

CHAP. 3 — AFFECTED ENVIRONMENT

7. Excavations and structures associated with gilsonite mining
8. Prospect holes associated with mining and exploration for gilsonite and shale oil
9. Cemeteries and graves
10. Right-of-way structures, excavations, artifacts associated with the "Gilsonite Railroad"
11. Supporting services structures associated with the "Gilsonite Railroad"
12. Sites, artifacts associated with sheep and cattle ranching
13. Ute rock art sites: Uncompahgre reservation period
14. Ute dwellings and resource acquisition/processing activities
15. Euro-American rock art sites
16. Modern (1930-present) recreation sites
17. Unknown function/ethnic affiliation sites

The archaeological sites associated with human activities during the historic period appear to be oriented toward historical themes. These are:

1. Architecture
2. Civilian Conservation Corps/work project
3. Commerce/industry
 - a. Gilsonite/oil shale mining
4. Engineering
5. Ethnicity
6. Farming/ranching
7. Military/Indian conflict
8. Native American
9. Recreation
10. Transportation: Railroad/stage/ferry
11. Waterworks

Most sites in the BCRA are in fair to good condition (greater than 50 percent of their contents undisturbed). Erosion and vandalism are the two most common disturbing factors, followed by excavation/collection (Phillips 1984).

PALEONTOLOGY

"Highly significant fossils are found in many places throughout the Vernal District. Some world-known localities, as well as some North American mammal-age type localities are found in the Vernal District" (Robinson 1978).

Numerous paleontological finds and sites have been discovered by archaeologists and/or paleontologists while performing work on lands administered by the BLM. These finds are usually connected to clearances for energy development and BLM range projects.

There are at least 20 geologic formations present in the BCRA. They range in time from the quarternary pleistocene to Pennsylvannian period formations. A large variety of environments provided habitats for diverse populations of aquatic/terrestrial plants and animals. Two formations, the Uinta and Green River, comprise two-thirds of the area of the planning units. Quaternary period deposits dominate the river-tributary systems while the remaining 17 are folded into the mountainous northeastern portion of the planning unit.

The known fossil assemblage in the Uinta Basin has enabled paleontologists to construct a reasonably accurate history . . . covering a several million-year span including evolutionary changes, climatic regimes, and appearance and extinction of life forms. For example, the earliest record of camels and ducks comes from the Uinta Basin. The Cenozoic era (the last 65 million years) has been divided into the shortest recognizable time intervals on the basis of fossil mammals. Two of these time intervals for North America, the Uintan and Duchesnean, are based on fossil mammals from the Uinta Basin.

The Duchesne River formation lies below the surface alluvium. Fossils are rare and not commonly encountered in this formation. However, when encountered, they are likely to be highly important because of their rarity (BLM 1982).

A variety of reports on this area have been completed. A complete list may be obtained by request from the Vernal District.

SOCIOECONOMICS

The format for this section includes an overview of the affected area, followed by a more detailed discussion of the significant economic considerations that pertain to the planning issues. The methodologies and computations that were used for the affected environment are discussed in Appendix 12 (Methodology for the Economic and Social Analysis).

Economic Conditions

This section focuses on Uintah and Duchesne counties in Utah and the communities of Dinosaur and Rangely in Colorado.

Statistics show that mining (mineral development) is the most important private industry in Uintah county. Growth in this industry was primarily responsible for the county's 62 percent population increase between 1970

CHAP. 3 — AFFECTED ENVIRONMENT

and 1980. Mining directly accounts for nearly 23 percent of the employment and 36 percent of the income in the county (see Table 3-5, Personal Income and Employment — Uintah and Duchesne Counties, 1981). Other sectors, which contribute to employment and support of the local economy include: the Federal government which accounts for five percent; manufacturing, which accounts for two percent; agriculture, which accounts for six percent; tourism, accounts for all undefined parts of the total county employment.

The 1980 Uintah County population was 20,506 (Tables 3-6, Summary of Regional Infrastructure Conditions and 3-7, Baseline and Interrelated Population Growth). About 31 percent of the county's population live in Vernal (1980 population of 6,600), which serves as the regions retail and service center.

Duchesne County has a similar economic base to that of Uintah County, however, it is more dependent on mining (Table 3-5). Growth in the petroleum industry was primarily responsible for the county's 72 percent population increase between 1970 and 1980. Thirty percent of the employment and nearly 44 percent of the income is directly attributable to mining. Duchesne County also has a small manufacturing sector (four percent of employment) and Federal government sector (seven percent of employment). Another sector which generates local employment is agriculture (12 percent of local employment). Tourism accounts for all of the undefined parts of county employment.

The 1980 Duchesne County population was 12,565. Duchesne (1980 population of 1,677), Myton (1980 population of 500), and Roosevelt (1980 population of 3,842) are the largest communities in the county (USDC 1981).

The town of Rangely, Colorado, (1980 population of 2,615) is located 20 road miles east of the resource area (USDC 1981). The community's economic base is primarily energy related. Growth of this base industry has resulted in a 33 percent population growth between 1970 and 1980.

The town of Dinosaur (1980 population of 410) is located 3 miles east of the BCRA (USDC 1981). The community's economic base is primarily agricultural and energy-related. Because of it's location directly south of Dinosaur National Monument and on U.S. Highway 40, tourism also plays a part in it's economy.

Summary data on the region's existing infrastructure conditions are contained in Table 3-6. Generally, the area is upgrading its infrastructure to meet the needs of existing and projected baseline populations.

A housing shortage in Uintah County was indicated by low vacancy rates and higher than average housing prices in 1980 and 1981. By 1983, this housing shortage was alleviated through continued housing construc-

tion and a slump in the oil and gas industry. Housing shortages have also been serious in the town of Rangely because public land surrounding the city has limited expansion and has resulted in inflated land prices which, in turn, has discouraged new housing construction.

Many of the schools in Uintah County have been operating over capacity. Three schools have been operating at 150 percent over capacity, and one school at 256 percent over capacity. To help alleviate the problem, two new elementary schools were opened in 1983. A new high school is under construction in Vernal and will be completed in 1986.

Both Duchesne and Uintah Counties have existing shortages of medical personnel, particularly for mental health care. They also have deficient jail space. Uintah's jail does not comply with Federal and State standards; however, a new expansion project should be completed during 1984.

Vernal and the surrounding area's water system is operating at 50 percent over capacity. Two new water systems are presently being developed. The sewer system is also operating over capacity; however, a new system with a 40,000 person capacity is now being installed. The town of Dinosaur has begun construction on a central sewer system designed for a 2,000 person capacity.

In general, the counties and communities in the area have been able to handle the added expenditures necessitated by growth in the 1970s and have adequate debt available to handle additional fiscal burdens (Table 3-8, Summary of Fiscal Conditions for Affected Counties and Communities).

Fifteen percent of Uintah County and eighteen percent of Duchesne County is Uintah and Ouray Indian Reservation land (USDA 1983). The reservation has a checkerboard land ownership distribution over which the tribal committee has jurisdiction as a politically distinct unit. Approximately 4,100 American Indians reside in Duchesne and Uintah county (USDA 1983). Only an estimated 50 percent of the tribe's potential work force is employed (Utah 1983). Few Indians are employed in energy-related developments. Lack of employment opportunities has led to outmigration.

There is an existing housing shortage on the reservation and many existing housing units are in deficient condition. The tribe's water system distributes water to a number of non-Indian communities including Ft. Duchesne, Myton, and Ballard. Demands on the system already exceed its present capacity.

The reservation also has it's own police force and health care facilities.

The Ute Tribe's largest sources of revenue are bonus, lease, and oil and gas royalty monies. Grants

Table 3-5

Personal Income and Employment
 Uintah and Duchesne Counties 1981
 (By Place of Work)

	UINTAH COUNTY		DUCESNE COUNTY	
	Earnings (Percent)	Employment (Percent)	Earnings (Percent)	Employment (Percent)
Agriculture	2	2	3	3
<u>TOTAL AGRICULTURAL</u>	<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>
Mining (Mineral Developments)	36	23	44	30
Construction	4	4	5	4
Manufacturing	1	2	5	4
Transportation and Public Utilities	10	7	7	5
Wholesale Trade	5	4	6	6
Retail Trade	8	13	7	14
Finance, Insurance, and Real Estate	2	2	2	2
Services	23	27	7	7
Other	-	-	-	-
<u>Total Private Industry</u>	89	83	82	72
Federal Government	3	5	4	7
State and Local Government	6	11	10	18
<u>Total Government</u>	9	16	14	25
<u>TOTAL NONAGRICULTURAL</u>	<u>98</u>	<u>98</u>	<u>97</u>	<u>97</u>
Unemployment (Fourth Quarter, 1983)		7.8		8.0
	(Dollars)	(Job)	(Dollars)	(Jobs)
Total Employment and Earnings	\$148,435,000	10,238	\$ 88,355,000	6,069
Total Personal Income (By Place of Residence)	\$195,717,000		\$106,001,000	
Per Capita Personal Income	\$ 9,058		\$ 8,520	

Note: Because of rounding, numbers are not additive.
 Total and percentage income figures include wage, salary, and proprietors' income. Total employment figures include wage, salary, and proprietors' employment, whereas the employment percentage figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated.

Sources: USDC 1983; UDES, 1984.

Table 3-5

Summary of Regional Infrastructure Conditions

Socioeconomic Development Category	Duchesne County	Utah County	Community of Rangely	Community of Dinosaur
Population (1980)	12,565	20,506	2,615	410
Infrastructure				
Housing				
Single family	2,622	4,893	492	83
Multi-family	142	253	85	0
Mobile homes	1,116	1,261	240	325
Hotel	249	574	100	33
Education				
Students	4,247	6,478	511	108
Present capacity	4,886	6,143	980	175
Teachers	185	223	N/A	N/A
Health Care				
Hospital beds				
General & long term	32	36	28	9
Medical personnel				
Doctors	N/A	11	3	9
Dentists	N/A	10	1	9
Nurses	N/A	N/A	10	9
Medical health care Personnel				
Personnel	5	N/A	N/A	9
Public Safety				
Law Enforcement				
Police officers	22	39	2	1
Patrol cars	8	21	5	2
Jail space (units)	36	27	N/A	N/A
Juvenile holding cells	0	N/A	N/A	N/A
Emergency Medical Services				
Ambulances	N/A	2	2	9
Emergency medical technicians	51	35	11	9
Utility Service Demands				
Water System				
Connections	1,789	6,215	714	N/A
Supply (10 ⁶ gallons/year)	2,263	3,723	658	N/A
Storage (10 ⁶ gallons/year)	1,789	1,205	365	.4
Sewage System				
(10 ⁶ gallons/year)	803	986	732	N/A
Solid Waste				
Acres/year	2.8	4.4	.7	NA

Source: Utah 1983; Argonne 1983

N/A: Not Available

Dinosaur's health care needs are catered by Rangely.

Table 3-7

Baseline and Interrelated Population Growth

	1980		1985		1990		1995		2000	
	Base	Other	Base	Other	Base	Other	Base	Other	Base	Other
Duchesne	12,565	17,778	4,965	18,632	9,542	18,684	12,333	18,292	14,910	
Roosevelt CCD	9,714	13,695	4,897	15,057	9,404	15,005	12,190	14,636	14,701	
Roosevelt	3,842	5,416	3,428	5,995	6,582	5,934	8,533	5,789	10,291	
Myton	500	705	171	775	329	773	427	754	515	
Unincorp. Area	5,372	7,574	1,298	8,287	2,493	8,298	3,230	8,093	3,895	
Duchesne & So. & No.										
Duchesne CCD ²	2,851	4,083	68	3,575	138	3,679	143	3,656	209	
Uintah	20,506	25,730	18,940	29,326	34,690	29,863	44,174	28,985	52,445	
Uintah-Ouray										
CCD	4,338	5,061	445	5,699	830	5,730	926	5,565	1,027	
Ballard	558	775	223	966	416	976	464	926	514	
Unincorp. Area	3,780	4,286	222	4,733	414	4,754	462	4,639	513	
Vernal CCD	16,168	20,653	13,858	23,611	32,011	24,117	43,041	23,404	51,209	
Vernal	6,600	9,291	6,165	11,065	13,918	11,369	18,786	10,941	22,328	
Unincorp. Area	9,568	11,362	12,330	12,546	19,942	12,748	24,462	12,463	29,090	
Bonanza ¹		16	4,637	16	1,849	16	207	16	209	
Moffat-Rio Blanco		24,255	1,176	28,345	3,004	27,646	3,837	28,144	4,518	
Dinosaur	410	501	517	405	1,367	425	1,744	437	2,055	
Rangely	2,614	3,193	659	3,993	1,637	3,805	2,093	3,962	2,463	
Grand	8,241	9,850	691	10,570	834	10,324	915	9,676	919	
Thompson CCD	326	380	691	366	834	366	915	365	919	
Moab CCD	7,915	9,470	-	10,204	-	9,958	-	9,311	-	
Daggett Co., Utah & Mesa Co., Colo.			1,510		1,198		1,731		2,185	

Note: Daggett County, Utah and Mesa County, Colorado are not within the affected area as the term is used in the text.

¹Bonanza does not correspond with any official census area, but is roughly the area delineated by the BCRA.

²CCD = County Census Division

Table 3-8

Summary of Fiscal Conditions for
Affected Counties and Communities

	<u>Average Annual Revenues (Thousands)</u>	<u>Average Annual Expenditures (Thousands)</u>
Duchesne County	4,874	4,209
Duchesne	423	343
Roosevelt	2,355	2,175
Uintah County	17,787	14,905
Ballard	68	68
Naples	653	652
Vernal	4,604	4,660
Dinosaur	143	80
Rangely	1,293	1,351

Source: State 1983

Table 3-9

Uintah County's 1982 Mining Employment Breakdown
(By Place of Employment)

	<u>Average Employment</u>	<u>Percent</u>
Oil and Gas Production and Field Services	1,460	71
Oil Shale	160	8
Tar Sands	0-10	a
Gilsonite	160	8
Sand and Gravel	20-49	1-2
Metal Mining	0-10	a
Miscellaneous	203-252	10-12
Total	2,052	100

Source: USES 1983; Haslem 1983; Carlburt 1983; Godlove 1983; Geokinetics 1983.

^aLess than 1 percent

CHAP. 3 — AFFECTED ENVIRONMENT

and contracts are the second largest source of revenues. Because the tribe cannot levy property taxes, energy developments which take place outside the reservation increase infrastructure-related costs and do not increase tribal revenues.

A number of other businesses depend on the mining industries to purchase their services and products, and many retail and service businesses depend on the workers to spend locally. The mining sector is comprised of oil and gas exploration, production, and field services, phosphate mining, gilsonite mining, oil shale development, and sand and gravel extraction. Employment by activity is identified in Table 3-9 (Uintah County's 1982 Mining Employment Breakdown).

Employment in the oil and gas sector is highly variable. Since 1980, the area has experienced both a minor "boom" and a minor "bust" in exploration work. The Vernal area has been somewhat cushioned from these "boom/bust" cycles because it has become the center for oil and gas field service companies which are a more stable source of employment.

Two companies are active in the shale oil business and there is one small tar sand operation in the area which employs less than 10 people.

Local units of government receive property tax revenues from mining equipment, mining facilities, and sales and property tax revenues from employees directly employed in the mining industry. Only Uintah County receives property tax revenues from mining equipment and facilities which are located within the BCRA.

Of the 39 livestock operations using BCRA forage, 21 are cattle operations and 18 are sheep operations. Fifty-three percent of these operators live in Uintah County, 5 percent in Duchesne County, and another 38 percent live in western Colorado.

Livestock operators have been grouped by herd size Table 3-10 (Livestock Operations by Herd Size). Based on the average budgets of the varying operators, most operators should be able to cover their long-term costs. However, many ranching operations differ in degree of indebtedness, operating cost, and size of operations, suggesting that some operators may not be able to meet long-term or cash costs. The returns to smaller operators have generally been too small to be the sole source of their income; few operators have earned a fair market return for their investments and land through their farm income. However, escalating farm real estate values between 1970 and 1981 have been contributing to fair market returns (Hughes 1983; Duncan 1983). Aggregate ranch budget statistics are summarized in Table 3-11 (Aggregate Costs and Returns for Operators Who Use Book Cliffs Resource Area Forage).

Grazing fees represent a minimum value for public forage; however, the grazing fee is not determined

through the market and is generally accepted as lower than its true economic value (USDA, USDI 1977). Although the forage quality, season of use, and added services make comparisons between BLM forage and privately leased forage questionable, private lease rates still provide one of the best measures of value. Utah's private lease rate averaged \$7.24 per AUM in 1982 (USDA 1983). There are a number of other indications that the value of public forage in the BCRA is close to the \$7.24 per AUM figure (Gee 1981; USFS 1980). Using the \$7.24 figure, the estimated annual value of livestock forage provided by the BCRA is \$484,935.

Although BLM does not recognize a capitalized value for grazing preferences, the market does recognize a capitalized value whenever grazing fees are lower than their true economic value (Gardner 1962). If a permit's value averages \$60 per AUM, and the entire permit value is capitalized in the ranch's value, then grazing privileges in the BCRA account for \$6,174,900 or 20 percent of the aggregate ranch value of operators using BCRA forage. Since grazing privileges can affect both base property values and rancher income, changes in grazing privileges could also affect ranchers ability to obtain loans.

Recreation activities within the BCRA include hunting, fishing, river floating, dispersed ORV use, camping, sightseeing, and Christmas tree cutting. In 1982, there were 7,200 recreation days spent in the resource area (excluding hunting days), which generated \$324,000 in expenditures. Hunters contribute to the local economy through their hunting-related expenditures. In 1982, big game hunting amounted to approximately 6,770 hunter days and accounted for \$304,650 in expenditures.

Social Conditions

The area was largely settled by "Mormon" colonizers, most of whom had small land holdings. They formed small, mostly rural villages which, because of their common religious beliefs, were close-knit communities.

A dominant emphasis in these communities included personal independence, local government and belief in progress and the development of natural resources (Centaur 1979). Although not as dominant today, many of these cultural values still hold true.

Energy-related development has brought significant growth to the Uintah Basin. As a result, traditional farming and ranching communities have lost some of their cultural identity (Utah 1983). Political, social, and economic diversity have increased. Energy-related developments have created jobs, brought new people to the area, and have created a diverse retail and service sector. Growth has forced the area to establish outside linkages with State and Federal agencies and has shown the regional ability to coordinate its efforts in response to impending problems.

Table 3-10

Livestock Operations By Herd Size

<u>Livestock Operators</u>	<u>1-99 Cows</u>	<u>100+ Cows</u>	<u>100+ Cows Yearlong</u>	<u>Sheep All</u>
Number of Operators	10	1	10	18
Average Herd Size	52	201	847	2,780
Aggregate Herd	520	201	8,470	50,040

Table 3-11

Aggregate Costs and Returns for
Operators Who Use Book Cliffs Resource Area Forage

	<u>Cattle</u>	<u>Sheep</u>	<u>Total</u>
Gross Revenues	\$2,415,282	\$3,585,258	\$6,000,540
Cash Cost	1,441,458	1,509,804	2,951,262
Returns Above Cash Cost	973,824	2,075,454	3,049,278
Returns to Family Labor and Investment	526,204	1,719,522	2,245,726

Source: Gee 1981.

CHAP. 3 — AFFECTED ENVIRONMENT

Many residents feel that the improvements in living conditions outweigh the problems associated with rapid growth. Residents are aware, although skeptical, of potential oil shale and tar sand developments. Attitudes towards mineral developments are even more cautious among local Ute Indian Tribal members.

Most tribal members are aware of possible energy developments and are concerned over possible cultural and environmental impacts. Preserving the primitive character of the Hill Creek Extension is a particular environmental concern of most tribal members (Duncan 1983b).

Social conditions of the local American Indian population differ from the local non-Indians. The Uintah and Ouray Indian Reservation is governed by an elected business committee which has sovereign power over tribal lands. The income and living condition disparity between Indian and non-Indians has not improved with energy developments.

Cooperation and rapport between livestock operators and BLM appears to be good. Wildlife-livestock conflicts are recognized in the Blue Mountain area and mineral-livestock conflicts are recognized throughout the BCRA. In both cases, there is the belief that many of these conflicts can be resolved through range improvements.

TRANSPORTATION

Four major roads carry the majority of traffic through the BCRA. These are U.S. 40, Utah 88, Utah 45, and County Road 262 (Figure 1-1). Dirt roads provide access to much of the Resource Area.

If traffic volumes increase, the level of service on U.S. 40 and between Utah 88 and Vernal, and Vernal and Jensen, would be unsatisfactory Table 3-12 (Projected 1985 Baseline Average Daily Traffic Levels). All other road segments would remain at a satisfactory level (UBS 1983). If the segment of U.S. 40 between Vernal and Jensen is upgraded in 1984 as planned, then its condition would improve to a satisfactory level.

Table 3-12

Projected 1985 Baseline Average Daily Traffic Levels

Highway Segment	Baseline
<u>Utah 88</u>	
From Ouray to U.S. 40	391
<u>U.S. 40</u>	
From Utah 88 to Vernal	3,955
From Vernal to Jensen	5,356
From Jensen to County 262	2,348
From County 262 to Colo. Line	1,975
<u>County 262</u>	
From Utah 45 to U.S. 40	323
<u>Utah 45</u>	
From Vernal to County 262	N/A

Source: Uintah Basin Synfuels Development Final EIS

NA = Not Available