"Understanding and Appreciating North Dakota's Landscape Character"

NORTH DAKOTA
SCENIC
BYWAYS PROGRAM

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Understanding and Appreciating North Dakota's Landscape Character
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Chapter 1
Introduction

The purpose of "Understanding and Appreciating North Dakota's Landscape Character" is basically twofold. First, this document should be used as a background or overview for viewing and appreciating North Dakota's scenic quality and overall diversity. This document should also be used to help prepare a scenic route nomination. It is intended to provide a better understanding of the unique landform, vegetation, and land-use patterns, and to be used as a guide to evaluate scenic quality found in the many regions of North Dakota.

Many times we look at our own backyard and do not realize its scenic beauty throughout the four seasons. The careful review of this document will offer many suggestions on how to understand and appreciate the place we live on a daily basis by simple observation. It is this beauty or scenic quality that a scenic byway should have for a outside visitor to enjoy as they pass through the corridor.

A second purpose of this document is to provide an evaluator with a better understanding and appreciation of the diverse scenic quality found throughout the North Dakota. This document contains information to help evaluators determine the overall quality of a nominated scenic byway. It is a common preconception by many North Dakotans that the eastern region of the state is extremely flat and without any scenic or unique features. This may be the case if the visitor to the Red River Valley only traveled on the major freeways and highways region, but numerous river valleys leading to the Red River offer diverse landscape quality. All regions of the state have interesting scenic/cultural areas, and can be found without significant detours from the major highways. The reduction of these preconceptions and a highly objective perspective of all regions of the state will provide an interesting statewide scenic byways system for all North Dakotans and visitors.

One of the most difficult aspects of determining scenic quality of a view is the appraisal of an overall rating for that view. It can be easily seen that a view of a plain or valley can have different levels of scenic quality. The view of the valley could be exemplary if viewed to the south, but looking to the north it might be an uninteresting valley with an auto salvage lot in the middle of the view. A view may also have varying levels of scenic quality. In most cases the foreground, middle-ground, and background should be carefully evaluated. For example, the view of a western North Dakota plain might have a spectacular butte in the far distance with rolling rangelands in the middle-ground, but the immediate foreground has a very unattractive parking lot. This would not be considered an exemplary view unless the foreground could be softened or screened from the parking lot. The consideration of all parts of the view is very important in an objective rating of a view or a series of views.

This is the level of landscape evaluation those involved with the scenic byway nomination must consider in their assessment and evaluation of a scenic corridor. It is not that difficult if the nominator considers the landscape they are viewing objectively. With a better understanding of the various

land forms and the diverse vegetation found within North Dakota each nominator or evaluator will be able to better assess the proposed scenic corridor.

Definitions:

The following are definitions of words and phrases found throughout this document.

- ***Colored strata*** — Narrow bands of brightly colored rocks found within the hills and buttes of southwestern North Dakota.

- ***Continental divide***— *A* topographic divide between two continental drainage systems. The drainage basin of large river systems.

- ***Drumlins*** — An oval or elongated hill within the landscape made-up of assorted materials from melting glaciers. A distinctive and relatively common feature of a ground moraine. These glacial materials tend to be formed in the direction in which the ice moved. They are rarely over 100 feet in height. One theory on how drumlins were formed indicates the material the ice dragged along became excessive allowing the ice to roll up over parts of the material much like a broom does while sweeping snow.

- ***Erratics***— Rocks at the surface that were brought in from other locations by a glacier.

- ***Escarpment***— a long cliff, a relatively steep face of rock or earth.

- ***Eskers***— Icebergs melted away from the main glacier stream beds and formed as low ridges. When the glacier retreated, the icebergs melted leaving "kettles" or "pot holes". The central area of North Dakota is marked by these depressions with many depressions filled with water.

- ***Glacial drift (till)***— See ground moraines. The land carried by the glacier across the landscape which was then deposited as the glacier melted backward. This soil make-up is found through much of North Dakota, except the southwest corner of the state.

- **Ground moraines** — *T*he most common of the moraines. They are also referred to as drift or till. The material dragged along under the ice was deposited by the glacier as it melted. In North Dakota the glacial till or drift can be a few inches to two hundred feet deep.

- ***Kame***— A mound or terrace of loosely sorted or stratified materials caused by water building up at or near the ice front. Under the ice itself streams of water flow through tunnels. The waters coming into these streams bring rock material of various sizes building up on stream beds.

- ***Landscape diversity*** — A term used to describe a landscape which has landform and natural variation. A landscape of all spring wheat for as far as the eye can see has little landscape diversity.

- ***Man-made*** — A term used to indicate or describe a feature within the landscape which has been created by human activities. A city or town is generally referred to as a man-made feature within the landscape.

- ***Moraines*** — Material deposited by a glacier. The bulldozer effect of glaciation due to the advance within the ice mass. The elongated mass of earth and rock deposited along the edge of the advancing glacial ice.

- ***Natural*** — A term used in scenic evaluation to denote a landscape feature which was created by nature. A park or man-made landscape is generally not considered natural in a scenic evaluation since it was created by human activities. The term naturalistic is usually used to describe these areas.

- ***Outwash plain*** — *A* flat plain created by water coming from the front of a glacier building a gently sloping landscape beyond the terminal or recessional moraine.

- ***Recessional moraine and hummocky hills*** — When glacier ice retreated back a distance from the terminal moraine it would stagnate again and again, or even advance forward slightly. Each retreat would leave other elongated series of hills and moraines. These ice fronts are rarely straight across the landscape.

- ***Scenic quality*** — A phase used to indicate that a landscape has a visual interest not commonly found within an area or region. A butte against the backdrop of the horizon offers unique scenic quality.

- ***Sloughs*** — A small water feature usually with high concentrations of waterfowl. A wetland is sometimes referred to as a slough by local residents.

- ***Terminal moraine*** — The hilly mass remaining which marks the farthest advance of the glacier. The glacial ice eventually retreated from the landscape leaving these unique land forms.

- ***Vegetative diversity*** — A landscape which offers many types of plant materials within the viewing area. An example might be the beauty associated with a broad river valley forest with an open prairie landscape beyond the valley.

Chapter 2
Landform of North Dakota

North Dakota is a very beautiful plains state, but it takes a certain amount of appreciation and understanding to see this beauty. A large percentage of the world's population lives on similar plains landscapes. The plains landscape occur more than any other landform type on the earth. The residents of the plain find it the easiest region to produce food, to transport and exchange goods, and to travel. The plains are not as simple to understand as it may seem, and to understand the scenic quality of North Dakota the viewer must first appreciate its landform and vegetation patterns. A simple understanding of how this landscape came about is available by reviewing the geology of the state.

> *When one considers these changes of elevation over North Dakota and compares them with the planet Earth in its entirety (radius 4,000 miles), he realizes that the Red River Valley would, in proportion, amount to about one coat of paint on the earth, the Drift Prairie to a second coat, the Missouri Plateau to a third, and the Turtle Mountains and the big buttes would require additional touches of paint.*

This concept from Dr. George Wheeler, former Biologist at the University of North Dakota in Grand Forks.

Map One:

"Summary of the Pleistocene Geology of North Dakota"; North Dakota Geological Survey, Misc. Series No. 10, 1958 by Lemke, R. W., and Colton, R. B.

Map One shows coverage of glaciation in North Dakota and the extent of continental glaciation over North America. In fact, most of North Dakota was under the ice sheet. The ice receded from the state approximately 25,000 years ago, which is considered quite recent by geologic time.

Glacial drift of earlier ice advance is found as far southwest in North Dakota as 40 to 60 miles west and south of the Missouri River. The Missouri River is normally accepted as the limit of ice sheet advance over this part of North America and for all practical purposes is accurate enough. North and east of the Missouri River the land carries a veneer of glacial drift, or soil, that was transported with the rocks at the surface (sometimes called erratics).

This landscape is dotted by potholes and some consider it very subdued. There are numerous broad, deep valleys carrying small streams and occasionally rivers. During the glacial melt, the valleys carried a tremendous volume of water. Throughout the glacial drift region are signs of a lake which existed in the past. The former flat beaches of the lakes have now become areas of crop cultivation.

Glaciers disrupted and altered original drainage. Before glaciers came over the land the Missouri, Yellowstone, Knife, Cannonball and other rivers flowed northeastward draining into Hudson Bay. Now they flow into the deflected Missouri River.

The Missouri River, deflected by the last great glacier, now turns southward in North Dakota and continues south and east until it reaches the Mississippi River at St. Louis. The Red River of the North, however, flows northward and ultimately into Hudson Bay. Thus a continental divide (a divide between two continental drainage systems) lies across North Dakota creating the two river systems.

Today the surface drainage over most of the glaciated region is immature. Flat, poorly drained, broad divides, plus potholes, lakes, slough sand and other centers of local interior drainage, mark much of the area. Relief over the area is low, usually considered undulating to rolling. The Red River Valley is the exception being a flat lake bed. Scenic glacial deposits can be found throughout the central drift prairie region of the state, including drumlins, eskers, kames and similar glacial features. Near the edges of the ice limits, roughly parallel to the Missouri River, is the hummocky, knob and kettle topography of the terminal and recessional moraines.

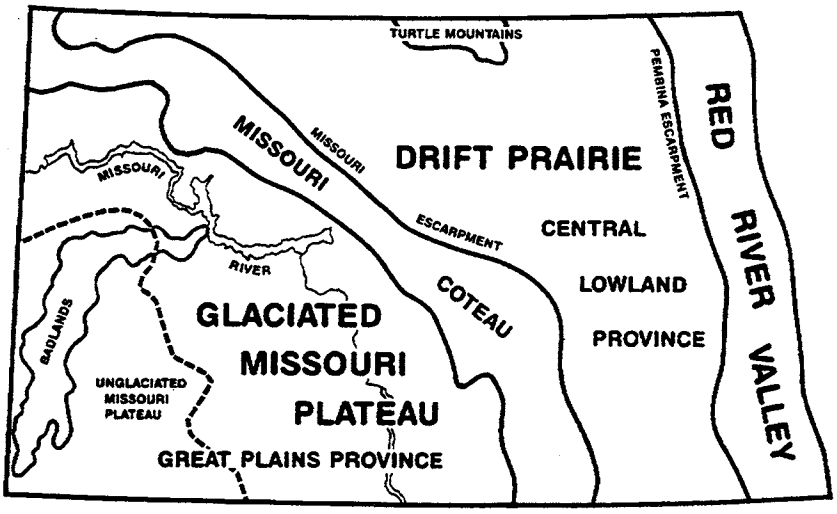
From the standpoint of physical geography, the unglaciated southwestern part of the state is very different with a high degree of scenic value. No layer or veneer of glacial drift can be found within this sloping region. Its soil is residual, developed over thousands of years, with rocks that were formed before the "Ice-Age." The drainage system of this region is very mature and complete making the valleys and rivers of the southwestern corner of the state some of the most scenic found in North Dakota. The region is referred to by its residents as "the slope" largely because of its direct drainage eastward or northeastward toward the Missouri River valley.

North Dakota lies at a low elevation for a central continent state. The northeastern part of the state is only 800 feet above sea level. The surface level of the state rises in three broad steps from the Red River Valley in the east through the higher Drift Plains of the central region to the Missouri

Plateau, in the southwest, where the elevation of the general level lies at about 3,000 feet excluding this region's buttes.

The landscape quality in southwestern North Dakota is unsubdued; local relief is the highest in the state and often hundreds of feet above the surrounding plains. This unglaciated region boasts spectacular badlands and the great buttes.

The classification of North Dakota's physical regions within the continental classification system is the Central Lowlands of North America, and the Great Plains with the Missouri Plateau as a subdivision of the Great Plains. The region referred to below as the Central Lowlands was glaciated and the region referred to the as Great Plains was mostly unglaciated. For the purpose of understanding and appreciating North Dakota's landscape this document will use the general terms of *(1)* The Central Lowlands and *(2)* The Great Plains.



Map Two:

North Dakota's broad landform categories

The following paragraphs summarize the generalized land forms found within these two provinces.

CENTRAL LOWLANDS PROVINCE

This area is generally found in the eastern half of the state, but can also be found near the Montana border in the far northwestern part of the state as indicated on Map Two. Within the central lowlands province two subdivisions can be identified. They are referred to as the Red River Valley and the Drift Prairie regions of the state. A brief overview of each region is needed to help understand their diverse landscape character.

Red River Valley

The plain called the Red River Valley extends southward over 200 miles from the Canadian line into South Dakota. The North Dakota portion of the valley averages only 35 miles in width with another 35 mile width in Minnesota. The Red River Valley is incredibly flat, sloping toward the Red River at about three feet per mile and northward at less than one foot per mile. This region of the state receives the greatest amount of rainfall in the state, averaging 20 inches annually. The 20 inch line occurs along the western beach ridges of the Red River Valley.

The valley's floor of today was originally the bottom of a great lake. Its waters drained off the lake bed about 10,000 years ago. Lake Agassiz, as it is referred to today, was formed when the retreating continental glacier melted back from the south, but its own mass blocked the natural drainage to the north. The sediments laid down in this lake form the generally excellent soils of the valley. The soil is well suited for agricultural production, so visitors can view nearly perfect rectangular farmsteads throughout much of the valley.

What may appear to be just tree rows and farmstead planting dotting the valley floor may in fact have a rich cultural and historical story to tell about homesteaders or a tree claim. The valley is especially interesting to view from above on the rolling beach ridges that line its western edge.

Sand and gravel beaches developed along the edge of Lake Agassiz. The beach ridges have excellent scenic quality and can be easily viewed and explained today. The lake level changed several times and today a series of beach lines or strandlines remain which show the former lake levels providing unique geologic conditions. The views from the valley floor toward these areas or arriving at the edge of these beach ridges offer scenic and diverse vegetative patterns on the landscape.

Lake Agassiz's maximum depth was once about 100 feet at present day Wahpeton, 200 feet at Fargo, and approximately 300 feet at Grand Forks. A unique feature of the Red River is its flow to the north. Very few rivers in North America have a northward flow.

A landform and vegetated area can be found at the northwestern edge of the Red River Valley. This region is referred to as the Pembina Escarpment and also offers varied scenic quality in the northeastern corner of the state. A pre-glacial valley of the original Red River system was eroded well into the bed rock layers of the upper rock formations. These formations still outcrop in an escarpment especially conspicuous in the northern part of the state where they are called the Pembina Mountains. A more accurate term is the Manitoba Escarpment. The Pembina Mountains are hardly noticeable when viewed from the west until the visitor reaches the edge of the hill and begins down their steep slopes. However, when viewed from the east the gullied, serrated walls provide many interesting opportunities for scenic viewing. This area is quite heavily wooded, providing diverse wildlife habitat including white tailed deer and fox. The southern parts of the escarpment is called Coteau des Prairies — a French term meaning "hills of the prairies." This region offers many opportunities to explain and interpret the history of its early French settlements. The escarpment is not perceivable at the surface along the southern half of the valley.

The Drift Prairie

The Drift Prairie is the second, or intermediate level of the state, but still classified generally as part of the Central Lowlands Province. It is intermediate in location between the Red River Valley and the Missouri Plateau. Its elevation ranges generally from 1,350 to 1,650 feet. It is referred to as Drift Prairie because it carries a surface layer of glacial till (sometimes referred to as drift). This physical region is about 200 miles wide in the northern part of the state and about 75 miles wide in the southern part. The plain is undulating to rolling, with occasional hills rising 150 to 200 feet above the prairie surface. Excellent examples of these land forms can be seen just west of Towner and south of Devil's Lake. In many places the drift region surface is marked by distinct glacial features. For example, in the area around Balfour there are many long, narrow drumlins, roughly parallel to each other extending in a northwest to southeast direction. This rapidly changing topography in combination with the neatly quiet farmsteads offer many scenic viewing opportunities.

Throughout the Drift Prairie the visitor does not find many rivers or large valleys, but there are hundreds of small lakes or ponds. These ponds are sometimes referred as "prairie pot holes." Some of these are due to irregularities, enclosed ridge areas left in the ground moraine, but many are the result of the melting away of great blocks of ice which were buried in the glacial drift.

Photo One:

Illustrates the landform called "drumlins."

Many of the natural lakes of North Dakota occupy portions of pre-glacial valleys which were only partially filled with glacial drift. Devils Lake, the largest naturally made water body in the state is a classic example. Devils Lake and its neighbor Stump Lake occupy hollows in an old partially filled valley which extended from near the Turtle Mountains on the west to the Red River. A string of lakes including Stump, Devils, Dry, Twin, Chain, Irvine, Aux Morts, Grass, Island, and Long Lake, lie in parts of this former drainage way. This chain of lakes covers a distance of over one hundred miles. The rolling topography and long views of this region offer spectacular views into these lakes and surrounding land forms throughout this region of the state.

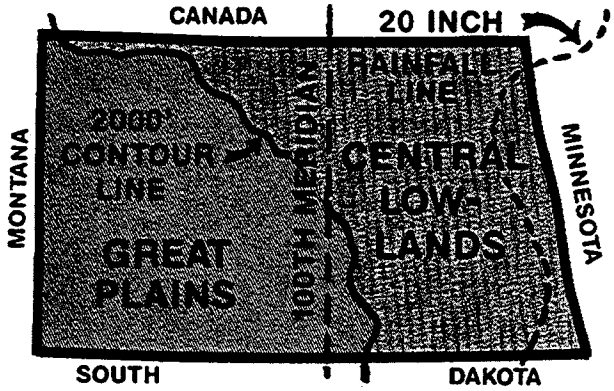
Glacial spillways are quite common throughout the drift prairie region, but are seldom recognized by observers, and very few people give thought to their spectacular scenic quality. If these areas were considered as part of a scenic byway their landscape quality could easily become apparent to the observer. The Apple Creek Valley from near McKenzie westward to Bismarck is one such example of a glacial spillway. Today a tiny creek meanders over the floor of a great valley which was formed by, and once filled with, an enormous torrent from the continental glacier.

The Turtle Mountains are an usual sub-region of the drift prairie located in the north central part of the state. The geology of the Turtle Mountains are outliers of the Missouri Plateau. They are eroded remnants which did not wear down with the surrounding drift plain during the ice age. The glacier overrode this area, but even its forces were unable to reduce the Turtle Mountains. The Turtle Mountains are really hill country, rising about 400 to 800 feet above the surrounding plain. The region extends into Manitoba to the north. On the international boundary is the beautiful and scenic International Peace Garden.

> *The world's only International Peace Garden, spanning the U.S.-Canada border, is a formal area of stone work and plantings duplicated on each side of the border, located in the lake-dotted Turtle Mountains of North Dakota and Manitoba.*

The Turtle Mountains occupy approximately 400 square miles in north central North Dakota but are not the only outliers found within the region. Land forms such as Dog Den Butte southwest of Balfour, Hawks Nest southwest of Carrington, and Big Butte south of Church's Ferry offer unique and interesting scenic quality as well as historic and educational opportunities for visitors.

The Red River Valley is not the only lake formed plain of the state. The Lake Souris plain in the north central part of the state covering most of Bottineau and McHenry counties, including parts of Rolette, Pierce, and Ward counties had a similar glacial origin. Lake Dakota, essentially an enlargement of the James River, south of Jamestown was also formed in a similar way. North Dakota has many smaller, flat and productive plains which were formerly lake bottoms. Many of these lake areas offer a diverse character with a potential for several scenic byways through this region.



Map Three:

(100th Meridian and the 2000' Contour Line divide the Central Lowlands and the Great Plains along with the 20 inch precipitation line)

GREAT PLAINS PROVINCE

This area is found in the southwestern portion of the state. The Great Plains Province is located to the west and south of the Missouri River. Like the Central Lowlands, there are two subdivisions found within the Great Plains Province. The first area is immediately west of the river and is also

a glaciated region. The second area is the far southwest corner of the state. The southwestern area of the state is the only part of the state which was not glaciated during the last ice advance. This region offers the most varied topography within the state as well as some of the highest elevations found in North Dakota. A number of scenic byways are possible within this region which could promote the unique geologic condition along with ranching and oil industries. The recently opened dinosaur museum in Dickinson has begun the geologic interpretation and explanation of this region, but actual sites and scenic viewing corridors are still needed.

The zone of separation between the Drift Prairie and the Missouri Plateau is an eroded belt of hill country called the Missouri Escarpment. In going from the Drift Prairie to the Missouri Escarpment a traveler changes his elevation about 400 feet in only a few miles. East of the Missouri River the plateau level is 1,800 to 2,000 feet above the sea. The extreme southwestern part this region has elevations above 3,000 feet.

Rock structures which make up the plateau lie in horizontal layers and are young rocks. This area is the most maturely eroded and hilly of the natural divisions found in North Dakota. Several distinct regions or features on or related to the Missouri Plateau merit special consideration, including the Coteau du Missouri, the Badlands, the Killdeer Mountains and the buttes.

Missouri Coteau: The Coteau du Missouri (a French term meaning "hills of the Missouri") is a belt of hills 10 to 30 miles wide on the eastern and northeastern margin of the Missouri Plateau. This is the terminal moraine of the last great ice advance. This glacier was called the Wisconsin ice sheet. The ice advanced to the Missouri Escarpment which checked but did not entirely halt the ice advance. Ice was pushed up onto the plateau but the front of the Wisconsin glacier stagnated, and finally began to retreat. This front is the present site of the Coteau du Missouri, which is near the edge of the plateau. It is a belt of hills which are a jumbled mass of stone and soil left in heaps and piles up to 150 feet in height. It crosses the state from Divide County in the northwest to and through Emmons and McIntosh counties in the southern part. It is a somewhat discontinuous curving strip running some 300 miles across the state. The region is so young that stream drainage has not been fully developed. Many people confuse these moraine hills with the Missouri Escarpment which is understandable because the Escarpment has a mantle of drift, but the moraine hills that are the Coteau lie on the Plateau between the Escarpment and the Missouri River.

The unglaciated part of the Missouri Plateau includes the Badlands. The Badlands are a place where North Dakota's landscape character varies greatly from the remainder of the state. It is a hilly land, but when one reaches the edge of this region he or she does not look up to the scenic hills but down.

Stream erosion and rain erosion acting on the soft clays and sand of the region have been the main factors contributing to the development of the Badlands. Mainly through the process of running water, the horizontal strata of the Badlands have been carved and sculptured into the infinite variety of weird forms so characteristic of Badlands scenery. Many streams and their tributaries flow to the river and cut their way deeply into the beds of clay and sand. They cut the region into a network of canyons, gorges, ravines and deep gullies. By simply turning around the

observer can gaze upon a flat, featureless plain that stretches away to the horizon. This is truly one of the most scenic and unique regions of the state.

> *The Theodore Roosevelt Memorial Park, dedicated in 1949, was established as a memorial to the former president, who, as a young man, ranched near here from 1883 to 1886. The magnificent park is best described by Roosevelt's biographer, Herman Hagedorn, who wrote,"Between the prairie lands of North Dakota and the prairie lands of Montana there is a narrow strip of broken country so wild and fantastic in its beauty that it seems as though some unholy demon had carved it to mock the loveliness of God. On both sides of a sinuous river rise then a thousand buttes cut into bizarre shapes by the waters of countless centuries. The hand of man never dared to paint anything as those hills are painted... " The park is separated into two units, the north and south. The north unit has an area of approximately 40 square miles and presents many of the best Badlands features, including petrified forests and remarkable views of the Grand Canyon of the Little Missouri River. The south unit has an area of approximately 90 square miles.*

The Theodore Roosevelt Memorial Park is still North Dakota's only national park and it is easy to see why this land has become a treasure associated with our national park system.

The scenic beauty of the Badlands is a sight not easily forgotten. Among the notable features of the Badlands are the bare slopes on which the variously colored strata appear as gray, yellow, brown, red, and black horizontal bands. The bright red bands of clinker or "scoria" were produced by the underground burning strata of lignite coal. Strata of lignite, from a few inches thick to twenty feet thick or more, occur throughout the Badlands. Some of these lignite beds have been completely burned. As the coal burned slowly underground, the overlying clays and sands were baked and changed to a red color. Many of these overlying beds were fused to a slag-like clinker by the heat. Burning coal seams may still be seen in this region today.

If residents hear a reference of buttes in southwestern North Dakota, they immediately think of the great lonely land forms which have resisted the erosion factors of nature. Many of these buttes rise only 400 to 700 feet above the plain, but provide a beautiful and scenic contrast to the surrounding landscape. Their flat topped rock-capped surfaces are all that remain of an earlier landscape level of the region. These rocks resisted wind and water while the soft material eroded away. The buttes make for some of the most spectacular backdrops found throughout the state, but their middle-ground and foreground are sometimes less spectacular. The buttes bear a relationship to the Missouri Plateau which is similar to that provided by the Turtle Mountains or the Hawks Nest within the Drift Prairies of the state to the east.

The Killdeer Mountains, in Dunn County, are scenic examples of these great buttes. Other outstanding buttes include Black, Blue, Bullion, Camel's Hump, East, Sentinel, West and White Buttes. Like many other landform characteristics found throughout the state, these buttes offer exciting scenic byway potential. A scenic byway which tied the Killdeer Mountains and the buttes together would certainly offer many spectacular views and scenic quality.

Chapter 3
Vegetative Diversity of North Dakota

The natural vegetation of an area is a reflection of other geographical characteristics. In North Dakota those characteristics which are most important are rainfall (or the lack of it), relief (or flatness), and severity of the winters.

Trees are the ultimate, or climax, vegetation of rainy or humid regions. At the other extreme is the cactus and other drought-tolerant vegetation of the desert. Between these two, on land too humid to be desert but too dry to support a forest cover, is a third great vegetation zone, the grassland. North Dakota, with a mean annual precipitation range of 14 to 22 inches, is within North America's former massive grassland zone.

The flatness of the plains contributes to free air movement or wind, which in turn increases evaporation, reducing rainfall effectiveness. The wind also serves as a dispersal agent for seeds, either carrying the seeds along through the air, as with the common dandelion, or by rolling and blowing the parent plant, such as the tumbleweed, along the ground. A flat plain lacks obstructions to water bearing winds which would cool the winds, forcing them to precipitate their moisture. The flat plain also lacks, almost entirely, deep valleys which intersect the ground water surface, permitting the roots of plants to reach a constant supply of water. Where such valleys do exist, trees and shrubs abound.

The severity of the North Dakota winter clearly affects plant growth and plant species found here, and the flora of the northern plain is a type which can lie entirely dormant through a long winter season.

The Grasses

North Dakota is part of the great "sea of grass" that lays over the area extending from the eastern and central woodlands of North America to the forests of the Rocky Mountains. The Red River Valley is more humid allowing taller grasses. Here the native grasses typically grow three feet high, and even up to six feet in more agreeable spots. The Red River Valley has been referred to as a Needle-Grass and Slender-Wheat-Grass Association. Among other types found are bluestem, Indian grass, switchgrass and dropseed.

Over the rolling drift prairies of central North Dakota a Grama and Western-Wheat-Grass Association is found. Here also is found needle-and-thread, Junegrass, and Kentucky bluegrass. The drift prairies are a transition zone between the taller grasses of the more humid east and the short prairie grasses of the west.

The western, more arid part of the state, is true short-grass country. This is the land of Grama, threadleaf sedge, Sandberg bluegrass—short grass species. But here also are found some taller grasses such as western wheat grass.

The grass plant is a masterpiece of adaptation to the physical environment of the northern plain. Its long slender leaves offer little resistance to the wind and bend easily. Those clusters of leaves point upward, allowing the sunlight to slide down every individual blade, multiplying the amount of energy that a plant can receive. An acre of grassland may have several acres of leaf surface to the sun. But the grass plant does not spend its energy in building trunks and branches. Except for seed making, its energy goes to roots to produce the rich agricultural lands the homesteader came to farm.

Grasses have an amazing root system. Their roots extend downward to depths reaching twelve feet, although most are within a foot of the surface. Since most grasses lack a tap root, they instead send down a cluster of roots which form a compact network of millions of branches, including the microscopic root hairs. These grass roots bring more than water to the plant. The roots also bring up essential minerals needed by the grass plant. These minerals are leached down to the ground water. The grass roots decay and provide the organic matter that makes the rich prairie soil. It is not difficult to understand the fact that the grasslands of the world are also the world's best dark soil regions.

The native prairie grass is therefore essentially an underground, subterranean plant. In this way it thwarts the drying drought on the surface, and its life-containing roots and its hard seeds lie dormant throughout the frigid cold periods of the year. But this subterranean existence wins on another field of battle: in late summer the grass leaves dry and the prairie is covered with a highly flammable straw. If an ill-timed spark ignites this dry grass, a veritable firestorm will run with the wind across the land. Other biologic forms will suffer greatly but the grass plant with its life-giving roots in a moist, cool subterranean vault of soil is unhurt. A few days after the fire bright green grass covers and hides the blackened scars left behind. Contrast this with the terrible and long-lasting effects of a forest fire upon that form of climax vegetation.

The roots of the prairie grasses are in a constant life and death struggle with each other and they virtually exclude other plant forms excepting a few species of wildflowers and certain small broadleafed plants such as goldenrod and sage. Prairie sod held an exclusive franchise against man until recently in human history.

> *NOTE: Only 1-2 percent of the vast regions of native grasslands found in the state just 120 years ago can be viewed in a landscape today.*

The present-day grassland has many unique uses. Grass has always been important to the agricultural economy of North Dakota. Early settlers found much of this prairie country covered by native grasses. These native grasses are still utilized by the farmer and rancher today. In 1989, the U.S. Bureau of the Census reported that 27 percent of North Dakota's land was open pastures containing both native and introduced grass species. The limited areas of native species continued to be reduced or eliminated. Grasslands generally increase in percentages of land use from east

to west throughout the state. However, as the demand for small grain crop land increased over the years more and more of the short and tall native prairies have been broken and planted to small grain crops in all areas of the state. As a result of this trend in land use, introduced grass varieties have been developed that are suitable for hay and pasture, but seldom offer the same scenic beauty of the original native prairie grasses.

Many new or introduced grasses have been released from the numerous experiment stations since the start of a grass breeding program in 1936. These grasses have in most regions competed very well with the native grasses. In many locations few native grass species can be found, but with proper landscape management the native grass species could be returned to the landscape offering unique scenic and educational opportunity.

The introduced grasses are cool-season types which provide maximum growth during the spring months. This is in contrast to the summer growth (warm season) of native range grass. Most cool-season grasses lose quality rapidly after heading in late June. The numerous grasses found and grown for hay in North Dakota include:

- **Wheatgrasses** — Crested, slender, intermediate, pubescent, tall, and western.
- **Other Cool-Season Grasses** — Brome, green stipa, Russian wildrye, Meadow fescue, Kentucky bluegrass, Reed Canary, and timothy.
- **Summer Grasses** — Switch, Big bluestem, Blue grama, side-oats grama.

Prairie to Woodland Transition

Scattered patches of brush and shrubs can be found in almost all parts of the state. Sagebrush grows extensively in the drier western part of the state. Over much of North Dakota, particularly in grassland areas which have been overgrazed, the low shrub wolfberry, commonly called buck-brush, occurs. Not uncommonly, the wild rose (the state flower) is found in association with buckbrush throughout most regions of the state.

Throughout much of the western part of the state a rather large shrub, buffaloberry (often up to six feet), can be found. Commonly called bullberry, this thorny bush produces a small, redberry excellent for jelly. Freshly picked buffaloberry served with milk makes a wonderful dessert.

In many locations such as draws, hollows, and the cooler north sides of hills, where moisture is almost but not quite sufficient to support a forest cover, Juneberries (or serviceberries) can be found. Together with chokecherries and wild plums these locations are sought for seasonal fruit for jams and jellies.

When these various shrubs — chokecherry, Juneberry, plum, hawthorn, raspberry, wild rose and buckbrush, or a combination of several of them, grow together in a patch or clump, a virtually impenetrable thicket is formed. Many farmers and ranchers regularly clear away unwanted brush,

seeding the land to more desirable vegetation, usually grasses or small grains. These areas need to be preserved where possible to offer the landscape character found by the early settlers.

Forest and Woodland

It must be stressed that the native forests and woodlands are very uncommon to North Dakota. They should also be preserved for future generations and for their scenic quality and variation in the landscape. The land percent of native forests and woodlands in North Dakota ranks very low. In fact, our state ranks 50th when comparing the percentage of forest cover we have to the rest of the U.S. Forests and woodlands can only be found in moist localities along stream banks, on lake shores, and in the draws and coulees of the hills.

Periodic droughts are the chief factor restricting forests to their present location. More than half of the forest area of North Dakota is contained within two hilly sections along the Canadian border, namely, the Turtle Mountain and the Pembina Hill areas. These areas are also known for their interesting varied land forms. North Dakota is one of the few states where forests occur within the geographic limits of both eastern and western timber types of the United States. This could be an important factor in describing an area's vegetative cover.

One can only speculate as to the extent of forests during the early days of settlement, but judging from scattered statements in historical accounts they were not much more extensive than they are today.

The natural establishment and growth of trees is in response to favorably combined factors of soil and climate, with moisture being the most critical factor. Today's forests are found in scattered areas of the state where soil and moisture have combined to stimulate tree growth. Small amounts of inadequately distributed moisture, wide extremes of temperature, and drying winds are the three most important climatic factors restricting tree growth in North Dakota.

There are an estimated 466,800 acres of native forest land in North Dakota of which 451,000 acres are considered sufficiently productive to be classified as commercial forest land. Through the years, this natural woodland has been supplemented by nearly 90,000 acres of plantings composed largely of shelterbelts and windbreaks.

More than sixty percent of the forests in the state are found in three blocks—the Turtle Mountains, the Pembina Hills, and the vicinity of Devils Lake. An additional twenty-five percent is strung along the bottoms of the Missouri, Red, and Sheyenne Rivers and their tributaries. The remainder is scattered in the Badlands, on lower north slopes of the Killdeer Mountains, in coulees along the canyon of the Little Missouri River, and in widely dispersed patches elsewhere in the state.

North Dakota has a surprisingly large number of native tree and shrub species common throughout the state. Forest vegetation divides into six broad types which change from east to west.

- In the east along the Red, Pembina, and Sheyenne Rivers and their tributaries, the ash-elm type dominates.

- In the Turtle Mountains, Pembina Hills, and the area south of Devils Lake, oak and aspen occur most frequently.

- In the central part along the flats of the Missouri River, cottonwood is the most common.

- The typically western types of ponderosa pine and juniper, which is also called cedar, begin to appear in the Killdeer Mountain region and in the Badlands.

This pattern is largely a matter of site, with moisture availability playing a critical role.

The ash-elm type is the most important of the six principal forest types in terms of both acreage and volume. It occupies nearly thirty-five per cent of the state's forest area and accounts for approximately sixty percent of the total volume. It varies widely in species composition, quality, and form; but for the most part, the ash-elm forests are stocked with rough and defective timber, making them more valuable as watershed, wildlife, and recreational areas than as a present or potential source of timber. The loss of the elm species — especially the American Elm, is currently changing this mixture drastically. Dutch elm disease can be identified in all counties of the state.

Although aspen trees occur widely over the state, the aspen type is concentrated chiefly in the Turtle Mountains and the Pembina Hills. It comprises 28 percent of the state' s forest area, but within much of this type the form and quality of the trees are poor. Oak, as a tree and as a type, is native to the drier ridges and the southern slopes within the Pembina Hills and the Turtle Mountains, and to the area south of Devils Lake. The type is dominant over about nineteen percent of the forest area of the state, but once again the growth, form, and size of the trees is poor.

Cottonwood is found extensively along the bottoms of the Missouri River. It is commonly found in pure stands but occurs also as an occasional tree in the ash-elm type. The cottonwood type covers 10 percent of the state's forest area. As a tree, Populus Deltoides has moderately good growth, form, and size; however, the larger trees are frequently defective.

In 1953 a state wide contest was held to find the largest tree in North Dakota. The winning tree was a cottonwood, four miles southeast of Mayville, which measured 108 feet in height and 23 feet in circumference at 4-1/2 feet above the ground. It had a crown spread of 64 feet and an estimated age of approximately 300 years. Although extreme, this is indicative of the size that can be attained by this species.

The ponderosa pine and cedar (Rocky Mountain Juniper) types, which make up the only native coniferous forests, constitute less than one percent of the state's forest resources. They are found chiefly in the region of the Little Missouri River and the Killdeer Mountains and mark the eastern limits of these types. However, it is not uncommon to find patches of pure juniper in the Badlands.

The largest single concentration of ponderosa pine type in the state is an area of about two thousand acres on the south bank of the Little Missouri River. This tract was a part of the Dakota National Forest, established by Theodore Roosevelt in 1908. It was discontinued nine years later due to the high cost of administration.

Native forests receive a bare minimum of attention. Most of them are grazed freely and generally accessible to cattle, while few are managed for the products they are fully capable of producing. Undoubtedly, many forested areas are more suited to game management and scenic quality than to forestry.

Uses of the Trees

The Mandan Indians were among the first inhabitants of North Dakota. Unique earth lodges, supported by timbers of oak, cedar, and cottonwood were the homes of these early settlers, and it is their remains which provide us with some interesting history. Studies of these village sites, found in the valley of the Missouri River near Bismarck, indicate that the Mandans may have occupied them as early as 1200 A. D. There is good evidence that they were cutting timbers for use in construction of their earth lodges at least 450 years ago. Oak and cedar appear to have been favored, but indications are clear there by 1700 A. D. the exhausted supply of these species forced the substitution of cottonwood.

Early homesteaders used material available to them. Where timber was scarce they made their homes from stones and prairie sod. While the lack of abundant wood may have been a deterring influence to permanent settlement, the open plains early became arteries of travel to the west. The state's wood resource was an element of importance in this early period. Steamboat travel was made possible by timbered river banks which provided an abundance of fuel, and the early railroads were heavy users of timber for ties and fuel. In this connection, the Northern Pacific Railway was responsible for the only logging camp to be operated commercially in North Dakota. The trees were cut and floated down the Little Missouri River to Medora to be utilized in the construction of the Northern Pacific's main line west.

The simple fact that trees give protection from the wind affords them great utility in North Dakota. The state's forestry activities are primarily associated with efforts toward windbreaks establishment for protection of homes, cattle, and wildlife. The tree planting effort of the early settlers offers an interesting cultural interpretation of the landscape.

The historical backgrounds of forestry in North Dakota might provide an interesting educational opportunity for a series of scenic byways. The settlers coming from heavily forested areas of the East found a land almost bare of trees. Their natural love for the forests, coupled with the need for protection of farmsteads, crops, and livestock from winds, inspired the first efforts in tree planting.

Most forestry activities in North Dakota are focused on planting trees in groves and strips. Both state and federal agencies have encouraged planting programs directed toward establishing

shelterbelts and windbreaks. Effective windbreaks, whether they be planted or natural, are a valuable, integral part of the prairie farm.

The chief function of the plantings is to protect homes, livestock, soil, roads, pastures, crops and wildlife. In the last ten years, farmstead windbreaks and field shelterbelts have accounted for 94 percent of planting activity.

Efforts to encourage the planting and growing of trees on the plains began early but were largely ineffective. The Homestead Act of 1863 was supplemented by the Timber Culture Act in 1873 which granted a settler partial title to a tree claim of an additional 160 acres if he planted ten acres of this quarter section in trees. A clear title to the land could be obtained when the trees were eight years old. As a result some groves were established in parts of the state, but most of them were unsuccessful, largely because of insufficient knowledge on how to plant and care for trees on the prairie. It should be noted that the I-94 Rest Area just east of Oriska was a 1880s tree claim and is today interpreted as part of the rest area's landscape theme.

To remedy the problem with tree success rates the U. S. Department of Agriculture established the Northern Great Plains Field Station at Mandan in 1912. It was here that research was begun on shelterbelt growth and survival potential on the prairies of North Dakota. An historical account of the shelterbelts and farmstead tree patterns may offer a varied and interesting visual opportunity as part of a scenic byway route.

Additionally, many areas of the state's views of farmstead landscapes, scattered with tree plantings and shelterbelts, offer varied scenic quality and diversity as part of a proposed scenic byway. The role of agriculture, especially small grain, can play a major role in understanding the scenic landscape. The identification of crop types typically grown and/or their rotation technique could be of great interest to North Dakota visitors. An objective evaluation of the landform and vegetation of North Dakota's various regions must include agricultural activities.

North Dakota's diverse wildlife may provide numerous scenic byway viewing opportunities throughout the year. Unique wildlife, like the importance of landform and vegetation, becomes another opportunity for appreciating North Dakota's overall landscape character. The vegetation and wildlife of the state are closely tied together since the trees, shrubs, grasses, and croplands found throughout the state become habitat areas for wildlife. A simple understanding of the vegetation also provides a good basis for understanding where different wildlife species can be viewed. Wildlife, large and small, are found throughout the state.

The wildlife of the state can be considered in four categories. The first category is the upland bird population, including pheasants (one of the most beautiful and interesting birds), partridge, and grouse. The second category is big game, the third is the predatory animals, and the final category is generally referred to as the furbearers. Each of these categories provide unique wildlife species. The following is a brief overview of each category.

The ruffed grouse is native to the forested lands of the northern areas and the Killdeer Mountains in the southern part of the state. Other species of grouse can be found throughout in tree claims,

coulees, and shelterbelts. The Ringneck pheasant is not a native wildlife species. It was introduced into the state in the early part of this century from China. It has adapted well to the state but are more commonly found in the southern counties of the state. The Hungarian and Chukar partridge were also released in the state in the 1920s and 1930s. They have become one of the leading game birds in the state.

Small numbers of wild turkey can be found in the river bottom region of the state. Recent surveys have indicated a rise in the populations of turkeys in the Missouri River region. The view of turkeys in a river bottom provide a wonderful focus for a scenic drive in the countryside.

Photo Two:

Snow and Blue Geese lifting off a prairie pot hole in a north central county.

North Dakota is located in the Central Flyway of North America. The term "prairie pothole" can be broadened greatly from a simple landform characteristic if the wildlife that inhabit these areas are included in a scenic quality evaluation. The drift prairie region of the state is excellent duck breaking grounds, and of great interest to many naturalists as well as hunters.

The concentrations of Mallard ducks in the Lower Souris National Wildlife Refuge is an unbelievable sight throughout much of the year. This region as well as numerous other state locations provide scenic opportunities uncommon in other regions of the country. In the spring and fall Snow and Blue Geese populations also add to the scenic enrichment within the drift prairie region.

Four major big-game species call be found in large to very small numbers in the state, but three of four species have very specialized regions where they can be seen in most abundance. The whitetail deer population has varied over the years, but is generally considered quite abundant throughout all regions of the state. The mule deer of North Dakota are not as readily visible as the whitetail deer. They are only found in the sparsely-populated areas in the western part of the state and are in greatest viewing concentrations in the Badlands.

The final big-game species found in the state are the beautiful pronghorn antelope and bighorn sheep. The pronghorn antelope is the only big-game animal in America today that is strictly found in the plains. This magnificent animal has lived on the North American continent for millions of years (see Photo Three). It prefers the open country where it can see its enemies at long distances. The antelope herds can be seen in limited numbers the southwest counties of the state.

Photo Three:

The beautiful pronghorn antelope in western North Dakota.

Bighorn sheep lived in western North Dakota in great numbers prior to white settlement. The sheep was not killed off like the bison, elk, or grizzly. In their case the rugged habitat they roamed also became the home of domestic sheep. Thousands of bighorn sheep died from diseases delivered to them by domestic sheep. Many efforts have been made by conservation groups to re-establish the bighorn back in the state, and today a growing number can again be seen in the most rugged terrain of the state's western counties.

Wapiti (North American Elk) and bison once grazed the grasslands and were dominant species. After being nearly wiped out in the last century, bison populations are increasing due to commercial and tourism value. To view a herd of these large animals is truly a memorable experience. Moose have also reestablished themselves in northeastern North Dakota and local concentrations may provide additional opportunities for viewing or interpretation.

The predatory and furbearing animals of the state are usually considered a nuisance to most North Dakota residents. However, recent national public attention to the coyote and red fox has not been for their nuisance value, but for their conservation. Many animals in this category once thought of as a problem to livestock and valuable wildlife have not become common enough to offer substantial viewing by the public in a natural setting. Wolves have all but vanished from the North Dakota landscape, but the prairie dog and the prairie-dog town has an interesting appeal in a number of locations throughout the state as tourist attractions.

The most important of the furbearing animals found in North Dakota include mink, muskrat, beaver, weasel, and jack rabbit. Skunk, badger and raccoon are also occasionally trapped. These animals are not unique to North Dakota and can be generally found in most regions of the Great Plains. Although, a discussion about the furbearing animals might help to explain the historical significance of the intense trapping. Early trapping which occurred in the northeast section of the state by Frenchman, offers interesting ties to the woodland character of this region.

Conclusion of Landform & Vegetation: *If an individual or an evaluation group begins to understand and appreciate the landform, vegetation, and the wildlife of a region they intend to nominate as a scenic byway, the final evaluation is made much more simple.*

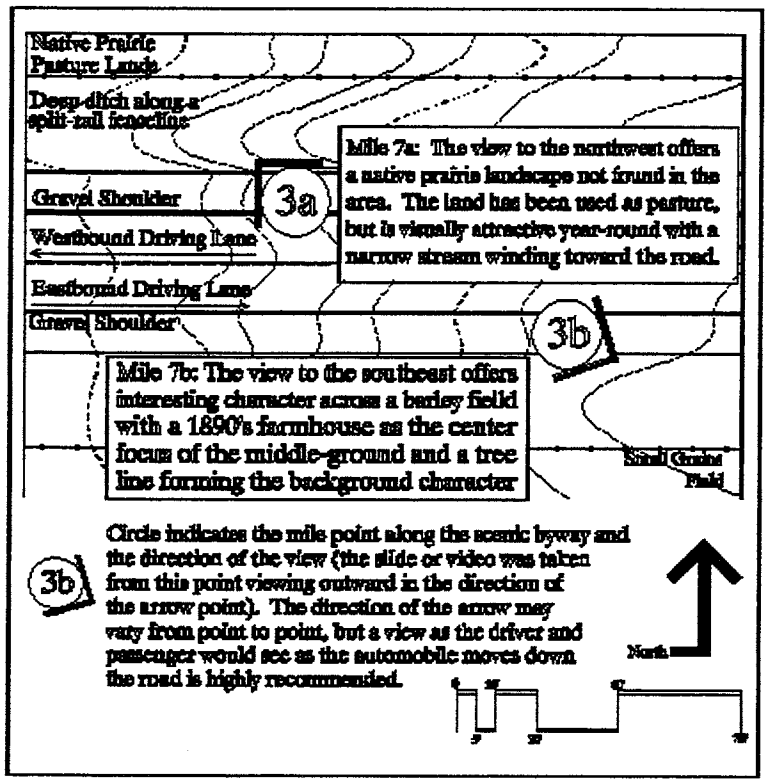
Chapter 4
Evaluating the Landscape

Introduction

The most difficult problem that occurs in evaluating a landscape or a landscape corridor is the identification of all its positive assets. Many times an individual traveling through a space or series of spaces does not see the same things each time. This is a sign that the space or spaces have a very positive landscape diversity or variation. Chapters Two and Three have been prepared to help the nominators and evaluators better understand and appreciate these potential changes. These changing qualities are very important in all scenic byways and every effort should be made to identify both landscape diversity and variation.

Mapping and Diagraming

One of the best ways to determine a corridor's assets is to have multiple individuals collect information and impressions of the proposed scenic byway being evaluated. This is sometimes



Map Four:

A small segment of a scenic corridor map illustrating methods of annotating each view as well as indicating view location and its direction.

referred to as a collaboration process. A simple map and clipboard can be used to observe the proposed scenic byway using simple notes and comments on its qualities. Many find that by using a process such as this they begin to see more and more about the corridor each time they view it. Use this process as an orientation for yourself, but also consider how visitors might view the byway.

The first step should be the preparation of a simple orientation map for the proposed scenic byway. This map should indicate the entire length of the proposed scenic byway with a starting point and an ending point. The following categories should be considered in the evaluation of the scenic quality and character of the proposed corridor. A map or a series of maps referenced back to the orientation map should start as described on page six of the "Guidelines for North Dakota Scenic Byways and Scenic Backways Program" document. You may find that some of these categories do not apply to your proposed corridor, but if you look close you may find some significant information you had not been aware of in the initial discussions or reviews. Map Four illustrates how a corridor route could be diagramed using the categories below. Note how the map shows the direction of the view at each point along the corridor. Each image should be dated as to the season it was taken. It is sometimes useful to photograph or tape a route during all the seasons of the year. Many other drawing and diagraming tools could be employed to orient and communicate to the evaluators the scenic character of the proposed byway. Map Five at the end of this chapter illustrates this diagraming technique for an entire scenic corridor route.

Use the following categories to help describe your scenic route where ever possible:

Scenic

The composition of features that are regional representative, associative or inspirational. These features are measured by their memorableness and distinctiveness of visual impression, their inactness and their unity.

Historic

Landscapes and structures that represent a legacy of the past.

Cultural

Activities or objects that represent unique and distinctive expressions of community life, customs or traditional ways and identify a place, region, or culture.

Recreational

Passive and active leisure activities usually associated with outdoor recreation that we seek to refresh and renew our spirits.

Natural

Pleasing visual experience of natural areas and/or ecologically-sensitive landscapes representing natural occurrences including land forms, water, vegetation, and wildlife.

Archaeological

Sites, artifacts or structures representing past human life and activities.

Another method of evaluation which can produce positive results involves questioning yourself and then following the questions with an overall rating. This works well only if the proposed byway is similar from start to end, but if the route has many landform, vegetative, or land-use changes an evaluation process may need to be developed for each of the varied segments of the proposed scenic byway.

A typical example might be:

Do the _____ qualities or characters found within this segment of proposed corridor merit further discussion?

If yes, are these qualities or characters visible in the corridor based on a simple rating of high, medium, or low?

> **NOTE:** *Additional information will be provided on this rating system in Chapter Five.*

A simple rating system is provided for each of the six categories listed as high, medium, or low. It is also advised to consider going beyond these ratings with an expanded written explanation of the quality or character found within the corridor. The sample worksheet found in Chapter Five has been provided to help you with these ratings, but your explanation and descriptions are just as important as the rating in most cases. Although, you should consider the power of the photograph – **"a picture is worth a thousand words".**

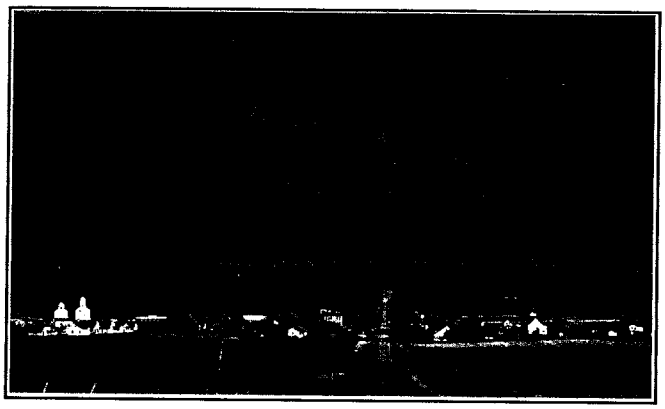
Another issue which is sometimes unnecessarily avoided by nominators, involves the identification of liabilities found within the corridor. It is usually thought that a negative feature should not be addressed in the evaluation process. This is not an approach to take in your evaluation process for a scenic byway route. The identification of the assets as well as any problem areas (liabilities) is important to help improve the scenic quality. Once the problems are identified simple solutions may be found to correct any visual problems.

An example might be that a potential scenic corridor has many positive assets, but a large electrical substation in the immediate foreground interferes with a beautiful view of the surrounding farmlands. The solution might be very simple — based on the location of the substation and the viewing locations, new tree plantings may help screen the problem view. If the problems are not

identified with the assets a potential solution may never be identified, which could cause the entire scenic corridor route to be lost.

Foreground, Middle-ground, and Background Landscape Evaluation:

The following are three very different views of the North Dakota landscape. All three landscapes have their unique beauty, but they are not considered visually equal if an evaluation process is carefully considered. The first view would be considered high in scenic quality for the background, middle-ground, and the foreground. The second example is an interesting landscape but does not offer the same diversity and character found in the first example — especially at all three visual levels of the landscape. The third view; well you be the judge of its scenic quality. It is important to consider foreground, middle-ground, and background in each photo. Review each photograph carefully and try to see the differences as explained in each of these sample photos.



View One: HIGH

Photo Four - In this view the visitor sees:

- A foreground offering the least amount of landscape diversity, but the rangeland fence line and narrow road still provide interesting visual focus toward the community.
- In the middle-ground the central focus becomes a lonely farming and ranching community with a wonderful contrast to the foreground and the background.
- In the background the variation of a plains landscape moving into a distant hilly region with buttes offers visual or scenic variation, so important in the necessary changing landscape character of a scenic byway.

Overall this landscape view offers excellent landscape diversity and character and would be of visual interest along a scenic byway in western North Dakota. This view also offers the potential for historic character. This small community certainly would have an historic story or two to be explained to the tourist or visitor.

The cultural resources found in the community are also a potential as part of this segment of a scenic byway – celebrations, ceremonies, and special events. The area would additionally offer active and passive recreational opportunities as well as the potential for significant archeological sites. It is very important to evaluate all opportunities and constraints associated with a view or

series of views. The view in a 180 degree rotation might be uniquely different from this view or possibly very unsightly. This is why a view from both directions is required.

View Two: MEDIUM

Photo Five - In this view the traveler sees:

- The wonderful beauty of the foreground's native grasses with a very interesting lone tree are part of this viewing area..
- In the middle-ground a small coulee becomes very visible (this landform feature is referred to as a dead ice moraine by geologists – having been created by the actions of glaciation).
- The background has an overall lack of interest to the viewer — but a prairie sunset could change the lack of interest very quickly.

This landscape is very interesting but is not of the highest scenic quality — it would be classified in the medium range for scenic quality. If the natural resource value was evaluated from this view it would be considered medium-high to high. The dead-ice moraine is found throughout the drift prairie region of the state, but unless these moraines are interpreted for the visitor their significance is generally not seen or understood. Scenic and natural resource potential are obvious in this view, but the archeological or cultural significance of this view or area may not be known without further interpretation. A location such as this could have a simple roadside parking area with a series of interpretive signs or displays installed to inform the visitor of the scenic, historic, cultural, recreational, natural, and archeological significance and understanding of an area. The parking area could be expanded to offer picnic tables and a grove of trees. This would turn a view such as this into a part of the scenic byway's interpretative process.

View Three: LOW

Photo Six - In this view the traveler along a rural highway sees:

- A typical fall scene of spring wheat being swathed in a field creates a detailed foreground.
- In the middle-ground the swathed grain is still the visual image, but its scale and detail are becoming less and less as the view continues into the background.
- The background offers more of the fall harvesting process, but has become monoculture — although a North Dakota sunset or a herd of whitetail could change the lack of visual interest. It should also be noted that the high power transmission lines in the background do not necessarily need to be a negative in a view. The interpretation of these visual elements in the landscape can be very important from a cultural or historic point of view. The same can be stated about oil wells and mining equipment.

This landscape is very interesting but is not of high scenic quality — it would be classified in the low range for overall scenic quality. Remember, that scenic quality is only one of the six categories being evaluated. This view offers cultural resource potential as an interpretation or explanation of prairie landscape farming techniques. In some cases a visitor to an area may know little or nothing about the region's culture and educational displays could be an extremely informative system. This view could also be evaluated quite highly for its natural resource character, since it can be broadly interpreted as a landscape created by the tremendous forces of glaciation. The regional history is an additional opportunity to explain the viewing area. Native American history moving into homesteading era of the 1880s offers many stories to be told along a scenic byway.

> *It is important to understand that these three typical photographs are only intended to suggest overall scenic quality in their rating. The historic, cultural, recreation, natural, and archeological resources of a nominated scenic byway have many other ways to be described and evaluated. The photograph is a valuable tool especially for visual issues, and can be useful for the categories, but written and graphic formats are also needed to thoroughly denote all aspects of a nominated scenic byway.*

Evaluating Intrinsic Qualities

Consider the following North Dakota Badlands view (as used on the cover of this document) for an overview of how foreground, middle-ground, and background influence the landscape we view.

All views provide a similar scenic character that can be used in many interesting and exciting ways as part of the typical scenic byway.

Foreground

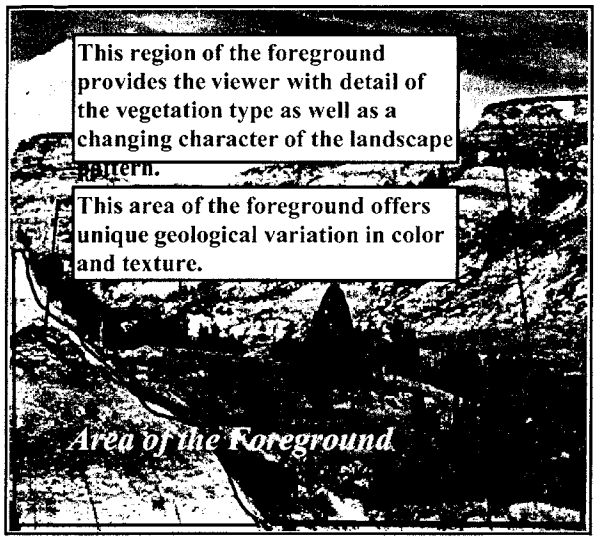


Photo Seven:

The foreground needs a high level of detail. The materials of the landscape can be seen and identified in the foreground. An interesting foreground should offer the visitor positive variations in color, materials, and texture. The color variation might be offered in the form of geologic character or changing vegetative types. Materials can provide additional interest with varying sizes and character. The texture can be contrasting in numerous ways – such as variation in grasses and trees or in

Middle-ground

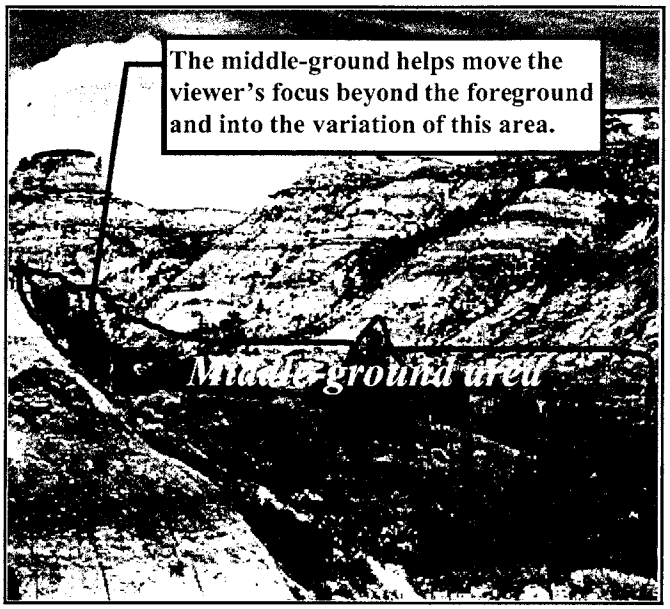


Photo Eight:

An interesting middle-ground can usually provide two visual aspects. The first purpose is to help move the viewer from the foreground to the background with a second option of offering a central focus of an overall view (such as a community or a river). The above example helps move the viewer into the background. The color and material continue to be important as described in the foreground, but the detail level decreases as the view moves toward the middle or back of the view.

Background

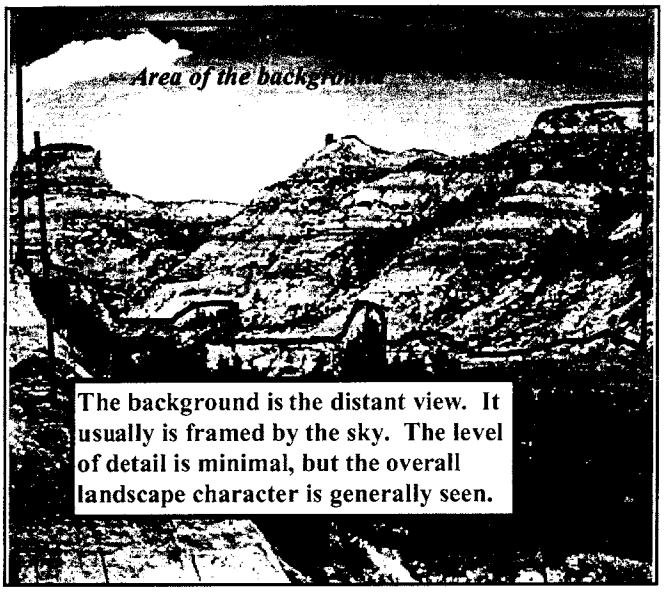


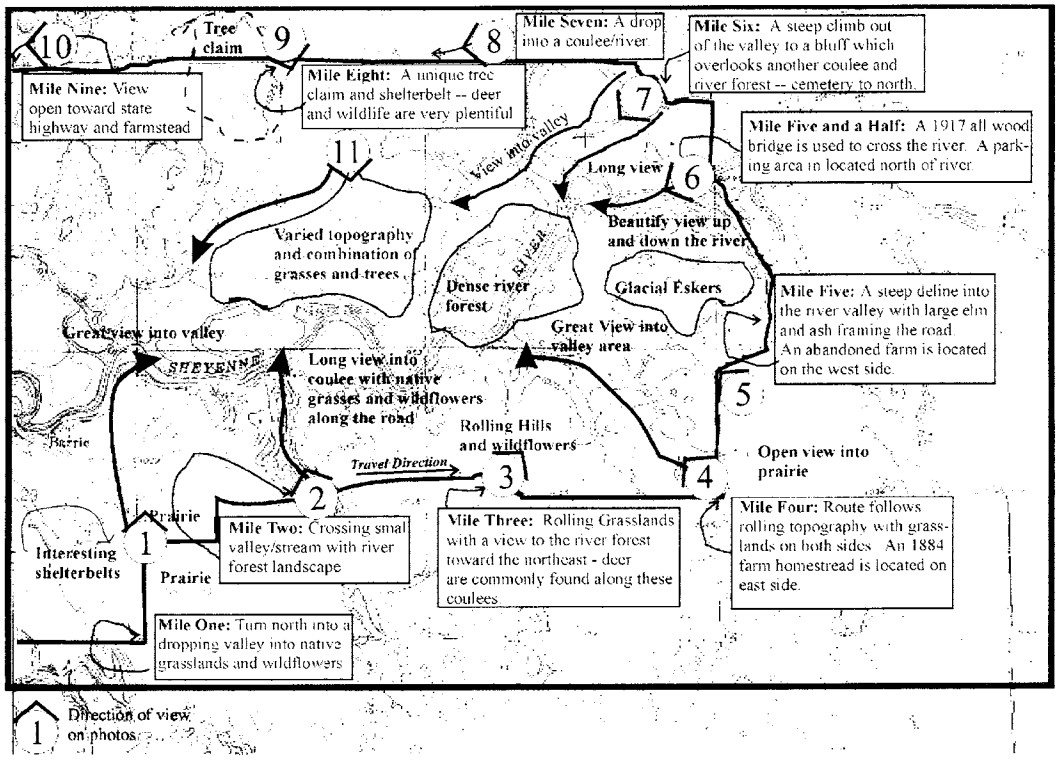
Photo Nine:

The background should provide the view with an understanding of the landscape and vegetative character of the region. There is a minimal amount of fine detail found in the background, but sometimes detail is apparent. Most backgrounds need the beauty of the sky to offer a contrast with the horizon. The background becomes less important if a view is focused into a deep valley, but usually the horizon (or background) can be seen even in a valley view. The view demonstrates how the landform character of the background is best seen by using both the middle-ground and the sky.

This technique can be used to evaluate most views along a scenic byway. There are few views which do not consist of a foreground, middle-ground, and background, although not all views have this strong of a distinction between them.

Continue to the next page for an example of the mapping and diagraming of a scenic byway route using a U.S.G.S. map. The map is part of an actual U.S.G.S. Quadrangle in southeast North Dakota. It is not being used to indicate a scenic byway route, but only to demonstrate graphic and diagraming techniques.

A Map/Diagram of a Scenic Byway Route through a Rolling Valley



Preparing a Scenic Byway Map:

The above map was prepared by using a standard 7-1/2 minute U.S.G.S. map (United States Geologic Service). These maps are sometimes referred to a quad map and are at a scale of 1" = 2,000' or 1:24,000. U.S.G.S. maps are generally very accurate for illustrating topography, physical landforms, roads, settlement/cultural patterns, wetlands, and overall vegetation. You may find that for some locations these maps are not very current or have not been updated for many years. In this case the updates can be made to the map without a problem. The changes could be drawn directly onto these maps without a loss of information. These maps are found at many libraries throughout the state and some bookstores. The County Office of the Natural Resource Conservation Service (NRCS) also have these maps available in many locations. A county or township map may also be used but they do not generally have many of the same mapping feature as found on the U.S.G.S. maps like topography and vegetation massing.

The above map was simply scanned into a computer package called Corel Draw with the diagramming completed using the program's powerful graphic tools. The view locators and mileage notes were also added to the scanned image as were the directional arrows. The guideline for proposing a scenic byway require a minimum of two views each miles, one view in each direction of the proposed scenic byway. Additional views are recommended along the route anywhere images might help explain the route's scenic conditions or offer a scenic opportunity for the proposed route. Also, do not be concerned with including negative images along with the positive views. Note that at each mile location on the above diagram a brief description of the surrounding areas this indicated in the rectangular boxes.

Color slides or video tape are recommended for recording these images. Special care should be taken to carefully identify the image as well as where the view was taken on the map (similar to the above map) and the direction of the view. Labeling of the supporting images (slides or videos) is very important for review purposes at all levels.

Chapter 5
Evaluating Scenic Byways

Evaluation Criteria of Intrinsic Qualities

The categories and the descriptions associated with the intrinsic qualities found in Chapter Four are from an information packet supplied by the National Scenic Byways Program. Many individuals reviewing these intrinsic qualities may become confused over categories, descriptions, and ratings. The purpose of the following explanation and sample worksheet is to help those preparing a nomination for a scenic byway, or those who will evaluate a scenic byway, better understand and appreciate the potential each byway offers the visitor.

Chapters Two and Three of this document have carefully explained the landform character and vegetation commonly found within the various regions of North Dakota. The end of Chapter Three also provided a very general overview of wildlife found within the regions of the state. Whenever possible consider this valuable information in your ratings, descriptions, and/or explanations of the nominated scenic byway. The appreciation and understanding of North Dakota's varied landscape will be an important method for determining the need for a scenic byway within the state.

Your written step should be based on an introduction or summary of the proposed scenic byway's land forms, vegetation, or land-uses, using the maps as described and illustrated in Chapter Four. It is very important to consider the following: if mile one differs greatly in landscape character or vegetation from mile ten, simply break the corridor into multiple segments. An example might be if the start of the proposed scenic byway (miles 1-4) were in the flat agricultural lands of the Red River Valley; it then proceeds into the beach ridges of Lake Agassiz (miles 5-7), and ends in the rolling, drift prairie region (miles 8-10) your summary could consider three separate segments.

- Segment One: Red River (miles 1-4).
- Segment Two: The beach ridges of Lake (miles 5-7).
- Segment Three: The Drift Prairie (miles 8-10).

Each segment would have very different land forms and vegetation characteristics to be evaluated. The scenic quality would be more easily understood if these variations were identified initially using different segments. These variations will only add to the overall character a scenic byway offers its visitors. Each segment would have other features or characteristics which could be summarized to help the evaluators understand the proposed scenic byway. The above example indicates variation in landscape and vegetative character, but major changes in land-use might also offer a better understanding if the different land-uses were broken, rolling, agricultural lands with highly ordered shelterbelts; in mile eight an abrupt valley begins dropping quickly into a community below along a deep cutting river – the community image is viewed until mile 11; and out of the valley a

less rolling, rangeland (less rolling than the agricultural lands opposite the valley) are found for miles 12 through 20. This example would have at least three distinct land-uses as part of the proposed scenic byway and would be best evaluated with three segments as described above. The decision about dividing the proposed corridor into segments of varying natural character or land-use patterns or as a continuous route should be considered as an orientation as well as introduction.

The second step should be to inventory or collect the information found for any or all of the following categories. The information should be evaluated for its importance in determination of a scenic byway. Start on the south or west end of the corridor (as described in Guidelines for North Dakota Scenic Byways & Scenic Backway Program document — pages 4-8) and record changes as they occur based on the six categories list below. Remember, it may be necessary to evaluate different segments separately as indicated. You may find that only two or three of these categories apply to the entire corridor or the individual segments of the corridor, but always consider these factors in your evaluation. By carefully reviewing each category, new ideas about the corridor may become apparent. It is sometimes helpful to have another individual evaluate a segment independently and to compare notes. Many times this will lead to very different interpretations and a more objective, better evaluation.

If negative issues are found along a nominated scenic byway the negative should be considered for its positive potential. Is a large dragline adjacent a proposed route a negative impact or does it offer a significant viewing opportunity of cultural development in a region? This is a difficult question but can become extremely important in the evaluation process. The six categories of intrinsic qualities are included because all sorts of viewing and interpretation should be explored as part of an interesting scenic byway. A scenic byway which only has scenic quality without unique or significant cultural or historical potential may be found uninteresting to the visitor – consider ALL categories, and do not avoid evaluation of negative issues. The interpretation of North Dakota's oil industry in an area of many active oil wells scattered throughout the landscape, may be an interesting and important segment of a future scenic byway.

> ***Overall Summary of the Scenic Byway Corridor:*** *The following worksheet should be used to determine the overall rating of the nominated scenic byway for each of the criteria. Your review process may not discover information on each category, but certainly consider each as a potential source of information. You should use this rating for the entire corridor. Additional worksheets may be used to rate the different segments. For example, if the scenic corridor has multiple landform characteristics, cultural, land-use, or vegetative segments along its total length, simply note these changes on the annotated base map.*

Remember, a rating worksheet may be prepared for each mile segment (1-3, 4-7, & 8-10 as explained above) for the nominated scenic byway's route.

Evaluating Intrinsic Qualities				
Categories	High	Medium	Low	Not Applicable - Use only if nothing is identified
Scenic Quality	The scenic corridor is characterized by the most outstanding characteristics of the individual landscape and vegetative features or combinations of these features (essentially unique in the region) with an absence of negative visual intrusions.	The scenic corridor is characterized by the varying characteristics of the individual landscape and vegetative features or combinations of these features with an absence of uncontrolled negative visual intrusions.	The scenic corridor is characterized by the limited landscape or vegetative characteristics of the landscape features or combinations of these features.	The scenic corridors should always have some type of scenic quality – whether it is rural, suburban, or urban.
Historic Character	Route contains multiple sites on the National Register or designed as a National Historic Landmark or National Monument which contains visible remains or established interpretation (signing, etc.) on site.	Route contains one or more sites on the State Register of Historic Landmark, Point of Interest, or Monument which contains visible remains or established interpretation (signing, etc.) on site.	Route contains one or more local or regional historic sites, points of historic interpretation, or monuments which contain visible remains or graphic signage at the site.	History is everywhere — it should be a part of the visitors' experience on the route. A careful investigation at the public library or discussions with elderly citizens of the region might uncover many unique historic opportunities.
Cultural Resource	The majority of the route or many segments of the route offer outstanding cultural viewing and experiences reflective of the region in which it moves through including celebrations of ethnic heritage, religious ceremonies and places, unique architectural character, or special events of interpreting cultural events.	The route or segments of the route offer various examples of cultural viewing and experiences reflective of the region. Opportunities for the traveler include celebrations of ethnic heritage, religious ceremonies and places, unique architectural character, or special interpretation of cultural events.	The route or segments of the route offer one or more examples of cultural viewing and experiences reflective of the area, region, or state. Opportunities might include seasonal events like a 4th of July celebration, a Labor Day picnic, religious events or activities, cultural events, or interesting domestic architecture.	Like history our cultural achievements can be found almost everywhere within the state. A careful analysis of the activities on an annual basis along a proposed route should produce numerous opportunities. An event which has been attended by the residents again and again might be of great interest to a visitor.
Recreational	Along or adjacent the scenic route numerous active and/or passive public recreational opportunities, facilities (parks, hiking, picnicing, campgrounds, etc.) and events (ball games, sporting activities, etc.) are available for viewing or participation by all ages.	Along or adjacent the scenic route active or passive public recreational facilities (parks, hiking, picnicing, campgrounds, etc.) and events (ball games, sporting activities, etc.) are available for viewing or participation by all ages.	Along or adjacent to the scenic route limited active or passive public recreational facilities (parks, hiking, picnicing, campgrounds, etc.) and events (ball games, sporting activities, etc.) are available for viewing or participation.	Good recreational opportunities may be very limited in some regions or areas. A softball tournament in a community may be both a recreational opportunity as well as a cultural resource.
Natural Resources	The scenic route contains high quality natural features (rivers, lakes, forestlands, native prairie, unique landforms, etc.) which are not commonly found throughout the region or area, and offer special learning experiences to the visitor.	The scenic route contains varied natural features (rivers, lakes, forestlands, native prairie, unique landforms, etc.) which are not commonly found throughout the region or area, and offer unique learning experiences to the visitor.	The scenic route contains limited natural features (rivers, lakes, forestlands, native prairie, unique landforms, etc.) which are commonly found throughout the region or area, but offer a learning experience to the visitor.	Scenic and natural resources generally have a strong tie to one another, but a region can have nearly hidden viewing and interpretation opportunities if geology and glaciation are considered along a route.
Archeological	One major archeological site or a series of significant archeological sites can be found adjacent or within a close distance (3-5 miles) to the scenic route, where highly focused interpretation and better understanding of the previous residents to the region can be viewed publicly.	Archeological sites can be found adjacent or within a 5-8 mile distance from the scenic route where some interpretation and understanding of the previous residents can be viewed publicly.	Archeological sites can be found adjacent or within a 5-7 mile distance from the scenic route, where limited interpretation and understanding of the previous residents can be viewed publicly.	An individual interested in archeology is going to be very demanding of a sites actual interpretation — care is needed in the designation of an archeological site.

This information is intended to augment the previous worksheet by providing the necessary explanations of categories which cannot be properly explained in a high, medium, or low rating system.

CATEGORY ONE: Scenic

Also consider the following categories and questions based on the rating of high, medium, or low on the worksheet. These categories and questions are best formatted and presented in a written outline:

Overall segment scenic character based on:

- Natural features (prairie lands, river forest, rolling hill).
- Built features/man-made features.

Describe all visual opportunities

Why is the scenic quality important?

Describe the general scenic character

Describe any visual impacts and issues

- Visual problems
- Unique problems

Can the visual problems be resolved?

CATEGORY TWO: Historic

Also consider the following categories and questions based on the rating of high, medium, or low on the worksheet. These categories and questions are best formatted and presented in a written outline:

The general history of the region

Historic features along the corridor

Historical institutions of the area

Physical history of the area, development patterns

Historic trade or settlement routes

Historic changes in the area

Why is the history important? Describe the historic character

Describe any impacts or issues.

CATEGORY THREE: Cultural

Also consider the following categories and questions based on the rating of high, medium, or low or the worksheet, These categories and questions are best formatted and presented in a written outline:

Describe the cultural issues found both local and regional.

Describe any negative issues (or problems) found both local or regional.

Cultural impacts

- Circulation systems (as related to regional ties)
- Land use patterns
- Zoning/ordinances
- Open space patterns
- Circulation systems

Cultural amenities

- Museums
- Library
- Theaters
- Ethnic restaurants

Impressions of population

- Interviews, owners, residents, retailers, visitors

Describe all items above which are important in the development of a scenic byway.

Why is culture important?

Describe the cultural character.

Describe any impacts.

Other options to consider, but not necessary unless the scenic byway is located through an urban segment:

Property values

Buildings

- Type
- Age
- Usage
- Condition of building or feature
- Height
- Architectural significance
- Style

Transportation - proximity to major systems

- State highways
- US highways
- Interstate highways
- Passenger/freight rail

Traffic System

- Streets - their size, usage, condition
- Condition of system

Transit System

- Bus system and stops, schedule, maps
- Rail system and stops, schedule, maps

Pedestrian System

- Major routes
- Volume
- Time of usage
- Condition of system

Parking

- On-street parking and limitations
- Parking structures
- Condition and functioning
- Proposed parking

CATEGORY FOUR: Recreational

Also consider the following categories and questions based on the rating of high, medium, or low on the worksheet. These categories and questions are best formatted and presented in a written outline:

Describe the recreational facilities found within the region.

What recreational opportunities are found within or adjacent to the scenic byway?

Why are they important?

CATEGORY FIVE: Natural

Also consider the following categories and questions based on the rating of high, medium, or low on the worksheet. These categories and questions are best formatted and presented in a written outline:

- Landform character
- Landscape character of the corridor
- Landform character - lakes, streams, topography

Soils

- Soil patterns

Water of the adjacent areas

- Rivers or lakes

Vegetative patterns

- Natural patterns
- Man-made patterns
- Unique natural resources

Natural limitations

Describe items that are important in the development of a scenic byway.

What is important about the natural features?

Describe any unique natural character of the region.

Describe any natural impacts

CATEGORY SIX: Archeological

Also consider the following categories and questions based on the rating of high, medium, or low on the worksheet. These categories and questions are best formatted and presented in a written outline:

Are archeological sites found within the region or along the corridor?

Which items are important in the development of a scenic byway?

Why are they important?

Describe the specific archeological character.

Describe any potential impacts of public access to these areas.

Notes:

Recommended References

The following categories contain numerous references on various scenic byway related topics. If your library does not have these specialized topics, ask your librarian to search the state-wide system. A loan can be provided to your library in most cases.

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Winters, Harold A. The late Pleistocene geomorphology of the Jamestown area.

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