# 6. Garfield County Profile

## **County Overview**

Garfield County is located on the "West Slope" in the scenic plateau and canyon county of west-central Colorado. The City of Glenwood Springs is the county seat. The county's land area is approximately 2,958 square miles. The BLM and USFS manage 62 percent of the land while 37 percent is managed by private landowners.

Adjacent counties include Eagle, Routt, Rio Blanco, Mesa, and Pitkin in Colorado, and Grand and Uintah counties in Utah. All towns and communities are located on the Colorado River or Roaring Fork River in the eastern and central parts of the county. Incorporated communities include the cities of Glenwood Springs and Rifle, the towns of Carbondale, New Castle, Silt, and Parachute, and the census-designated Battlement Mesa. The western part of the County is characterized by large ranches, few inhabitants, and few roads.

A key arterial transportation route for the State of Colorado, Interstate 70, bisects the county from east to southcentral Garfield County. Other major transportation routes include State Highways 13, 82, and 139. A railroad corridor follows closely to the pattern of I-70 through the County along the Colorado River.

Garfield County is one of the fastest growing counties in western Colorado. According to the U.S. Census Bureau, Garfield County's population in 2010 was 56,389, 57,076 in 2015, and 59,605 in 2020.

Garfield County is known for year-round recreation such as hunting, hiking, camping, sightseeing, whitewater rafting, bird watching, skiing, and snowmobiling. Other important components of the economy include oil and gas (O&G), coal extraction, agriculture, and limited manufacturing and construction activities. Agriculture and forestry sectors will experience an increase in droughts, an increase in grass and wildfire events, changes in the growth cycle as winters warm, an influx of new and damaging agricultural diseases or pests, and changes in the timing and magnitude of rainfall. The Plant Hardiness Zone map available for the United States has shifted over the past decade and changed the annual growing season and expected agricultural production conditions. Colorado and Garfield County are particularly vulnerable to increased pest pressures on agricultural and forested lands. These added stressors could have devastating economic effects if new forest management practices are not adopted. The grass, shrub, and forest vegetation types in Garfield County have adapted to a mixture of low- and high-severity fires along a broad range of historic frequencies. It is generally acknowledged by land managers and fire ecologists that a policy of fire suppression for the past 100 years has exacerbated the potential for high-intensity wildfire by increasing the density of living and dead fuels in these ecosystems.

Weather and terrain play a critical role in determining fire frequency and behavior. Steep slopes, drainages, and hill-top saddles (common in Garfield County) are conducive to extreme fire behavior. The dry climate with strong gusty winds can turn an ignition from a discarded cigarette, vehicle parked over dry grass, or lightning into a major wildfire event in a matter of several minutes.

Garfield County is a desirable place to live because of diverse ecosystems, recreational opportunities, and aesthetics. However, the County is characterized by factors that promote catastrophic wildfires that

include an abundance of vegetation-fuels, expansive occurrence of cheatgrass below 6,500 feet elevation, terrain that promotes extreme fire behavior, and weather conditions that encourage fire ignitions and rapid spread.

#### Climate

The climate of Garfield County is generally semi-arid with hot summers and cold winters. Average monthly precipitation various from a low during the winter months to high during the fall months. However, all months do receive precipitation. Gusty and sustained winds are also common throughout the County. The average wind speed reported in the county for severe wind is 58 mph.





Source: Monthly Climate Normals - High Plains Regional Climate Center, 2021

Since 1895 Colorado's overall average temperature has increased by 2.1°F. While overall temperature shifts have not been consistent, the trend for increasing temperatures is apparent. Climate modeling suggests warmer temperature conditions will continue in the coming decades and rise steadily into mid-century. This trend will likely contribute to an increase in the frequency and intensity of wildfire events, due to reduced snowpack, drought conditions, and higher temperatures. Temperature increased across the southwest region with the greatest increases in southern California and western Colorado.



#### Figure 4: Colorado Average Temperature (1895-2020)

Source: National Oceanic and Atmospheric Administration (NOAA), 2020<sup>1</sup>

Additionally, the length of the frost-free season has been increasing nationally since the 1980s. While a longer warm season may provide some additional recreational opportunities in western Colorado, concurrent changes in temperature, water availability, pest pressures, and tree mortality may exacerbate wildfire event conditions.

Since 1895, yearly annual precipitation for Colorado has decreased slightly (decline by 1.8" per century). Snow droughts can arise from a lack of precipitation (dry snow drought), temperatures that are too warm for snow (warm snow drought), or a combination of the two. Rivers and reservoir water sources are increasingly important to communities and residents in the planning area to meet water needs during periods of shortage

<sup>&</sup>lt;sup>1</sup>NOAA. 2020. "Climate at a Glance: Statewide Time Series.". Accessed October 2021. <u>https://www.ncdc.noaa.gov/cag/statewide/time-series/25/tavg/12/12/1895-</u>2020?base\_prd=true&begbaseyear=1901&endbaseyear=2000&trend=true&trend\_base=100&begtrendyear=1895&endtrendyear=2020



Figure 5: Average Monthly Precipitation

Source: NCEI, 1991-2020

Table 10: Garfield Co	unty Aver	age Montl	hly and An	nual Temp	eratures ar	nd Precipit	ation						
Climate Attribute							Month						
	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Νον	Dec	Overall Monthly Average
		-			Glenwood	Springs (	2006-202	(0					
Avg. Max Temp (F)	36.0	41.5	53.4	60.2	69.9	83.9	89.4	86.6	79.2	64.1	51.0	36.6	62.7
Avg. Min Temp (F)	12.4	18.6	26.8	32.8	39.9	48.1	54.7	52.3	44.4	33.4	23.8	15.0	33.5
Average Total Precip (in.)	1.08	1.07	1.18	1.64	1.69	0.75	1.35	1.38	1.51	1.65	0.88	1.1	1.3
					Rifl	le (2006-2	020)						
Avg. Max Temp (F)	35.9	43.0	55.7	63.3	73.6	87.8	92.4	89.4	81.1	64.9	51.8	36.6	64.6
Avg. Min Temp (F)	12.1	19.2	27.5	32.9	40.5	49.3	56.8	54.3	45.9	33.9	24.0	14.4	34.2
Average Total Precip (in.)	0.68	0.56	0.7	1.0	1.09	0.5	0.96	1.02	1.17	1.22	0.54	0.62	0.8

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Source: NOAA NCEI Climate Normals, 2006-2020

# Topography

Garfield County has considerable diversity in slope, aspect, and elevation. The flow of the Colorado River and Roaring Fork River over thousands of years has shaped the terrain of Garfield County with older flood plains increasing in elevation from the current river channel. Topographic features include plateaus, basins, mesas, and mountain ranges. Low to moderate slopes occur on the Colorado River and Roaring Fork River flood plains and plateaus while steep slopes are associated with foothills, mesas, and mountain ridges. Elevations vary from 4,941 feet along the Colorado River and other streams, such as Parachute Creek, to the high peak at Flat Top Mountain at 12,354 feet.

## Wildland Vegetation

Garfield County is home to a variety of vegetation types ranging from lodgepole pine forest (~0.1%) to shrubland (18.6%). The four largest vegetation types in the county include shrubland, pinyon-juniper forest, oak shrubland, and spruce-fir. The following figure shows vegetation types in the county.



Figure 6: Vegetation Types in Garfield County (CSFS)

Variation in vegetation within the County is caused by diversities in elevation, terrain, climate, soil, and occurrence of wildfire. Activities such as livestock grazing, mining, and infrastructure development also impact vegetation types allowing the establishment of invasive non-native plants. Ecosystem boundaries are typically characterized by gradual species transitions rather than clear-cut boundaries. Agricultural lands account for approximately 2.5% of lands in Garfield County and occur primarily around

communities and include irrigated and non-irrigated pastures, alfalfa fields, and orchards. Structures in the WUI are also a fuel source.

Existing vegetation contribute to fuel sources for wildland fire and have a direct effect on fire behavior. These vegetation types occur throughout the County and are conducive to extreme fire behavior. Each type of vegetation-fuel presents unique challenges to reduce fuel hazards. Understanding the fire behavior characteristics of different vegetation-fuel types facilitates effective fuel-management and wildfire suppression strategies.

#### **Wildfire Protection Authorities**

The wildland fire protection authorities that operate in Garfield County include seven fire protection districts, two federal interagency fire management units, and DFPC. The FPDs include the Carbondale & Rural FPD, De Beque FPD, Glenwood Springs Fire Department (FD) (herein grouped with the FPDs), Colorado River Fire Rescue FPD (previously Burning Mountain and Rifle FPD), Grand Valley FPD, Gypsum FPD, and Lower Valley FPD. The FPDs are responsible for the initial attack of wildfires on lands within their jurisdictions.

Fire Protection Authority	Apparatus
Colorado River Fire Rescue	4 type 1 engines
	z type 3 engines
	2 type 0 engines
	2 type 2 tenders
	1 mod seasonal
Carbondale & Rural FPD	2 type 6 engines
	5 type 3 engines
	2 1800-g tactical tenders
De Beque FPD	3 brush trucks
	2 4,000-g tenders
	1 3,500-g tender
	2 drop tanks
	1 structure engine
Glenwood Springs FD	4 type 1 engines
	2 type 3 tenders
	2 type 6 engines
Grand Valley FPD	3 type 6 brush trucks
	4 all-terrain vehicles
	2 type 1 engines
	1 class S2 tender
	1 class S3 tender
Gypsum FPD	1 type 3 brush truck
	1 4500 a tastical tander
	1 2600 g class A tender
	2 class A structural engines
Lipper Colorado River Interagency Fire	2 type 6 engines
Management Unit	1 type 4 engine

Table 11: Wildfire Protection Authorities Response Capabilities in Garfield County

Fire Protection Authority	Apparatus
	1 type 3 helicopter from June 1-Aug 30
Northern Colorado Interagency Fire	1 type 6 engine
Management Unit	1 enhance type 6 engine
Division of Fire Protection and Control	4 single engine air tankers available upon request
Source: EDDs	

Source: FPDs

The Upper Colorado River Interagency Fire Management Unit (UCRIFMU) and the Northern Colorado Interagency Fire Management Unit (NCIFMU) are responsible for responding to wildfires on federal lands within their jurisdictions. The UCRIFMU jurisdiction within Garfield County includes the BLM Colorado River Valley and Grand Junction Field Offices, and the USFS White River National Forest. The NCIFMU is responsible for the portion of the BLM White River Field Office that occurs in Garfield County.

Authority for wildland fire suppression on state and private lands rests with FPDs and/or the County Sheriff. DFPC can assume suppression authority under state emergency fire fund (EFF) procedures. Mutual aid agreements among the agencies provide guidance for initial wildfire attack and support during an incident. Wildfire protection within the County cannot be accomplished by solely one authority because of the complexity of land ownerships. Cooperation and coordination are keys to effective wildfire and fuels management, which is coordinated through the county's Wildfire OP.

## Values at Risk

Human welfare receives priority protection in the event of a wildfire. Economic and ecological values are secondary to human welfare, and they receive proper protection through collaborative planning as presented in this CWPP. Economic and ecological values are intermixed in Garfield County because of the economic base from the O&G industry, agriculture, tourism, and recreation. Oil and gas exploration, drilling, and extraction occurs throughout the County and is extremely important to its economy. Examples of values at risk to wildfire in Garfield County include:

- Agricultural lands
- Air quality
- Businesses and industries
- Community infrastructure
- Communication towers
- County and state parks
- Forest and rangelands
- Homes and structures
- Human welfare •
- Local economies

- Municipal water supplies
- Natural vegetation •
- Oil & gas industry •
- Recreation and tourism •
- Source water protection areas
- Transportation •
- Viewsheds •
- Watershed health and water quality
- Wildlife and aquatic habitats

Wildfires occur in all portions of the County and could have severe, long-term impacts on economic and ecological values. Catastrophic wildfire could impair water quality to Garfield County towns and communities through source water contamination. Wildfire could also impair Colorado River water quality for downstream cities, towns, and communities in Colorado, Utah, Nevada, and Arizona. The Colorado State Forest Service evaluated Values at Risk Ratings across the entire state. For Garfield

County, many of the higher at-risk classes are located near the most densely populated portions of the county exacerbating potential risks for residents.



Figure 7: Values at Risk Rating for Garfield County

## **Oil and Gas Industry**

Extensive O&G exploration, drilling, and extraction activities occur throughout the county. The O&G industry is important to the economic wellbeing of the County but does pose both positive and negative challenges to wildfire management including:

- O&G equipment or infrastructure can spark wildfire events in remote areas.
- Gas well production sites and associated infrastructure can be vulnerable to damage from wildfires.
- O&G activity and vehicle travel may occur in areas with flammable vegetation-fuels such as cheatgrass and oak brush.
- Disturbed areas are reseeded with native grasses but soil-surface disturbances may cause the increase of cheatgrass and other weeds.
- Exploration and production sites are generally in remote areas that may be difficult to reach quickly in the event of a wildfire ignition.
- Buried pipelines can pose dangerous situations to bulldozing fire breaks to contain a wildfire.
- O&G roads may serve as fire breaks in rangeland and forest vegetation and provide fast access to remote areas.

- O&G personal are frequently the first to report wildfires occurring in remote locations because of the line of sight provided by the elevated locations on hill slopes and ridge tops.
- Many O&G companies require that vehicles carry fire extinguishers to suppress small fires.
- During wildfire season, some companies have water trucks that can be made available for wildfire response.

O&G companies must adhere to fire restrictions imposed by the FPDs or federal agencies due to a combination of things such as weather conditions, fuel conditions, time of year, and personal staffing shortages. Additionally, due to permitting requirements, the FPD that has jurisdiction over the well site will have maps showing the well site and ingress and egress to that well site.

#### **Conservation Districts**

The three conservation districts in Garfield County are Mount Sopris, South Side, and Bookcliff. Conservation districts provide an important benefit to wildfire management by working with private landowners in addressing vegetation management issues such as weed abatement and the timely revegetation of disturbed sites. Conservation districts work with landowners to reduce wildfire hazards and risks through education programs such as the large and small acreage workshops. Also, appropriate soil and vegetation management are critical to provide for watershed health and water quality. Garfield County is a watershed not only for its own residents but also for all towns and cities that draw water downstream from the Colorado River. The conservation districts can also provide important information and resources for post-fire rehabilitation on private lands.







Figure 9: South Side Conservation District

Figure 10: Bookcliff Conservation District



#### **Insurance Services Office Fire Hazard Ratings**

The Insurance Services Office (ISO) provides fire and wildfire hazard assessment services for residential and commercial property insurers to help establish a standardized basis for appropriate fire insurance premiums. The ISO ratings within Garfield County range from 3 to 10 depending on proximity to fire protection (Table 9). The insurance industry surveys more than 44,000 fire-response jurisdictions regularly for up-to-date information concerning a community's fire protection services. The Fire Suppression Rating Schedule provides a standardized methodology for reviewing the firefighting capabilities of individual communities. The schedule measures major elements of a community's fire-suppression capacity and develops a numerical grading known as a Public Protection Classification. Ratings range from 1 (best) to 10 (worst). These ratings are established based on the following factors and are developed independent of any findings and conclusions stated in this CWPP:

- Fire alarms Ten percent of the overall grading are based on how well the fire department receives fire alarms and dispatches its fire-fighting resources.
- Engine companies Fifty percent of the overall grading is based on the number of "engine companies" and the amount of water a community needs to fight a fire. This includes suppression resource distribution, equipment maintenance, available personnel, and training.
- Water supply Forty percent of the grading is based on the community's water supply. In urban interface settings where a municipal water supply is available, the water supply is assessed for fire suppression capacity beyond daily maximum consumption, as well as the distribution of fire hydrants. In rural areas, documenting the ability to provide a continuous water supply to firefighting apparatus through a water tender relay may suffice.

Fire Protection District	ISO Rating
Colorado River Fire	3 within 5 miles of fire station; 5-7 miles is a 10-W; 10 elsewhere
Rescue	
Carbondale & Rural	5 in hydrant areas; 10 elsewhere
De Beque	6
Glenwood Springs	2 within 5 miles of fire station; 10 elsewhere
Grand Valley	3 within 5 miles of fire station; 10 elsewhere
Gypsum FPD	5 in hydrant areas; 8 elsewhere
Lower Valley FPD	6

#### Table 12: Garfield County ISO Ratings

Source: Garfield County FPDs