FORMATION OF THE MINNESOTA RIVER VALLEY

The Wisconsin Glaciation, the most recent ice advance in Minnesota, started approximately 75,000 years ago. Its many different ice lobes pushed their way into Minnesota while the Des Moines lobe covered what is now the Minnesota River Lowlands. Landscape formations such as wetlands, lakes, and outwash streams were created as the ice moved and retreated.

Most of Minnesota’s most prominent topography is due to moraines that were formed when the glacial ice stayed in one place for an extended period of time. With the retreat of the Wisconsin Glacier, approximately 12,000 years ago, a large mass of ice blocked the natural drainage way leaving no drainage outlet. Melt-water began to pond behind the Big Stone Moraine forming Glacial Lake Agassiz. With the melting of the ice mass to the north, Glacial Lake Agassiz grew immensely covering the majority of what is now northwestern Minnesota. Several outlets started to breach the Big Stone Moraine ice dam and eventually a main outlet channel formed near Brown’s Valley to create the Glacial River Warren.

At first, the River Warren split into several channels forming wide plains, terraces, and channels. Later, these multiple channels were abandoned and a single channel was formed. The turbulent, eroding waters of Glacial River Warren carved the Minnesota River Valley creating “valley walls that reached up to 252 feet high and an extensive valley floor that spanned 5 miles at some points” (Anfinson 13). When the natural drainage way to the north reopened, the melt-water started flowing to the north and the outlet that fed the Glacial River Warren was abandoned. Today the Glacier River Warren Valley is the Minnesota River Valley. The Minnesota River slowly winds its way through this wide valley with a flowage that is stark contrast to the mighty River Warren. (Tester)

Glacial River Warren and Design:
The Glacial River Warren created the Minnesota River Valley’s landscape character and identity. The valley floor, ancient river terraces, valley walls, bluffs, and the tributary channels form this landscape. This Minnesota River Trail work reflects the glacial valley identity; the character of trail segments, special places along the trail, trail experiences, the communities along the trail, and the valley’s cultural patterns all respond to and reflect this special landscape and its features.

Adapted from Minnesota’s Geology
Adapted from Southwestern Minnesota Archaeology

FORMATION OF MINNESOTA RIVER VALLEY
Deep layers of glacial till bury the Minnesota Valley’s bedrock. Therefore, the bedrock is most visible in rock outcroppings where the glacial till was eroded away by the Glacial River Warren. The different types of exposed bedrock in the valley reveal the story of the valley’s shifting bedrock geology.

In the Redwood Falls area, Morton Gneiss outcroppings are extensive. Morton Gneiss or Rainbow Granite is considered one of the oldest rocks at 3,600 million years old (Ojakansas and Matsch). Morton has an active mine of this famous architectural stone that is operated by the Cold Spring Granite Company.

Towards New Ulm, Cretaceous Sandstone is most prevalent. This highly erosive substance is made of poorly consolidated soft shale, quartz sand, and lignitic clay. A small area of Sioux Quartzite is located northeast of New Ulm. This rock is primarily found outside the study area by Pipestone and near the Southwestern Minnesota/South Dakota border.

The bedrock shifts dramatically from New Ulm to Mankato. St. Peter sandstone or Kasota stone, a pure quartz sand with a yellow ochre color, is layered between the Prairie du Chein and Glenwood dolomites. These sedimentary layers are evident in the bluffs of the Minnesota River Valley between Mankato and St. Peter.

**Bedrock Geology and Design:**
The shift in bedrock from gneiss and granite to Kasota stone drove the design work. Trail alignments were sited to experience the bedrock conditions in areas where the bedrock is revealed. The stone used to create the trail’s signature elements reflect the change in bedrock geology. In areas with granite, granite is used, areas with Kasota stone, Kasota stone is used, etc.
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BEDROCK GEOLOGY

Granite
Gneiss
Cretaceous, Undifferentiated
Sioux Quartzite
Saint Peter Sandstone
Municipalities

Redwood Falls
New Ulm
Saint Peter
Mankato
SURFICIAL GEOLOGY

Surficial geology defines the majority of the landscape character and how that character is experienced. The Minnesota River Valley has five distinct landscape types, each of which have been shaped by layers of glacial till. The valley’s surficial geology includes ground moraine, outwash channels, ancient terraces, stagnation moraines, and an ancient lakebed.

Ground moraine dominates the majority of the area creating level to slightly rolling terrain. Old outwash channels created by glacial streams are evident in the Geographic Information System (GIS) analysis mapping, but are not perceived in the actual landscape. The ancient terraces of the Glacial River Warren are still evident and are quite large in some areas. These terraces contribute to defining the width and breath of what was once the Glacial River Warren. Portions of New Ulm and Saint Peter are sited on these river terraces.

Stagnation moraines are visible in the landscape and are characterized by a hillier terrain that contains pothole lakes caused by glacially formed depressions. Swan Lake in Nicollet County is an example. The lakebed of the ancient Glacial Lake Minnesota is south of Mankato. A very level landscape and many small tributaries of the Minnesota River characterize this area.

Surficial Geology and Design:
The trail is sited to experience the characteristics of the five landscape types shaped by the surficial geology. Because New Ulm and Saint Peter are located on ancient river terraces, the design interprets these terrace landscapes.
Alluvium
Glacial Lake Off-shore Environment
Glacial Lake Near-shore Environment
Ground Moraine
Glacial Lake Shore
Stagnation Moraine
Terraces
Present Day Lakes
Municipalities

Redwood Falls
New Ulm
Saint Peter
Mankato
In the Minnesota River Basin, 1183 minor watersheds make up 12 major watersheds. A major tributary generally defines the major watersheds. This study area’s major tributaries are the Redwood River which cuts through Redwood Falls in a deep, picturesque ravine, the Cottonwood River at New Ulm that has a culturally significant, beautiful state park, and the Blue Earth River which meets the Minnesota River near Mankato.

Historically this area was dotted with prairie wetland complexes, such as the Swan Lake complex. As European settlers moved into the region and started to farm the land, the wetlands were systematically drained by systems of drainage tiles and drainage ditches. This extensive drainage created a very rich and productive agricultural landscape, but it resulted in the loss of approximately 2-3 million acres or 90 percent of the historic prairie wetlands. Because of this, the Minnesota River is susceptible to frequent flooding and is considered one of the most polluted rivers in the state and the nation. (Minnesota River Basin Data Center). This water pollution affects more than just the environment of the Minnesota River Valley. “The Minnesota River is the state’s largest tributary to the Mississippi River. Where the Minnesota River flows into the Mississippi River, the flow of the Mississippi doubles” (Minnesota River Basin Data Center). The nutrients in the Minnesota River contribute to the pollution of the Gulf of Mexico and its ever-increasing hypoxia zone, the “dead zone” devoid of oxygen that cannot support life.

Efforts by several organizations, individuals, and government bodies are being made to improve the water quality and restore wildlife habitat in the Minnesota River Valley. Many of the major tributaries to the Minnesota River are undergoing clean up and restoration. The U.S. Department of Agriculture’s Conservation Reserve Program (CRP) and Minnesota’s Reinvest in Minnesota Reserve Program (RIM) have worked together to provide incentives to farmers for enrolling their land into conservation easement programs that takes it out of agricultural production. Riparian buffers, frequently flooded land in the Minnesota River Valley and its tributaries, and land that is near a major identified pollutant source are the first targets for these programs.

Hydrology and Design:
Because both Redwood Falls and New Ulm were sited by tributaries of the Minnesota River, these small rivers play important roles in the trail alignment and trail interpretation planning/design strategies. Using the Minnesota River Trail to interpret some of these crucial clean-up efforts and the resulting conservation lands and promoting water quality education is a project goal.
Mapping the Pre-European Settlement vegetation of this region shows a gradient along the Minnesota River from the Prairie to the Big Woods. The majority of this landscape was once tall grass prairie dominated by big bluestem, little bluestem, switch grass, and Indian grass with many large patches of wet prairie. In this drier prairie landscape it is easy to see how the Minnesota River Valley with its river bottom forest and hardwood bluffs attracted its first inhabitants. (Anfinson)

Small patches of the transitional Aspen-Oak and Oak Savanna were found as the river approached the big woods to the east. As the river turned north at Mankato, the vegetation changed dramatically to the Big Woods complex that included oak, maple, basswood, and hickory.

This landscape is very altered now. Agricultural land has replaced the wet and dry prairie and the Big Woods. Fragmentation of these native plant communities has had a negative impact on wildlife. Most of the main sites of biodiversity significance that still exist are being managed through the Scientific and Natural Areas (SNA), Wildlife Management Areas (WMA) and state parks.

Some of the most notable biodiversity sites in the study area are Cedar Rock WMA, Cedar Mountain SNA, Fort Ridgely State Park, the Swan Lake complex, Minneopa State Park, and the Kasota Prairie SNA.

**Vegetation and Design:**
The alignment and design of the Minnesota River Trail celebrates these areas of biodiversity. The transition of Prairie to Big Woods that once existed is interpreted and revealed. Native plants are placed at trailheads, kiosks, and rest circles.
PRE-EUROPEAN SETTLEMENT VEGETATION & PRESENT BIODIVERSITY
PRESENT LANDCOVER

Agriculture is dominant throughout the Minnesota River Valley region, starting in the mid-1800s with the first immigrant settlers. Slowly, prairie gave way to today’s landscapes: an agricultural matrix of cultivated land, farmsteads, windbreaks, and county roads. Drainage ditches and drainage tile systems have altered the land's natural drainage.

Over the last half century, farming has radically changed. Agricultural technology has led to specialized crop production on much larger farms. Market forces and government programs have led to the consolidation of small, traditional farms into large farming and feedlot operations. Unused homes and barns dot the valley landscape. However, farming continues to be the economic powerhouse of the region, and farming is still very much a part of the culture of this landscape. Its presence and its history are very important to its communities. Historical societies and many independent groups have become very active in preserving the agricultural history of the valley. Many of the barns and farmsteads have been placed on the National Register of Historic Sites. A century farm program has been started, celebrating farms that have been in continuous family ownership for at least 100 years and are at least 50 acres in size. Farm and machinery museums can be found in the valley as well as many harvest and farm festivals.

Most recently, there has been some movement away from the larger farms. Those interested in sustainable agriculture have started to bring back the traditional farm. Using agri-tourism ideas, sustainable farmers have formed networks and hosted events throughout the year. Many small farms have also diversified to include wineries, bed and breakfasts, or have become ‘U-pick’ or CSA (community supported agriculture) sites.

**Design and Present Land Cover:**

Both large-scale conventional farming and smaller sustainable farming are features of the Minnesota Trail landscape that are experienced and interpreted by the trail.
THE DAKOTA PERSPECTIVE

“The Minnesota and Mississippi River Valleys have been home to the Dakota for centuries. The existence of our ancestors was sustained by their relationship with the earth and their surroundings. For generations, Dakota families fished from the rivers, gathered rice from area lakes, hunted game on the prairies and in the river valley woodlands, and established villages along the riverbanks and surrounding lakes. Our ancestors lived in harmony with the world around them, and Dakota culture flourished.

In the 1640s, the first recorded non-Indian contact with the Dakota took place. For the next 200 years, our ancestors tolerated the presence and ever increasing numbers of non-Indians encroaching on their homelands. Some Dakota villages took advantage of the presence of non-Indians by establishing trade, inter-marriage, and even adopting many non-Indian ways of life and religion. Still other villages did not accept or trust the newcomers and did not wish to have traditional ways of life changed. By the end of the 1700’s, the fur trade had become a major way of life for many Dakota, and almost all villages were trading goods with the non-Indians.

In 1805 US soldiers arrived at Mendota, and the world of the Dakota began to change drastically. A series of treaties forced on the Dakota nation over the next 50 years would see their homeland taken away, their ability to provide for themselves destroyed, and an increasing reliance upon the government’s promises for payments and goods. The traditional Dakota way of life was stolen and replaced by confinement to reservations. Missionaries, fur traders, Indian Agents and the U.S. government all worked to change the culture of the Dakota. The U.S. government broke treaties, made endless empty promises and slowly attempted to eradicate the Dakota nation.

Finally, in 1862, the Dakota could no longer allow this mistreatment. Our ancestors battled for their homelands, their way of life, their culture. The events of 1862 ended with the largest mass execution in United States history when 38 Dakota were hanged at Mankato.

As a result of the Dakota boldness in standing up for their rights, the United States Congress abrogated all treaties with our ancestors and decided that the Dakota had to be removed from Minnesota. The majority of Dakota were sent on barges to Crow Creek, South Dakota, in 1863, and eventually removed to Santee, Nebraska. Other Dakota traveled to Canada and settled there. Some Dakota never left their homeland. Those Dakota who remained in Minnesota spent many impoverished years attempting to gain support and help from the federal government. Generations of our ancestors experienced U.S. government control, Indian boarding schools, and little opportunity for success. Strong Dakota communities eventually developed at Lower Sioux, Prairie Island, Upper Sioux, and Shakopee.”

Excerpted from the Shakopee Mdewakanton website: http://www.ccsmdc.org
Dakota Villages & European Settlements

1862 Reservation Land adapted from Through Dakota Eyes

- Dakota Villages
- European Settlements
- Battle Sites
COMMEMORATION

On November 7, 2002, the first-ever Dakota Commemorative March was organized to honor the nearly 1,700 women, children and elders who were forced to march 150 miles from the Lower Sioux reservation to a concentration camp at Fort Snelling following the 1862 Dakota War. The Commemorative March allowed Dakota people to grieve for their ancestors, some of whom died on the original march and were never buried, and for the loss of ancestral lands when treaties were abrogated and the Dakota were forcibly removed from the state. One of the organizers, Waziyatawin Angela Wilson, wrote of this traumatic history in a collection of writings about the March, In the Footsteps of Our Ancestors, published by Living Justice Press in 2006.

“The punishment of the Dakota after the war officially ended was swift and brutal, resulting in Dakota casualties and losses that have yet to be enumerated. Governor Alexander Ramsey stated unambiguously in September of 1862 that, “The Sioux Indians of Minnesota must be exterminated or driven forever beyond the borders of the State.” Henry Sibley was commissioned to carry out these goals, which he did with marked success. At the final Battle of Wood Lake, Dakota people began to surrender, believing that they would be treated as prisoners of war, while others fled north into Canada or west into the Dakotas. Twelve hundred Dakota initially surrendered to Colonel Sibley, and that number quickly grew to two thousand.

It was soon clear that the price for Dakota military resistance to the invasion would be exceedingly high. Upon surrendering, the men were immediately separated from the women and children, shackled, and tried for war crimes before a five-man military tribunal. By November 5, 392 trials had been completed, some having lasted as little as five minutes; 307 Dakota men were sentenced to death, and 16 were given prison terms. An executive order was still required, however, and the trial records were sent to Washington for President Lincoln’s review.

On November 8, the condemned men were forcibly removed to the concentration camp at Mankato, where they continued to await execution orders. On December 26, 1862, at the order of President Abraham Lincoln, thirty-eight of those Dakota men were hanged in what remains the largest mass execution in United States history. In the spring of 1863, those with commuted death sentences were transported to Davenport, Iowa, and imprisoned there for three years. By the time they were finally released in 1866, only 247 were still alive; 120 had died in prison.

Meanwhile, on November 7, 1862, the group of some 1,600 women and children were forcibly marched to Fort Snelling, where they, too, were imprisoned through the winter. In May of 1863, the 1,300 women and children who had survived the death camp were sent to a new reservation beyond Minnesota’s borders in Crow Creek, South Dakota.

Once the Dakota were forcibly removed from Minnesota, bounties were placed on the scalps of any and all Dakota people who remained. These bounties began at $25 and eventually were raised to $200. Moreover, the treaty money, which had arrived too late the previous summer to prevent the war, was sent back to Washington and then redistributed to White settlers, totaling $1,370,374 in 1863-64, as recompense for depredations incurred during the war. The Dakota treaties were abrogated, the people were exiled from our homeland, and our lands were opened to White settlement. The legacy of the policies is evident in the extant diaspora of our exiled people and our only minimal presence in our ancient homeland.”

With permission from Waziyatawin Angela Wilson, Decolonizing the 1862 Death Marches forward by Diane Wilson
DAKOTA COMMEMORATIVE MARCH CIRCLE

The Dakota Commemorative March and the preliminary plans for native red plantings as a 'living memorial' along its route by Molly Schoenhoff, one of the marchers, inspired this design. During the march, marchers stop at each mile to pray and place a red prayer tie stake into the ground. The names of two of the original marchers are on the stake.

Because the march is a linear journey, this design is to be placed right in the path to act as a mile marker. If this is not desirable or possible, the design could be placed at key points or large intervals instead of at every mile.

A circle of big bluestem and Indian grass (tallgrass prairie) on one side and little bluestem or prairie dropseed (short prairie grass) on the other side surrounds the path. Red Osier dogwood leads up to the paved circle. The path texture changes to stone as the circle space is entered. Family names could be engraved on the pavers. The circle provides room for the marchers to set stakes into the row of earth set in the stone alongside a permanent wooden stake and place offerings there. One of the stakes is permanent so descendants of the original marchers can pray and make offerings at the sites throughout the year.

The commemorative march route may be very different from the Minnesota River State Trail's alignment, but both may cross at certain points. Placing a Commemorative March Circle at some of these points may be desired.
DAKOTA COMMEMORATIVE MARCH CIRCLE

Tallgrass Prairie
Red Osier Dogwood

Stakes with Prayer Ties
Short Prairie Grasses