The Visual Resource Inventory
For The
Casper Field Office

Completed March 3, 2003
by
Eve Bennett, Outdoor Recreation Planner

Record of Concurrence

I have reviewed and concur with the described methodology and findings of the attached VRM Inventory. It is my decision that this inventory be used as base line information for visual resources within the Casper Field Office planning area. The VRM Classes resulting from this inventory will be considered during alternative formation for the Casper Field Office RMP Revision. However, class boundaries may be adjusted as deemed necessary to reflect resource allocation and management objectives set during the planning process.

Field Manager

3/24/04
Date

Visual Resource Inventory for the Casper Field Office

Team Members- Chris Arthur, Eve Bennett, Charlie Fifield, Bob Nelson and George Soehn

Overview

A Visual Resource Inventory was conducted for the Casper Field Office to assist in the current RMP planning effort. This inventory determines visual resource values for the planning area and helps define appropriate VRM class boundaries.

The inventory consists of a scenic quality analysis evaluation, delineation of distances zones and sensitivity level analysis as defined by BLM handbook, H-8410-1. Based on these three factors, BLM administered lands are placed into one of four Visual Resource Management (VRM) classes which represent the intrinsic value of the visual resources. During the RMP process, boundaries are adjusted as deemed necessary to reflect resource allocation decisions made for the planning area.

All visual rating forms, GIS metadata and shape files along with written materials are filed at the Casper Field Office. A CD containing photo documentation of representative landscapes depicting the results of the Scenic Quality evaluation accompanies this report. This material will be made available upon request for public review.

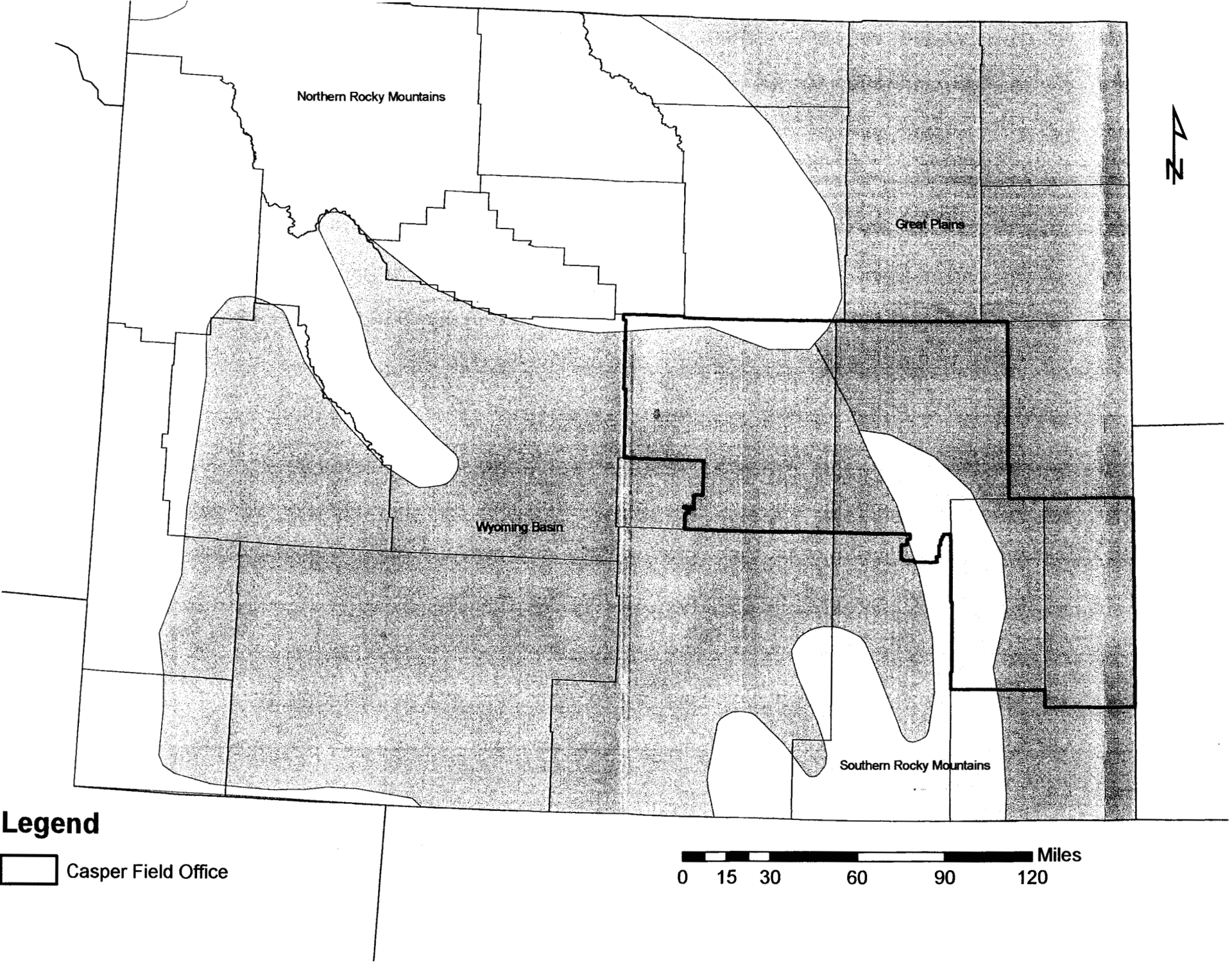
Scenic Quality Analysis

Scenic quality is a measure of the visual appeal of a given tract of land. During this evaluation, public lands are given an A, B, or C rating based on apparent scenic value. Scenic values are determined using seven key components: landform, vegetation, water, color, adjacent scenery, scarcity and cultural modification. Each is ranked on a comparative basis with similar features within the physiographic province.

Four physiographic provinces make up the planning area include the Great Plains, the Northern and Southern Rocky Mountains, and the Wyoming Basin (Figure 1). The Wyoming Basin makes up the majority of south western and central Wyoming. Bordered by several mountain ranges, this large basin was formed from the deposition and subsequent erosion of alluvial soils (Reiners and Thurston 1996). The lower elevations are characterized by short grass prairies and sagebrush steppe communities (USDI, USGS 1998). Regional uplifts, along with sandstone hogbacks and cuestas add color and create diversity in this vast and ever changing landscape.

The central portion of the field office is comprised of the most northerly extent of the Southern Rocky Mountain province. A small portion of the Northern Rocky Mountain province lies in the northwestern corner of the planning area. These provinces are distinguished by rugged landscapes and varied topography. The steep slopes of area mountain ranges are flanked by abruptly dipping sedimentary rock. High plateaus bordered by cliffs overlook gently sloping valleys. Vegetation communities in higher elevations are dominated by coniferous forests. Greasewood and sagebrush communities are found at lower altitudes (Driver 2003).

The Great Plains is the largest physiographic province in the United States spanning 500 million acres and thirteen states. With the climate, soils and topography being generally suitable for agricultural and ongoing western migration, very little of this vast area remains untouched by human activities. Estimates place undisturbed areas at less than 1% of the original grasslands. Large tracts of these natural grasslands are found in the western portions of the Great Plains and are generally used as rangelands. Native plant communities are composed of a rich complex of grasses and forbs. In contrast, agricultural areas are dominated by row crops and monoculture pastures (Wilson nd). This province constitutes the remaining portion of the field office, lying just east of the Southern Rocky Mountain Province.


Northern Rocky Mountains
Great Plains
Wyoming Basin
Southern Rocky Mountains
N
Legend
Casper Field Office
Miles
0 15 30 60 90 120

Methodology
The methodology used to complete the scenic quality evaluation was developed using guidelines set in BLM Technical Note 407: Integrating GIS Technologies with the Visual Resource Management Inventory Process (Jackson and Horyza 2001) and the BLM Handbook 8400, Visual Resource Management (USDI, BLM 1984).

The first step in this process was to divide the field office into scenic quality units. Within each scenic quality unit, the seven key components are to be relatively consistent. After reviewing the general composition and distribution of these components through-out the planning area, it was determined that the landform boundaries could be used synonymously as Scenic Quality Units.

A. Landform
Landform Units were determined using 30 meter DEM generated contours (Figure 2). Areas containing distinctive and/or relatively similar topographic features were agreed upon by VRM team members and drawn over the contour map. The Landform Units for the North Platte River were delineated by creating a one mile buffer zone. The buffer zone was further subdivided to reflect general changes to topography. Some topographic changes do occur within the borders, however, the boundaries to be representative of current management practices and defensible as Scenic Quality Units. The remaining landform units were digitized on-screen using the 30 meter DEM contours as a backdrop. Data correction was completed with the display zoomed to a minimum of 1:24,000.

The rating criteria for landforms are based on the concept that topography becomes more interesting as it becomes more diverse and/or more massive or severely or universally sculptured (USDI, BLM 1984). A rating of 5 was given to the areas containing the most interesting landforms, while relatively flat areas with gently rolling hills were given a score of 2.

B. Vegetation
A vegetation map was developed to assist team members in rating vegetative criteria within the Scenic Quality Units (landforms). Vegetation communities for the planning area were mapped using the GIS theme titled gapveg-cfo.shp (Figure 3). The base information for this theme originated for the Wyoming GAP Analysis. The primary cover types were merged into nine major vegetation communities to be used in large scale planning efforts. The resulting merged vegetation communities are included in Appendix 2. The vegetation map includes agricultural modifications.

The rating criteria for vegetation considers the diversity plant communities which create a variety of patterns, forms and textures (USDI, BLM 1986). Areas containing several differing vegetation types are rated higher than plant communities containing similar vegetation types.

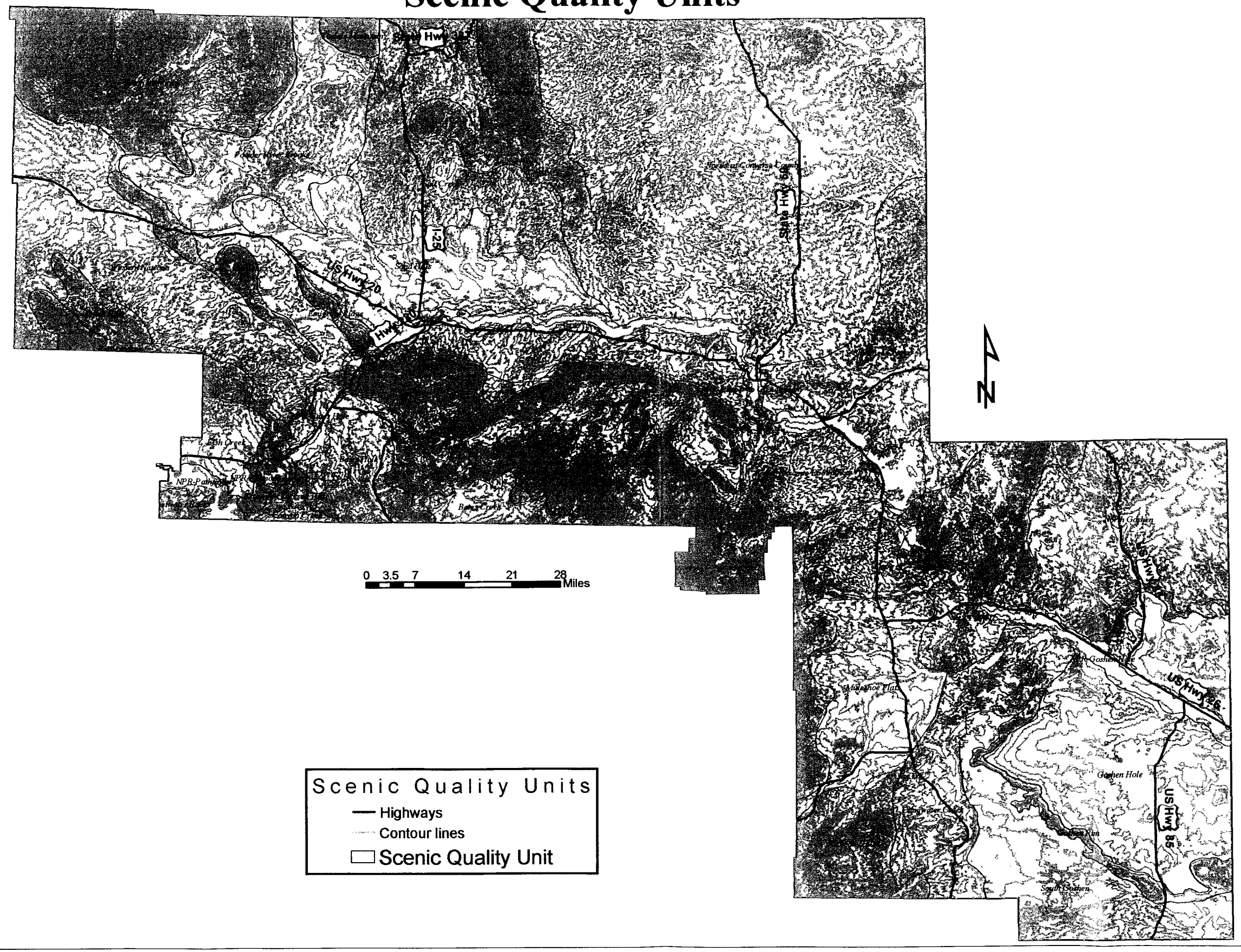
B. Water
The vegetation map described above adequately depicted larger riparian areas and reservoirs. This map was used to evaluate the relative dominance of water within a scenic quality unit. Water is considered an important factor in the determination of visual quality because it adds the elements of movement, color and serenity. Rating scores are based on the degree in which water dominates the landscape. Additional information on perennial streams and other water sources are available at the Casper Field Office (Figure 4) and were used to validate the water rating scores.

D. Color
Colors within a given landscape appear more or less vivid depending on the season, time of day and other environmental factors which affect light or obstruct view. Therefore, colors within the landscapes were evaluated based on how they generally appear during periods of high use. Colors within a given landscape are generally derived from the soils, rock formations and vegetation types. High scores were given when the landscape colors add the elements of variety, contrast and harmony.

E. Scarcity
The scarcity rating gives added importance to those features within a landscape that are considered to be rare or unique to the physiographic province in which the scenic quality unit resides.

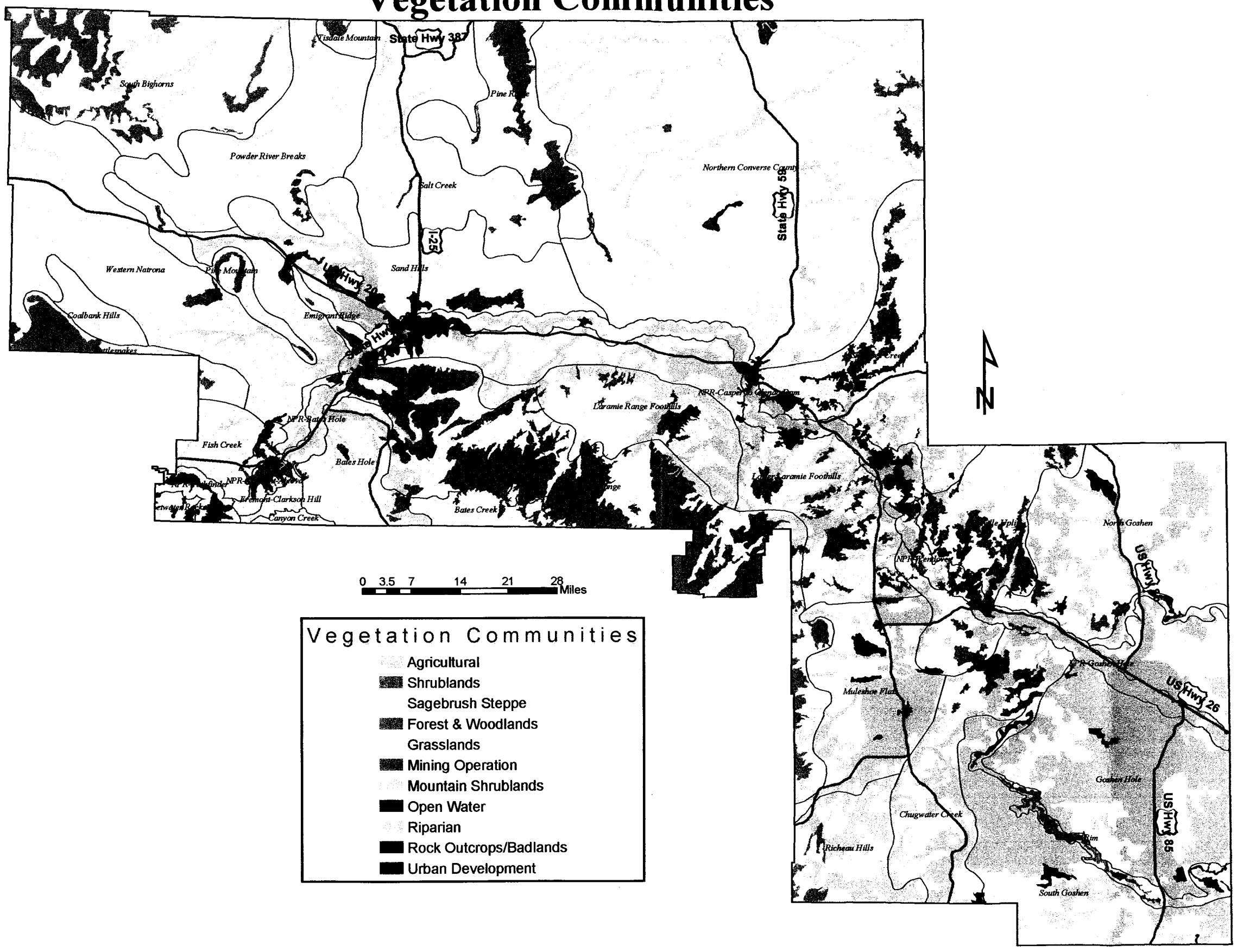
Scenic Quality Units

Figure 2



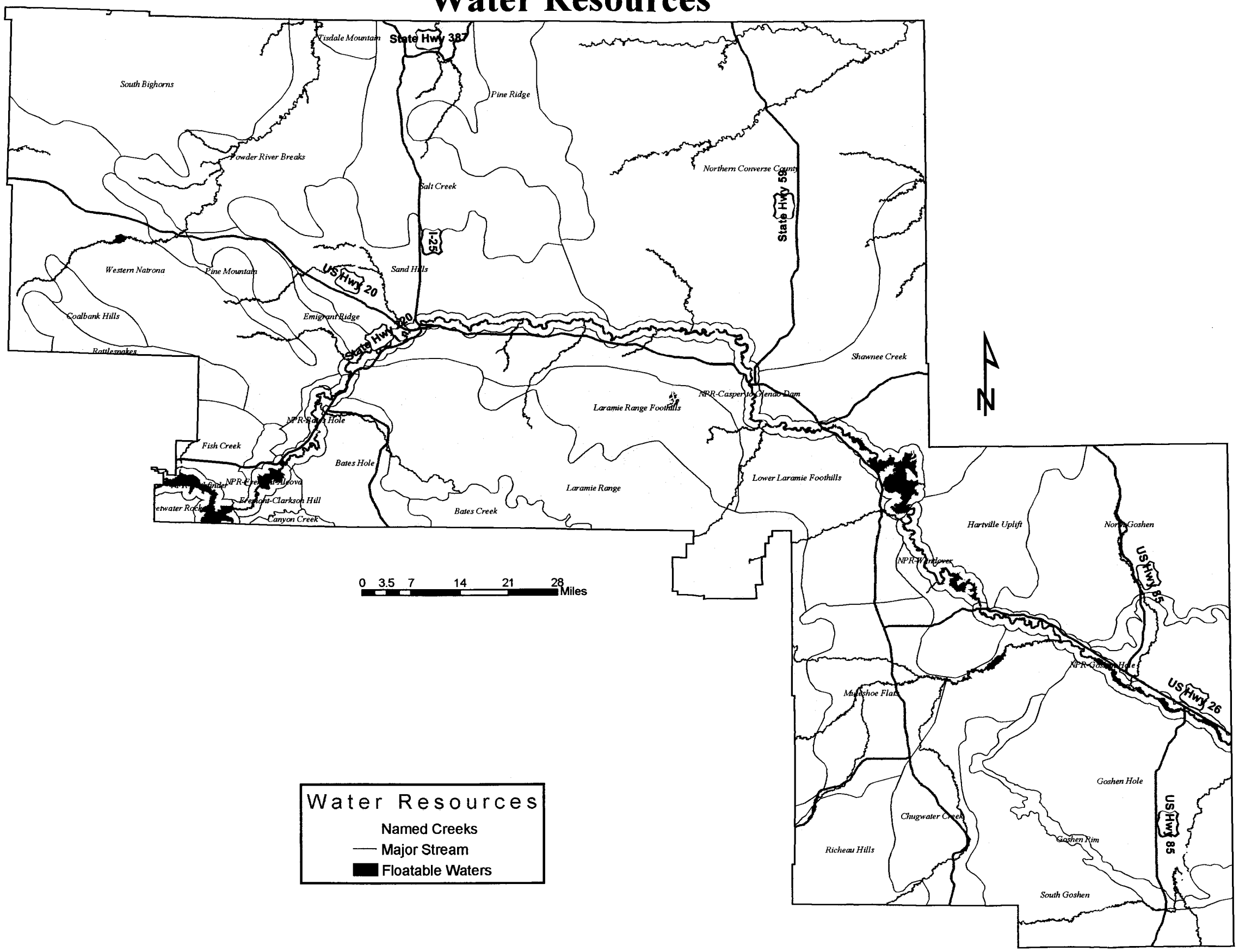
Vegetation Communities

Figure 3



Water Resources

Figure 4



F. Adjacent Scenery
Rating criteria for this key factor is based on the concept that adjacent scenery potentially has the ability to impact the overall scenic quality of an area.

G. Cultural Modifications
Cultural modifications were mapped using GIS layers from the Casper Field Office GIS database. These layers were used to evaluate the relative abundance of large scale cultural modifications within each scenic quality unit. Mapped disturbances include Interstate 25, highways, county roads, mineral sales, urban areas and oil and gas fields (Figure 5).

The effect of cultural modifications to a given landscape can be extremely subjective and may enhance as well as detract from the overall scenic quality. It is the only key factor in which a negative score can be given. The rating scale ranges from -4 to +2.

H. Scenic Quality Class
The Scenic Quality Classes for the Casper Field Office was derived by evaluating the seven components within each Scenic Quality Unit. All key components except cultural modifications were rated on a scale of 1-5 with 5 being the highest. The sum of the individual scores determines the overall scenic quality rating for a given unit. Scenic Quality Units with a final score of 18 or higher received an A, scores ranging from 12 to 17 are equivalent to a B rating with final scores of less than 12 received a scenic quality rating of C (Appendix 1). The resulting classes are shown in figure 6.

Distance Zones
Distance Zones are an important consideration in the VRM inventory as visual impact of any given intrusion will lessen as it moves from the foreground and middle ground into the background. Distance zones were delineated from key observation points and depict areas that can be seen within the boundaries of the foreground and middle ground.

Viewshed was calculated for both single points and linear feature, consisting of series of points along a line (i.e. roads and trails). Point locations included campgrounds and historic cultural resources for which setting may contribute to overall site significance. Linear features included the North Platte River, perennial fishing streams, all major travel corridors and selected secondary routes. Viewshed for foreground and middle ground areas were calculated for a distance of 3 miles, with a viewer height of 5ft and an object height of 0 ft. Points were placed every quarter mile along linear features. All calculations were done using ArcGIS and 30 meter DEMs. The resulting shape files were used to define boundaries for many of the sensitivity level rating units (Figure 7).

Viewshed analysis was not completed for previously mapped management areas and areas of disturbance such as oil and gas fields, mine locations, agricultural areas, urban areas and Habitat Management Plan areas (HMPs). The mapped disturbances were defined as foreground.

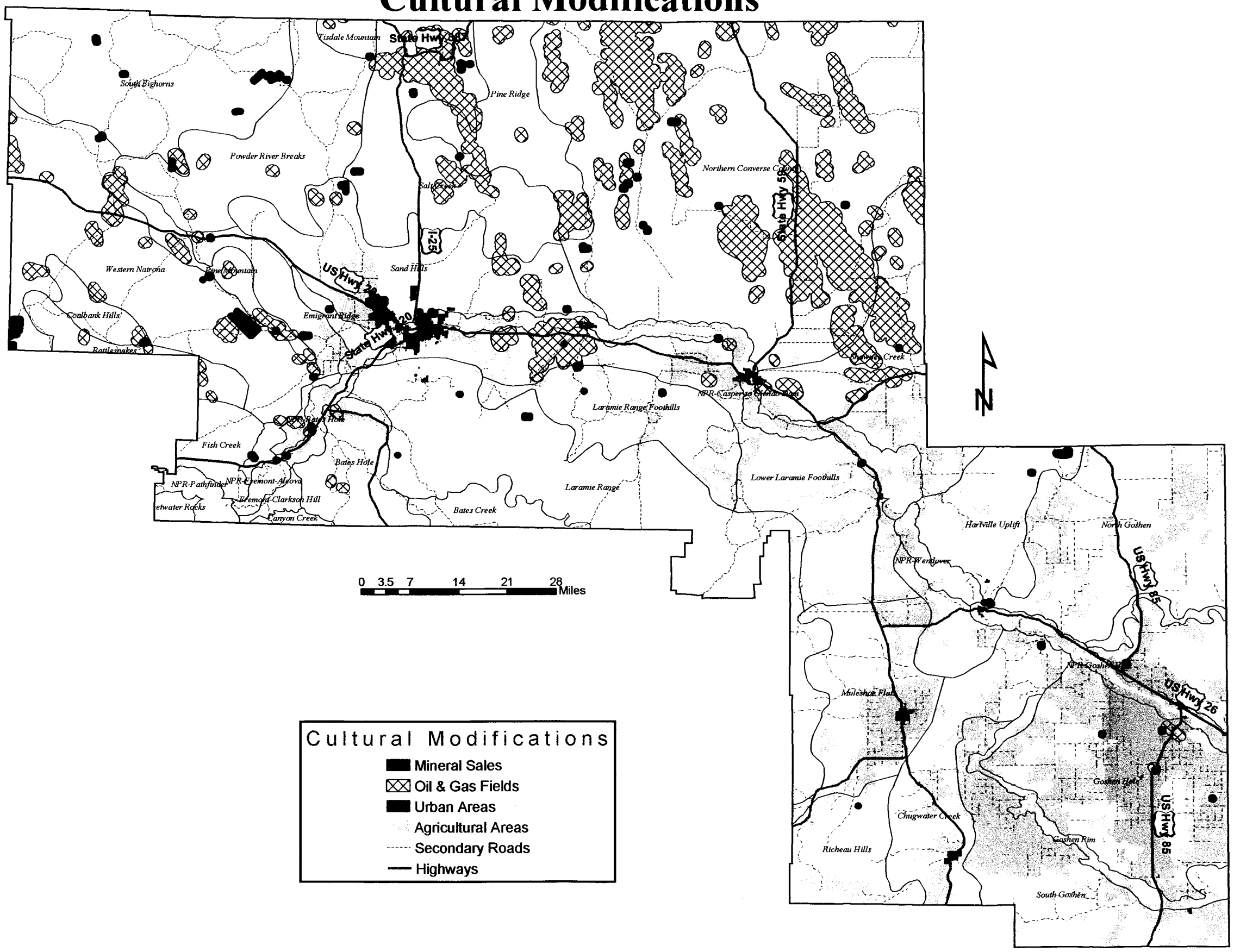
All remaining portions of the field office were defined as being within the background.

Sensitivity Level Analysis
During the Sensitivity level analysis team members attach importance values to differing landscapes based on perceived viewer expectations. The team members relied on their knowledge of the field office, relationships with user groups and comments received during the scoping process. Sensitivity level ratings were based on use volumes, user attitudes, public interest, adjacent land uses and special management area objectives.

Important use categories identified, divided into individual Sensitivity Level Rating Units (SLRUs) and rated accordingly (Appendix 3). Many categories overlapped especially those SLRUs with strong linear features. Therefore, a resource use priority system was created to identify the overriding sensitivity level of any given tract of land within the planning area. Existing disturbances were considered during this process.

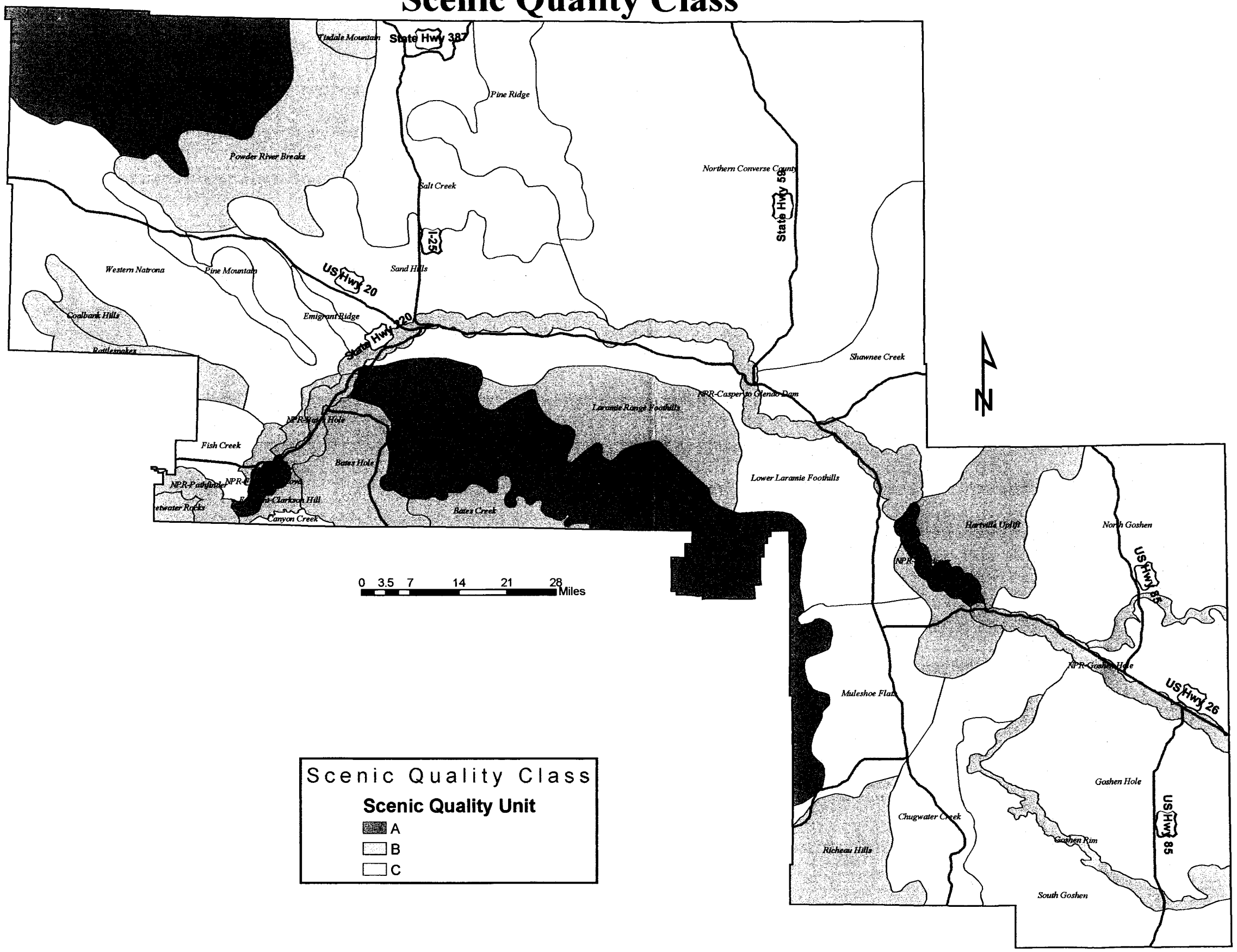
Cultural Modifications

Figure 5



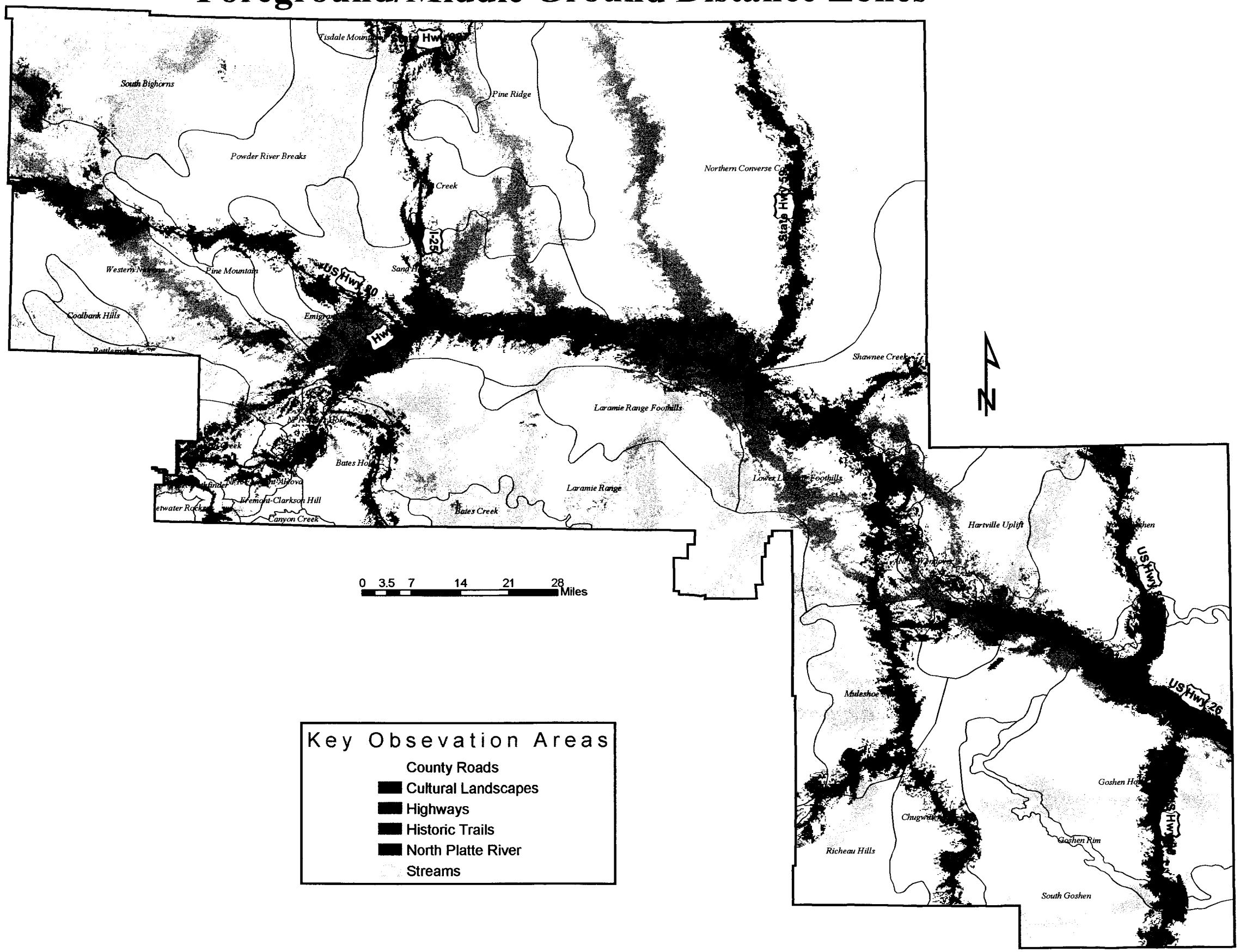
Scenic Quality Class

Figure 6



Foreground/Middle Ground Distance Zones

Figure 7



The priority system established by team members resulted in the following ranking for resource use sensitivity levels:

- urban
- energy development
- cultural resources and historic trails
- recreation areas (including the North Platte River)
- travel corridors
- streams and reservoirs (not previously included in the developed recreation areas)
- wildlife viewing areas
- agricultural lands
- background and seldom seen areas

Key observation areas for SLRUs were mapped using several different themes. Boundaries were defined using the delineated distance zones. Figure 8 depicts the results of Sensitivity Level Analysis for the Casper Field Office.

Urban areas, Industrial Areas and Agricultural lands
Urban areas, industrial areas and agricultural lands by definition involve an abundance of human activity and visual intrusions. Sensitivity to human disturbances within industrial areas was rated low. Agricultural and urban areas received a medium rating.

Cultural Resources/Historic Trails
The key element in determining VRM sensitivity with respect to cultural resources is determining the historic integrity of a given site. "Historic integrity is the composite of seven qualities: location, design, setting, materials, workmanship, feeling, and association (emphasis added) Integrity enables a property to illustrate the significant aspects of its past." (USDI-BLM 1995). The historic setting is the landscape within which a property exists and is the equivalent of the viewshed in visual resource management terms. Those sites for which the setting is a component of significance are primarily historic in origin, as prehistoric sites are typically important for their scientific data content and their setting is very subordinant in determining significance. Cultural resources relating to the historic period more commonly include the setting as an element in determining site integrity and consequently setting (or viewshed) is much more important. Historic trails, and National Historic Trails System trails in particular can be extremely sensitive to integrity of setting, as the ability to recreate the experience of the original users is a critical component in assessing the significance of a given trail segment (relates also to feeling and association). Those trail segments which have a pristine setting would have the highest potential to contribute to the overall historic significance of the trail, and therefore the sensitivity of such segments would be high. Conversely, trail segments passing through developed areas have a lesser potential to contribute to the overall significance because the setting, or viewshed, has already been compromised by other activities.

While the goal in cultural resource management is to try to maintain the site setting in its original form for cultural resource purposes, the effect is the same as managing an area for high visual sensitivity. The level of visual sensitivity is tied closely to historical significance for the trail corridor or the viewshed of other historic sites for which viewshed is an important component.

Travel Corridors
Major travel corridors include federal and state highways. Variations among ratings did occur for key factors that influenced visual sensitivity, however, the amount of use was deemed to be the most important contributing factor. Team members gave all major travel corridors medium sensitivity level.

Secondary travel routes that rated as having a high level of sensitivity include a portion of the South Bighorn/Redwall Back County Byway, the Alcova Back Country Byway, Casper Mountain Road, Muddy Mountain Road, Esterbrook Mountain Road and three of the county road units. All other secondary routes rated as having a medium level.

Recreation Areas (including perennial streams and reservoirs)

Public recreation areas include BLM developed recreation areas, the North Platte River, major reservoirs and perennial fishing streams. These areas tend to have increased visitor numbers and user expectations. For this reason the majority of these areas were rated high. Areas that did not receive the high rating included portions of the South Bighorn/Redwall Back Country Byway, the Manville-Hartville reservoir, and perennial streams in the Cheyenne-Belle Fourche drainage system. These all were given a medium rating due to low visitor numbers, adjacent land uses or differing visitor expectations.

Wildlife Habitat and Viewing Areas
Wildlife areas include several smaller reservoirs, Goldeneye Wildlife and Recreation Area, Table Mountain HMP, Jackson Canyon ACEC, and the Bolten Creek EEA. The ratings for these areas varied and were influenced by special area objectives, amount of use, differing user expectations and adjacent land use.

Background Areas
The background was divided into SLRUs using existing boundaries for Scenic Quality Units. These represent seldom seen areas and remote landscapes for the Casper Field Office and ratings were based on dispersed recreational values. Backgrounds and seldom seen areas within Scenic Quality Units receiving an "A" or "B" rating, scored high for sensitivity; areas within Scenic Quality Units receiving a "C" were given a medium sensitivity rating.

Rehabilitation Areas
In addition to defining potential VRM class boundaries, the inventory process provides for identification of rehabilitation areas. These are areas in which the existing visual intrusions exceed acceptable levels and class objectives should include visual resource mitigations measures. The level of rehabilitation will be determined through the RMP process by assigning the VRM class approved for that particular area. Rehabilitation areas recommended for the Casper Field Office include:

1. Salt Creek Oil Field,
2. Casper Canal Shooting Area
3. Iron Creek Oil Field
4. UMETCO pit/rock quarry on the west end of the Rattle Snakes

Visual Resource Classes
VRM classes are developed for public lands by overlaying the Scenic Quality, Distance Zones and Sensitivity Levels. The following matrix is used to determine VRM Classes resulting from this process. Class boundaries may be adjusted, during the RMP to reflect resource allocation decisions made for the planning area. The VRM class boundaries for the Casper Field Office derived from this inventory have been shown in Figure 9 and are available in electronic form. VRM Class I was not established for the Casper Field Office as it is reserved for Special Management areas (i.e. Wilderness Study Areas).

		Visual Sensitivity Levels								
		High			Medium			Low		
Special Areas		I	I	I	I	I	I	I		
Scenic Quality	A	II	II	II	II	II	II	II		
	B	II	III	III/IV	III	IV	IV	IV		
	C	III	IV	IV	IV	IV	IV	IV		
		f/m	b	s/s	f/m	b	s/s	f/m	b	s/s
		Distance Zones								

f/m: foreground/ground, b: background, s/s: seldom seen

VRM Class objectives have been defined in BLM handbook 8410-1 and listed below:

> Class I: To preserve the existing character of the landscape. This provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II: To retain the existing character of the landscape. The level of change should be low. Management activities may be seen, but should not attract the attention of the casual observer. The basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape should be repeated.

Class III: To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV: To provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the viewer attention. However, every attempt should be made to minimize the impacts of these activities through careful location, minimal disturbance, and repeating basic elements.

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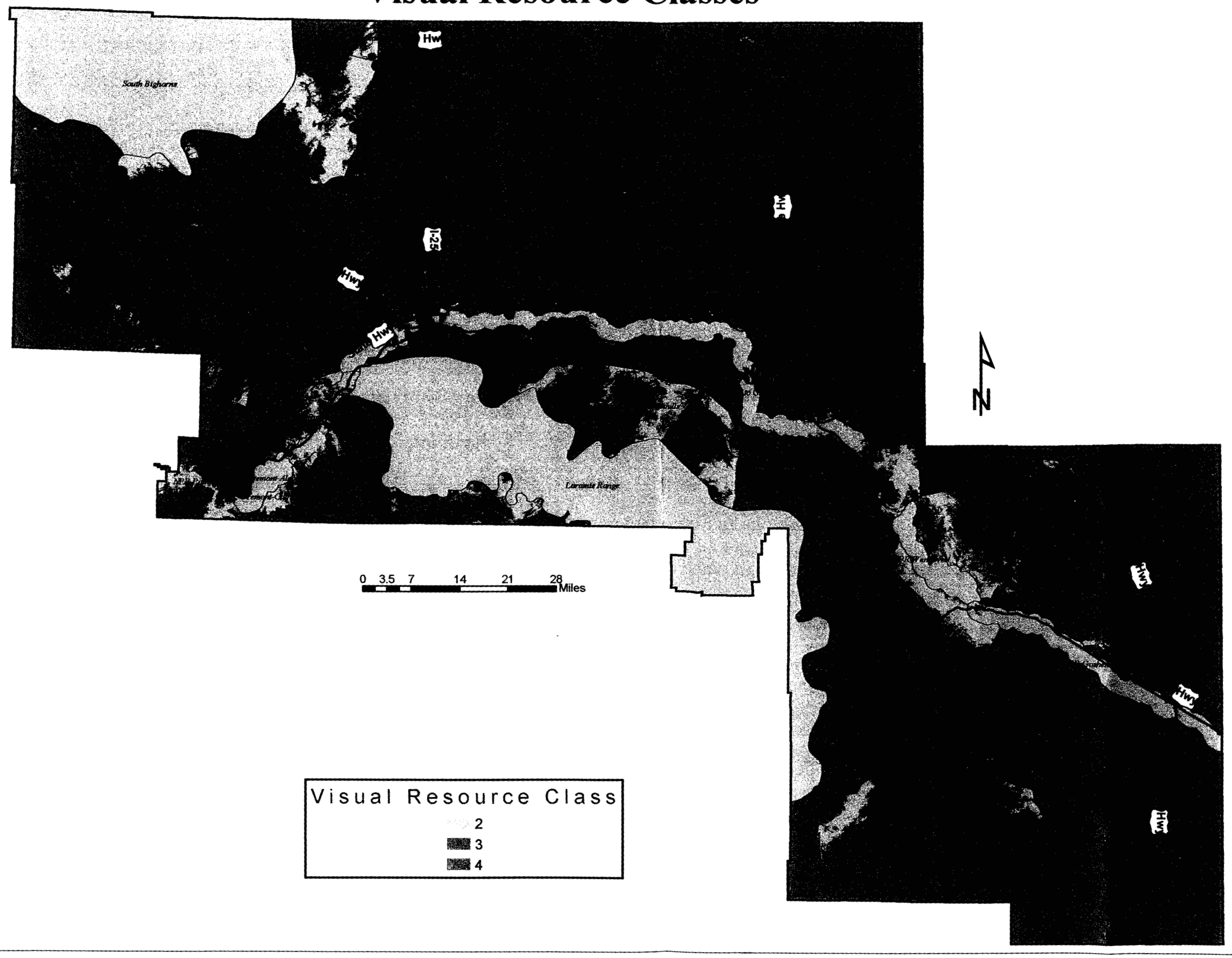
Visual Resource Classes

Figure 9



Visual Resource Classes

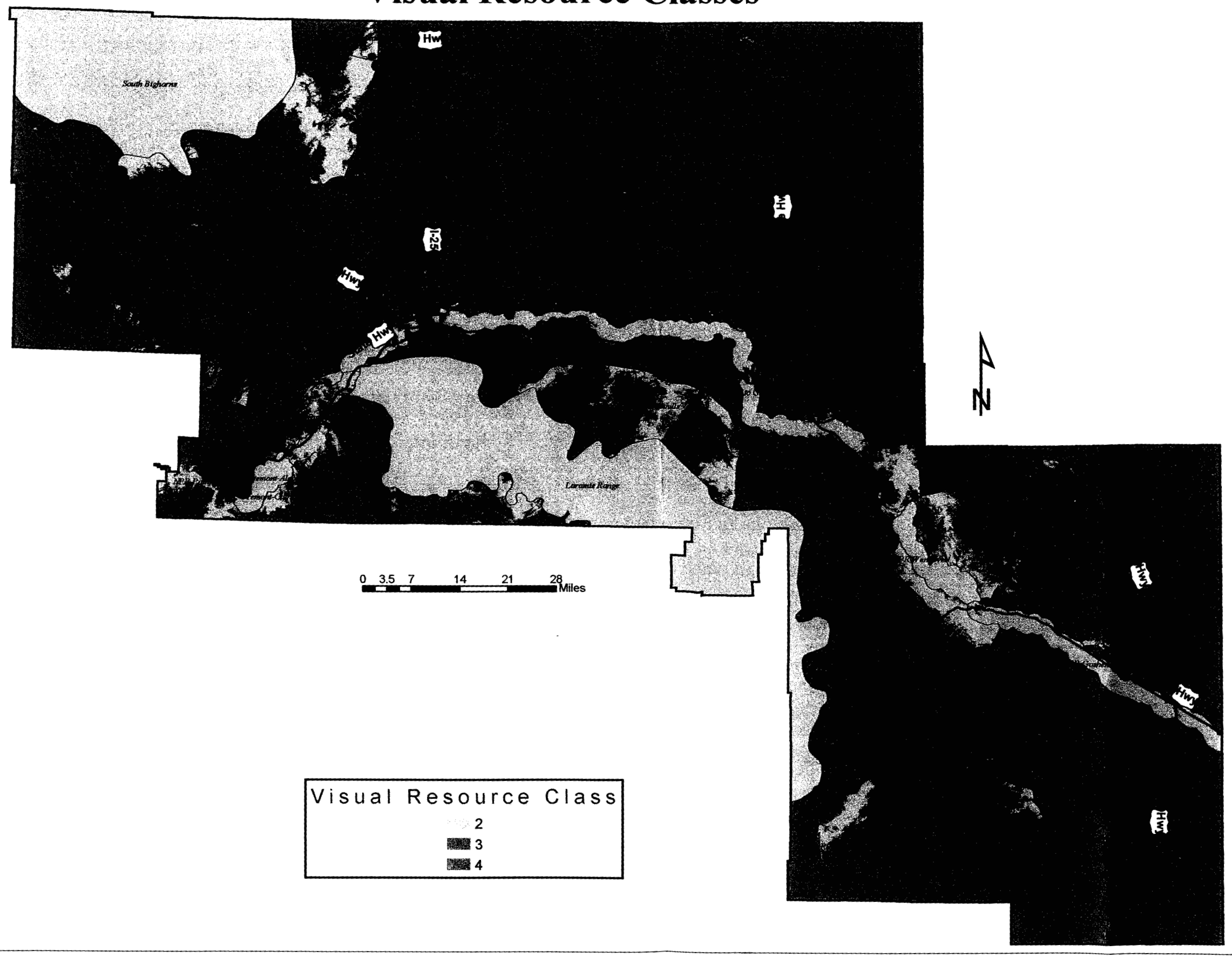



Figure 9