

## SECTION 2 NATURAL ENVIRONMENT

### 2.1 INTRODUCTION

Red Cliff lies at an elevation of 8,610 feet between the Sawatch mountain range west of town and the Gore range north of town and east is Ten Mile and Mosquito Range. The Eagle River flows north, then west through the center of town. Another tributary, Turkey Creek, enters at the northeast corner of the town following the natural drainage from Shrine Pass and forming a confluence at the Eagle River's western bend. Homestake Creek joins the Eagle River just west of the town.

### 2.2 TOPOGRAPHY

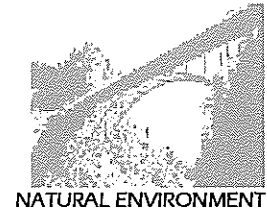
The topography ranges from moderately sloping to extremely steep with abrupt changes in elevation. The elevation varies from a low of 8,500 feet along portions of the Eagle River to 8,700 feet at the western entrance to town. The general topography of the area slopes gently to the west. Approximately one-fifth of the incorporated area has slopes in excess of 30%.

### 2.3 CLIMATE

The climate of the Town of Red Cliff varies greatly with the change of seasons. Winters are very cold with mean average temperatures in the winter months, December through February, of 17.3 degrees Fahrenheit. While the summer months are relatively mild with mean average temperature for June through August of 53.7 degrees Fahrenheit. The following table, Table 1, shows the average monthly temperatures and precipitation for the Town of Red Cliff.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. High (F <sup>0</sup> )	31	34	39	46	56	67	73	71	64	54	39	32
Avg. Low (F <sup>0</sup> )	0	3	11	18	27	34	39	38	31	22	11	3
Mean (F <sup>0</sup> )	15	19	25	32	42	50	56	55	47	38	25	18
Avg. Precip. (in)	.86	.95	1.13	1.22	1.45	1.21	1.75	1.66	1.32	0.78	0.87	0.83

Town of Red Cliff Wastewater Facilities Master Plan – Baseline Engineering Corporation, February 2005



## 2.4 VEGETATION

Vegetation around Red Cliff consists primarily of aspen and conifer woodland. Aspen stands are located outside the downtown along the southern and western end. Shrubs are sparsely scattered in the understory and include common juniper. Elk sedge and less abundant grasses are also present including slender wheatgrass south of town along the Eagle River flood plain. The aspen forest is classified as *Populus tremuloides/Carex geyeri* plant association, and is common and widespread throughout Colorado.

Conifer woodland is located at the top and slopes on the northeast side of the mountains bordering the town. Lodgepole pine and some Douglas fir also occur with an open canopy and shrub species including buckbrush are scattered through the understory. Herbaceous cover includes elk sedge, Thurber fescue, and slender wheatgrass. Shrubs are sparse among the steep rock slopes along the town boundary.

## 2.5 GEOLOGY AND SOILS

Crystalline igneous and metamorphic rocks range in age from Middle Precambrian to Late Cretaceous. Crystalline bedrock is composed of Clear Creek Granite, an unnamed migmatite, and a dorite, all of Middle Precambrian age. Both bedrock and the overlying sedimentary rocks are cut by intrusive sills and dikes of the Pando Porphyry, a quartz latite porphyry of the Late Cretaceous age.

Sedimentary rocks lie precariously on the weathered surface of the Precambrian basement rocks above the Upper Cambrian Sawatch Quartzite, a cliff-forming medium bedded, medium-grained reddish-brown quartzite. The Sawatch and overlying Paleozoic strata have been warped into a broad northwest-trending syncline broken by faults of the Homestake fault zone during the Late Cretaceous Laramide orogeny.

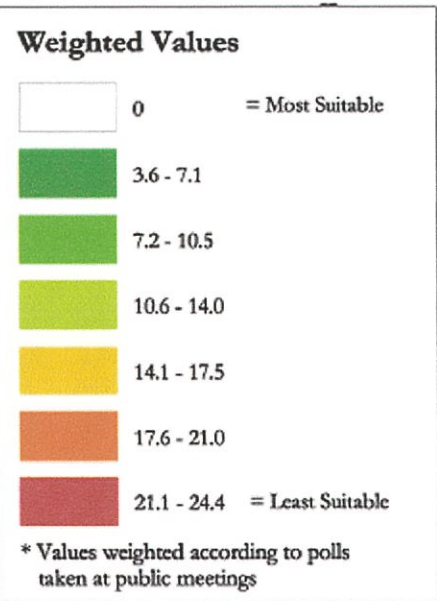
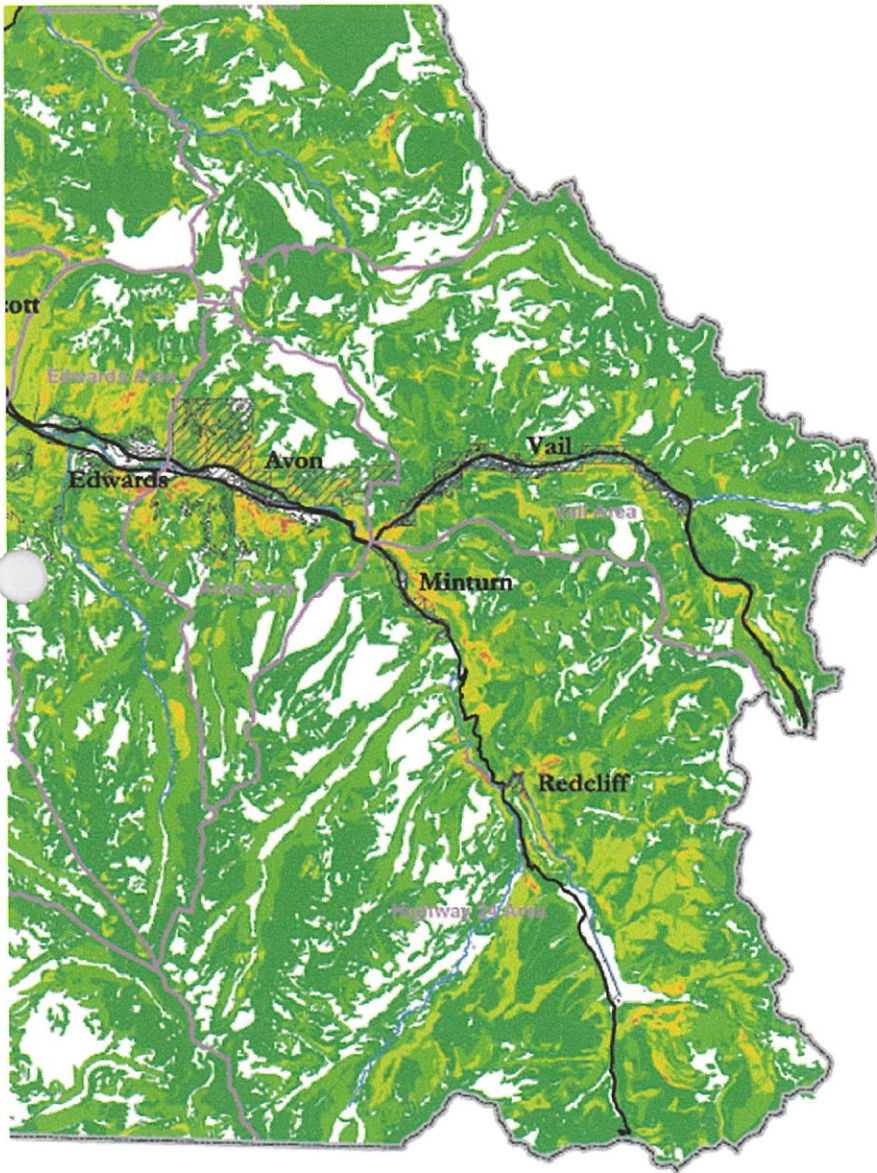
Overlying the Sawatch is a poorly-exposed sequence of brown, red, and buff dolomites and dolomitic sandstones referred to the Upper Cambrian Peerless Formation. This slope is about 100 to 150 feet thick in this area.

Above the Peerless is a second cliff-forming unit, the Upper Devonian Parting Formation. It consists of about 70 feet of massive, coarse grained quartzite with

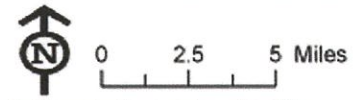


shale partings. The Parting is the lowermost of the three formations comprising the Chaffee Group.

**MAP 3: GEOHAZARD**



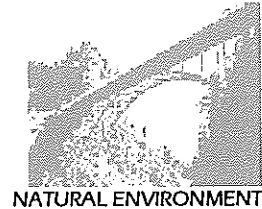
- Map Elements:**
- 100 year floodplains
  - Areas of greater than 30% slope
  - Areas with high wildfire risk
  - Areas of extensive geological hazard
  - Areas of highly erodible soils
  - Areas of rockfalls, landslides, poor slope stability, avalanches, and mine subsidence



Eagle County Comprehensive Plan  
 Source: FEMA, USGS, BLM, USFS, JF Sato, Eagle County  
 Map Produced by NWCCOG GIS and Eagle County GIS Department

**RED CLIFF MASTER PLAN  
 Town of Red Cliff, Colorado**

This map is for planning purposes and should not be used for precise measurement



A band of thin glacial till covers the Quaternary outcropping. The till is considerably weathered and was deposited during the Cedar Ridge glacial advance, just prior to 620,000 years ago. The advance appears to have dammed the former course of the Eagle River, and caused it to cut a new deep gorge through which the River and the Union Pacific Railway right-of-way now pass. The abandoned river valley segment is not occupied by Homestake Creek. Deposits of the later Bull Lake and Pinedale glaciations are prominent in nearby areas. Immediate below the Sawatch cliff is a steep slope covered by thin talus.

Soil information was obtained from a draft soil survey for a portion of the White River National Forest (USDA-USFS, 1992) The soils consist of rocky ridges and steep backslopes with slopes ranging from 15 to 150 percent. The soils are a mix of Cryoboroll on ice scoured backslopes formed in residuum, till and colluvium from mixed sedimentary and crystalline rocks, and rock outcrops as cliffs and talus.

The Cryoboroll soils are shallow to deep and well to excessively well drained. Typically the surface layer is dark grayish brown cobbly loam about 6 inches thick. The next layer is a very pale brown and very cobbly loam about 4 inches thick. The next layer is very pale brown extremely cobbly sandy loam greater than 33 inches thick. Permeability of these soils is moderate to rapid, and the available water holding capacity is low. Effective rooting depth is greater than 10 inches. Runoff is moderately rapid and the water erosion hazard rating is moderate.

## **2.6 WILDLIFE**

Wildlife Resources were evaluated following the guidelines provided by Eagle County Environmental Impact Report (EIR) and evaluated based on these Wildlife-Related Issues. Wildlife habitat corresponds to the vegetation types discussed in Section 2.4. Predominate wildlife habitats consist of aspen forest, big sagebrush shrubland, conifer woodland and rock outcrops.

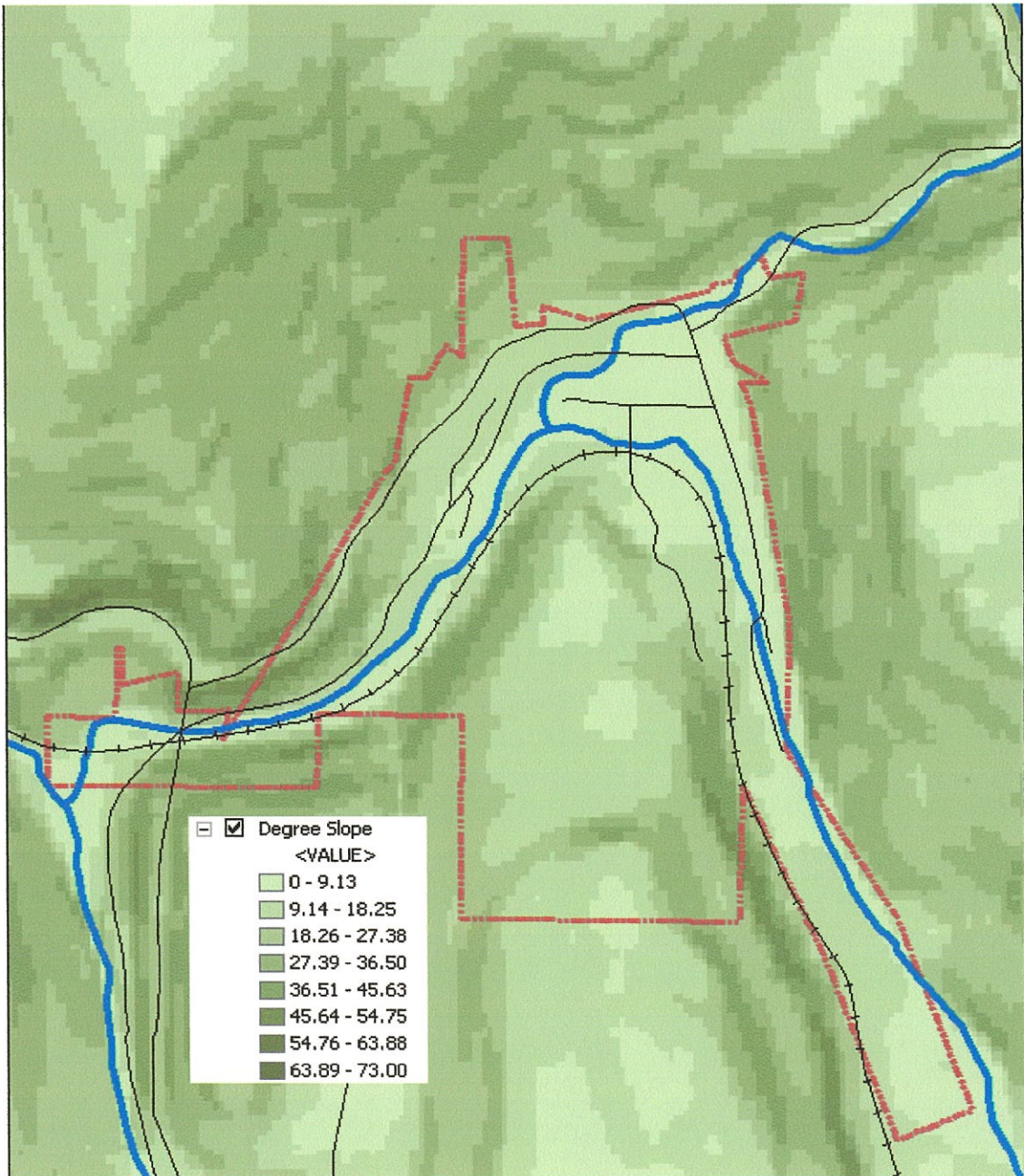
Below are brief descriptions for each of these species and an evaluation;

**Peregrine Falcon:** Peregrines migrate through western Colorado and nest on high steep cliffs generally along stream courses. Peregrine falcons migrate through western Colorado and nest in canyons and cliffs along the Colorado River and its tributaries.





### MAP 4: SLOPE ANALYSIS



### RED CLIFF MASTER PLAN Town of Red Cliff, Colorado

This map is for planning purposes and should not be used for precise measurement

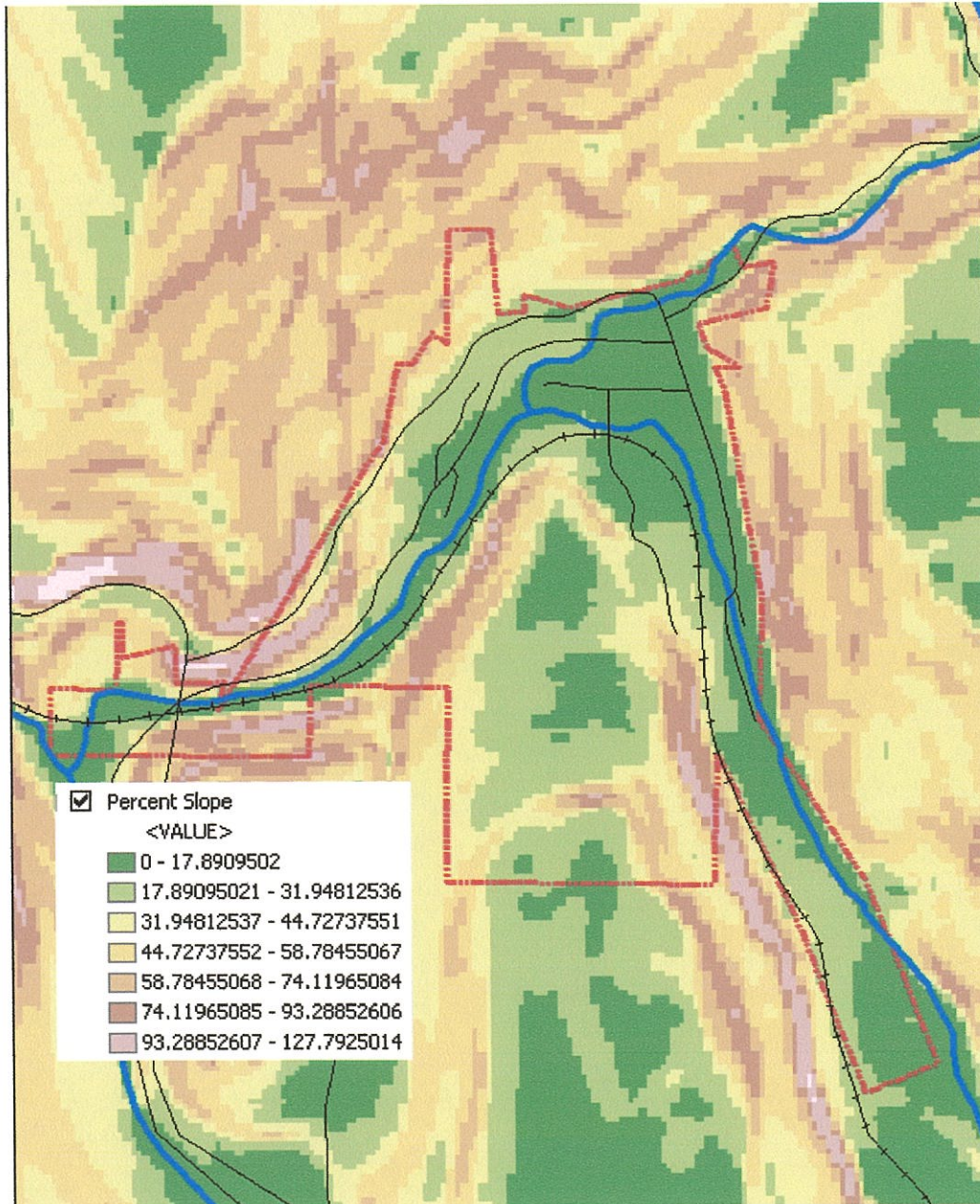


Source:  
Map Produced by NWCCOG GIS





### MAP 5: PERCENT SLOPE



### RED CLIFF MASTER PLAN Town of Red Cliff, Colorado

This map is for planning purposes and should not be used for precise measurement



Source:  
Map Produced by NWCCOG GIS



**Mexican spotted Owl:** This subspecies occurs in forested highlands and rocky canyonlands below 9,500 feet throughout the southwestern United States and Mexico. (Johnson and Johnson 1985, Ganey and Balda 1989, Boyle 1999).

**North American Lynx:** Lynx in western states live in subalpine/coniferous forests of mixed age and structural calluses. Mature forests with downed logs provide escape cover and den sites. In early 1999 the Colorado Division of Wildlife released lynx in Colorado in an effort to reestablish breeding populations in the state.

**Northern Goshawk:** The northern goshawk is the largest North American member of the genus *Accipiter* and inhabits coniferous, deciduous, or mixed forests. Nesting stands typically have a high degree of canopy closure and are often located on northern aspects (Reynolds 1989). Suitable nesting habitat is critical to the reproductive biology of goshawks. Nest areas are frequently reused for years and many goshawks have between two and four alternate nest areas within their home range. Nest areas are occupied by breeding goshawks from early March until late September (Reynolds et al. 1992).

**Big Game:** Big game species potentially occurring around Red Cliff include Bear, Mountain Lion, American elk, mule deer, and big horn sheep. Elk are the most common big game species found in the area.

**Small Game and Furbearers:** Small game species occurring in the area are the mountain cottontail, raccoon, shrews, moles, rats, mice, bats, chipmunks, squirrels, muskrat, beaver, marmot, porcupine, martin, skunk, otter, fox, coyote, and bobcat. The most common area of occurrence is in shrubby vegetation along moist drainage, particularly on the south end of Red Cliff along the Eagle River in the grassy areas of the flood plain along with rodent and ground squirrel species are prey for raptors and a variety of terrestrial predators expected to occur on or near the river.

The Eagle River and its tributaries are mapped as suitable habitat for the river otter, a state threatened species.

**Raptors:** A database search of the CDOW Wildlife Resource information Service and the Colorado Breeding Bird Atlas (Kingery 1999) indicated that approximately 12 species of raptors (birds of prey) potentially occur in the vicinity of the town. These include golden eagle, red tailed hawk, northern harrier, prairie falcon, Peregrine Falcon, American kestrel, Cooper's hawk, sharp-shinned hawk, northern goshawk, great horned owl, boreal owl, flammulated owl and northern saw-whet owl. Many of these species are

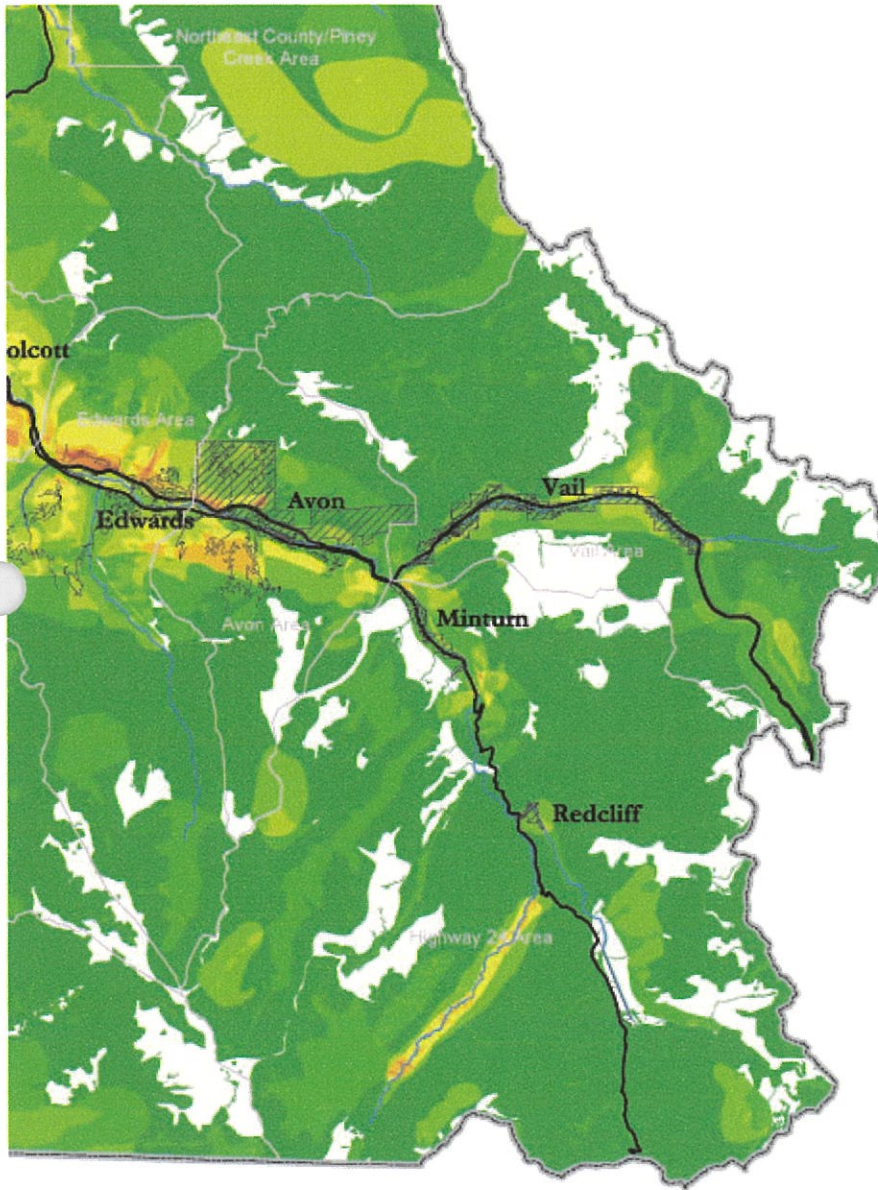




NATURAL ENVIRONMENT

infrequent spring and fall migrants that occasionally pass along the Eagle River Valley.

**MAP 6: WILDLIFE HABITAT**



**Weighted Values**

0	= Most Suitable
3.8 - 7.6	
7.7 - 11.3	
11.4 - 15.1	
15.2 - 18.9	
19.0 - 22.6	
22.7 - 26.4	
26.5 - 30.1	
30.2 - 33.9	
34.0 - 37.7	= Least Suitable

\* Values weighted according to polls taken at public meetings

**Map Elements:**

- Habitat for Elk, Mule Deer, Black Bear, Bighorn Sheep, Mtn. Lion, Lynx, Bald Eagle, Sage Grouse, and Peregrine Falcon
- Highway crossing areas
- Colorado Natural Heritage Program conservation areas
- Riparian Areas



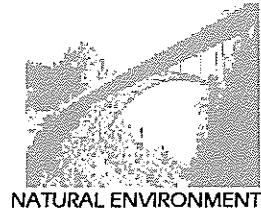
0 2.5 5 Miles

Eagle County Comprehensive Plan  
 Source: CDOW, CSU, USFS, BLM  
 Map Produced by NWCCOG GIS and Eagle County GIS Department

**RED CLIFF MASTER PLAN  
 Town of Red Cliff, Colorado**

This map is for planning purposes and should not be used for precise measurement





## **2.7 HYDROLOGY**

The town has two established points of diversion. The first is on the Eagle River; the second is along Turkey Creek. The confluence of these two rivers lies within the town. At the present time, the town draws water at a point on Turkey Creek a short distance uphill from town. If the creek were blocked by a slide, then the water supply of the town would be cut off, although the Eagle River would still be flowing. As noted previously, a geologically recent landslide occurred west of the Red Cliff Area diverted the Eagle River west of its former position.

## **2.8 VISUAL ANALYSIS**

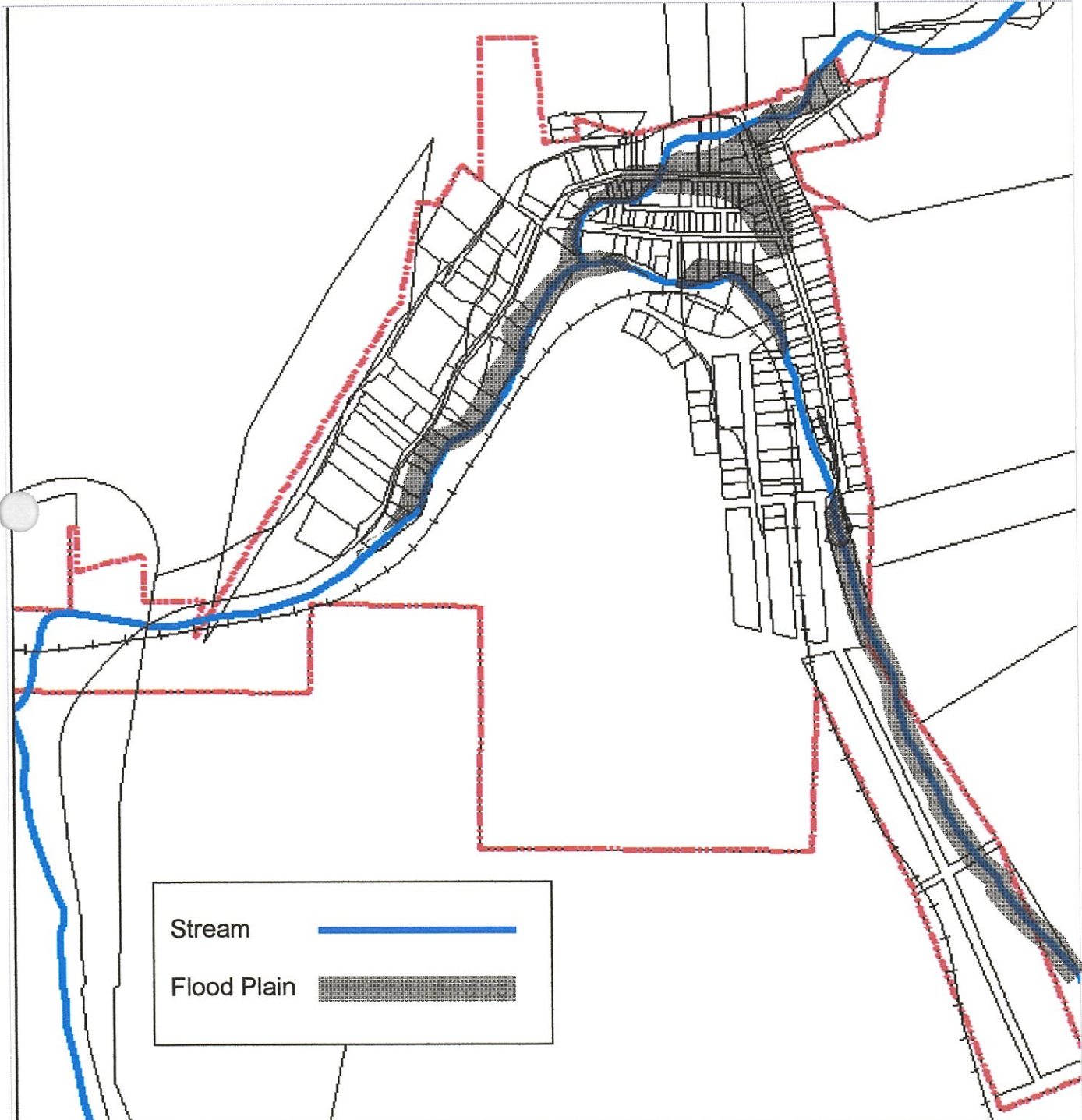
An important feature that contributes to the quality of life in Red Cliff is its location and proximity to the mountains plus the sense of historical place within the context of settling and pioneering the mining industry in the Colorado mountains.

A visual analysis dividing the town into units has been prepared for Red Cliff. These units were then studied to determine which factors gave an area a sense of visual character. The criteria used to define such areas were based on a number of elements, including the identification of visual corridors, view sheds, types of views. For example, long, short, panoramic filtered, and enclosed. The following is a listing of the visual units that discusses the predominant characteristics of each area on Map 9.



NATURAL ENVIRONMENT

### MAP 7: FLOODPLAIN HAZARDS



### RED CLIFF MASTER PLAN Town of Red Cliff, Colorado

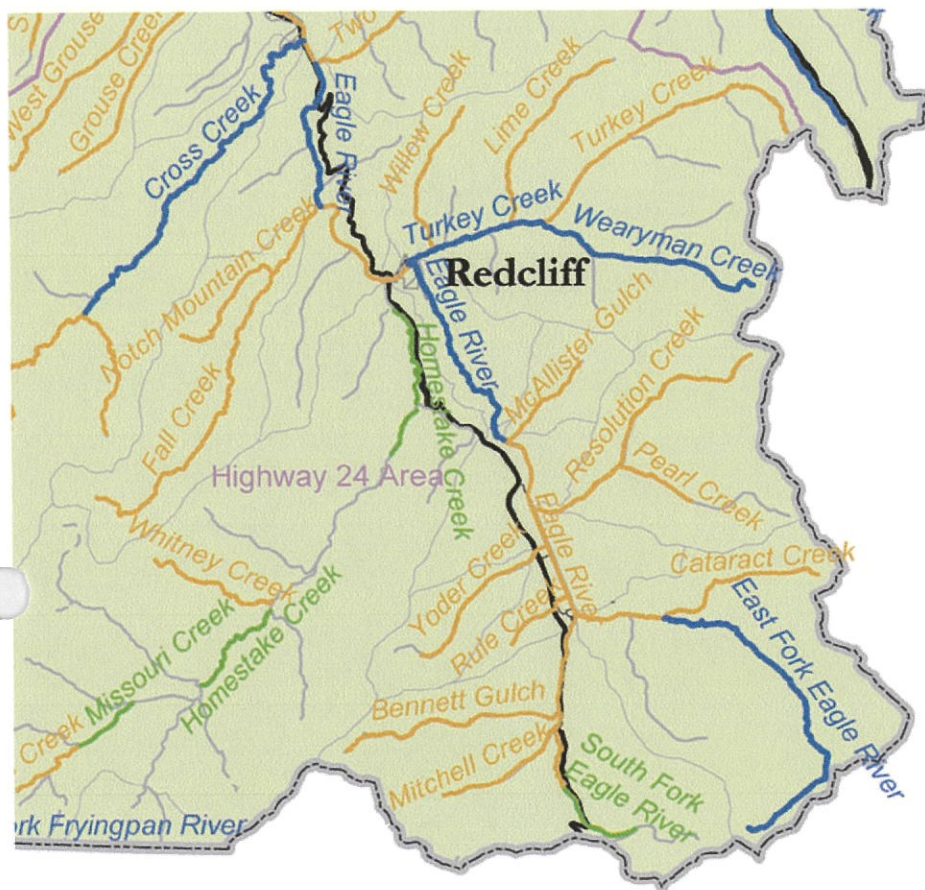
This map is for planning purposes and should not be used for precise measurement



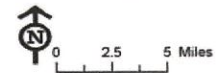


NATURAL ENVIRONMENT

**MAP 8: STREAMFLOW MONITORING STATUS**



- Streams with CWCB Legal In Stream Flow Rights and Monitoring Data
  - Streams with Data but No CWCB Legal Rights
  - Streams with CWCB Legal Rights but No Known Data
  - Small Watershed Boundaries
- Large Watersheds**
- Colorado Headwaters
  - Eagle
  - Roaring Fork
- CWCB = Colorado Water Conservation Board

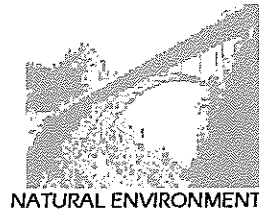


Eagle County Comprehensive Plan  
 Source: CWCB, USGS  
 Map Produced by NWCCOG GIS and Eagle County GIS Department

**RED CLIFF MASTER PLAN  
 Town of Red Cliff, Colorado**

This map is for planning purposes and should not be used for precise measurement

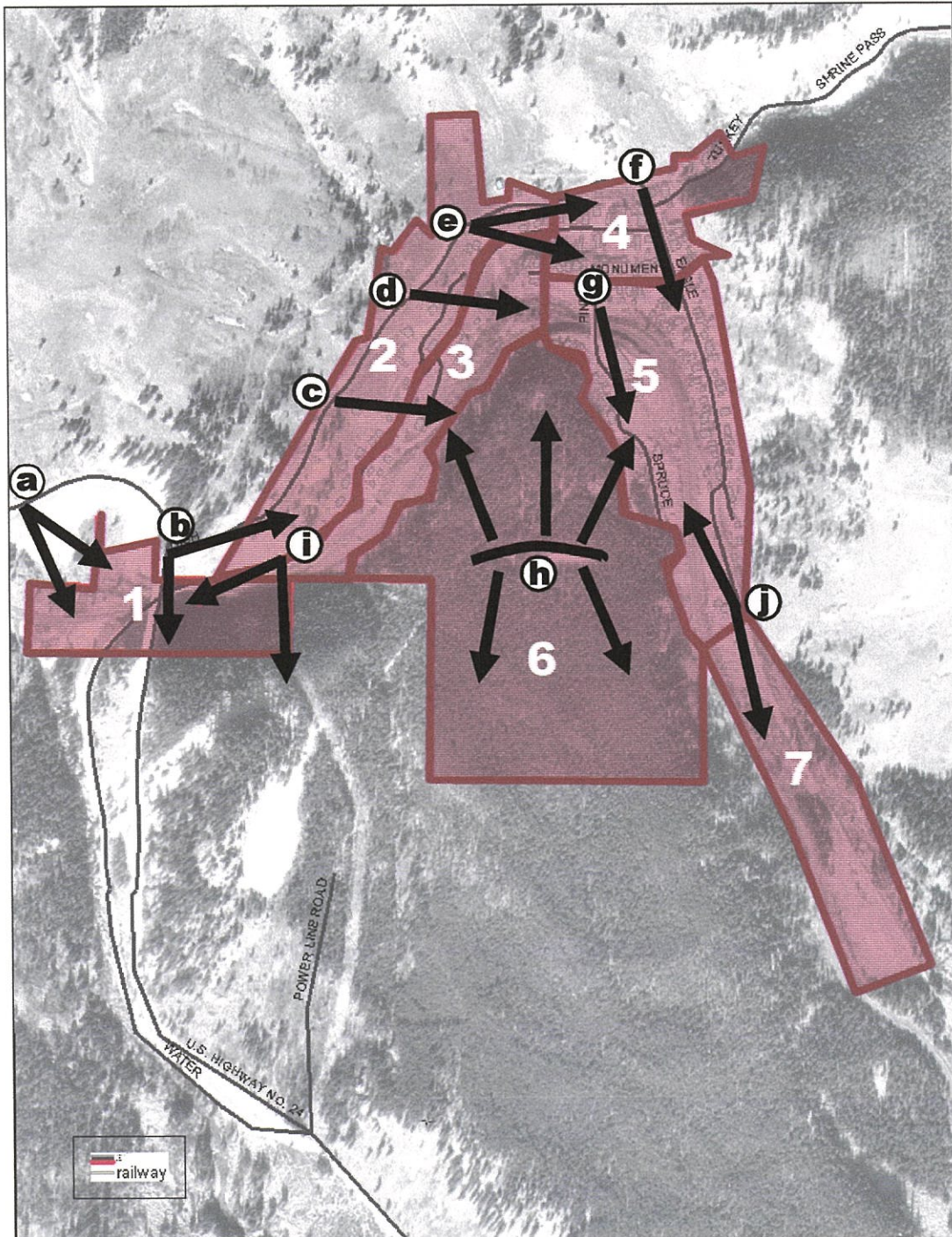




- #1 This is an area of unique visual character since it forms the foreground plane for views from Highway 24 descending from Battle Mountain summit onto the Red Cliff bridge spanning across the Eagle River and the steep canyon walls along with dramatic 180 degree topographic views.
- #2 The visual quality of contrasts is enhanced while entering Red Cliff driving along the High Road with steep cliffs on the left and a conifer forest clinging to the rock face of the canyon on the right.
- #3 The visual quality of this unit is quite diverse as significant changes in topography are viewed from the bottom of the canyon. Looking up to the west, south and north a feeling of enclosure is strong as Water Street runs under the Red Cliff Bridge showing spectacular views. However, over the past 10 years, a mixed and eclectic style of architecture, specifically single family homes, have dominated the historical architectural style within the older neighborhood.
- #4 The visual character of the downtown is observed of this unit by the urban area of Red Cliff which has a rather open and loose visual character contrasting with the formal and linear appearance of Eagle Street slicing through the informal layout of houses and businesses along Eagle Street, Water Street, and Monument Street. The vacant lots, open space, and variety of setback distances from these streets in this unit help create this feeling. Recently, there has been a positive trend of new construction that has been filling the vacant lots downtown with a compatible architectural style that is more historical with the present downtown. Older structures are also being remodeled and painted. Size and style of buildings and homes reinforce a sense of human scale.
- #5 This area expresses a horizontal openness along a flat shelf created by the Eagle River which Eagle Street travels over, but it also has a contained, vertical visual character by the steep hillside rising sharply east of Eagle Street and to the west up to a geological prominence where the town cemetery is currently located.
- #6 The visual character of this area is open views in terms of surrounding mountains 180 degrees east and north of the downtown. The best views toward the meadow located southeast of the downtown and the cliffs rising above the railroad grade southeast of the town.



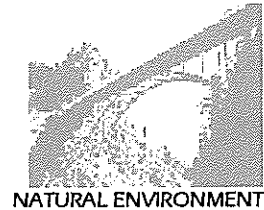
**MAP 9: VISUAL ANALYSIS**



**RED CLIFF MASTER PLAN  
Town of Red Cliff, Colorado**

This map is for planning purposes and should not be used for precise measurement



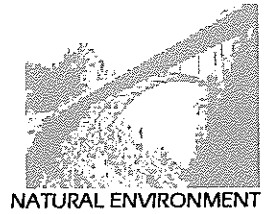


- #7 This view forms a foreground plane and gives a sense of visual enclosure. Primary views from here are to the open space to the north and northwest of the town along the Eagle River flood plain. The drainage area for the Eagle River forms a unique visual corridor. The unit is rather enclosed forming a tight visual space with a substantial steep hill side slope. Downstream, the corridor becomes less confined and the character of views becomes open and diffuse. This area is rather open in terms of visual character. Views follow the canyon and to the meadow located northwest of the southern town limits and the southern face of Battle Mountain.

#### Directional View Analysis

- a. This is a directional view from Highway 24 descending from Battle Mountain summit onto the Red Cliff Bridge spanning across the steep canyon walls above the Eagle River.
- b. A sense of anticipation and exploration happens as the bridge approaches and the view divides looking left down toward the Town of Red Cliff and looking right driving south across the Red Cliff Bridge to Tennessee Pass.
- c. Views along High Street approaching Red Cliff looking to the right and south across the canyon created by the Eagle River
- d. Views along High Street approaching Red Cliff looking to the right and south across to the steep canyon walls and escarpment created by the Eagle River
- e. Views looking down over the roofs of downtown Red Cliff and ahead (anticipation of entry) while traveling along High Street turning onto Eagle Street.
- f. A sense of entry into Red Cliff Downtown as the road turns right and approaches onto Eagle Street
- g. Location at the intersection of Monument Street and Spruce looking up and across the bridge over the Eagle River towards the Town Hall and the Red Cliff Cemetery.
- h. A unique 360 degree view from the Red Cliff Cemetery, back towards the downtown and the dramatic cliffs lining the Eagle River.





- i. Major views looking up at the steep cliffs and the Red Cliff Bridge west of downtown from Water Street at the bottom of the Eagle River canyon.
- j. Views looking north and south along a corridor of rugged topography and steep mountain slopes cut and formed by the Eagle River drainage from the headwaters to the south and through town to the north.