

Amphibians: Big Hole lies in the conifer-alpine ecoregion so the diversity of amphibians is relatively low. Two species are found in the park: the Columbia spotted frog (*Rana luteiventris*) and the western toad (*Bufo boreas*). The number of spotted frogs in a 2002 study was estimated at over 2000 individuals, based on the presence of tadpoles and other life stages in wetlands adjacent to the Big Hole River.

The western toad is a federal species of concern. In the 2002 survey, an individual western toad was found in tall sedges near an oxbow of the Big Hole River. This species was also observed twice during a 1987 inventory. In general, however, this species appears to be rare in the battlefield.

Fish: The North Fork is a tributary of the Big Hole River that flows through the Big Hole. Potential fish species in the North Fork include arctic grayling (*Thymallus arcticus*), brook trout (*Salvelinus fontinalis*), burbot (*Lota lota*), longnose dace (*Rhinichthys cataractae*), longnose sucker (*Catostomus catostomus*), mottled sculpin (*Cottus bairdi*), mountain whitefish (*Prosopium williamsoni*), and rainbow trout (*Oncorhynchus mykiss*) (MDFWP 2004 in NPS BIHO 2005). Ruby Creek and Trail Creek enter the North Fork just south of the park boundary. Fish species that occur in these creeks include brook trout, sculpin, westslope cutthroat (*Oncorhynchus clarki lewisi*), longnose sucker, and burbot (MDFWP 2004 in NPS BIHO 2005). These species may also occur within Big Hole from these creeks. Fishing is allowed within the park with the purchase of a Montana fishing license (NPS BIHO 2005).

### 3. Special Status Species (including Federally-listed Species)

Special status species are those listed as endangered or threatened under the Endangered Species Act (ESA), candidates or species proposed for listing under the ESA, species listed by states as endangered or threatened, or species of special concern or listed by the parks as sensitive.

#### a. City of Rocks Special Status Species

There are no federally-listed species known to occur in the reserve. There are, however, two species of special concern that occur in the reserve: the ferruginous hawk and Townsend's big-eared bat.

Three plants identified by the Idaho Natural Heritage Program and the Idaho Native Plant Society are also found in the reserve. These include Simpson's hedgehog cactus (*Pediocactus simpsonii*), found at its northern extent in the park, it occurs in rocky or sandy soils on a windswept slope. It is threatened by grazing, collectors and disturbance. Narrow-leaved Indian paintbrush (*Castilleja angustifolia*) occurs in shallow, rocky soils and also reaches its northernmost extent in the reserve. It is threatened by disturbance and is unpalatable as a forage species. Kruckeberg's sword fern (*Polystichum kruckebergii*) is found in cool, moist granite microhabitats. It grows in rock crevices and is threatened from trampling or removal by visitor activities, such as rockclimbing.

#### b. Craters of the Moon Special Status Species

The USFWS provided the following list of species that could be affected by the proposals in this plan: gray wolf (endangered as of August 2010), pika (candidate listing not warranted), and greater sage-grouse (candidate, listing warranted but precluded by higher priorities).

The following list of species was compiled in March 2010:

Species	Status		
	BLM	Idaho	USFWS
<b>MAMMALS</b>			
<b>Merriam's Shrew (<i>Sorex merriamii</i>)#</b>		SC	
<b>Gray wolf (<i>Canis lupus</i>)</b>	T		T
<b>Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)</b>	S	SC	SC
<b>Western small-footed myotis (<i>Myotis ciliolabrum</i>)</b>	W		
<b>Long-eared myotis (<i>Myotis evotis</i>)</b>	W		

Species	Status		
	BLM	Idaho	USFWS
California myotis ( <i>Myotis californicus</i> )	S	SC	
Fringed myotis ( <i>Myotis thysanodes</i> )	S	SC	
Long-legged myotis ( <i>Myotis volans</i> )	W		
Yuma myotis ( <i>Myotis yumanensis</i> )	W		
Western pipistrelle ( <i>Pipistrellus hesperus</i> )#	W	SC	
Pika ( <i>Ochotona princeps</i> )			SC
Pygmy rabbit ( <i>Brachylagus idahoensis</i> )^	S	SC	SC
Kit fox ( <i>Vulpes macrotis</i> )^	S	SC	
Paiute ground squirrel ( <i>Spermophilus mollis</i> )	S	SC	
BIRDS			
Trumpeter Swan ( <i>Cygnus buccinators</i> )**	S	SC	
Northern Pintail ( <i>Anas acuta</i> )**		SC	
Lesser Scaup ( <i>Aythya affinis</i> )**		SC	
Eared Grebe ( <i>Podiceps nigricollis</i> )			SC
Western Grebe ( <i>Aechmophorus occidentalis</i> )**		SC	
White-faced Ibis ( <i>Plegadis chihi</i> )**	S	SC	
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )*	S	T,SC	C, SC
Northern Goshawk ( <i>Accipiter gentilis</i> )**	S	SC	
Ferruginous Hawk ( <i>Buteo regalis</i> )	S	SC	SC
Swainson's Hawk ( <i>Buteo swainsoni</i> )	W	SC	SC
Golden Eagle ( <i>Aquila chrysaetos</i> )			SC
Prairie Falcon ( <i>Falco mexicanus</i> )	S		
Merlin ( <i>Falco columbarius</i> )**		SC	
Peregrine Falcon ( <i>Falco peregrinus</i> )	S	E,SC	SC
Dusky Grouse ( <i>Dendrogaopus obscurus</i> )	W		
Greater Sage-grouse ( <i>Centrocercus urophasianus</i> )	S		C, SC
Columbian Sharp-tailed Grouse ( <i>Tympanuchus phasianellus columbianus</i> )	S	SC	
Sandhill Crane ( <i>Grus canadensis</i> )		SC	
Wilson's's Phalarope ( <i>Phalaropus bicolor</i> )**	W	SC	
Long-billed Curlew ( <i>Numenius americanus</i> )	W	SC	SC
California Gull ( <i>Larus californicus</i> )**		SC	
Franklin's Gull ( <i>Larus pipixcan</i> )**		SC	
Short-eared Owl ( <i>Asio flammeus</i> )	W	SC	
Western Burrowing Owl ( <i>Athene cunicularia</i> )	W	SC	
Flammulated Owl ( <i>Otus flammeolus</i> )		SC	SC
Calliope Hummingbird ( <i>Stellula calliope</i> )	S		SC
Lewis' Woodpecker ( <i>Melanerpes lewis</i> )	S	SC	SC
Red-naped Sapsucker ( <i>Sphyrapicus nuchalis</i> )	W		
Williamson's Sapsucker ( <i>Sphyrapicus thryoideus</i> )**	S		SC
Cordilleran Flycatcher ( <i>Empidonax occidentalis</i> )	W		
Hammond's Flycatcher ( <i>Empidonax hammondi</i> )	S		
Willow Flycatcher ( <i>Empidonax traillii</i> )**	S		SC
Olive-sided Flycatcher ( <i>Contopus borealis</i> )	S		SC
Loggerhead Shrike ( <i>Lanius ludovicianus</i> )	S	SC	SC
Pinyon Jay ( <i>Gymnorhinus cyanocephalus</i> )	W	SC	SC

Species	Status		
	BLM	Idaho	USFWS
Juniper Titmouse ( <i>Baeolophus ridgwayi</i> )#		SC	
Sage Thrasher ( <i>Oreoscoptes montanus</i> )	W		SC
Green-tailed Towhee ( <i>Pipilo chlorurus</i> )	W		SC
Grasshopper Sparrow ( <i>Ammodramus savannarum</i> )	W	SC	
Brewer's Sparrow ( <i>Spizella breweri</i> )	S	SC	SC
Sage Sparrow ( <i>Amphispiza belli</i> )	S		SC
Black-throated Sparrow ( <i>Amphispiza bilincata</i> )	S		
Brewer's Blackbird ( <i>Euphagus cyanocephalus</i> )	W		
Cassin's Finch ( <i>Carposdacus cassinii</i> )	W		SC
Black Rosy-finch ( <i>Leucosticte atrata</i> )		SC	SC
REPTILES AND AMPHIBIANS			
Western night snake ( <i>Hypsiglena torquata</i> )#	S		
Short-horned Lizard	S		
Western toad ( <i>Bufo boreas</i> )^	S		
INVERTEBRATES			
Cave Obligate Harvestman ( <i>Speleomaster lexi</i> )		SC	
Cave Obligate Harvestman ( <i>Speleomaster pecki</i> )		SC	
Cave Obligate Mite ( <i>Flabellorhagidia pecki</i> )		SC	
Idaho dunes tiger beetle ( <i>Cicindela arenicola</i> )#	S	SC	
Blind cave leiodid beetle ( <i>Glacivicola bathysciodes</i> )	S	SC	
spur-throat grasshopper ( <i>Melanoplus digitifer</i> )#		SC	
Grasshopper ( <i>Argiacris amissuli</i> )#		SC	
Idaho pointheaded grasshopper ( <i>Arolophitus pulchellus</i> )#	S	SC	
Gillette's Checkerspot ( <i>Euphydryas gillettii</i> )#		SC	

#### BLM

T = Species listed as threatened under ESA

S = Bureau of Land Management Sensitive Species; includes species listed as BLM Type 2 through 4 Sensitive Species List Dated May 2004.

W = Watch list species: Type 5 sensitive species that are not BLM otherwise classified but current population or habitat information suggests that the species may warrant sensitive species status in the future. List Dated May 2004.

#### State (Idaho)

E = Endangered

T = Threatened

SC = Idaho Species of Greatest Conservation Need as listed in the Idaho Comprehensive Conservation Strategy (IDFG 2006)

#### State (Montana)

C = Candidate

CH = Designated Critical Habitat

LE = Endangered

LT = Threatened

SC = Species of Concern

XN = Experimental non-essential population

#### State (Utah)

E = Endangered

T = Threatened

SP= Any wildlife species or subspecies that has experienced a substantial decrease in population, distribution and/or habitat availability

SD= Any wildlife species or subspecies that occurs in limited areas and/or numbers due to a restricted or specialized habitat

SP/SD= Any wildlife species that has both a declining population and a limited range

Conservation Species: any wildlife species or subspecies, except those species currently listed under the Endangered Species Act as Threatened or Endangered, that meets the state criteria of Endangered, Threatened or of Special Concern, but is currently receiving sufficient special management under a Conservation Agreement developed and/or implemented by the state to preclude its listing above. In the event that the conservation agreement is not implemented, the species will be elevated to the appropriate category.

**State (Wyoming)**

E = Endangered

T = Threatened

SC = Species of Concern (Status 1A, 2B, 3B, etc.)

**Other**

\*\* = birds found at Craters of the Moon only as migrants. These species neither breed or winter here.

# = Have not yet been identified at Craters but likely to occur based on habit requirements and nearby records in Idaho CDC database

^ = Previously recorded at Craters of the Moon but no records in 10 or more years

\* = Bald Eagle formally reclassified as recovered on 9 July 2007. Previously listed as Threatened. Minimum five year monitoring period starts 10 July 2007 and is of high interest to USFWS during this period.

**USFWS**

E = Endangered

T = Threatened

C = Candidate for listing as threatened or endangered or the USFWS is conducting a status review for listing

SC = Species of Conservation Concern

DL= Delisted

**Park**

PSC = Park Species of Concern

Additional information about special status species is discussed in the MMP (NPS CRMO 2005). The MMP also contains a list of known sagebrush affiliated species.

Gray wolf: The gray wolf population is listed as an experimental population under Section 10 (j) of the ESA. Gray wolves thrive in a wide range of habitats, including temperate forests, mountains, tundra, taiga and grasslands. The nearest active pack territory in the area was in the Little Wood River Basin less than 10 miles from the preserve (12/31/09). Gray wolves are also known to occur in the vicinity of the monument and preserve. A group of three wolves was observed with 500 yards of the monument in 2009 and a pack was observed and tracked just north of the area in 2001.

Bald Eagle: The bald eagle, previously a threatened species, was delisted from ESA protection in June 2007 (72 FR 37345). Bald eagles have been observed flying in the monument and preserve during much of the year. The nearest nest site is near Carey Lake, just outside the western boundary of the monument. Transient eagles are found throughout Blaine, Butte, Minidoka, and Power Counties, including within the monument.

Peregrine Falcon: The peregrine falcon was removed from the endangered species list in 1999. It is still at depressed population levels in the Rocky Mountains and is listed as an endangered species in Idaho. No known nesting sites have been identified within the monument or preserve but it is a regular migrant through the preserve and two breeding season records of single birds have been documented as recently as June 2009.

Greater Sage-Grouse: Since 1950, 148 sage-grouse leks have been documented on BLM administered land within the monument. Between 1999 and 2003, there were 53 active leks. Idaho Department of Fish and Game (IDFG) observations indicate a 36 percent decrease in sage-grouse leks over the past 25 years (NPS CRMO 2005:137). During 2009-10 at least eight active leks were monitored on NPS lands. Lek counts indicate that populations were increasing in the preserve from 2001 thru 2008 with counts stable since that time.

Pygmy Rabbit: There are records of this species in the monument beginning in the 1930s. Pygmy rabbits prefer mature sagebrush stands with a dense canopy cover (Gabler *et al.* 2001 in NPS CRMO 2005:140). Several targeted surveys in the past decade, however, have failed to document any recent occupation, however pygmy rabbits were recently found again on the north side of Craters in December 2010. See also information about this species for Fossil Butte.

**Bats:** The monument contains hundreds of caves and several cave-related species of concern, including bats. The monument has four of the six known maternity colonies of Townsend's big-eared bats from Idaho (Pierson *et al.* 1999 in NPS CRMO 2005:140, and Idaho Conservation Data Center (ICDC) unpublished data). Many hibernacula have been identified in the monument for this and other species.

**Invertebrates:** Two of the four known worldwide sites for the blind cave leiodid beetle are in the monument (ICDC 2002a in NPS CRMO 2005:140). The Idaho dunes tiger beetle is known from several sites near the southeast corner of the Wapi lava flow. The Idaho point-headed grasshopper is known from the Lost River drainage adjacent to the monument.

There are no known federally-listed or proposed plants occurring in the monument. One species, Ute ladies tresses (*Spiranthes diluvialis*), an orchid, a federally-listed threatened species is known from throughout Idaho, but not documented from Craters of the Moon. The monument provides habitat, however, for two state and BLM-designated special status plants. These include obscure phacelia (*Phacelia inconspicua*), which occurs on north- and east-facing slopes of volcanic mountains and buttes. Picabo milkvetch (*Astragalus oniciformis*) is endemic to stable sandy soils in the north-central portion of the monument, near the foothills of the Pioneer Mountains and outside the monument in the Picabo Hills. Another rare species, meadow pussetoes (*Antennaria arcuata*) is documented directly outside the monument boundary in moist meadows associated with Huff Creek. Another rare milkvetch, mourning milkvetch (*Astragalus atratus* var. *inseptus*) was initially inventoried in a kipuka in 1983 but has not been seen again.

### c. Fossil Butte Special Status Species

Species	Scientific Name	Federal Status	Wyoming Status
<b>MAMMALS</b>			
Gray wolf	<i>Canis lupus</i>	T	T
Grizzly bear	<i>Ursus arctos</i>	T	SC
Black-footed ferret	<i>Mustela nigripes</i>	E	SC
Pygmy rabbit	<i>Brachylagus idahoensis</i>	SC	SC
<b>BIRDS</b>			
Whooping crane	<i>Grus americana</i>	E	E
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	SC
Greater sage-grouse	<i>Centrocercus urophasianus</i>	C	SC
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	SC	SC
Mountain Plover	<i>Charadrius montanus</i>	SC	SC
<b>PLANTS</b>			
Ute Ladies Tresses	<i>Spiranthes diluvialis</i>	T	N/A

See Key under Craters of the Moon

**Pygmy Rabbit:** Pygmy rabbits are widely distributed throughout southwest Wyoming but are found in uneven distribution at Fossil Butte. Pygmy rabbits are a sagebrush obligate species, dependent on the sage steppe community for life history requirements. The rabbits are found in old stands of sagebrush, with tall, large shrubs and dense canopy coverage.

At Fossil Butte, these habitat stands for pygmy rabbits tend to occur in deeper sandier soils (Weiss and Verts 1984; Heady, Gabler, and Laundre n.d. in NPS FOBU 2005:55-56). Their preferred habitat also has a higher component of dead shrubs when compared to other stands of sagebrush (Katzner and Parker 1997 in NPS FOBU 2005:55-56). According to the Fire Management Plan EA, a higher density of living and dead shrubs suggests that pygmy rabbit habitat could be more susceptible to fire than uninhabited stands of sagebrush. Shrub height, shrub density and soil depth varies considerably within and among stands of vegetation on the monument dominated by sagebrush.

The pygmy rabbit is believed to be highly susceptible to habitat fragmentation because of its inability to disperse over long distances and its reluctance to cross open spaces (Katzner and Parker 1997, and Weiss, and Verts 1984 in NPS FOBU 2005:55-56).

Higher numbers of pygmy rabbits have been observed where there was “taller denser sagebrush on mounded islands surrounded by an expanse of shorter sagebrush,” than “in the more homogenous sagebrush areas” (Roberts 2001:9 -10 in NPS FOBU 2005:55-56).

Bald Eagle: The nearest bald eagle nest is 1-2 miles from the monument.

Greater Sage-grouse: The greater sage-grouse (*Centrocercus urophasianus*) is another sagebrush obligate species of management concern at Fossil Butte NM, and elsewhere throughout its historical range. One lek complex has been identified in the monument.

Sage-grouse populations have declined significantly during the past 100 years (Braun 1998 in NPS FOBU 2005). Habitat loss from urban and agricultural development, overgrazing, altered fire regimes, and recreation appears to account for the population decline throughout much of the West (Miller and Eddleman 2001 in NPS FOBU 2005). In Wyoming, sage-grouse populations have declined by 30 percent since 1900 (BLM 2000, Wyoming sage-grouse working group 2003 in NPS FOBU 2005). The rate of decline across the species range has slowed significantly since 1986 (News release 2004 in NPS FOBU 2005). In Wyoming, the Game and Fish Department has lowered the daily bag limit (from three to 2) and possession limit (from four to three) for sage-grouse, but it still considers the population large enough to allow hunting (NPS FOBU 2005:55-56).

Habitat fragmentation and declining sage-grouse populations resulted in the filing of at least seven petitions to afford the sage-grouse protection under the Endangered Species Act (BLM 2003 in NPS FOBU 2005). On March 10, 2010, the USFWS concluded that the greater sage-grouse warrants protection throughout its range under the ESA but listing is precluded by higher priorities. The species was added to the list of candidate species. It would remain a species of management concern at Fossil Butte (NPS FOBU 2005:55-56).

Sage-grouse appear to require habitat comprising stands of sagebrush that vary considerably in species composition, age, structure, density, and coverage (Wyoming sage-grouse working group 2003; Miller and Eddleman 2001 in NPS FOBU 2005: 55-56). Winter habitat differs from summer habitat, breeding habitat, and brood-rearing habitat (Connelly, Schroeder, Sands 2000 in NPS FOBU 2005:55-56). Winter, nesting and brood-rearing habitat in the monument have not been delineated.

#### *Wyoming Plants of Special Concern*

The Wyoming Natural Diversity Database has identified the following six plants of special concern NPS FOBU 2005:10).

Sodaville Milkvetch (*Astragalus lentiginosus* var. *salinus*): This species is a short-lived perennial forb. Wyoming populations are found in big sagebrush communities on rocky clay slopes and ridges below rimrock at elevations of 6,540-6,800 feet. Population trends are unknown. Principal threats include soil displacement and compaction by off-road vehicles and competition from exotic species. The plant is regarded as a low conservation priority. The distributions of Sodaville milkvetch is unknown, but is believed to be rather widely distributed, with considerable habitat in the monument.

Martin Ceanothus (*Ceanothus martini*): This species is a non-thorny multi-branched low shrub. Wyoming populations occur on steep sagebrush slopes or mountain shrub communities on shallow-stony or hard clay soils at elevations of 7,600-8,080 feet. Population trends are not known. Principal threats include road construction, off-road vehicles and grazing. The plant is regarded as a low conservation priority. Martin ceanothus occurs in only one location on the monument.



Western Dodder (*Cuscuta occidentalis*): This species is a rootless, annual parasitic herb. Wyoming populations occur in mountain big sagebrush slopes or mountain shrub communities at elevations of 6,400-7,600 feet. Population trends are not known. Principal threats include efforts to eradicate agricultural pests. The plant is regarded as a low conservation priority. Only four small patches (<10 square feet/patch) of Western dodder have been observed on the monument.

Entire-Leaved Peppergrass (*Lepidium integrifolium* var. *integrifolium*): This peppergrass is a perennial forb. Wyoming populations occur in sparsely vegetated and seasonally wet clay flats, greasewood communities on clay hummocks, and moist alkaline meadows at elevations of 6,200-6,770 feet. Population trends are not known. Principal threats include human development. The plant is regarded as a high conservation priority. The distribution of entire-leaved pepperweed has been mapped.

Ternate Desert-Parsley (*Lomatium triternatum* var. *anomalum*): This species is a pubescent perennial forb. Wyoming populations occur on ridgetops or slopes of brown clay-humus soil at elevations of 7,850-8,080 feet. Population trends are not known. Populations may be moderately threatened by natural erosion and landslides. The plant is regarded as a medium conservation priority. The distribution of ternate desert-parsley is unknown, but is believed to be rather widely distributed, with considerable habitat in the monument.

Tufted Twinpod (*Physaria condensate*): This species is a prostrate, rosette-forming perennial forb, a narrow endemic of the southern Overthrust Belt and lower Green River Basin in southwest Wyoming. Populations occur on dry, rocky calcareous knolls and ridges, clay banks, and shaley hills in sparsely vegetated cushion plant communities in openings within sagebrush grassland at elevations of 6,700-7,400 feet. Population trends are apparently stable. Threats are apparently minimal, though development associated with mineral exploration may be a potential short-term threat. The plant is regarded as a high conservation priority. The locations of most occurrences of tufted twinpod are known.

There are also 34 species of migratory birds of special concern at Fossil Butte. See the Fire Management Plan for a list of these species identified by those that are known to occur in the monument and those that may occur and their habitats (shrub-steppe, mountain shrub, riparian, conifer, aspen, short-grass prairie, wetlands, shrub, prairie and juniper woodlands) (NPS FOBU 2005:74-75).

#### d. Golden Spike Special Status Species

Species	Scientific Name	Federal Status	Utah Status
<b>MAMMALS</b>			
Gray wolf	<i>Canis lupus</i>	E	E
Grizzly bear	<i>Ursus arctos</i>	T	T (Extirpated)
<b>BIRDS</b>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T
Greater sage-grouse	<i>Centrocercus urophasianus</i>	C	SP/SD
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	C	T
Whooping Crane	<i>Grus americana</i>	E Extirpated	Extirpated
<b>PLANTS</b>			
Passey Onion	<i>Allium passeyi</i>	C	G1/S1 Utah Natural Heritage Program
Deseret Milkvetch	<i>Astragalus desereticus</i>	T	T
Goose Creek Milkvetch	<i>Astragalus anserinus</i>	C	C
<b>MOLLUSKS</b>			
Fat-whorled Pondsnaill	<i>Stagnicola bonnevillensis</i>	C	N/A

See Key under Craters of the Moon

Gray Wolf: The gray wolf is extirpated from Golden Spike.

Grizzly Bear: The grizzly bear is extirpated from Golden Spike.

Bald Eagle: Annually, in November, hundreds of bald eagles fly into Utah and stay until the ice starts to melt in March. Bald eagles can be seen at Golden Spike but are not known to nest.

Greater Sage-grouse: The greater sage grouse (*Centrocercus urophasianus*) is not known to occur in Golden Spike.

Passey Onion: The Passey onion (*Allium passeyi*) is known only to occur in Box Elder County. Because it is endemic to such a small area it has been proposed as endangered on the Federal Register since 1976 but has not yet been listed.

#### e. Grant-Kohrs Special Status Species

Based on the preliminary Section 7 consultation with the USFWS, there are two federally-listed species that may occur at Grant-Kohrs. According to the consultation letter, the USFWS has determined that bull trout (*Salvelinus confluentus*) and gray wolves (*Canis lupus*) from the Yellowstone nonessential experimental population may be present in the vicinity of the Grant-Kohrs Ranch National Historic Site. The letter states that “For Section 7 consultation purposes wolves designated as nonessential experimental population that are within the boundaries of any unit of the National Park or National Wildlife Refuge systems are treated as a threatened species. As such, the Section 7 procedures for listed species would apply to federal actions within National Parks and National Wildlife Refuges.”

Species	Scientific Name	Federal Status	Montana Status
<b>MAMMALS</b>			
Grizzly Bear	<i>Ursus arctos</i>	T	LT
Gray Wolf	<i>Canis lupus</i>	T	LT
<b>BIRDS</b>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	
Golden Eagle	<i>Aquila chrysaetos</i>	SC	SC
Great Blue Heron	<i>Ardea herodias</i>		SC
Bobolink	<i>Dolichonyx oryzivorus</i>	SC	SC
Lewis' Woodpecker	<i>Melanerpes lewis</i>	SC	SC
<b>FISH</b>			
Bull Trout	<i>Salvelinus confluentus</i>	T critical habitat	LT, CH
Western Cutthroat Trout	<i>Oncorhynchus clarki lewisi</i>		SC
<b>AMPHIBIANS</b>			
Western Toad	<i>Bufo boreas</i>		SC

See Key under Craters of the Moon

Gray wolf / Grizzly Bear: Gray wolf and grizzly bear are most likely incidental and transient visitors to the Deer Lodge valley. Suitable habitat does exist for these species in the surrounding mountains. Elk calving grounds along the Flint Creek Range west of the park provide a seasonal food source. But because of distance to cover (over five miles) and human disturbance and activity in and around the park, it is a very low probability that these species would be found in the park (NPS GRKO 2004). The park is within both the central Idaho and Yellowstone nonessential experimental population areas. The central Idaho experimental population area includes portions of Idaho south of Interstate 90 and west of Interstate 15. It also includes a corner of Montana south of Interstate 90, east of Highway 93 as it runs south of Missoula, south of Highway 12 to Lolo pass, and west of Interstate 15. The Yellowstone experimental



population area includes the entire State of Wyoming, a portion of southeastern Idaho east of Interstate 15, and a portion of Montana east of Interstate 15 and south of the Missouri River. There is one known sighting of a lone gray wolf near the site's northern boundary in 2008 (RIPES evaluator Dr. Paul Hansen verbal communication with Superintendent Rotegard).

Bald Eagle: The bald eagle is documented as a common year-round inhabitant. It has been observed perching, roosting, and foraging but no nests are known to exist (Arends 2001 in NPS GRKO 2004). Important habitat elements include large cottonwood trees, open water along the Clark Fork River, proximity to calving grounds in the neighboring range and mountains, and distance from human activity. Nesting and winter concentration areas exist about 25 mi downstream between Flint Creek and Hoover Creek along the Clark Fork River.

Bull Trout: Bull trout are members of the family Salmonidae and are native to the Pacific Northwest and western Canada. Because bull trout are not anadromous, the USFWS has the responsibility under the ESA for the bull trout. On July 10, 1998, USFWS listed the Klamath and the Columbia River bull trout population segments as threatened (63 FR 31647) and the species was listed as threatened for the coterminous United States on November 1, 1999 (64 FR 58909).

The MDFWP recognizes the portion of the Clark Fork River crossing Grant-Kohrs Ranch as a bull trout fishery. Before mining activity in the Upper Clark Fork River, the potential for viable bull trout fishery was likely quite high. But metals toxicity and sedimentation of streams by mining wastes greatly reduced habitat quality. Fish population surveys conducted between 1979 and 1983 encountered no bull trout at stations above and below park (Knudson 1984). Fish population data cited by MDFWP (2002) indicate incidental bull trout occurrence along the Clark Fork River crossing the park with unknown use. Cold-water tributaries to the Clark Fork River (the Blackfoot River and Rock Creek) represent the extent of greatest bull trout populations in the upper Clark Fork basin (NPS GRKO 2004). In a phone conversation with Jason Lindstrom (September 3, 2010), MDFWP area fish biologist, he indicated that in current sampling work that bull trout have not been detected along the Clark Fork River passing through the park. He did indicate that bull trout have been detected downstream at Jens and that there is a viable population in Warm Springs Creek.

Birds: The Montana Partners in Flight (MTPIF) Bird Conservation Plan (Young 2000) lists the following 27 species, which were detected at Grant-Kohrs during surveys, as "Priority Level II" or "Priority Level III" for conservation needs in Montana: Bald Eagle, Northern Harrier, Swainson's Hawk, Killdeer, Greater Yellowlegs, Spotted Sandpiper, Long-billed Curlew, Long-billed Dowitcher, Wilson's Snipe, Wilson's Phalarope, Red-necked Phalarope, Red-naped Sapsucker, Downy Woodpecker, Willow Flycatcher, Least Flycatcher, Cassin's Vireo, Warbling Vireo, Gray Catbird, MacGillivray's Warbler, Clay-colored Sparrow, Song Sparrow, Lazuli Bunting, Bobolink, Red-winged Blackbird, Yellow-headed Blackbird, Brewer's Blackbird, and Cassin's Finch. As of February 2010, the Montana Natural Heritage Program (MNHP) lists the following birds indicated as "present" in the 2005 Grant-Kohrs report as species of concern (SOC): Golden Eagle, Great Blue Heron, Bobolink, and Bald Eagle. Lewis's Woodpecker is also listed by MNHP as a SOC and is indicated as "probably present" in the 2005 Grant-Kohrs report.

Amphibians: The MNHP also lists the western toad (*Bufo boreas*) as a SOC. As noted earlier, western toads were confirmed breeders in 1-2 sites in a survey of 12 park wetlands in 2001-2002.

Other Fish: The MNHP lists Westslope Cutthroat Trout and Bull Trout as species of concern (SOC). Although both have been identified in Powell County, neither was identified in the 2002 park fish inventory.

Plants: There are currently no special status plants within the park.

#### f. Hagerman Fossil Beds Special Status Species

One federally-listed species and six federal species of special concern occur at the park. Another four species have been identified by the Idaho Native Plant Society as of special concern. One state-listed endangered species, the peregrine falcon, is known to regularly migrate through the monument but is not known to nest.

Species	Scientific Name	Federal Status	Idaho Status
<b>BIRDS</b>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	SC
Peregrine Falcon	<i>Falco peregrinus anatum</i>	SC	SC
<b>FISH</b>			
White Sturgeon	<i>Acipenser transmontanus</i>	SC	SC
<b>INVERTEBRATES (FRESH WATER SNAILS)</b>			
Desert Valvata	<i>Valvata utahensis</i>	SC	
Snake River Physa	<i>Physa natricaria</i>	SC	
Bliss Rapids Snail	<i>Taylorconcha serpenticola</i>	SC	
Idaho springsnail	<i>Pyrgulopsis idahoensis</i>	SC	
Lanx	<i>Lanx sp.</i>	SC	

See Key under Craters of the Moon

**White Sturgeon:** “The Snake River population in Idaho is found in the Snake and Salmon rivers. In the Snake River, individuals range upstream to Shoshone Falls and have been introduced below American Falls dam. Although there are no barriers on the Salmon River, the white sturgeon is rarely seen above the North Fork Salmon River. In Idaho, the 2 viable populations are located between Bliss and C. J. Strike dams and from Hells Canyon Dam downstream to Lower Granite Dam in Washington (IDFG in preparation). Recent estimates of numbers of fish over 0.6 m (two ft.) in the two reaches are 2700 and 3600, respectively. Populations in other reaches of the Snake River are small”

([http://fishandgame.idaho.gov/cms/tech/CDC/cwcs\\_appf/White%20Sturgeon%20\(Snake%20River%20System\).pdf](http://fishandgame.idaho.gov/cms/tech/CDC/cwcs_appf/White%20Sturgeon%20(Snake%20River%20System).pdf))

**Mollusks:** The decline of the aquatic mollusk species has been primarily attributed to changes in the river from free-flowing, cold water to impounded, slower, warmer water habitats (USFWS 1995 in NPS GRKO 2003:37). Elements threatening or limiting the quality of habitat include: increasing water temperatures, decreasing water quality through lower dissolved oxygen and sedimentation, and pollutants (Weigel 2002 in NPS 2003:37). Another variable is the population increase of nonnative invasive aquatic species such as the New Zealand mudsnail (*Potamopyrgus antipodarum*), which has been found 70 miles upstream from the monument at Lake Walcott. This species, which shows an increasing population, poses a potential threat to the five endemic snail species that are listed as endangered or threatened (Weigel *et al.* 2002 in (NPS 2003:30).

**Plants:** There are currently no federally-listed plants within the park. Four species currently or formerly identified as sensitive by the Idaho Native Plant Society occur in the monument:

Plant Species	Scientific Name
Swamp milkweed	<i>Asclepias incarnate</i>
Mourning milkvetch	<i>Astragalus atratus</i> var. <i>ophiogenes</i>
Packard's buckwheat	<i>Eriogonum shockleyi</i> var. <i>packardeae</i>
no common name	<i>Mentzelia torreyi</i> var. <i>acerosa</i>

#### g. Little Bighorn Special Status Species

In the response to initial consultation under Section 7, the USFWS noted that “Considering the location of the Little Bighorn Battlefield . . . the Service does not anticipate the occurrence of any federally-listed threatened endangered, candidate or proposed species at those sites (USFWS 2008).

The following summary was taken from the RMP (NPS LIBI 2007: 24):

No formal survey by the Fish and Wildlife Service and the Montana Heritage Program has been done at the monument for flora or fauna rare species. Comprehensive inventories of flora have been completed (Bock *et al.* 1987), including a vegetation survey (Simonson 2001), and a survey of vascular plants and birds (Bock and Bock 2006).

Although informal surveys for bald eagles and whooping cranes have been conducted, none have been detected. There are no bald eagle nests on the Little Bighorn River (Hanebury, pers. comm.). In addition, although it is unlikely that the black-footed ferret would inhabit the 17-acre prairie dog town adjacent to the park, the USFWS is working with the Crow Tribe to manage a potential future release of ferrets in Big Horn County (Hanebury, pers. comm.).

In past EAs, analysis of the likelihood of park use by whooping cranes, bald eagles and other sensitive species was analyzed.

Whooping Cranes: Whooping cranes could use the nearby Little Bighorn River riparian area as potential stopover or foraging habitat, however, use of the area is unlikely due to the presence of Interstate 90 to the west and heavy use of areas to the east by tourists (NPS LIBI 2005a:11).

Bald Eagles: Bald eagles may fly over the park, but they are unlikely to forage or remain in the immediate project area due to high disturbance factors from foot and automobile traffic within the monument (NPS 2005: 11). No suitable bald eagle nesting habitat exists within the project area, and no known bald eagle nest sites exist within 0.5 miles of the project area (NPS LIBI 2005a:11).

State-Listed Mammals: Several state-listed species of concern occur within the monument and may breed within and adjacent to the project area, including black-tailed prairie dog, hoary bat, Merriam's shrew, and meadow jumping mouse. The black-tailed prairie dog was removed from federal candidate status on August 12, 2004.

State-Listed Birds: Several state-listed species of concern occur within the monument and may nest within and adjacent to the project area, including Swainson's hawk, burrowing owl, Brewer's sparrow, Columbian sharp-tailed grouse, grasshopper sparrow, lark bunting, and Long-billed curlew (NPS LIBI 2005a:12). (Note: lark bunting is no longer on the state list.) Based on past projects, if active nests are located within 0.5 miles of the project area seasonal restrictions on construction activities would be implemented to minimize / mitigate direct impacts to nests or individuals. A nesting population of Great Blue Herons (*Ardea herodias*) occurs on the Little Bighorn River floodplain within Custer battlefield.

State-Listed Amphibians and Reptiles: A population of horned lizard occurs at Weir Point in the study area according to park personnel (NPS LIBI 2005a:12). This is the only known population of this species in the park. Based on past projects, this area would be avoided to the extent possible and activities conducted during spring or fall to minimize impacts during the breeding season for this species.

State-Listed Vascular Plants: Currently, there are no state-listed plant species of concern within the monument.

Species	Scientific Name	Federal Status	Montana Status
<b>MAMMALS</b>			
Black-footed ferret	<i>Mustela nigripes</i>	E	LE
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>		SC
Merriam's shrew	<i>Sorex merriami</i>		SC
Meadow jumping mouse	<i>Zapus hudsonius</i>		SC
<b>BIRDS</b>			
Whooping crane	<i>Grus americana</i>	E	LE

Grasshopper sparrow	<i>Ammodrammus savannus</i>		SC
Great Blue Heron	<i>Ardea herodias</i>		SC
Sharp-tailed grouse	<i>Tympanuchus phasianidae</i>		SC
Veery	<i>Catharus fuscescens</i>		SC
Bald eagle	<i>Haliaeetus leucocephalus</i>	DL	SC
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	SC
Brewer's sparrow	<i>Spizella breweri</i>		SC
<b>AMPHIBIANS</b>			
Northern leopard frog	<i>Rana pipiens</i>		SC
Plains spadefoot	<i>Spea bombifrons</i>		SC
<b>REPTILES</b>			
Snapping turtle	<i>Chelydra serpentina</i>		SC
Western hog-nosed snake	<i>Heterodon nasicus</i>		SC
Greater short-horned lizard	<i>Phrynosoma hernandesi</i>		SC
Common sagebrush lizard	<i>Sceloporus graciosus</i>		SC

See Key under Craters of the Moon

#### **h. Minidoka Special Status Species**

Based on consultation with the USFWS, two federal species of concern could occur within the vicinity of Minidoka.

**Pygmy Rabbit:** During consultation for the GMP (NPS MIIN 2005), the NPS also contacted the Idaho Conservation Data Center to request a list of plant and animal species of special concern that could be located in or near the national monument. The Conservation Data Center collects and maintains data about the occurrence of plant and animal species considered important to Idaho's biological diversity. This information indicated that the national monument is within the known range of the Pygmy rabbit (*Brachylagus idahoensis*). This Idaho species of special concern is ranked by the BLM as imperiled range wide (Type 2) due to loss of critical habitat. Pygmy rabbits are generally limited to areas on deep soils with tall, dense sagebrush which they use for cover and food (Green and Flinders 1980 *in* NPS MIIN 2005). Individual sagebrush plants in areas inhabited by pygmy rabbits are often six feet or more in height (Flath 1994 *in* NPS MIIN 2005). Although within the range of the Pygmy rabbit, the national monument does not provide suitable habitat and is therefore highly unlikely to support populations of this species.

**Greater Sage-Grouse:** The national monument is also located within the historical range of the greater sage-grouse, a species that has been petitioned for federal listing under the Endangered Species Act and that is designated by the BLM as a sensitive species. Many populations of this species have declined dramatically in last few decades. Sage-grouse, however, are dependent on large acreages (i.e., hundreds of thousands of acres) of sagebrush-grassland habitats that have a 15 to 25 percent sagebrush canopy cover and good grass and forb cover (flowering herbaceous plants) (IDFG 1997 *in* NPS MIIN 2005). As a result, Minidoka does not provide suitable habitat for this species.

#### **i. Nez Perce: Bear Paw Special Status Species**

In the response to initial consultation under Section 7, the USFWS noted that "Considering the location of the . . . Nez Perce National Historical Park, Bear Paw Battlefield Site, the Service does not anticipate the occurrence of any federally-listed threatened endangered, candidate or proposed species at those sites (USFWS 2008). There are no federal or state listed or candidate species that occur at Bear Paw Battlefield.

#### **j. Nez Perce: Big Hole Special Status Species**

Five federally-listed species and one candidate species could potentially occur within Big Hole, although they are not known to reside there. There are also a number of species that have been identified as sensitive by the USFWS, State of Montana or the park.

Species	Scientific Name	Federal Status	Montana Status
<b>MAMMALS</b>			
Grizzly Bear	<i>Ursus arctos</i>	T	LT
Gray wolf	<i>Canis lupus</i>	T	LT
Canada lynx	<i>Lynx canadensis</i>	T	LT
Swift fox	<i>Vulpes velox</i>		SC
<b>BIRDS</b>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	SC
Mountain plover	<i>Charadrius montanus</i>	SC	SC
Great gray owl	<i>Strix nebulosa</i>	SC	SC
Boreal owl	<i>Aegolius funereus</i>	SC	SC
<b>FISH</b>			
Montana arctic grayling	<i>Thymallus arcticus</i>	T	SC
Westslope cutthroat trout	<i>Oncorhynchus clarki lewisi</i>		SC
<b>AMPHIBIANS</b>			
Western toad	<i>Bufo boreas</i>	SC	SC
<b>PLANTS</b>			
Ute ladies' tresses	<i>Spiranthes diluvialis</i>	T	
Lemhi penstemon	<i>Penstemon lemhiensis</i>		W
Camas	<i>Camassia quamash</i>	PSC	

See Key under Craters of the Moon

Grizzly Bear: On March 22, 2007, the USFWS announced that the Yellowstone Distinct Population Segment of grizzly bears is a recovered population no longer meeting the ESA's definition of threatened or endangered, and as such the species was delisted (72 FR 14866). There has been no incidental or confirmed observations of this species at the park.

Gray Wolf: During scoping the USFWS noted that the gray wolf was the only listed species known from Big Hole. For Section 7 consultation purposes wolves designated as nonessential experimental populations that are within the boundaries of any unit of the National Park or National Wildlife Refuge systems are treated as a threatened species. The Rocky Mountain gray wolf is also listed by the Montana Natural Heritage Program as "species of special concern."

The proposed action occurs within both the central Idaho and Yellowstone nonessential experimental population areas. The central Idaho experimental population area includes portions of Idaho south of Interstate 90 and west of Interstate 15. It also includes a corner of Montana south of Interstate 90, east of Highway 93 as it runs south of Missoula, south of Highway 12 to Lolo pass, and west of Interstate 15. The Yellowstone experimental population area includes the entire State of Wyoming, a portion of southeastern Idaho east of Interstate 15, and a portion of Montana east of Interstate 15 and south of the Missouri River.

Canada Lynx: There has been no incidental or confirmed observations of this species at the park.

Swift Fox (*Vulpes velox*): Swift fox inhabit open prairie and arid plains, including areas intermixed with winter wheat fields in north-central Montana. They use burrows when they are inactive; either dug by themselves or made by other mammals (marmot, prairie dog, badger). The burrows are usually located in sandy soil on high ground such as hill tops (Pruss 1999) in open prairies, along fencerows, or occasionally in a plowed field. An individual may use several different dens throughout the year.

A statewide assessment of swift fox habitat was conducted by the DFWP in May 1994 to identify large blocks of prairie grassland. Suitable swift fox habitat was generally defined as extensive in size (preferably over 100,000 acres), with relatively level topography, and with greater than 50 percent of the area



undisturbed by agriculture. A total of 8,000,000 suitable acres were identified in Montana (Giddings and Knowles 1995).

Swift fox were thought to be common on the eastern plains of Montana in the early 1900's but were exterminated and believed to be extinct in the state by 1969 (Hoffmann *et al.* 1969). Sporadic observations throughout eastern Montana have been recorded since 1969 and reintroductions of swift fox on the Blackfoot Indian Reservation in northwestern Montana in 1998 (Foresman 2001) and in southern Saskatchewan and Alberta from 1983 to 1991 are thought to be the source of many of these sightings. These populations continue to expand to the south and east in Montana. Recent surveys in Montana have documented swift fox in many of the counties bordering Canada in north-central Montana (Moehrenschrager and Moehrenschrager 2001). There were no confirmed observations of this species at the park in the mammal inventory of 2002.

Bald Eagle: This species (*Haliaeetus leucocephalus*) may be periodically seen in the park, but does not nest and is not a resident. The lack of habitat types and suitable nesting trees do not provide the resources necessary to facilitate long-term occupation and nesting opportunities. Most management actions regarding the bald eagle have been directed toward the protection of nests and communal roosts (see Buehler 2000). Management for this species within the park is focused on the winter needs of bald eagles. Winter habitat suitability for bald eagles is defined by food availability, the presence of roost sites that provide protection from inclement weather, and the absence of human disturbance (Buehler 2000).

Mountain Plover (*Charadrius montanus*): No management activities in Montana specific to Mountain Plover are regulated. However, the unifying habitat features desirable to Mountain Plovers are extremely short vegetation, a high percentage of bare soil, and an extensive area (0.5 to 1 km diameter) of nearly level terrain (Knowles and Knowles 1997). Management practices should emulate these parameters. Population estimates for Montana range from 750 to 2820 (FaunaWest Wildlife Consultants 1991). The species is ranked #1 in conservation effort needs for Montana (Carter and Barker n.d.), and is a Species of Management Concern in Region 6 (USFWS 1995). There have been no confirmed observations of this species at the park since 2002.

Great Gray Owl (*Strix nebulosa*): Little specific habitat information for Montana is currently available, because systematic surveys for great gray owls have not been done. Great gray owls are known to use lodgepole pine/Douglas-fir in Montana. Habitat information from other great gray owl sources state that their habitat is dense coniferous and hardwood forest, especially pine, spruce, paper birch, poplar, and second-growth, especially near water. They forage in wet meadows, boreal forests and spruce-tamarack bogs in the far north, and coniferous forest and meadows in mountainous areas.

No known active management is ongoing for great gray owls in the state. Habitat management, when conducted should take into account a long-term view of forest succession and consider landscape and regional forest patterns. Because of the owl's large home range, management must be coordinated among administrative units to maintain links between interacting biological units (Hayward and Verner 1994).

During the 2002 bird survey at the park, tape playbacks were used to find a few target species including the great gray owl. None were detected during tape playbacks.

Boreal Owl (*Aegolius funereus*): Boreal owl habitat is high elevation spruce/fir forest, with lodgepole pine sometimes present. Mature spruce/fir forests with multilayered canopies and a highly complex structure, at elevations greater than 1500m with a mosaic of openings or meadows (Hayward 1989). In central Idaho, owls nested in mixed conifer (40 percent), spruce-fir (18 percent) Douglas-fir (21 percent) and aspen stands (21 percent) (Hayward 1989). One nest in MT was found in a dead broken-topped subalpine fir; nest opening measured 73X64 mm (Holt and Ermatinger 1989). Nests in MT have been exclusively lodgepole pine and spruce fir; no owls were found below 1292m in MT or ID (75 percent occurred above 1584m) (Hayward and Verner 1994).



During the 2002 bird survey at the park, tape playbacks were used to find a few target species including the boreal owl. None were detected during tape playbacks.

Montana Arctic Grayling: The Montana arctic grayling (*Thymallus arcticus*), a threatened aquatic species, occurs in the North Fork in Big Hole (MDFWP 2004 *in* NPS BIHO 2005). The Montana arctic grayling population inhabits all of the Big Hole River and its tributaries, with spawning densities the highest in the main stem of the river around Wisdom (Byorth 1996). This population in the Big Hole River and its tributaries is the only location this species is found in the lower 48 states.

Westslope Cutthroat Trout: These fish (*Oncorhynchus clarki lewisi*) occur within Ruby Creek, Trail Creek, and the North Fork, so they may also be present in Big Hole.

Western Toad: The western toad (*Bufo boreas*) is listed by the Montana Natural Heritage Program as species of special concern. The western toad was documented with incidental observations in a 2002 herpetological study. One individual western toad was found in tall sedges near an oxbow of the Big Hole River. This species was observed twice during the 1987 inventory conducted by Van Sickle. This species appears to be rare in the battlefield.

Ute Ladies' Tresses (*Spiranthes diluvialis*): This species may occur within the park but has not been found (Wilson 2005 *in* NPS BIHO 2005).

Lemhi Penstemon (*Penstemon lemhiensis*): A short-lived perennial forb, this species is endemic to Lemhi County in eastern Idaho and to four counties in southwest Montana, including Beaverhead County where Big Hole is located. The species is known from only 191 occurrences, 102 of which are in Idaho, and 89 are in Montana. Over 50 percent of these populations are made up of 30 plants or less. There are only three large populations with over 300 plants. One of these occurs in Big Hole and it may be the largest known population of the species. Lemhi penstemon is listed as a sensitive species by the USFS and BLM, and is ranked G3 and S3 (rare but not imperiled with 21-100 occurrences in the state) by the MNHP. The species has reportedly been in decline throughout its range, and is facing threats from altered fire regimes and invasion by spotted knapweed. The species requires bare soil microsites to become established and prescribed burning has been demonstrated to be effective in stimulating germination and population growth. Given the large, globally significant population size at Big Hole, and the potential declines reported elsewhere in the species' range, documenting the distribution and abundance of Lemhi penstemon at Big Hole is important, and would support more informed management decision-making.

In 2009, inventory and monitoring teams completed samples of 75 quadrats in each sampling frame over the course of two days in Lemhi penstemon habitat. Survey teams encountered spotted knapweed in only one quadrat on the upper portion of the Howitzer Hill, containing 29 plants. Scattered patches of spotted knapweed were found on other roadcuts in the battlefield but the species was not found elsewhere in the vicinity of *P. lemhiensis*. The teams provided UTM coordinates of spotted knapweed patches to the park resource manager immediately upon conclusion of the survey.

Heidel and Shelly (2001) demonstrated a strong positive response in several study populations to prescribed burning, and also recounted an anecdotal observation of the Big Hole populations during the 1990's responding to a prescribed burn with a substantial increase in the number of plants. Results from 2009 suggest that the Big Hole populations remain concentrated on steep slopes and along the old roadcut where slope movements maintain open microsites, and that it may be vulnerable to grass and shrub canopy closure over time, as well as to new weed colonizers. This is potentially the greatest current threat to the Big Hole population. The distribution and abundance of spotted knapweed, however, does not seem to pose a threat to *P. lemhiensis* at this time.

Camas: This species (*Camassia quamash*) is a bulb-producing lily that was one of the most widely utilized plant foods of the Nez Perce people. At Big Hole it is an inventory and monitoring program vital sign. Camas was also a focal resource at many of the significant historical events memorialized by Big Hole

National Battlefield and Nez Perce National Historical Park. The battle at Big Hole occurred at a traditional Nez Perce camas harvesting campsite. Camas is therefore a central element of the cultural landscape at Big Hole.

Annual monitoring of camas is conducted to help park staff better understand the status and trends of plant populations and, in turn, make informed decisions about resource management and restoration. Competition from invasive weed species, particularly thatch-building grasses such as timothy (*Phleum pratense*), is a likely stressor on camas populations at Big Hole. Some other nonnative plants may also produce undesirable shifts in prairie plant vegetation, including a reduction in camas.

## **C. Cultural Resources**

Cultural resources include archeological resources, historic structures, cultural landscapes and ethnographic resources and museum objects (which were considered but dismissed as impact topics).

### **1. Prehistoric and Historic Archeology**

#### **a. City of Rocks Archeology**

Southern Idaho, including the City of Rocks area, was occupied by big-game hunters near the end of the Pleistocene. By about 7,500 years ago, inhabitants are known as the Desert Culture of the Archaic Period and depended on seed and root gathering, including grinding. Just east of City of Rocks, during this same period, a rock shelter documents a dependence on sheep and bison hunting.

By about 4,500-5,000 years before the present, there is evidence of village life in pit houses along the Snake River and partial reliance on salmon. The closest villages (near Twin Falls) were a three to four day walk from City of Rocks.

Between 1,000 and 2,000 years ago, lifestyles may have been more sedentary and could have included crop-growing as documented by pottery from Fremont cultures in Utah found mixed with Shoshoni pottery, including at three sites within the reserve.

By the time of British and American contact, there was a band of Northern Shoshone whose range included the City of Rocks area and who were known to harvest pine nuts from the area to supplement their diet of hunting, fishing and gathering.

More than 60 archeological sites have been documented in the reserve. Some of these sites have been damaged by vandalism, grazing, and development. As of the 1994 Comprehensive Management Plan, no systematic archeological survey had been conducted; therefore, the number of known sites is likely to increase.

#### **b. Craters of the Moon Archeology**

Both the Great Rift Zone and sagebrush steppe ecosystem contain a wealth of cultural resources dating back to the last volcanic eruptions, which were likely witnessed by the Shoshone people (NPS CRMO 2005:6). There are approximately 85 known, recorded cultural resource sites in the monument, representing a variety of types and chronological periods, with artifacts from at least 8,000 years ago to the present. Prehistoric use, dating to 9,600 years ago, has been documented at nearby sites on the Snake River Plain. Prehistoric sites in the monument include lithic scatters, rock shelters, rock features, and pictographs. Near the north end of the monument, it is likely that stone quarry tool sites may also be found. Little work, however, has been done to synthesize the results of existing finds or to provide a comprehensive framework for understanding the sites (NPS CRMO 2005:145).