APPENDIX A STANDARDS FOR PUBLIC LAND HEALTH AND GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT

STANDARDS FOR PUBLIC LAND HEALTH

Standards describe conditions needed to sustain public land health, and relate to all uses of the public lands. Standards are applied on a landscape scale and relate to the potential of the landscape.

Standard 1: *Upland* soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.

- Indicators:
  - Expression of rills, soil pedestals is minimal.
  - Evidence of actively-eroding gullies (incised channels) is minimal.
  - Canopy and ground cover are appropriate.
  - There is litter accumulating in place and is not sorted by normal overland water flow.
  - There is appropriate organic matter in soil.
  - There is diversity of plant species with a variety of root depths.
  - Upland swales have vegetation cover or density greater than that of adjacent uplands.
  - There are vigorous, desirable plants.

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods. Riparian vegetation captures sediment, and provides forage, habitat and bio-diversity. Water quality is improved or maintained. Stable soils store and release water slowly.

- Indicators:
  - Vegetation is dominated by an appropriate mix of native or desirable introduced species.
  - Vigorous, desirable plants are present.
  - There is vegetation with diverse age class structure, appropriate vertical structure, and adequate composition, cover, and density.
  - Streambank vegetation is present and is comprised of species and communities that have root systems capable of withstanding high streamflow events.
  - Plant species present indicate maintenance of riparian moisture characteristics.
  - Stream is in balance with the water and sediment being supplied by the watershed (e.g., no headcutting, no excessive erosion or deposition).
  - Vegetation and free water indicate high water tables.
  - Vegetation colonizes point bars with a range of age classes and successional stages.
  - An active floodplain is present.
  - Residual floodplain vegetation is available to capture and retain sediment and dissipate flood energies.
  - Stream channels with size and meander pattern appropriate for the stream's position in the landscape, and parent materials.
  - Woody debris contributes to the character of the stream channel morphology.

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential. Plants and

animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations, and ecological processes.

- Indicators:
  - Noxious weeds and undesirable species are minimal in the overall plant community.
  - Native plant and animal communities are spatially distributed across the landscape with a density, composition, and frequency of species suitable to ensure reproductive capability and sustainability.
  - Plants and animals are present in mixed age classes sufficient to sustain recruitment and mortality fluctuations.
  - Landscapes exhibit connectivity of habitat or presence of corridors to prevent habitat fragmentation.
  - Photosynthetic activity is evident throughout the growing season.
  - Diversity and density of plant and animal species are in balance with habitat/landscape potential and exhibit resilience to human activities.
  - Appropriate plant litter accumulates and is evenly distributed across the landscape.
  - Landscapes composed of several plant communities that may be in a variety of successional stages and patterns.

Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

- Indicators:
  - All the indicators associated with the plant and animal communities standard apply.
  - There are stable and increasing populations of endemic and protected species in suitable habitat.
  - Suitable habitat is available for recovery of endemic and protected species.

Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado. Water Quality Standards for surface and ground waters include the designated beneficial uses, numeric criteria, narrative criteria, and anti-degradation requirements set forth under State law as found in (5 CCR 1002-8), as required by Section 303(c) of the Clean Water Act.

- Indicators:
  - Appropriate populations of macroinvertabrates, vertebrates, and algae are present.
  - Surface and ground waters only contain substances (e.g. sediment, scum, floating debris, odor, heavy metal precipitates on channel substrate) attributable to humans within the amounts, concentrations, or combinations as directed by the Water Quality Standards established by the State of Colorado (5 CCR 1002-8).

GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT

Guidelines are the management tools, methods, strategies, and techniques (e.g., best management practices) designed to maintain or achieve healthy public lands as defined by the standards. Currently, the only guidelines for BLM Colorado that have been developed in concert with the Resource Advisory Councils are livestock grazing management guidelines.

1. Grazing management practices promote plant health by providing for one or more of the following:

- periodic rest or deferment from grazing during critical growth periods;
- adequate recovery and regrowth periods;
- opportunity for seed dissemination and seedling establishment.

2. Grazing management practices address the kind, numbers, and class of livestock, season, duration, distribution, frequency and intensity of grazing use and livestock health.

3. Grazing management practices maintain sufficient residual vegetation on both upland and riparian sites to protect the soil from wind and water erosion, to assist in maintaining appropriate soil infiltration and permeability, and to buffer temperature extremes. In riparian areas, vegetation dissipates energy, captures sediment, recharges ground water, and contributes to stream stability.

4. Native plant species and natural revegetation are emphasized in the support of sustaining ecological functions and site integrity. Where reseeding is required, on land treatment efforts, emphasis will be placed on using native plant species. Seeding of non-native plant species will be considered based on local goals, native seed availability and cost, persistence of non-native plants and annuals and noxious weeds on the site, and composition of non-natives in the seed mix.

5. Range improvement projects are designed consistent with overall ecological functions and processes with minimum adverse impacts to other resources or uses of riparian/wetland and upland sites.

6. Grazing management will occur in a manner that does not encourage the establishment or spread of noxious weeds. In addition to mechanical, chemical, and biological methods of weed control, livestock may be used where feasible as a tool to inhibit or stop the spread of noxious weeds.

7. Natural occurrences such as fire, drought, flooding, and prescribed land treatments should be combined with livestock management practices to move toward the sustainability of biological diversity across the landscape, including the maintenance, restoration, or enhancement of habitat to promote and assist the recovery and conservation of threatened, endangered, or other special status species, by helping to provide natural vegetation patterns, a mosaic of successional stages, and vegetation corridors, and thus minimizing habitat fragmentation.

8. Colorado Best Management Practices and other scientifically developed practices that enhance land and water quality should be used in the development of activity plans prepared for land use.

APPENDIX B AIR QUALITY

CLIMATE

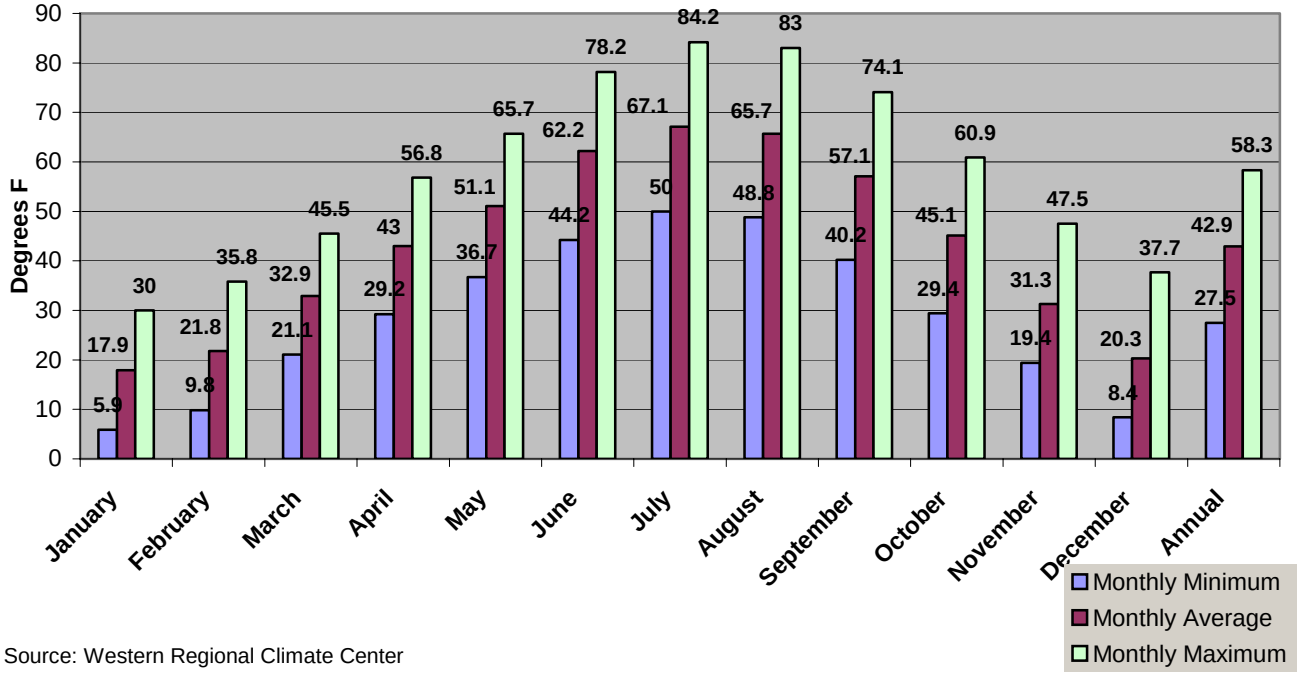
Climatological data was not readily available for all locations throughout the Little Snake RMPPA. Available data used in the analysis are denoted in the following tables and figures.

Table B-1: Little Snake RMPPA Regional Temperature Data

Temperature °F													
Station	Elev. Feet	Annual Mean	Annual Summer Mean / Max	Annual Winter Mean / Min	Extreme Max	Extreme Min	Frost-Free Period 32° F Days	32° F Date Begin	32° F Date End	24° F Days	24° F Date Begin	24° F Date End	Years of Record
Dinosaur Nat. Mon	5,921	47	87	12	--	--	--	--	--	--	--	--	--
Brown's Park	5,354	45	86	10	--	--	--	--	--	--	--	--	--
Maybell	5,925	42	84	4	101	-61	--	--	--	--	--	--	--
Meeker	6,242	44	83	9	100	-43	91	6/11	9/10	143	5/12	10/2	30
Craig	6,285	43	82	8	99	-45	94	6/8	9/10	151	5/5	10/3	10
Hayden	6,375	43	82	8	100	-45	76	6/11	8/26	145	5/9	10/1	28
Steamboat Springs	6,770	39	79	3	96	-50	28	6/23	7/21	123	5/18	9/18	30
Yampa	7,892	39	75	8	88	-24	--	--	--	--	--	--	--
Rangeley	5,230	47	89	7	--	--	--	--	--	--	--	--	--

Source: Little Snake DEIS, 1988, updated by Western Regional Climatic Center, 2002
-- indicates that data are not available

Table B-2: Monthly Average Temperatures for Craig, Colorado



Source: Western Regional Climate Center

Table B-3: Little Snake Regional Precipitation Data

Precipitation										
Station	Elev. Feet	Annual				Extreme				Years of Record
		Mean	Snow		Hail	High	Date	Low	Date	
			Inches	Days	Days					
Dinosaur Nat. Mon	5,921	11.8	43	85	1.6	--	--	--	--	--
Brown's Park	5,354	8.5	17	--	--	--	--	--	--	--
Maybell	5,925	12.3	54	97	0.8	--	--	--	--	--
Meeker	6,242	16.4	87	93	--	--	--	--	--	30
Craig	6,285	16.0	76	103	3.1	18.7	1957	7.4	1958	10
Hayden	6,375	16.8	113	118	1.9	24.6	1957	11.6	1958	28
Steamboat Springs	6,770	23.3	165	143	0	35.9	1957	17.2	1966	30
Yampa	7,892	16.4	120	142	4.3	4.1	1957	10.4	1966	30
Rangeley	5,230	10.1	26	--	--	--	--	--	--	--

Source: Little Snake DEIS, 1988, updated by Western Regional Climatic Center, 2002
-- indicates that data are not available

Table B-4: Average Monthly Precipitation for Craig, Colorado

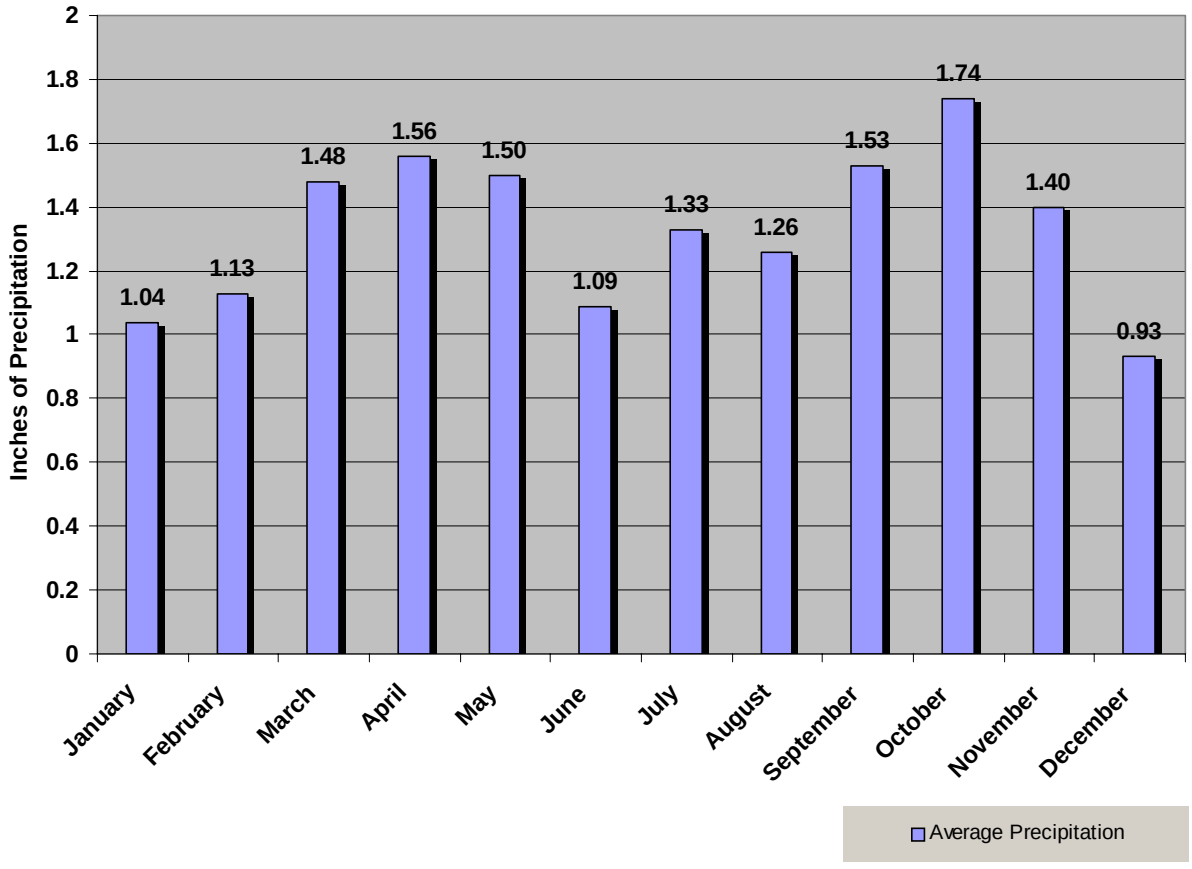


Table B-5: Selected Atmospheric Dispersion Values for Craig, Colorado

Stability Frequency (percentage)				Approximate Mixing Height	
Season	Unstable	Neutral	Stable	Morning	Afternoon
Annual	9	51	40	380	2,540
Spring	18	55	27	610	3,080
Summer	7	43	50	340	3,770
Fall	7	53	40	240	2,120
Winter	3	54	43	320	1,170

Source: BLM, 1983 (GRHF II DEIS)

Table B-6: Monthly Average Wind Speed and Direction for Craig and Hayden, Colorado (wind speeds in miles per hour)

Craig, CO	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Wind Speed	3.9	4.4	5.5	6.7	6.5	8.1	7.4	5.7	5.1	4.9	4.0	5.5
Wind Direction	W	W	W	W	W	W	E	E	W	W	W	W
Hayden, CO	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Wind Speed	6.6	6.7	7.0	8.2	8.2	8.4	8.1	8.0	8.0	7.4	6.7	7.5
Wind Direction	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	E

B.1 APPLICABLE AIR QUALITY REGULATORY ISSUES

Air quality is regulated under the 1970 Clean Air Act (CAA) (42 U.S.C. 7401 et seq.), as amended in 1977 and 1990, and the 1999 Regional Haze Regulations. The purpose of the CAA is to protect and enhance air quality in order to promote public health, welfare, and the productive capacity of the nation. The Clean Air Act addresses criteria air pollutants, National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, and the Prevention of Significant Deterioration (PSD) program. The Regional Haze Regulations address visibility impairment.

The Colorado Department of Public Health and the Environment (CDPHE) have been delegated authority from the Environmental Protection Agency (EPA) to administer the State's Clean Air Act. CDPHE has adopted the National Ambient Air Quality Standards (NAAQS), so there are no ambient air quality standards specific to Colorado.

B.1.1 Ambient Air Quality Standards for Criteria Pollutants

The Environmental Protection Agency (EPA) has promulgated regulations implementing the CAA in 40 Code of Federal Regulations (CFR) Parts 50 through 99, and has established National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for six criteria pollutants:

- Ozone (O_3)
- Carbon Monoxide (CO)
- Particulate Matter (PM_{10} and $PM_{2.5}$)
- Nitrogen Dioxide (NO_2)
- Sulfur dioxide (SO_2)
- Lead (Pb)

For each criteria pollutant, health-based (or primary) standards have been established to protect public health with an adequate margin of safety, and welfare-based (or secondary) standards have been established to protect the public welfare (e.g., crops, vegetation, wildlife, buildings and national monuments, and visibility) from adverse effects of air pollution. Table B-7 identifies typical sources and effects of criteria pollutants.

Table B-7: Sources and Effects of Criteria Pollutants

Pollutants	Health and Welfare Effects
Ozone – Ozone is not directly emitted, but forms as a result of an atmospheric chemical reaction between oxides of nitrogen (NOx) and volatile or reactive organic compounds (so-called ozone precursors), and the energy of the sun. Various factors affect this process, including the quantity of gases present, the volume of air available for dilution, the temperature, and the intensity of the ultraviolet light. Ideal conditions occur in the summer and early fall on warm, windless, sunny days. Typical sources of ozone precursors include motor vehicle exhaust and industrial processes, including processes using solvents.	Ozone is a highly reactive gas that irritates the mucous membranes and lung tissues, aggravates respiratory processes, causes eye irritation, reduces visibility and can damage vegetation and weaken rubber and fabrics. Elevated ambient ozone concentrations are known to affect those with existing respiratory processes such as asthma. Acute exposures can cause bronchial constriction, lung edema, and abnormal lung development.
Carbon Monoxide – Carbon monoxide is a colorless, odorless gas that is formed by the incomplete combustion of fuels. It is a site-specific pollutant with high levels typically found in the vicinity of emission sources, such as heavily congested intersections, industrial processes, and power plants. The highest levels of CO in the ambient air typically occur during the colder months of the year when inversion conditions that trap air pollution near the ground beneath a layer of warm air are more frequent. EPA estimates that in urban areas, from 85 to 95% of all CO emissions may come from motor vehicle exhaust.	Carbon monoxide can cause harmful health effects by combining with hemoglobin and reducing the amount of oxygen that is delivered to the body's organs. The health threat from lower levels of CO is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart failure. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks.
Sulfur Dioxide – Sulfur dioxide belongs to the family of sulfur oxide gases (SOx). These gases dissolve easily in water. Sulfur is present to some degree in all raw materials and fuels, and SO_2 is formed when sulfur-containing fuels such as coal, oil, and gasoline are burned, and when gasoline is extracted from oil. SO_2 dissolves in water vapor to form acid, and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and the environment. Coal-burning power plants generate over 65% of all SO_2 emissions, although locomotives, large ships, and some non-road diesel equipment currently burn high sulfur fuel and contribute to large releases of SO_2.	Because of the way it reacts in the atmosphere, SO_2 can cause a wide variety of health and environmental impacts. Particularly sensitive groups include people with asthma who are active outdoors, children, the elderly, and people with heart or lung disease. Sulfate particles are the major cause of reduced visibility in many parts of the U.S., including our national parks. In addition, SO_2 and NOx react with other substances in the atmosphere to form acidic rain, fog, snow, or dry particles which can damage forests and crops, change the makeup of soil, and make lakes and streams acidic and unsuitable for fish.
Nitrogen Dioxide – Nitrogen dioxide is formed from the combustion of fuel, with higher combustion temperatures generating more NO_2. Major sources of NO_2 and other oxides of nitrogen (NOx) include industrial processes, boilers, power plants, mobile sources, and commercial and residential sources that burn fuels. NOx is one of the main ingredients involved in the formation of ground-level ozone.	Ground-level ozone is formed when NOx and volatile organic compounds (VOCs) react in the presence of heat and sunlight. NOx and sulfur dioxide react with other substances in the air to form acidic rain, fog, snow or dry particles. Nitrate particles and NO_2 can also reduce visibility in urban areas and on a regional scale, and accelerates the eutrophication (or oxygen depletion) of water bodies, particularly coastal estuaries.
Particulate Matter (PM_{10} and $PM_{2.5}$) – Airborne particulate matter consists of tiny coarse-mode or fine-mode particles or aerosols combined with dust, dirt, smoke, and liquid droplets. Fine-mode PM is derived primarily from the incomplete combustion of fuel sources, whereas coarse-mode PM is formed from crushing, grinding, or abrasion of surfaces. Sources of PM include industrial processes, power plants, mobile sources,	Particulate Matter causes a wide variety of health and environmental impacts. Many scientific studies have linked breathing PM to significant health problems, including aggravated asthma, increased respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, and premature death. PM is the major cause of reduced visibility, and can stain and damage stone and other

construction activities, and fires. With regard to mobile sources, more particulate is emitted to the atmosphere from the use of diesel fuel vs. the use of gasoline.	materials, including culturally significant objects such as monuments and statues.
Lead – The primary source of airborne lead used to be motor vehicles operating on leaded gasoline. The introduction of unleaded gasoline has dramatically reduced lead emissions.	Lead causes damage to the kidneys, liver, brain and nerves, and other organs. Exposure to lead may also affect the brain and nerves - excessive exposure to lead causes seizures, mental retardation, behavioral disorders, memory problems, and mood changes. Low levels of lead damage the brain and nerves in fetuses and young children, resulting in learning deficits and lowered IQ. It can also affect animals and plants. Wild and domestic animals can ingest lead while grazing, and experience the same type of effects as people who are exposed to lead. Elevated levels of lead in the water can cause reproductive damage, and blood and neurological changes in some aquatic life.

Ambient air concentration refers to the mass of pollutants present in a volume of air and can be reported in units of micrograms per cubic meter ($\mu g/m^3$) or parts per billion (ppb). The EPA has developed ambient air quality standards for each criteria pollutant for a specific averaging time (Table B-8). Short averaging times (1, 3, 8, and 24 hours) addresses short-term exposure while the annual standards address long-term exposure. Longer-term standards are set to lower allowable concentrations than are short-term standards to recognize the cumulative effects of long-term exposure.

Table B-8: National Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)	NAAQS (ppm)	NAAQS (ppb)
Ozone (O_3)	1 hour	235	0.12	120
	8 hour	157	0.08	80
Carbon Monoxide (CO)	1 hour	40,000	35	35,000
	8 hour	10,000	9	9,000
Sulfur Dioxide (SO_2)	3 hour	1300	0.5	266
	24 hour	365	0.14	99
	Annual	80	0.030	23
Nitrogen Dioxide (NO_2)	Annual	100	0.053	53
Particulate Matter (PM_{10})	24 hour	150		
	Annual	50		
Particulate Matter ($PM_{2.5}$)	24 hour	65		
	Annual	15		
Lead (Pb)	Calendar quarter	1.5		

B.1.1.1 Ambient Air Quality Data for Criteria Pollutants

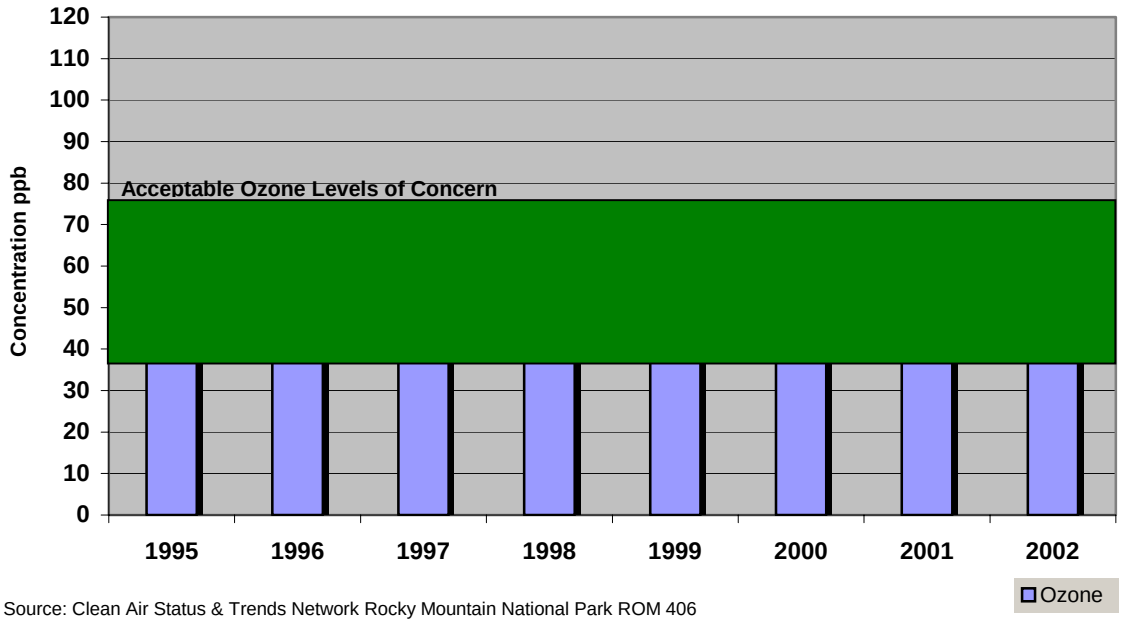
Data provided by CDPHE are used to establish background air quality levels. Information collected from the nearest applicable monitoring stations indicate that current concentrations are in compliance with applicable standards. However, current and complete data on the concentrations of criteria air pollutants for the Little Snake RMPPA are not available. Additional sources have more recent information for some pollutants, such as the Clean Air Status and Trends Network (CASTNet). However, the data are not collected in compliance with applicable standards. Information from the additional sources are listed below, where applicable, to provide a basis for comparison.

- **Ozone.** Ozone concentration data in compliance with applicable standards were collected at various rural sites throughout Colorado including Ute Mountain Ute Reservation, Mesa Verde National Park, and Great Sand Dunes National Monument. Ozone 1-hour and 8-hour max values from Mesa Verde National Park were chosen because they represented the highest rural values and were most

conservative. Non-compliant data for O_3 was available from CASTNet station in Rocky Mountain National Park. Mean annual O_3 concentrations in Rocky Mountain National Park are typical for remote areas in the western United States (Singh et al. 1978), and are within the acceptable ozone levels of concern (LOC) established for the Bridger Wilderness in Wyoming (Fox et al. 1989) (Table B-9).

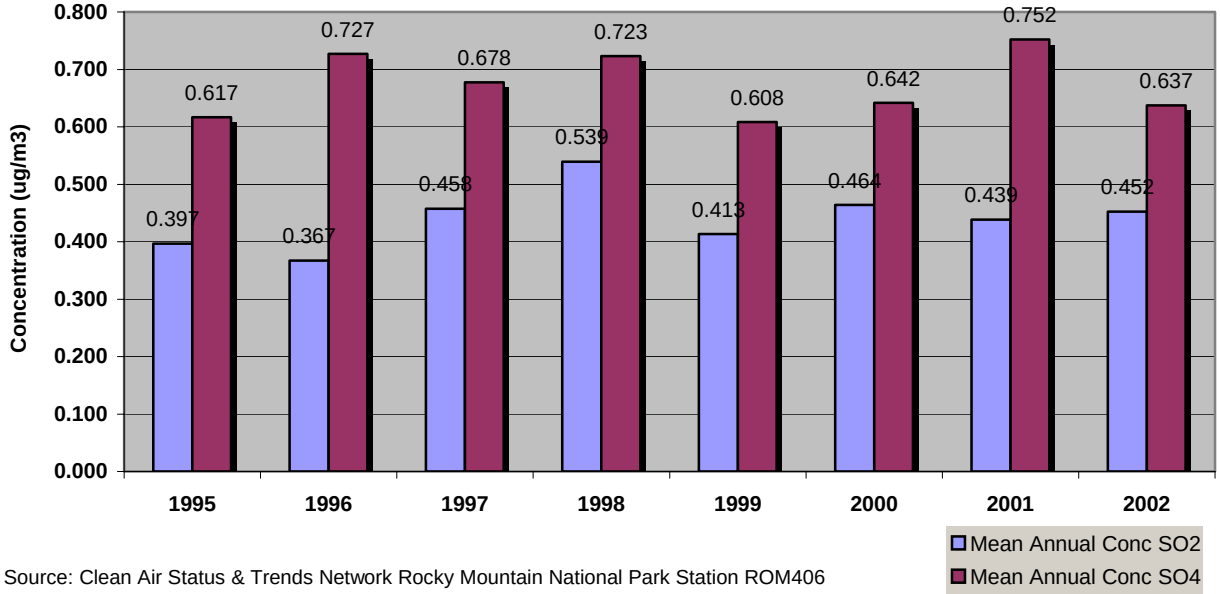
- **Carbon Monoxide (CO).** The only carbon monoxide (CO) data available is over two decades old for areas along Interstate 70, south of the Little Snake RMPPA. However, CO levels in the Little Snake RMPPA are expected to be well below standards given the undeveloped and remote nature of the RMPPA.
- **Sulfur Dioxide and Other Sulfur Compounds.** Data for sulfur-containing pollutants (sulfur dioxide [SO2], sulfate [SO4-2]), and ozone [O3]) were available from Craven Creek, Wyoming in 1981-1982. More recent non-compliant data from CASTNet was available for Mount Zirkel Wilderness and Rocky Mountain National Park (Table B-10). SO_2 concentrations typically range from 1 to 10 ppb in remote areas (Seinfeld, 1986). The CASTNet data indicated significantly lower values (averaging $\geq$ 1.0 ppb) of SO_2 concentrations than acceptable recorded data from Craven Creek, Wyoming. However, data from both sources indicate acceptable levels of SO_2 concentrations in remote areas. SO_4^{-2} concentrations from CASTNet were only available for Rocky Mountain National Park. SO_4^{-2} concentrations are typically about 0.6 ppb in remote areas and about 2.5 ppb in urban areas (Stern 1973). Although SO_4^{-2} concentrations are well below urban levels, concentrations in Rocky Mountain National Park are slightly above levels typical of remote areas.
- **Nitrogen Dioxide and other Nitrogen Compounds.** Concentrations of nitrogen-containing pollutants (HNO_3, NO_3-, and NH_4+) applicable to the Little Snake RMPPA are only available from the Green River Basin Visibility Study site from January to December 2001. Non-compliant data from CASTNet station in Rocky Mountain National Park is available from 1995 through 2001. Although nitrogen-containing pollutants recorded in Rocky Mountain National Park are well below the standards and typical urban levels, they are slightly higher than levels typical of remote areas (Table B-11).
- **Particulate Matter.** The only particulate matter (PM_{10}, $PM_{2.5}$) data available from CDPHE represent urban particulate measurements in Steamboat Springs. Rural particulate values in the Little Snake RMPPA are anticipated to be significantly lower because of lower population concentrations and fewer people.
- **Lead (Pb).** Lead (Pb) is also a criteria pollutant, however, since lead is no longer used as a gasoline additive, it is not considered to be a pollutant of concern from any activities in the area.

Table B-9: Mean Annual Ozone Concentrations in Rocky Mountain National Park



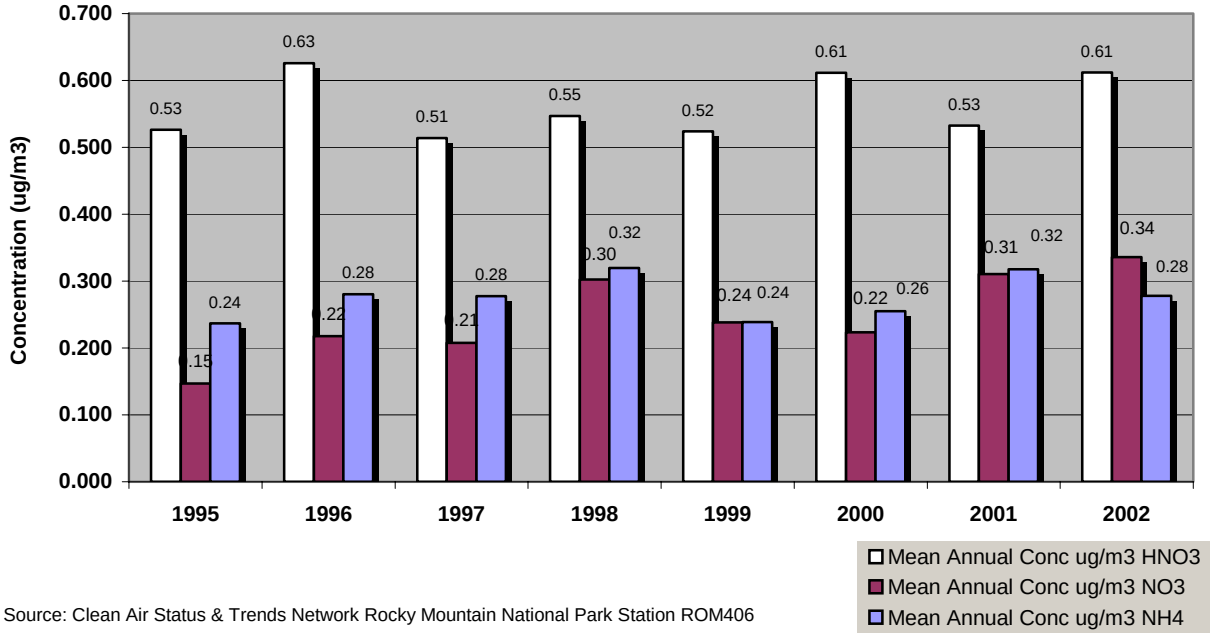
Source: Clean Air Status & Trends Network Rocky Mountain National Park ROM 406

Table B-10: Mean Annual Concentrations of Sulfur Compounds in Rocky Mountain National Park, Colorado



Source: Clean Air Status & Trends Network Rocky Mountain National Park Station ROM406

Table B-11: Mean Annual Concentrations of Nitrogen Compounds in Rocky Mountain National Park, Colorado



Source: Clean Air Status & Trends Network Rocky Mountain National Park Station ROM406

B.1.1.2 Hazardous or Toxic Air Pollutants

Hazardous or toxic air pollutants (HAPs) are those pollutants hazardous to human health or the environment, but are not specifically covered under another portion of the CAA. HAPs cause, or contribute to, air pollution that may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness (42 U.S.C. 74212). EPA administers the National Emission Standards for Hazardous Air Pollutants (NESHAP) program, which targets emissions of toxic air pollutants. EPA has developed a list of sources and source categories that emit any of 189 identified hazardous air pollutants (HAPs), and is developing emission standards for these source categories based on the application of maximum achievable control technology (MACT). MACT is emission control technology that achieves a level of emission control and reduction that is at least equivalent to the level of control achieved by the best-controlled source for the category. MACT is required for any stationary source that emits more than 10 TPY of any one, or 25 TPY of any combination, of HAPs. HAPs data does not exist for the Little Snake RMPPA.

B.1.1.3 Prevention of Significant Deterioration

In areas meeting the NAAQS (attainment areas) or in areas for which there is insufficient information to determine whether they meet the NAAQS (unclassifiable areas), New Source Review (NSR) and permitting are implemented under the EPA-administered Prevention of Significant Deterioration (PSD) program. The goal of the PSD program is to ensure that air quality in attainment or unclassifiable areas does not significantly deteriorate, while maintaining a margin for future industrial growth. Proposed new or modified sources are required to apply Best Available Control Technology (BACT), the maximum degree of emission reduction achievable given economic, energy, and environmental factors. Such sources are required to demonstrate that their emissions would not significantly impact the air quality or result in the attainment area being reclassified as nonattainment. The PSD major source threshold level for 28 specific source categories is 100 tons per year (TPY) of potential emissions of any air pollutant. For other source categories, the PSD major source threshold level is 250 TPY of any air pollutant, with

the exception being modifications to existing sources that would result in a net emissions increase greater than 40 tons per year.

Under the PSD program, each area in the U.S. is classified by the air quality in that region according to the following system:

- **PSD Class I Areas.** Areas with pristine air quality, such as wilderness areas, national parks and some Indian reservations, are accorded the strictest protection. Only very small incremental increases in concentration are allowed in order to maintain the very clean air quality in these areas.
- **PSD Class II Areas.** Moderate incremental increases in concentration are allowed, although the concentrations are not allowed to reach the concentrations set by the NAAQS.
- **PSD Class III Areas.** No areas have yet been designated Class III. Concentrations would be allowed to increase to established NAAQS concentrations.

In order to enforce the PSD program, the EPA developed incremental ambient air quality standards (Table B-12). Comparisons of potential PM_{10}, NO_2, and SO_2 concentrations with PSD increments are intended only to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption analysis. Regulatory PSD Increment Consumption analyses are the sole responsibility of the State of Colorado, which has been granted primacy (with EPA oversight).

In project specific EISs, BLM does not expect that a PSD analysis will be performed. Rather the PSD Standards are only used as a reference to give the public a better understanding of the level of potential impact.

Table B-12: PSD Incremental Standards

Pollutant	Averaging Time	PSD Increment					
		Class I			Class II		
		($\mu g/m^3$)	(ppm)	(ppb)	($\mu g/m^3$)	(ppm)	(ppb)
Nitrogen Dioxide (NO_2)	Annual	2.5	0.0013	1.3	25	0.013	13
Particulate Matter (PM_{10})	24 hour	8			30		
	Annual	4			17		
Sulfur Dioxide (SO_2)	3 hour	25	0.0096	9.6	512	0.1956	196
	24 hour	5	0.0019	1.9	91	0.0348	35
	Annual	2	0.0008	0.8	20	0.0076	8

B.1.2 Regional Haze and Visibility

Visibility impairment in the form of regional haze obscures the clarity, color, texture and form of what can be seen. While some haze-causing pollutants are emitted directly into the atmosphere from stationary and mobile sources, others are formed during secondary reactions when gases emitted to the air are carried downwind and form particles as they are transported. Emissions from human-caused and natural sources can be carried great distances contributing to regional haze. Examples of haze causing pollutants include sulfate formed from sulfur dioxide (SO_2) and nitrate formed from nitrogen oxides (NO_x).

EPA proposed regional haze regulations in 1997, issuing them in conjunction with the new $PM_{2.5}$ NAAQS because the same particulate matter that causes serious respiratory health effects also degrades visibility. The regional haze regulations are intended to maintain visibility on the least impaired days and improve visibility on the most impaired days in mandatory Federal Class I areas across the United States, so that visibility in these areas is returned to natural conditions by the year 2064. EPA's 1999 Regional Haze rule (40 CFR Part 51.300–309) requires the states, in coordination with EPA, the National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and other interested parties, to develop and implement air quality protection plans to reduce the pollution that causes visibility impairment in 156 national parks and wilderness areas across the country, and to ensure that future visibility impairment does not occur in those areas. The first state plans for regional haze are due in 2003 to 2008, and are

expected to have the additional benefit of improving visibility in broad areas across the country that are beyond the targeted national parks and wilderness areas.

Visual range, one of several ways to express visibility, is the furthest distance a person can distinguish a dark landscape feature from a light background like the sky. Visibility is typically expressed in terms of deciviews (dv), a measure for describing perceived changes in visibility. One dv is defined as a change in visibility that is just perceptible to an average person, about a 10 percent change in light extinction. Without human-caused visibility impairment, natural visual range is estimated to average about 8 dv (visual range of about 110-115 miles) in the western United States and about 13 dv (visual range of about 60-80 miles) in the eastern United States (Malm, 1999).

Interagency Monitoring of Protected Visual Environments (IMPROVE) has measured visibility in national parks and wilderness areas in the United States since the 1980s. There are two IMPROVE monitoring stations in Colorado: Mount Zirkel and RMNP. Monitored aerosol concentrations are used to reconstruct visibility conditions for each day monitored, ranked from clearest to haziest. Conditions are reported in three categories:

- 20 percent clearest—mean visibility for the 20% of days with the best visibility
- Average—the annual mean visibility
- 20 percent haziest—mean visibility for the 20% of days with the poorest visibility

B.1.3 Atmospheric Deposition

Atmospheric deposition refers to the processes by which air pollutants are removed from the atmosphere and deposited in terrestrial and aquatic ecosystems. It is reported as the mass of material deposited on an area (kilograms per hectare [kg/ha]) per year (yr). Air pollutants are deposited by wet deposition (precipitation) and dry deposition (gravitational settling of particles and adherence of gaseous pollutants to soil, water, and vegetation). Substances deposited include:

- Nitrogen and sulfur compounds (nitrates, nitrites, and sulfates and sulfites)
- Acids (sulfuric acid (H_2SO_4) and nitric acid (HNO_3)), also known as acid rain
- Air toxics (such as pesticides, herbicides, and volatile organic compounds (VOC))
- Nutrients (such as nitrate (NO_3^-) and ammonium (NH_4^+))

Estimation of atmospheric deposition is complicated by contribution to deposition of several components: rain, snow, cloud water, particle settling, and gaseous pollutants. Deposition varies with precipitation, which in turn, varies with elevation and time.

There are no established regulations for atmospheric deposition. However, guidelines, or identified levels of concern (LOC), set for the Bridger Wilderness in Wyoming (Fox et al., 1989) are widely accepted and used to determine concentrations.

B.1.3.1 Wet Deposition

The National Atmospheric Deposition Program (NADP) assesses wet deposition by measuring the chemical composition of precipitation (rain and snow). Precipitation acidity (pH) data was obtained from three NADP stations in or near the Little Snake RMPPA: Sand Spring in Moffat County, Buffalo Pass Dry Lake in Routt County, and Buffalo Pass Summit Lake in Routt County.

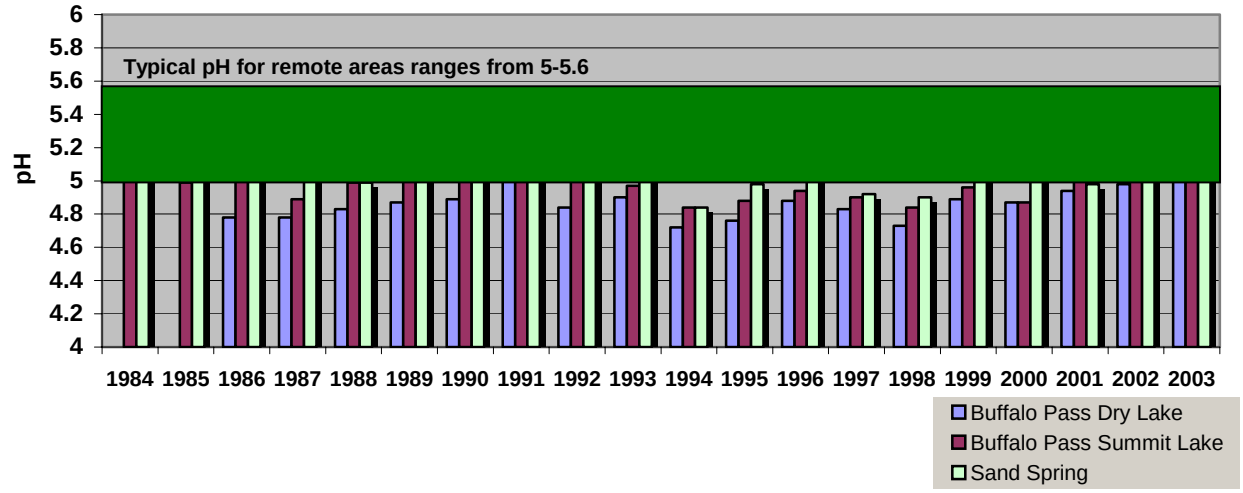
The natural acidity of rainwater is considered to generally be within a range of pH from 5.0 to 5.6 (Seinfeld, 1986). All three monitoring stations dropped below a pH of 5.0, indicating acidification of precipitation, starting in 1994 and continuing through 2001.

Data from all the monitoring stations were used to trend the deposition of NH_4, NO_3, and SO_4 in the Little Snake RMPPA from 1986 through 2003 shown on Table B-14Table B-15Table B-16. Wet ammonium (NH_4^+) deposition values shown in Table B-14 are low for all three monitoring stations. Wet deposition of both nitrate (NO_3^-) and sulfate (SO_4^{-2}) at Buffalo Pass Dry Lake and Buffalo Pass Summit Lake stations are moderately elevated, while nitrate and sulfate data at Sand Spring are low (Table B-15 and Table B-16). A steady decrease in SO_4^{-2} wet deposition has been occurring at the Buffalo Pass stations between 1995 and the early 2000s.

B.1.3.2 Dry Deposition

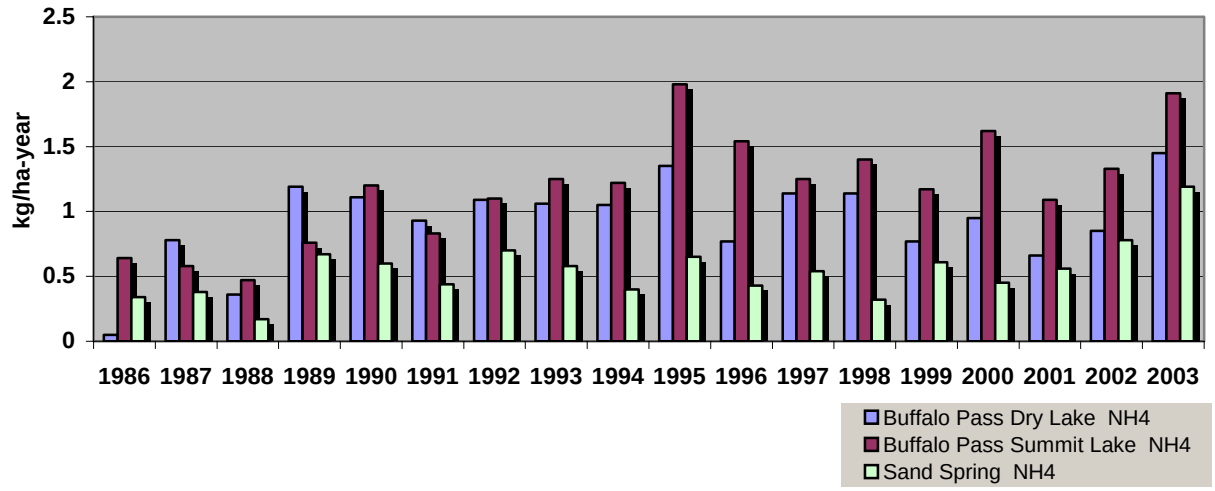
Clean Air Status and Trends Network (CASTNet) measures dry deposition of sulfur- and nitrogen-containing compounds (SO_2, HNO_3, SO_4^{-2}, NO_3^-, and NH_4^+) for Rocky Mountain National Park (Table B-17). Dry deposition values in Rocky Mountain National Park are low (less than 1 kg/ha-yr) and steady for all pollutants, except for HNO_3 which ranged from 1.5 to 4.6 kg/ha-yr.

Table B-13: Mean Annual Precipitation pH in the Little Snake RMPPA



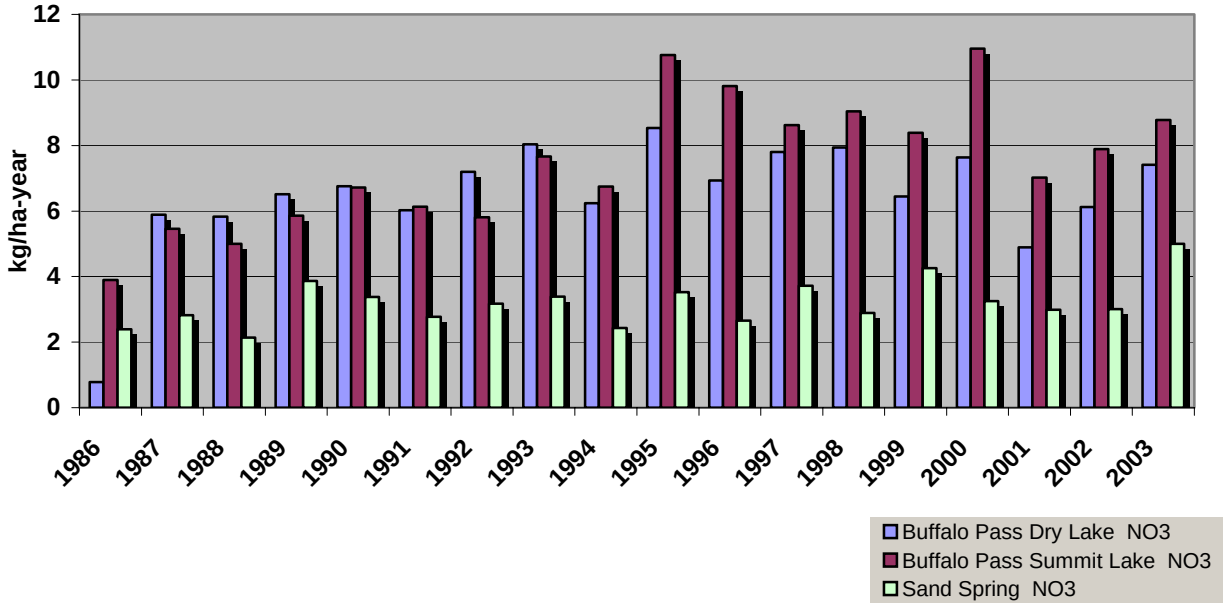
Source: National Atmospheric Deposition Program Buffalo Pass Dry Lake, Buffalo Pass Summit Lake and Sand Spring Stations

Table B-14: Mean Annual Wet Deposition of NH_4 in the Little Snake RMPPA



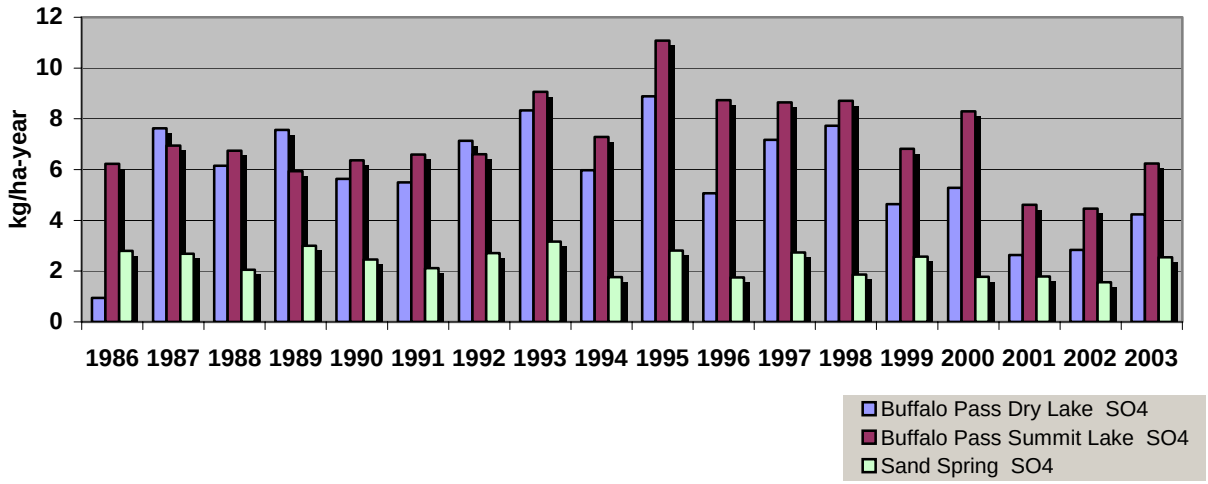
Source: National Atmospheric Deposition Program Buffalo Pass Dry Lake, Buffalo Pass Summit Lake and Sand Spring Monitoring Stations

Table B-15: Mean Annual Wet Deposition of NO_3 in the Little Snake RMPPA



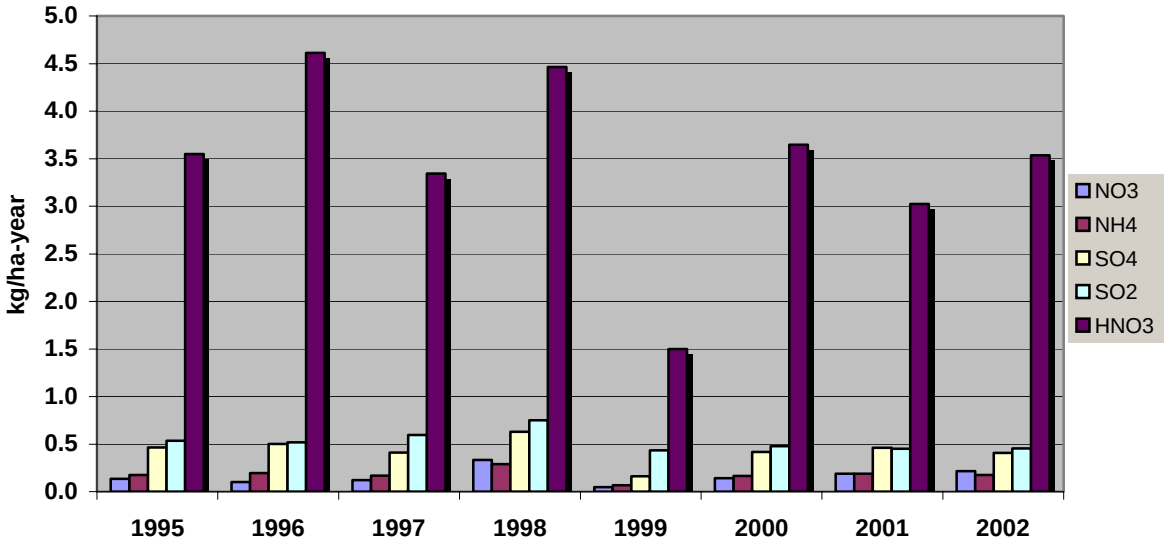
Source: National Atmospheric Deposition Program Buffalo Pass Dry Lake, Buffalo Pass Summit Lake and Sand Spring Monitoring Stations

Table B-16: Mean Annual Wet Deposition of SO_4 in the Little Snake RMPPA



Source: National Atmospheric Deposition Program Buffalo Pass Dry Lake, Buffalo Pass Summit Lake and Sand Spring Monitoring Stations

Table B-17: Mean Annual Dry Deposition of Sulfur and Nitrogen Compounds in Rocky Mountain National Park, Colorado



Source: Clean Air Status & Trends Network Rocky Mountain National Park Station ROM406

APPENDIX C WATER RESOURCES

STREAM SEGMENTS WITHIN THE LSFO

2 Bar Creek	Flycreek	Sand Springs Gulch
Beaver Creek	Fortification Creek	Scandinavian Gulch
Berry Gulch	Fourmile Creek	Second Creek
Big Gulch	Gill Reservoir	Shell Creek
Bighole Gulch	Government Corral Creek	Slater Creek
Bobhughes Creek	Hayden Gulch	South Fork Cottonwood Gulch
Boxelder Gulch	Horse Gulch	South Fork Fourmile Creek
Browse Spring Draw	Jeffway Gulch	South Fork Little Snake River
Bunker Creek Tributary	Jesse Gulch	Spring Creek
Butcher Knife Creek	Johnson Creek	Spring Gulch
Butler Creek	Little Middle Creek	Sulphur Gulch
Cantling Creek	Little Snake River	Talamantes Creek
Canyon Creek	Little Trout Creek	Taylor Canyon
Castor Gulch	Long Gulch	Temple Gulch
Chase Spring Draw	Maudlin Gulch	Thornburg Gulch
Coal Creek	Milk Creek	Timberlake Creek
Cottonwood Creek	Morgan Gulch	Trib to Martin Cull Reservoir
Cottonwood Gulch	Morrison Creek	Trout Creek
Day Creek	Mud Spring Draw	Ute Gulch
Deadman Draw	Mule Creek	Vermillion Creek
Deal Gulch	NS Creek	Watson Creek
Deception Creek	Oak Creek	West Fork Sand Creek
Deep Creek	Pagoda Creek	Williams Fork River
Deer Creek	Phillips Creek	Willow Creek
Dry Creek	Pole Gulch	Woodbury Gulch
Dry Fork Little Bear Creek	Red Creek	Wymore Gulch
East Timberlake Creek	Roaring Fork Slater Creek	Yampa River
Elkhead Creek	S. Fork First Creek	Unnamed Tributary to Steamboat Lake
First Creek	Sage Creek	
Fisher Creek	Sand Creek	

APPENDIX D PLANT AND ANIMAL SPECIES LIST

Common Name	***Scientific Name***
PLANTS	
Fungi	
white pine blister rust	*Cronartium ribicola*
bleeding rust	*?*
Gymniosperms	
douglas-fir	*Pseudotsuga menziesii*
Englemann spruce	*Picea engelmannii*
fir	*Abies sp.*
juniper	*Juniperus scopulorum or Juniperus ostersperma*
limber pine	*Pinus flexilis*
lodgepole pine	*Pinus contorta*
pine	*Pinus sp.*
pinyon pine	*Pinus edulis*
ponderosa pine	*Pinus ponderosa*
spruce	*Picea sp.*
subalpine fir	*Abies lasiocarpa*
Angiosperms	
alfalfa	*Medicago*
alkali cordgrass	
alkali sacaton	*Panicum bulbosum*
alkaligrass	
aspen	*Populus tremuloides*
aster	*Aster sp.*
basin big sage	*Artemesia tridentata tridentata*
basin wildrye	*Elymus ?*
big bluegrass	*Poa ?*
big sagebrush	*Artemesia tridentata*
birdfoot sage	
biscuit-root	*Cogswellia ?*
bitterbrush	*Purshia tridentata*
black sagebrush	*Artemesia nova*
bluebell	*Mertensia sp.*
bluebunch wheatgrass	*Agropyron spicatum*
bottlebrush squirreltail	*Sitanion hystrix*
broom snakeweed	*Gutierrezia sarothrae*
buckwheat	*Eriogonum sp.*
bud sage	
bud sagebrush	
buttercup	*Ranuculus sp.*
cheat grass	*Bromus tectorum*
chickweed	*Alsine sp.*

Common Name	***Scientific Name***
chokecherry	*Prunus sp.*
Columbia needlegrass	*Stipa ?*
columbine	*Aquilegia sp.*
cottonwood	*Populus sp.*
crested wheatgrass	*Agropyron cristatum*
currant	*Ribes sp.*
cushion milkvetch	
debris milkvetch	
Duchesne buckwheat	
Duchesne milkvetch	
Dudley bluffs bladderpod	*Lesquerella congesta*
Dudley bluffs twinpod	*Physaria obcordata*
dwarf mistletoe	
elk sedge	*Carex geyeri*
elkweed	
false dandelion	
four-wing saltbush	*Atriplex canescens*
fringed sagebrush	*Artemesia frigida*
Gamble oak	*Quercus gambelii*
Gardner saltbush	*Atriplex gardneri*
Gibbin's penstemon	*Penstemon ?*
globemallow	*Sphaeralcea sp.*
goldenweed	*Aplopappus sp.*
Graham beardtongue	*Penstemon grahamii*
greasewood	*Sarcobatus sp.*
green needlegrass	*Stipa viridula*
green rabbitbrush	*Chrysothamnum greenei*
groundsel	*Senecio sp.*
halogeton	*Halogeton glomeratus*
Hooker sandwort	*Arenaria ?*
horsebrush	
Idaho fescue	*Festuca idahoensis*
Indian paintbrush	*Castilleja coccinea*
Indian ricegrass	*Oryzopsis hymenoides*
inland saltgrass	*Distichlis spicata*
Kentucky bluegrass	*Poa pratensis*
king spike fescue	*Festuca ?*
kinnikinnik	*Archtostaphylos uva-ursi*
larkspur	*Delphinium sp.*
leafy spurge	
ligulate feverfew	
locoweed	*Astragalus sp.*
lupine	*Lupinus sp.*
matted fiddleleaf	
milkvetch	*Astragalus sp.*
mountain big sage	*Artemesia tridentata vasayana*
mountain clover	*Trifolium ?*

Common Name	***Scientific Name***
mountain mahogany	*Cercocarpus sp.*
mutton bluegrass	*Poa fendleriana*
narrowleaf evening primrose	*Primula ?*
needle-and-thread	
Nelson milkvetch	*Astragalus ?*
Nuttall sandwort	*Arenaria ?*
Oregon grape	*Odostemon aquifolium*
Ownbey's thistle	
penstemon	*Penstemon sp.*
phlox	*Phlox sp.*
prairie sandreed	*Calamovilfa longifolia*
prickly pear cactus	*Opuntia sp.*
rabbitbrush	*Chrysothamnus sp.*
rock-tansey	
Rocky Mountain thistle	
Ross' sedge	*Carex ?*
rubber rabbitbrush	*Chrysothamnus nauseosus*
sagebrush	*Artemesia sp.*
saltbush	*Atriplex gardneri*
sand dropseed	*Sporobolus cryptandrus*
sand sagewort	*Artemesia ?*
Sandberg bluegrass	*Poa secunda*
sego lily	*Calochortus nuttallii*
serviceberry	*Amelanchier sp.*
shadscale	*Atriplex confertifolia*
shrubby cinquefoil	*Dasiphora fruticosa*
silver sagebrush	*Artemesia cana*
single-stemmed wild buckwheat	*Eriogonum ?*
skunk bush sumac	*Rhus trilobata*
slender wheatgrass	*Agropyron trachycaulum*
snowberry	*Symphoricarpos sp.*
spiny hopsage	*Grayia spinosa*
starvling milkvetch	*Astragalus ?*
stinging nettle	*Urtica dioica*
strigose easter-daisy	
tamarisk	*Tamarix parviflora*
thickspike wheatgrass	*Agropyron dasystachyum*
threadleaf sedge	*Carex filifolia*
tufted cryptanth	
Uinta Basin spring-parsley	
violet	*Viola sp.*
western wheatgrass	*Agropyron spicatum*
White River beardtongue	*Penstemon scariosus var. albifluvius*
wild onion	*Allium sp.*
wild parsley	
willow	*Salix sp.*
winterfat	*Eurotia lanata*

Common Name	***Scientific Name***
Wood rose	*Rosa woodsii*
woodside buckwheat	
woody aster	*Aster parryi*
Wyoming big sage	*Artemesia tridentata wyomingensis*
ANIMALS	
Insects	
Mormon cricket	
mountain pine beetle	*Dendroctonus ponderosae*
spruce bark beetle	*Dendroctonus rufipennis*
Fish	
bonytail chub	*Gila elegans*
brook trout	*Salvelinus fontinalis*
brown trout	*Salmo trutta*
catfish	
cold water gamefish	--
Colorado pike minnow	*Ptychocheilus lucius*
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*
Colorado roundtail chub	*Cila robusta*
flannelmouth sucker	*Catostomus latipinnis*
humpback chub	*Gila cypha*
mountain sucker	*Catostomus platyrhynchus*
northern pike	*Esox lucius*
rainbow trout	*Oncorhynchus*
razorback sucker	*Xyrauchen texanus*
sucker	
warm water gamefish	--
Amphibians	
boreal toad	*Bufo boreas boreas*
Great Basin spadefoot	*Spea intermontana*
northern chorus frog	*Pseudacris triseriata*
northern leopard frog	*Rana pipiens*
tiger salamander	*Ambystoma tigrinum*
Woodhouse's toad	*Bufo woodhousii*
Reptiles	
short-horned lizard	*Phrynosoma douglasii*
midget faded rattlesnake	*Crotalus viridis concolor*
northern sagebrush lizard	*Ssceloporus graciosus graciosus*
prairie rattlesnake	*Crotalus viridis viridis*

Common Name	***Scientific Name***
Birds	
American kestrel	*Falco sparverius*
American white pelican	*Pelecanus erythrorynchos*
bald eagle	*Haliaeetus leucocephalus*
Barrow's goldeneye	*Bucephala islandica*
black tern	*Chlidonias niger*
black-crowned night heron	*Nycticorax nycticorax*
blue grouse	*Dendragapus obscurus*
Brewer's sparrow	*Spizella brewerii*
burrowing owl	*Athene cunnicularia*
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*
common nighthawk	*Chordeiles minor*
Cooper's hawk	*Accipiter cooperi*
dusky flycatcher	*Empidonax oberholseri*
ferruginous hawk	*Buteo regalis*
golden eagle	*Aquila chrysaetos*
great blue heron	*Ardea herodius*
greater sage grouse	*Centrocercus urophasianus*
green-tailed towhee	*Pipilo chlorurus*
horned lark	*Alauda alpestris*
house wren	*Troglodytes aedon*
killdeer	*Charadrius vociferus*
loggerhead shrike	*Lanius ludovicianus*
long-billed curlew	*Numenius americanus*
Mexican spotted owl	*Strix occidentalis lucida*
mountain plover	*Charadrius montanus*
mourning dove	*Zenaidura macroura*
northern goshawk	*Accipiter gentilis*
northern harrier	*Circus cyaneus*
osprey	*Pandion haliaetus*
peregrine falcon	*Falco peregrinus*
plain titmouse	*Parus inornatus*
prairie falcon	*Falco mexicanus*
red-tailed hawk	*Buteo jamaicensis*
sage sparrow	*Amphispiza belli*
sage thrasher	*Oreoscoptes montanus*
sandhill crane	*Grus canadensis*
sharp-shinned hawk	*Accipiter striatus*
southwestern willow flycatcher	*Empidonax traillii extimus*
Swainson's hawk	*Buteo swainsoni*
white-faced ibis	*Plegadis chihi*
wild turkey	*Meleagris gallopavo*
yellow warbler	*Dendroica petechia*
yellow-billed cuckoo	*Coccyzus americanus*

Common Name	***Scientific Name***
Mammals	
bighorn sheep	*Ovis canadensis*
black bear	*Ursus americanus*
black-footed ferret	*Mustela nigripes*
burro	*Equus asinus*
Canada lynx	*Lynx canadensis*
cow	*Bos sp.*
deer	*Odocoileus hemionus or Odocoileus virginianus*
elk	*Cervus canadensis*
gray wolf	*Canis lupus*
ground squirrel	*Citellus sp.*
horse (wild and domestic)	*Equus caballus*
kit fox	*Vulpes macrotis*
man	*Homo sapiens*
moose	*Alces americana*
mountain lion	*Felix concolor*
mule deer	*Odocoileus hemionus*
pronghorn	*Antilocapra americana*
river otter	*Lutra canadensis*
domestic sheep	*Ovis sp.*
swift fox	*Vulpes velox*
Townsend's big-eared bat	*Plecotus townsendii*
white-tailed prairie dog	*Cynomys gunnisoni*
wolverine	*Gulo luscus*

APPENDIX E CULTURAL AND HERITAGE RESOURCES

E.1 CULTURAL SITE TYPES

Cultural resources in the Little Snake RMPPA have been classified according to one or more site types. Site types are groupings of sites with similar physical or cultural characteristics. Sites fitting into more than one category are usually more complex and have more information potential than do single-category sites. At the broadest level, cultural resources sites are categorized as either prehistoric or historic types. For further information than that provided below, refer to the Class I Overview of Prehistoric Cultural Resources (La Point, 1987).

Prehistoric sites can be associated with one or more of four cultural traditions: Paleo-Indian, Archaic, Formative (Fremont or Ancestral Puebloan), and Proto-historic. There are approximately 1,420 prehistoric sites in the RMPPA, with sites from each cultural tradition. Prehistoric site types are descriptive and information is not readily available during original recordation to determine functional types of most sites. Therefore, these site types are based upon physical characteristics that are generally recorded. Prehistoric site types occurring in the Little Snake RMPPA are shown in Table E-1.

Historic sites are cultural resources with a period of significance following 1860 A.D. There are approximately 120 historic sites in the Little Snake RMPPA. Historic resources can fit into both thematic categories and into descriptive types. Some of the themes are organized chronologically while most are functionally organized. Historic site types occurring in the Little Snake RMPPA are shown in Table E-2.

Table E-1: Prehistoric Site Types Occurring in the Little Snake RMPPA

Prehistoric Site Types		
Site Type	**Description**	**Occurrence in the RMPPA [1]**
Lithic Scatter	Area where the waste from the manufacture of stone tools or the tools themselves are found. Includes open or sheltered lithic, chippings, or chipping station.	There are over 350 lithic scatters in the RMPPA, comprising over 25% of all cultural resource sites. Lithic scatters have been identified from each cultural group who has used the area.
Campsite	A campsite is a lithic scatter with the addition of features associated with fire making: charcoal, ash, fire-cracked rocks, or burnt bone. Includes open camps, habitation, camp, burnt spots, fire pots, hearths. A campsite may also be a hearth, with no associated cultural material.	There are nearly 300 campsites (over 21% of total) in the RMPPA. Most campsites are hearths.
Quarry	Area where stone is obtained and worked on site. Includes chipping, manufacture and extraction/mining areas.	Only four quarries are known in the RMPPA.
Kill Site	An area containing stone and/or bone tools in association with the remains of one or more animals. Includes traps or jumps designed for the procurement of wildlife resources. Sites may contain elements of several other site types.	--
Rock Shelter:	An area protected from the weather by an overhanging rock formation. Includes caves and overhangs. May be referred to as sheltered camps. Usually has a drip line and may or may not have surface cultural material.	Despite the abundance for areas conducive to sheltered camps, less than 30 sites have been identified.

Prehistoric Site Types		
Site Type	**Description**	**Occurrence in the RMPPA [1]**
Rock Art	Roughly defined rock art includes any artistic expression or message on a rock surface. Rock art can be of two types: petroglyphs and pictographs. Petroglyphs are designs pecked or incised into the surface of the rock; pictographs are painted on the rock surface with various shades of pigment. Cultural affiliation of rock art has been determined by the presence of diagnostic subject matter (La Point, 1987).	There are around 20 rock art sites, some associated with other site types.
Burial	Remains of human beings, fragmentary or whole.	--
Tipi Rings	Circular arrangement of spaced rocks, 3 – 15 meters in diameter. Includes stone circles. May be associated with other site types.	Several tipi rings have been identified.
Wickiup	Poles or branches of pinyon or juniper laid up against living trees. Interior may be floored with juniper bark. May be associated with other site types.	--
Granary	Mud-mortared sandstone slab structures, usually about 1.5x1.5x1.5 meters. Most often built into sandstone ledges, sometimes mud-lined and capped or lidded with a large slab.	Several granaries have been identified in the RMPPA.
Rock Walls	Alignments or walls of mud-mortared or dry-laid stone masonry. May be single or multiple and may or may not have a doorway. Usually built on a ridge.	Few sites have been identified.

[1] These numbers won't be available until the database reconciliation is complete (anticipated in mid- to late-2005).

Table E-2: Historic Site Types Occurring in the Little Snake RMPPA

Historic Site Types		
Site Type	**Description**	**Occurrence in the RMPPA [1]**
Trails	Identified routes followed by early explorers or by many emigrants. Physical evidence may (Overland) or may not (Dominguez-Esante) remain.	--
Forts	Military establishments for the protection of persons or property. Also gathering and exchange points before the establishment of towns.	--
Stage Stations	Wayfarers' resting places and fresh harness animal acquisition points.	--
Homestead	One or more structures of varied size, shape, and materials used to shelter isolated Euro-American families claiming land under various homestead laws.	--
Ranch	Cluster of structures of single and multiple uses associated with a livestock-based family economic operation.	--
Railroad	Roadbed, tracks, trestles, bridges, depots, and rolling stock associated with early (and continued) industrial transportation of goods and people.	--
Town	Aggregation of structures sheltering domestic, business, education, social, political, and religious activities. Individual structures may be single or multiple use, but population is multifamily.	--
Unique Structure	Any structure's merit is associated with a particular person.	--
Site	The location where a historic event occurred but no tangible evidence remains of the action itself.	--
Architectural	A structure's merit is its manner or style of construction.	--
School	A structure built for educational purposes but whose historical function is as a community center in the absence of nearby towns.	--
Community Center	A structure, often a public school, which provides a relatively local meeting place for residents of areas with few towns.	--
Mine	An outcropping of valuable mineral resource and the structures associated with the removal activity.	--
Reclamation Projects	Structures associated with irrigation, water and soil retention, or flood control. These are usually engineering features.	--

[1] These numbers won't be available until the cultural database reconciliation is complete (anticipated in mid- to late-2005).

APPENDIX F PALEONTOLOGY

F.1 PALEONTOLOGICAL RESOURCES POTENTIAL

Paleontological resources are integrally associated with the geologic rock units (formations) in which they are located. If extensive excavation on a certain formation in one geographic area results in significant paleontological resources, there is a potential that excavations throughout the extent of the formation may produce fossil material as well. The geographic extent of the Little Snake RMPPA contains 128 named formations at the surface, 78 of which are known to be fossiliferous (Armstrong & Wolney 1989). The 128 rock units in the Little Snake RMPPA and associated information are organized from oldest to youngest in Table F-1. However, these formations have differing potentials to contain significant fossils. Caution must be exercised when comparing fossils to rock units in as much that Table F-1 only reflects the amount of paleontological work done in certain areas, while other areas may also contain fossils, but have had no examinations as of yet (Armstrong & Wolney 1989). Additionally, some of the rock unit names that have been assigned over the years are no longer accepted, but have been included for reference purposes.

Table F-1: Paleontological Resource Potential by Geologic Formation in the Little Snake RMPPA

Geologic Era	Geologic Period (Epoch)	Formation Name	Fossils Present	Class
Precambrian	**–**	Red Creek Quartzite	None	IV
		Biotitic Gneiss, Schist, and Migmatite	None	IV
		Felsic and Hornblendic Gneisses, either Separate or Interlayered	None	IV
		Granitic Rocks of 1,700 ma Age Group	None	IV
		Mafic Rocks of 1,700 ma Age Group	None	IV
		Granitic Rocks of 1,400 ma Age Group	None	IV
		Alkalic and Mafic Rocks	None	IV
		Uinta Mountain Group (Sedimentary)	None (?)	III
Paleozoic	**Cambrian**	Sawatch Quartzite	None (?)	III
		Lodore Formation	Fish	II
		Peerless Formation	Trilobites	II
	Cambrian - Ordovician	Dotsero Formation	Stromatolites	III
	Ordovician	Manitou Limestone	Invertebrates (including trilobites, brachiopods, cephalopods	II
		Harding Sandstone	Cephalopods, early vertebrates	II
	Devonian	Parting Formation	Algal carbonate beds, fish	II
		Coffee Pot Formation	Mainly unfossiliferous	III
	Mississippian and Devonian	Dyer Dolomite	Brachiopod bivalves, algal layers	II
		Gilman Sandstone	Unfossiliferous	III
	Mississippian	Leadville Limestone	Algal layers, oolites, mixed invertebrates	III

Geologic Era	Geologic Period (Epoch)	Formation Name	Fossils Present	Class
		Madison Limestone	Oolitic, algal, mixed invertebrates	III
		Humbug Formation	Invertebrates	III
		Doughnut Formation	Unknown	III
	Pennsylvanian	Molas Formation	Unknown	III
		Morgan Formation	Unknown	III
		Belden Formation	Trace	III
		Minturn Formation	Footprints, brachiopods, conodonts, trilobites, corals	II
		Round Valley Limestone	Unknown	III
		Eagle Valley Evaporites	Unknown	III
		Jacques Mountain (Fm. or Mbr?)	Unknown	III
	Pennsylvanian - Permian	Maroon Formation	None	III
		Fountain Formation	Mainly unfossiliferous, but intertongues with fossils of Pennsylvanian-Permian age.	III
		Casper Formation	Mixed-skeletal lime	III
		Weber Sandstone	Unknown	III
	Permian	Satanka Shale (Owl Canyon Fm., properly)	Unknown	III
		Phosphoria Formation	Unknown	III
		Park City Formation	Unknown	III
		Goose Egg Formation	Stromatolites	III
		Forelle Limestone	Unknown	III
	Permian - Triassic	State Bridge Formation	Brachiopods	II
Mesozoic	**Triassic**	Moenkopi Formation	Unknown	III
		Woodside Formation	Unknown	III
		Red Peak Formation	Unknown	III
		Chugwater Formation	Plants	II
		Shinarump Fm. or Group	Unknown	III
		Chinle Formation	Tracks	II
		Jelm Formation	Unknown	III
		Popo Agie Formation	Small theropod footprints and trackways	II
	Jurassic	Glen Canyon Sandstone or Group	Unknown	III
		Navajo Sandstone	Vertebrate and invertebrate tracks and traces	II
		Nugget Sandstone	Vertebrate and invertebrate tracks and traces	II
		Carmel Formation	Ammonites	II
		Entrada Sandstone	Unknown	III
		Sundance Formation	Ammonites, belemnites, oysters	II
		San Rafael Group	Unknown	III
		Curtis Formation	Belemnites, microfossils	II
		Morrison Formation	Dinosaurs, lizards, other reptiles, birds, mammals, amphibians, fish, invertebrates, plants	I
	Cretaceous	Burro Canyon Formation	Plant, dinosaur.	II
		Cedar Mountain Formation	Dinosaurs, egg-shells, mammals	II
		Cloverly Formation	Dinosaurs	II

Geologic Era	Geologic Period (Epoch)	Formation Name	Fossils Present	Class
		Dakota Sandstone	Plant, dinosaur bones and tracks	II
		Mowry Shale	Marine and freshwater invertebrates, fresh-water fish, fossil bones, plants	II
		Mancos Shale	Invertebrates (ammonites, oysters, brachiopods, clams, crayfish burrows), sharks, large marine reptiles, fish, dinosaurs, pollen, plants	II
		Benton Shale	Clams, oysters, squid-like baculites.	II
		Graneros Shale	Foraminifera	III
		Greenhorn Limestone	Unknown	III
		Carlile Shale	Shark teeth?	III
		Niobrara Formation	Microfossils, clams, oysters	II
		Frontier Sandstone	Clams, baculites, scaphites, microfossils	II
		Castlegate Sandstone	Burrows	III
		Mesa Verde Formation, Undivided	Plants, dinosaurs, mammals, crocodilians, turtles, snails, oysters	II
		Mesaverde Group or Formation	Plants, dinosaurs, mammals, turtles, crocodilians, fish, trackways, snails	II
		Sego Sandstone	Unknown	III
		Corcoran Sandstone	Unknown	III
		Cozette Sandstone	Unknown	III
		Iles Formation	Dinosaurs, turtles, invertebrates (clams, oysters, ammonites, freshwater gastropods) trace plants	II
		Williams Fork Formation	Mammals, dinosaurs, crocodilians, turtles, fish, sharks, invertebrates, reptiles, plants	Ia
		Price River Formation	Unknown	III
		Pierre Shale, Undivided	Ammonites, baculites, clams, gastropods	II
		Lewis Shale	Clams, microfauna, 1 baculite	II
		Farrer (Neslen) Formation	Unknown	III
		Fox Hills Formation	Plants	II
		Lance Formation	Mammals, dinosaurs, crocodilians, plants	I
		Medicine Bow Formation	Plants	II
		Middle Park Formation	Unknown	III
		Ohio Creek Conglomerate	Unknown	III
		Laramide Intrusive Rocks	None	IV
Cenozoic	**Tertiary (Paleocene)**	Fort Union Formation	Mammals, reptiles (including potentially redeposited dinosaurs), amphibians, fish, invertebrates, plants, pollen	II

Geologic Era	Geologic Period (Epoch)	Formation Name	Fossils Present	Class
		Middle Park Formation Exclusive of Windy Gap Member	Plants	II
	Tertiary (Paleocene – Eocene)	Coalmont Formation	Abundant plant remains, potential mammals, beetles, other insects, fish	II
		Wasatch Formation (DeBeque Formation)	Mammals (including early horses, primates, marsupials, carnivores), crocodilians, alligators, lizards, turtles, birds, eggs, amphibians, fish, plants, and invertebrates.	Ia
	Tertiary (Eocene)	Wasatch Formation (DeBeque Formation) Niland Tongue	Unknown	II
		Wasatch Formation (DeBeque Formation) Cathedral Bluffs Member	Unknown	II
		Green River Formation	Mammals, reptiles, amphibians, birds, fish, invertebrates, insects, microfossils, algal balls, plants (often in abundance)	I
		Green River Formation Lower Part	Fish; invertebrates	II
		Green River Formation Parachute Creek Member	Lizards, small crocodilians, turtles, bats, birds, small fish, a frog, invertebrates, various abundant insects (including eggs, larvae and adults), plants	Ia
		Green River Formation Garden Gulch Member	Fish scales, small vertebrates, invertebrates, plants	II
		Green River Formation Douglas Creek Member	Insects, snails, ostracodes	II
		Green River Formation Luman Tongue	Freshwater clams, snails, ostracodes, pollen, spores	II
		Green River Formation Tipton Tongue	Unknown	II
		Green River Formation Laney Member	Giant algal heads to 30 ft. high and 20 ft. across formed around silicified conifer tree trunks	II
		Green River Formation Coughs Creek Tongue	Unknown	III
		Green River Formation Thirteen Mile Creek Tongue	Invertebrates	III
		Green River Formation Evacuation Creek Member	(See Uinta Formation).	I
		Uinta Formation	Large mammals, turtles, crocodilians, small reptiles, fish, invertebrates, insect larvae, plants (leaves, wood, algae)	I
		Washakie Formation	Mammals, fish scales, turtles, crocodilians, lizards, freshwater clams	Ia
		Bridger Formation	Fish, mammals, snails	I

Geologic Era	Geologic Period (Epoch)	Formation Name	Fossils Present	Class
	Tertiary (Eocene – Oligocene)	Duchesne River Formation	Unknown	III
		Middle Tertiary Intrusive Rocks	None	IV
	Tertiary (Oligocene)	White River Formation or Group	Mammals, reptiles, amphibians	Ia
		Knight Formation	Mammals	I
		Bishop Conglomerate	Invertebrates	III
		Ash-Flow Tuff of Main Volcanic Sequence	None	IV
	Tertiary (Miocene)	North Park Formation	Mammals, including horses	I
		Wagontongue Formation	Vertebrates	II
		Rhyolitic Intrusive Rocks and Flows of Late-Volcanic Bimodal Suite	None	IV
		Basaltic Intrusive Rocks related to Basalt Flows	None	IV
	Tertiary (Miocene – Pliocene)	Brown's Park Formation	Mammals (including mastodonts, rhinocerotids, antilocaprids, horses, camels)	Ia
		Troublesome Formation	Mammals (including squirrels, horned gophers, rabbits, horses, camels, owl, cats), insects, plants	Ia
		Dry Union Formation	Mammals and other vertebrates	II
		Bouldery Gravel on Old Erosion Surfaces	Unknown	III
		Basalt Flows and Associated Tuff, Breccia, and Conglomerate of Late-Volcanic Bimodal Suite	Mammals, wood	II
	Quaternary (Pleistocene)	Older Gravels and Alluviums	Unknown	III
		Older Glacial Drift	Mammoths?, invertebrates	II
		Gravels and Alluviums	Mammoths, bison, horses, and invertebrates	II
		Glacial Drift of Pinedale and Bull Lake Glaciations	Unknown	III
	Quaternary (Pleistocene – Holocene)	Quaternary Landslide Deposits	Bison, cows, deer, squirrels, rabbits	II
		Eolian Deposits	Mammoths, Bison	II
	Quaternary (Holocene)	Modern Alluvium	Bison, horse?	II

Source: Armstrong & Wolney 1989

APPENDIX G LIVESTOCK GRAZING MANAGEMENT

	Allotment Number[1]	Allotment Name	Public Acres	Public AUMS	Private Acres	Other Federal Acres	State Acres	Susp. AUMs	Class of Livestock
1	4002	Three Forks	10097	2627	33092		1433		Cattle
2	4011	West Beaver Creek	31	4	1299				Cattle
3	4013	South Twin Buttes	638	81	1020				Cattle
4	4014	Twin Buttes	287	80	1165				Cattle
5	4015	Flat Top Mountain	79	22	526				Cattle
6	4016	Battle Creek	186	53	968			79	Cattle
7	4020	Yahoo Mountain	1696	396	604				Cattle
8	4023	Upper Fly Creek	1029	185	2270				Cattle
9	4024	Lower Fly Creek	490	98	690				Cattle
10	4025	Government Corral Cr	537	148					Cattle
11	4026	East Camel Back Mtn.	137	28	1275				Cattle
12	4030	Lower Slater Creek	596	100	806				Cattle
13	4033	First Creek	1386	277	7325		626		Cattle
14	4034	Fan Rock	408	158	3150				Cattle
15	4036	Upper Putt Creek	2577	652	5469		640		Cattle
16	4037	N. Serviceberry Mtn.	491	70	329		633		Cattle
17	4038	Lower Willow Creek	342	20					Cattle
18	4039	Serviceberry Mtn.	2398	616					Cattle
19	4047	Cutoff Gulch	240	30					Cattle
20	4048	Alkali Draw	1037	56	3670				Cattle
21	4050	Hat Hill	801	120					Cattle
22	4054	Sugarloaf Basin 15	161	21	2562				Cattle
23	4055	Sugarloaf Peak	701	73	6455				Cattle
24	4056	Coal Bank Draw	251	43	329				Cattle
25	4063	Rimrock Yampa	1250	166	4142				Cattle
26	4066	West Big Bottom	168	24					Cattle
27	4067	South Big Bottom	40	4	40				Cattle
28	4068	North Big Bottom	40	6					Cattle
29	4071	East Side North Fork	120	18					Cattle
30	4073	East County Road #7	531	80					Cattle
31	4075	LU #23	165	20	822				Cattle
32	4077	North Cedar Mountain	569	103					Cattle
33	4080	Boone Gulch	120	15					Cattle
34	4081	Coon Gulch	78	14					Cattle
35	4082	N. Coon Gulch Sec 15	40	28	320				Cattle
36	4084	Hayden Cutoff Draw	161	36	82				Cattle
37	4085	Wymore Gulch	322	40					Cattle

1 *Shaded cells indicate Section 15 allotments.*

	Allotment Number[1]	Allotment Name	Public Acres	Public AUMS	Private Acres	Other Federal Acres	State Acres	Susp. AUMs	Class of Livestock
38	4086	South Cole Gulch	40	7					Cattle
39	4087	North Cole Gulch	40	5	320				Cattle
40	4088	Lower Little Bear	305	58	512				Cattle
41	4089	East Cedar Hill	173	35					Cattle
42	4090	Upper Little Bear	160	49					Cattle
43	4094	Elkhead Creek	230	63	2098				Cattle
44	4095	Upper Calf Creek	482	74	5080				Cattle
45	4099	North Mount Harris	38	9					Cattle
46	4102	Wolf Mountain	546	113					Cattle
47	4104	Tow Creek	120	36					Cattle
48	4105	North Farnsworth Cr.	116	16	173				Cattle
49	4106	Trull Creek	407	31	404				Cattle
50	4107	Mystic	383	139	1478				Cattle
51	4109	Georges Gulch	53	8	570				Cattle
52	4110	Coleman Gulch	638	125					Cattle
53	4114	Smith Creek	10	3	1117				Cattle
54	4116	South Hamilton	33	5	922				Cattle
55	4117	Mill Creek	40	8					Cattle
56	4119	Hahn's Peak	123	16					Cattle
57	4122	Copper Ridge	245	48	1043				Cattle
58	4123	Ute Gulch Sec. 15	494	68	170				Cattle
59	4125	Moffat Oil Field	138	10	727				Cattle
60	4127	West Dunkley	40	12	480				Cattle
61	4129	Upper Waddle Creek	120	21					Cattle
62	4130	Lower Waddle Creek	369	46				76	Cattle
63	4131	Badger Creek	1962	210					Cattle
64	4132	Upper Castor Gulch	468	398	1366				Cattle
65	4133	Upper Horse Gulch	1593	134					Cattle
66	4135	Spring Gulch	257	33					Cattle
67	4136	Searcy Gulch	129	40					Cattle
68	4138	Big Sugarloaf	121	33					Cattle
69	4139	South Fork W.F.	980	265				55	Cattle
70	4142	Dunstan Gulch	1754	340					Cattle
71	4143	Oklahoma Flat	222	36					Cattle
72	4147	Upper Sand Creek	80	10					Cattle
73	4149	Beaver Flat Tops	541	78	1616				Cattle
74	4153	Gill Draw	80	23	480				Cattle
75	4154	Lone Gulch	39	8	1383				Cattle
76	4158	Hillberry Mountain	800	100					Cattle
77	4171	Rattle Snake Butte	320	44	80				Cattle
78	4174	South Moffat Oil Field	475	66			676	23	Cattle
79	4175	Ditch #4 Sec 15	213	68	1875		638		Cattle
80	4177	County Road #179	119	36					Cattle

	Allotment Number[1]	Allotment Name	Public Acres	Public AUMS	Private Acres	Other Federal Acres	State Acres	Susp. AUMs	Class of Livestock
81	4179	Blacktail Mountain	720	144					Cattle
82	4180	South Blacktail Mtn.	293	94	281				Cattle
83	4181	North Woodchuck Hill	945	220	1962		8		Cattle
84	4183	Sheep Rock	82	15	289				Cattle
85	4185	Lower Raspberry Creek	330	112	974		17		Cattle
86	4187	West Phippsburg	41	6					Cattle
87	4190	Middle Hunt Creek	106	34	3218				Cattle
88	4192	South Hunt Creek	794	168	2946				Cattle
89	4193	Watson Creek	1056	2670			666		Cattle
90	4194	East Finger Rock	200	52					Cattle
91	4195	West Trapper	1940	51					Cattle
92	4196	Larson Creek	119	17	528		253		Cattle
93	4197	Little Snake Butte	240	41					Cattle
94	4198	Middle Deer Creek	630	90	718				Cattle
95	4199	Lower Deer Creek	265	35	744				Cattle
96	4202	East Powder Wash	24127	2090	2705		263	91	Cattle
97	4207	Sand Creek	8119	1084	2306		1017		Cattle
98	4209	Suttles Basin	5138	615	1928		1160	166	Cattle
99	4210	Upper Housel Gulch	4697	573	3828				Cattle
100	4222	Grounds	7566	987	451				Cattle
101	4303	South Bears Ears	24231	606	612		800		Cattle
102	4305	East Boone Draw	7045	501	3920		1280		Cattle
103	4309	Teepee Draw	7842	322	962				Cattle
104	4310	Smelter Hill	7942	446	3159				Cattle
105	4313	Upper Rye Grass	3176	315	3019				Cattle
106	4314	Deer Valley	640	74					Cattle
107	4315	Browns Draw	12075	773	795				Cattle
108	4316	Peterson Draw	2603	170	1618			380	Cattle
109	4317	Holland Draw	2527	182	526				Cattle
110	4318	Ricegrass	2358	260			1744		Cattle
111	4323	West Douglas Mountain	21055	924	5137				Cattle
112	4324	Piskwik	12277	1400			1152	198	Cattle
113	4329	Beaver Basin	92	71	276		840		Cattle
114	4330	Three Corners	281	93	327		199		Cattle
115	4331	Galloway Individual	189	33	978		172		Cattle
116	4333	Skeltzer Draw	164	20	1599		2113		Cattle
117	4336	Green Canyon	831	100				23	Cattle
118	4338	Vermillion Flats	2050	138					Cattle
119	4339	North Zenobia Creek	570	45					Cattle
120	4340	South Green River	4551	435					Cattle
121	4405	Upper Freeman Draw	1080	60	4788				Cattle
122	4406	Lay Peak	857	92	956		3		Cattle
123	4407	Sand Hills	11093	1637	2197		647		Cattle
124	4408	N. Deception Creek	4865	648	320				Cattle

	Allotment Number[1]	Allotment Name	Public Acres	Public AUMS	Private Acres	Other Federal Acres	State Acres	Susp. AUMs	Class of Livestock
125	4409	South Deception	3423	229	12109	7000	865		Cattle
126	4410	Upper Hughes Creek	1478	325	1762		120		Cattle
127	4411	Temple Canyon	8493	741	2714		1470		Cattle
128	4414	Big Bend	1559	214	34		42		Cattle
129	4415	East Godiva	1497	124	73				Cattle
130	4416	Lower Maudlin Gulch	8523	708	5421		1292		Cattle
131	4417	Jesse Flats	980	100	2154		160	20	Cattle
132	4418	Hale Gulch	544	36	675				Cattle
133	4419	Cinder Knob	1095	143					Cattle
134	4420	Coal Mountain	1282	158	1597		360		Cattle
135	4421	Maggies Nipple	1148	119	802		8		Cattle
136	4422	Colowyo Commons	7000	520	26687		1958		Cattle
137	4424	Upper Boxelder Gulch	1916	418	2855		661		Cattle
138	4429	East Canyon	2899	256	330				Cattle
139	4433	Sugarloaf Butte	627	24	2770				Cattle
140	4434	Little Juniper	4570	161	4818				Cattle
141	4435	East Spring Creek	4570	574	4818		2477	38	Cattle
142	4436	Lay Peak Common	84	9	1596				Cattle
143	4437	Mud Spring Gulch	928	101	1612				Cattle
144	4439	Yampa	210	30	77		646		Cattle
145	4440	Lay Creek EU	651	289	1180				Cattle
146	4507	Upper Mud Springs	1920	188	2920			30	Cattle
147	4511	Four Mile	2336	290	229				Cattle
148	4512	Wagon Tongue	1125	217	520				Cattle
149	4514	Pole Gulch	16042	1261	5070		488	289	Cattle
150	4515	Cedar	2104	192			5481		Cattle
151	4517	Dry Gulch	4118	482					Cattle
152	4519	Seven Mile	2603	462	3047		641		Cattle
153	4520	Danforth	190	15	720				Cattle
154	4522	Thornburg Gulch	5505	492	12				Cattle
155	4524	Big Hole Gulch	2166	321	7389				Cattle
156	4525	Earl Martin	567	55	2148				Cattle
157	4526	West Great Divide	720	81	2920		640	91	Cattle
158	4527	LU 98	920	113	1122				Cattle
159	4528	College Station	1000	306					Cattle
160	4529	Lower Taylor Creek	347	27	415				Cattle
161	4530	Alkali Springs	12036	1812	1751		1591		Cattle
162	4531	LU 102	640	111	198				Cattle
163	4532	LU 16	480	63					Cattle
164	4533	LU 205	320	31	1080				Cattle
165	4534	8 Double Slash	1640	140	320				Cattle
166	4535	Lower Spring Creek	1196	150	4788				Cattle
167	4540	South Great Divide	1320	172	1847				Cattle
168	4541	Upper Dressler Gulch	888	112	9				Cattle
169	4543	Upper Timberlake	1093	126	2088				Cattle

	Allotment Number[1]	Allotment Name	Public Acres	Public AUMS	Private Acres	Other Federal Acres	State Acres	Susp. AUMs	Class of Livestock
170	4544	E. Experiment Station	1400	306					Cattle
171	4545	Ferndale	630	100					Cattle
172	4546	Great Divide	925	137	5477				Cattle
173	4547	LU 257	219	25	6				Cattle
174	4548	North Great Divide	3950	404	100016		1280		Cattle
175	4549	Timberlake	1889	319	2016				Cattle
176	4551	Middle Timberlake	3860	421	3994				Cattle
177	4552	West Fortification Dike	200	32	2602				Cattle
178	4553	North Pole Gulch	1781	187	436				Cattle
179	4554	Pome	57	9					Cattle
180	4555	Martin	354	45	1738				Cattle
181	4579	Ellis EU	240	34					Cattle
182	4600	Williams Fork	1428	133	447			215	Cattle
183	4601	East Ute Gulch	802	104	333		327		Cattle
184	4602	Long Gulch	1648	198	2281				Cattle
185	4603	Iles Mountain	6841	962	3116		620		Cattle
186	4604	Kendall	25	6	167				Cattle
187	4605	Lower Morapos Creek	182	26	2803				Cattle
188	4608	Stinking Gulch	233	40	7		656		Cattle
189	4609	Lower Milk Creek	2576	508	3693		646		Cattle
190	4611	East Fork Wilson Creek	546	79	475				Cattle
191	4614	Lower James Creek	155	24	607				Cattle
192	4619	East Thornburg	352	39	449				Cattle
193	4620	West Thornburg	191	17	278				Cattle
194	4640	State Block Sec 15	41	8	3218		13709		Cattle
195	4641	S.Saddle Mtn Sec. 15	123	24	857				Cattle
196	4642	Stagecoach	125	20	595				Cattle
197	4643	Pearl Lake	5	2	264				Cattle
198	4645	East Well Sweep	648	55	595				Cattle
199	4646	East Elk Mountain	79	16	1188				Cattle
200	4649	Lower Day Creek	384	36	780				Cattle
201	4651	West Elkhead Creek	160	29	1120				Cattle
202	4652	Farnsworth Creek	816	244	29				Cattle
203	4653	Lower Calf Creek	20	4					Cattle
204	4654	Upper Smith Creek	160	40					Cattle
205	4655	East Smith Creek	12	2					Cattle
206	4027	Lake Creek	125	39	345				Cattle/Horse
207	4028	West Long Mountain	974	204	954				Cattle/Horse
208	4029	Bible Back Mountain	2462	494	2168				Cattle/Horse
209	4032	7308 Peak	561	129	621			60	Cattle/Horse
210	4059	North Fork Big Gulch	1514	263	6128				Cattle/Horse
211	4070	Lower Big Gulch	646	92	585				Cattle/Horse
212	4113	Horse Mountain Sec 15	320	45	319				Cattle/Horse
213	4141	N. Horse Mtn Sec 15	624	89					Cattle/Horse

	Allotment Number[1]	Allotment Name	Public Acres	Public AUMS	Private Acres	Other Federal Acres	State Acres	Susp. AUMs	Class of Livestock
214	4189	North Hunt Creek	84	9					Cattle/Horse
215	4224	Red Wash	15142	1365	5267		1556		Cattle/Horse
216	4302	Dry Creek	89343	5670	804		2548		Cattle/Horse
217	4304	West Boone Draw	27700	1666					Cattle/Horse
218	4306	East Douglas Mountain	15758	637	5719		664		Cattle/Horse
219	4311	Thompson Basin	8738	784	7683				Cattle/Horse
220	4320	Browns Park	44655	4876	8755		1000		Cattle/Horse
221	4325	Cold Springs	43414	3800	3745		10955	1000	Cattle/Horse
222	4335	Spitzie Draw	17245	1643	252	538	343	200	Cattle/Horse
223	4523	LU 3-A	1676	173	320				Cattle/Horse
224	4644	Little Trout Creek	786	109					Cattle/Horse
225	4657	Red Creek Sec. 15	12	3	79				Cattle/Horse
226	4126	Lower Moody Gulch	491	142					Cattle/Yrlg Cat
227	4069	Sand Springs	105	15	101				Horse
228	4118	N. Steamboat Lake	24	7					Horse
229	4203	Deer Creek Road	54	5	143				Horse
230	4607	Monument Butte	143	14	381				Horse
231	4040	West Sand Point	235	47					Sheep
232	4041	Cull Reservoir	160	32					Sheep
233	4042	East Fortification	555	185					Sheep
234	4043	West Black Mountain	591	140	1570				Sheep
235	4058	East Bord Gulch	1367	152					Sheep
236	4060	County Road #7	417	58					Sheep
237	4064	Spronks Creek	116	18					Sheep
238	4076	Upper Cottonwood	1000	286					Sheep
239	4079	North Sand Springs	57	9					Sheep
240	4096	Dry Fork	199	42					Sheep
241	4098	Morgan Creek	1705	418					Sheep
242	4101	Wolf Creek	80	20					Sheep
243	4103	Northeast Wolf Mtn.	353	109					Sheep
244	4140	Upper Pagoda Creek	242	41					Sheep
245	4145	Peck Gulch	200	34					Sheep
246	4146	Dowden Gulch	2162	480					Sheep
247	4155	Temple Gulch	24	5	510				Sheep
248	4160	Scotchmans Gulch	40	11					Sheep
249	4161	Sage Creek Reservoir	200	50					Sheep
250	4162	Hubberson Gulch	40	8					Sheep
251	4164	West Fish Creek	29	5	1025				Sheep
252	4165	Upper Fish Creek	360	60					Sheep
253	4172	Lower Middle Creek	826	184					Sheep
254	4178	North Moffat Oil Field	43	4					Sheep
255	4182	Bear Lake	165	36					Sheep
256	4186	Little White Snake	707	157					Sheep

	Allotment Number[1]	Allotment Name	Public Acres	Public AUMS	Private Acres	Other Federal Acres	State Acres	Susp. AUMs	Class of Livestock
257	4188	Upper Raspberry Creek	365	83	935				Sheep
258	4191	Meadowbrook Creek	199	66					Sheep
259	4204	Horse Draw	6655	765	1156		7460		Sheep
260	4212	Lang Spring	3249	364	437				Sheep
261	4213	Nipple Rim	39141	4900	281		650		Sheep
262	4215	State Line	6602	896					Sheep
263	4225	Nipple Peak	4031	422	372		11163	1500	Sheep
264	4300	Hiawatha	22042	2906			640	404	Sheep
265	4401	West Wapiti Peak	2146	290	7575		637		Sheep
266	4403	Sagebrush Creek	14983	2241	6328		1921		Sheep
267	4430	South Duffy Mountain	483	90	1937				Sheep
268	4438	West Spring Creek	7680	494	1980		5044	100	Sheep
269	4513	West Four Mile	3780	199	371				Sheep
270	4518	Scandinavia	8512	896	750			360	Sheep
271	4536	Upper Spring Creek	1405	188	3336		2		Sheep
272	4542	Big Gulch	1042	127	452				Sheep
273	4618	Thornburg Mountain	1036	120	642				Sheep
274	4022	Long Mountain Sec 15	667	210					Sheep/Cattle
275	4031	Jack Rabbit Creek	1074	140	1118				Sheep/Cattle
276	4044	N. Fork Fortification	39	7	1177				Sheep/Cattle
277	4045	County Road #40	196	38	1989				Sheep/Cattle
278	4046	Gravel Pit	353	72	1260				Sheep/Cattle
279	4049	Lucas Hill	1878	277	23812				Sheep/Cattle
280	4057	Lower Bord Gul Sec15	1909	240					Sheep/Cattle
281	4065	Horse Gulch Sec 15	10200	1205	26762		642		Sheep/Cattle
282	4074	Prospect	635	90	3368		638		Sheep/Cattle
283	4078	South Cedar Mountain	360	45					Sheep/Cattle
284	4083	Lower Cottonwood	727	141	3368		387		Sheep/Cattle
285	4091	Black Mountain	1897	364	6670		639		Sheep/Cattle
286	4092	Lower Elkhead Creek	76	10					Sheep/Cattle
287	4097	Bull Gulch	229	39	429				Sheep/Cattle
288	4134	Deal Gulch	1290	215	2250				Sheep/Cattle
289	4148	Millers Gulch	319	64	1559				Sheep/Cattle
290	4150	Gill Reservoir	159	32	3643				Sheep/Cattle
291	4152	Bunker Creek	192	40	1330				Sheep/Cattle
292	4163	Grassy Creek	2219	441	27943		598		Sheep/Cattle
293	4166	Upper Middle Creek	849	189					Sheep/Cattle
294	4169	Upper Trout Creek	365	60					Sheep/Cattle
295	4170	Trout Creek	1572	213	3997				Sheep/Cattle
296	4208	West Dripping Rock	4579	611			323		Sheep/Cattle
297	4214	Powder Wash	29855	2500	2464		320	750	Sheep/Cattle
298	4217	Sheepherder Spring	74147	9042	737		1483	240	Sheep/Cattle
299	4219	Sand Wash	69457	7568	3722		3012		Sheep/Cattle
300	4301	Shell Creek	7868	520					Sheep/Cattle

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301	4307	Cross Mountain	16005	1170	4560		1275	200	Sheep/Cattle
302	4308	Sawmill Canyon	17496	1357	4176	325		216	Sheep/Cattle
303	4326	Canyon-Horseshoe	19685	2103	270		1339	189	Sheep/Cattle
304	4327	Diamond Peak	25801	2037	2636		7262		Sheep/Cattle
305	4400	Disappointment	22304	1610	8386	390	1246	3693	Sheep/Cattle
306	4404	Crooked Wash	7889	800	9978		1070	2492	Sheep/Cattle
307	4412	Juniper Mountain	5956	800					Sheep/Cattle
308	4413	Lay Creek	1869	287	746		312		Sheep/Cattle
309	4426	Upper Wilson Creek	440	60	2097				Sheep/Cattle
310	4431	Lower Boxelder Gulch	11489	2374	1525		636		Sheep/Cattle
311	4432	Duffy Mountain	9268	1345	569				Sheep/Cattle
312	4500	Upper Fourmile	4195	505	516				Sheep/Cattle
313	4501	Fortification Rocks	3070	414	1680				Sheep/Cattle
314	4502	Little Fortification	314	56					Sheep/Cattle
315	4503	North Blue Gravel	1189	150	3914				Sheep/Cattle
316	4504	Serviceberry Mtn.	78	42	1103				Sheep/Cattle
317	4506	Lower Fortification	967	116	644				Sheep/Cattle
318	4508	Chicken Sage	4715	475	34				Sheep/Cattle
319	4509	East Mud Spring Draw	1425	113					Sheep/Cattle
320	4510	West Mud Spring Draw	1800	140	156				Sheep/Cattle
321	4521	Greasewood	20895	2638	21130		4276		Sheep/Cattle
322	4537	House	838	115	1082				Sheep/Cattle
323	4538	Bord Gulch	960	126	2280				Sheep/Cattle
324	4539	Dressler Gulch	452	48	3473		643		Sheep/Cattle
325	4578	State Block EU	1668	171	159		10940		Sheep/Cattle
326	4606	East Axial Basin	1520	161	2784		2079		Sheep/Cattle
327	4610	Taylor Creek	2300	213	474				Sheep/Cattle
328	4612	Coal Butte	320	36	1224				Sheep/Cattle
329	4615	Elkhorn Creek	2429	585	5518				Sheep/Cattle
330	4617	Thornburg Monument	1447	117	252				Sheep/Cattle
331	4656	Lower Bear Gulch	1076	238	3982				Sheep/Cattle
332	4658	North Baldy Mountain	40	8	400				Sheep/Cattle
333	4516	Headquarters	3821	454			2071	36	Sheep/Horse
334	4051	North Mud Spring	1772	364	5692		474		Shp/Cat./Horse
335	4052	South Mud Spring	550	204	5869		816		Shp/Cat/Horse
336	4053	Middle Bord Gulch	471	93	1598				Shp/Cat/Horse
337	4072	West County Road #7	710	86	1453				Shp/Cat/Horse
338	4093	N. Fork Elkhead Creek	1490	298					Shp/Cat/Horse
339	4100	Little Butcher Knife	315	106					Shp/Cat/Horse
340	4112	Day Creek	382	71	3793				Shp/Cat/Horse
341	4115	Buck Mountain	923	250					Shp/Cat/Horse

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342	4137	West Well Sweep	715	59	1546				Shp/Cat/Horse
343	4144	Berry Gulch	1760	293					Shp/Cat/Horse
344	4206	Snake River	53855	6082	6070		2568		Shp/Cat/Horse
345	4402	Cedar Springs Draw	20161	2638	11532		1932	627	Shp/Catt/Horse
346	4018	West Squaw Mountain	1266	212	745				Yrlng cattle
347	4019	North Yahoo Mountain	1940	277	1265		343		Yrlng cattle
348	4021	South Yahoo Mountain	320	46	640				Yrlng cattle
Total	Section 15		361055	42657	289596	7000	52903	1595	
Total	Section 3		841213	88702	412457	1253	98862	11619	
Total	Overall		2474730	269970	1391872				