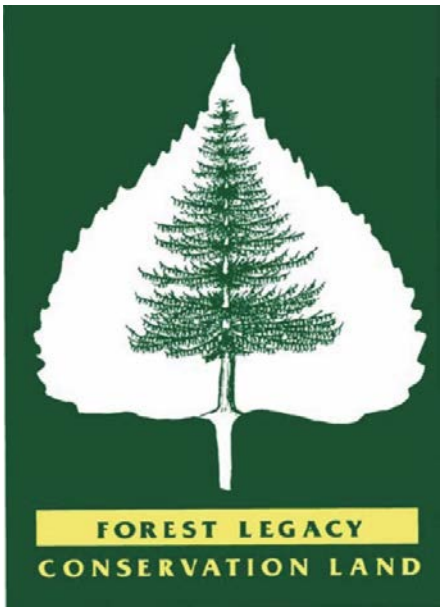
COLORADO STATE-WIDE FOREST LEGACY ASSESSMENT OF NEED



Colorado State Forest Service
Fort Collins, Colorado 80523-6010

Cooperatively Funded By:

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2020
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Presented to:

Colorado State Forest Service
Fort Collins, Colorado 80523-6010

September 15, 2020
Assessment of Need

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Introduction

The Forest Legacy Program (FLP) authorizes the USDA Forest Service, State Forestry Agencies, or state governments to purchase permanent conservation easements or contribute to fee acquisitions on private forestlands to prevent those lands from being converted to non-forest uses. The forestlands in the program contain important scenic, cultural, and recreation resources, fish and wildlife habitats, water resources, and other ecological values that will support continued traditional forest uses receive priority. Those landowners who choose to participate in the program are required to follow a Multi-Resource Management Plan (MRMP) designed for ongoing management for the forest resources on the property. Activities consistent with the MRMP include timber harvesting, grazing, and recreation activities, based upon the terms of the conservation easement. These activities are consistent with the conservation purposes outlined in the Deed of Conservation Easements for FLP properties.

For Colorado to participate in the FLP, the Colorado State Governor as the lead FLP agency identified the Colorado State Forest Service (CSFS) in 2000. The first task in 2001 was to produce an Assessment of Need (AON) for such a program. An updated AON with modified Forest Legacy Areas (FLAs) was created in 2006 to allow increased conservation opportunities. This report serves as an update to that document. The current (2020) AON recognizes the prevailing ecological, economic, and social conditions. This document contains a background of Colorado's heritage and natural resources, an overview of the tasks performed, and descriptions of each (FLA), as well as project selection criteria.

The priority ranking of the criteria was addressed in 2020, based upon input from selected Colorado land conservation groups.

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**
8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

DESCRIPTION OF THE DOCUMENT

Section 1 of this document presents information pertaining to the historical, cultural, physical, biological, and ecological elements of Colorado, all of which influence the Forest Legacy Program implementation and project selection.

Section 2 presents the Forest Legacy criteria selection methodologies and Forest Legacy Area determination to identify areas in Colorado that are in danger of conversion from traditional forest uses. The original FLA boundaries were drawn on geo-political boundaries. While successful, this methodology was found lacking due to inflexibility resulting in failure to take advantage of conservation opportunities meeting the criteria outside of the designated FLAs when they arose. At the suggestion of State Forest personnel, the current AON utilized Hydrologic

Unit Codes (HUCs) as FLA boundaries intending to be 1) inclusive of privately owned forests, with 2) definable and easily recognized, and 3) readily modifiable boundaries.

Section 3 identifies eight FLAs within Colorado where protection efforts provided under the Forest Legacy Program should be applied. For each of the eight FLAs, this document (1) specifies location chiefly using Basin (HUC 6) boundaries, and (2) describes topography, ecology, recreation, water, and other resources.

Included in Section 4 are SFSCC project selection criteria for inclusion in the FLP along with procedures to implement the FLP.

Section 5 lists the numerous land trust organizations already in existence in Colorado.

STATEMENT OF PURPOSE

From 14,000-foot mountain peaks to open prairies, Colorado provides a broad range of scenic vistas. The state contains varied environments including high alpine meadows, spruce-fir forests, lodgepole and ponderosa pine forests, aspen meadows, mountain deserts, plains riparian areas, and shrub and grass prairies. Further, Colorado provides crucial habitat to numerous wildlife species. The states diverse landscape and ecology also facilitate an abundance of options for outdoor recreation.

Colorado's wide base of recreation opportunities, strong economy, and high quality of life has led to an influx of new residents. With a population increase of 14.5% between 2010 and 2019, Colorado was the third fastest growing state (US Census, 2019) in the nation. This immigration along with residents' desire to move out of developed urban environments in the Front Range poses a threat to currently undeveloped land including those traditionally covered by forests. Increased subdivision and development of forested areas has numerous adverse effects such as loss of biodiversity, altered hydrology, and deficiency of natural resources.

Fragmentation of traditionally large forested areas leads to declines in quality habitat and displacement of the wildlife. Additionally, ecologically significant environments such as riparian areas and unique flora and fauna communities are lost through development. Moreover, increased impervious surfaces from new roads and infrastructure threaten water quality by changes in groundwater and moisture availably, increased runoff, and pollution.

Development pressures on forested lands not only threaten ecological resources but also have direct impacts on people. Many landowners find it hard to resist offers from developers to sell their land. Large forested areas, which had traditionally been in one family's stewardship for many generations, are separated into 35-acre or smaller parcels. Consequences related to the increase in subdivision include poor use of land, environmental impacts, and high costs for counties (Davis, 2006). More landowners of smaller parcels yield fewer traditionally commercial adjoining timber stands and less active stewardship management. Additionally, these smaller parcels result in restricted opportunities for conservation easement implementation or inclusion into local, state, or federally protected lands.

This Assessment of Need for the Forest Legacy Program in Colorado evaluates the current condition and use of privately owned forests in Colorado in 2020. Results of the values and attitudes regarding private forests identified by stakeholders in the 2001 AON were used with updated or reformatted input by participating conservation groups, representing current conditions in 2020. The determination of the 2020 FLAs represent the importance of healthy forests. The conservation of these private forests, combined with existing of public forestlands, helps maintain the functioning forested landscape. The CSFS and SFSCC are recommending those eight FLAs for continued inclusion in the FLP.

SECTION 1: STATE OF COLORADO BACKGROUND INFORMATION

Cultural Heritage

Long before Colorado received statehood in 1876, humans inhabited the land and rich cultural and historical events occurred. Hundreds of archaeology sites across the state, both Native American and Euro-American, uncover artifacts from at least 12,000 years ago to the end of the last Ice Age. The Great Plains have a substantial archaeological record providing unique information about prehistoric and historic people who lived in the region. Archaeologists hypothesize the most uninviting areas of Colorado, the alpine tundra regions, were used by humans at least 7,000 years ago (Black, 2017).

The earliest visitors to Curecanti Recreation Area in the Upper Gunnison River Basin were most likely large game hunters and gathers. This Native American presence occurred as early as the Paleo-Indian traditions up to 10,000 years ago. Until the European explorers first arrived in the 18th and 19th centuries, the natives spent only part of each year in the high country because of the cold winters and limited growing season (National Park Service, 2015).

Present day Colorado represents many cultures and backgrounds. The 2018 census estimated the state's population at 84.1% white, 21.7% Hispanic or Latino, 4.2% African American, and 4.5% Asian, with the remainder falling into the categories of Pacific Islander, American Indian, Alaska native, or 2 or more races (percentages do not total 100 because individuals may report more than one race).

Population

Demographic shifts throughout Colorado have been significant over the past several decades. During the 1960's, the resident population began increasing at a substantial rate as compared to the previous decades when growth was not nearly as notable. According to the U.S. Census Bureau, published July 1, 2019, the population change from 2010-2019 was 14.5% for Colorado but just over 6.3% for the country. Since 1960, the state's population has more than tripled from 1,758,947 to the current population of over 5,758,736 people, with the median age of 36.9. These figures place an average of 52 people per square mile in Colorado. However, this population density is misleading in that 75% of the total Colorado population is contained within nine of the 64 counties. See Figure 1 (below) for Colorado's population trend from 1860 to 2020.

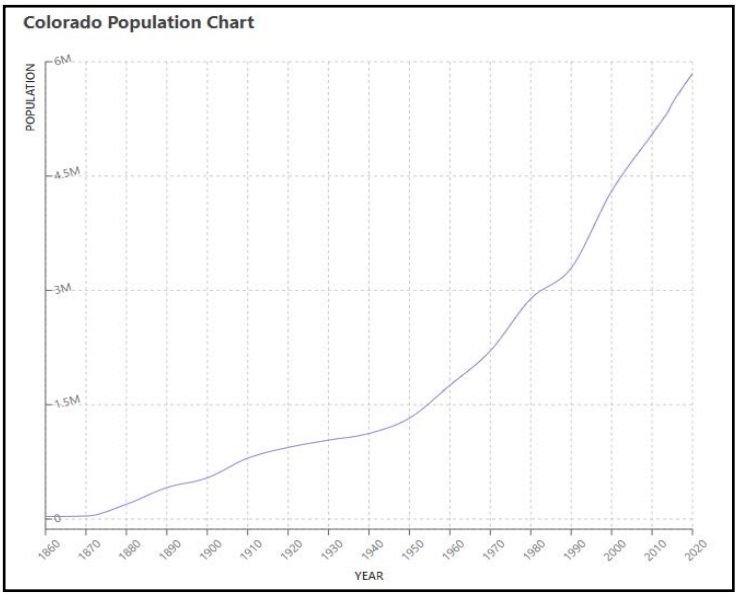


Figure 1. Colorado Population Chart, 2020, World Population Review

With 75% of the total population of the state residing in the Front Range Corridor (along I-25, from Fort Collins to Pueblo), developmental pressures on vacant property are expanding. Denver, the largest and most sprawling metropolitan area in Colorado, and its surrounding counties (Jefferson, Douglas, Arapahoe, Adams, Broomfield, and Boulder), is situated just east of the Rocky Mountains. The Front Range counties have seen population increases averaging 17.4% from 2010 to 2019 (U.S. Census Bureau, 2019).

Growth in Colorado is inevitable; conservation and sustainable development can help curtail the consequences of growing populations within a finite land mass, therefore a conservation program such as FLP should be considered.

Land Ownership and Use

Of the 66.6 million acres in Colorado, 38 million (57%) are privately owned, 24.1 million acres (36%) are managed federally (Federation of American Scientists, 2020), and 2.8 million surface acres (4%) are managed by the state (Colorado State Land Board, 2019). Federal land ownership within the state is composed of 60% U.S. Forest Service, 35% Bureau of Land Management, 3% National Park Service, 2% Department of Defense, and 1% U.S. Fish and Wildlife Service. Approximately 22.9 million acres (34%) of Colorado is forested. Of the forested land in the state, approximately 73.1% is federally owned, 23.6 % is owned privately, and 3.3% is owned by the state and local entities (Colorado State Forest Service, 2020). As of 2012, approximately 48% of Colorado was in farmland (Farmland Information Center, 2012). See Figure 2 (below) for land ownership within the state.

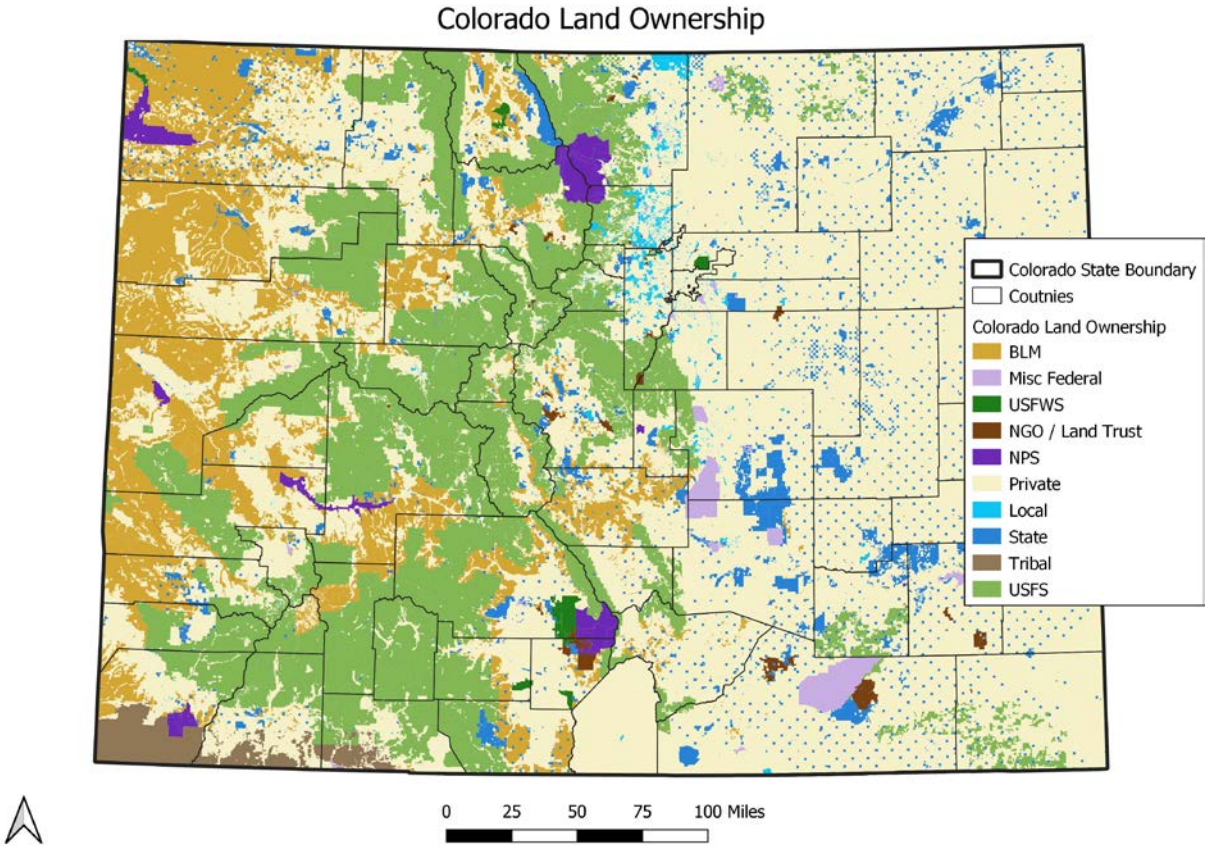


Figure 2. Colorado Ownership and Protection Map, 2019, Colorado Natural Heritage Program

Economics

Since the days of fur trapping, buffalo hunting, and mining Colorado has experienced profound changes in the areas on which its economy depends. The recent past has produced significant economic increases. Since 2010, employment growth has increased annually by approximately 50%. Review of Colorado economic metrics indicated that real GDP over 5 years grew at 3.6% ranking the State as number 5 in the nation. Additionally, during 2019, employment increased by 2.1% ranking the state 11th overall and unemployment at 2.7% earned Colorado a place among the five lowest. Colorado's average unemployment rate has decreased from 9.6 % in 2010 to 2.7% in September 2019. During the same 10-year period, personal income growth averaged 4.4 % Wage and salary income rose from an average of $40,436 in 2010 to $54,446 in 2018 (CU Leeds School of Business 2019).

The Trade, Transportation and Utility (TTU) sector employees' one sixth of Colorado work force, increasing by 1.3% in 2019 to 397,500 jobs. Construction, which had been the main source of Colorado's recent boom, decreased by a statistically misleading 29% in 2019 due to completion of large projects. The challenges to the industry include continued shortages of skilled workers. Colorado's net farm income is estimated to increase 21% in 2019 to $1.52 billion well ahead of the estimated US increase of 4%. This is due to Colorado agriculture being weighted toward cattle, which continued to show strong growth (CU Leeds School of Business 2019).

NOTE: At the time of the preparation of this discussion, COVID 19 economic disruption has (at least temporarily) made all prediction of economic status impossible.

Climate

The state of Colorado has low humidity and an average annual precipitation of 17 inches. The average annual temperature is 43.5 ^{o}F. Flooding, thunderstorms, hail, tornadoes, lightning, blizzards, and avalanches occur within the state. Although the temperature decreases and the precipitation increase with altitude, the climate is also dependent on winds and topographic features. The Rocky Mountains are the main source of the diverse weather conditions in most areas of Colorado. An increase of 1000 feet in elevation translates to a temperature decrease of 4-5 ^{o}F. Cooler air holds less water than warmer air causing more precipitation to fall on the windward (west) side of the mountains. Air is forced up, it cools, and the water vapor condenses and falls as rain or snow. Therefore, the humidity and precipitation are lower and winds more intense along the Eastern Slope as opposed to the Western Slope.

The mountains of Colorado have summer highs around 80 ^{o}F in the valleys while higher mountains experience highs around 60 ^{o}F. Winter low temperatures can drop below -30 ^{o}F and in extreme cases have been below -60 ^{o}F. Winds on the mountain peaks, or above 11,000 feet, can exceed 50 to 100 mph. The majority of precipitation within peaks and mountain ranges occurs during winter months.

The Eastern Plains of Colorado is usually dry and windy. The maximum summer temperature is around 95 ^{o}F, with winter low temperatures of 0 to -15 ^{o}F. Although precipitation can be heavy during the summer months, the region is typically in a state of drought or on the verge of it. The western edge of the plains, near the foothills of the mountains, experience more mild daily temperature changes, with lower summer temperatures and higher winter temperatures. This is also, where most of the population resides.

Western Colorado's topography is less extreme than the mountains, with lower elevations, canyons, and plateaus. Closer to the Utah border, the temperature is warmer and precipitation is lighter. Compared to the Eastern plains, western Colorado has colder but calmer and less variable winters. Temperatures can drop below zero, but most of the region receives abundant sunshine. Areas around Grand Junction have particularly mild weather and support extensive fruit growing. Summer high temperatures exceed 100 ^{o}F at elevations below 5,500 feet. Temperatures

rarely drop below -10 ºF. Precipitation is more evenly distributed than other parts of the state. Annual precipitation is only between 8 to 14 inches in the western valleys.

The average temperature within the state has increased by 2.9 degrees since 1970, exacerbating existing issues such as snowpack, water scarcity, drought, and insect infestation. Warmer spring temperatures increase the speed of snowmelt in the Rocky Mountains, which create more opportunity for flooding, erosion, and drought. Pine beetle infestation can reach higher elevations as temperatures rise, which increases the likelihood of a forest fires and rapid snowmelt. An increase in the temperature and changing chemistry of water bodies effects water dwelling fauna, thus destabilizing entire ecosystems. Flora and fauna, which occupy specific habitat and range, are driven to higher elevations in order find suitable habitat. This can result in habitat loss, species population reduction, and an increase in invasive species (Doesken, et al., 2003).

Rivers and Water Resources

Colorado's annual precipitation generates approximately 14 million acre-feet (AF) of water, approximately 80% of which is produced from snow. Eighty to 90 percent of the states' population resides east of the Continental Divide, while 70 to 80 percent of the states' water occurs west of it. An average of 500,000 AF of water is diverted from the western slope to the eastern slope annually. (Colorado State Web Portal, 2015). Eighteen (18) USGS delineated River Basins (HUC 6s) fall within the state, see Figure 3 (below).

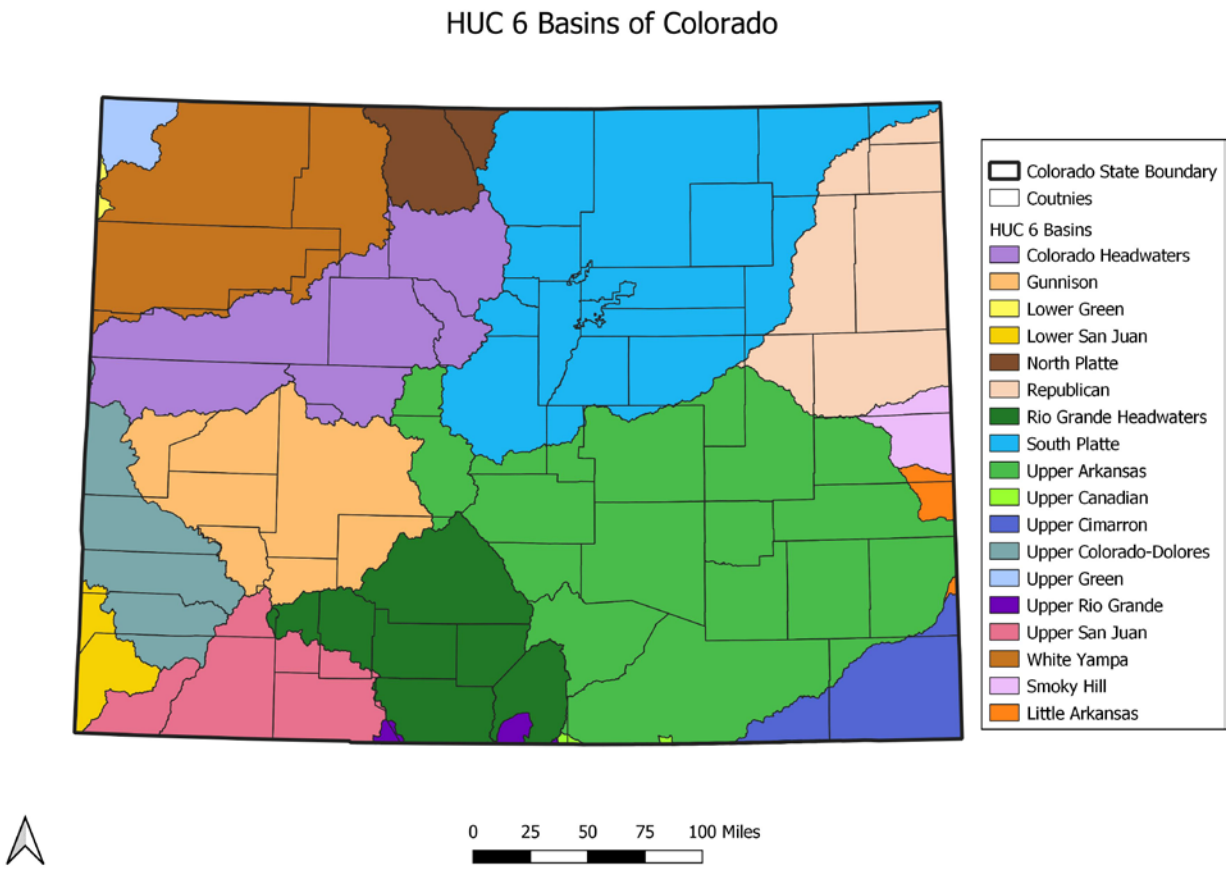


Figure 3. HUC 6 Basins of Colorado, USGS

Colorado, a headwater state, has more than 105,344 miles of rivers (CDPHE, 2019) with four major rivers originating within the state – the Colorado, South Platte, Arkansas, and Rio Grande. More than 60 percent of

Colorado's water exits the state and flows downstream to eighteen states plus Mexico. Less that 5.3 million AF are consumed within the state annually, with approximately 83% supplied by surface water and 17% produced from groundwater. The percentage of statewide water delivery is broken down into the following water-use groups: 86.7% agriculture, 6.7% municipal and industrial, 5.5% recreational and environmental, and 1.1% self-supplied industrial (Colorado State University, 2020).

Increasing human population directly affects the demand for water. It is predicted that Colorado's water supply will be spread increasingly thin in the coming years. As a result, conservation and recycling of water will become more important, agricultural water rights will continue to be converted to other uses, and it is likely that new reservoirs and water diversions may be unavoidable despite their associated adverse impacts (Crockett, 2014).

Ecoregions

The physical environment of Colorado can be described and categorized using the Environmental Protection Agency's Ecoregion Descriptions. "Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources," EPA, 2019. There are six Level III Ecoregions within Colorado, see Figure 4 (below). These include the Wyoming Basin, Colorado Plateaus, Southern Rockies, Arizona/New Mexico Plateau, High Plains, and the Southwestern Tablelands.

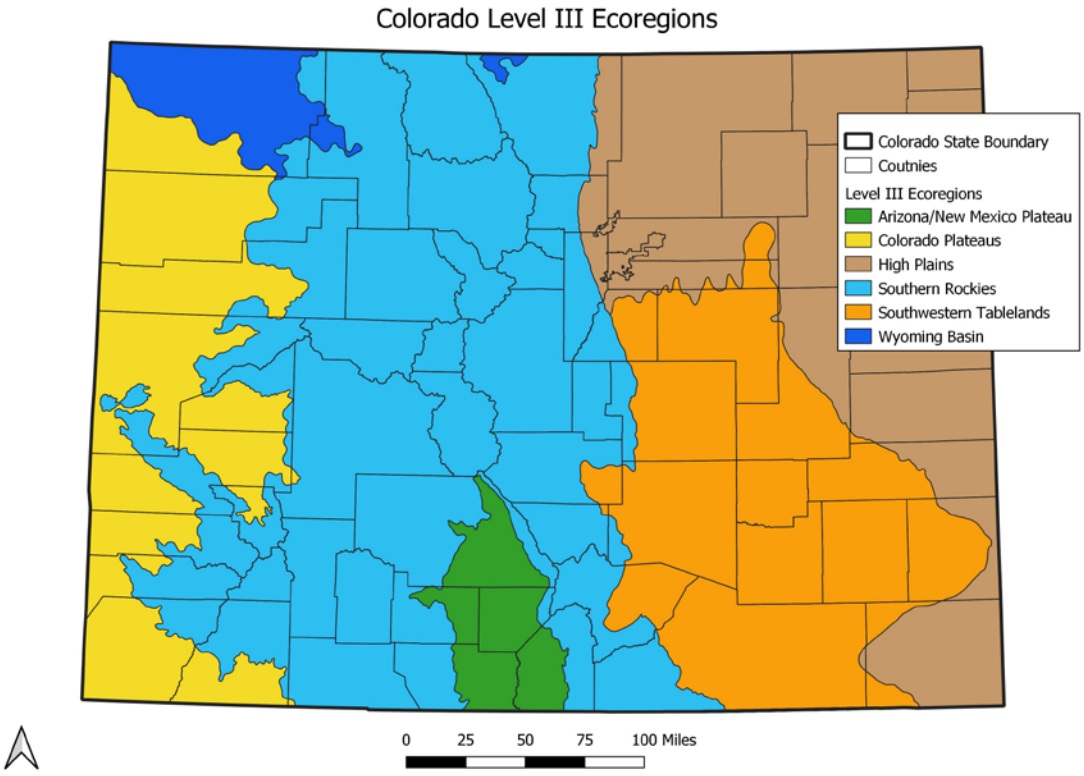


Figure 4. Level III Ecoregions of Colorado, EPA, Ecoregion Download Files by State - Region 8.

The Wyoming Basin ecoregion is a broad intermontane basin dominated by relatively arid grasslands and shrublands, with high hills and low mountains. This region is utilized for livestock grazing, petroleum production, and mining of coal, trona, bentonite, clay, and uranium.

The Colorado Plateaus ecoregion has a variety of geologic formations, including canyons, mesas, plateaus, and mountains. The typical topography is rugged tableland, with extremely steep sidewalls marking abrupt changes in

local relief, often of 1000 to 2000 feet or more. However, the region contains large low-lying areas accommodating hot and dry tolerant vegetation such as salt brush and greasewood.

The Southern Rockies are composed of high elevation mountains, with coniferous forest covering the majority of the region. Still, elevational banding denotes vegetation, soil type, and land use. The lowest elevations are generally grass or shrub covered and heavily grazed. Low to middle elevations are also grazed and covered by a variety of vegetation types. Middle to high elevations, having alpine characteristics, are largely covered by coniferous forests and have little grazing activity. The region includes the Colorado Mineral Belt, an area of ore deposits, ranging from the San Juan Mountains to the Colorado Front Range.

The Arizona/New Mexico Plateau represents a large transitional area between four ecoregions. However, only a portion of this ecoregion occurs within Colorado, known as the San Luis Valley. The local relief in this Valley is relatively low. The precipitation within the San Luis Valley is the lowest in the state, yet provides a valuable water supply due to the migration of runoff and groundwater to the low point at San Luis Lake. Desert and wetlands exist side by side. The valley wetlands provide crucial migratory bird habitat.

The High Plains contain smooth to slightly irregular plains having a high percentage of cropland. Grama-buffalo grass is the potential natural vegetation in this region. Gas and oil fields are found throughout Colorado's portion of the ecoregion, with the greatest concentration found in the Denver Basin area.

The Southwestern Tablelands contain red colored canyons, mesas, badlands, and dissected river breaks. Little of the Southwestern Tablelands is in cropland. Much of this region is in sub-humid grassland and semiarid rangeland. The natural vegetation in the Colorado portion of this region is mostly grama-buffalo grass, with some juniper-scrub oak-grass savanna on escarpment bluffs (EPA, 2019).

Geology, Topography, and Soils

Surface features of the state's land are very diverse attributed to the three distinct geographical regions--the Great Plains in the east, the basins and plateaus in the west, and the Rocky Mountains rising to 14,000 feet at 53 peaks bisecting the state from north to south. All of this land rises well above sea level (the average elevation at 6800 feet), with Colorado's lowest point at 3350 feet where the Arkansas River flows into Kansas and the highest point at Mount Elbert (14,433 feet).

All of Colorado's rivers flow away from the Continental Divide, the division of eastern and western North America formed by the Rockies. A major hydrographic feature, the Divide directs water flow toward the Gulf of California on the Western Slope and toward the Gulf of Mexico on the Eastern Slope. Many rivers flow from Colorado, including one of North America's longest rivers, the Colorado River, which drains the western slopes containing about one-third of the land area of Colorado. The North and South Platte Rivers, the Arkansas, and the Rio Grande drain the eastern slopes in an array of complicated drainage patterns.

The Colorado Rockies occupy an active geologic region that stressed and disrupted a weak crust about 30 million years ago forming the current Rocky Mountains. Glacial erosion shaped many mountains and valleys creating an ancient erosion surface that still exists on flat-lying sedimentary rocks in the high country. Several small glaciers remain tucked away in northern ranges. Landslides have deeply scarred mountainsides and wind-formed sand dunes exist in several inter-montane valleys and the Eastern Plains. These weathering and erosional forces continually alter surface topography, yet Colorado's geology seems constant at a glimpse.

All geologic features, combined with climate, topography, vegetation, and animal activity, create complex patterns of soil distribution in Colorado. In general, soils differ from those of regions that are more humid by being lower in

organic matter and higher in total plant nutrients. Colorado is home to many fossorial and den-producing mammal species that are distributed according to soil types (i.e. moles, ground squirrels, and prairie dogs). Agricultural areas are also restricted to certain soil types, for example, nearly all of the plains are covered by brown soils, producing valuable grasses for cattle grazing (Chronic, 1980).

Agriculture

The Eastern Slope of the Rockies represents the center of agriculture and urban and industrial development. Of the total land area making up the state (66.6 million acres), 16% is used as cropland (10,600,000 acres) with currently 2.6 million acres irrigated. While the total cropland has remained, for the most part, unchanged since 2000, total irrigated acres have been reduced by 24%. This reduction is a result of explosive urban growth in the Front Range communities (USDA, 2019).

Farms and ranches make up 31,600,000 acres of land and rank ninth in the nation (USDA, 2020), producing over 25 products. Corn, sunflower, and wheat are the crops produced in the largest quantities. However, Colorado ranks in the top ten for production of 15 crops including millet, barley, potatoes, onions and peaches. Colorado market sheep, lambs and cattle on feed are all 3rd in production for the country. Colorado agricultural cash receipts for 2017 were 6.8 billion, 68% from livestock products and 32% from crops (USDA, 2018).

Mineral Resources and Mining

Colorado's mining industry began in 1859 after gold was discovered near Denver in the bed of the Clear Creek. Since then, non-fuel mineral resource exploration and production has grown to a yearly contribution of $2.26 billion in 2014 ranking Colorado 13th in the nation. This industry derives direct and indirect benefits from mining significant amounts of gold, lead, gypsum, limestone, silver, molybdenum, uranium, and zinc. However, crushed stone, sand, and gravel account for over 80% of the revenues. The dollar value of aggregates' have increased steadily, except for a drop in 2008, since 2000. This increase is again reflective of the Front Range urban growth. Precious metals, molybdenum, Portland cement and Gemstones production, while only accounting for $406 million in 2014, has remained steady since 2008 (USGS, Minerals Yearbook 2014).

Recreation

Colorado's millions of acres of forests, grasslands, and parks, resulting in 92% of the state's residents participating in outdoor recreation activities, contributing 62.5 billion dollars to the economy annually (State of Colorado, 2019). There are 58 mountain peaks exceeding 14,000 feet, known as fourteeners, that occur within the state; the most of any state in the US. Eleven national forests, four national parks, two national grasslands, eight national wildlife refuges, 42 state parks, and numerous trails are used for backpacking, hiking, camping, boating, fishing, hunting, birding, and other activities. During winter months, outdoor enthusiasts can also snowshoe, winter camp, and backcountry ski and snowboard in these areas. As winter turns to spring and summer, snow melts down from the mountains. Melting snow spills into rivers and streams creating prime areas for rafters and kayakers.

In addition to public park areas, there are 32 ski resorts available to the public, including such world-class resorts as Vail, Aspen, and Steamboat. Many of these resorts also have areas for cross-country skiing. During spring and summer months, most ski resorts are open to golfers, hikers, and mountain bikers.

Those wishing to get away from civilization and see more of the state can travel along the 485-mile Colorado Trail. Extending from Denver westward across the state to Durango, the trail passes through seven national forests, six wilderness areas, five major river systems, and eight Colorado mountain ranges. The trail is open to hikers,

horseback riders, and, to some extent, mountain bikers (The Colorado Trail Foundation, 2020).

Forest Types and Distributions

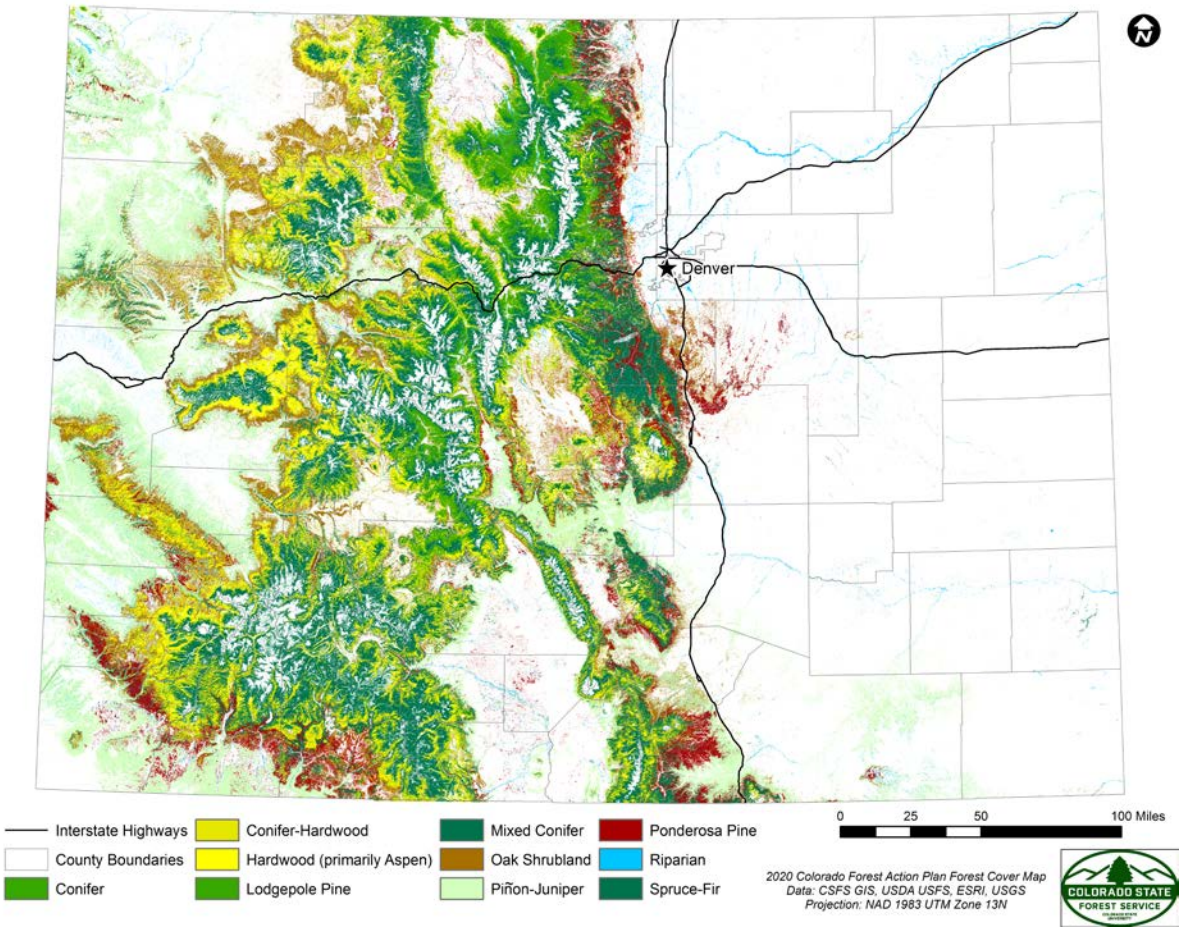


Figure 5. Forest Cover Types, Colorado State Forest Service 2020

The Colorado State Forest Service produced the following forest type and distribution descriptions in 2020:

Hardwood (primarily Aspen):

- One of the most extensive forest types in Colorado, aspen covers a broad elevation range from approximately 6900 to 10,500 feet above sea level.
- Approximately one-third of this forest cover type is on privately owned lands.
- Aspen forests have experienced die-off (e.g. sudden aspen decline) influenced by drought, warmer temperatures, aspect, elevation and age. In addition, fire suppression and browsing of young foliage are threats.
- Aspen forests provide critical habitat for a variety of species as well as wood stock for a variety of products.
- Important to water quality, and has aesthetic and recreation value.

Pinon-Juniper:

- Another of the most extensive forest types in Colorado primarily distributed on Colorado's West Slope with some distribution in south-central Colorado and on the eastern plains, spanning an elevation range of

approximately 4900 to 8000 feet above sea level.
- Approximately one-third of this forest type is on privately owned lands.
- Uses of pinon-juniper forests include elk habitat, firewood, pine nuts and biomass for energy production.
- Important to water quality, and has aesthetic and recreation value.

Spruce-Fir:
- Representing approximately one-fifth of Colorado's forests, this forest cover type occurs at an elevation range of 9,000 to 12,000 feet above sea level.
- Engelmann spruce, subalpine-fir and other conifers are included in this forest type, with aspen also occurring.
- A variety of species uses this forest type as habitat including Canada lynx and boreal toads.
- Wood products include lumber and plywood.
- This forest type is a critical to water supply due to winter snow capture and retention.
- Has aesthetic and recreation value.

Ponderosa Pine:
- Takes a number of forms including forest, woodland, and savanna.
- Ponderosa pine represents approximately one-tenth of Colorado's forests, with almost half on privately owned land.
- Some of the species using this forest type include the Pawnee montane skipper a butterfly listed as threatened, northern goshawk and the American three-toed woodpecker.
- These forests comprise a significant portion of the wildland-urban interface.
- Threats include Mountain Pine Beetle (MPB), fire exclusion, and development. Fire exclusion has resulted in increased tree density, Douglas-fir encroachment, and greater crown fire risk. There has been a significant MPB outbreak in the last decade in this cover type.
- Ponderosa pine is milled for lumber and furniture.
- Important to water quality, and has aesthetic and recreation value.

Oak Shrublands:
- Oak shrublands cover approximately ten percent of Colorado, most abundant in western Colorado, along with the southern Front Range, and central Colorado.
- Almost sixty percent of this cover type is on private lands.
- Some of the species using this cover type include mule deer, elk, black bear, grouse, and turkey.
- Fire plays a role in promoting regeneration, removal of encroaching trees, and promoting density and cover of gamble oak. Fire suppression has altered fire characteristics.
- Important to water quality, and has aesthetic and recreation value.

Mixed Conifer:
- This forest type occurs between lower elevation ponderosa pine forests and higher elevation subalpine forests, and contains a diverse mix of conifers including White fir, Douglas-fir, Rocky Mountain juniper, Engelmann spruce, blue spruce, subalpine fir, bristlecone pine, and limber pine.
- Approximately one third of the forest type is in private lands.
- Elk, northern goshawks and owls, among other species use this forest type as habitat.
- Wildfire cycles vary considerably with historically low to mixed severity. Fire suppression contributes to denser forests and the resulting in denser forests with more dead fuel, resulting in greater chances for crown fires, threatening water supply.
- This forest type provides a variety of wood products.
- Important to water quality, and has aesthetic and recreation value.

Lodgepole Pine:

- This forest type occurs in relatively homogeneous stands at elevations similar to mixed-conifer.
- Approximately one tenth of the acres are on private lands.
- Species using this forest type includes mule deer, elk, black bears, and Canada lynx.
- Wildfire played a key role in establishing lodgepole forests. Significant portions of these forests were impacted by a large epidemic of Mountain Pine Beetle in the past decade. Ski areas and real estate development have contributed to wildland-urban interface (WUI) expansion in these forests.
- Varieties of wood products are derived from this forest cover type including lumber, log furniture, decking, plywood, and firewood.
- Important to water quality, and has aesthetic and recreation value.

Riparian:

- Consisting of Montane and Plains versions, these forest types provide critical habitat in the semi-arid climate of Colorado.
- Roughly, one third of montane acres are on private land while approximately three quarters of Plains acres are privately owned.
- Montane tree species include willow, alder and blue spruce, and can occur on ponderosa pine, aspen and spruce-fir forest types. Plains are mostly comprised of cottonwood and willow.
- Species in the montane forest type include numerous amphibians, including the boreal toad, beaver, Elk, mule deer, and moose. In the Plains, forest type including native fish, amphibians, Bald eagles, deer, turkey and owls.
- Threats to riparian areas include reduced water levels and soil disturbance. These disturbances can promote invasion by Tamarisk and Russian olive. Other threats can include pollution, surface water diversion, and groundwater depletions.
- Important to water quality, and has aesthetic and recreation value.

Conifer:

- This forest type is characterized by an open woodland structure. In Colorado, this forest type is best represented at higher elevations above Ponderosa pine ecosystems in dry, rocky environments. Primary tree species include Limber pine and Bristlecone pine, and Juniper may be mixed in the stands. Mountain Mahogany is also present. At higher elevations, species such as Engelmann spruce and sub-alpine fir dominate in an open distribution.
- This forest type is variable regarding fire dependency, due to sparse, rocky settings with limited fuels and tree density.
- Species dependent on this forest type are small mammals and birds, especially Clark's nutcracker, which depend on the pine seeds for food.
- Important to water quality, and has aesthetic and recreation value.

Conifer-Hardwood:

- Occupying slopes and plateaus at mid-elevations characterize this forest type. Species mix is aspen along with a wide variety of trees such as Douglas fir, white fir, subalpine-fir, blue spruce, lodgepole pine, limber pine and ponderosa pine, and oak shrub. These forests tend to be transitioning from aspen to conifers, depending on disturbance.
- It is considered a fire-adapted community with aspen re sprouting post-fire.
- Important to water quality, and has aesthetic and recreation value.

Forest Products

While Colorado has millions of acres of forested land, the forestry industry does not contribute greatly to the state's gross product. In fact, more than 90 percent of forest products used in Colorado are imported from outside of the

state (CSFS). Colorado forest products include saw timber, fuelwood, posts, poles, and furniture wood. Economically important species include aspen, spruce, fir, Douglas fir, lodgepole pine, and ponderosa pine.

Forests in Colorado have relatively low productivity rates so management is partially focused on restoring health. Major concerns include mountain pine beetle, decline of aspen stands due to fungal infections, round headed pine beetle, and spruce beetle. Management goals include improvement of forest health for multiple use management, promotion of forestry-related projects, and emphasis on local and state wood-product markets. Increasing the consumption of local wood products, helps keep forests healthy by reducing the number of older trees that are more prone to disease and infestation, as well as the reduction of wood biomass, reducing the intensity of a potential wildfire (BLM).

Wildlife and Fisheries

Colorado Parks and Wildlife (CPW) has statutory authority over 960 native species, including mammals, birds, fish, reptiles, amphibians, mollusks, and crustaceans. Colorado is home to approximately 500 native vertebrate species of animals, including 124 species of mammals, 260 species of birds, 46 species of fish, 17 species of amphibians, and 53 species of reptiles. Additionally, Colorado has 2,600 species of plants, and 50,000 to 100,000 species of insects (Colorado Parks and Wildlife, 2015). Some of these have always been rare, but many have become imperiled by changes in their habitats caused by human impacts on resources (Colorado Parks and Wildlife, 2015).

The CPW has developed a list of 159 Species of Greatest Conservation Need (SGCN) comprised of two tiers of species by need of conservation. Tier 1 is composed of the species in greatest peril and consists of 55 species (13 Mammals, 25 fish, 13 birds, 2 amphibians, and 2 reptiles). Tier 2 consists of 104 Species (23 Mammals, 2 fish, 48 birds, 8 amphibians, 14 reptiles, and 9 mollusks). Many fewer are listed as threatened, endangered, or of special concern by the U.S, Fish and Wildlife Service and the Colorado Division of Wildlife: birds (19), mammals (13), fish (23), reptiles (10), amphibians (7), and plants (16) (numbers are estimates as they reflect decisions only on animals and plants for which population information exists) (Colorado Parks and Wildlife, 2015).

The native biological diversity of Colorado is supported by its relatively intact natural landscapes. Approximately 80% of our vertebrate species are doing well and 20% require conservation action in order to survive. Of the at-risk categories of species, fish and amphibians have the highest percentage of at-risk taxa, at 43% and 41% respectively. These aquatic-dependent vertebrates are in the greatest need of conservation attention. The primary threat to fish includes introduced species and water development. Amphibians are mostly threatened by disease and non-native species (Colorado Parks and Wildlife, 2015).

The percentage of at-risk species within the categories of mammals, birds, and reptiles are each roughly 20%. Direct mortality, and urban and energy development most significantly threaten mammals. Colorado has 240 native breeding bird species, the largest of the vertebrate groups. Although the percent of threated bird species is only 20%, they have 51 at-risk species; having the highest number of vulnerable species among the animal categories. The biggest threat to birds includes habitat loss due to conversion to cropland, forestry, energy development, and wetland/riparian alteration. Threats to reptiles are invasive species and energy development. Good planning, education, and adequate funding can protect and manage Colorado's unique biodiversity features and lower the number of at-risk species (Colorado Parks and Wildlife, 2015).

Protection of species is not only important for biodiversity, but for Colorado's heritage, quality of life, and economic prosperity (Ver Steeg, 2019). Hunting and fishing license sales support all of Colorado's wildlife management efforts, including threatened and endangered species programs, wildlife reintroductions, and habitat conservation without placing additional burdens on taxpayers. Further, hunting and fishing contribute a significant amount to state and local economies, rivaling only the ski industry in total revenue generated (Colorado Wildlife Council, n.d.).

Fifty four percent or 125 million dollars and the largest source of funding for the CPW is through licenses, passes, fees, and permits related to outdoor recreation. Excise taxes on hunting and fishing equipment, firearms and ammunition along with license fees contribute 78% of all wildlife revenue (CPW, 2015). The boreal toad, cutthroat trout, big horn sheep, black-footed ferrets, Sage grouse, elk, and bats are just a few examples of species that have benefited from conservation efforts (Colorado Wildlife Council, n.d.).

Aesthetics and Scenic Resources

From snow-covered mountains to deep canyons and expansive prairies, Colorado offers visual wonders of almost every kind. The main approach west along I70 into the Denver area is back-dropped by the impressive vertical horizon of the Southern Rocky Mountains. A short drive from the city takes a visitor suddenly into a seemingly infinite land of topographical marvels. Recreation opportunities exist, whether the visitor wishes to visit a National Park or hike in wilderness areas.

Within Colorado, 26 Scenic and Historic Byways, 11 of which are designated America's byways, provide routes between historic sites and magnificent scenery (Colorado's Tourism, 2020). The state's diverse terrain can be viewed by following the sky-blue signs sporting the state flower, the columbine, and the words "Scenic Byway". Most byways travel through National Forest land; therefore, many recreational opportunities can be accessed.

The changing of seasons in Colorado brings a striking array of colors. As mountains give up their persistent covering of snow, spring weather delivers luscious wildflowers and brilliant greens on an otherwise drab-brown country. Waterfowl, shorebirds, and other viewable wildlife flood into areas of Colorado to breed and feed. As the fall approaches, quaking aspens turn gold adding spectacular hues to mountainsides that can often be seen from roads and paths.

Unique Natural Areas

Many Colorado forests provide habitat for rare and important plant and animal species and are sometimes themselves a valuable resource. Established in 1977, the Colorado Natural Areas Program (CNAP) is a statewide initiative focused on the recognition and protection of areas that contain at least one unique or high-quality natural feature of statewide significance, such as community, geologic, paleontological, rare plant, and rare fauna. CNAP has 95 designated State Natural Areas protecting over 250 rare, threatened or endangered species or plant communities. The program addresses 178,275 acres of significant land as well as 126 species of greatest conservation need, designated by the CPW (Colorado Parks and Wildlife, 2017). These natural areas occur mostly in the mountain and western parts of the state. Because of the need for watershed conservation, many of these areas contain riparian systems, especially along major rivers.

Many examples of important conservation areas exist among these selected natural areas. Owl Canyon in Larimer County includes 658 acres supporting a dense population of pinyon pine at the northeastern extremity of its range in North America. Individual trees from these stands are from 200 to 500 years old. Arapaho National Wildlife Refuge, located in an intermontane glacial basin south of Walden, was established in 1967 as a nesting and rearing stopover for waterfowl. Garden Park, located 8 miles north of Cañon City in south central Colorado, harbors a rich diversity of vertebrate fossils. This natural area may possibly be the most valuable Jurassic dinosaur graveyard in the world.

Other unique areas of Colorado include North America's highest dunes rising over 750 feet against the Sangre de Cristo Mountains. The Great Sand Dunes National Park includes 30 square miles of dunes, alpine lakes and tundra, ancient spruce and pine forests, large stands of aspen and cottonwood, grasslands, and wetlands (National Park Service, 2020).

Located in north central Colorado, Rocky Mountain National Park is a national icon with its rugged peaks and lush spruce and aspen forests. The Continental Divide runs north to south through the park. Carved by glaciers, the Rocky Mountains support diverse environments including montane, subalpine, alpine tundra, and basins. The park is home to countless species of plants and animals, including elk, black bear, moose, coyote, bobcat, and deer, and was visited by approximately 4.6 million people in 2018 (National Park Service, 2020).

The Earth's oldest living inhabitants, the bristlecone pine, finds a home near tree line in the Colorado Rockies. With an average age of 1,000 years, bristlecones have been recorded at just under 5,000 years old, which makes it a resource worth protecting (Encyclopedia Britannica, 2017). These pines sequester more carbon than any other species. The Colorado species of bristlecone can be found on Black Mountain in Pike National Forest, Mount Evans in Summit County, and Mount Royal near Frisco. The oldest bristlecone in Colorado is approximately 2,500 years old (Walking Mountains, 2016).

Urban Influences

Perhaps the most recognized threat to private forested areas in the state is urban expansion. Residential and commercial developments are increasing within forested lands. Colorado's wildland-urban interface (WUI) is the area where man-made structures are built within or in close proximity to natural vegetation. Based on the CSFS 2017 Colorado Wildfire Risk Assessment, there were 2.9 million people living in the WUI. At that time, the WUI was estimated to cover roughly 3.4 million acres; one model projects this area could increase to roughly 9 million acres by 2040 (Theobald, 2015). Current data shows counties with moderate to high increases in housing density lie mostly in areas along the Front Range of Colorado. As humans cause many of the major wildfires in Colorado, the potential for more frequent wildfires within the WUI seems clear as populations continue to grow.

SECTION 2: CRITERIA AND FOREST LEGACY AREA DETERMINATION

In order to assess the need for protection of privately owned forest, and to develop the criteria by which those privately owned forests would be chosen, identification of areas of potential conversion and the consultation of selected Colorado land conservation groups, were needed. The primary goals of this assessment were 1) establish project-specific criteria that incorporated input from land conservation professionals, and 2) establish FLA boundaries that are inclusive of private forests with graphically definable and modifiable boundaries. The CSFS chose to accomplish this using the following two steps:

Step 1: Criteria, 2020

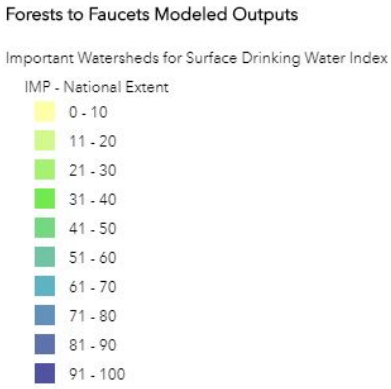
In 2020, the private forestland protection criteria were modified from the 2006 Forest Legacy Assessment of Need Five Year Review by consulting with Colorado land conservation groups. The following organizations were involved in updating the criteria and ranking: Colorado Cattlemen's Agricultural Land Trust (CCALT), The Conservation Fund (TCF), and The Nature Conservancy (TNC), The Trust for Public Land (TPL), and Colorado Parks and Wildlife (CPW). Table 2 presents the cumulative ranking of these criteria:

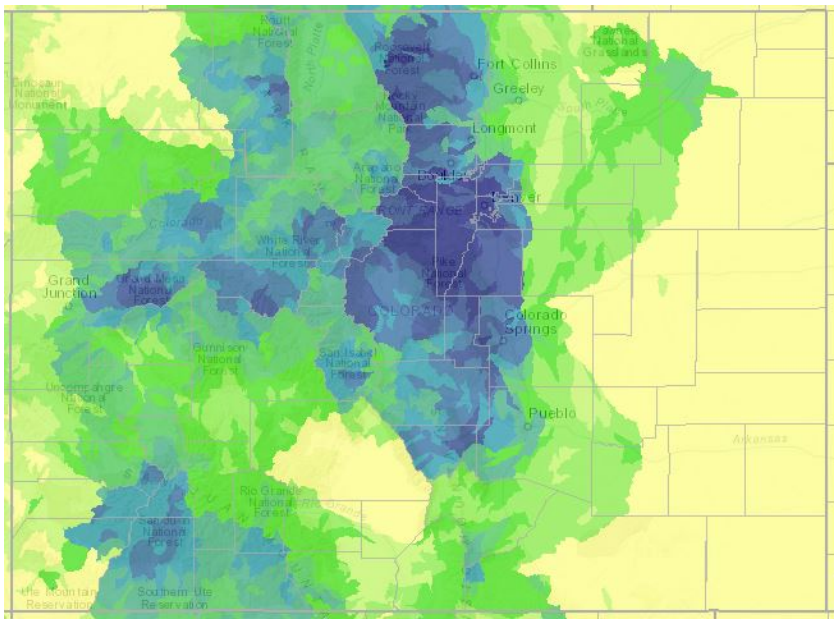
Table 1,
Private Forest Land Protection Criteria, 2020

Criteria	Priority
Water Quality/Quantity	1
Wildlife Habitat	2
Growth/Sprawl Control	3
Large Continuous Forest	4
Wetland/Riparian Areas	5
Unique Ecological Areas	6
Wildfire Control Issues	7
Private Property Rights	8
Forest Timber Products	9
Lifestyle Protection for Landowner	10

The updated criteria will be used to rank future projects according to their priority and emphasis.

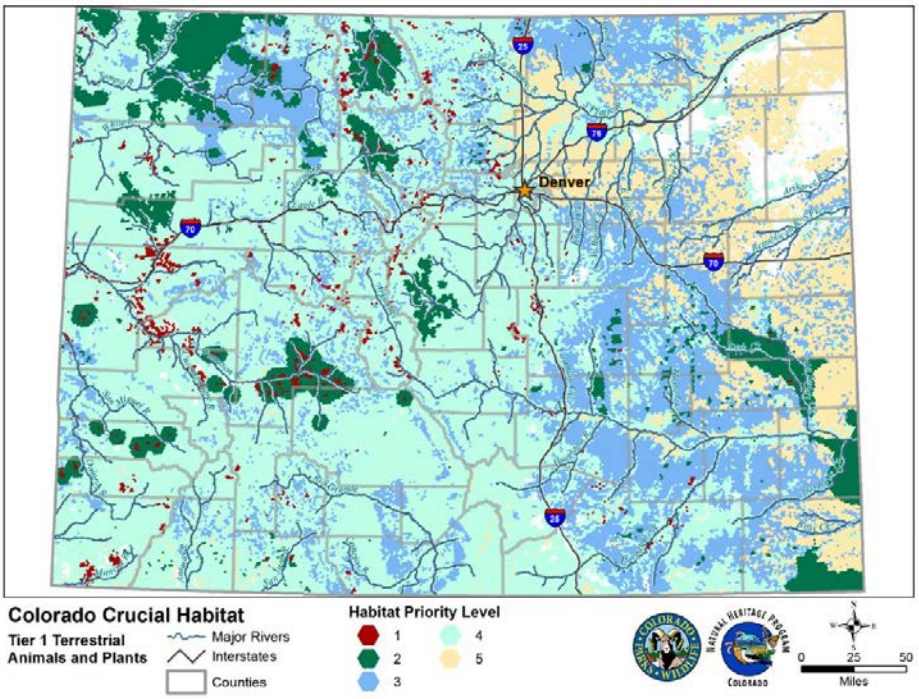
1. Water Quality/Quantity: The National Forests to Faucets 2.0 (F2F2), 2019 Assessment is a geographic analysis done by the US Forest Service that uses data to show importance of sub-watersheds for surface drinking water and to look at potential threats to those watersheds. Threats to these important forested watersheds include fire, insects and disease, development, and reduced run-off due to a changing climate.





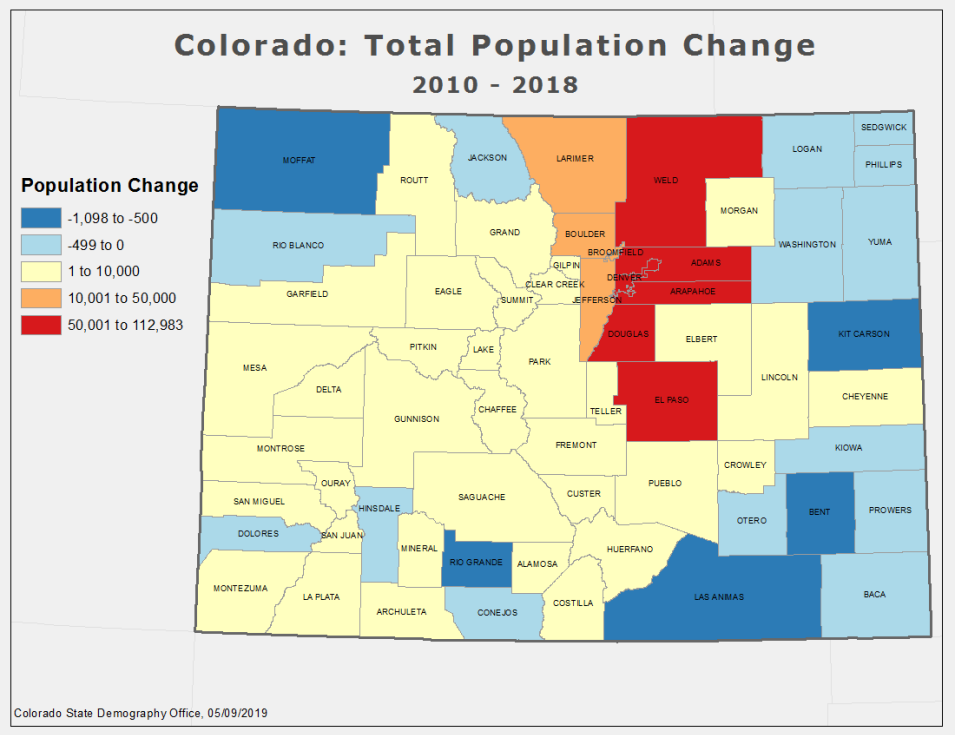
https://usfs.maps.arcgis.com/apps/MapSeries/index.html?appid=e84fc83c8be542079d3c1d489d45be21#

2. Wildlife Habitat: Colorado's 2015 State Wildlife Action Plan (SWAP) by Colorado Parks and Wildlife include several maps that relate to wildlife conservation in Colorado. The Colorado Crucial Habitat map (below) shows crucial habitat and priority level for Tier 1 terrestrial animal and plant species of greatest conservation need (SGCN).



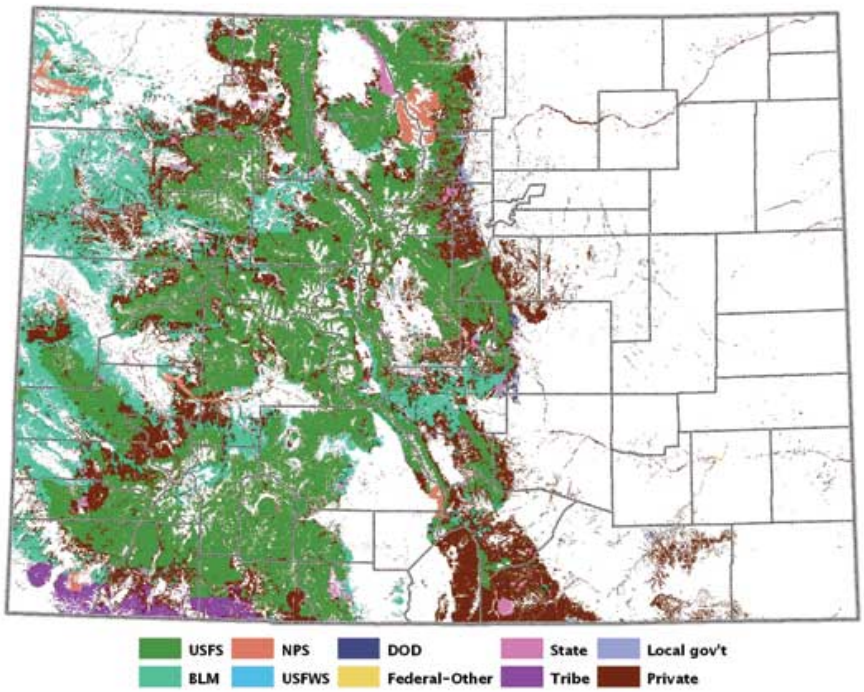
https://cpw.state.co.us/Documents/WildlifeSpecies/SWAP/CO_SWAP_FULLVERSION.pdf

3. Growth/Sprawl Control: To illustrate the housing density pressure and population sprawl, the Colorado State Demography Office, total population change 2010 – 2018 by county map was used.



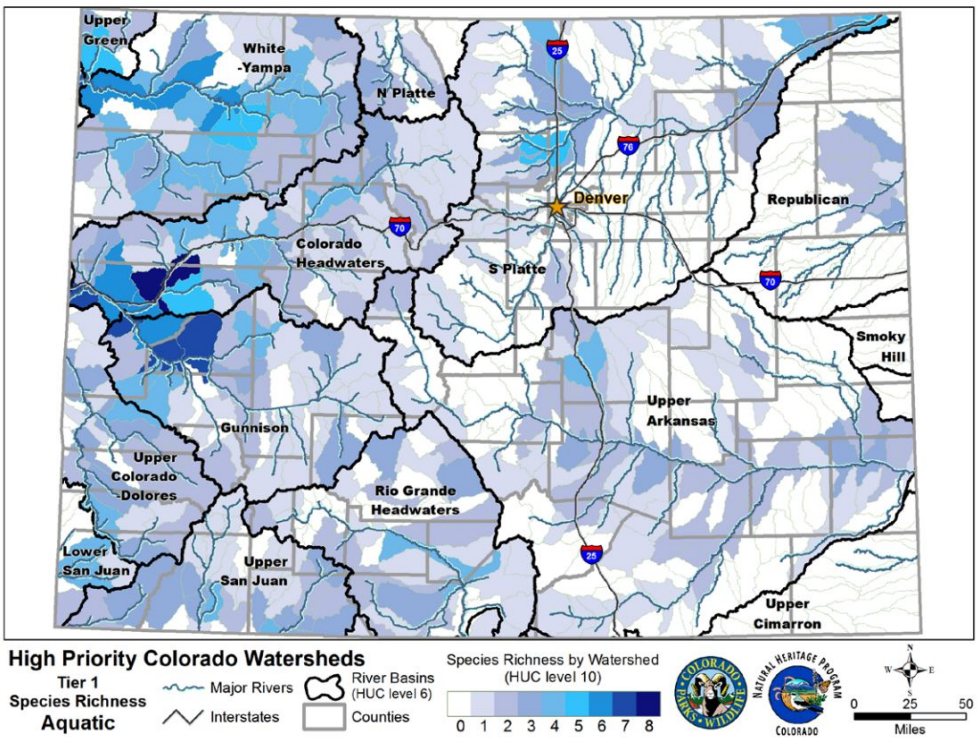
https://storage.googleapis.com/maps-static/TtlChg1018.png

4. Large Continuous Forest: A forest ownership map by the Colorado State Forest Service was used. The map illustrates the forest ownership within Colorado, which includes the U.S. Forest Service (USFS), Bureau of Land Management (BLM), National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), Department of Defense (DOD), Federal, State, Tribe, Local government, and Private.



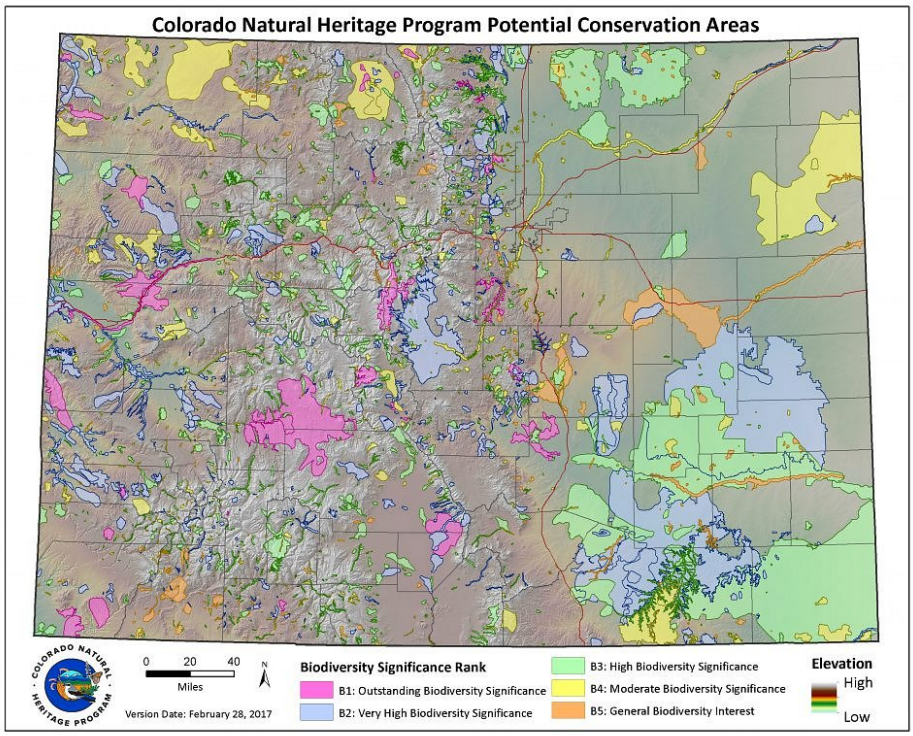
https://csfs.colostate.edu/colorado-forests/forest-types/

5. Wetland/Riparian Areas: The High Priority Colorado Watersheds map developed by the Colorado Parks and Wildlife as part of the 2015 SWAP was used to represent significant wetland/riparian areas. The map shows the priority of watersheds (HUC 10) in relation to the Tier 1 (SGCN) species richness.



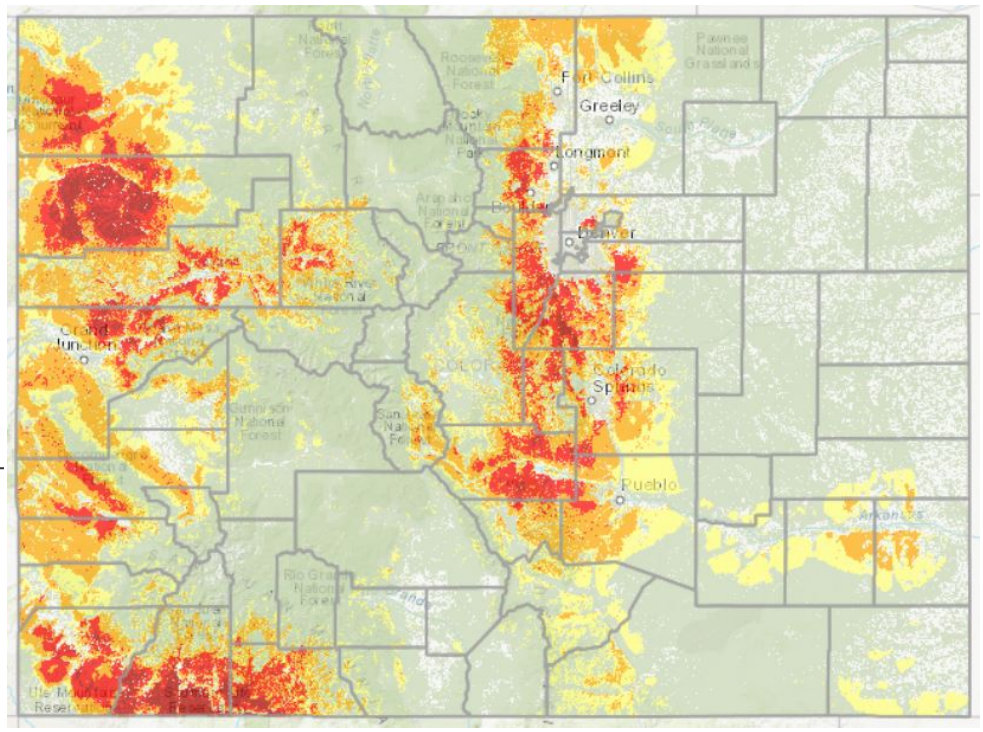
https://cpw.state.co.us/Documents/WildlifeSpecies/SWAP/CO_SWAP_FULLVERSION.pdf

6. Unique Ecological Areas: The Colorado Natural Heritage Program produced the Potential Conservation Areas map (below), showing the biodiversity significance ranking by area.



https://cnhp.colostate.edu/ourservices/mapping/

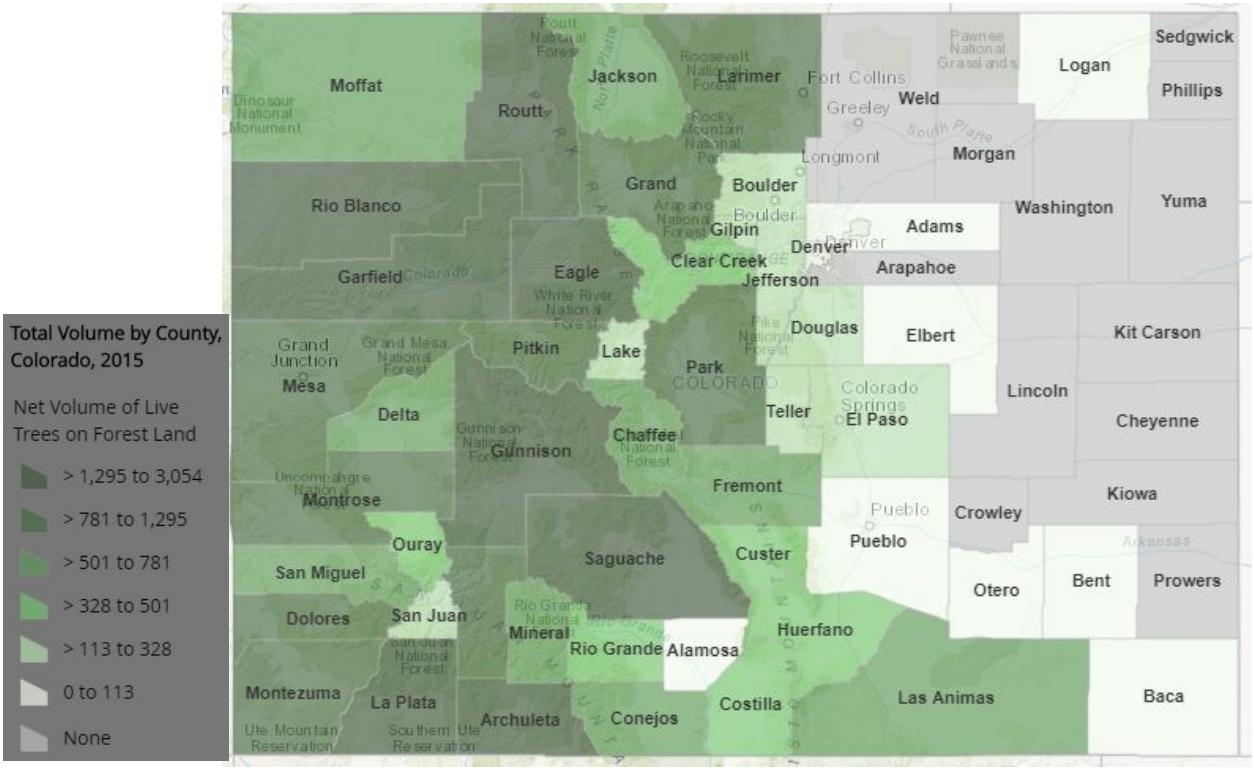
7. Wildfire Control Issues: The Wildfire Risk map (below), published by the Colorado State Forest Service, and identifies areas with the greatest potential impacts from a wildfire.



https://co-pub.coloradoforestatlas.org/#/

8. Lifestyle Protection for Landowners: No data set could be identified which could represent lifestyle protection for landowners spatially. This value was not represented on the FLA map. This criteria will be assessed through the State-wide Forest Legacy application review process.

9. Forest Timber Products: This data set came from the 2015 Forest Inventory and Analysis (FIA) program at the Rocky Mountain Research Station of the U.S. Department of Agriculture Forest Service. The volume of wood in a forest can be an important indicator of forest health, sustainability, and structure. The map (below) illustrates the total wood volume (cubic feet) per county.



https://www.arcgis.com/apps/MapJournal/index.html?appid=707aec494f694647b88fc07952e8e78a

10. Lifestyle Protection for Landowners: No data set could be identified which could represent lifestyle protection for landowners spatially. This value was not represented on the FLA map. This criteria will be assessed through the State-wide Forest Legacy application review process.

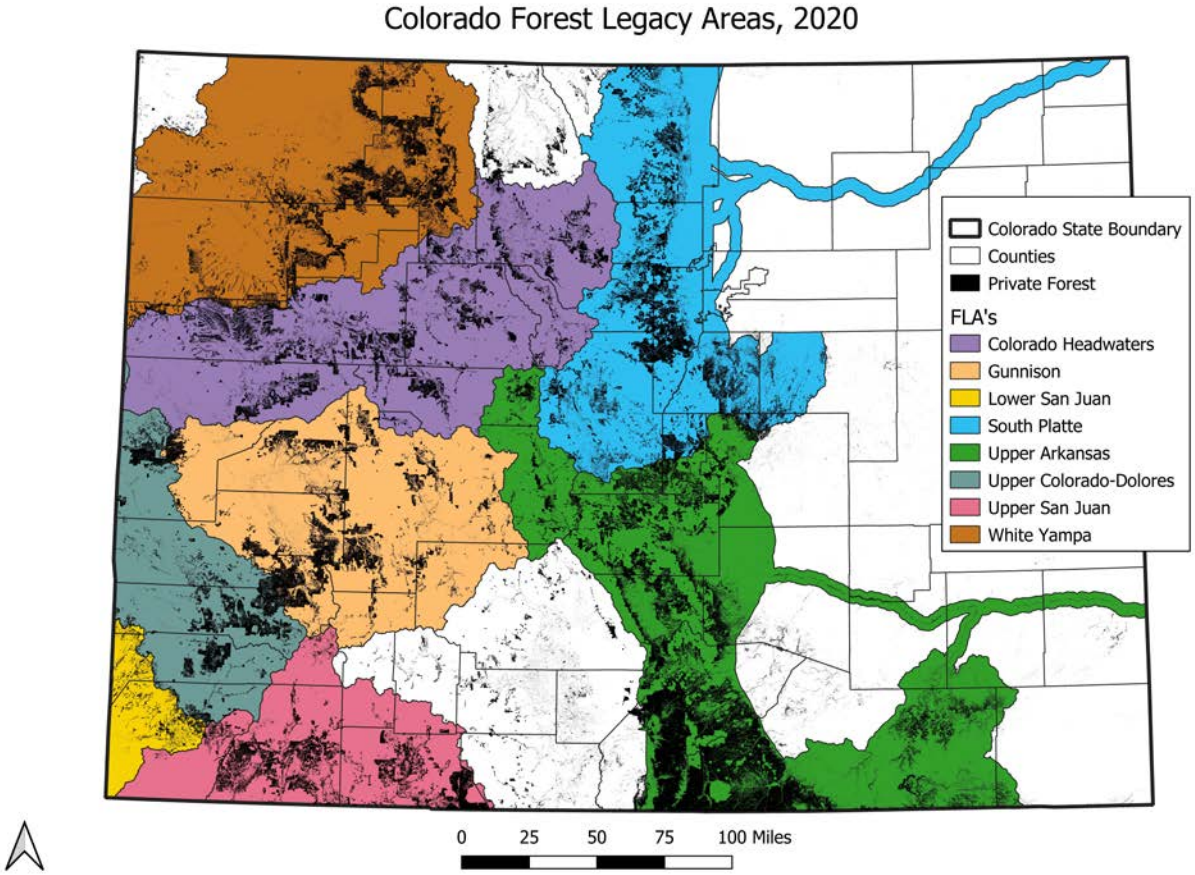
Step 2: Forest Legacy Area Determination, 2020

An update to Colorado's Forest Legacy Areas (FLAs) was required due to changing conditions over the last 20 years. This report provides more current and accurate information and data that is true to current conditions in the state. The updated FLA map expands the eligibility of private forestlands in the state. The three objectives for the production of Colorado's 2020 (FLAs) were: 1) inclusive of privately owned forests, 2) definable boundaries, and 3) modifiable boundaries.

Without designating the entire state to be eligible for the Forest Legacy program, the first task was to identify the majority of Colorado's private forests. This was performed by intersecting the privately owned land (2019 COMap) GIS data and forest (2017 COWRAP) GIS data. The intersection of these two layers created a "private forest" layer. The inclusivity of this private forest layer was crucial to the composition of the 2020 FLAs.

The second and third objectives of the FLA selection were to have easily definable and modifiable boundaries. It was suggested that river basins (HUC 6s) be the foundation of the FLA boundaries as they are geographically depictable and encompass large areas. GIS shapefiles of hydrologic boundaries were downloaded from the USGS watershed boundary dataset. The basins were ranked according to the amount of private forests contained within each and chosen based on those assessments as well as connectivity.

In order to eliminate zones that had little to no forest conservation potential, modifications to three of the basin boundaries (South Platte, Upper Arkansas, and Upper San Juan) were made. These modifications utilized both political and geographical perimeters. Political features used to modify HUC 6 boundaries included county lines and roads, while geographical boundaries used to modify FLAs were watersheds (HUC 10s) and riparian buffers on major water features.



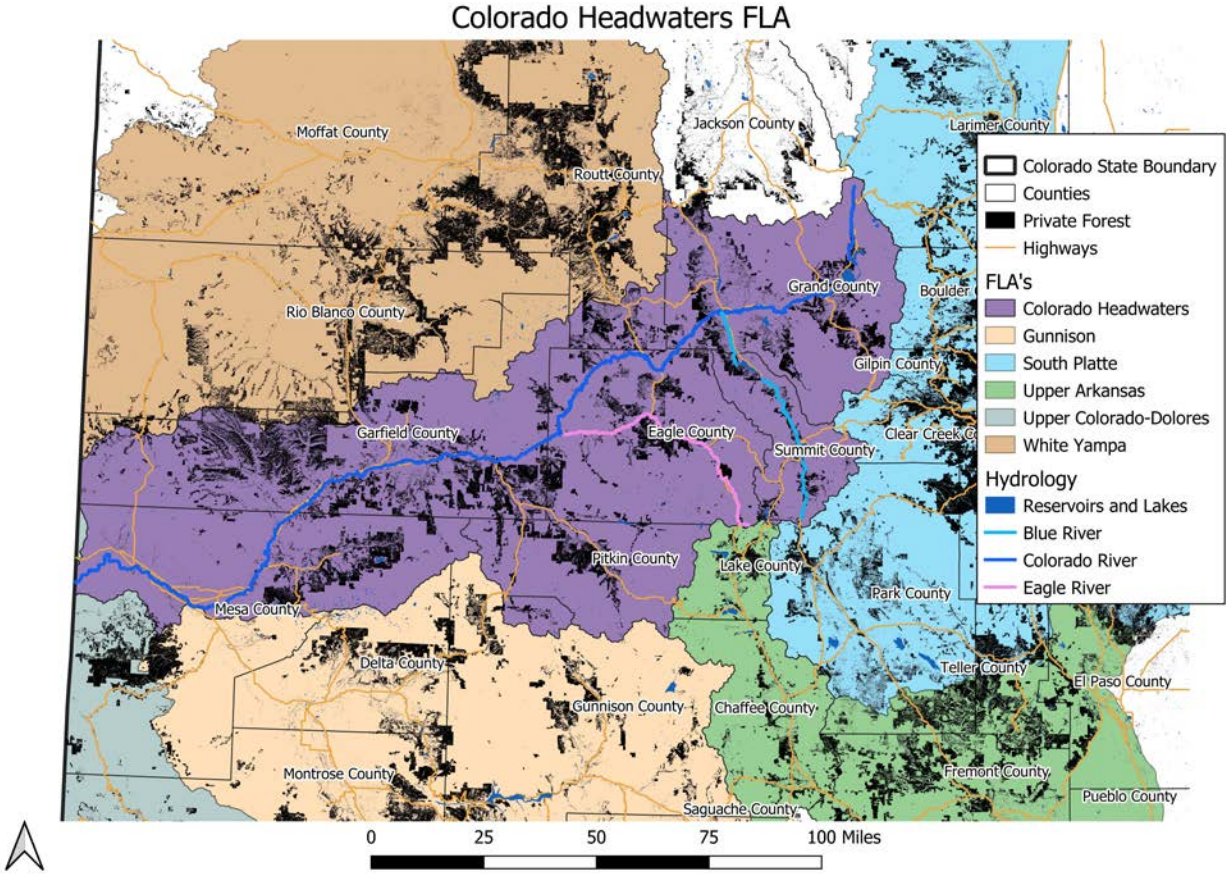
SECTION 3: FLA DESCRIPTIONS

The Forest Legacy Area descriptions incorporate surface land ownership data from COMap 2019, chartered city and town populations from the US Census Bureau (Revised September 14, 2015), and population growth rate estimates from the Sate Demography Office (2020). Mountain peaks exceeding 14,000 feet (fourteeners) are discussed within this section (Note: There are 58 fourteeners in the state, with a significant number of them occurring on basin boundaries). Of the 32 ski resorts in Colorado, 31 of them are located within the conglomerate of Forest Legacy Areas. Ski resort information was accessed from Uncover Colorado (Ripley, 2020).

Animal species discussed in each Forest Legacy Area characterization belong to one of the two groups: 1) The state of Colorado's quintessential animals and 2) Colorado Parks and Wildlife Tier I listed species (Colorado Parks and Wildlife, 2015) (Appendix A) which hold a Federal Status. Eleven animals fall into the first category while 22 species are included in the second category (Note: The bison was eliminated from group one due to there being only domestic populations within Colorado. Due to their extirpation from the state, the wolverine and bonytail chub were eliminated from group two).

The Level III and IV Ecoregions listed for each FLA were determined with GIS data accessed from the EPA. Additional information for each Level IV ecoregion can be found on USGS's Characteristics of Level IV Ecoregions in Colorado (Appendix B). The 8 areas outlined next in this document were identified as Forest Legacy Areas for the Forest Legacy Program in Colorado.

Colorado Headwaters Forest Legacy Area



Area Coverage Description: The Colorado Headwaters Basin (140100) within Colorado forms the boundary of this FLA.

Forest Legacy protection goals for the Colorado Headwaters FLA:

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**
8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

The population within this area is estimated to be 156,000 with a population density of 16 people per square mile, with a four-year population growth rate of 3.7%. The Colorado Headwaters FLA makes up approximately 9.4% (6.3 million acres) of the state and contains approximately 12% of Colorado's private forests (850 thousand acres). The

land ownership within this FLA is 28.5% (1.8 million acres) private, 24.5% (1.5 million acres) BLM, 43% (2.7 million acres) USFS, 1.9% (120 thousand acres) NPS, and 0.7% (40 thousand acres) CPW. Counties that occur in the Colorado Headwaters include Eagle, Garfield, Grand, Gunnison, Mesa, Pitkin, Routt, and Summit. Major cities in the region are Aspen, Glenwood Springs, Grand Junction, Rifle, and Vail.

The Arapahoe, Grand Mesa, Routt, and White River National Forests occur in this region. Colorado State Parks within this FLA include Harvey Gap, Highline Lake, James M. Robb – Colorado River, Rifle Falls, Rifle Gap, Sylvan Lake, and Vega. Ten fourteeners are found in this basin, with three of the peaks sharing a boundary with another FLA. With 15 ski resorts, Colorado Headwaters possesses the highest number of all the FLA's. Popular ski resorts within the region include Vail, Keystone, Breckenridge, and Aspen. Conserving this FLA will provide benefits to the public, as the values, areas, and Colorado's citizens' value resources in this FLA.

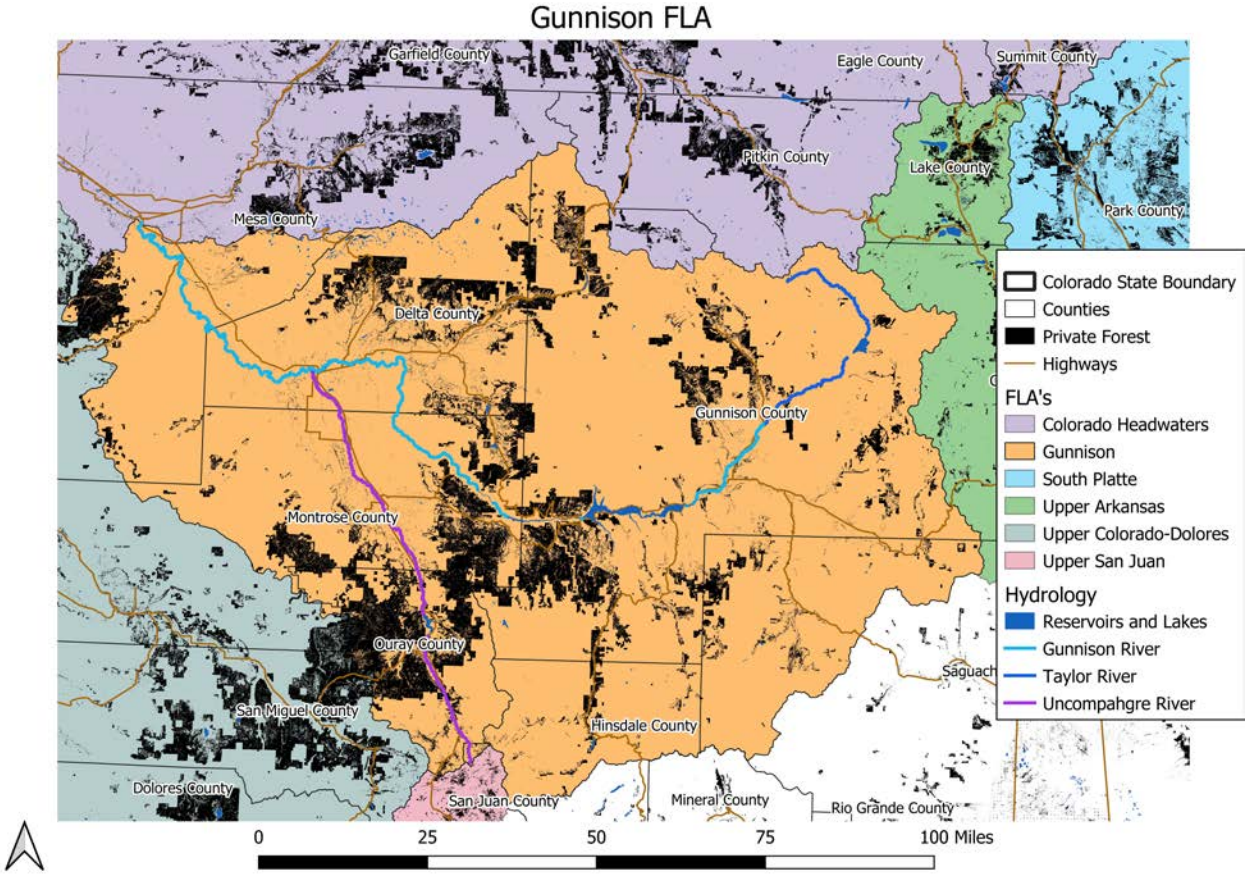
Other conservation organizations including but not limited to Colorado Cattlemen's Agricultural Land Trust (CCALT), and Colorado Open Lands (COL), as well as other regional land trusts have recognized the unique nature of this FLA for private lands protection, and have many forestlands already protected with conservation easements.

The protection of the forestlands in this FLA have numerous benefits to the public. Much of this area is highly traveled through the I-70 corridor, and the forestlands around this corridor are highly utilized by Colorado citizens and tourists from all over for recreational purposes. Protection of the water resources along the Colorado River headwaters is imperative to the public, as there are many large reservoirs and important water infrastructure features that are important to serve a growing population, growing recreational uses, and growing wildfire risk. Protection of forestlands in this FLA will ensure the scenic integrity of the area, highly sought out for recreational and tourism purposes. Wildlife habitat mentioned above will remain intact, benefitting recreationalists.

There are ten group one animals that have range within this FLA, which includes mountain lion, black bear, elk, moose, mountain goat, bald eagle, bighorn sheep, pronghorn, mule deer, and white-tailed deer. Group two species that occur in the region include: boreal toad, greater sage grouse, south white tailed-tailed ptarmigan, American pica, little brown myotis, lynx, humpback chub, and razorback sucker. The western yellow-billed cuckoo has possible occurrence within this area, making the count for group two species amount to nine.

Included within this basin is the Southern Rockies (21) and the Colorado Plateaus (20) Level III Ecoregions. The Southern Rockies make up the eastern three quarters of the FLA, with the Level IV Ecoregions being the alpine zone (21a), crystalline subalpine forests (21b), crystalline mi-elevation forests (21c), foothill shrublands (21d), sedimentary subalpine forests (21e), sedimentary mid-elevation forests (21f), volcanic subalpine forests (21g), and volcanic mid-elevation forests (21h). The Level IV Ecoregions within the Colorado Plateaus include shale deserts and sedimentary basins (20b), semiarid benchlands and canyonlands (20c), and arid canyonlands (20d).

Gunnison Forest Legacy Area



Area Coverage Description: The Gunnison River Basin (140200) forms the boundary of this FLA.

Forest Legacy protection goals for the Gunnison FLA:

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**
8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

The approximate population within the Gunnison River Basin is 43,000, with a population density of five people per square mile, with a four-year population growth rate of 4.6%. The region makes up an estimated 7.7% (5.1 million acres) of the state and contains approximately 9.9% (700 thousand acres) of Colorado's private forests. The land ownership within this FLA is 27.1% (1.4 million acres) private, 25.3% (1.3 million acres) BLM, 45.3% (2.3 million acres) USFS, 1.3% (70 thousand acres) NPS, and 0.7% (40 thousand acres) CPW. Counties that occur within

boundaries of this FLA include Delta, Gunnison, Hinsdale, Mesa, Montrose, Ouray, Saguache, and San Juan. Major cities in this region are Delta, Gunnison, and Montrose.

The Grand Mesa, Gunnison, and Uncompahgre National Forests occur in this region. State Parks found within the basin include Crawford, Paonia, Ridgway, and Sweitzer Lake. Nine fourteeners are found in this basin, with one of the peaks sharing a boundary with another FLA. There are five ski resorts within the Gunnison basin, including Crested Butte Mountain Resort. Conserving this FLA will provide benefits to the public, as Colorado's citizens value the areas and resources mentioned.

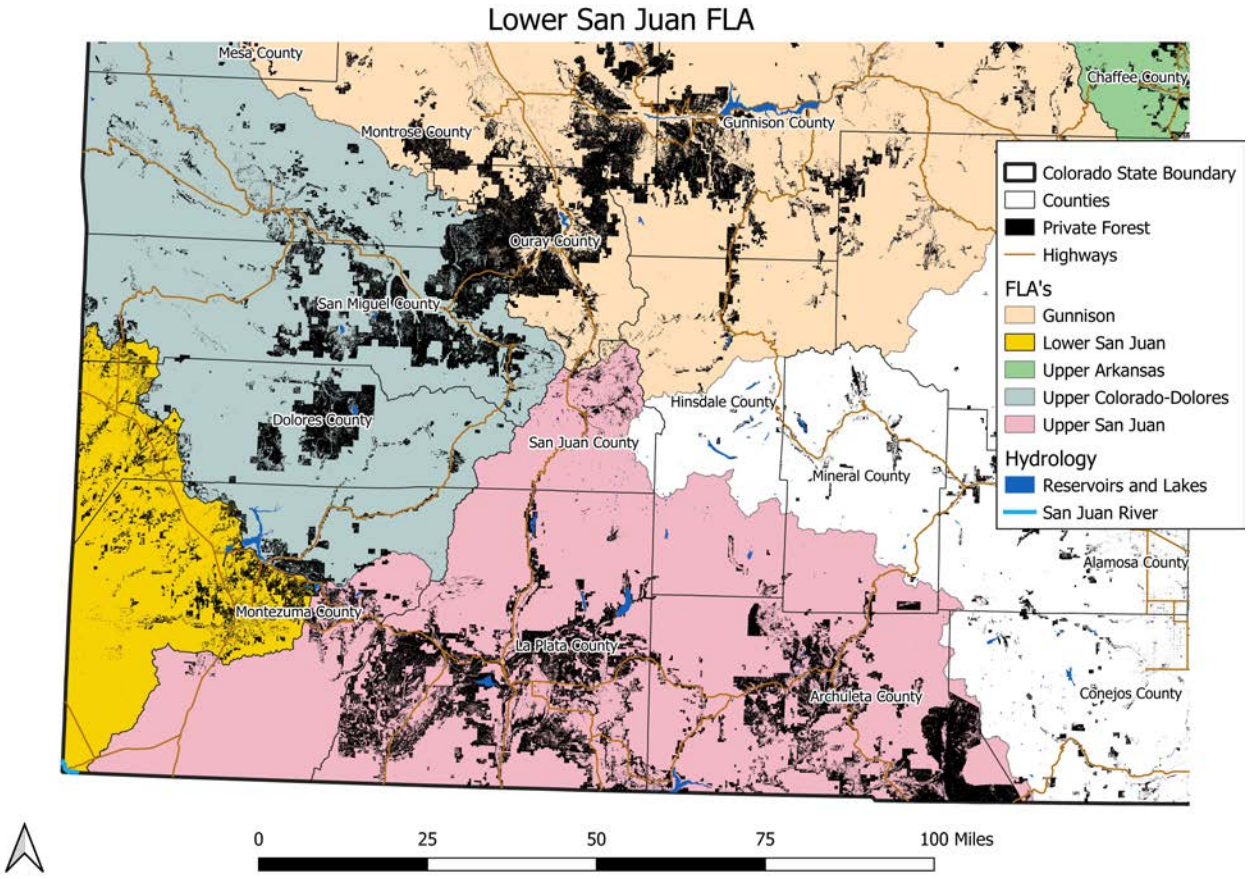
Other conservation organizations including but not limited to Colorado Parks and Wildlife, Colorado Cattlemen's Agricultural Land Trust (CCALT), and Colorado Open Lands (COL), Gunnison Ranchland Conservation Legacy Trust. Funding for conservation of this area has been received from many organizations including Great Outdoors Colorado (GOCO), and the Natural Resource Conservation Service (NRCS). The conservation organizations and funders recognize the unique nature of this FLA for private lands protection, and have many forestlands already protected with conservation easements.

The protection of the forestlands in this FLA have numerous benefits to the public. Much of this area is highly traveled from Montrose to Gunnison along Highway 50, and Montrose south through Ouray and Silverton, and the forestlands around these corridors are highly utilized by Colorado citizens and tourists from all parts of the nation for recreational purposes. Protection of the water resources in the Gunnison River watershed is imperative to the public, as it ensures the scenic quality of the landscape.

Protection of the wildlife habitat in this FLA provides benefits to the public, as this FLA has habitat for nine of the Colorado's iconic animals including: mountain lion, black bear, elk, moose, mountain goat, bald eagle, bighorn sheep, pronghorn, and mule deer. Nine of the group two species inhabit this region, which consists of: boreal toad, Gunnison sage grouse, south white-tailed ptarmigan, western yellow-billed cuckoo, American pika, Gunnison's prairie dog, little brown myotis, lynx, and humpback chub.

Included within this basin is the Southern Rockies (21) and the Colorado Plateaus (20) Level III Ecoregions. The Level IV Ecoregions within the Southern Rockies of this FLA are the alpine zone (21a), crystalline subalpine forests (21b), crystalline mi-elevation forests (21c), foothill shrublands (21d), sedimentary subalpine forests (21e), sedimentary mid-elevation forests (21f), volcanic subalpine forests (21g), and volcanic mid-elevation forests (21h), sagebrush parks (21i), and grassland parks (21j). The Level IV Ecoregions within the Colorado Plateaus include shale deserts and sedimentary basins (20b) and semiarid benchlands and canyonlands (20c).'

Lower San Juan Forest Legacy Area



Area Coverage Description: This forest legacy area is comprised of the portion of the Lower San Juan River Basin (140802) that falls within the state of Colorado.

Forest Legacy protection goals for the Lower San Juan FLA:

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**
8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

This forest legacy area contains an estimated 10,000 people and has a population density of nine people per square mile, with a four-year population growth rate of 2.4%. This is the smallest FLA, covering an estimated 1.1% (750 thousand acres) of the state, and containing 1.2% (90 thousand acres) of private forests within the state. The land

ownership within this FLA is 52.6% (400 thousand acres) private, 26.8% (200 thousand acres) BLM, 0% (300 acres) USFS, 0.8% (6 thousand acres) NPS, 0.3% (2 thousand acres) CPW, and 18.8% (150 thousand acres) tribal. Counties included within the Lower San Juan are Dolores, Montezuma, and San Miguel. The major city within the area is Cortez.

The Ute Mountain Ute Indian tribal lands occur in the southwest corner of the FLA. A very small part of the San Juan National Forest occurs within this region; however, it is such a small acreage that it comprises approximately only 0.03% of the area. No state parks are located within the FLA. There are no fourteeners or ski resorts within the Lower San Juan FLA.

Other conservation organizations including but not limited to the Mesa County Land Trust (MCLT) and Colorado Open Lands (COL).

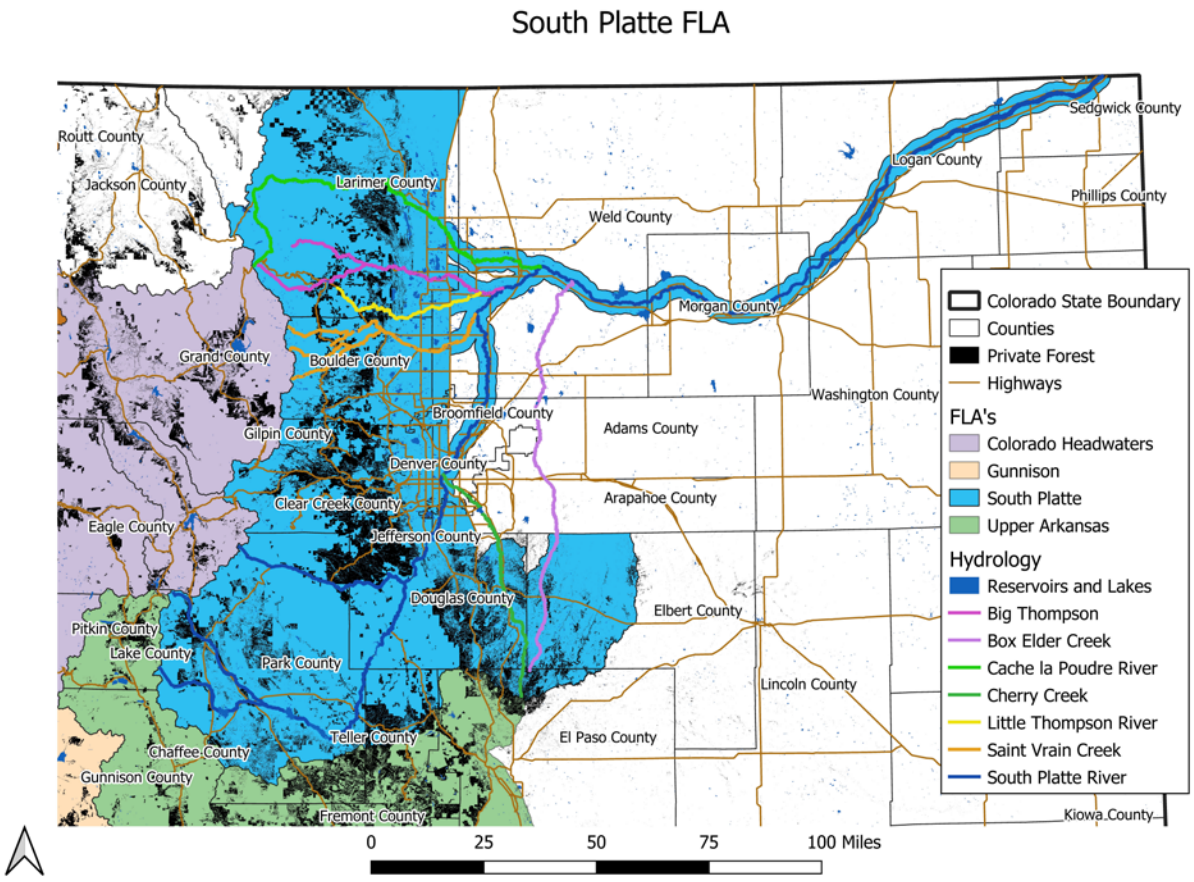
The protection of the forestlands in this FLA have numerous benefits to the public. The area consists mainly of undeveloped stretches of forested lands around these corridors. The protection of the forestlands in this FLA have numerous benefits to the public. This FLA consists of the forestlands to the east of Highway 491. Much of this area consists mainly of open areas, with limited development. Many tourists visit this area for the Canyons of the Ancients National Monument, Hovenweep National Monument, Yucca House National Monument, and Four Corners.

The conservation of the forestlands around these corridors will ensure that the public may continue to enjoy the scenic and open nature of the landscape. Protection of the water resources in the Dolores River watershed is imperative to the public, as it ensures the scenic quality of the landscape.

Protection of the wildlife habitat in this FLA provides benefits to the public, as this FLA has five group one animals that can be found here are: mountain lion, black bear, elk, bald eagle, and mule deer. Eight animals belonging in the second category are: Gunnison sage grouse, southwestern willow flycatcher, American pika, Gunnison's prairie dog, little brown myotis, and Colorado pikeminnow. The group two species with possible occurrences within the FLA are the Western yellow-billed cuckoo and New Mexico jumping mouse.

The vast majority of this FLA falls within the Colorado Plateaus (20), with the other portion within the Southern Rockies (21). The level IV ecoregions included in the Plateaus (20) are Monticello-Cortez uplands and sagebrush valleys (20a), shale deserts and sedimentary basins (20b), semiarid benchlands and canyonlands (20c), and arid canyonlands (20d). The level IV ecoregion within the Rockies is sedimentary mid-elevation forests (21f).

South Platte Forest Legacy Area



Area Coverage Description: This forest legacy area includes a portion of the South Platte River Basin (101900), within Colorado. The boundary of the FLA east of Interstate 25 was formed by using a 2.5-mile buffer along the South Platte, St. Vrain, Cache la Poudre, Little Thompson, and Big Thomson Rivers. Additionally, watersheds (HUC 10s) that encompassed the Black Forest, east of Interstate 25 were included. Because these watersheds extended further than the black forest, the shapes were cut at the north border of Elbert County.

Forest Legacy protection goals for the South Platte FLA:

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**
8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

Of the eight FLAs, the South Platte contains both the largest population and population density, at an estimated 2,000,000 people, and 212 people per square mile, respectively. The estimated four-year population growth rate of the South Platte FLA is 5.7%. This area covers approximately 9% (6 million acres) of Colorado and 13% (900 thousand acres) of the private forests within the state. The land ownership within this FLA is 55.3% (3 million acres) private, 1% (60 thousand acres) BLM, 29.5% (1.8 million acres) USFS, 2.9% (180 thousand acres) NPS, and 1.8% (110 thousand acres) CPW. Counties included within this FLA include Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, El Paso, Elbert, Gilpin, Jefferson, Larimer, Logan, Morgan, Park, Sedgwick, Teller, Washington, and Weld. Major cities within this FLA are Boulder, Denver, Fort Collins, Greeley, Longmont, and Sterling.

The Arapahoe, Pike, Roosevelt, and a small portion of the San Isabel National Forests occur in this region. South Platte contains 15 and the largest number of state parks of the other FLAs. Boyd Lake, Castlewood Canyon, Chatfield, Eldorado Canyon, Eleven Mile, Golden Gate Canyon, Jackson Lake, Lory, Mueller, Roxborough, Spinney Mountain, St. Vrain, State Forest, and Staunton State Parks occur in the South Platte FLA. Ten fourteeners are found in this region, with four of the peaks sharing a boundary with another FLA. Three ski resorts are located in the South Platte FLA, including Loveland ski area. Conserving this FLA will provide benefits to the public, as the values, areas, and Colorado citizens' value the resources mentioned.

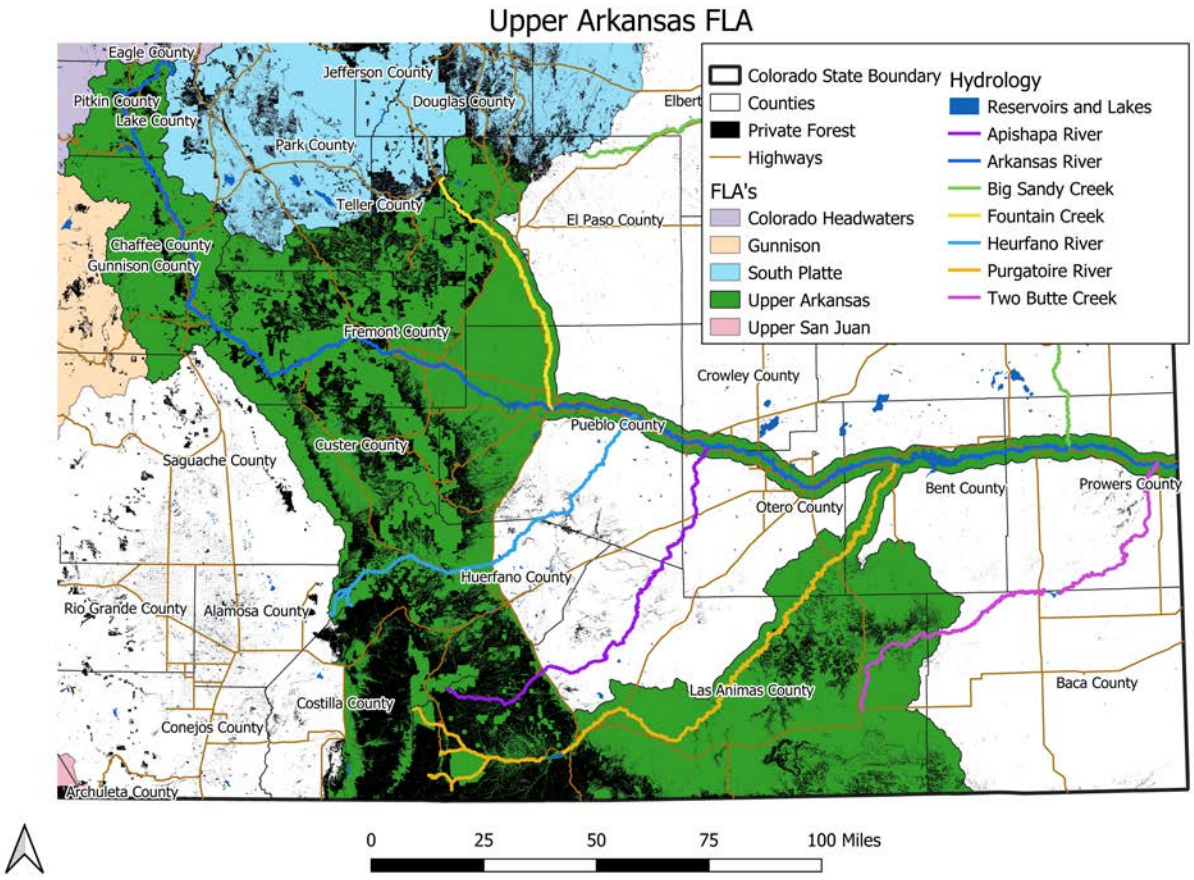
Other conservation organizations including but not limited to the Colorado Cattlemen's Agricultural Land Trust, the Trust for Public Land, the Nature Conservancy, and Ducks Unlimited. Funding for the conservation of this area has come from many funders, including Great Outdoors Colorado (GOCO). Habitat for migrating birds

The protection of the forestlands in this FLA have numerous benefits to the public. This FLA consists of most of the northern Front Range of Colorado, on the west side of I-25. The South Platte River is quite prevalent in this FLA, as it extends to the eastern border of Colorado. Also prevalent Big Thompson and the Cache La Poudre Rivers, and their tributaries extending from the northern Colorado border, through Denver. As evidenced above, the population growth in this area of Colorado in particular is significant. Many of the towns and communities along I-25 in this FLA are sprawling and continue to require water being used for traditional purposes such as ranching and forestry, to being used for domestic uses for a growing population. Protecting the forestlands in this FLA will benefit the public, as it will keep water in use for traditional uses for private landowners, and will also ensure water quality and quantity through forest health on private properties. Dolores River watershed is imperative to the public, as it ensures the scenic quality of the landscape.

Protection of the wildlife habitat in this FLA provides benefits to the public as all eleven of the group one species, the mountain lion, black bear, elk, moose, mountain goat, bald eagle, snow goose, bighorn sheep, pronghorn, mule deer, and white-tailed deer can be found within this FLA. Eight of the group two animals are expected to occur in the region, which includes the boreal toad, south white-tailed ptarmigan, American pika, Gunnison's prairie dog, little brown myotis, lynx, prebles meadow jumping mouse, and greenback cutthroat trout.

The majority of the area falls within the Southern Rockies (21), west of Interstate 25. The rest of the South Platte FLA lies in the High Plains (25) and Southwestern Tablelands (26). The alpine zone (21a), crystalline subalpine forests (21b), crystalline mi-elevation forests (21c), foothill shrublands (21d), sedimentary subalpine forests (21e), sedimentary mid-elevation forests (21f), volcanic subalpine forests (21g), and volcanic mid-elevation forests (21h), and grassland parks (21j), form the portion of the Rockies within this FLA. The Level IV Ecoregions within the plains (25) include the rolling sand plains (25b), moderate relief plains (25c), flat to rolling plains (25d), and the Front Range fans (25l). Pine-oak woodlands (26i) and foothill grasslands (26j) occur within the tablelands (26), and form part of the Black Forest.

Upper Arkansas Legacy Area



Area Coverage Description: Although this FLA is mostly comprised of the Upper Arkansas River Basin (110200), it also contains portions of the Upper Cimarron (110400), Middle Arkansas (110300), Upper Canadian (110800), Upper Rio Grande (130201), and Rio Grande Headwaters (130100) River basins. The east portion of the Upper Arkansas basin was disconnected at Interstate 25. The boundary of the FLA east of Interstate 25 was formed by using a 2.5-mile buffer along the Arkansas River, Purgatoire River, and Fountain Creek, and watersheds (HUC 10s) to include plains riparian forests. Watersheds within the east portion of the Rio Grande Headwaters basin (in Costilla County) were incorporated in the FLA in order to include forests west of the Upper Arkansas basin. Because the selected watershed extended into non-forest land, the shapes were excluded at Colorado 159 and 4th Avenue (in Costilla County).

Forest Legacy protection goals for the Upper Arkansas FLA:

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**

8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

The Upper Arkansas contains approximately 622,000 people and has an approximate population density of 49 people per square mile, with a four-year population growth rate of 5.7%. This area covers approximately 12.1% (8 million acres) of Colorado and 29.1% (2 million acres) of the private forests within the state, being the largest and containing the greatest amount of forest of the FLAs. The land ownership within this area is 67% (5.4 million acres) private, 6.9% (560 thousand acres) BLM, 17% (1.4 million acres) USFS, 0% (900 acres) NPS, and 0.9% (70 thousand acres) CPW. Counties that occur in the Upper Arkansas include Baca, Bent, Chaffee, Costilla, Crowley, Custer, El Paso, Fremont, Huerfano, Lake, Las Animas, Otero, Park, Prowers, Pueblo, Saguache, and Teller. The major cities found in this FLA are Canon City, Colorado Springs, La Junta, Pueblo, and Salida.

The Pike and San Isabel National Forests, and the Comanche National Grassland occur in this region. The Upper Arkansas contains six State Parks: Cheyenne Mountain, John Martin Reservoir, lake Pueblo, Lathrop, Mueller, and Trinidad Lake. With the highest number of any of the FLA's, this region contains 24 fourteeners, two of which share a boundary with another FLA. The five tallest fourteeners; Mount Elbert, Mount Massive, Mount Harvard, Blanca Peak, and La Plata Peak; are located in this region. Monarch Mountain is the sole ski resort located within the Upper Arkansas FLA. Conserving this FLA will provide benefits to the public, as the values, areas, and Colorado's citizens value resources mentioned.

Other conservation organizations including but not limited to the Colorado Cattlemen's Agricultural Land Trust (CCALT), the Trust for Public Land (TPL), the Nature Conservancy (TNC), Colorado Parks and Wildlife (CPW), and the Palmer Land Trust. Funders for this area include but are not limited to TNC and Great Outdoors Colorado (GOCO).

The conservation of the forestlands in this FLA have numerous benefits to the public. This FLA consists of most of the southern Front Range of Colorado, on the west side of I-25 as well large swaths of private forested lands on the west side of I-25, on the Colorado/New Mexico border, and the riparian corridor around the Purgatoire River that extends to the eastern Colorado border. The Arkansas, Apishipa, and Purgitoire Rivers are quite prevalent in this FLA. As evidenced above, the population growth in this area of Colorado in particular is significant. Many of the towns and communities along I-25 in this FLA, including Colorado Springs, are sprawling and continue to require water being used for traditional purposes such as ranching and forestry, to being used for domestic uses for a growing population. Protecting the forestlands in this FLA will benefit the public, as it will keep water in use for traditional uses for private landowners, and will also ensure water quality and quantity through forest health on private properties. Maintaining the scenic quality of the open forested landscapes in this FLA is of benefit to the public driving through the 1-25 south corridor and those recreationalists who utilize this area.

Protection of the wildlife habitat in this FLA provides benefits to the public as all eleven of the group one species, the mountain lion, black bear, elk, moose, mountain goat, bald eagle, snow goose, bighorn sheep, pronghorn, mule deer, and white-tailed deer can be found within this FLA. Fifteen of the group two animals, and the highest number of all the FLAs, are expected to occur in the region, which includes the boreal toad, lesser prairie chicken, south white-tailed ptarmigan, American pica, black-footed ferret, Gunnison's prairie dog, little brown myotis, lynx, New Mexico jumping mouse, Preble's meadow jumping mouse, Colorado checkered whiptail, Mississauga, Arkansas darter, greenback cutthroat trout, and Rio Grande cutthroat trout.

With the greatest environmental diversity of the FLAs, the Upper Arkansas encompasses four Level III Ecoregions:

Southern Rockies (21), Arizona/New Mexico Plateau (22), High Plains (25), and Southwestern Tablelands (26). The level IV ecoregions within the region include: alpine zone (21a), crystalline subalpine forests (21b), crystalline mi-elevation forests (21c), foothill shrublands (21d), sedimentary subalpine forests (21e), sedimentary mid-elevation forests (21f), volcanic subalpine forests (21g), and volcanic mid-elevation forests (21h), sagebrush parks (21i), grassland parks (21j), San Luis shrublands and hills (22a), San Luis alluvial flats and wetlands (22b), rolling sand plains (25b), flat to rolling plains (25d), piedmont plains and tablelands (26e), mesa de Maya/Black mesa (26f), Purgatoire hills and canyons (26g), pinyon-juniper woodlands and savannas (26h), pine-oak woodlands (26i) and foothill grasslands (26j), and sand sheets (26k).

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Upper Colorado-Dolores Forest Legacy Area

Area Coverage Description: The part of the Upper Colorado-Dolores river basin (140300) that falls within the state of Colorado comprises this FLA.

Forest Legacy protection goals for the Upper Colorado-Dolores FLA:

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**
8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

There is an estimated population of 5,400 and a population density of approximately one person per square mile within the Upper Colorado-Dolores, with a four-year population growth rate of 3.5%. This area covers approximately 4.2% (2.8 million acres) of the state and contains approximately 5.9% (400 thousand acres) of private forests. The land ownership within this FLA is 24.8% (700 thousand acres) private, 36.8% (1 million acres) BLM, 36.1% (1 million acres) USFS, 0% NPS, and 1.1% (30 thousand acres) CPW. Counties within the Upper Colorado-Dolores include Dolores, Mesa, Montezuma, Montrose, and San Migel. The major city within this area is Telluride.

The Grand Mesa, Manti-La Sal, San Juan, and Uncompahgre National Forests occur in this region. One State Park, Lone Mesa, is located in the Upper Colorado-Dolores FLA. Three fourteeners are found in this area. Telluride ski resort is located in this region. The conservation of this property provides benefits to the public who recreate in these areas.

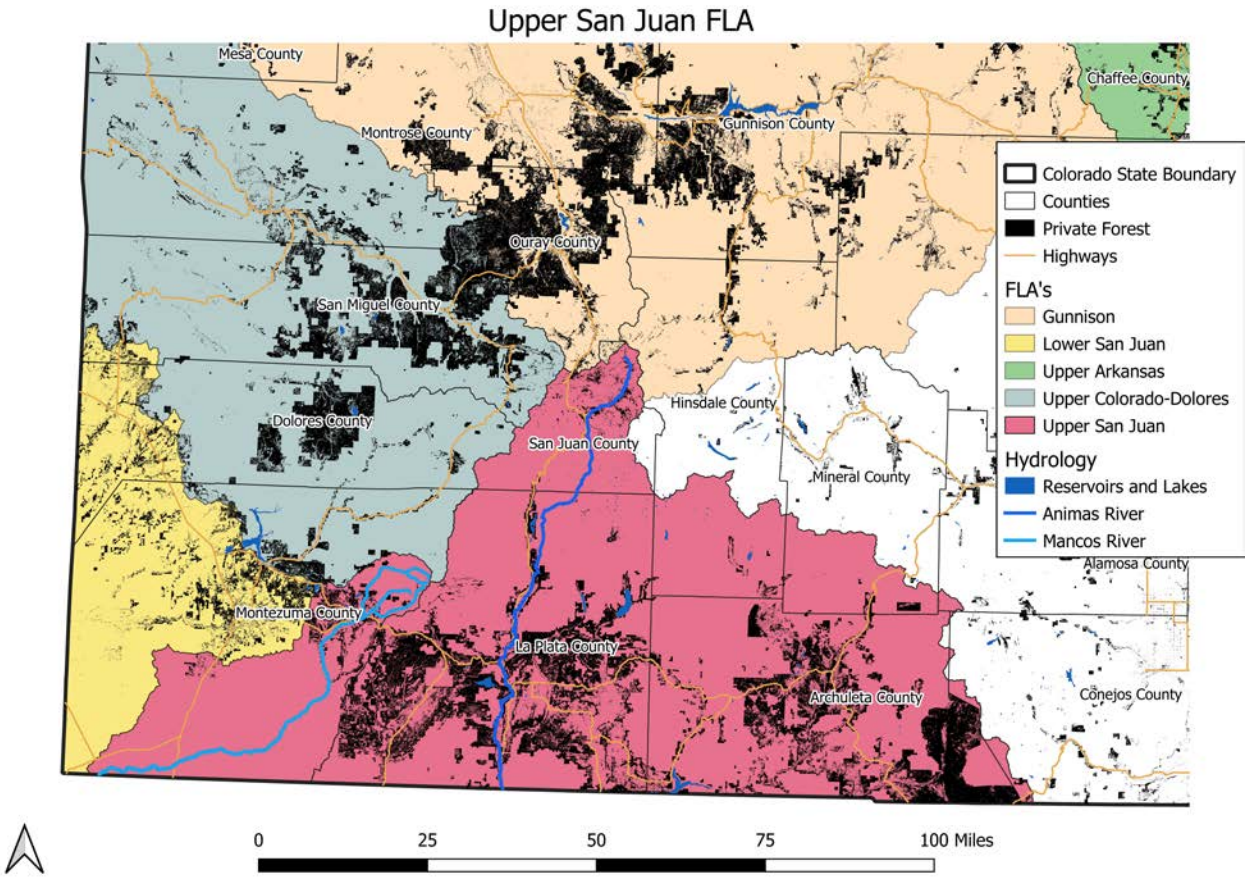
This FLA consists of the forestlands to the west of Highways 50 and 550, and includes many highly traveled areas for tourism and recreation. The Uncompaghre Plateau is a notable feature in this area. The Dolores River runs through the FLA, and the forestlands directly around the River ensure water quality and quantity for timber and agricultural operations in the area. The Gunnison River runs through the northern part of this FLA.

Conservation organizations including but not limited to the the Mesa Land Trust. Funding for this area has come. Funding for the conservation of this area has come from many funders, including Great Outdoors Colorado (GOCO).

Protecting the wildlife habitat in this FLA provides benefits to the public. Colorado's classic species that are found in this region include mountain lion, black bear, elk, mountain goat, bald eagle, bighorn sheep, pronghorn, and mule deer. Seven animals, and the lowest number of animals in group two, are within this FLA. These species include the Gunnison sage grouse, south white-tailed ptarmigan, southwestern willow flycatcher, American pica, Gunnison's prairie dog, little brown myotis, and lynx.

The Colorado Plateaus (20) and the Southern Rockies (21) comprise this FLA. Monticello-Cortez uplands and sagebrush valleys (20a), shale deserts and sedimentary basins (20b), semiarid benchlands and canyonlands (20c), and arid canyonlands (20d) lie within the Plateaus (20). The level IV ecoregions within the Southern Rockies (21) are alpine zone (21a), sedimentary subalpine forests (21e), and sedimentary mid-elevation forests (21f).

Upper San Juan Forest Legacy Area



Area Coverage Description: This FLA includes the Upper San Juan River Basin (140801) within the state of Colorado. Additionally, the southeast portion of the FLA incorporates the Upper Rio Grande (130201), to encompass private forests on the eastern edge of Archuleta County.

Forest Legacy protection goals for the Upper San Juan FLA:

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**
8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

The approximate population within this forest legacy area is 31,000 and the population density is seven people per square mile, with a four-year population growth rate of 3.6%. The Upper San Juan FLA covers an estimated 4.5% (3 million acres) of the state and 7.3% (500 thousand acres) of private forests. The land ownership within this region is 28.1% (850 thousand acres) private, 3.2% (95 thousand acres) BLM, 45% (1.4 million acres) USFS, 1.6% (50 thousand acres) NPS, 0.4% (10 thousand acres) CPW, and 20.9% (600 thousand acres) tribal. Archuleta, Hindsdale, La Plata, Mineral, Montezuma, and San Juan counties are located in the region. Durango is the major city occurring within the area.

The San Juan and Rio Grande National Forests can be found in this FLA. The Ute Mountain Ute Indian Tribal Lands and the Southern Ute Indian Tribal Lands occur in the southwest and southeast portions of the region, respectively. The Mancos and Navajo State Parks are located in the Upper San Juan. There are four fourteeners are found in this area. Four ski resorts are located in this region, including Silverton mountain ski area. Conserving this FLA will provide benefits to the public, as the values, areas, and Colorado's citizens value resources mentioned.

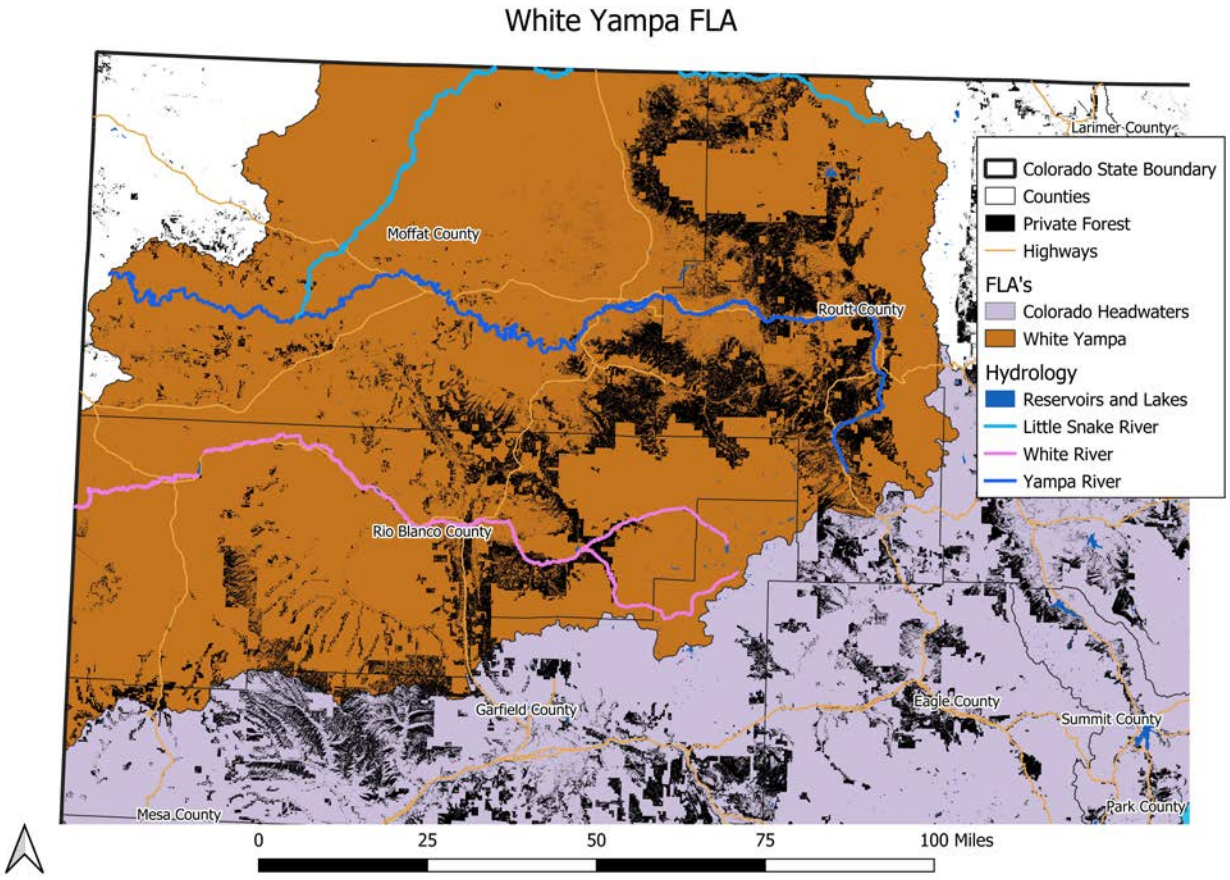
Conservation of this FLA provides benefits to the public. This FLA consists of the forestlands to the the east of Durango, up to Silverton, and east past the town of Pagosa Springs. The Navajo Reservoir and the San Juan River, and its many tributaries are notable features of the landscape that are largely undeveloped. Recreation and tourism is important to the economy of this area, notably around Pagosa Springs and Silverton.

Conservation organizations including but not limited the Colorado Cattlemen's Agricultural Land Trust, Colorado Open Lands, The Conservation Fund, and the Trust for Public Land has been involved in closing conservation transactions in this area.

Conservation of the wildlife habitat in this FLA provide benefits to the public. Group one animals with ranges in this FLA include mountain lion, black bear, elk, moose, mountain goat, bald eagle, bighorn sheep, and mule deer. Nine of the group two species inhabit this region, which consists of south white-tailed ptarmigan, southwestern willow flycatcher, western yellow-billed cuckoo possible occurrence, American pica, Gunnison's prairie dog, little brown myotis, lynx, New Mexico jumping mouse, and Colorado pikeminnow.

The Colorado Plateaus (20) and Southern Rockies (21) Level III Ecoregions are identified within the Upper San Juan. Monticello-Cortez uplands and sagebrush valleys (20a), shale deserts and sedimentary basins (20b), semiarid benchlands and canyonlands (20c), and arid canyonlands (20d) are within the plateaus (20) of the area. The Level IV Ecoregions within the Southern Rockies include the alpine zone (21a), crystalline subalpine forests (21b), crystalline mi-elevation forests (21c), foothill shrublands (21d), sedimentary subalpine forests (21e), sedimentary mid-elevation forests (21f), and volcanic subalpine forests (21g).

White Yampa Forest Legacy Area



Area Coverage Description: This forest legacy area includes the White Yampa River Basin (140500), within the Colorado State borders.

Forest Legacy protection goals for the White Yampa FLA:

1. **Protection of water quality and production amounts.**
2. **Protection of significant wildlife habitat.**
3. **Reduction of forested land fragmentation because of development pressures, subdivision, and increasing housing density.**
4. **Maintaining continuity of forested lands adjacent to protected lands.**
5. **Protection of significant riparian communities.**
6. **Protection of unique ecological areas.**
7. **Reduction of risk and occurrence of wildfires especially in developed areas or ecologically sensitive areas.**
8. **Protection of private property owner's rights.**
9. **Protection of economically significant timber forest products through positive forest stewardship programs.**
10. **Protection of lifestyle for property owners.**

With an estimated population of 28,000, a population density of 3 people per square mile, and a four-year population growth rate of 3.5%, this forest legacy area makes up approximately 9.3% (6.2 million acres) of the state and contains approximately 12% (850 thousand acres) of Colorado's private forests. The land ownership within this FLA is 37.5% (2.3 million acres) private, 38.3% (2.4 million acres) BLM, 17.9% (1.1 million acres) USFS, 1.7% (10 thousand acres) NPS, and 1% (64 thousand acres) CPW. The counties within the White-Yampa include Garfield, Moffat, Rio Blanco, and Routt. Major cities found within this area are Craig and Steamboat Springs.

The Routt and White River National Forests occur in this region. The Elkhead Reservoir, Pearl Lake, Stagecoach, Steamboat Lake, and Yampa River State Parks are within the forest legacy area. There are no fourteeners located in this FLA. Two ski resorts, including Steamboat, are located in the White-Yampa region. Conserving this FLA will provide benefits to the public, as the values, areas, and Colorado's citizens value resources mentioned.

Conservation of this FLA provides benefits to the public. The White River, the Yampa River, and the Little Snake River are notable features of the landscape, and are currently that largely undeveloped in this rural FLA. The Roan Plateau is another notable feature of this FLA. Recreation and tourism is important to the economy of this area, notably around Steamboat Springs, Meeker, and Craig. Portions of this FLA are visible to the public from I-70 and other major regional highways and roads, and conservation of the area ensures the scenic nature of the area. Conservation organizations including but not limited the Colorado Cattlemen's Agricultural Land Trust, Colorado Open Lands, The Nature Conservancy, the Yampa Valley Land Trust, Colorado Parks and Wildlife, Natural Resource Conservation Service, Great Outdoors Colorado.

Conservation of the wildlife habitat in this FLA provide benefits to the public. Within the group one, the mountain lion, black bear, elk, moose, bald eagle, bighorn sheep, pronghorn, mule deer, and white-tailed deer can be found within this FLA. Nine of the group two animals are expected to occur in the region, which includes the boreal toad, greater sage grouse, south white-tailed ptarmigan, western yellow-billed cuckoo, American pika, Gunnison's prairie dog, little brown myotis, lynx, Colorado pike minnow, and humpback chub.

Included within this FLA is the Wyoming Basin (18), Colorado Plateaus (20) Southern Rockies (21). The Level IV Ecoregions within the Wyoming Basin include rolling sagebrush steppe (18a), foothill shrublands and low mountains (18d), and salt desert shrub basins (18e). The shale deserts and sedimentary basins (20b), semiarid benchlands and canyonlands (20c), escarpments (20e), and Uinta basin floor (20f) are found within the plateaus (20). The Level IV Ecoregions included in that part of the Southern Rockies (21) are the alpine zone (21a), crystalline subalpine forests (21b), crystalline mi-elevation forests (21c), foothill shrublands (21d), sedimentary subalpine forests (21e), sedimentary mid-elevation forests (21f), and volcanic subalpine forests (21g).

SECTION 4: FOREST LEGACY PROJECT SELECTION CRITERIA AND PROCEDURE

In 2001, a list of 26 criteria were identified in which prospective FLP projects will be ranked. A subcommittee of the SFSCC will review project proposals. Each proposal will receive a qualitative ranking based on the extent to which they address the criteria. Criteria marked with a "*" are required and must be clearly addressed in the project proposal to establish eligibility. The remaining criteria will be evaluated as adding value to the proposal and used to select among multiple competing projects. No rank significance is implied by the order in which the criteria are listed.

1. ***FLA Area Inclusion:** The proposed property boundary must lie, at least in part, within a defined Forest Legacy Area.
2. ***Willing Landowner:** Written expression of interest must be received from the landowner.
3. ***Easement Condition:** Conservation easement terms must be clearly consistent with FLP guidelines.
4. ***Plan Quality:** The land management plan must encourage active forest stewardship through compliance with Forest Stewardship Program plan guidelines.
5. ***Money Leverage:** At least 25% of the project costs must be secured from non-federal cash or in-kind sources
6. ***Threat of Conversion to Non-Forest Use:**
7. ***Readiness:** Proposal must clearly describe the current status of project development and the time line for transaction completion.
8. ***Value of Project:** Proposal must clearly describe the cost-benefit relationships of the project.
9. **Size:** Size of the parcel will be given a value in ranking of the proposals submitted. Larger parcels will be given a higher value than smaller parcels. Smaller parcels may be given a high value during ranking based upon the other criteria.
10. **Forest Type:** Forest types will be ranked using a numbered grading system based upon forest types in Colorado and their economic and ecological values.
11. **Forest Condition:** Current condition of the forested area and its use will be graded on a numbering system.
12. **Continuity with Other Protected Lands:** Proposed lands which are contiguous or adjacent to other public and protected lands will be given a higher point value than those that do not border public or protected lands.
13. **Wildlife Habitat:** Proposed lands which demonstrate important habitat to wildlife, or demonstrate a high diversity of wildlife species on the land will be given a higher ranking to those lands which do not contain significant wildlife habitat.
14. **Urgency:** Submitted projects will be given consideration dependant on the urgency of the project need, i.e. projects with an immediate danger of development or other conversion to non-forest uses will be given a higher ranking than projects with a lesser threat of conversion.
15. **Partnerships:** Partnerships with other management agencies, either local or state/federal, or partnerships with other conservation organizations will give proposed projects a higher ranking than those that are relying on the FLP solely.
16. **Community Support:** Projects which can demonstrate support and/or acceptance from surrounding landowners or communities will be given a higher ranking than projects which have little or no acceptance from local community groups.
17. **Scenic Resources:** Proposed properties which have a positive aesthetic appearance or those properties

which would preserve an overall positive aesthetic appearance to the surrounding areas will be given higher ranking than areas that do not, or would not promote a positive aesthetic appearance.

18. **Ecological/Environmental Significance and Resources:** Projects which can demonstrate the occurrence of significant ecologic or environmental resources will be given a higher ranking than projects which do not have significant quantities or qualities of ecologic or environmental resources.

19. **Economic Significance:** Project areas which can demonstrate a significant economic impact through traditional forest use will be given a higher consideration than projects which will not provide economic returns from forest products or traditional forest uses. innovative non-traditional forest uses that are demonstrably resource compatible, including projects that support the continued ecological health of the forest.

20. **Wildfire Hazard Reduction:** As Wildland Fire/Urban Interface concerns are an increasingly important issue in Colorado, projects located within the identified "Redzone" for Colorado, or projects which demonstrate a potential reduction of wildfire occurrences, or projects which provide access for wildfire mitigation and control will be given a higher consideration and ranking than projects which do not support wildfire control.

21. **Aquatic Resources:** Submitted project plans which show a demonstrated effort to protect or enhance aquatic resources such as lakes, rivers, wetland areas, and streams, will be given a higher ranking and consideration than projects which do not.

22. **Historic Land Use:** Lands which have demonstrated a historic and ongoing traditional forestry land use, and which ensure that such uses will continue, will be given a higher consideration in the ranking procedure than lands which have not historically demonstrated traditional forest uses.

23. **Public Access:** Project areas which allow public access for recreational, educational, or other use of the subject property, or use of adjacent public lands will be ranked higher than plans which do not allow for access.

24. **Water Quality Protection:** Submitted project plans which show a demonstrated effort to protect or enhance water quality resources in lakes, rivers, and streams, will be given a higher ranking and consideration than projects which do not.

25. **Cultural Resources:** Project areas which contain significant cultural resources, such as historic sites or archeological resources will be given a higher consideration than project areas which do not contain these resources.

26. **Other Public Values:** Other resources or assets contained within a proposed project area, or proposed project plan, will give additional ranking points to the project at the discretion of the SFSCC members.

The SFSCC will be the ongoing advisory group for establishing priorities in project selection. Additionally, the CSFS will be entirely responsible for enrollment in the FLP and administration of land or easement procurement. At the discretion of the CSFS and the State Forester, sub-contractors, land trust organizations, or other state or federal agencies may be used for land or easement procurement.

PROJECT SELECTION PROCESS

Project proposals will be identified through a periodic request process managed by the Colorado State Forest Service Forest Legacy Program Manager. A subcommittee of the State Forest Stewardship Coordinating Committee will support this process. The basic components will include 1) public announcement, 2) sub-committee ranking according to stated criteria, 3) recommendation/approval of ranked project list to State Forester, and 4) submission of list to national program manager for consideration.

SECTION 5: FOREST LAND CONSERVATION AND LAND TRUSTS

Existing Land Trusts Programs

National, Regional, and Local land conservation organizations play a vital role in the protection of private lands in Colorado. These organizations will be important partners in the success of Forest Legacy. Colorado is fortunate to have an extensive network of land trusts across the state.

Certified Conservation Easement Holders and Land Trust Alliance Members Operating in Colorado

Access Fund
Adams County Parks & Open Space
American Farmland Trust
Appalachian Trail Conservancy
Aspen Valley Land Trust
Black Canyon Regional Land Trust
Boulder County Parks and Open Space
Central Colorado Conservancy (Formerly Land Trust of the Upper Arkansas)
City of Fort Collins Natural Areas Department
City of Loveland Parks & Recreation Department
Clear Creek Land Conservancy
Colorado Cattlemen's Agricultural Land Trust
Colorado Headwaters Land Trust
Colorado Open Lands
Colorado Parks and Wildlife
Colorado West Land Trust
Crested Butte Land Trust
Douglas Land Conservancy
Ducks Unlimited, Inc. (Wetlands America Trust)
Eagle Valley Land Trust
El Paso County Environmental Division
Estes Valley Land Trust
Garden Conservancy
Jefferson County Open Space
La Plata Open Space Conservancy
Lake Superior Watershed Conservancy
Larimer County Natural Resources
Lower Arkansas Valley Water Conservancy District
Montezuma Land Conservancy
Mountain Area Land Trust
National Park Trust
Orient Land Trust
Palmer Land Trust
Pitkin County Open Space & Trails
Rio Grande Headwaters Land Trust
Roaring Fork Conservancy
Rocky Mountain Elk Foundation
San Isabel Land Protection Trust
San Miguel Conservation Foundation
South Metro Land Conservancy
Southern Plains Land Trust
The Conservation Fund
The Humane Society Wildlife Land Trust
The Nature Conservancy
The Trust for Public Land
Wilderness Land Trust

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Members of the State Forest Stewardship Coordinating Committee and Stakeholders that participated in the ranking of criteria and/or submittal of data for consideration of use in this report

Colorado State Forest Service
Colorado Cattlemen's Agricultural Land Trust
Colorado Open Lands
USDA Forest Service, Region 2
The Nature Conservancy
The Conservation Fund
Colorado Parks and Wildlife

Appendix A

PREPARED FOR THE CITIZENS OF COLORADO AND ITS VISITORS
BY COLORADO PARKS AND WILDLIFE

State Wildlife Action Plan

A STRATEGY FOR CONSERVING WILDLIFE IN COLORADO

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Chapter 2: Species of Greatest Conservation Need

This chapter presents updated information on wildlife species that are in need of conservation attention in Colorado, with a focus on native species. Colorado's first SWAP, completed in 2006, identified 210 Species of Greatest Conservation Need (SGCN). Those species were grouped into Tier 1 and Tier 2 categories, reflecting a relative degree of conservation priority. Conservation attention is still warranted for the species on the original SGCN list. However, the utility of such a long Tier 1 species list for prioritizing conservation work over the intervening years has been somewhat confounding. Thus, a primary focus of the SGCN component in this SWAP revision has been to improve the SWAP's usefulness for conservation prioritization, while continuing to recognize the broader interests and capacity of Colorado's conservation community overall. To that end, we have re-defined how we are characterizing Tier 1 and Tier 2 SGCN, and modified the criteria used to determine Tier 1 and Tier 2 status.

Also, in the interest of improving the SWAP's applicability across Colorado's conservation community, we have added a rare plant component to the plan, and retained and expanded the insect component of the SGCN list. Though CPW does not have statutory authority over plant and insect species, we recognize the crucial role these taxa play in the ecosystems and wildlife communities of the State. SWAP elements for plants and non-mollusk invertebrates are presented in Appendices A and B, respectively.

Revised Interpretation of Tier 1 and Tier 2

Although the 2015 revision of Colorado's SWAP retains the original two-tier SGCN structure, **we have re-interpreted the Tier 1 list to represent the species which are truly of highest conservation priority in the state,** and to which CPW will likely focus resources over the life of this plan. Though the agency will certainly maintain flexibility in responding to evolving conservation needs and scientific knowledge, our best current estimate of how our work will probably be focused over the coming decade is reflected in the new Tier 1 list of 55 species. All other previously Tier 1 SGCN have been moved to the Tier 2 list, with one exception. Recent genetic studies indicate that the subspecies designation for northern pocket gopher (*Thomomys talpoides macrotis*) is not valid. Thus, this subspecies has been removed from the SGCN list. Tier 2 species remain important in light of forestalling population trends or habitat conditions that may lead to a threatened or endangered listing status, but the urgency of such action has been judged to be less. When planning future conservation work, these tier rankings should be considered along with other important factors, including potential funding and partnership

opportunities, and responsiveness to "one-time-only" opportunities. It is our hope and expectation that our conservation partners and stakeholders will work together toward conservation of all SGCN, including those on the Tier 2 list. As an agency, we remain committed to improving the status of all SGCN, and welcome collaborative efforts to do so.

Revised SGCN Criteria

For this iteration of our SWAP, we have expanded the criteria that were used to develop the original SGCN list[3], which were primarily focused on species' conservation status. Those criteria were retained and augmented by further consideration of the species' role in Colorado wildlife communities, as well as our ability to make a measurable contribution to conservation of species populations, according to the criteria listed in Table 2. In distinguishing Tier 1 and Tier 2 species in the original SWAP, we developed an additional set of sub-criteria that placed more emphasis on economic considerations[4]. Due to the revised interpretation of Tier 1 status, some of these criteria were deemed to be of less importance in the revised SWAP. The remaining criteria have been absorbed into the updated criteria in Table 2.

[3] Listed as federal candidate, threatened or endangered species under the ESA; Classified as state endangered or threatened species, or species of special concern; Global ranking scores of G1, G2 or G3 by the Colorado Natural Heritage Program; Identified as conservation priorities through a range-wide status assessment or assessment of large taxonomic divisions; Assigned state ranking scores of S1 or S2 AND a global ranking score of G4 by the Colorado Natural Heritage Program. Species were removed from the list if they: occur peripherally in Colorado but are common elsewhere AND for which management actions in Colorado are likely to have no population-level effect; are very common but were placed on lists due to economic considerations (e.g., Mallard).

[4] Knowledge of management techniques needed for recovery; Impact on federal recovery; Cost of recovery or management action implementation; Direct cost of recovery action to others; Public appeal or interest in the species; Economic impacts of listing (cost incurred by listing); Importance to state biological diversity; Multiple species benefits from management of target species.

Table 2. Criteria used to revise the list of Tier 1 Species of Greatest Conservation Need.

1) Federal and State Status
a) Listed or proposed as endangered at federal or state level
b) Listed or proposed as threatened at federal or state level
c) Other indication of special concern at federal or state level
2) Colorado's contribution to the species overall conservation (portion of overall range that occurs in Colorado)
a) The health of the population in Colorado compared to other portions of its range (better = higher)
b) Population status and level of conservation activity in surrounding states and other portions of the species range
c) Level of conservation activity in Colorado relative to its status in the state
3) Urgency of conservation action:
a) New threats to the species
b) Lack of Scientific Knowledge
c) Increases in severity of existing threats or new data that show a significant, persistent decline in population status
d) Likelihood and immediacy of potential ESA listing
e) Funding or partnership opportunities that are time limited
4) Ability to Implement Effective Conservation Actions:
a) Few regulatory issues present to impede conservation success
b) Limitations in mitigating population and/or habitat threats are minimal (i.e., conservation success is highly likely)
c) Cost to implement effective conservation
d) Socio-political factors (general willingness to support conservation of the species)
5) Ecological Value of the species:
a) Species is a good indicator to the overall health of the habitat it occupies
b) Keystone species – plays a significant role in defining the habitat in which it lives
c) Umbrella species – protecting these species indirectly protects the many other species that make up the ecological community used by the species

Updated SGCN List

The 2015 SGCN list of vertebrate animals and mollusks– the groups for which CPW has statutory authority – contains 159 species (Table 3). Fifty-five species have been identified as Tier 1 SGCN, including 2 amphibians, 13 birds, 25 fish, 13 mammals, and 2 reptiles (Table 3). Of these, all were on the Tier 1 SGCN list in 2006 with the following exceptions: White-tailed ptarmigan[5] and wolverine were previously Tier 2; plains topminnow, little brown bat, New Mexico meadow jumping mouse, and American pika were not SGCN in 2006. Conservation opportunity, Colorado's contribution to conservation, and changes in conservation status are all partially explanatory in these changes.

[5] The 2006 SWAP listed white-tailed ptarmigan as a SGCN at the species level. This 2015 SWAP lists the subspecies Southern white-tailed ptarmigan, based on the USFWS recognition of the Colorado population of white-tailed ptarmigan as a separate subspecies.

The revised Tier 2 SGCN list of vertebrates and mollusks contains 104 species, including 8 amphibians, 48 birds, 2 fish, 23 mammals, 14 reptiles, and 9 mollusks. Of the Tier 2 species, 10 vertebrates and one mollusk were not identified as SGCN in 2006. The pygmy rabbit was not a SGCN in 2006 because at that time the species had not been reported in Colorado. Recent evidence suggests that this species may be present in northwestern Colorado. The following species were not SGCN in 2006, but have been added to the 2015 Tier 2 list due to designation as a Sensitive Species by the Bureau of Land Management and/or the U.S. Forest Service: Great Basin spadefoot, black tern, grasshopper sparrow, Rocky Mountain capshell, American marten, big free-tailed bat, hoary bat, pygmy shrew, desert spiny lizard, and milksnake. Thirty bird species have been removed from the SGCN list. This change is not a result of change in species status, but rather is due to the revisions of the criteria used to define SGCN.

There are four species on the SGCN list that no longer occur as wild populations in Colorado: bison, gray wolf, grizzly bear, and wolverine. These species were historically part of Colorado's native animal community, and would meet the criteria for SGCN if they were to re-colonize or be re-introduced to the state during the time period covered by this plan. There are no plans to re-introduce wolves or grizzly bears to the state, but it is possible that wolverine and/or genetically pure, wild bison could be re-introduced if social and political concerns can be satisfactorily addressed and such efforts are biologically justified.

Status and Trend

The status of each vertebrate and mollusk SGCN is summarized in Table 3. The lists generated by the U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, State of Colorado, Colorado Natural Heritage Program, and NatureServe all use species status in some form to develop their respective lists. We did not develop a new metric that specifically evaluated species status within Colorado, but rather used the lists generated by these other organizations to inform our evaluation of species status.

A species' population trend is also used by other organizations in the development of their lists, but we do consider it as a separate factor here (Table 3, Declining Trend column). Both data from studies as well as best professional judgments were used to determine declining trend. Data were found in recovery plans, status assessments, and both published and unpublished reports. For landbirds we relied heavily upon the Partners in Flight Species Assessment Database (PIF Science Committee 2012) to evaluate trends on a continental scale.

Table 3. Vertebrate and Mollusk Species of Greatest Conservation Need.

Species are grouped by Tier and taxonomic group, and then sorted alphabetically by common name. Legend: Federal Listing: LE – listed Endangered; LT – listed Threatened; LT* - listed Threatened status applies to Distinct Population Segment only; C – Candidate; P – Petitioned; N - Not Warranted. State Listing: SE – state endangered; ST – state threatened; SC – Special Concern. Agency Sensitive: BLM – Bureau of Land Management; USFS – U.S. Forest Service; USFWS - U.S. Fish and Wildlife Service Birds of Conservation Concern for Bird Conservation Regions 16 and 18. NatureServe Global/State Status: 1 – critically imperiled; 2 – imperiled; 3 – vulnerable; 4 – apparently secure, but with cause for long-term concern; 5 – demonstrably secure; T – subspecies status; Q – taxonomic uncertainty; B – breeding; N – non-breeding; NR – not ranked; X - extirpated. Species mark with a double-asterisk (**) were added as habitat indicator species.

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
AMPHIBIANS															
Anaxyrus boreas boreas	Boreal toad (Southern Rocky Mountain population)	Tier 1	P	SE	x	x			x	x		x	G4T1	S1	
Lithobates pipiens	Northern leopard frog	Tier 1		SC	x	x						x	G5	S3	?
BIRDS															
Leucosticte australis	Brown-capped rosy-finch	Tier 1					x	x				x	G4	S3B,S4N	
Athene cunicularia	Burrowing owl	Tier 1		ST	x	x	x					x	G4	S4B	
Tympanuchus phasianellus columbianus	Columbian sharp-tailed grouse	Tier 1		SC	x	x				x	x	x	G4T3	S2	
Aquila chrysaetos	Golden eagle	Tier 1					x			x		x	G5	S3S4B, S4N	
Centrocercus urophasianus	Greater sage-grouse	Tier 1	C	SC	x	x		x		x	x	x	G3G4	S4	
Grus canadensis tabida	Greater sandhill crane	Tier 1		SC									G5T4	S2B,S4N	x
Centrocercus minimus	Gunnison sage-grouse	Tier 1	LT	SC		x	x	x	x	x	x	x	G1	S1	
Tympanuchus pallidicinctus	Lesser prairie-chicken	Tier 1	LT	ST		x	x	x			x	x	G3	S2	

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
Charadrius montanus	Mountain plover	Tier 1		SC	x	x	x						G3	S2B	
Tympanuchus phasianellus jamesii	Plains sharp-tailed grouse	Tier 1		SE									G4T4	S1	
Lagopus leucura altipetens	Southern white-tailed ptarmigan	Tier 1	P		x							x	G5	S4	
Empidonax traillii extimus	Southwestern willow flycatcher	Tier 1	LE	SE			x						G5T1T2	SNA	
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	Tier 1	LT*	SC	x	x	x			x			G5T3Q	S1B	
FISH															
Etheostoma cragini	Arkansas darter	Tier 1	C	ST		x							G3G4	S2	
Catostomus discobolus	Bluehead sucker	Tier 1			x	x			x	x		x	G4	S4	
Gila elegans	Bonytail chub	Tier 1	LE	SE					x	x			G1	SX	
Hybognathus hankinsoni	Brassy minnow	Tier 1		ST								x	G5	S3	
Ptychocheilus lucius	Colorado pikeminnow	Tier 1	LE	ST					x	x		x	G1	S1	x
Oncorhynchus clarkii pleuriticus	Colorado River cutthroat trout	Tier 1		SC	x	x						x	G4T3	S3	
Luxilus cornutus	Common shiner	Tier 1		ST									G5	S2	
Catostomus latipinnis	Flannelmouth sucker	Tier 1			x	x			x	x		x	G3G4	S3	
Platygobio gracilus	Flathead chub	Tier 1		SC	x								G5	S3	
Oncorhynchus clarkii stomias	Greenback cutthroat trout	Tier 1	LT	ST					x			x	G4T2T3	S2	
Gila cypha	Humpback chub	Tier 1	LE	ST						x			G1	S1	x
Catostomus playtrhynchus	Mountain sucker	Tier 1		SC	x	x							G5	S2	
Phoxinus eos	Northern redbelly dace	Tier 1		SE	x						x		G5	S1	
Lepomis humilis	Orangespotted sunfish	Tier 1									x		G5	S5	x

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
Etheostoma spectabile	Orangethroat darter	Tier 1		SC									G5	S3	x
Hybognathus placitus	Plains minnow	Tier 1		SE	x							x	G4	SH	
Fundulus sciadicus	Plains topminnow	Tier 1			x								G4	S4	
Xyrauchen texanus	Razorback sucker	Tier 1	LE	SE					x	x		x	G1	S1	
Gila Pandora	Rio Grande chub	Tier 1		SC	x	x							G3	S1	
Oncorhynchus clarkii virginalis	Rio Grande cutthroat trout	Tier 1	N	SC	x	x			x			x	G4T3	S3	
Catostomus plebeius	Rio Grande sucker	Tier 1		SE	x	x							G3G4	S1	
Gila robusta	Roundtail chub	Tier 1		SC	x	x			x	x		x	G3	S2	x
Phoxinus erythrogaster	Southern redbelly dace	Tier 1		SE	x						x		G5	S1	
Noturus flavus	Stonecat	Tier 1		SC						x			G5	S1	
Phenacobius mirabilis	Suckermouth minnow	Tier 1		SE								x	G5	S2	
MAMMALS															
Ochotona princeps	American pika**	Tier 1	N										G5	S5	
Mustela nigripes	Black-footed ferret	Tier 1	LE	SE						x		x	G1	S1	
Myotis thysanodes	Fringed myotis	Tier 1			x	x						x	G4	S3	
Cynomys gunnisoni	Gunnison's prairie dog	Tier 1	N		x	x			x			x	G5	S5	
Myotis lucifigus	Little brown myotis	Tier 1	P									x	G3	S5	
Lynx Canadensis	Lynx	Tier 1	LT	SE								x	G5	S1	
Zapus hudsonius luteus	New Mexico meadow jumping mouse	Tier 1	LE		x	x			x			x	G5T2	S1	
Perognathus fasciatus	Olive-backed pocket mouse	Tier 1										x	G5	S3	x
Zapus hudsonius preblei	Prebles meadow jumping mouse	Tier 1	LT	ST					x			x	G5T2	S1	x

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
Euderma maculatum	Spotted bat	Tier 1			x	x						x	G4	S2	
Corynorhinus townsendii pallescens	Townsend's big-eared bat ssp.	Tier 1		SC	x	x					x	x	G3G4T3T4	S2	
Cynomys leucurus	White-tailed prairie dog	Tier 1			x	x						x	G4	S4	
Gulo gulo	Wolverine	Tier 1	N	SE								x	G4	S1	
REPTILES															
Aspidoscelis neotesselata	Colorado checkered whiptail	Tier 1	N	SC					x	x		x	G2G3	S2	
Sistrurus catenatus	Massasauga	Tier 1	P	SC	x	x						x	G3G4	S2	
AMPHIBIANS															
Acris blanchardi	Blanchard's cricket frog	Tier 2		SC		x							G5	SH	
Hyla arenicolor	Canyon tree frog	Tier 2				x							G5	S2	
Scaphiopus couchii	Couch's spadefoot	Tier 2		SC									G5	S1	
Spea intermontana	Great Basin spadefoot	Tier 2				x							G5	S3	
Gastrophryne olivacea	Great Plains narrowmouth toad	Tier 2		SC									G5	S1	
Anaxyrus debilis	Green toad	Tier 2											G5	S2	
Lithobates blairi	Plains leopard frog	Tier 2		SC	x	x							G5	S3	
Lithobates sylvatica	Wood frog	Tier 2		SC	x								G5	S3	
BIRDS															
Botaurus lentiginosus	American bittern	Tier 2			x		x						G4	S3S4B	
Falco peregrinus anatum	American peregrine falcon	Tier 2		SC	x	x	x						G4T4	S2B	
Pelecanus erythrorhynchos	American white pelican	Tier 2				x							G4	S1B	
Haliaeetus leucocephalus	Bald eagle	Tier 2		SC	x	x	x						G5	S1B,S3N	

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
Patagioenas fasciata	Band-tailed pigeon	Tier 2											G4	S4B	x
Bucephala islandica	Barrow's goldeneye	Tier 2											G5	S2B	
Leucosticte atrata	Black rosy-finch	Tier 2					x	x					G4	S4N	
Cypseloides niger	Black swift	Tier 2			x	x		x	x				G4	S3B	x
Chlidonias niger	Black tern	Tier 2			x								G4	S2B	
Dolichonyx oryzivorus	Bobolink	Tier 2						x					G5	S3B	x
Aegolius funereus	Boreal owl	Tier 2			x								G5	S2	
Spizella breweri	Brewer's sparrow	Tier 2			x	x	x						G5	S4B	x
Peucaea cassinii	Cassin's finch	Tier 2					x						G5	S5	x
Aimophila cassinii	Cassin's sparrow	Tier 2			x								G5	S4B	x
Calcarius ornatus	Chestnut-collared longspur	Tier 2			x		x	x					G5	S1B	x
Buteo regalis	Ferruginous hawk	Tier 2		SC	x	x	x					x	G4	S3B,S4N	
Otus flammeolus	Flammulated owl	Tier 2			x		x	x					G4	S4	
Setophaga graciae	Grace's warbler	Tier 2					x						G5	S3B	
Ammodramus savannarum	Grasshopper sparrow	Tier 2			x		x						G5	S3S4B	x
Vireo vicinior	Gray vireo	Tier 2					x	x					G4	S2B	
Tympanuchus cupido	Greater prairie-chicken	Tier 2			x			x					G4	S3	x
Baeolophus ridgwayi	Juniper titmouse	Tier 2					x						G5	S4	x
Calamospiza melanocorys	Lark bunting	Tier 2					x						G5	S4	x
Passerina amoena	Lazuli bunting	Tier 2											G5	S5B	x
Sterna antillarum	Least tern	Tier 2	LE	SE									G4	S1B	
Melanerpes lewis	Lewis's woodpecker	Tier 2			x		x						G4	S4	x

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
Lanius ludovicianus	Loggerhead shrike	Tier 2			x								G4	S3S4B	x
Numenius americanus	Long-billed curlew	Tier 2		SC	x	x	x						G5	S2B	
Rhynchophanes mccownii	McCown's longspur	Tier 2			x		x						G4	S2B	
Strix occidentalis lucida	Mexican spotted owl	Tier 2	LT	ST									G3T3	S1B,SUN	
Colinus virginianus	Northern bobwhite	Tier 2											G5	S4	x
Accipiter gentilis	Northern goshawk	Tier 2			x	x							G5	S3B	
Circus cyaneus	Northern harrier	Tier 2			x								G5	S3B	
Contopus cooperi	Olive-sided flycatcher	Tier 2			x			x					G4	S3S4B	x
Gymnorhinus cyanocephalus	Pinyon jay	Tier 2					x	x					G5	S5	x
Charadrius melodus	Piping plover	Tier 2	LT	ST									G3	S1B	
Falco mexicanus	Prairie falcon	Tier 2					x						G5	S4B,S4N	
Progne subis	Purple martin	Tier 2			x								G5	S3B	
Selasphorus rufus	Rufous hummingbird	Tier 2						x					G5	SNA	x
Amphispiza belli	Sage sparrow	Tier 2			x								G5	S3B	x
Asio flammeus	Short-eared owl	Tier 2			x								G5	S2B	x
Buteo swainsoni	Swainson's hawk	Tier 2											G5	S5B	x
Bartramia longicauda	Upland sandpiper	Tier 2					x					x	G5	S3B	
Catharus fuscescens	Veery	Tier 2					x						G5	S3B	
Oreothlypis virginiae	Virginia's warbler	Tier 2						x					G5	S5	
Charadrius alexandrinus nivosus	Western snowy plover	Tier 2		SC		x	x						G3T3	S1B	
Plegadis chihi	White-faced ibis	Tier 2				x							G5	S2B	
Grus Americana	Whooping crane	Tier 2	LE	SE								x	G1	SNA	

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
FISH															
Etheostoma exile	Iowa darter	Tier 2		SC									G5	S3	
Couesius plumbeus	Lake chub	Tier 2		SE	x						x		G5	S1	
MAMMALS															
Sciurus aberti	Abert's squirrel**	Tier 2											G5	S5	
Idionycteris phyllotis	Allen's big-eared bat	Tier 2				x							G4	SNR	
Martes Americana	American marten	Tier 2			x								G4G5	S4	
Nyctinomops macrotis	Big free-tailed bat	Tier 2				x							G5	S1	
Ovis Canadensis	Bighorn sheep	Tier 2			x	x							G4	S4	
Bison bison	Bison	Tier 2											G4	SX	
Cynomys ludovicianus	Black-tailed prairie dog	Tier 2	N	SC	x	x						x	G4	S3	
Thomomys bottae rubidus	Botta's pocket gopher (*rubidus* ssp.)	Tier 2		SC									G5T1	S1	
Conepatus leuconotus	Common hog-nosed skunk	Tier 2			x								G4	S1	
Sorex nanus	Dwarf shrew	Tier 2											G4	S2	
Canis lupus	Gray wolf	Tier 2	LE	SE	x							x	G4G5	SX	
Ursus arctos	Grizzly bear	Tier 2		SE									G4	SX	
Lasiurus cinereus	Hoary bat	Tier 2			x								G5	S5B	
Vulpes macrotis	Kit fox	Tier 2		SE	x	x							G4	S1	x
Sorex preblei	Preble's shrew	Tier 2											G4	S1	
Brachylagus idahoensis	Pygmy rabbit	Tier 2											G4	SNR	
Sorex hoyi montanus	Pygmy shrew	Tier 2			x								G5T3T4	S2	

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
Clethrionomys gapperi	Red-backed vole**	Tier 2											G5	S5	
Lontra Canadensis	River otter	Tier 2		ST	x						x	x	G5	S3S4	
Lemmiscus curtatus	Sagebrush vole	Tier 2											G5	S1	
Lepus americanus	Snowshoe hare**	Tier 2											G5	S5	
Vulpes velox	Swift fox	Tier 2		SC	x	x						x	G3	S3	
Lepus townsendii	White-tailed jackrabbit	Tier 2											G5	S4	
MOLLUSKS															
Ferrissia walker	Cloche ancylid	Tier 2											G4G5Q	S3	
Promenetus umbillicatellus	Cockerell	Tier 2											G4	S3	
Anodontoides ferussacianus	Cylindrical papershell	Tier 2		SC									G5	S2	
Ferrissia fragilis	Fragil ancylid	Tier 2											G5Q	S1	
Physa cupreonitens	Hot springs physa	Tier 2											G5Q	S2	
Uniomerus tetralasmus	Pondhorn	Tier 2											G5	S1	
Acroloxus coloradensis	Rocky Mountain capshell	Tier 2		SC	x								G3	S1	
Promenetus exacuous	Sharp sprite	Tier 2											G5	S2	
Physa gyrina utahensis	Utah physa	Tier 2											G5T2	S1	
REPTILES															
Thamnophis cyrtopsis	Black-necked gartersnake	Tier 2											G5	S2?	
Lampropeltis californiae	California kingsnake	Tier 2		SC		x							G5	S1	
Thamnophis sirtalis	Common gartersnake	Tier 2		SC									G5	S3	x
Sceloporus magister	Desert spiny lizard	Tier 2				x							G5	S2	
Gambelia wislizenii	Long-nosed leopard lizard	Tier 2		SC		x							G5	S1	

Species	Common Name	Priority Tier	Federal Status	State Status	USFS Sensitive Species	BLM Sensitive Species	USFWS Birds of Conservation Concern	PIF US-Canada Watch List	CO's Contribution to Conservation	Urgency of Conservation Action	Ability to Implement Effective Conservation Actions	Ecological Value of the Species	NatureServe Global Status Rank	CNHP/NatureServe State Status Rank	Declining Trend
Rhinocheilus lecontei	Long-nosed snake	Tier 2											G5	S1?	
Crotalus oreganus concolor	Midget faded rattlesnake	Tier 2		SC		x							G5T4	S3?	
Lampropeltis triangulum	Milksnake	Tier 2				x							G5	S2?	
Rena dissectus	New Mexico threadsnake	Tier 2		SC									G4G5	S1	
Hypsiglena chlorophaea	Desert nightsnake	Tier 2											G5	S3	
Phrynosoma modestum	Round-tailed horned lizard	Tier 2		SC									G5	S1	
Tantilla horbartsmithi	Smith's black-headed snake	Tier 2											G5	S2?	
Phrynosoma cornutum	Texas horned lizard	Tier 2		SC									G4G5	S3	
Kinosternon flavescens	Yellow mud turtle	Tier 2		SC									G5	S1	

Appendix B

Appendix B
Characteristics of Level IV Ecoregions in Colorado

The exhibit below is based on material contained in the poster entitled, *Ecoregions of Colorado*, as available from the U.S. Environmental Protection Agency's (EPA's) Western Ecology Division (http://www.epa.gov/wed/pages/ecoregions/co_eco.htm#Ecoregions%20denote).

The poster is part of a collaborative project primarily between EPA Region 8, EPA National Health and Environmental Effects Research Laboratory (Corvallis, Oregon), Colorado Department of Public Health and Environment (CDPHE), Colorado Division of Wildlife (CDOW), United States Department of Agriculture–Forest Service (USFS), United States Department of Agriculture–Natural Resources Conservation Service (NRCS), United States Department of the Interior–Bureau of Land Management (BLM), and United States Department of the Interior–Geological Survey (USGS)–National Center for Earth Resources Observation and Science (EROS).

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. By recognizing the spatial differences in the capacities and potentials of ecosystems, ecoregions stratify the environment by its probable response to disturbance (Bryce, S.A., Omernik, J.M., and Larsen, D.P., 1999, Ecoregions – a geographic framework to guide risk characterization and ecosystem management: Environmental Practice, v. 1, no. 3, p. 141-155). These general purpose regions are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources within the same geographic areas (Omernik, J.M., Chapman, S.S., Lillie, R.A., and Dumke, R.T., 2000, Ecoregions of Wisconsin: Transactions of the Wisconsin Academy of Sciences, Arts, and Letters, v. 88, p. 77-103).

The approach used to compile this map is based on the premise that ecological regions can be identified through the analysis of the spatial patterns and the composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality and integrity (Wiken, E., 1986, Terrestrial ecozones of Canada: Ottawa, Environment Canada, Ecological Land Classification Series no. 19, 26 p.; Omernik, J.M., 1987, Ecoregions of the conterminous United States (map supplement): Annals of the Association of American Geographers, v. 77, no. 1, p. 118-125, scale 1:7,500,000; Omernik, J.M., 1995, Ecoregions – a framework for environmental management, in Davis, W.S., and Simon, T.P., eds., Biological assessment and criteria-tools for water resource planning and decision making: Boca Raton, Florida, Lewis Publishers, p. 49-62). These phenomena include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
18. Wyoming Basin (Level III Ecoregion)								
Rolling Sagebrush Steppe (18a)	2,197	Rolling plains with hills, cuestas, mesas, terraces, and near the footslopes, alluvial fans, and outwash fans.	5,200-7,500/ 100-400	Quaternary alluvium, colluvium, outwash, thin residuum, and eolian deposits. Tertiary and Cretaceous claystone, sandstone, and other sedimentary rock. Areas of lenticular coal, oil shale, and marlstone. Rock outcrops occur.	Ryan Park, Maybell, Rockriver, Mayspring, Ryark, Berlake, Taffim, Styers, Ruedloff, Tresano	*Precipitation (annual)*: 10-15 inches, up to 20 at higher elevations *January min/max (°F)*: 4/32 *July min/max (°F)*: 48/88 *Frost free days*: 60-90	Sagebrush steppe with areas of bitterbrush shrubland and scattered juniper woodland at higher elevations. Associated vegetation may include western wheatgrass, needle-and-thread, blue grama, Sandberg bluegrass, Junegrass, rabbitbrush, fringed sage, Wyoming big sagebrush, silver and black sagebrush in lowlands, and mountain big sagebrush at the higher elevations.	Shrub-covered rangeland, with some areas of cropland, especially along the Yampa River. Crops include hay, wheat, barley, and oats. Oil, gas, and coal production.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
Foothill Shrublands and Low Mountains (18d)	248	Footslopes, alluvial fans, hills, low mountains, ridges, and valleys.	6,000-9,600/ 200-1,000	Quaternary alluvium and colluvium derived from Tertiary sedimentary and older crystalline rocks of the surrounding mountains. Tertiary claystone, mudstone, sandstone, and oil shale. Precambrian quartzite, conglomerate, and shale.	Uinta, Miracle, Chittum, Rentsac	*Precipitation (annual)*: 10-20 inches *January min/max (°F)*: 8/34 *July min/max (°F)*: 54/84 *Frost free days*: 60-90	Big sagebrush shrubland, with pinyon-juniper woodland. Higher elevations may have areas of lodgepole pine, aspen, and subalpine fir. Associated vegetation may include rabbitbrush, mountain big sagebrush, pricklypear, bluebunch wheatgrass, and Idaho fescue on fine-textured soils. Rocky Mountain juniper, Utah juniper, and mountain mahogany woodlands occur on rock outcrops.	Shrub-covered rangeland and wildlife habitat.
Salt Desert Shrub Basins (18e)	718	Plains, nearly level floodplains and terraces, and rolling alluvial fans. Streams are ephemeral or intermittent; many are incised and flow into playas. Substrates are fine textured material or platy shale gravels. Seasonal playas have high levels of soluble salts.	5,400-7,300/ 50-300	Quaternary alluvium and colluvium; gravel and fan deposits; areas of active and stabilized dune sand and loess. Tertiary and Cretaceous siltstone, sandstone, claystone, and areas of oil shale and marlstone.	Luhon, Brownsto, Niart, Rentsac, Atchee, Mikim, Huguston, Teagulf	*Precipitation (annual)*: 8-15 inches *January min/max (°F)*: 6/32 *July min/max (°F)*: 50/88 *Frost free days*: 60-90	Desert shrublands dominated by alkaline-tolerant shrubs and grasses; greasewood, Gardner's saltbush, fourwing saltbush, shadscale, bud sage, and big sagebrush. Stabilized sand dunes are dominated by alkali cordgrass, Indian ricegrass, blowout grass, alkali wildrye, and needle-and-thread.	Shrub-covered rangeland and wildlife habitat. Oil and gas production.
Laramie Basin (18f)	116	High elevation valley, nearly flat floodplains, and low terraces. Streams and rivers are moderate gradient, with cobble, gravel, and sandy substrates.	7,800-9,100/ 100-300	Quaternary alluvium and colluvium. Tertiary gravels and fan deposits in stream and floodplain areas. Tertiary shale, siltstone, and conglomerate. Triassic and Permian siltstone, shale, and sandstone.	Driggs, Newfork, Pendergrass, Clergern	*Precipitation (annual)*: 15-20 inches *January min/max (°F)*: 4/30 *July min/max (°F)*: 40/76 *Frost free days*: 60-90	Mixedgrass prairie with needle-and-thread, western wheatgrass, blue grama, Indian ricegrass, and other mixedgrass species, along with rabbitbrush, fringed sage, and various forb and shrub species.	Grassland and shrubland. Rangeland, seasonal grazing, some hay production.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
20. Colorado Plateaus (Level III Ecoregion)								
Monticello-Cortez Uplands and Sagebrush Valleys (20a)	951	Nearly level to rolling plains and basins containing stream terraces, alluvial fans, and low rolling hills and ridges.	6,000-7,300/ 25-200	Quaternary colluvium, alluvium and eolian deposits. Western area underlain by Cretaceous Dakota sandstone formation. Eastern areas underlain by Cretaceous Cliff House and Pictured Cliffs sandstone and Lewis shale, or Tertiary arkosic sandstone, siltstone, and shale.	On uplands: Witt, Sharps, Cahona, Lazear, Pulpit. In valleys: Falfa, Arboles, Bayfield, Uzona	*Precipitation (annual)*: 10-15 inches *January min/max (°F)*: 12/38 *July min/max (°F)*: 52/88 *Frost free days*: 90-120	Sagebrush, steppe and associated grasses, with scattered pinyon-juniper woodland. Dominant species include: Wyoming big sagebrush, western wheatgrass, and Indian ricegrass. Some two-needle pinyon pine, bitterbrush, and serviceberry.	Dryland cropland with some areas of irrigated cropland, shrubland, and rangeland. Crops include pinto beans, Anasazi beans, winter wheat, and alfalfa.
Shale Deserts and Sedimentary Basins (20b)	2,923	Nearly level to rolling plains and basins, with benches, low rounded hills, and badlands.	4,900-8,000/ 25-400	Quaternary colluvium, alluvium, and eolian deposits. Cretaceous Mancos shale (northwest of Rangley, east of Meeker, Grand Valley, Dry Creek Basin, Disappointment Valley, and in the southwest, just north of the Mancos River). Tertiary claystone, siltstone, mudstone, shale and sandstone (areas west of Meeker, and in the Colorado River valley outside of Rifle). Jurassic and Triassic shale and siltstone, salt anticlines (Paradox Valley, Big Gypsym Valley).	Bulkley, Evanston, Forelle, Paradox, Diamondville, Rock River, Persayo, Farb, Redlands, Hagerman, Palma, Transfer, Callan, Skein, Chipeta, Uncompahgre	*Precipitation (annual)*: 8-15 inches *January min/max (°F)*: 6/36 *July min/max (°F)*: 48/92 *Frost free days*: 90-150	Sparse cover of mat saltbrush shrubland and salt desert scrub; shadscale, Nuttall's saltbrush, blackbrush, fourwing saltbrush, Wyoming big sagebrush, desert trumpet, galleta grass, and other associated grasses. Floodplain areas support greasewood, alkali sacaton, seepweed, and shadscale. Badland areas have little to no vegetation cover.	Shrubland and rangeland, areas of dryland and irrigated cropland with winter wheat, small grains, forage crops, and pinto beans. Orchards of apples, peaches, pears, and apricots in the Gunnison and Colorado River valleys. Shrublands provide important winter habitat for wildlife.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
Semiarid Benchlands and Canyonlands (20c)	9,079	Benches, mesas, cuestas, alluvial fans, hillslopes, cliffs, arches, and canyons. A few insolated peaks. Areas of low relief alternate with areas of high relief.	5,400-9,200/ 100-1,000	Quaternary alluvium and colluvium. Tertiary and Cretaceous siltstone, sandstone, claystone, oil shale, and marlstone. In deep canyons and cliffs: areas of Permian siltstone, sandstone, and shale, and Pre-Pennsylvanian Paleozoic shale, limestone and sandstone.	Atchee, Cahona, Hagerman, Lamphier, Lazear, Mikim, Palma, Persayo, Redcreek, Rentsac, Shavano, Skein, Skyway, Transfer, Utaline, Veatch, Zyme, Callan, Castner, Chipeta, Cochetopa	*Precipitation (annual)*: 10-18 inches (on highest sites) 20-25 inches *January min/max (°F)*: 8/40 *July min/max (°F)*: 48/88 *Frost free days*: 60-120	Pinyon-juniper woodland, Gambel oak woodland, and sagebrush steppe with black sagebrush, winterfat, Mormon tea, fourwing saltbrush, shadscale, galleta grass, and blue grama.	Woodland and shrubland. Rangeland, recreation, coal mining, oil and gas production. Oil shale extraction.
Arid Canyonlands (20d)	70	Narrow canyons, cliffs, valley floors, floodplains, structural benches, mesas, and cuestas. Terrain deeply eroded by major rivers and their tributaries.	4,900-6,000/ 200-500	Quaternary alluvium and colluvium. Cretaceous sandstone, shale, and conglomerate. Rock outcrops are common.	Claysprings, Myton, Uzona, Tocito	*Precipitation (annual)*: 8-10 inches *January min/max (°F)*: 18/40 *July min/max (°F)*: 60/92 *Frost free days*: 120-150	Desert shrubland: blackbrush, shadscale, Indian ricegrass, fourwing saltbrush, blue grama, mat saltbrush, saline wildrye, and galleta grass.	Shrubland. Recreation, rangeland, and wildlife habitat.
Escarpments (20e)	1,013	High, dissected cliffs, escarpments, mesa tops, and breaks with a wide elevational range. Includes the Book Cliffs and Roan Cliffs.	6,000-9,000/ 500-3,000	Quaternary alluvium and colluvium. Tertiary and Cretaceous sandstone, shale, siltstone, marlstone, limestone, and areas of oil shale. Rock outcrops are common.	Claysprings, Myton, Uzona	*Precipitation (annual)*: 15-25 inches (at higher elevations) 32 inches *January min/max (°F)*: 4/36 *July min/max (°F)*: 46/84 *Frost free days*: 60-90	Pinyon-juniper woodland, mountain mahogany, aspen, and Douglas-fir forest at highest elevations.	Shrubland, evergreen and deciduous woodland, some forests. Recreation and wildlife habitat, some limited grazing.
Uinta Basin Floor (20f)	39	Synclinal basin containing mountain-fed streams, alluvial terraces, outwash terraces, floodplains, hills, and ridges.	5,500-6,100/ 50-200	Quaternary colluvium, alluvium, and eolian deposits. Tertiary and Cretaceous sandstone and shale.	Potts, Walknolls, Veatch, Redcreek, Castner	*Precipitation (annual)*: 8-10 inches *January min/max (°F)*: 6/34 *July min/max (°F)*: 56/88 *Frost free days*: 90-120	Desert shrubland: saltbrush, greasewood, shadscale, Indian ricegrass, galleta grass, Wyoming big sagebrush, fourwing saltbrush, winterfat, needle-and-thread.	Shrubland. Rangeland, cropland, and wildlife habitat. Oil and gas production.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
21. Southern Rockies (Level III Ecoregion)								
Alpine Zone (21a)	3,690	Glaciated. High mountains with steep slopes, ridges, and exposed rocky peaks above timberline. Some wetlands and glacial lakes. High gradient headwater streams with boulder, cobble, and bedrock substrates.	10,000-14,400+/ 400-2,500+	Quaternary rubble, glacial drift, and colluvium. Exposed bedrock. Tertiary andesitic lavas, basalts, breccia, tuffs, and conglomerates. Precambrian metasedimentary rocks: pelitic schist, amphibole schist, quartzite, diamictite, quartz-pebble conglomerate, and marble. Permian and Pre-Pennsylvanian Sangre de Cristo Formation: arkosic conglomerate, sandstone, and siltstone.	Mirror, Bross, Whitecross, Henson, Teewinot	*Precipitation (annual)*: 35-70+ inches (deep winter snowpack) *January min/max (°F)*: -8/24 *July min/max (°F)*: 36/72 *Frost free days*: Less than 30	Alpine meadows. Dominated by bistort, alpine timothy, alpine avens, alpine bluegrass, alpine clover, tufted hairgrass, and various sedges. Trees if present are krummholz (dwarf and/or prostrate shrubs) and include spruce, fir, and pine. Willow thickets occur in depressions and wet meadows.	Snow, ice, bare rock, and alpine meadows. Recreation and wildlife habitat. Snowmelt provides water source to lower elevation ecoregions.
Crystalline Subalpine Forests (21b)	4,737	Glaciated. High mountains with steep slopes. High gradient perennial streams with boulder, cobble, and bedrock substrates.	8,500-10,000 in the north/ 9,000-12,000 in the south/ 400-2,500	Quaternary glacial till and colluvium. Tertiary intrusive rocks. Precambrian metasedimentary, metavolcanic, and intrusive rocks: pelitic schist, amphibole schist, quartzite, diamictite, quartz-pebble conglomerate and marble. Precambrian granitic gneiss, felsic gneiss, amphibolite, and granitic rocks. Copper, silver, and gold deposits.	Boyle, Granile, Kebler, Lakehelen, Leadville, Limber, Lucky, Peeler, Resort, Seitz	*Precipitation (annual)*: 30-58 inches (deep winter snowpack) *January min/max (°F)*: -4/28 *July min/max (°F)*: 36/72 *Frost free days*: 30-60	Subalpine forests dominated by Engelmann spruce and subalpine fir. Often Interspersed with aspen groves, lodgepole pine forest, or mountain meadows, and with Douglas-fir at lower elevations. May include limber pine and Rocky Mountain bristlecone pine. Understory is dominated by dwarf huckleberry and grouse whortleberry.	Evergreens and some deciduous forest. Timber production, recreation, hunting, wildlife habitat, and seasonal grazing. Some gold mining. Snow cover is a major source of water for lower, more arid ecoregions.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
Crystalline Mid-Elevation Forests (21c)	4,455	Partially glaciated. Low mountain ridges, slopes, and outwash fans. Moderate to high gradient perennial streams with boulder, cobble, and bedrock substrates.	7,000-9,000/ 400-1,000	Quaternary glacial till, colluvium, and alluvium. Precambrian metasedimentary, metavolcanic, and intrusive rocks: pelitic schist, amphibole schist, quartzite, diamictite, quartz-pebble conglomerate, and marble. Precambrian granitic gneiss, felsic gneiss, amphibolite, and granitic rocks. Copper, silver, and gold deposits.	Boyett, Granile, Larkson, Peeler, Seitz, Wetmore, Legault, Sphinx, Catamount, Ivywild, Cabin, Frenchcreek, Pendant, Pierian, Raleigh, Rogert, Teoculli, Woodhall	*Precipitation (annual)*: 20-32 inches *January min/max (°F)*: 8/36 *July min/max (°F)*: 50/80 *Frost free days*: 60-90	Ponderosa pine forest with areas of Douglas-fir forest. Understory may include mountain mahogany, bitterbrush, wax currant, skunkbush, woods rose, mountain muhly, Junegrass, Arizona fescue, king spike-fescue, and various sedges.	Evergreen and some deciduous forest. Wildlife habitat, rangeland, timber production, recreation, and mineral extraction. Some gold mining.
Foothill Shrublands (21d)	4,780	Unglaciated. Hills, ridges, and footslopes. Moderate to high gradient perennial, intermittent, and ephemeral streams with cobble, gravel, and sandy substrates.	Mostly 6,000-8,500, small areas up to 10,000/ 200-900	Quaternary glacial till, colluvium, and alluvium. Tertiary and Cretaceous shale and sandstone. Permian sandstone, limestone, and siltstone. Precambrian metasedimentary: sandstone, claystone, shale, siltstone, and conglomerates. Precambrian metamorphic rocks: amphibolite, schist, gneiss, quartzite, quartz-pebble conglomerate, and marble.	Ring, Bond, Bronell, Brownsto, Coaldale, Potts, Kerhayden, Neville, Patent, Travessilla, Bowen, Bushvalley, Castner, Dominson, Embargo, Gelkie, Keeldar, Libeg, Lucky, Martinsdale, Nederland, Noden, Norriston, Pando, Parlin, San Isabel, St. Elmo	*Precipitation (annual)*: 12-20 inches *January min/max (°F)*: 10/36 *July min/max (°F)*: 46/84 *Frost free days*: 75-100	Sagebrush shrubland, pinyon-juniper woodland, and foothill-mountain grasslands. Also includes areas of mountain mahogany shrublands and scattered Gambel oak woodlands. The woodlands are often interspersed with mountain big sagebrush, skunkbush, serviceberry, fringed sage, rabbitbrush, blue grama, Junegrass, western wheatgrass, Indian ricegrass, Scribner needlegrass, muttongrass, and blue grama.	Shrubland and grassland, some woodland. Rangeland and wildlife habitat.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
Sedimentary Subalpine Forests (21e)	6,196	Glaciated. High mountains with steep slopes. High gradient perennial streams with boulder, cobble, and bedrock substrates.	8,500-10,000 in the north, 9,000-12,000 in the south/ 400-1,500	Quaternary drift and colluvium. Faulted and folded Tertiary sedimentary rocks of limestone, siltstone, shale, and sandstone. Permian arkosic conglomerate, sandstone, and siltstone of the Sangre de Cristo Formation. Flat Tops Mountains: Pre-Pennsylvanian Paleozoic limestone, sandstone, quartzite, and dolomite. Uncompahgre Plateau: Cretaceous sandstone and shale.	East: Ashcroft, Granile, Leadville, Limber, Seitz, Vulcan, Wetterhorn, Gralic, Storm, Adel, Leaps, Ruby. Southwest: Graysill, Scotch, Neddleton, Ryman. Uncompahgre Plateau: Gateway	*Precipitation (annual)*: 28-50 inches (Deep winter snowpack) *January min/max (°F)*: 2/32 *July min/max (°F)*: 40/76 *Frost free days*: 30-60	Subalpine forests dominated by subalpine fir, Engelmann spruce, and lodgepole pine. Areas of Douglas-fir or aspen forests at lower elevations. Understory may include whortleberry, kinnickinnick, snowberry, sedges, mountain brome, and forbs.	Evergreen and some deciduous forest. Timber production, recreation, hunting, wildlife habitat, and seasonal grazing. Some gold mining. Snow cover is a major source of water for lower, more arid ecoregions.
Sedimentary Mid-Elevation Forests (21f)	7,532	Partially glaciated. Low mountain ridges, slopes and outwash fans. Moderate to high gradient perennial streams with boulder, cobble, and bedrock substrates.	7,000-9,000/ 400-1,000	Quaternary drift and colluvium. Faulted and folded Tertiary sedimentary rocks of limestone, siltstone, shale, and sandstone. Uncompahgre Plateau: Cretaceous sandstone and shale.	East: Allens Park, Granile, Gulnare, Lakehelen, McIntyre, Mulgon, Seitz, Troutville, Ula, Wahatoya, Brownsto, Patent, Cabin, Castner, Pierian, Poncha. Southwest: Archuleta, Fivepine, Nortez, Morapos, Cerro, Fughes, Nortez. Uncompahgre Plateau: Mayflower, Cebone, Wetopa, Lamphier, Falcon	*Precipitation (annual)*: 20-32 inches *January min/max (°F)*: 6/34 *July min/max (°F)*: 44/84 *Frost free days*: 60-90	Ponderosa pine forest, Gambel oak woodland, and aspen forest (especially on the Western slope). Areas of mountain mahogany and two-needle pinyon pine. Shrub vegetation includes antelope bitterbrush, fringed sage, serviceberry, and snowberry. Understory grasses of Arizona fescue, bluegrass, Junegrass, needlegrasses, mountain muhly, pine dropseed, and mountain brome.	Evergreen and some deciduous forest. Timber production, summer livestock grazing, wildlife habitat, and recreation. Some copper, silver, and gold mining.
Volcanic Subalpine Forests (21g)	3,940	Glaciated. High mountains with steep slopes. High gradient perennial streams with boulder, cobble, and bedrock substrates.	9,000-12,000/ 600-1,800	Quaternary drift and colluvium. Tertiary pyroclastic material, breccia, and volcanic ash flows, including basalt, andesitic lavas, and water-laid volcanics and conglomerates.	Frisco, Granile, Needleton, Seitz, Snowdon, Taglake, Clayburn, Hapgood, Lamphier, Wetopa. Rubble and rock outcrops.	*Precipitation (annual)*: 28-50 inches (deep winter snowpack) *January min/max (°F)*: 2/32 *July min/max (°F)*: 40/74 *Frost free days*: 30-60	Subalpine forests dominated by Engelmann spruce, subalpine fir, aspen and, in the north, lodgepole pine. Understory may include whortleberry, kinnickinnick, snowberry, sedges, mountain brome, and forbs.	Evergreen and some deciduous forest. Timber production, recreation, hunting, wildlife habitat, and seasonal grazing. Some gold mining. Snow cover is a major source of water for lower, more arid ecoregions.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
Volcanic Mid-Elevation Forests (21h)	1,010	Partially glaciated. Low mountain ridges, slopes and outwash fans. Moderate to high gradient perennial streams with boulder, cobble, and bedrock substrates.	7,000-9,000/ 400-1,000	Quaternary drift and colluvium. Tertiary pyroclastic material, breccia, and volcanic ash flows, including basalt, andesitic lavas, and water-laid volcanics and conglomerates.	Frisco, Granile, Seitz, Shule, Cochetopa, Youman	*Precipitation (annual)*: 20-32 inches *January min/max (°F)*: 4/32 *July min/max (°F)*: 42/76 *Frost free days*: 60-90	Ponderosa pine, Douglas-fir, and aspen forests, with scattered areas of Gambel oak woodlands. Understory of dwarf juniper, western wheatgrass, Oregon grape, blue grama, sideoats grama, and neddlegrasses.	Evergreen and some deciduous forest. Timber production, summer livestock grazing, wildlife habitat, and recreation. Some gold mining.
Sagebrush Parks (21i)	2,098	High intermontane valleys. Moderate gradient perennial streams with cobble, gravel, and sandy substrates.	7,500-9,500/ 100-400	Quaternary alluvium, colluvium, and loess. Cretaceous and Tertiary sandstone, shale, siltstone, and conglomerate. Tertiary volcanic rocks.	Evanston, Gold Creek, Lucky, Parlin, Cheadle, Gas Creek	*Precipitation (annual)*: 10-16 inches *January min/max (°F)*: -4/28 *July min/max (°F)*: 44/78 *Frost free days*: 60-90	Sagebrush shrubland: Wyoming big sagebrush, mountain big sagebrush, black sagebrush, western wheatgrass, bottlebrush squirreltail, and elk sedge. Areas of bunchgrasses include Arizona fescue and mountain muhly.	Shrubland and some grassland. Recreation, rangeland, and wildlife habitat. Some hay production. Oil and gas production in North Park.
Grassland Parks (21j)	1,254	High intermontane valleys. Moderate gradient perennial streams with cobble, gravel, and sandy substrates. Some wetlands.	7,900-9,800/ 100-400	Quaternary alluvium, colluvium, and sand. Tertiary siltstone, sandstone, conglomerate, volcanic basalt and ash-flow tuff. Precambrian gneiss, schist, and quartzite.	Gebson, Alvarado, Becks, Bushvalley, Coutis, Feltonia, Gas Creek, Gelkie, Hodden, Venable, Quander, Norriston, Morset, Libeg, Hoodle	*Precipitation (annual)*: 10-20 inches *January min/max (°F)*: 6/36 *July min/max (°F)*: 40/76 *Frost free days*: 60-90	Foothill grasslands with bunchgrasses dominant: Arizona fescue, Idaho fescue, Columbia needlegrass, Canby bluegrass, mountain muhly, bluebunch wheatgrass, needle-and-thread, Junegrass, and slender wheatgrass.	Grassland. Recreation, rangeland, and wildlife habitat.
22. Arizona/New Mexico Plateau (Level III Ecoregion)								
San Louis Shrublands and Hills (22a)	993	Low mountains, hills, mesas, and foothills.	7,900-9,100/ 400-1,000	Quaternary gravels and alluvium. Tertiary igneous rocks of basalt flows, pre-ash flow andesitic lavas, breccias, tuffs, and conglomerates.	Travelers, Garita, Luhon, Space City, Costilla, Tolman, Bendire, Curecanti, Rock River, Stunner, Hesperus	*Precipitation (annual)*: 10-14 inches *January min/max (°F)*: 4/32 *July min/max (°F)*: 42/76 *Frost free days*: 30-60	Shrublands, grasslands, and pinyon-juniper woodlands at highest elevations. Species include big sagebrush, rubber rabbitbrush, winterfat, western wheatgrass, green needlegrass, blue grama, and needle-and-thread.	Shrub- and grass-covered rangeland. Low density grazing, wildlife habitat.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
San Louis Alluvial Flats and Wetlands (22b)	1,217	Irregular plains. Wetlands, springs, and areas with high water table. Few large perennial streams which originate in mountains.	7,500-8,000/ 10-100	Quaternary alluvium or gravel, sand, and silt.	Graypoint, Platoro, Dunul, San Arcacio, Zinzer, Acacio, Alamosa, Lajara, Vastine, Gunbarrel, Mosca, San Luis	*Precipitation (annual)*: 6-10 inches *January min/max (°F)*: 0/34 *July min/max (°F)*: 46/80 *Frost free days*: 60-90	Shrublands dominated by shadscale, fourwing saltbush, and greasewood.	Irrigated cropland has replaced most of the natural vegetation. Crops include potatoes, alfalfa, barley, hay, and wheat. Small areas of vegetables such as lettuce, spinach, and carrots.
Salt Flats (22c)	866	Irregular plains and alkaline basins.	7,400-7,700/ 10-100	Quaternary alluvium of gravel, sand, and silt.	Space City, Costilla, Cotopaxi, Hooper, San Luis, Corlett	*Precipitation (annual)*: 6-8 inches *January min/max (°F)*: 0/34 *July min/max (°F)*: 46/80 *Frost free days*: 60-90	Shrublands dominated by shadscale, fourwing saltbush, greasewood, horsebrush, spiny hopsage, rubber rabbitbrush, saltgrass, and alkali sacaton.	Shrub-covered rangeland with low density grazing, wildlife habitat, and some small areas of irrigated cropland.
Sand Dunes and Sand Sheets (22e)	254	Large dunes, low parabolic and longitudinal shrub-stabilized dunes, and sand sheets.	7,500-8,900/ 100-700	Quaternary eolian sand deposits, dunes, and sand sheets.	Cotopaxi, Space City, Costilla, Alamosa, Lajara, Vastine	*Precipitation (annual)*: 8-12 inches *January min/max (°F)*: 0/34 *July min/max (°F)*: 44/80 *Frost free days*: 60-90	Sand sagebrush, rubber rabbitbrush, sand dropseed, sand verbena, prairie sunflower, and spiny hopsage on sand sheets. Dune areas are mostly devoid of vegetation, some Indian ricegrass, blowout grass, and lemon scurfpea.	Bare sand, shrublands, grasslands. Recreation, some low density rangeland on vegetatively stabilized sand sheets. Wildlife habitat.
25. High Plains (Level III Ecoregion)								
Rolling Sand Plains (25b)	4,620	Undulating plains with areas of active sand dunes. Few perennial streams. Drainage network is not well established due to a lack of runoff and sand-choked drainage ways. Disappearing subterranean streams.	3,500-5,100/ 25-150	Quaternary eolian sand sheets and dunes. Underlain by Tertiary claystones and sandstones of the Ogallala Formation.	Valent, Vona, Julesburg, Haxtun, Jayem, Busher, Bijou	*Precipitation (annual)*: 12-20 inches *January min/max (°F)*: 14/42 *July min/max (°F)*: 60/92 *Frost free days*: 140-160	Sandsage prairie: sand sagebrush, sand bluestem, prairie sandreed, blowout grass, lemon scurfpea, little bluestem, rabbitbrush, Indian ricegrass, and sand dropseed.	Grassland and rangeland with some areas of irrigated cropland.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
Moderate Relief Plains (25c)	6,206	Irregular plains with moderate slope. Intermittent streams, with a few large perennial streams which mostly originate in higher relief areas. Silty and sandy substrates. Small, open, depressional wetland "playas" scattered throughout region.	3,600-6,500/ 50-200	Quaternary loess, sandy, gravelly, and loamy alluvium and some thin residuum. Tertiary claystone, sandstone, and conglomerate, including the Tertiary Ogallala Formation in the east. Cretaceous shales, sandstones, claystones, and coal beds in the west.	Olney, Ascalon, Platner, Stoneham, Nucla, Kim, Dix, Altvan, Keith, Kuma, Ulysses, Colby, Norka	*Precipitation (annual)*: 12-18 inches *January min/max (°F)*: 14/44 *July min/max (°F)*: 60/92 *Frost free days*: 140-160	Shortgrass prairie: blue grama, buffalograss, with threadleaf sedge, fringed sage, Junegrass, and western wheatgrass. Riparian areas contain cottonwood/shrub/herbaceous species.	Grassland and rangeland with areas of dryland and irrigated agriculture. Gas and oil production.
Flat to Rolling Plains (25d)	13,219	Flat to rolling plains. Intermittent streams, with a few large perennial streams. Silty and sandy substrates. Small, open, depressional wetland "playas" scattered throughout region.	3,600-5,700/ 10-150	Quaternary loess, alluvial deposits, and some thin residuum. Tertiary gravel, claystone, sandstone, and sand deposits, including the Ogallala Formation in the east. Cretaceous shales, sandstones, claystones, and coal beds in the west.	Stoneham, Fort Collins, Olney, Richfield, Keith, Colby, Wages, Rosebud, Manter, Ascalon. Platner, Haxtun, Rago, Alliance, Canyon, Weld, Norka, Adena	*Precipitation (annual)*: 12-18 inches *January min/max (°F)*: 16/46 *July min/max (°F)*: 62/94 *Frost free days*: 140-180	Shortgrass prairie: blue grama, buffalograss, with threadleaf sedge, fringed sage, Junegrass, and western wheatgrass. Riparian areas contain cottonwood/shrub/ herbaceous species.	Dryland and irrigated cropland with winter wheat, grain sorghum, corn, barley, sunflowers, and sugar beets (grown under irrigation). Some grassland and rangeland. Gas and oil production, especially in the Denver Basin.
Front Range Fans (25l)	782	Fans, irregular plains, and scattered low hills. Intermittent and perennial streams with gravelly, silty, and sandy substrates. Streams are generally colder and may contain species found more commonly in the Southern Rockies (21).	4,800-5,300/ 50-200	Quaternary gravel and sandy alluvium, eolian sand deposits. Underlain by sandstone, claystone, and shale of the Cretaceous Laramie and Fox Hills formations and sandstone, mudstone, claystone, and conglomerate of the Tertiary Denver and Arapahoe formations to the south.	Altvan, Ascalon, Larimer, Stoneham, Dacono, Nunn, Renohill, Shingle, Otero, Thedalund, Olney, Ulm, Engelwood, Nederland, Kutch, Denver	*Precipitation (annual)*: 14-18 inches *January min/max (°F)*: 12/40 *July min/max (°F)*: 56/88 *Frost free days*: 120-140	Shortgrass and mixedgrass prairie: blue grama, needle-and-thread, western wheatgrass, buffalograss, Junegrass, and little bluestem. Big bluestem is scattered in low concentrations throughout the region. Riparian areas contain cottonwood/shrub/herbaceous species.	Urban and residential, some irrigated cropland with hay, corn, wheat, and barley. Many manmade lakes and gravel pits.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
26. Southwestern Tablelands (Level III Ecoregion)								
Piedmont Plains and Tablelands (26e)	13,373	Irregular and dissected plains. Intermittent streams, with few large perennial streams which mostly originate in mountains or higher relief areas. Silty and sandy substrates.	3,600-6,500/ 50-200	Quaternary alluvium and eolian deposits of loess, silt, and sand. Cretaceous shale, limestone, and sandstone.	Wiley, Baca, Colby, Manvel, Minnequa, Penrose, Rocky Ford, Nepesta, Ascalon, Fort Collins, Stoneham, Kim, Razor, Midway, Limon, Deertrail, Absted, Harvey, Truckton, Yoder, Blakeland, Ordway, Cadoma, Campo, Platner	*Precipitation (annual)*: 12-16 inches, with 10-12 inches in low lying area between Pueblo and Las Animas *January min/max (°F)*: 14/46 *July min/max (°F)*: 60/92 *Frost free days*: 120-160	Shortgrass prairie: blue grama, green needlegrass, buffalograss, needle-and-thread, and red threeawn. Also may include mixedgrass species such as western wheatgrass, galleta grass, sand dropseed, and little bluestem. Sand sagebrush, yucca and cholla cactus can also occur.	Mostly grass-covered rangeland with scattered areas of dry and irrigated cropland. Dryland agriculture is mostly to the north of the Arkansas River.
Mesa de Maya/Black Mesa (26f)	565	Broad mesa, knobs, and dissected plains with deep canyons. Rough, rocky, steep slopes are common.	4,500-6,200/ 75-500	Quaternary alluvium and colluvium. Capping the mesa: Tertiary basalt, 60 to 70 feet thick. Cretaceous sandstone and shale. On slopes and exposed canyons: Jurassic sandstone, claystone, mudstone, and limestone, Triassic sandstone, siltstone, and limestone.	Capulin, Torreon, Apache, Travessilla, Carnero, Fruitland, Manzano, Alicia, Kim. Rock outcrops	*Precipitation (annual)*: 14-18 inches *January min/max (°F)*: 16/46 *July min/max (°F)*: 58/90 *Frost free days*: 100-150	Pinyon-juniper woodland and shortgrass prairie. On top of the mesa: shortgrass prairie dominated by blue grama, hairy grama, sideoats grama, galleta grass, buffalograss, and western wheatgrass. On rocky slopes and in canyons: juniper with pinyon pineoak woodlands with a few isolated areas of mesquite shrublands.	Woodland, rangeland, and wildlife habitat.
Purgatoire Hills and Canyons (26g)	1,041	Dissected plains and tablelands with some hills, steep canyons, and rock outcrops.	4,900-7,400/ 100-700	Quaternary alluvium and colluvium. Cretaceous sandstone and shale. Jurassic sandstone, claystone, and shale. Triassic sandstone and siltstone. Permian siltstone, dolomite, and sandstone.	Travessilla, Baca, Manvel, Minnequa, Penrose	*Precipitation (annual)*: 12-16 inches *January min/max (°F)*: 14/46 *July min/max (°F)*: 58/90 *Frost free days*: 100-150	Juniper woodlands and shortgrass prairie. Rocky Mountain juniper, oneseed juniper, Utah juniper, blue grama, and buffalograss.	Woodland and wildlife habitat.
Pinyon-Juniper Woodlands and Savannas (26h)	997	Dissected plains and tablelands with some scattered ridges and hills.	5,100-7,100/ 100-500	Quaternary alluvium and colluvium. Cretaceous shale, limestone, and sandstone.	Travessilla, Baca, Noden, Bond, Razor, Midway, Limon, Manvel, Minnequa, Penrose, Wetmore (in west at the base of mountains). Rock outcrops.	*Precipitation (annual)*: 12-20 inches with highest near the mountains *January min/max (°F)*: 16/44 *July min/max (°F)*: 56/88 *Frost free days*: 90-120	Pinyon-juniper woodlands: pinyon pine, Rocky Mountain juniper, eastern redcedar, and oneseed juniper.	Woodland and wildlife habitat.

Level IV Ecoregion		Physiography		Geology (Surface and Bedrock)	Soil Series	Climate	Natural Vegetation	Land Use and Land Cover
Ecoregion Name (Number)	Area (Square Miles)	Physical Characteristics	Elevation (Feet)					
Pine-Oak Woodlands (26i)	580	Dissected plains and hills.	6,000-7,500/ 100-300	Quaternary alluvium and colluvium. Tertiary and Cretaceous arkosic, conglomerate, sandstone, claystone, and shale.	Brussett, Peyton, Kettle, Weld, Fondis, Bresser	*Precipitation (annual)*: 14-20 inches *January min/max (°F)*: 10/36 *July min/max (°F)*: 50/80 *Frost free days*: 90-120	Pine-oak woodlands and foothill grasslands. Ponderosa pine, Gambel oak, mountain mahogany, skunkbush, western serviceberry, and chokecherry. Gambel oak often forms a well developed understory in the Ponderosa pine forests. Grasslands include yellow Indiangrass, little bluestem, switchgrass, fescues, mountain muhly, Junegrass, bluebunch wheatgrass, needle-and-thread, slender wheatgrass, western wheatgrass, sideoats grama, and galleta grass.	Woodland, grassland, rangeland, wildlife habitat. Increasing urban and residential development.
Foothill Grasslands (26j)	1,805	Dissected and irregular plains.	5,900-7,000/ 50-200	Quaternary alluvium. Tertiary and Cretaceous arkosic conglomerate, sandstone, claystone, and shale.	Bresser, Truckton, Ellicott, Stapleton, Columbine, Cushman, Ascalon	*Precipitation (annual)*: 14-20 inches *January min/max (°F)*: 12/40 *July min/max (°F)*: 52/84 *Frost free days*: 100-150	Foothils prairie with a scattering of pine woodlands. Yellow Indiangrass, big and little bluestem, switchgrass, fescues, mountain muhly, Junegrass, bluebunch wheatgrass, needle-and-thread, slender wheatgrass, western wheatgrass, sideoats grama, and galleta grass. Ponderosa pine, mountain mahogany, Gambel oak, western serviceberry, and chokecherry in small scattered pockets.	Grassland, rangeland, some scattered woodland and cropland. Increasing urban and residential development.
Sand Sheets (26k)	566	Rolling plains with stabilized sand sheets and areas of low sand dunes.	3,500-5,900/ 25-100	Quaternary eolian sands and alluvial gravels and sands. Cretaceous shale and sandstone.	Valent, Vona, Bijou, Wigton	*Precipitation (annual)*: 10-16 inches *January min/max (°F)*: 14/46 *July min/max (°F)*: 60/88 *Frost free days*: 120-150	Sandsage prairie: sand sagebrush, sand bluestem, prairie sandreed, blowout grass, lemon scurfpea, and little bluestem.	Grassland, some shrubland and rangeland.

Source: Chapman, S.S., G.E. Griffth, J.M. Omernik, A.B. Price, J. Freeouf, and D.L. Schrupp. 2006. *Ecoregions of Colorado* (color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, Virginia (map scale 1:1,200,000). <http://www.epa.gov/wed/pages/ecoregions/co_eco.htm>. Accessed October 1, 2010.

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