

Chapter 3.0 – Affected Environment

This chapter describes only those aspects of the environment affected by the alternatives. The focus is on resources identified as issues through public scoping.

Considered in concert, the past and present activities help to shape the current environment of the project area (*see* Figure 4).

The affected environment described is based on the needs of the specific resources involved. Fire and fuel loading used an area of about 49,000-acres to evaluate fire based on vegetation and fire regimes. For wildlife and wildlife habitat, a 14,105-acre diversity unit was used in the analysis. Soils and aquatic resources were most logically analyzed from a watershed perspective and the 25,162-acre Bald Ridge Analysis Area 001 watershed was used (reference 115).

3.1 Health and Safety/Issue: Air Quality and Control of Wildland Fire

The North Absaroka and Absaroka-Beartooth Wilderness Areas and Yellowstone National Park are designated Class I airsheds. The closest local communities that are in a northeastern down-wind direction of the projects are Clark, Wyoming (approximately 10 miles) and Belfry and Bridger, Montana (>50 miles).

There is a health and safety threat due to the fuels buildup in the areas and lack of defensible fire breaks. The highest risk is of a wildland fire burning out of the wilderness and threatening high use areas, resource values and life and property.

3.2 Aesthetics/Issue: Visual Quality and Recreation

The Chief Joseph Highway is a designated State Scenic Byway across National Forest System lands. This designation is an indicator that scenic resources along these routes are especially attractive and important to the public.

Much of the scenic landscape has experienced fire exclusion from past fire suppression policies, causing an altered landscape that is not obvious to casual viewers because the landscape may still present a natural appearance. The Visual Management System establishes allowable levels of human-caused change to the scenic environment. This system is used to plan project activities in order to keep visual impacts within varied levels of acceptable change. The visual quality objectives involved with the project are retention and partial retention.

For retention, the objective allows management activities that are not visually evident. Activities may only repeat form, line, color, and texture that are frequently found in the characteristic landscape. Changes in size, amount, intensity, direction, pattern, etc. should not be evident.

Partial retention allows management activities that remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, and texture common to the characteristic landscape but changes in the qualities of size, amount, intensity, direction, pattern, etc. remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color,

or texture that are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape.

In the Bald Ridge project area, the visual quality objective is retention. The current condition of the vegetation is outside this objective due to the expansive area of dead and dying trees. In the last decade, disease has killed large areas of limber pine along the highway. Over time, these same dead trees will begin falling to the ground, contributing to fuel accumulations and a further decline in aesthetics.

In the Dead Indian project area the visual quality objective is retention and partial retention. None of the units are readily visible from the highway.

Forest Plan direction states that when management activities alter a landscape, visual quality objectives must be met within one full growing season after completion of a project, excepting those projects having the objective of visual enhancement. This is a primary long-term objective of the Bald Ridge project as stated in Section 1.3 Purpose and Need.

Recreationists, particularly big game hunters, utilize the area for hunting. Between bow and rifle hunting seasons, the area is open most of the fall for different species (approximately September through October).

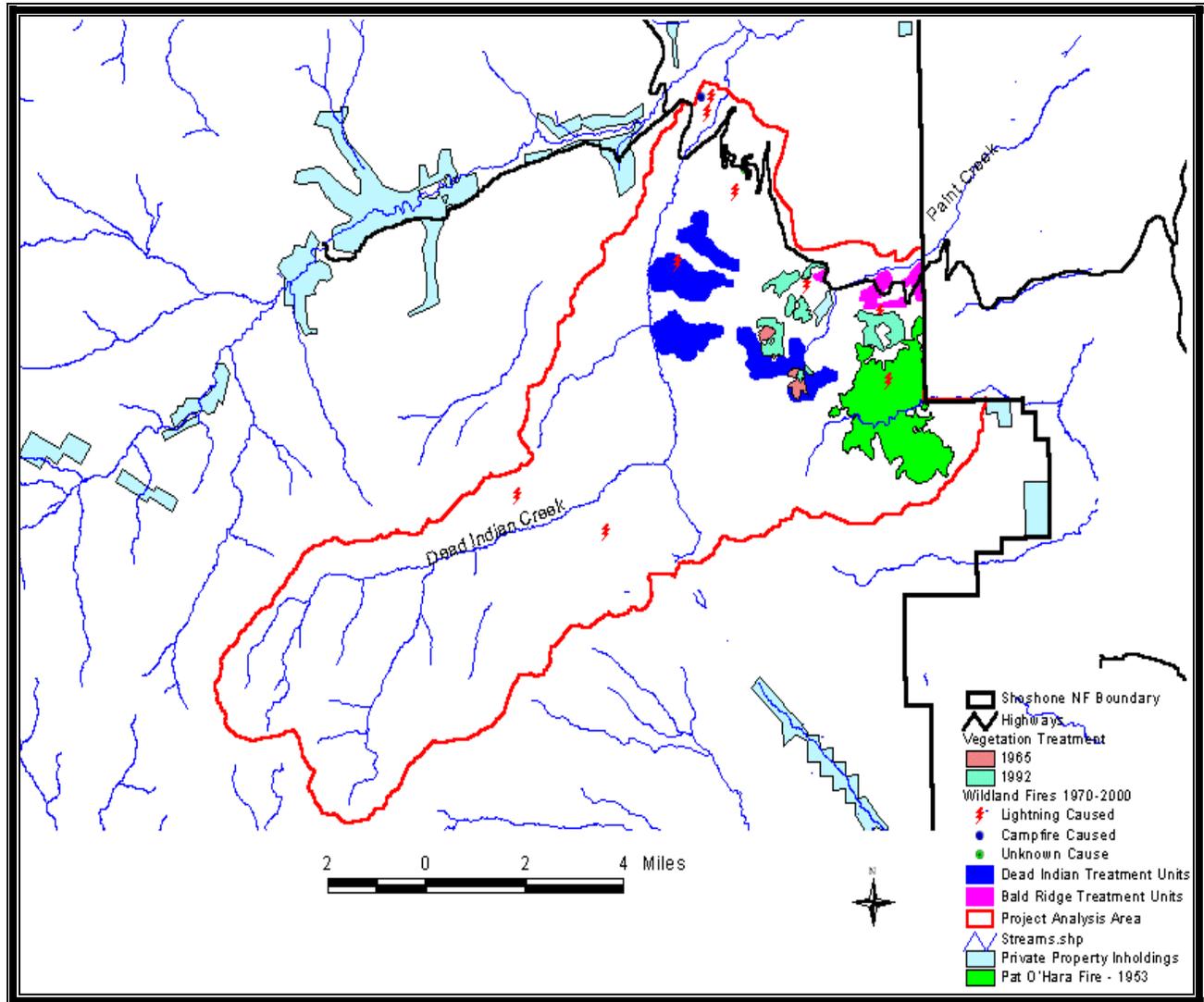


Figure 4 – Current Environment

3.3 Vegetation/Issue: Vegetation, Fire History, and Fuel Loading

Two factors are discussed in relation to vegetation: habitat type and fire groups. Habitat type refers to a land area potentially capable of producing similar plant communities at climax. Expected vegetation composition information and associated fire effects can be inferred from this information (reference 137). Fire groups are an aggregation of habitat types that associate the relationships of major tree species to fire, forest fuels, the natural role of fire, vegetation succession, and fire management considerations (reference 127). Fuel models were developed in the early 1970s to give an indication of the expected fire behavior with a wildfire under various weather, fuel, and topographical conditions (reference 157). The combination of this information provides valuable information to the land manager in assessing fire effects.

The area used for the fire and fuels analysis for these two projects contains approximately 49,000 acres. Open grassy meadows, bare soil and rocky bluffs occurring mostly along ridges occupy approximately 30% of the area and timber stands of varying density in mid to late seral stages occupy approximately 70%. Table 1 shows the species composition.

Table 1 Tree Cover Composition

Species	Percentage
Douglas-fir	43%
Spruce/fir	40%
Lodgepole	14%
Whitebark pine	2%
Limber pine	1%

3.3.1 Vegetation

Potential vegetation types (habitat types) are used to designate sites with similar environmental and biotic conditions. They are an expression of the biotic potential of a site, regardless of the current successional vegetation that might be occupying the site. The interactions of the site with the local climate influence the potential vegetation the site can support.

The primary forest vegetation types within the treatment areas include habitat types from the Douglas-fir (*Pseudotsuga menziesii*), Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*), lodgepole (*Pinus contorta ssp. latifolia*), whitebark pine (*Pinus albicaulis*) and limber pine (*Pinus flexilis*) series.

The primary non-forest vegetation types include habitat types from the Idaho Fescue and Mountain Big Sagebrush Series (reference 113). The mountain big sagebrush (*Artemisia tridentate vaseyana*) type in the area is limited, which was identified as a concern. It is an important habitat component for many species, and especially for mule deer within the project area. Sagebrush, as with any timber or shrub component has characteristics associated with differing seral stages (age classes) that are important to wildlife. The majority of sagebrush stands in this area are old decadent stands.

Relatively small areas of the Idaho fescue / Bluebunch wheatgrass habitat type and minor inclusions of the Shrubby Cinquefoil (*Potentilla fruticosa*) / Idaho fescue type occur in swales and areas of moist soils (reference 113).

Past and present activities helped to shape the existing vegetation. The timber stands in the analysis area are variable in age, ranging from 25 to 250 years. The variation in age can be attributed to past vegetative silvicultural treatments and past fire history.

Approximately 700 acres, 2% of the analysis area, has had various silvicultural treatments over the last 40 years. In the early 1960s, 120 acres were clearcut in the upper portion of Dry Fork of Paint Creek and pre-commercial thinned in 1999. In 1994, 579 acres were cut utilizing shelterwood/overstory removal (554 acres) and clear-cut (25 acres) silvicultural treatments within Dry Fork of Paint Creek and Paint Creek. In addition to the commercial treatments, personal use firewood cutting has been occurring within 300 feet of the roads in the analysis area.

White pine blister rust is killing limber pine stands in the Bald Ridge project area. Currently >50% of the limber pine in the project area is infested with the rust and in various stages of dying.

Fire Groups. Fire groups are groupings of habitat types that respond similarly to fire disturbances. Fire groups describe the natural role of fire following a sequence from low to high elevations. Forest plant communities are maintained or change through time and space in response to their associated fire regime. A fire regime is defined by the amount of time between fires (frequencies or intervals) and the intensity at which fires burn.

The stands of the Douglas-fir and limber pine habitat types have a much more productive understory consisting of ninebark, snowberry, common juniper, mountain big sagebrush, king fescue, Idaho fescue, bluebunch wheatgrass, and arrowleaf balsamroot. These habitat types are typically in the fire groups 1 (limber pine habitat types). Fire return intervals within these types range from 25 to 75 years (reference 127). Forest productivity is considered “low to low moderate” based upon the habitat type (reference 137). The lower timberline/grassland–shrub land ecotone has fluctuated over time. Work by R. G. Reider documents this transition environment (reference 138).

Understories in dense north aspect Douglas- fir and Engelmann spruce stands are typically of the elk sedge, heart leaf-arnica, or common juniper habitat types. The fire frequency and intensity for these vegetative types is typically within fire groups 2 and 3 (cool, dry Douglas-fir and moist Douglas-fir habitat types). Fire groups are a characterization of the vegetation based on the influences of fire particularly relative to succession. Fire return intervals within these types range from 50 to 75 years (reference 127).

Subalpine fir and Engelmann Spruce forests are typically of the heart leaf-arnica, or common juniper habitat types. Some pockets of the moist grouse whortleberry habitat type are found as inclusions. Lodgepole pine is often present as a seral species. The fire regimes for these types are within fire group 6 (mid and lower elevation subalpine forests). Fire return intervals within these types range from 50 to 130 years with stand replacement fires in the 300-year range (reference 127).

Appendix H summarizes habitat type, fire group and fuel model by burn unit.

3.3.2 Fire History

Past and present activities help to shape the existing conditions. Fire has played a significant role in shaping the character and development of the landscape. Fire evidence indicates that fires have been occurring frequently over much of the analysis area. Studies conducted near the analysis area (Russell Peak – 6 miles NE of projects) show the average fire frequency to be 29 years with a range of 13 to 46 years between fires (reference 156). Fires that covered large areas of the forest occurred in 1595, 1672, 1693, 1721, 1810, 1825, 1836, 1848, and 1858 with an average fire frequency of 33 years and a range of 10-89 years (reference 156).

There has been one large fire within the analysis area since the early 1900s. The Pat O'Hara fire, started by lightning on August 21, 1953 burned 2,539 acres. The fire was aggressively suppressed, as it was near private property and timber suitable for lumber production. Had the fire not been suppressed, it is likely that the entire analysis area would have burned. The frequency of this fire, 50 years since the last known large fire, was well within the historic range of 18-65 year fire frequency. The burn still produces sediment during high intensity summer storm events.

The fire regime (frequency and intensity of fire) for the majority of the analysis area (80%) is classified as a mixed severity regime with an average fire frequency of 35-100 years. The higher elevations (20%) in the spruce-fir habitat type are classified as a stand replacement regime with an average fire frequency of 200+ years. The mixed fire regime consists of fires that are variable in frequency and severity and have a combination of under-story and stand-replacement fires. These fires tend to burn in a fine-grained pattern of different severities, including patches where most of the moderately susceptible trees (such as Douglas-fir and lodgepole pine) survived. Any given location within a mixed fire regime could experience some stand-replacement fires and some non-lethal fires along with a number of fires that burned at mixed severities (reference 149).

The stand replacement fire regime consists of fires that kill most overstory trees and usually burn extensive areas uniformly, especially in wind-driven crown fires (reference 148). However, a major proportion of stand-replacement regime is caused by lethal surface fire that consumes the ground fuels and kills the root collar of thin barked species such as spruce, fir, and lodgepole pine.

Through fire scar analysis, at least five different fires burned portions of the analysis area since the early 1700s. Fires have occurred in 1771, 1798, 1820, 1838, and 1903 (reference 152). Based on this analysis the average estimated fire frequency within the analysis area is 33 years with a range of 18 to 65 years. This data correlates with the studies that have occurred near the area. Fires that started during this period of time were allowed to burn and function in their natural ecological role.

In 1905, with the creation of the Forest Service, forest rangers were hired primarily to fight forest fires. Prior to this time fires were allowed to burn freely in the forest both from lightning and other sources such as Indians and livestock ranchers.

Since 1940, from local fire records, there have been a total of 16 lightning caused fires (*see* Appendix I) totaling 2,867 acres and five person-caused fires totaling 0.5 acres. All fires since the

early 1900s have been suppressed. Had the fires not been suppressed any of the 17 lightning caused fires could have burned a large portion of the analysis area.

Since all other fires have been suppressed since the early 1900s, most of the analysis area (93%) has not seen fire for 97–250 years. Prior to 1903, the area had fires that burned a portion of the area every 18–65 years. Using the last known large fire that burned within the analysis area in 1903, it has been 97+ years since most of the analysis area has burned, which is outside the average range of fire frequency by over 30 years.

3.3.3 Fuel Loading. The fuel loading is estimated as high as 47 tons per acre; heavy accumulations of dead and down material create ground fuels and heavy ladder fuels that contribute to the high potential of a large, intense fire. The fire analysis area contains four primary fuel types. Fuel models were developed in the early 1970s that give an indication of the expected fire behavior with a wildland fire under various weather, fuel and topographical conditions (reference 157). Appendix J summarizes in detail the fuel models present, fire behavior, and dead and down fuel loading.

3.3.4 Sensitive Flora and Special Considerations

Sensitive Plants. Presently, there are no mapped sensitive plant populations within the proposed burns (WYNDD, 2000). However, populations of Absaroka Goldenweed (*Pyrrcoma carthamoides var subsquarrosa*) were found in Idaho fescue grasslands within Dead Indian burn units 3 and 6, and Bald Ridge unit 1. All locations are in areas of sparse vegetation growth not conducive to burning.

Populations of Hall's Fescue (*Festuca hallii*) are found in adjacent Idaho fescue grasslands (on Bald Ridge) on calcareous soils. Shoshonea (*Shoshonea pulvinata*) can be found in areas of shallow, gravelly, calcareous soils of limestone rock outcrops that are present in the project area but none were observed during field assessments.

Noxious Weeds. Canada thistle exists within the general area, primarily along disturbed areas such as roadways, fences, and stock tanks. Other weed threats include scotch thistle, musk thistle, and spotted knapweed on adjacent road rights-of-way. A draft 2000 USFS Region 1 weed risk assessment rating was used to address potential spread, consequences, and adverse effects, and overall the project area has a low to low- moderate rating (see Project File).

White Pine Blister Rust. White pine blister rust (*Cronartium ribicola*) has been present in Wyoming for at least 50 years. The disease has infected over 50% of the limber pine located along the Highway 296 corridor on the east side of Dead Indian Pass. There are several damaging agents causing the mortality at the Dead Indian Pass area: Dwarf mistletoe *Arceuthobium cyanocarpum*, mountain pine beetle (*Dendroctonus ponderosae*), Ips beetle (*Ips pini*), foliar diseases (needle blight-*Dothistroma septospora* and needlecast-*Lophodermella arcuata*) and white pine blister rust are documented. Recent survey (2000) of two monitoring plots on Dead Indian Pass indicated that 44% of the limber pines were dying/top killed due to the blister rust and in severe decline. Another 34% of the limber pines were infected with the rust. Only 22% of the limber pines were uninfected with rust on these plots. However, some of these rust-free trees were infected with dwarf mistletoe

(reference 159).

3.4 Wildlife/Issue: Big Game Security, Winter Range, Proposed, Threatened and Endangered, Sensitive Species and Management Indicator Species (MIS)

This section describes the current physical and biological conditions of the project area. A description of the biology and ecology of the evaluated species pertaining to this proposal and the potentially affected area (14,105 acres) was prepared; this data was used for evaluation and analysis. The amount and type of habitat, habitat characteristics of the area that could potentially be affected for the species evaluated, and the existing habitat capability in comparison to its optimum potential are described.

The following were consulted for wildlife locations and habitat data within and adjacent to the project area: the Wyoming Natural Diversity Database (WYNDD) Program (10/2000), Shoshone Forest Sensitive Species Survey reports, the draft Wyoming Bird Conservation Plan, Grizzly Bear Cumulative Effects Model data base, Interagency Grizzly Bear Committee (IGBC) annual reports and flight location data, Yellowstone Wolf Project Annual Reports and flight location data, and Wyoming Game and Fish Department personnel.

On site visits have been conducted to inspect the project area for proposed, endangered, threatened, and sensitive (PETS) species and Forest Plan management indicator species (MIS), as well as their habitats. Field surveys included an on-the-ground field review with Wyoming Game & Fish personnel during the summer of 2000. An interdisciplinary team field inspection was completed on February 1, 2001. Follow-up inventories were completed in May of 2001.

MIS and Species of Concern. A review of issues resulting from scoping as well as readily available and accessible information relating to the habitat requirements of all potentially affected species, distribution of habitats in the project influence zone, recorded observations of the species on the SNF, known areas of population occupancy, field trips to the project sites(s) in 2000 and 2001, and other data led to the conclusion that only the species identified should be evaluated in-depth for this analysis.

The species discussed were identified as being within, or likely to occur within the project area, or potentially affected by the alternatives. Only these species were evaluated in detail as part of the effects analysis as being potentially affected. All other species were considered and dismissed from in-depth analysis following a comprehensive review of the data.

Seventeen wildlife species, in addition to game trout, were selected during the forest planning process to be management indicator species. The management indicator species for the SNF include five featured species, five recovery species, seven ecological indicator species, as well as game trout (which are represented by the trout species present in an area). These species were selected for forest planning purposes, however, each is to be considered and addressed, as appropriate, at the project level. Methods used for selection of management indicator species or groups of species for forest planning purposes are explained in detail in the planning records of the Land and Resource Management Plan for the Shoshone National Forest.

Evaluation of MIS for this project focused only on the management indicator species that were considered relevant to the scope of the proposed actions.

Existing Wildlife Habitat. The major vegetation types in the project areas are forested types interspersed with sagebrush grasslands and montane meadows. The primary forest vegetation types are limber pine and lodgepole pine in the drier areas, and Douglas-fir and spruce/fir types on the more moist sites.

Much of the following discussion is based on habitat relationships data by Thomas et al 1979. Of the 14,105-acre diversity unit analyzed, the general vegetation composition is 10,112 acres (72%) of timber type, and 3,993 acres (28%) of grassland types. The 3,993 acres of grassland is composed of 534 acres (13%) classified as sagebrush/grassland type and 3459 acres (87%) of grassland type. The grassland to forested land ratio for the area is 28:72. Optimum habitat for elk specifically, and early succession wildlife species in general, is a recommended 60:40 ratio. As timberland is in excess of that required for optimum use of the area for early succession species, opportunities exist for enhancement of these species by setting back succession.

Presently in the wildlife diversity unit, 9,202-acres (91%) of the timberland (65% of the total area) is mature timber, with approximately 1/3 having some old growth characteristics (many large trees, snags, several canopy layers, 70% canopy coverage, and considerable dead/down material). Early to mid-seral succession stands are very limited. Timber patch sizes in the area are very diverse, ranging from several acres to several hundred acres. Many wildlife species related to mature timber and old growth characteristics require patch sizes of 30 acres or more, especially during the critical birthing/nesting period. Most birthing or nesting sites for timber related species is on gentle slopes (<15%) near water. The majority of timbered stands proposed for treatment within the Dead Indian treatment units are >15% slopes.

Most of the timber stands currently provide both hiding and thermal cover for big game species. Relative to the issue of hiding cover (or security cover), most of the timbered land provides big game hiding cover, which provides security for individual animals, thus allowing them to remain in the area even during high levels of disturbance such as hunting. Timber patches six feet or more in height and a minimum 30 acres in size can generally characterize hiding cover for elk and deer. As topography influences the effectiveness of vegetation as hiding cover, steeper terrain requires taller and denser vegetation to hide an animal. Optimum patch size for hiding cover, to be effective for all species, is 30 acres or more.

Thermal cover is cover used by animals to assist in the regulation of their body temperature. Optimum big-game thermal cover patch size is approximately 30 to 60 acres, with a canopy coverage of 70% or more.

Interspersion or distribution of the differing types and successional stages (each having unique structure and providing necessary niches for some species) can be enhanced toward more optimum levels when considering overall vegetative diversity and species richness. These opportunities could be capitalized upon via setting back succession in timber stands throughout the area, in patch sizes meaningful to wildlife. As can be seen from the above discussion, so long as patches of mature timber of > 30 acres with 70% canopy are retained for old growth related species, hiding

cover, and thermal cover, opportunities for enhancement of other habitat characteristics and for varied wildlife species can be accommodated.

Whitebark pine habitat types are present in significant amounts only in treatment Unit 5 in the Dead Indian project. These types are typically of the heartleaf arnica type. The fire regimes for these types are within fire group 8 (cold, upper subalpine and timberline habitat types). Fire return intervals within these types range from 50 to 300 years (reference 127). Within the wildlife diversity analysis unit (based on 14,105 acres) approximately 304 acres (3%) of the timberland is whitebark pine, which is an important component for grizzly. Regeneration opportunities exist for enhancement of this species and its related benefits in the long-term from prescribed burning. Although some cones are being produced, the condition of the whitebark component is not at its optimum for producing cones, and being a seral species, it is being encroached in much of the area.

3.4.1 Proposed, Threatened and Endangered, and Sensitive Species

This section describes the current condition of the species population.

Canada lynx (*Lynx canadensis*) – The lynx is a listed threatened species. Habitat and extensive winter snow survey work has been conducted for this species during the past several years on the SNF in partnership with the Wyoming Game and Fish Department. Results indicate a rather naturally fragmented boreal forest habitat component on the middle two-thirds of the Forest due to topography and associated factors. The larger potential habitat patches occur in the Dubois/Togwotee Pass area with some additional but more limited potential on parts of the Lander Ranger District and in the Beartooth Mountains (reference 77, 85, 103).

Tracks of two different lynx have been confirmed in the Dubois area. Also confirmed were tracks of a single lynx in both the Lander District and in the Beartooth Mountains just across the Wyoming/Montana state line, immediately adjacent to the Forest. More recent sampling during the winter of 1999 also substantiated the presence of lynx in the Clarks Fork Canyon area. Lynx have been recorded at several locations during the past several decades on the Clarks Fork District, ranging from the Sunlight Basin area to the Northeast entrance of Yellowstone Park, with most being concentrated in the vicinity of the Swamp Lake Botanical Area.

Special designated habitat for the Lynx is termed “potential habitat” as per the 2000 Lynx Conservation Assessment and Strategy, and was delineated for the Shoshone Forest in 2000. Potential habitat was mapped and stored in the Shoshone Forest GIS database. A portion (*see* Figure 5) of the Dead Indian project contains lynx potential habitat (reference 105).

The project area occurs in the middle two-thirds of the Forest and thus possible use by lynx at either site would likely only be occasional and for passing through during exploration and travel. The Bald Ridge project area does not contain suited habitat for the lynx. The Dead Indian project area does contain some areas of suited habitat, but overall it is very marginal for meeting the species’ yearlong needs, especially the preferred denning habitat and a high density of snowshoe hares.

Lynx require late seral stage forests or older regenerating stands (>20 years since disturbance) for denning. The most common component of den sites appears to be large woody debris, either down

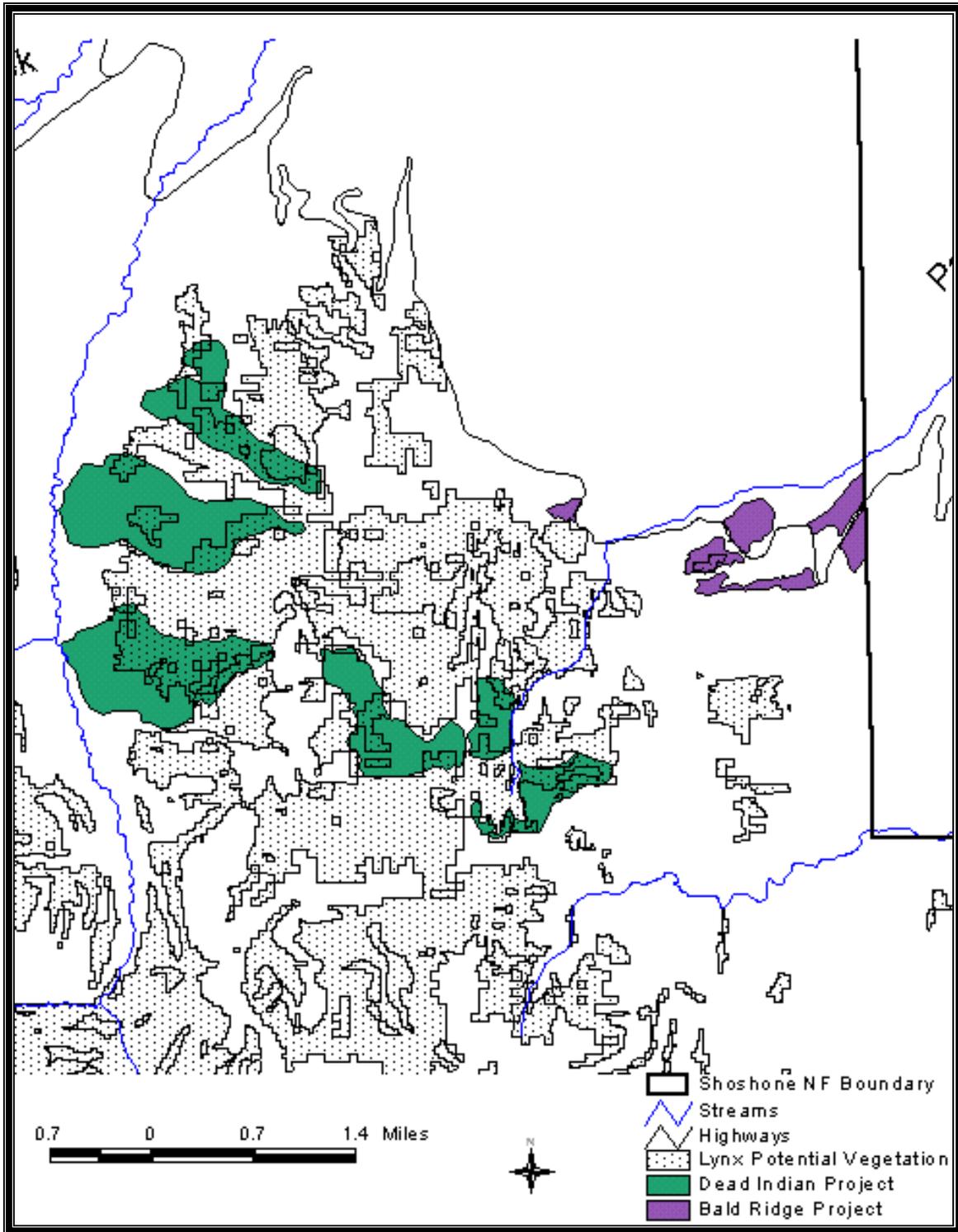


Figure 5-Potential Lynx Habitat

logs or root wads. The major food source is snowshoe hares and red squirrel. A snowshoe hare density of > 1 per five acres appears adequate to support a viable lynx population.

Lynx foraging habitat is generally one of two types:

- Early successional young forest where dense, multi-layered understory maximizes cover from ground level up to 6 feet
- Older forests with a substantial understory of conifers or small patches of shrubs and young trees that provide dense cover that touches the snow in winter

Young, densely regenerating aspen stands with a well-developed understory also provide good quality habitat for snowshoe hares and other potential lynx prey species, such as grouse. Vegetation structure appears to be more important for hare abundance than does species composition. A complex mosaic of species and age-classes is likely to provide the best overall habitat over the long-term for the lynx, although it appears that moist Douglas-fir habitat types where lodgepole pine is a major seral species is a basic component of good lynx habitat.

Stands in which dens of lynx have been found are characterized by downfall, snags, large trees, hollow trees and stumps. Until more definitive information on habitat of these carnivores becomes available, it appears that denning habitat can be provided by preserving and recruiting large snags, decadent broken-top trees, and downfall as potential components of structural diversity necessary for densities in closed-canopy forests (reference 3, 77, 85, 103, 104, 105, and 106).

Because they require large home ranges and stands of late seral forest intermixed with early succession multi-layered forest, the proposed treatment area contains potential habitat for the lynx. The potential does exist for enhancing the treatment area for snowshoe hares (by setting back succession and increasing interspersion), which are the primary food source for lynx. (reference 103, 104, 105, and 106)

Grizzly bear (*Ursus arctos*) - The grizzly bear is a listed threatened species as well as a Forest management indicator species. The proposed action area lies within Management Situations 2 for the Dead Indian portion, and Situation 5 for the Bald Ridge portion. The Grizzly Bear recovery area is defined as Situations 1, 2, and 3 (see Figure 6).

Situation 2 areas lack distinct population centers; highly suitable habitat does not generally occur, although some grizzly bear habitat components exist; and grizzly bears may use the area. Situation 5 areas lack survival and recovery values for the species and federal activities and programs probably will not affect species conservation and recovery (reference 92).

The Bald Ridge project area contains no habitat for the grizzly bear, and the Dead Indian project contains only a few parcels of high quality habitat (mostly some scattered whitebark pine stands and a few small riparian areas), and bear use is quite limited. Existing data from the cumulative effects model data base indicate that these project areas contains mostly low-value habitat, although seasonal essential spring food sources in the form of ungulate carrion and riparian vegetation do occur in the Dead Indian area. There are also very limited amounts of whitebark pine, whose cones provide an important food source during the fall when cones are produced. The majority of the

whitebark pine is very scattered and mixed with other species, or the stands are on south facing steep slopes with large spacing between trees. The type of stands do not characterize high quality habitat. However, immediately adjacent to the treatment units are dense mixed species stands with a whitebark pine component and numerous squirrel cone caches, which produce a fall food source for bears.

Protein rich foods are needed in early spring when bears emerge from denning, in order to put weight on and for lactating females with cubs. Succulent vegetation, carrion, and elk calves provide the major protein sources for bears in spring and early summer. Also extremely important are the gut piles, carcasses, and crippled game animals associated with the fall hunting season, which are a critical food source for the bear during hyperphagia (abnormally increased appetite prior to denning).

The grizzly bear currently uses the Bald Ridge project area only rarely. The Dead Indian project area is better habitat with bears and sign being quite common during both spring and fall.

Bald eagle - (*Haliaeetus leucocephalus*) is a listed threatened species as well as a Forest management indicator species, and is known to winter along the lower Clarks Fork River. The climate and elevation along the upper stretch of the river limit use by bald eagles. There has been a significant increase in the number of nesting bald eagles in Wyoming and the Greater Yellowstone area in the past two decades. Special habitat requirements for eagles include moderate to large open water bodies during all seasons, and large trees for nesting, perching and roosting. Bald eagles are largely fish eaters with the addition of other foods such as crippled waterfowl, carrion, and occasionally rabbits during the winter. Both project areas are several miles from the nearest stretch of the river (reference 106). Currently no bald eagle nesting is known to occur in the project areas or on the SNF. The project sites do not appear to provide the aquatic habitat, suitable nesting structures, or prey base during brood rearing season to offer habitat of more than incidental use.

Gray wolf - The gray wolf (*Canis lupus*), is a listed threatened species being managed as an experimental population, and is a Forest management indicator species. The species was reintroduced in the Yellowstone National Park area in 1995 and now is designated as a non-essential experimental population and treated as a proposed species. This designation provides greater flexibility in the management of wolves and allows greater accommodation in land use activities.

The gray wolf is known to use the proposed treatment areas (Eicher, personal communication, and 2000 wolf location reports), however as it is an experimental population and six breeding pairs have been established, no land use restrictions may be employed on National Forest lands as wolf population growth rates have remained positive toward population recovery levels (50 CFR Part 17.84(xii)(4)).

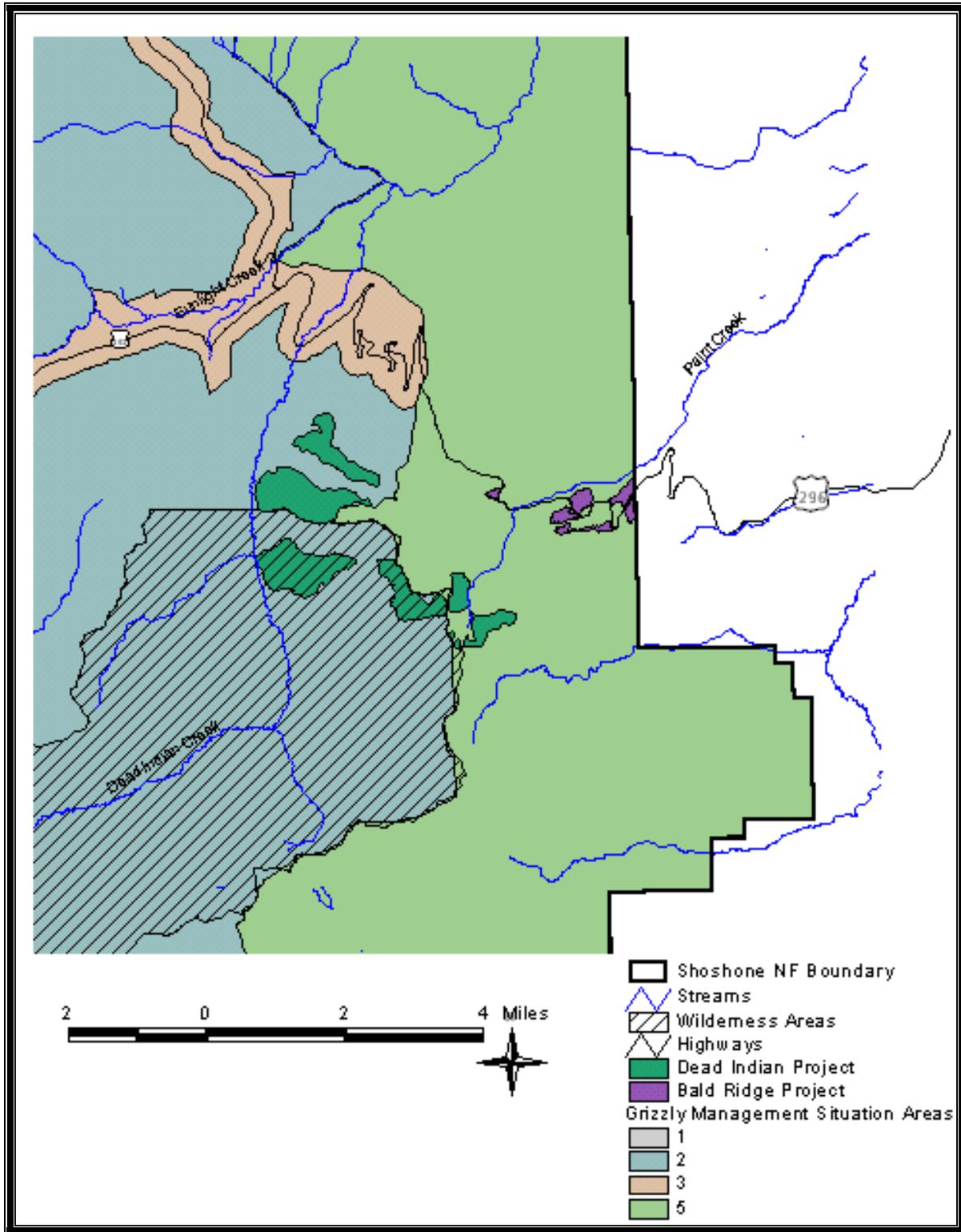


Figure 6-Grizzly Bear Management Situation Areas

The availability of a stable ungulate prey base is the primary special habitat requirement for this species although smaller animals and carrion are also used as prey. A concentration of available prey and winter range does occur within the project area. Wolves are known to use the project area, and a known den site was within several miles during the 2000 season (reference 2, 19, 95, 109, and 112).

3.4.2 Sensitive Fauna

Small Forest Carnivores. Potential habitat does exist in the treatment area for pine marten, fisher, and wolverine. All of these sensitive species are generally forest dwelling species requiring some complex, large physical structures commonly associated with mesic late-succession forest, and all avoid large open areas such as large meadows or clear-cut. Canopy cover over 50% appears to be preferred, and areas having less than 25% canopy cover appear to be avoided. Removal of canopy often affects these species adversely, depending on the scale of canopy removal.

Physical structure of the forest appears to be more important than species composition of the vegetation, and while suitable habitat is not necessarily old growth, there is little question that some preferred components are representative of old-growth structures. Such forest structure can be characterized by a diversity of tree sizes and shapes; light gaps and associated understory vegetation; snags; fallen trees and limbs; and limbs and other shrubby vegetation close to the ground. There appears to be a preference and a need for structure near the ground, especially during the winter.

Stands in which dens of marten, fisher, and (to a lesser extent) wolverine have been found are characterized by downfall, snags, large trees, hollow trees and stumps. Until more definitive information on habitat of these carnivores becomes available, it appears that denning habitat can be provided by preserving and recruiting large snags, decadent broken-top trees, and downfall as potential components of structural diversity necessary for densities in closed-canopy forests (reference 3, 77, 85, 103, 104, 105, and 106).

Marten (*Martes americana*) - The pine marten, a sensitive species as well as a Forest management indicator species for late succession coniferous forest, prefers habitat that includes some late succession stands of mesic coniferous forest in contiguous blocks with a high degree of canopy closure; a large amount of dead, down and decaying woody material; and a complex physical structure near the ground. Recent surveys on the SNF indicate this species is widespread and occurs wherever suitable habitat (mature spruce-fir, lodgepole, Douglas-fir, and mixed conifer forests) is available. Martens were found on each snowmobile route surveyed on the Forest (233 miles of snow track surveys) in 1995-96 with an average rate of occurrence of .7 marten per mile of route. The species is classified as a furbearer in Wyoming and martens are legally harvested most years on the SNF during the trapping season.

No surveys have been conducted for the marten in the project areas. Based upon habitat availability, it is unlikely that marten use the Bald Ridge treatment area, and it is highly likely that pine marten use the proposed Dead Indian treatment area.

Fisher (*Martes pennanti*) - Habitat requirements for the fisher, a sensitive species, include late succession coniferous forests with high canopy closure during the warmer seasons, and young to mature forests in the winter. This species is considered to be very rare in Wyoming and on the SNF. The Wyoming Game & Fish Department questions that it is a reproductively viable species in the State.

Recent extensive surveys on the Forest (all 600km of main snow machine routes and 1400 km off main routes) failed to locate any sign of fishers. No fishers have been observed on the Clarks Fork District. Several fishers have been recorded in the northeast portion of Yellowstone National Park adjoining the Clarks Fork District within the past few years. Given this, it is possible but very unlikely that the fisher would use the treatment area.

Wolverine (*Gulo gulo*) - The status of this sensitive species in Wyoming appears to be one of very low densities both historically and at the present time in the western third mountainous part of the State including the SNF. Major habitat concerns revolve around areas above timberline used for denning, travel, and scavenging. Preferred habitat is generally high altitudes during the summer and lower elevation forested areas during the winter period. Preferred habitat is generally thought to be best in terms of abundance of year-round food supplies and large sparsely inhabited relatively remote areas. Wolverines appear to be very intolerant of human activity.

On the northern portion of the Forest, incidental reports from knowledgeable sources during the past several decades reported sightings on Piney Ridge and Standard Peak on the Greybull District (Barker, personal communication). In addition the WYNDD contains reports for the northern portion of the Forest in Pilot Creek and Elk Fork.

Recent extensive helicopter survey work on the Forest resulted in the location of one set of wolverine tracks in Robinson Creek, South Fork Shoshone River drainage (Luce, 1995). Two wolverines were observed in Sunlight Basin in the fall of 1986, a distance of several miles from the project area (Luce, personal comm. 1996). This indicates that wolverines could use suitable habitat in the Dead Indian project area.

Birds. The project area contains many bird species. The contiguous late seral forest with canopy closure of greater than 70 percent and snags provide habitat for selected management indicator species and sensitive bird species, that according to the Wyoming Natural Heritage Database, likely occur on the Clarks Fork Ranger District. Forest ecological management indicator species for late forest succession are the hairy woodpecker and northern goshawk; and sensitive species include the northern three-toed woodpecker, black-backed woodpecker, olive-sided flycatcher, golden-crowned kinglet, pygmy nuthatch, and boreal owl. The general habitat preference for this group is coniferous forest or coniferous forest mixed with aspen. All but the goshawks require or use snags to a high degree. Only the goshawk and the boreal owl are likely to be found in the project.

Northern goshawk (*Accipiter gentilis*) – The goshawk is a sensitive species as well as a Forest Management Indicator Species. The U.S. Fish and Wildlife Service recently determined that this species was not warranted for listing under the Endangered Species Act. However, it does remain on the Forest Service Region 2 Sensitive Species list. Goshawks appear to be relatively common in forested areas in Wyoming and the SNF, and nesting can usually be observed each year on the

Forest with minimal effort. They nest in a variety of habitats but typically mature mixed conifer, and conifer/aspen are common nesting sites.

Boreal owl (*Aegolius funereus*) - Recent surveys (1998 and 1999) on the SNF have documented the presence of this sensitive species. Presence was confirmed on 2 of 4 survey routes via vocal identification. A total of 3 separate individuals were positively documented by the surveys and as many as 7 individuals may have been present. The habitat types surveyed generally consisted of mature Englemann spruce-subalpine fir or mixed mature spruce-fir/lodgepole pine with scattered small to large openings confirming the importance of these habitat types for Boreal owl breeding sites (reference 1).

The sagebrush areas provide habitat for one of the Forest management indicator species, the brewer's sparrow. This species has been considered relative to this proposal, and determined to be not of major concern, as the proposed treatment would have beneficial effects in the long term. Blue grouse and ruffed grouse, both Forest ecological management indicator species, exist in and adjacent to the treatment area. Existing habitat for these species is limited, primarily as a result of the limited amount of, and old age structure of aspen communities. Multi-storied aspen, shrub types, and riparian habitat are primary components of good grouse habitat. These species will not be evaluated in-depth, as the effects of this proposal would be negligible for ruffed grouse as minimal aspen is being proposed for treatment, and effects on blue grouse are only beneficial.

Small Mammals. Many small mammals exist in the area, and suitable habitat may exist within the upper reaches of the analysis area for sensitive species such as the dwarf shrew (*Sorex nanus*) and the water vole (*Microtus richardsoni*). They live in underground burrows and feed above ground or in the water. Unique habitat (caves, talus, rock outcroppings, etc.) also exists in the area and may provide habitat for sensitive species such as the Townsend's big-eared bat (*Plecotus townsendii*) and the fringed myotis (*Myotis thysanodes*). The area has not been surveyed for these species. Although these mammals may inhabit the general area, their specific habitat niches would not be affected by the project. Another indicator species, the beaver, exists in the general area, however because its habitat is not affected, it is not evaluated in depth.

Amphibians. Wetland and riparian types provide the primary habitat for most amphibians, as they are usually found near a permanent water source. Sensitive species that are likely present in the general area are the spotted frog (*Rana pretiosa*), northern leopard frog (*Rana pipiens*), tiger salamander (*Ambystoma tigrinum*), and western boreal toad (*Bufo boreas boreas*). Few surveys have been completed for these species on the Forest. However, in 1994, Chris Garber (The Nature Conservancy, Cheyenne Wyoming) conducted a survey along the Chief Joseph Highway. One spotted frog response was recorded near the Swamp Lake area. The western boreal toad, northern leopard frog, and tiger salamander may be present in the general area, however due to their wetland/riparian affiliation, their habitat will not likely be affected by the proposal, and they were not further evaluated.

3.4.3 Featured Species

Featured species of MIS are elk, mule deer, bighorn sheep, moose, and mountain goat. Mountain goats are not present in the project area. Both bighorn sheep and moose use the Dead Indian area only to an incidental degree.

Elk (*Cervus canadensis*) – This MIS and species of concern as identified during scoping relative to the Dead Indian project, is a very common big game species throughout the Forest. It inhabits a wide diversity of land types ranging from alpine, forested types, to sagebrush grassland types. The species appear to be very adaptable, with populations within the Clarks Fork herd unit being well over objective at present.

Mule Deer (*Odocoileus hemionus*) – This MIS and species of concern as identified during scoping relative to the proposal, is a very common big game species throughout the Forest. It inhabits a wide diversity of land types ranging from alpine, forested types, to sagebrush grassland types.

3.5 Watershed/Issue: Soil, Water, Riparian, and Aquatic Resources

The soil, water, riparian and aquatic affected environment is based on the 25,163-acre watershed. Past and present activities help to shape the existing conditions.

3.5.1 Soils

Primary formations within the project area include the Chugwater, Dinwoody/Park City, Tensleep Sandstone, Madison Limestone, and Wapiti (volcanic) formations. The Chugwater formation (primarily soil map unit 233) is a highly erosive parent material; several road cuts through this formation produce sediment to Paint Creek. The analysis area is a potential watershed of concern (reference 141). This is due to erosive soils (Chugwater) and sediment still being produced by the 1953 Pat O'hara fire.

The Wyoming Geologic Survey has mapped the geologic hazards on the Forest (reference 130). Dead Indian burn units 1, 3, and 6, and Bald Ridge burn unit 1 have multi flow landslides mapped. Bald Ridge burn unit 1 located on the Chugwater formation (soil map unit 233) has the greatest potential of landslide or mass movement.

Both projects are within the boundaries of the Shoshone National Forest Soil Survey (Area 656). This survey is in the process of being correlated by the NRCS. The areas considered for prescribed fire are found in map units 104, 162, 159, 232, and 233. Soils within the project area are from the Mollisol, Inceptisol, and Alfisol soil orders. Mapping unit descriptions can be found in the project records. In the Bald Ridge project, the soils are a gravelly loam texture and are considered well drained.

Erosion and Sedimentation (Soil Ratings). Erosion hazard is slight on 0-14% slopes, moderate on 15-35% slopes, and high on slopes greater than 35% slopes (reference 136). Soil compaction and rutting hazards are moderate and can be avoided by restricting vehicle activities to periods of low soil moisture (reference 136, 139). Prescribed burning soil interpretations ratings are slight to moderate depending primarily on surface texture and slope.

3.5.2 Aquatic Species and Habitats

State-classified water uses, and the water quality they need, must be sustained to comply with anti-degradation policy, unless the State decides that vital economic and social development justify impacts. Streams in the analysis area within wilderness are designated by the State of Wyoming as Class I water, while non-wilderness streams are designated Class II (reference 143).

Dead Indian Creek drains into the Clarks Fork of the Yellowstone River, a Wild and Scenic River. From approximately the wilderness boundary downstream to the confluence with the Clarks Fork River, Dead Indian Creek is on the 1996 Wyoming statewide water quality assessment 303(d) list. This means this portion of the river is subject to anti-degradation standards and further monitoring to determine beneficial use attainment.

Beneficial uses within and downstream of the analysis area include agriculture, protection and propagation of fish and wildlife, human consumption (after treatment), recreation, and scenic value. Water rights downstream of the analysis area are directly tied to these beneficial uses. They include rights primarily for irrigation use and stock watering. Water in the watershed is also used by recreationists for human consumption and stock watering.

Riparian Ecosystems (Riparian Areas, Wetlands, and Associated Flood Plains).

Within the proposed Bald Ridge project area Paint Creek is primarily located in a narrow, steep limestone canyon. As a result, the canyon receives little use. The headwaters of Blaine Creek are also located in the proposed project area. There are localized areas of heavy livestock use along some of the riparian habitat.

Within the proposed Dead Indian project area; current stream fish habitat conditions in Dead Indian Creek adjacent to the proposed project area are generally good with riparian meeting proper functioning condition. The stream is located in timbered habitat with large stream substrate. As a result, the stream banks are well armored and resistant to erosion. There are some reaches up and downstream of the project with riparian areas that are functioning at risk primarily due to livestock grazing.

Due to the high elevation, snow pack, and cool mountain temperatures, summer warming of streams, especially above 65 degrees, is not a concern within the project area. Mountain streams are typically supersaturated with dissolved oxygen due to the mixing action and exchange with ambient air. As a result, low dissolved oxygen levels are not a concern in Dead Indian or Paint Creek.

Fisheries Management Indicator Species (MIS). In the Forest Plan, game trout were selected as the management indicator species for aquatic habitat. The lower Clarks Fork near the Forest boundary has a series of falls that are impassable for upstream fish migration. As a result, all of the Clarks Fork and its tributaries upstream of these falls were historically barren of fish. Historic native game trout stream species in the Clarks Fork River and its tributaries downstream of these falls included Yellowstone cutthroat trout (YSC) and mountain whitefish. Range-wide native, wild YSC have been reduced to a very small fraction of their historic range due to introduction of non-native fish species, habitat modification/degradation, and past over-fishing (reference 76).

The Yellowstone cutthroat trout are included on the Forest Service Region 2 sensitive species list and were petitioned for listing under the Endangered Species Act. On February 23, 2001 the U.S. Fish and Wildlife Service concluded that the petition did not provide substantial biological information to indicate that a listing may be warranted at this time.

All current fish species upstream of the falls on the Clarks Fork River near the Forest boundary have been stocked at some time. The Wyoming Game and Fish Department (G&F) found that current game trout species in this reach of Dead Indian Creek include rainbow trout, rainbow-cutthroat hybrids and YSC. Currently, G&F manages the fishery as wild. G&F does plant the Dead Indian campground with YSC due to high angler use. G&F also periodically plants the headwaters of Dead Indian Creek with YSC because this area receives moderate to high angler pressure from backcountry users. Also, YSC stocking in the upper reaches is used in an attempt to swamp the rainbow gene pool in the lower reaches of this drainage. Estimated population densities are good for this type of stream system (Yekel, pers comm). Wyoming G&F rates Dead Indian Creek as a class 3 fishery which are important trout waters, fisheries of G&F regional importance (reference 125).

As a result of the limestone geology near the Bald Ridge project area, Paint Creek goes underground near the Forest boundary after runoff. There are no fish or accessible fish habitat on the Forest. Off Forest below the canyon, Paint Creek contains rainbow and brown trout. Non-game trout species include longnose dace, mountain sucker, longnose sucker, and white sucker. There are no fish in Blaine Creek both on and off the Forest due to its small size and inconsistent stream flow, which does not provide suitable fish habitat.

