

CHAP. 3 — AFFECTED ENVIRONMENT

Soils

A wide variety and complex combination of soils are found in the BCRA due to differing geologic, topographic, climatic, and vegetative conditions. Figure 3-18 shows the locations of the generalized soil types in the BCRA. Unfavorable soil properties such as surface rock fragments, shallow depth to bedrock and steep slopes present limitations for erosion control and revegetation. The generalized soil types and some basic information about them is found in Table 3-4 (Soils of the Book Cliffs Resource Area). The BCRA soil inventory is complete and offers much more detailed information (SCS 1982).

Approximately 98,800 acres (9 percent) are in critical erosion condition and 12,300 acres (1 percent) in severe erosion condition. Inventory methods did not distinguish between natural geologic erosion and that caused by human activities. Generally, the problem areas are intermittent washes in desert areas, steep canyon sides and drainage bottoms in intermediate elevations. The location of the severe and critical erosion areas are shown in Figure 2-6.

The current erosion rate is approximately 1.45 tons per acre per year totalling 1,566,000 tons annually from the BCRA (Seiler and Tooley 1982; USBR 1975). This is an average figure and may appear inconsistent with the fact that only 10 percent of the BCRA is in severe or critical erosion condition and less than 2 percent of the vegetation is in poor ecological condition. The majority of this sediment is believed to come from the badlands ecological site and from intermittent drainage courses that lead from badlands sites to the Green and White Rivers. Most actively eroding gullies are found in these areas.

LAND TENURE ADJUSTMENT

Disposals

Certain lands within the BCRA have been identified for potential exchange or sale (Figure 2-7). Potential disposal lands meet one of the basic FLPMA requirements: They are isolated and difficult to manage.

The potential disposal lands have diverse plant and animal communities, mineral character, and terrain. They would require extensive inventory and analysis prior to any exchange or sale. Any other land exchanges or disposals would require a planning amendment.

Acquisitions

Certain lands have been identified for potential acquisition (Figures 2-14 and 2-22). If acquired, these lands would benefit the management of pub-

lic domain through facilitating access, maintaining or enhancing public uses or values, maintaining or enhancing local social or economic values, or facilitating implementation of other aspects of this Resource Management Plan.

These lands are also very diverse and would require extensive inventory and analysis prior to an acquisition.

AIR RESOURCES

The BCRA is contained within the Uinta Basin air basin, an air basin defined as "a region within which air movement tends to be confined by topographical barriers, meteorology, and local circulation". Upper winds are generally westerly to southwesterly. Surface winds are strongly influenced by the complexity of the terrain. In the more central part of the Basin, east to southeast winds dominate as a result of nighttime and early morning drainage flow down the White River. The second most common wind flow pattern occurs from the southwest to west as a result of both daytime upslope winds and channeling of the regional westerly flow. In the southern portion of the Basin, in more complex and elevated terrain, nighttime and early morning downslope winds generally occur toward the north and northwest with daytime upslope flow toward the south and southeast. The basin areas are subject to prolonged and intense inversions which occur in both winter and early mornings in the summer. The inversions are most severe in the winter due to lower mixing heights which may reach only from 3,000 to 4,000 feet above ground associated with generally lighter winds. The strong, prolonged inversions hold pollution emissions, creating a buildup of concentrations until the inversion dissipates or is forced out by other meteorological conditions. Mixing heights would be expected to be higher in the more rugged terrain and lower in the more sheltered lower valley locations.

Air quality is presently considered good to excellent as a reflection of the remoteness of the area from major pollutant sources. The work of Aerocomp (1983) shows that concentrations of health related criteria pollutants (sulfur dioxide, nitrogen oxides, carbon monoxide, lead) are presently well within the National Ambient Air Quality Standards (NAAQS). Concentrations close to the ozone standard have been measured at White River Shale Oil's tracts U-a and U-b, but appear to be the result of long range transport phenomena rather than a nearby source. The current emission inventory provided by the State of Utah clearly demonstrates that unimproved roads are the predominant source of particulate emissions within the area, as well as nearby cities and towns, and appear to be the most significant source of higher total suspended particulate (TSP) levels. Naturally occurring, blowing dust probably causes or contributes to occasional high TSP

SOIL TYPES

Figure 3 - 18

1. Empedrado-Coberly-Cathedral
2. Rock Outcrop-Travessilla-Winona
3. Mivida-Montwel-Nakai
4. Haverdad-Clapper-Uffens
5. Badland-Demant-Montwel
6. Badland-Demant-Tipperary
7. Penistaja-Abra-Begay
8. Walknolls-Badland-Rock Outcrop
9. Motto-Casmos-Walknolls
10. Atchee-Nelman-Lanver
11. Walknolls-Badland-Casmos
12. Atchee-Haverdad-Rock Outcrop
13. Castner-Winteridge-Towave
14. Castner-Towave-Veatch
15. Tosca-Seeprid-Utso

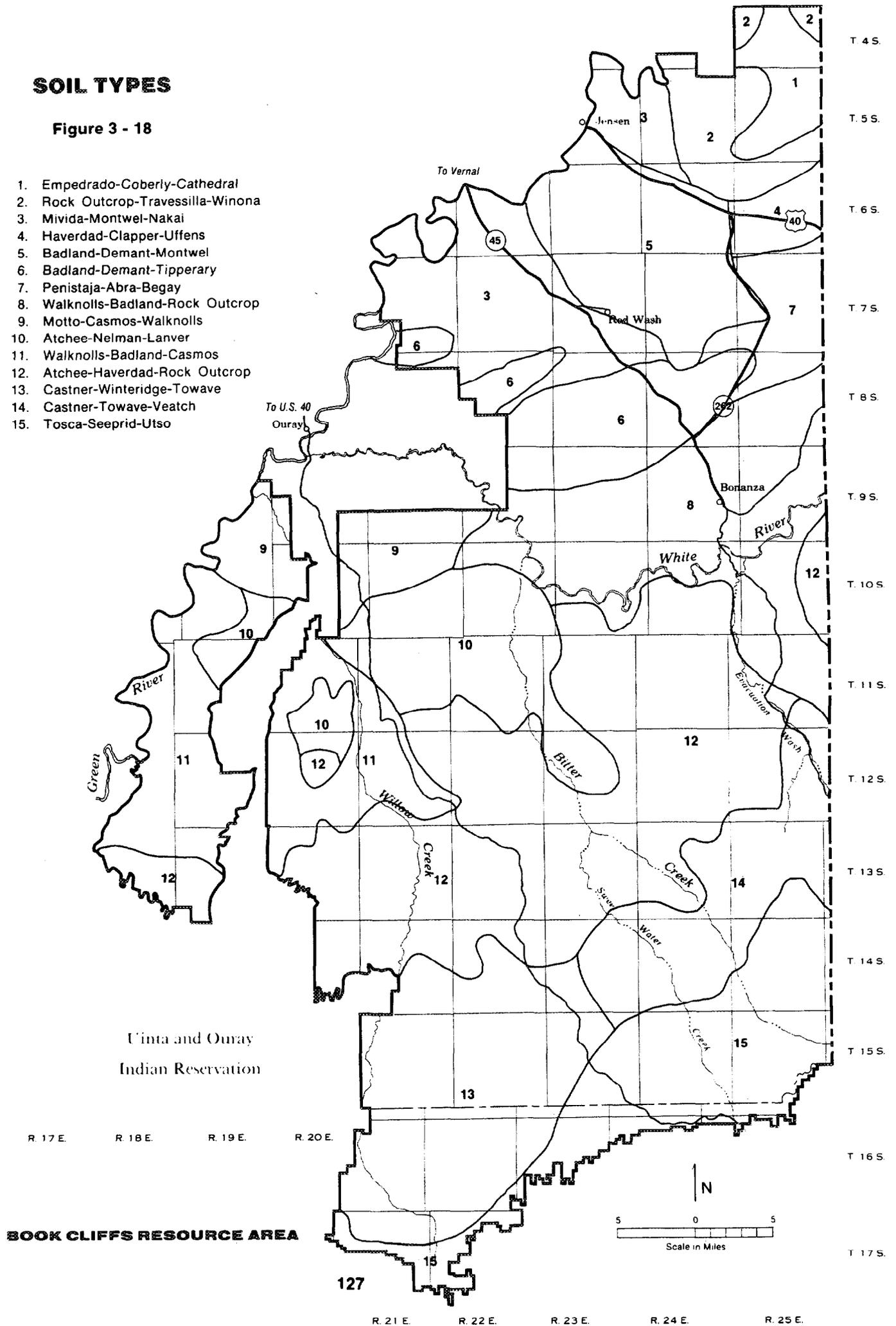


Table 3-4
Soils of the Book Cliffs Resource Area

Soil/Type Description	Percent of the BCRA	Slope (Percent)	Limitations
<u>Empedrado-Coberly-Cathedral</u>			
Shallow to very deep, well drained, and gently sloping to moderately steep soils on Blue Mountain Plateau.	1	4-25	Surface rock fragments. Depth to bedrock.
<u>Rock Outcrop-Travessilla-Winona</u>			
Rock outcrop and very shallow and shallow and well-drained soils on gently sloping to moderately steep mountain sideslopes and valleys.	3	4-25	Shallow depth to bedrock. Slopes. Surface rock fragments.
<u>Mivida-Montwel-Nakai</u>			
Moderately deep and very deep and well-drained soils on level to moderately steep summits and eroding shoulders.	6	1-25	Depth to bedrock.
<u>Haverdad-Clapper-Uffens</u>			
Very deep and well-drained soils on level to moderately steep valleys and valley sideslopes in the Cliff Creek area.	2	0-25	Surface rock fragments. Slope. Alkali.
<u>Badland-Demant-Montwel</u>			
Badland and moderately deep and well-drained soils on gently sloping to very steep hillslopes.	5	4-90	Very fragile. Clayey textures. Depth to bedrock. Steep slopes.
<u>Badland-Demant-Tipperary</u>			
Badland and moderately deep and very deep and well-drained soils on eroding hills and dunes.	6	1-25	Clayey textures. Depth to bedrock. Fragile.
<u>Penistaja-Abra-Begay</u>			
Very deep and well-drained soils on gently sloping to sloping terraces and toeslopes.	2	3-15	None

Table 3-4 (Continued)

Soil/Type Description	Percent of the BCRA	Slope (Percent)	Limitations
<u>Walknolls-Badland-Rock Outcrop</u>			
Very shallow and well-drained soils on nearly level to very steep hillslopes.	11	2-90	Depth to bedrock. Slope. Sixteen percent of Walknolls soil is in severe or critical erosion condition.
<u>Motto-Casmos-Walknolls</u>			
Very shallow and shallow and well-drained soils on nearly level to very steep hillslopes of lower Willow Creek.	4	2-50	Excess sodium. Depth to bedrock. Surface rock fragments. Nine percent of Motto soil is in severe erosion condition.
<u>Atchee-Nelman-Lanver</u>			
Very shallow to moderately deep and well-drained soils on nearly level to steep hillslopes and drainages.	7	2-50	Depth to bedrock. Surface rock fragments. Twenty percent of Atchee soil is in critical erosion condition.
<u>Walknolls-Badland-Casmos</u>			
Very shallow and shallow and well-drained soils on nearly level to very steep plateaus and hillslopes.	8	2-50	Depth to bedrock. Surface rock fragments.
<u>Atchee-Haverdad-Rock Outcrop</u>			
Very shallow, shallow and very deep and well-drained soils on nearly level to very steep upland hillslopes and drainages.	21	2-80	Depth to bedrock. Surface rock fragments. Steep slopes. Twenty percent of Atchee soil is in critical erosion condition.

Table 3-4 (Continued)

Soil/Type Description	Percent of the BCRA	Slope (Percent)	Limitations
<u>Castner-Winteridge-Towave</u>			
Shallow, very shallow and very deep, and well-drained soils on plateaus, summits, and hillslopes.	8	1-70	Slope. Depth to bedrock.
<u>Castner-Towave-Veatch</u>			
Very shallow to very deep, and well-drained soils on sloping to very steep plateaus, shoulders, and backslopes.	7	8-80	Slope. Depth to bedrock.
<u>Tosca-Seeprid-Utso</u>			
Deep and well-drained soils on gently sloping to very steep plateau summits and hillslopes.	9	4-80	Slope. Coarse fragments. Depth to bedrock.

Source: Soil Descriptions and Interpretations of Portions of Grand and Uintah Counties, Utah and Garfield and Moffat Counties, Colorado. Soil Conservation Service, Bureau of Land Management, Utah Agricultural Experiment Station. 1982.

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levels but not the pervasive long-term levels monitored in the towns.

The air quality classification of the BCRA is presently Class II under the Prevention of Significant Deterioration (PSD) regulations. There are several Class II areas of special concern in close proximity to the BCRA which might be affected by air pollution transport from the BCRA including the Uintah and Ouray Indian Reservation, Dinosaur National Monument, and the Colorado National Monument. The Colorado National Monument and the Colorado portion of Dinosaur National Monument are Colorado Category I areas.

CULTURAL RESOURCES

Approximately 700 archaeological and historical sites have been recorded in the BCRA. These probably represent less than one percent of the potential number.

The recorded sites represent a fairly continuous human occupation of this area for the past 10,000 years. Cultural materials of the Paleo-Indian period (6,000 to 10,000 BC), the Archaic stage hunter-gatherers (ca. 6,000 BC-AD 350), the Fremont horticulturalists (ca. AD 950-1200), and the Protohistoric Ute and Shoshoni people have been discovered. The activities of Euro-American trappers, traders, explorers, miners, and homesteaders have also left their traces on the land.

Archaeological inventories indicate that certain environments were preferred for occupation and use by the American Indian. Other environments do not appear to contain archaeological remains. This information has been used to formulate theoretical statements concerning where common types of archaeological sites can usually be found. This has enabled BLM management to protect valuable cultural resource sites and areas while avoiding undue delay in development or use of natural resources.

A recent cultural resource study in the 648 square miles of the BCRA south of the White River revealed that prehistoric sites other than petroglyphs were present in the Utah juniper community and absent from the big sagebrush, pinyon-Utah juniper-Douglas fir-aspens, greasewood, and salt-desert scrub communities. Petroglyphs were most often found in the greasewood and big sagebrush communities. Historic sites were most often found in the greasewood, Utah juniper, and salt-desert scrub communities (Reynolds et al. 1983).

The following types of prehistoric archaeological sites are known in the BCRA:

1. Villages
2. Camps (several subtypes)
3. Resource procurement sites (numerous subtypes)

4. Lithic (stone) tool procurement and processing sites
5. Burials (several subtypes)
6. Rock alignments, stone cairns, rock circles
7. Caches, storage cists, structures
8. Bed rock mortars
9. Hearths (camp fires), ovens (several subtypes)
10. Petroglyphs, pictographs, signatures, scratchings
11. Fremont structural sites
12. Archaeoastronomy sites
13. Unknown function, cultural affiliation sites

The Cockleburr Wash Petroglyph Site is the only prehistoric site presently listed on the National Register of Historic Places. Three historic sites in the BCRA are listed or considered eligible for inclusion on the National Register of Historic Places. The Ignacio stage stop (destroyed), the White River ferry crossing, and the Uintah Dragon toll road.

Several other historic period sites (1776 to present) are considered significant under the criteria for inclusion on the National Register of Historic Places (36 CFR 800). These are:

1. Dragon, Utah-Private ownership
2. Watson, Utah-Private ownership
3. Rainbow, Utah-Private ownership
4. Gilsonite Railroad-Mixed ownership

Another ten sites have been determined to have potential for inclusion on the National Register of Historic Places according to criteria listed in 36 CFR 800. These include an excavated cave, a well-preserved homestead, and an early 20th Century oil shale plant. Approximately 27 percent of the cultural sites in the BCRA have been termed significant; 5 percent of the total number of sites appear to have the potential for National Register listing (Phillips 1984).

The following types of historic period sites are known in the BCRA:

1. Civilian Conservation Corps reservoirs, dams, structures
2. Cabins and out structures
3. Dams
4. Wagon roads and way stations
5. Ferries
6. Corrals and enclosures

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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