

## **CHAPTER TWO**

### **NATURAL RESOURCES AND ENVIRONMENTAL SETTING**

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#### **2.1 LOCATION AND ACCESS**

The Town of Alpine is generally located in west central Wyoming along the Wyoming–Idaho boarder (Figure 2-1). More specifically, Alpine is situated in northern Lincoln County near the confluence of the Greys and South Fork of the Snake River.

Vehicular access to Alpine is available via three U.S. highways. U.S. Highway 89 south connects Alpine to the Lincoln County communities of Etna, Freedom, Thayne and Afton. U.S. Highway 26/89 connects Alpine to the nearby Town of Jackson and Yellowstone and Grand Teton National Parks. Northwest of Alpine Junction, U.S. Highway 26 continues northwest into the eastern Idaho communities of Irwin, Swan Valley, and Idaho Falls.



#### **2.2 GEOGRAPHY AND SURROUNDING NATURAL ASSETS**

Alpine is surrounded by abundant timber, fish and wildlife resources. These natural resources are primarily located in three national forests, a nearby wildlife habitat management area that is managed by the Wyoming Game and Fish Department, Palisades Reservoir, the Snake River, Greys River, and Salt River.

Alpine borders the Bridger-Teton National Forest that extends through most of eastern Lincoln County and western Sublette County. Northwest of Alpine, the Targhee National Forest extends into Idaho’s Bonneville County. Caribou National Forest is situated west of Alpine and the Palisades Reservoir (Figure 2-2). These forested areas contain a significant volume of timber resources that provide habitat for a wide variety of wildlife habitat. Aquatic fishery resources are found in the Greys River drainage and other drainages within each of the national forests.





The Bridger-Teton National Forest encompasses the nearby Snake Range Mountains to the north and the Salt Range Mountains to the south. These two mountain ranges provide area residents and visitors with considerable outdoor recreation opportunities such as fishing, hunting, camping, hiking, biking, snowmobiling, and cross-country skiing. Similar activities take place in the Caribou National Forest and Targhee National Forest.

The Snake River flows through the Bridger-Teton National Forest and enters Palisades Reservoir near Alpine. Fishing activities are popular in Palisades Reservoir when water levels are sufficient to sustain a productive fishery. The Grand Canyon of the Snake River, northeast of Alpine, offers summertime recreational opportunities for white-water rafters and kayakers.

## **2.3 SOILS**

### **2.3.1 General Soil Characteristics**

Soils in the vicinity of Alpine consist of well-drained to excessively well-drained soils. Surface soils are characterized by a soil loam that ranges between gravelly loam, silt loam, and silty clay loam (Figure 2-3). The underlying soil material is a very gravelly sandy loam or a silty clay (Sunrise Engineering, 1995).

These soil characteristics are generally not conducive to effective soil-based wastewater treatment. Rapid percolation from coarse-grained soils in roughly 80 percent of Alpine can cause shorter retention times in the aerated portion of the soil profile and discharge contaminants to local groundwater resources (Sunrise Engineering, 1995).

### **2.3.2 Radon**

Radon is an odorless, colorless, and tasteless gas that naturally occurs in rocks, soils, water and air. The ultimate source of radon is uranium; most rocks contain some uranium. Radon can enter buildings from rocks and soil through cracks, vents or other openings in basement floors, walls, or an onsite water system. However, buildings served by public groundwater supplies generally have a lower risk of radon exposure because some of the radon is released into the air as a result of pumping, water treatment, and/or a natural decay of radon in the community water distribution system (U.S. Geological Survey, 1998).

Average indoor radon levels in the United States are about 1.3 picocuries per liter (pCi/L); in contrast, average outdoor radon levels near 0.4 pCi/L. Elevated radon levels are generally present throughout many areas in Lincoln County.

When radon levels exceed 4 pCi/L, the U.S. Environmental Protection Agency recommends some form of mitigation. Potential mitigation measures may include actions such as the sealing of foundation cracks, covering soil under the building with concrete or a vapor barrier, and ventilating crawlspaces.



## 2.4 CLIMATE

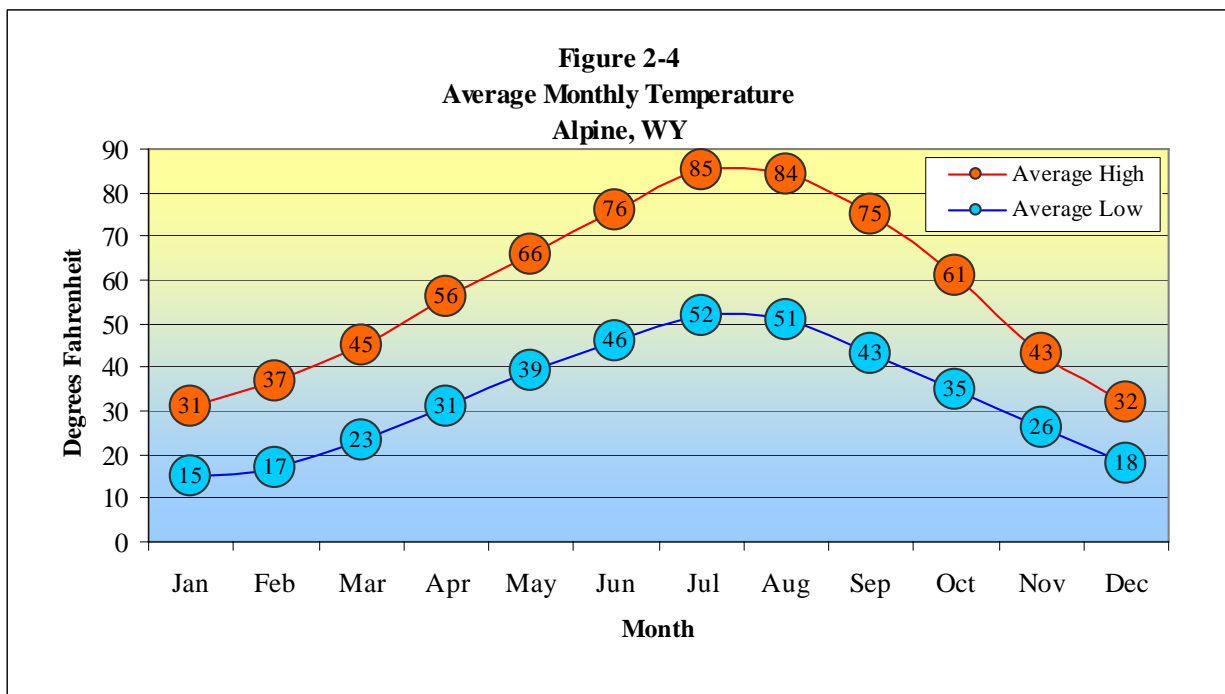
### 2.4.1 Precipitation

Available precipitation data indicates that Alpine receives an average of 16 to 18 inches of precipitation per year. The month of May, which averages 2.63 inches of precipitation, is usually the wettest month of the year. In contrast, July is usually the driest month of the year when precipitation levels average about 1.28 inches (Weather.com, 2005).

### 2.4.2 Air Temperature

Ambient air temperatures in the community fluctuate significantly throughout the year (Figure 2-4). Average daily temperatures typically range between 52 and 85 degrees Fahrenheit in the warmest month of July (Weather.com, 2005). The coldest month, January has temperatures that typically range between 15 and 31 degrees Fahrenheit.

A record high temperature of 98 degrees Fahrenheit occurred in 1984. A record low temperature of -32 degrees Fahrenheit occurred in 1963.



### 2.4.3 Surface Wind

No surface wind data for Alpine is available from any public agencies. However, residents indicate that prevailing winds are generally from the southwest (Brown, 2006).

## 2.5 WATER RESOURCES

### 2.5.1 General

There are three fourth level hydrologic units located in the vicinity of Alpine that are connected to the Upper Snake River drainage. These hydrologic units include the following watershed areas:

- Greys-Hoback
- Palisades
- Salt

Major rivers and streams within this proportion of the Upper Snake River drainage include the South Fork of the Snake River, the Greys River and the Salt River. The Greys River and Salt River are tributaries to the Snake River. The confluence of these surface water bodies occurs at Palisades Reservoir.

### 2.5.2 Surface Water Flows

Surface water flows for the major rivers located near Alpine (Table 2-1) vary significantly by month. These flows peak during May and June when runoff is greatest due to snowmelt.

<i>Gaging Station</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
Snake River Above Palisades Reservoir (Near Alpine)	1,509	1,589	1,827	3,318	8,771	13,300	8,434	5,352	4,100	2,176	1,841	1,681
Greys River Above Palisades Reservoir (Near Alpine)	210	202	231	638	1,754	1,976	928	478	366	312	264	228
Salt River Above Palisades Reservoir (Near Etna)	442	431	472	946	1,670	1,444	834	611	626	606	576	506
Notes: 1) Snake River average based on data from April 1937 - December 2004, 2) Greys River average based on data from March 1937 - December 2004, and 3) Salt River average based on flows from October 1953 - December 2004.												
Source: United States Geologic Survey, 2006.												

### 2.5.3 Palisades Reservoir

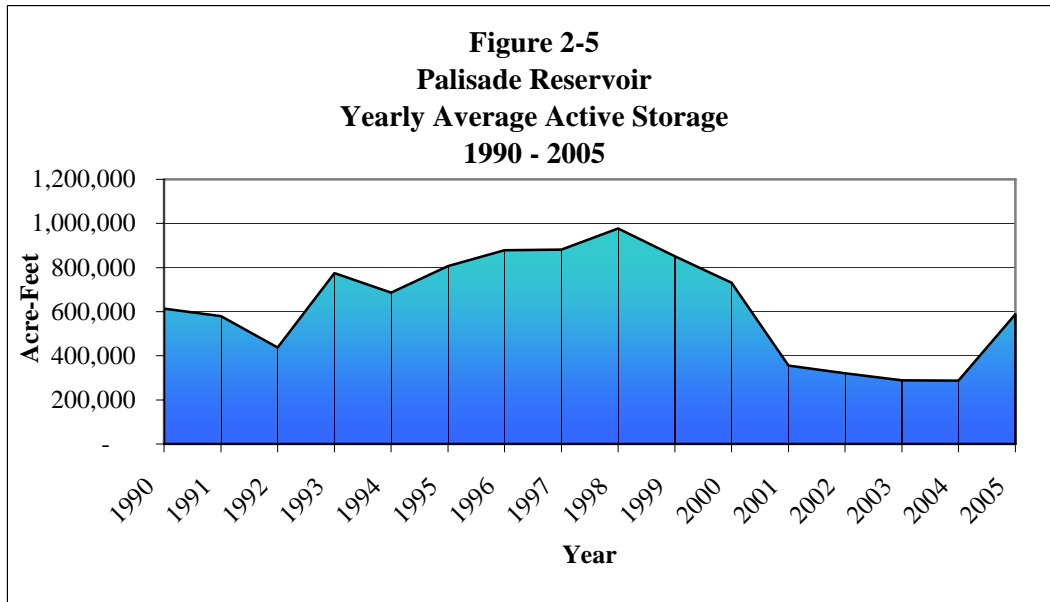
Construction of the Palisades Dam was completed in July 1958. The purpose of the Palisades Reservoir project is to provide needed holdover storage and flood control and generate electricity (U.S. Bureau of Reclamation, 2005).

The Palisades Reservoir collects water from the Upper South Fork of the Snake River drainage. The drainage area above Palisades Reservoir includes approximately



5,225 square miles of land. The reservoir was designed to collect and hold a maximum active capacity of about 1,200,000 acre-feet of water.

Historic lake capacities depict the severity and effects that the recent drought has had on Palisade Reservoir capacities (Figure 2-5) Data provided by the U.S. Bureau of Reclamation provided that the 2005 average active capacity (287,893 acre-feet) was well below the 1990 – 2005 average capacity (631,485 acre-feet).



Source: U.S. Bureau of Reclamation, 2005.

#### 2.5.4 Flood Plains

Available flood plain data suggest that stormwater flows generated from a potential 100-year flood condition would not affect any developed or undeveloped lands within the municipal boundary (Figure 2-6). Defined boundaries associated with the adjacent Palisades Reservoir provide reasonable assurance that the Town of Alpine would not be flooded by the U.S. Bureau of Reclamation through its storage and management of surface water resources.

#### 2.5.5 Groundwater Wells

A number of groundwater wells are located within the community. Two of these wells are owned and operated by the Town of Alpine (see Chapter Six).

As stated earlier, local soils are generally not conducive to effective soil-based wastewater treatment. In the absence of disinfection and other potential water treatment, the water quality of privately-owned groundwater wells in portions of the community may limit the use of these water resources to non-potable water uses.



## 2.6 FOREST RESOURCES

### 2.6.1 Available Timber in the Vicinity of Alpine

Most of the timber in the vicinity of Alpine is lodgepole pine and Douglas fir. There are also significant stands of Aspen located through out the area. These resources bring a scenic quality to the community, as well as habitat to various types of wildlife.

### 2.6.2 Timber Stands in Residential Areas

Timber stands of lodgepole pine dominate the overstory along much of the southern part of Alpine. In October 2005, approximately 90 homes were located in forested areas along the southern boundary of Alpine (Figure 2-7). More specifically, these homes were located in the Lake View Estates, Tracts A, B and C, as well as Grandview Enterprises Subdivision, Alpine Pines Subdivision, Mountain Meadows, Alpine Estates 1 and 2, and Bridger Homes. The density of trees in this area represents a potential fire hazard to the community.



The U.S. Forest Service is aware of this potential threat. In 2002 and 2003, the Greys River Ranger District of Bridger-Teton National Forest and Palisades Ranger District of the Caribou-Targhee National Forest pursued funding for an Alpine Fuels Hazard Reduction Project. The project was identified as an opportunity to improve forest vegetation in the vicinity of Alpine. Following its investigation of a 527-acre study area in the vicinity of Alpine, the U.S. Forest Service concluded that the project area contains a higher density of conifer species than was historically present.

*“The history of fire exclusion through fire suppression has favored the more shade tolerant and less fire resistant species such as subalpine fire and Englemann spruce that are found in the project area. An elevated increase in insect activity also indicated that current conifers are in a stressed condition, suggesting that the existing stands are susceptible to future beetle activity and related mortality.”* (U.S. Forest Service, Bridger-Teton and Caribou-Targhee National Forests, 2003).

## 2.7 WILDLIFE RESOURCES

### 2.7.1 Big Game Animals and Their Habitat

Big game animals in the Alpine vicinity include elk, mule deer, moose, mountain lion and black bear. Elk, mule deer and moose are the predominant big game animals near the community.



The vast amounts of public lands that are located to the east, northeast, and southeast provide these animals with ample habitat and room to roam freely. However, the habitat characteristics of these animals vary considerably.

Seasonal range maps, originally developed by the Wyoming Game and Fish Department in 1988 and periodically updated, provide a general indication of the type and location of habitat for big game animals in Wyoming. The seasonal range designations provided on these maps are based upon seasonal range definitions that were developed by the Wildlife Society between 1984 and 1990. The Wildlife Society, comprised of professional wildlife biologists, formed a number of committees during this period to establish seasonal wildlife definitions that could be used by all wildlife resource managers in Wyoming.

The range definitions applicable to the Alpine vicinity include:

- **Crucial:** Any particular seasonal range or habitat component, but describes that component which has been documented as the determining factor in a population's ability to maintain and reproduce itself at a certain level.
- **Summer/Spring/Fall:** A population, or portion of a population, of animals that annually use the documented habitats within this range from the end of a previous winter to the onset of persistent winter conditions.
- **Winter/Year Long:** A population, or portion of a population, of animals that makes general use of the documented suitable habitat sites within this range on a year-round basis. During winter months, there is a significant influx of animals from other seasonal ranges.

The general location of the habitat for elk, mule deer and moose near Alpine are presented in the following paragraphs.

### **2.7.1.1 Elk**

The Rocky Mountain Elk is one of 6 subspecies of elk in North America and the only elk species that remains in Wyoming. Elk are seasonally present in the vicinity of Alpine primarily during the spring, fall and winter months. Crucial habitat ranges are found south of Alpine within the Wyoming Game and Fish Habitat Management Area, the adjoining Bridger-Teton National Forest, and some lands administered by the U.S. Bureau of Land Management (Figure 2-8).

During the winter, elk seek wooded and bushy areas in lower elevations that contain south and southwest slopes. The seasonal movement of elk is primarily influenced by snow conditions as hard-packed snow constrains the efforts of elk to reach buried sources of food. Elk typically avoid areas where snow depths are greater than 18 inches even though elk can move through snow depths up to three feet (Wyoming Game and fish Department, 1995).

The Greys River Wildlife Habitat Management Unit, which was established in the 1940's, is located south of Alpine. This wildlife management area serves as an important winter grazing ground for local elk herds. Wyoming Game and Fish representatives regard this habitat management area as crucial to the survival of these animals (Fralick, 2005). The Wyoming Game and Fish wildlife management area south of Alpine represents an important winter feeding ground for elk (Fralick, 2005).

Insert Figure 2-8 Elk Seasonal Habitat

Between April to mid-June, elk primarily seek a wide variety of grasses on transitional range areas. With the beginning of summer, elk tend to migrate to higher elevations and remain in a summer range for about four months. As grasses dry and reduce in protein, elk supplement their grass consumption with forbs and sedges (Wyoming Game and Fish Department, 1995).

With the close of summer, elk return to winter range areas and graze on transitional ranges until the end of December. Such habitats often include timber stands of Douglas fir, aspen and lodgepole pine. As forbs lose their succulence, elk shift their consumption to dry grasses and browse (leaves, stems, and buds of woody plants). Snow conditions occasionally limit the availability of grass. When this occurs, elk will usually seek shrubs. If snow depths limit the availability of shrubs, elk diets will incorporate aspen, conifers, sagebrush, willow and other taller browse (Wyoming Game and Fish Department, 1995).

#### **2.7.1.2 Mule Deer**

Mule deer are also highly migratory use a wide variety of habitats. These habitats generally include higher elevation forests, riparian lowlands, juniper-ponderosa pine breaks and ridges, brushy foothill areas, and, occasionally, above forest timberlines.

In the vicinity of Alpine, mule deer are prevalent in the Bridger-Teton National Forest. Winter/year long habitat is primarily located north and east of Alpine along the Snake River, along the north side of the Greys River east of Alpine, and within the Greys River Wildlife Habitat Management Unit (Fralick, 2005). Spring, summer and fall habitats are located north, east and south of the community (Figure 2-9).

The diet of mule deer is seasonal and modifies with changes in climate and vegetation. During Spring, mule deer seek greening grasses. As new forb and shrub growth takes place, these forage opportunities are incorporated into their diet. During the Summer, shrub and forb consumption remains high. Mule deer continue to seek grasses, but the consumption of grasses declines considerably. By Fall, mule deer continue to seek forbs, but begin to seek shrubby vegetation as a primary source of food. Mule deer will also pursue grasses when rainfall generates the growth of cool season grasses.

#### **2.7.1.3 Moose**

Moose use a variety of different habitats including coniferous and deciduous forests, shrublands, riparian areas, agricultural croplands, and moist mountain meadows (Wyoming Game and Fish Department, 1993).

In the vicinity of Alpine, critical moose habitat is located along the Greys River and extends into portions of southeast Alpine. Winter/year long habitat for moose is primarily found along the north side of the Snake River and the north side of the Greys River. Spring, summer and fall habitat ranges are situated throughout much of the Bridger-Teton National Forest that is generally north and east of Alpine (Figure 2-10).

Insert Figure 2-9 Mule Deer Seasonal Habitat

Insert Figure 2-10 Moose Seasonal Habitat

Moose in the Rocky Mountains depend largely upon vegetation they consume from a combination of willow, spruce, fir, lodgepole pine, aspen and birch trees. Between 1963 and 1967, extensive observations were made of moose in the vicinity of Jackson, Wyoming over six seasonal periods. These observations indicated that willow species received about 60 percent of all consumption throughout the year. Upland spruce/fir, lodgepole pine and aspen forest areas represented about 19 percent of the total annual consumption of vegetation. The remaining types of vegetation consumed primarily included sagebrush and bitterbrush from sagebrush and grassland areas (Houston, 1968).

### **2.7.2 Significance of Big Game Habitat to Future Land Use Expansion**

Future residential and commercial expansion in the vicinity of Alpine will primarily take place north of Alpine. Elk, mule deer and moose have winter/year long habitat and/or spring, summer and fall habitat, on private lands north of Alpine. However, no crucial seasonal ranges are located on private lands in this potential land use expansion area.

Future residential and commercial development will no doubt displace some smaller areas of the winter/year long and spring/summer/fall habitat for elk, mule deer and moose. However, any loss of habitat in the potential community expansion area is not considered significant. The planned Alpine Meadows and Snake River Junction projects, as well as the ongoing expansion of the Flying Saddle property, are located on properties that are immediately adjacent to U.S. Highways 26 and 89. Vehicular traffic along these highways already diminishes the quality of this wildlife habitat. The future migration of elk, moose, and mule deer populations near Alpine may gradually shift somewhat east of Alpine as elk and mule deer travel south of Alpine during the winter months.