	1996	2010

Historic District	Size (Acres)	Property Types Found	Year Identified	Estimated Date of Management Plan
Garden of the Gods	9,526	Open Camps, Trail, Ceremonial	1990	2012
Elephant Foot	7,587	Visuals, Audio, Archaeology	2001	2008
Buck Creek	26,221	Quarries, Open Camps, Lithic Workshops	1989	2009
Leigh Creek	2,496	Quarries, Lithic Worhshops, Trail	1990	No Date
Woodrock Tie Hack	24,427	Cabins, Flumes, Dams, Roads	1999	1999

Four of the Historic Districts (Battle Park, Elephant's Foot, Medicine Wheel, and Leigh Creek) were considered as management areas, and three, (Battle Park, Elephant's Foot, and Medicine Wheel) were included in alternatives. Site setting (the surrounding landscape) is a contributing element for seven of the Districts, since integrity of setting contributes to possible inclusion in the National Register of Historic Places. To properly manage the site setting for these seven Historic Districts, as outlined by the Park Service Bulletin 15, the District's boundary and a specific Historic District management plan should be developed. Prior to completion of the management plan, the District should be managed to insure that the contributing elements for National Register eligibility are protected.

Regardless if any of the Districts are selected for management area designation, a guideline in the Heritage Resource section of Plan Chapter One identifies the need to consult a map of Historic Districts during site-specific NEPA to ensure that the proper procedures are followed. The Historic Districts were initially identified during inventories for project-specific NEPA and further highlighted during forest plan revision by the analysis based on the following criteria:

- They are the highest quality Historic Districts presently known on the Bighorn National Forest.
- They represent the most important heritage site types on the Bighorn National Forest.
- Their presence may influence the management of other Forest programs.
- The Historic Districts represent multiple historic themes and time periods.

Seven of the Historic Districts include sites that can be classified as important to indigenous people's religious and traditional practices. Local tribes, through the consultation process, requested that these sites/landscapes not be specifically identified as management areas, if possible.

During the analysis process, several other potential Historic Districts were dropped from forest plan management direction because they consist of data sets that were better represented within other identified districts, and/or they could be adequately managed during site-specific NEPA analysis.

Prehistoric/American Indian Resources

The earliest evidence of human activity on the Forest comes from the Paleoamerican period, which lasted from approximately 11,000 to 8,000/7,500 years before present (B.P.). Paleoamerican people are thought to have been largely dependent upon big game hunting, especially during the end of the Ice Age when the large mammals, such as mammoth, wild horse, giant ground sloth, and ancient bison were living. However, by 10,000 B.P., two concurrent but separate Paleoamerican lifeways were developing.

This period is well represented archaeologically in northern Wyoming and the Bighorn National Forest. Twenty-three sites with Paleoamerican material have been recorded on the Forest including Folsom and Foothills/Mountain type cultural complexes.

Trails are another indication of Paleoamerican activity on the Forest. There are at least seven trails, with fair to good integrity, considered to have their origins in the Paleoamerican period. This site type (trail) is rare in the region and throughout the United States.

Archaic Period

The Forest has at least 63 sites from the Archaic period (8,000 B.P. to 2,000 B.P.). Cultural remains from this period include base camps, open lithic scatters, stone quarries, animal processing sites, and the appearance of the use of conical living structures in the latter portion of the period. The structures are noted in the archaeological record by rings of stones used to hold down the edges of the conical structure, commonly referred to as a tepee ring. During this time period, the dependence on plant foods increased and is noted by the appearance of milling stones and large earthen baking ovens.

Late Prehistoric Period

The Late Prehistoric Period roughly dates from 2,000 B.P. to 500 B.P. Besant and Avonlea point types as well as other side-notched and corner-notched points are evidenced. Communal bison hunting was at its zenith in the Late Prehistoric, and ceramic artifacts begin to appear. At the beginning of the period, the major new adaptive shift is in weaponry, from the use of the atlatl (spear thrower) to the bow and arrow. Forty-five (45) well document sites from the time period have been recorded on the Forest. The Avonlea Complex materials appear on the Forest.

Protohistoric Period

The Protohistoric Period dates from 350 to 200 B.P. Zier (1984) defined it as "That time from the earliest contact of Indians with goods of European origin to actual contact with whites, accompanied by written records." The Protohistoric is a somewhat arbitrary assignment due to the slow and sporadic introduction of Euro-American products to the Plains Indian groups.

In the early portion of the Protohistoric Period, the major groups occupying the northwest plains (including the Big Horn Mountains area) included Apache, Shoshone, and the Absaroka/Crow (Craig and Gilbert 1982, Zier 1984).

Shoshone groups are believed to have entered Wyoming in the 1500s from the Great Basin. Throughout the next two hundred to two hundred fifty years, they traveled as far north as Canada and as far east as the Black Hills of South Dakota. Archaeological evidence, including bison kill sites, bundle burials, pictographs, steatite vessels, and Shoshone word lists, help trace their migration pattern and territory (Shimkin 1986:308).

Because of their relationship with the Comanches in the southwest, the Shoshone groups in Wyoming probably acquired the horse and gun before many of the other local groups (i.e. Crow). This advantage allowed them to expand rapidly during the Protohistoric period, and they became the dominant tribal group in the area until the end of the period.

At the time of historic contact, the Crow Indians occupied the area bounded by the Bighorn River on the west and Powder River on the east (Frison, et al. 1978:1-3). By the Protohistoric Period, the Big Horn Mountains became a stronghold for the Crow. The Big Goose site on the eastern flank of the Big Horns provides evidence of some of the earliest Crow occupation (530 and 450 B.P.). Ceramic and/or radiocarbon dates document Crow occupation on the Forest as early as 310 B.P.

Characteristics of the Protohistoric Period include small stone arrow points; the appearance of Euro-American trade goods such as metal arrow points, glass beads, and metal awls; and most important, the acquisition of the horse. Site types that date to the period include ceremonial sites (e.g. stone alignments, vision quest, medicine wheels), conical pole lodges, and campsites with pottery and a low density of lithic artifacts (because the lithic tools were being replaced by metal tools). The exact number of sites on the Forest is unknown due to the overlapping dates with the historic period, but at least 20 sites are considered to of Protohistoric age. The site types considered important on the Forest from the period are stone alignments associated with religious practices of American Indians. This site type continues into the historic period. .

Historic Period

The Historic Period dates from approximately 1800 to 1950 and is divided as follows:

- Early historic, 1800 to 1842
- Pre-territorial, 1842 to 1868
- Territorial, 1868 to 1890
- Expansion, 1890 to 1920
- Depression, 1920 to 1939
- Modern, 1939 to present

For this discussion, the last three subdivisions will be combined, discussed by theme, and not focus beyond 1945-50, as an item has to be 50 years old to be considered a heritage resource.

Early Historic, 1800 – 1842

This period is characterized by actual contact and interaction between tribes and Euro-Americans. Explorers and trappers were the first known to make contact with tribes around the Big Horn Mountains. By 200 B.P., the Crow, Cheyenne, Sioux, and Shoshone tribes inhabited areas around the Big Horn Mountains. The Arapaho, Blackfeet, Gros Ventre, Assiniboine, Plains Cree, and Pawnee were frequent visitors (Wardlow 1997).

The Crow and their allies tended to cooperate with the U.S. or Euro-American trappers, as well as the Eastern Shoshone. The Dakota/Siouan groups and the Cheyenne, being more closely associated with Canadian traders and enemies of the Crow, tended to be hostile towards Americans. (Bearss 1970:92.)

At least 10 sites on the Forest are assigned to the Early Historic period. Any site from this time period is considered important. They are extremely difficult to identify because of the lack of stone lithic materials present, as the stone tools were being replaced by metal.

Pre-Territorial, 1842 – 1868

During this time period, there was an increase in Euro-Americans and U.S. military expeditions. Additionally, the eastern Siouan groups continued to be pushed westward by United States expansion, as well as pressure from the south by the Arapaho and Cheyenne.

By the end of the period, hostilities broke out between the U.S. Military and their Indian allies the Crow and Shoshone, and an alliance formed of the Cheyenne, Arapaho, and Siouan groups. Many of these conflicts were played out on the eastern flanks of the Big Horn Mountains.

Beginning in the 1850s, the United States government attempted to settle the armed conflict with a number of treaties. The pertinent ones for the Big Horn National Forest include the 1851 and 1868 Fort Laramie treaties with the Crow, and the 1868 Treaty at Fort Bridger with the Shoshone

There are at least 8 sites on the Forest dating from the Pre-territorial period. These sites are significant due to their limited number.

Territorial, 1868 – 1890

Indian conflicts with Euro-Americans and the U.S. military continued during this period. Regionally, the conflict ended, for all practical purposes, within a year of Lt. Colonel Custer's defeat at the battle of the Little Bighorn in 1876. Just weeks after Custer's defeat, one skirmish occurred on the Forest—the (Lt.) Sibley Battle.

By 1900, the tribes in the region were delegated their present reservations, and they ceded their rights to the Big Horn Mountains. The United States still continues a trust relationship under the terms of past treaties and maintains a government-to-government affiliation with the tribes. In recent years, this relationship has moved the United States government to enact various laws and Executive Orders to protect and to enhance indigenous peoples' right to access and use traditional sites on federal lands.

The Big Horn Mountains were explored by two U.S. military expeditions in 1877 and 1881, lead by General Sheridan. Trails used by the expeditions have been recorded on the Forest; however, no evidence of military campsites has been noted.

Other uses of the Forest during the period include prospecting and limited extraction of lumber and fire wood. Generals Crook and Sheridan used the Big Horns for hunting and fishing trips, the precursor for the recreational use of the Forest.

At the end of the territorial period, we see the beginning of agriculture/ranching industry that helped support the formation of small towns adjacent to the Forest and the expansion of the railroad into the area. The first cattle were introduced to the Bighorn Basin in 1879 (Schermer and Gnabsik 1979:54; Markoff 1982:11; Murray 1980:64). Overgrazing, drought (1885 and 1886), and the severe winter losses of 1886-1887 caused some of the big outfits to fold while others consolidated.

Sheep were first brought into the area in 1871 when J.D. Woodruff settled on Owl Creek for ten years. The sheep industry grew slowly but did well in semi-arid areas. It escaped the big losses suffered by cattle ranchers in 1886-1887 and thereafter began to fill the vacuum (Schermere and Gnabsik 1979:55).

Passage of the Desert Land Act in 1877 allowed the acquisition of additional land if it was irrigated. The first irrigation ditch was opened in 1878 on Clear Fork, and many more followed (Ibid.:68).

Settlements near the Big Horn Mountains began with suppliers to the forts. Freighters, contractors, farmers, and ranchers settled nearby and organized townships. Buffalo was the first in 1876. Big Horn began as the freighters' headquarters. Sheridan was plated in 1882. In the Bighorn River basin, scattered settlements appeared in 1879 (Schermer and Gnabsik 1979a:50). These settlements created a demand for lumber. Army sawmills were established on Clear Creek in 1877 and on Piney Creek the following year. In 1868, the first commercial sawmill opened at the head of Prairie Dog Creek. It supplied the lumber to the settlements; however, large-scale lumber operations were not instituted until the 1890s (Ibid.:79).

There are several sites from this period on the Forest, but formal recording has not been accomplished.

Expansion (1890-1920), Depression (1920-1939), Modern (1939-ca.1945)

Mining: After 1877, miners entered the Big Horn Mountains in large numbers, but no significant strikes occurred until 1890 (Markoff 1982:8). Actual mining, as distinguished from prospecting, first occurred in 1884 at Walker Prairie, but little development occurred until after the first big gold rush at Bald Mountain (Murray 1980:91).

The Bald Mountain strike took place in August 1890 on the western slope of the Big Horn Mountains due west of Sheridan. Hundreds of miners arrived by the end of the year-end, and Bald Mountain City, a typical mining boom-town of tents, log cabins and saloons, was established. The following spring brought large-scale investment and heavy equipment from Denver and New York, and the Fortunatus Mining Company, Inc. became the foremost

operator in the area (Markoff 1982:8). Evidence of the company's activities is still visible at the Fortunatus Gold Mill Site. The Bald Mountain district's payoff began to decrease by the late 1890s and after the large mines closed there was only marginal activity from the 1900s on.

Other mining areas opened up soon after, but not on the scale of Bald Mountain. There were mining operations at Walker Prairie on the eastern slope between Big Goose and Wolf Creeks (Schermer and Gnabsiik 1979:76). There was a small rush at Kelley Creek on the southeastern slope of the Big Horn Mountains near Buffalo.

The mining industry experienced a momentary revival in the late 1920s. However, the limited operations did not survive the Depression. The economic hardships stimulated interest in reopening mines, but nothing resulted beyond plans and a few placers (Schermer and Gnabsik 1979a:78).

Numerous sites related to mining have been recorded on the Forest. Site types include prospect pits, adits, log cabins, and roadways. Though mining played an important role in early local development, the sites on the Forest are rather minor compared to others in the region.

Lumber: The first logging operations took place near the Bozeman Trail forts in the late 1860s. In 1886, the Ferguson and Farnham Sawmill was established at the head of Prairie Dog Creek; several other mills including sites on Goose, Canyon, Babione, Piney, Trapper, and Mill Creeks (Ibid.:79). Lumber was dry-chuted down to avoid dangerous wagon hauling over poor trails. The small mills were moved from site to site, and once a spot was logged out, numerous chutes and flumes were left scattered about the creeks (Murray 1980:114). It was not until the mining districts constructed switchback roads that mills went up "on top" and became big operations.

The first large mill was built in 1891 on Sheep Creek. Two years later it was purchased to supply ties for the Burlington Railroad. The mill was moved to the Tongue River in 1895 and a wooden flume system was constructed to transfer ties and lumber off the mountain to the Tongue River Canyon, and then by river to the sawmill at Ranchester. The lumber camp was named Rockwood and was established in 1895. This headquarter camp was relocated two more times, in 1900 to the Little Tongue, and in 1905 to the Woodrock camp at the fork of the South Tongue (Markoff 1982:15).

Timber use gradually dwindled after World War I. There was a short-lived tie cutting increase in the 1920s, with much of the activity occurring along the Sourdough Creek drainage west of Buffalo. The timber was used for Forest Service range improvements (drift fences, corrals), bridges, and ranger stations. During World War II, a gradual resurgence of timber harvest activities occurred in the Big Horn Mountains.

There are over fifty recorded sites associated with historical logging on the Forest. Site types include roads and trails, log cabins, flash dams, flumes, and holding ponds. Timber played an important part at the local level in early development; however, the timber harvest operations were rather common and represented small and short-term operations. The exception is the Tongue River tie-flume that is considered an engineering wonder.

Grazing and Irrigation: Following the cattle industry bust in the late 1880s, the increase

of careful grazing practices resulted in a rebound in cattle numbers. However during the 1893-95 depression, cattle numbers dropped by 40% (from 100,000 to 60,000 head) in the plains surrounding the Big Horn Mountains (Murray 1980:78).

The unstable cattle industry left an opportunity for sheep-raising. Although the wool industry was also hit hard by the 1893-1895 depression, it recovered rapidly, reaching a peak by the late 1890s. Many cattlemen found it profitable to diversify by raising sheep.

The first grazing permits for the Bighorn Forest were issued in 1899, two years after the creation of the Forest Reserve. The following table shows the trends in permitted livestock numbers on the Forest from 1899 to 1926.

Table HR- 3. Numbers of permitted cattle and sheep on the Bighorn National Forest, 1899 to 1926.

Year	Number of Cattle Permitted	Year	Number of Sheep Permitted
1899	3,000	1900	225,000
1906	30,000	1906	55,000
1919	45,000	1911	100,000
1926	23,000	1919	125,000

Source: Markoff 1982

The transfer of the Forest to the Department of Agriculture's jurisdiction in 1905 led to improved livestock grazing practices. Grazing permits gave priority to ranches bordering on the National Forest, transient livestock were forbidden during summers, and grazing fees were introduced. Permits were let annually until 1925 when the Forest Service changed to the current process of issuing permits for a ten years period (Markoff 1982:14).

The 1894 Carey Act initiated federal support for state-sponsored irrigation projects. An early result was the first successful large-scale irrigation work in the Basin, the Sidon Canal. After 1905, the Forest Service began building storage dams in the mountains to extend the irrigation season in the lower drainages. Private companies also built irrigation dams such as Kearney Lake (on Piney Creek) in 1906, and S.L. Wiley's German Bench Ditch on the Greybull River in 1902 (Murray 1980: 210, 248; Schermer and Gnabsik 1979:60).

In 1916, the Forest Service began a program of constructive range improvements by building drift fences and corrals. In the following years, this work expanded to bridges, water tanks, and trails (Markoff 1982:14). During the 1930s, Forest Service rangers, the Civilian Conservation Corps, and local ranchers worked on stock tanks and irrigation pipes to alleviate drought conditions. Many miles of drift fences were built or repaired to improve livestock distribution.

Numerous livestock- or irrigation-related sites have been recorded. Site types include dams, ditches, cow camps, stock trails, and fences. Many of the site types (e.g., dams and ditches) are rather common throughout the West. However, the Forest does contain a fair representation of historic cow camps. This site type is becoming rather uncommon throughout the region, as historic cow camps are being replaced with modern structures.

Recreation businesses began as an offshoot of cattle ranching. The earliest recreation spots were dude ranches, the first opening in 1891 at the D.H. Ranch on Little Goose Creek. Dude ranches, including the Eaton's, Hazelton Resort, and IXL developed in and near the Bighorn National Forest beginning in 1904. Dude ranching not only became a viable economic pursuit off Forest, but also resulted in the development of additional recreation/tourist activities on the federal land. The Forest Service produced promotional literature and built recreation facilities. Private business and Boy Scouts set up specific camping sites on the Forest under permits. On the national level, recreation was gaining momentum in the late teens and early 1920s, and the Forest Service produced its first recreational use plan in 1929.

The Depression, not surprisingly, seriously hurt the high-cost tourist business. Many dude ranches closed, but local and regional recreationists continued to use the Big Horn Mountains for camp and picnic grounds. The Civilian Conservation Corps (CCC) built over 100 such sites. Motels became popular for mid-level income tourists who could not afford resorts and dude ranches. Motels appeared along Highway 16 and 14 on special-use permits in the Forest (Ibid.:361-362). Recreation, therefore, became an increasingly important income-producer for federal and private interests in the Big Horn, taking up some of the slack in grazing and lumber.

There are some sites associated with this theme on the Forest. However, the majority have either been destroyed/removed, are not a focus of heritage resource surveys, or they have been altered to the point that they are ineligible for inclusion to the NRHP.

Forest Management: The Bighorn Forest Reserve was proclaimed in February 1897 to be managed by the Department of Interior's General Land Office (Markoff 1982:15). In February 1905, President Roosevelt signed an act that consolidated the forest divisions of Interior and Agriculture into a new Forest Service under the latter department. Policies were developed to keep the forests productive for the long term.

The Forest Service determined that timber growth exceeded timber cuts and so encouraged more cutting. Dwindling game on the Forest led to efforts after 1910 to restrict hunting and to stock the areas as game and fish reserves (Murray 1980:229). Fires were another concern. Four large fires were reported in the pre-federal years: in 1880, 1889, and 1884 near Buffalo and in 1897 near Copeman's Tomb (Connor 1940:72). Forest Service records from 1909 to 1937 reported 280 fires, with outbreaks occurring in almost every year.

From 1916, road building, as well as the aforementioned range improvement efforts, became leading Forest Service activities. Roads afforded access for recreation, as well as fire fighting.

Wildlife resources were more actively managed in this period and wardens enforced game laws. Approximately one-third of the Forest was set-aside in wildlife preserves, mostly on elk migration routes. Winter ranges were also established (Murray 1980:328-329). Big game consisted primarily of deer, elk, and bear (black and grizzly). Populations of furbearers (e.g., beaver and martin) began to rebound after their severe depletion by earlier "market hunters." Predators (coyote, puma, and wolf) were hunted without regard for, or knowledge of, ecological balance (Connor 1940:92-93, 97). During this period, fish hatcheries were established to stock lakes and streams.

In the Depression years, increased federal money allowed for more projects in the National Forest. In addition to cooperative irrigation projects between the Forest Service and local agriculturist, a notable feature of the 1930s was the Civilian Conservation Corps (CCC). CCC camps were established near the headwaters of Muddy Creek in 1933, at Turkey Creek from 1934 to 1937, and at Tensleep Meadows from 1935 to 1937. A camp was also set up near present day Crazy Woman Campground. Dayton was the site of the winter camp until 1940. CCC workers built Sibley Dam on Prune Creek and Meadowlark Lake in the Tensleep Meadows project (Murray 1980:351). Road building was another CCC activity (see section on roads).

Sites associated with forest management and the CCC era are fairly extensive on the Forest. The CCC built the vast majority of workstations on the mountain and these stations are still used today. CCC workmanship on workstations, roadways, and dams is considered to be of the highest quality; however, many such structures exist across National Forest system lands. On the Bighorn National Forest, three fire lookouts and two large dams are of primary importance.

ENVIRONMENTAL CONSEQUENCES

General

Direct and indirect effects upon heritage resources for each alternative are shown by the potential risk rating estimated for each management area. For example, because there are fewer activities that would adversely affect heritage resources in the Category 1 management areas, they are assigned a "low" potential risk for adversely affecting heritage resources. On the other hand, Category 5 management areas that overlap with the historic districts have a "high" potential risk for adversely affecting heritage resources. The rationale for making a low, moderate, or high potential risk rating for each management area is detailed below.

It is important to note that the potential risk ratings are 'theoretical' impacts, because if project level planning and implementation were done according to the heritage resource laws and regulations, the vast majority of potential adverse effects would be mitigated to no adverse effects. In other words, these ratings of low, moderate, and high are a theoretical risk of potential effects at the forest plan level of analysis and do not account for standard mitigation measures, such as site avoidance, incorporated in project-specific NEPA analysis.

Direct and Indirect Effects of the Alternatives

The following discussion of direct and indirect effects to heritage resources is divided into four parts:

1. **Assigning Potential Risk Ranking to Each Management Area** – this is a narrative description of how the potential risk ranking of low, moderate, or high was assigned to

each management area. It is based upon the types of activities that are likely to occur within each management area.

2. **Table Summarizing the Number of Acres in Each Potential Risk Ranking Category.**
3. **Summary Ranking of Alternatives –** The alternatives are displayed in ordinal ranking calculated by using a weighted average of the total number of acres in each of the three categories. The No Action Alternative has the highest potential risk ranking, because it does not explicitly include changes to the National Historic Preservation Act, new laws such as Native American Grave Protection and Repatriation Act, and recent Executive Orders that went into effect since 1985.
4. **Summary of Heritage Resource Benefits by Alternative** – Description of how each alternative meets, or does not meet, various heritage resource concerns.

1. Assigning Potential Risk Ranking to Each Management Area

Each management area was assigned a potential risk ranking based on the following:

- The type of management activities likely to occur. Management Area Category 5 areas will have road construction, while Management Area Category 1 areas will not likely have this activity. Therefore, Category 5 areas have a higher potential for adverse impacts to heritage resources due to management activities than does Category 1 areas. Livestock grazing, recreation, and vegetation management are the management activities with the highest potential for adverse impacts to heritage resources.
- The amount of overlap between high-risk management areas and the historic districts. There is a higher potential risk for adverse effects where road construction and emphasis on vegetation management overlaps with the historic district boundaries.
- Management Areas 2.1 3.1 (Alternatives A, B, C, D-DEIS, and E), and MW (Alternative D-FEIS) prioritize heritage resource management and are assigned low potential risk rankings; in fact, these areas are considered beneficial in the management of heritage resources.

Management Area Category 1

The management activities that could affect heritage resources within this category are, for the most part, completed. Limited infrastructure maintenance, such as trail maintenance, will be the primary Forest Service activity. Recreation impacts of repeated use of popular camp spots will continue. Livestock grazing occurs in these management areas, as well as in all other categories.

- Direct effects include ongoing impacts from established travel systems, repeatedly used disperse camping areas, new areas of repeated use, and areas of excessive human congregation (e.g., lake margins) that have not had heritage inventories completed, and are affecting an historic property.

- Indirect affects, for example, would be site deterioration from erosion of an existing trail system that passes through an archaeological site.
- This category is considered to have a **low** potential risk rating to adversely affect Heritage Resources based on past inventory work. The general objectives of these management areas are considered compatible with heritage resources.

Management Area Category 2

This category, which includes Heritage Special Interest Areas and Research Natural Areas (RNAs), is considered to have the lowest potential to impact heritage resource values. The Bull Elk Park RNA and the Shell Canyon RNA management areas totaled 1,618 acres in the 1985 plan.

- The direct effects, benefits in this case, of including 2.1 Management Areas is that the proactive, heritage-emphasis envisioned in Section 110 of the National Historic Preservation Act (NHPA) would be more likely to be achieved.
- Indirect effects would be conflicts between heritage resources and other programs. The following programs are most likely to be affected:

  Dispersed recreation: if repeated use areas erode sufficiently to require protection.

  Livestock grazing: high value heritage areas may require more intensive management in order to protect the heritage values in the 2.1 management areas.
- This category is considered to have a **low** potential risk rating to adversely affect heritage resources based on past inventory work. The general objectives of these management areas are considered compatible with heritage resources.

Management Area Category 3

Most Category 3 activities are considered to have a low potential risk ranking to adversely affect heritage resources. The exceptions are activities in MA 3.31 Backcountry Recreation, Year-round Motorized. Activities in this management area are considered to have a moderate compatibility with heritage resources where the management area occurs with or overlaps Historic Districts. The 3.31 management areas are moderately compatible, because motorized recreation activities may conflict with the audio and visual characteristics of the Historic Districts' site setting qualities.[1]

- Direct effects would primarily include noise from motor vehicles and visual affects from timber sales when such actions take place within a Historic District.
- Indirect effects would be site deterioration from erosion of an existing trail system that passes through an archaeological site.
- The programs associated with Category 3 are considered to have a **low** potential risk rating to adversely impact heritage resources, as the number of actions predicted is small. The exception is MA 3.31 Backcountry Recreation Year-round Motorized that

[1]"Site Setting" in this context is define as the pre-settlement condition of the environment, including visual and audio elements.

overlaps with a Historic District, which is considered to have a **moderate** potential risk rating to adversely impact heritage resources. The primary reason for the moderate rating is that portions of the transportation system are within Historic Districts that include a pre-settlement site setting as an important part of their character.

Management Area Category 4

The management activities that could affect heritage resources within this category are, for the most part, completed. Infrastructure maintenance (e.g., road and trail maintenance) will be the primary Forest Service activity. Recreation impacts of repeated use in popular camp spots will continue. Livestock grazing occurs in these management areas.

- Direct effects include ongoing impacts from established travel systems, repeated use of disperse camping areas, and areas of excessive human congregation (e.g., lake margins), that have not or will not have heritage inventories completed, and the actions are affecting an historic property. Additionally, there could be an impact to indigenous people conducting traditional cultural practices in Historic Districts where noise and visual impacts from dispersed recreationists can be seen and heard.
- Indirect effects include site deterioration from erosion of existing trail systems that pass through an archaeological site, and inadvertent camping on archaeological properties.
- The programs associated with Category 4, with one exception, are considered to have a **low** potential risk rating to adversely impact heritage resources, as the number of new actions predicted is small, and most sites have already been impacted from past actions. The exception is dispersed recreation, Management Area 4.3, that overlaps with an Historic District, which is considered to have a **moderate** potential risk rating to adversely impact heritage resources. The primary reason for the moderate ranking is that portions of the specific management area designations overlap with Historic Districts that have a pre-settlement site setting as an important part of their character.

Management Area Category 5

The programs generated under the category have been established, through the 1985 Plan, such as suited timber acres in relationship to commercial timber sales. Therefore, the changes to the number of suited acres, by alternative, influence the potential for impacts to heritage resources.

- The primary direct effects from MA 5.11 Forest Vegetation Emphasis and MA 5.13 Forest Products occur during timber sales. The primary impacts would be to the site setting of Historic Districts when visual integrity was an associated characteristic, as well as noise from trucks and machinery during tree harvest.
- Direct effect from MA 5.12 Rangeland Vegetation Emphasis is primarily domestic livestock grazing that causes trampling/bogging/trailing. This impacts the integrity of intact buried cultural deposits, as well as disturbing exposed cultural features and artifacts.

- Indirect affects associated with MA 5.11 Forest Vegetation Emphasis and MA 5.13 Forest Products are primarily limited to road reconstruction or new road construction, which in and of themselves seldom impact heritage resources. The real indirect impact is new road construction when the roads are left open for the public. The new roadways allow for easy access and heavier use in areas that were previously seldom visited, resulting in an increase potential for illegal artifact collecting and/or unintentional impacts to heritage resources.
- Indirect effects from MA 5.12 Rangeland Vegetation Emphasis stem from the lack and/or inability to enforcement utilization standards on what are typically small areas across an individual allotment/pasture. Even if the allotment as a whole meets or exceed standards, localized over utilization of vegetation can occur. When small localized over utilization occurs on an archaeological site, it results in erosion/deflation that effects site integrity, increases rodent activity do to destruction of rodent burrows, and produces a more desirable surface condition for illegal artifact collecting—lack of vegetation and/or exposing artifacts from erosion.
- MA 5.11 Forest Vegetation Emphasis, MA 5.13 Forest Products, MA 5.4 Plant and Wildlife Habitat, and MA 5.5 Dispersed Recreation and Forest Products, in general, are considered to have a **low** potential risk rating to adversely impact Heritage Resources. The exception would be when timber harvest creates a visual or auditory impact within a Historic District where those resources are contributing elements to the site setting. Therefore, suited acres within the Historic Districts will be assigned a **high** potential risk rating.
- Livestock grazing is considered to have a **high** potential for adversely affecting heritage resources, because grazing animals within a short period of time can congregate on an archaeological site, and cause irreversible impacts. The effect is considered to be about the same across alternatives, since the revised plan effects analysis is not predicting that the current permitted number of AUMs, approximately 118,000, will change due to the revision decision. For the analysis, the AUMs total is used as a constant, and the following table does not include acres for MA 5.12 Rangeland Vegetation Emphasis.
- MA 5.21 Water Yield (No Action Alternative and Alternative A only) is considered to have a **low** potential risk rating for adverse impacts to heritage resources.
- MA 5.41 Deer and Elk Winter Range is considered to have a **low** potential risk rating for adverse impacts to heritage resources. The management area encourages vegetation growth for wildlife winter range, and the primary management tool is prescribed fire that increase vigor for most grass and forbs species, though, timber harvest can occur.

Management Area Category 8

The majority of activity within this category is associated with built structures, such as dams and ski runs. These structures have been previously constructed, and maintenance to the structures will be the primary activity in the future.

- Direct impacts would be wave action/water level fluctuations at water impoundments that have not been previously inventoried, and a heritage resource is being affected.

- Indirect impacts would be erosion from any road or trail that runs through a historic property.
- This category is considered to have a **low** potential risk rating to adversely impact heritage resources, as the majority of facilities were constructed/permitted several years ago (e.g., water storage/reservoirs). If heritage resources were affected, that impact has already occurred. There are no proposals for new ski areas or dam construction. Expansion of present facilities may occur, but the potential increase in a facilities size would be considered small at the forest plan level, and all new work would be inventoried.

Management Area Category MW – Medicine Wheel National Historic Landmark and Vicinity

Based on public comment between the draft and final EIS, it was clear that a unique management approach to the area in and around the landmark was necessary. Public comment indicated that the DEIS assignment of a 3.1 designation to this area did not truly convey the management sophistication placed on the area by the Historic Preservation Plan (HPP) in 1996. Therefore, the special MW category was used in Alternative D-FEIS to denote the unique management needs of the area, as defined by the HPP. Key elements are:

- The Revised Plan goals and objectives apply to MA MW. If there are conflicts between the Forestwide direction in Chapter 1 and the HPP standards and guidelines, resolution will be through the consultation process described in the HPP.
- The standards and guidelines and monitoring plan within the HPP apply to MA MW.
- The 1985 Forest Plan management area boundaries exist within MA MW, but there is no specific management area direction associated with those lines, per the HPP.
- Lands suitable for timber production under the 1985 Forest Plan, as amended by Forest Plan Amendment 12, are suited for timber production under the Revised Plan.
- Direct effects include ongoing impacts from established travel systems, repeated use of disperse camping areas, and areas of excessive human congregation (e.g., lake margins), that have not or will not have heritage inventories completed, and the actions are affecting an historic property. Additionally, there could be an impact to indigenous people conducting traditional cultural practices, especially, within the present/original landmark boundary. Lastly, there could be an impact to indigenous people conducting traditional cultural practices from noise, interruptions, and/or visual impacts from dispersed recreationists.
- Indirect effects include site deterioration from erosion of existing trail systems that pass through an archaeological site, and inadvertent camping on archaeological properties.
- In general, the MW Management Area Category does not preclude other management activities, but instead stipulates that those activities be carried in such a matter that they do not adversely affect the heritage resource characteristics that make the area unique.

The MW Category is considered to have a **low** potential risk rating to adversely impact heritage resources.

2. Table Summarizing the Number of Acres in Each Potential Risk Ranking Category

Table HR- 4. Acres of potential risk rating by category or program by alternative.

Risk Grouping[2]	Potential Risk Rating	Alternative (all figures are acres)						
		No Action[3]	A	B	C	D-DEIS	D-FEIS	E
Mgt. Area Category 1	Low	284,108	284,110	321,929	447,893	269,898	318,578	252,715
Mgt. Area 2.1	Low	0	89	20,004	17,024	0	0	0
Mgt. Area 2.2	Low	1,618	1,618	21,190	21,188	21,190	6,575	1,618
Mgt. Area 3.1	Low	110	110	20,863	20,863	20,863	(See below)	20,863
Mgt. Area 3.31 Overlap with Historic Districts	Moderate	2808	2808	16,874	13,207	294	0	1660
All Other Acres, Mgt. Area Category 3	Low	188,752	197,145	285,770	280,812	180,149	161,450	12,529
Mgt. Area 4.3 Overlap with Historic Districts	Moderate	0	0	0	0	672	0	3149
All Other Acres, Mgt. Area Category 4	Low	19,147	19,147	142,643	168,082	127,043	112,490	7,652

[2] The risk grouping is based either upon the management area category or other factor (such as where suited timber overlaps with Historic Districts) as described in the narrative above this table.

[3] No Action Alternative will always be considered to have the highest potential to impact Heritage Resources, as the 1985 Forest Plan would need to be amended to include changes to the NHPA, new laws, and recent Executive Orders. In Alternative ranking, one equals lowest potential to impact Heritage Resources.

Risk Grouping[2]	Potential Risk Rating	Alternative (all figures are acres) No Action[3]	A	B	C	D-DEIS	D-FEIS	E
Mgt. Area Category 5, Suited Timber Overlap with Historic District,	High	24,010	31,715	10,805	3,520	22,184	17,682	29,445
AUMs (5.12) (Constant)	High							
All Other Acres, Mgt. Area Category 5	Low	569,739	566,965	262,448	129,846	460,146	466,387	772,843
Mgt. Area Category 8	Low	1,358		1,358	2,580	2,580	990	2,540
MW	Low	0	0	0	0	0	20,863	0

3. Summary Ranking of Alternatives

The percentages of low, moderate, and high potential risk rating for impacts are shown in the following table. In general, the No Action Alternative is considered to have the highest potential risk rating to impact heritage resources because the alternative does not take into consideration the Historic Districts nor does it explicitly include the laws and regulations developed since 1985. The next highest potential risk rating for impacts is Alternative E followed by Alternatives A, D-DEIS, B, D-FEIS, and C. However, it should be noted that the differences between the alternatives is very small, and the degree of heritage resource protection is largely influenced at the project level.

Table HR- 5. Alternative potential risk rating by percentage of units measured.

Alternative	Low Potential	Moderate Potential	High Potential	Ranking (1 = lowest risk, 6 = highest risk)
No Action				7
A	87.72%	0.22%	12.04%	5
B	88.07%	1.38%	10.54%	3
C	88.98%	1.07%	9.93%	1
D-DEIS	88.45%	0.07%	11.46%	4
D-FEIS	88.90%	0.00%	11.09%	2
E	87.55%	0.39%	12.05%	6

4. Summary of Heritage Resource Benefits by Alternative

Potential significant circumstances/conditions that might influence an alternative's ranking include:

- Does the alternative include changes to laws, new laws, new Excecutive Orders, etc.?
- Are Historic Districts considered in the alternative, with direction for incorporation into long and short term planning and management?
- Potential to impact Historic Districts.
- The number of Special Interest Area (SIA) designations, with more being a larger benefit for heritage resources.
- The number of compatable acres, as more acres is considered to benefit for heritage resources, as overall potential to impact a heritage resource is reduced.
- The funding level for heritage resource management (Section 110 of the NHPA) could change based upon the priorities and goals for each alternative. That is, given that the Forest's overall budget would not change, some alternatives (A and E) would potentially require shifting money from the Forest's recreation budget in order to fund higher outputs for timber harvest and fuels. Conversely, Alternative C would likely result in an increase in the recreation budget, resulting in likely increases to the heritage program. Heritage resources are funded from the 'recreation' portion of the Forest's budget.

Table HR- 6. Summary of heritage resource benefits by alternative.

	Alternatives						
	No Action	**A**	**B**	**C**	**D-DEIS**	**D-FEIS**	**E**
Updated Laws, Orders, Regulations	No	Yes	Yes	Yes	Yes	Yes	Yes
Historic Districts	No	Yes	Yes	Yes	Yes	Yes	Yes
Potential Risk to Districts (1=Lowest Risk, 6=Highest Risk)	7	5	3	1	4	2	6
Number of Heritage Special Interest Areas	1	1	3	2	1	1	1
Compatable Acres (all Category 1 and 2; 3.1 and MW)	285,878	306,680	383,986	506,970	311,897	346,014	275,142

	Alternatives						
	No Action	**A**	**B**	**C**	**D-DEIS**	**D-FEIS**	**E**
Budget for implementation of Section 110 projects (same = approximately current levels)	Same	Less	Same	More	Same	Same	Less

The benefits analysis does suggest a more clear separation than the satistical analysis. Alternative C is considered to be the best alternative for the management of heritage resources. Though Alternative C has one less special interest area than Alternative B, the discrepancy is off-set by the large number of acres in the compatible category, and the potential increase in budget. The potential of additional funding would allow more dallors to be invest in overall heritage resource management. The next least benign alternative is B (primarily based on the three Heritage SIAs), followed by D-FEIS, D-DEIS, A and E.

Cumulative Effects

General

The cumulative effects table at the beginning of this chapter includes the list of past, present and reasonably foreseeable future activities that were considered with regard to cumulative effects to heritage resources. In the past, the present, and future, heritage resources have and will continue to be affected by both natural and human caused disturbances. All of the impacts cited in the direct and indirect effects section would have long-term cumulative consequences. In summation, they include land management projects that cause surface disturbance (e.g., timber sales; road construction), increased public visitation (e.g., increase potential to inadvertently impact a site by camping on it), management neglect, and livestock grazing. Other actions that are included in cumulative effects are natural impacts, such as weathering and deterioration, erosion, landslides, fires, and other physical/natural processes. Finally, long-term consequences of non-sanctioned activities are also incorporated; for example, creation of non-system ATV trails through an historic property and vandalism and/or illegal excavation and collection of heritage resource artifacts. The most likely activities sanctioned through forest planning that would affect heritage resources are vegetation management, management neglect resulting from budget short falls, and domestic livestock grazing. The primary non-sanctioned activities are the same as noted above.

Off-Forest activities (see the cumulative effects table in the Introduction to this chapter) also contribute to cumulative effects to heritage resources. The primary actions include the following:

- Coalbed methane (includes urbanization/development, road construction, etc.).
- Urbanization/development.
- Vegetation management.
- Road construction/travel management.
- Agricultural activities.
- Mining activities.
- Neglect/Natural Determination (relatively unique to heritage resources).

These activities have impacted and will continue to impact heritage resources. Past, present, and potential future cumulative effects are summarized in the following table.

It is assumed that actions off-Forest have comparatively greater effect on the region's heritage resource base as federal heritage resource laws do not apply on private ownership and very limited state provisions apply to state lands. Federal laws do apply to private and state lands when federal licensing, permitting, or funding occurs. However, in general, construction, farming/ranching, and development on private and state lands can destroy heritage resources without providing for avoidance, data recovery, or other mitigation measures. Because of this, heritage resources on federal lands assume greater importance in documenting past lifeways, archaeological and historical research, interpretation and education for the enjoyment of the public, and the protection and use of traditional properties by indigenous and ethnic groups.

Table HR- 7. Summary of cumulative effects by time periods.

Time Period	On Forest	Off Forest	Comments
Past effects (1905 to 1985)	All actions noted but primarily: general development, road construction, urbanization (i.e., summer homes), timber/vegetation management, livestock grazing, recreation, artifact collecting, natural deterioration, and neglect	All actions: same, with the addition of agricultural land uses such as farming, crop production.	The majority of historic sites on and off Forest have been destroyed or severely impacted, and few prehistoric sites have not incurred some type of impact.
Present effects (1985 to 2005)	All actions noted but primarily recreation in association with illegal artifact collecting, domestic livestock grazing, and neglect	All actions--primary: growth/urbanization, artifact collecting, grazing, neglect, and mineral development/coal bed methane (direct effect of construction impacts; indirectly, contributes to population increase)	The majority of historic structures on Forest are in a state of good to extremely poor condition. Estimated that 15% of known eligible prehistoric surface sites may be

Time Period	On Forest	Off Forest	Comments
			destroyed. Extensively impacted from artifact collecting and grazing. Overall lack of Section 110 compliance on all federal lands—neglect--for both historic and prehistoric sites.
Foreseeable future (2005 to 2020)	Main actions would be grazing, recreation, artifact collecting, and neglect	All actions noted but primarily development, urbanization, mineral development/coal bed methane (contributes to population increase), artifact collecting, grazing, and neglect	With the exception of a few managed sites, all historic structures would be remnants (neglect--non-compliance with Section 110 of the NHPA—low budget). Prehistoric sites would continue to dwindle in numbers. Most recorded surface sites in a range from fair to poor.

Past Effects

The period of analysis for past effects is 1905 (establishment of the Forest Service) to 1985, as the present management philosophy and direction is based on the 1985 Forest Plan. The keystone of heritage resource management and protection began with the passage of the National Historic Preservation Act of 1966 (NHPA). Before this time, heritage resources (sites[4]) were not taken into account during project planning or implementation, unless the site was of unusual notoriety and/or importance to the local community or groups who where willing to take steps for the site's protection. Undoubtedly, numerous sites on and off federal lands were destroyed, particularly historic structures, such as homesteads and tie-hack cabins from the turn of the century, as they were primarily viewed as eyesores and potential public safety hazards.

Even after the passage of the NHPA in 1966, it took several years before heritage resource management was fully implemented on the Bighorn National Forest. The first surveys began in the mid-1970s, and were primarily sample surveys for compliance with Section 106 of the Act on major projects, such as timber sales. However, the vast majority of the

[4] Site(s) and property(ies), as used in the discussion of Cumulative Effects section, equates to being a site or property that would be considered eligible to the National Register of Historic Places (NRHP).

work accomplished did not meet standards for Section 106 as understood at that time, and no real management occurred with regard to compliance with Section 110 of the NHPA. It was not until mid-1980s that the Forest began a full-scale program in heritage resource management. In contrast, adjacent lands managed by the Bureau of Land Management began compliance with Section 106 by the late 1970s, and implemented a few statewide projects to fulfill Section 110 responsibilities by the early 1980s.

It is estimated that past cumulative effects have destroyed the majority of historic sites[5] on and off the Bighorn National Forest. Examples of historic sites are homesteads, tie-hack and mining structures/cabins/towns, wagon roads, and trash dumps.

In addition, all exposed prehistoric sites[6] (ca. pre-1810) on or off the Forest have been impacted to some extent. It is logical to assume the loss of prehistoric sites on private and state lands were higher due to agriculture production, road construction, and community development.

Discussion with other agencies and the State Historic Preservation Office (SHPO) indicate that past cumulative effects have destroyed and/or adversely impacted approximately 75% of historic sites and 25% of the prehistoric sites in the study area (the Bighorn National Forest and adjacent four counties); however, specific numbers are unknown. Properties would be classified from fair to good condition with the majority in the good category.[7] The percentages may seem large, but ranching/farming, road construction, mining, water projects, urbanization, etc., all occurred and/or were established long before the enactment of heritage resources laws.

Present Effects

Present cumulative effect analysis is based on the period from 1985 to 2005. Heritage resources, both on and off-Forest, are affected by artifact collecting, livestock grazing, and neglect. Additional effects, specific to private, state, and other non-Forest Service lands (e.g., Bureau of Land Management) include growth/urbanization and mineral/coalbed methane development.

The condition of most historic structures, on federal lands, range from good to extremely poor condition. However, many are suffering from neglect due to insufficient funding. The same can be said for historic structures on private and state lands. By the end of the present period, it is estimated that 80% of the historic structures in the study area will be gone, and the remaining structures will be in a fair to extremely poor category.

Based on ongoing studies (Peterson and Laurent 2001), it is estimated that 15% of the known eligible prehistoric surface sites on the Forest will be destroyed from cumulative

[5] Ca. post 1810 to 1954; a site has to be 50 years or older to be historic.

[6] Examples of prehistoric sites include campsites, quarries for stone tools, buffalo and sheep traps, petroglyphs, and trails.

[7] Ranking on conditions are 100 to 90% of the structure is intact equals to extremely good, 90 to 75% good, 75% to 50% fair, poor 50% to 40%, and extremely poor below 40%.

effects by the end of the present period. On adjacent federal and state lands, the rate is expected to be higher; the Forest Service is actively analyzing and reducing threats to heritage resources from livestock grazing, while other federal and states agencies are not. Private lands, again, in general, are not subject to federal heritage protection laws, and impacts are occurring. Grazing, artifact collecting, mineral development, and urbanization are considered to represent the majority of continuing impacts. An exact number is unknown, but for comparison, at least an additional 5% of surface prehistoric sites have been destroyed, and the remaining sites have deteriorated from good to fair.

Future Effects

The time period considered for future foreseeable cumulative effects is from 2005 to 2020. Pre-1940-45 historic structures, whether on federal, state, or private lands, by the end of the period are expected to be in extremely poor condition or little more than remnants from neglect, and/or modernization (replacement or significant modification of structure). On the Forest, it is predicted that aside from structures under administrative control, all historic structures will be remnants (e.g., tie-hack structures; mining cabins). No matter the historic property type, in the future impacts will be primarily from neglect due to lack of funding.

By the end of the period, some post 1940s structures may become eligible to the NRHP. Few, if any, would be found on Forest Service land, as our structures were built pre-1940-45, and those built after 1950 simply would not be expected to meet criteria for listing as an eligible property.

In the future, impacts to prehistoric sites from livestock grazing will be reduced significantly on Forest, through the re-issuance process of ten-year-term grazing permits, but some impacts would continue. Impacts from recreation will increase in line with use predictions resulting in an increased potential for inadvertent damage, as well as intentional damage through vandalism and illegal collection of artifacts. It is estimated that by the end of the period, 40% of the presently recorded eligible sites would be considered non-eligible (primarily from neglect), and the remainder being from good to poor condition with the majority being in the good condition.

Cumulative Effects by Alternative

Heritage resources on federal lands are managed under a variety of laws, federal regulations, and policies. Primary management and protection is avoidance of heritage resources during any action that could potentially impact an historic property. Therefore, the potential impacts of activities on the Bighorn National Forest and/or other adjacent Federal Land managers in the analysis area are low.

Management and protection is not a consideration for actions that may affect historic properties on private lands, unless federal money is involved or a permit is required. It is unknown how many properties could be effect on private lands, but the potential would be considered high, because federal laws would not apply on private land. Actions on private lands would be little influenced by the selection of any proposed Alternative, in

relationship to changes in cumulative effects to heritage resources.

Since, it is impossible to know the number of sites that have been impacted in the past or will be impacted in the future, cumulative effects can only be discussed within the context of high or low potential for impact. Therefore, potential impacts to historic properties on private lands would be high, as opposed to low potential for impacts on federal lands. In both cases, the potential rankings at a programmatic level can be considered constants, high for private lands and low potential for federal lands.

Without any quantitative data from lands off Forest, the only data available for comparison is the same data and philosophy used in the direct and indirect analysis section. One of the most important historical trends is that the higher number of acres disturbed would increase the likelihood for the potential to impact a heritage resource. Under this scenario, the alternative with the most ground disturbing acres would have the highest potential to impact an historic property. Therefore, as examples, the number of increase or decrease in AUMs (held as a constant), number of new road miles, and timber harvest acres for ASQ were examined. Based on the analysis, Alternative E would have the highest potential for cumulative effects followed by A, D-DEIS, D-FEIS, B, and C.

In conclusion, the selection of any alternative would result in minimal cumulative effects to heritage resources. For instance, the Forest projects that it will create approximately 20.6 miles of new roadway under Alternative E, while it is projected that over 17,000 miles of new roadway will be constructed for coalbed methane production in the Powder River basin. This helps to illustrate the extremely low level of expected cumulative effects anticipated, as a result of Forest related activities under any of the proposed alternatives.