
Harmony-Preston Valley State Trail Master Plan Amendment

Harmony to the Iowa State Border and Niagara Cave

November 2, 2021



The Minnesota Department of Natural Resources, Parks and Trails Division would like to thank all who participated in this master planning process. Individuals and community leaders in Harmony have been working for many years to help establish this trail extension. Many DNR staff, city, county, and state officials, trail association members, and local citizens contributed their time and energy to the planning process as well.



DNR Parks and Trails Region 3 staff and trail crew. (2018)

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**Department of Natural Resources Approval
of Master Plan Amendment for the Harmony-Preston Valley State Trail**

Minnesota Statutes, section 86A.09, subd. 1 requires that a master plan be prepared for units of Minnesota’s outdoor recreation system, including state trails. In 1992, the Minnesota Legislature first authorized the Harmony-Preston Valley Trail as part of the Blufflands Trail System (Minnesota Statutes, section 85.015, subd. 7). The statute was amended in 2015 to include connections to the Iowa border and Niagara Cave (Minnesota Session Laws – 2015, 1st Special Session, Chapter 4, S.F. No. 5, Sec. 34).

This master plan amendment received input and comment both within the Department of Natural Resources and from the public.

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Erika Rivers, Director
MNDNR Parks and Trails Division

11/02/2021

Date

Master Plan Amendment Outline

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Purpose

The purpose of this master plan amendment is to address the extension of the Harmony-Preston Valley State Trail from the City of Harmony to the Minnesota-Iowa state border, including a connection to Niagara Cave, in Fillmore County. The trail extension is proposed to be a 10-foot wide bituminous (asphalt- paved) trail for a distance of approximately 5.5 miles, with a trail segment, approximately 0.5 mile long, connecting to Niagara Cave. This document amends the Harmony-Preston Valley Trail Master Plan, approved April, 1995. The fully developed Harmony-Preston Valley State Trail will consist of approximately 24 miles, from its intersection with the Root River State Trail (north of Preston) to the Minnesota-Iowa state border and Niagara Cave.

This amendment will provide additional year-round recreational trail opportunity, extending from Harmony to the Minnesota-Iowa state border. While the Harmony – Preston Valley State Trail will terminate at the state border, it is anticipated to connect to recreational trails in Iowa. The Iowa trail system includes a proposed connection to the Harmony – Preston Valley State Trail and may also connect to other trails and recreational areas along the Upper Iowa River and in the communities of Cresco and Decorah, Iowa. The proposed interstate trail systems is estimated to combine over 100 miles of recreational trails in southern Minnesota and northern Iowa.

The Harmony-Preston Valley State Trail will continue to be developed and managed for non-motorized uses, consistent with the previously developed segments of the Harmony-Preston Valley State Trail, including walking/hiking, bicycling and in-line skating, and cross country skiing.

Background – Trail Overview

Overview of the Harmony-Preston Valley State Trail

Currently, the Harmony-Preston Valley State Trail is an 18 mile, paved (bituminous) trail that connects the communities of Harmony and Preston to the Root River State Trail in Fillmore County. It is a multi-use, non-motorized trail, with the predominate uses consisting of bicycling, walking/hiking, in-line skating and cross-country skiing.

The northern two-thirds of this trail is constructed on an abandoned railroad grade and is generally level and wheelchair accessible. The southern segment between County Road 16 and Harmony was not constructed on an abandoned railroad grade, and is comparatively more challenging with varying terrain.

Root River State Trail to Preston

The Root River State Trail joins the Harmony-Preston Valley State Trail at the Isinours Junction. For the 5.6 miles south to Preston, the trail travels through wooded areas and farmland, crossing and winding alongside Watson Creek and the South Branch of the Root River.

Preston to County Road #16

The trail continues south out of Preston for another 3.9 miles until it intersects County Road 16. The trail meanders alongside Camp Creek for much of this section, allowing for recreational opportunities for anglers and access to trout fishing.



A family enjoying the Harmony-Preston Valley State Trail, Harmony Trailhead Park, Harmony, MN.

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County Road #16 to Harmony

The southern 8.5 miles of the existing trail, still continuing south, climbs out of the valley and zig-zags along a ridgeline to Harmony. This portion of the trail was not constructed on an abandoned railroad grade and follows more challenging terrain, including one rather strenuous incline that may not be suitable for all trail users. Scenery along the trail consisting mainly of farmland and rolling terrain, while scattered sinkholes and small wooded areas present diversity, opportunities for resource interpretation and points of interest along the trail.

Trailhead in Harmony

The trailhead in Harmony is located in Harmony's central business district, just west of Highway 52 on 1st Avenue, near the Harmony Visitor Center. The parking lot entrance to **Harmony-Preston Valley Trailhead Park** is off of 4th St NW, just east of 2nd Ave NW. Public parking, picnic tables, a playground, informational and educational signage, and public restrooms are located at the trailhead park. Local dining, lodging and entertainment in the City of Harmony is within a short distance of the trailhead park.



Harmony-Preston Valley Trailhead Park, Harmony, MN.

Legislative Authorization

The Harmony-Preston Valley Trail is part of the Blufflands Trail System, and was originally authorized in 1992. The statute was amended in 2015, (1st Special Session, Chapter 4, S.F. No. 5, Sec. 34), to include connections to the Iowa border and Niagara Cave (Minnesota Statutes 85.015, Subd. 7).

- (a) The Root River Trail shall originate at Chatfield in Fillmore County, and thence extend easterly in the Root River Valley to the intersection of the river with Minnesota Trunk Highway No. 26 in Houston County, and extend to the Mississippi River.
- (b) Additional trails may be established that extend the Blufflands trail system to include La Crescent, Hokah, Caledonia, and Spring Grove in Houston County; Preston, Harmony, Fountain, Wykoff, Spring Valley, Mabel, Prosper, Canton, Ostrander, and connections to the Iowa border including a connection to Niagara Cave in Fillmore County; Rochester, Dover, Eyota, Stewartville, Byron, and Chester Woods County Park in Olmsted County; and Winona, Minnesota City, Rollingstone, Altura, Lewiston, Utica, St. Charles, and Elba in Winona County. In addition to the criteria in section [86A.05, subdivision 4](#), these trails must utilize abandoned railroad rights-of-way where possible.
- (c) The trails shall be developed primarily for non-motorized riding and hiking.

Figure 1. Root River and Harmony - Preston Valley State Trail Map Guide.

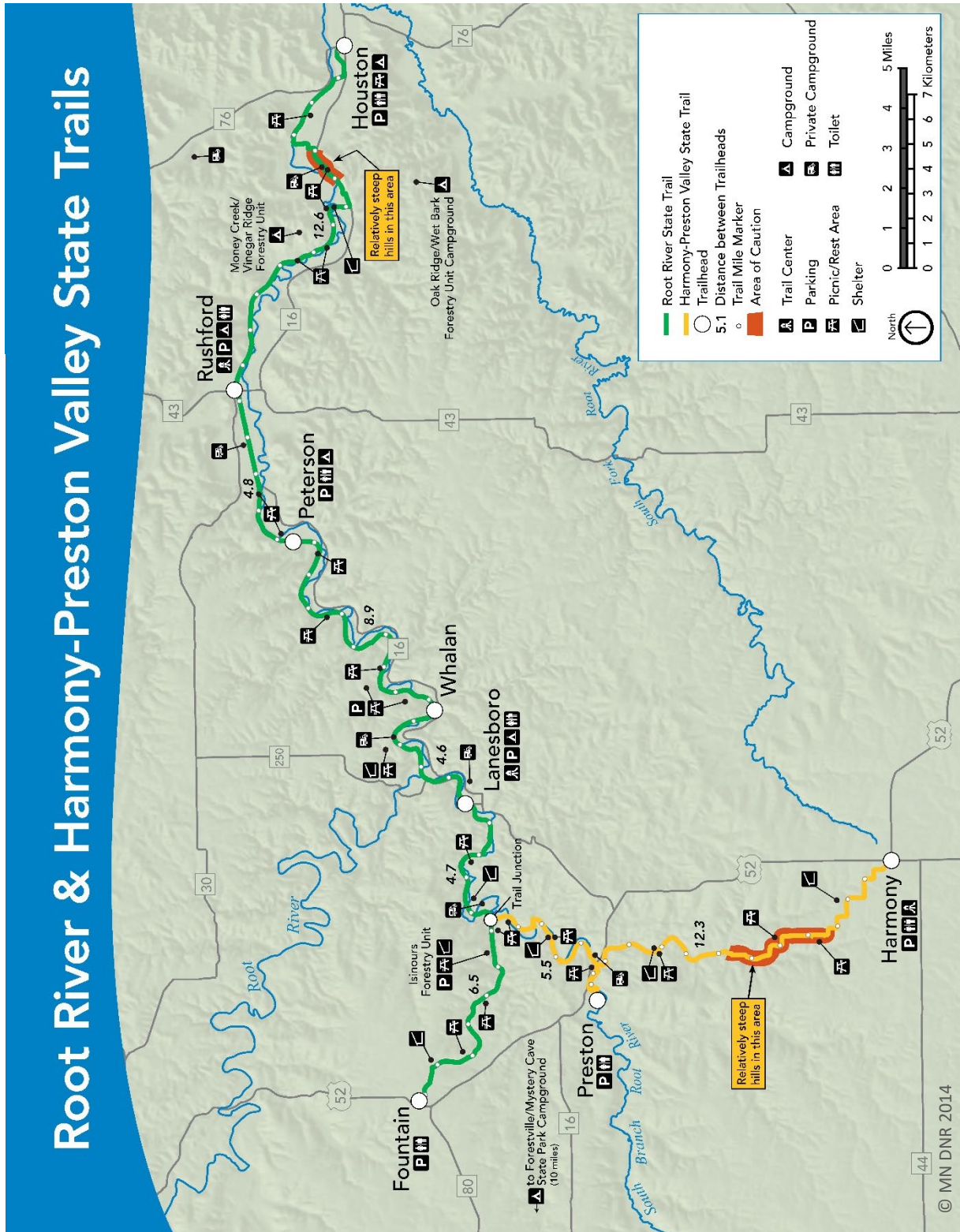
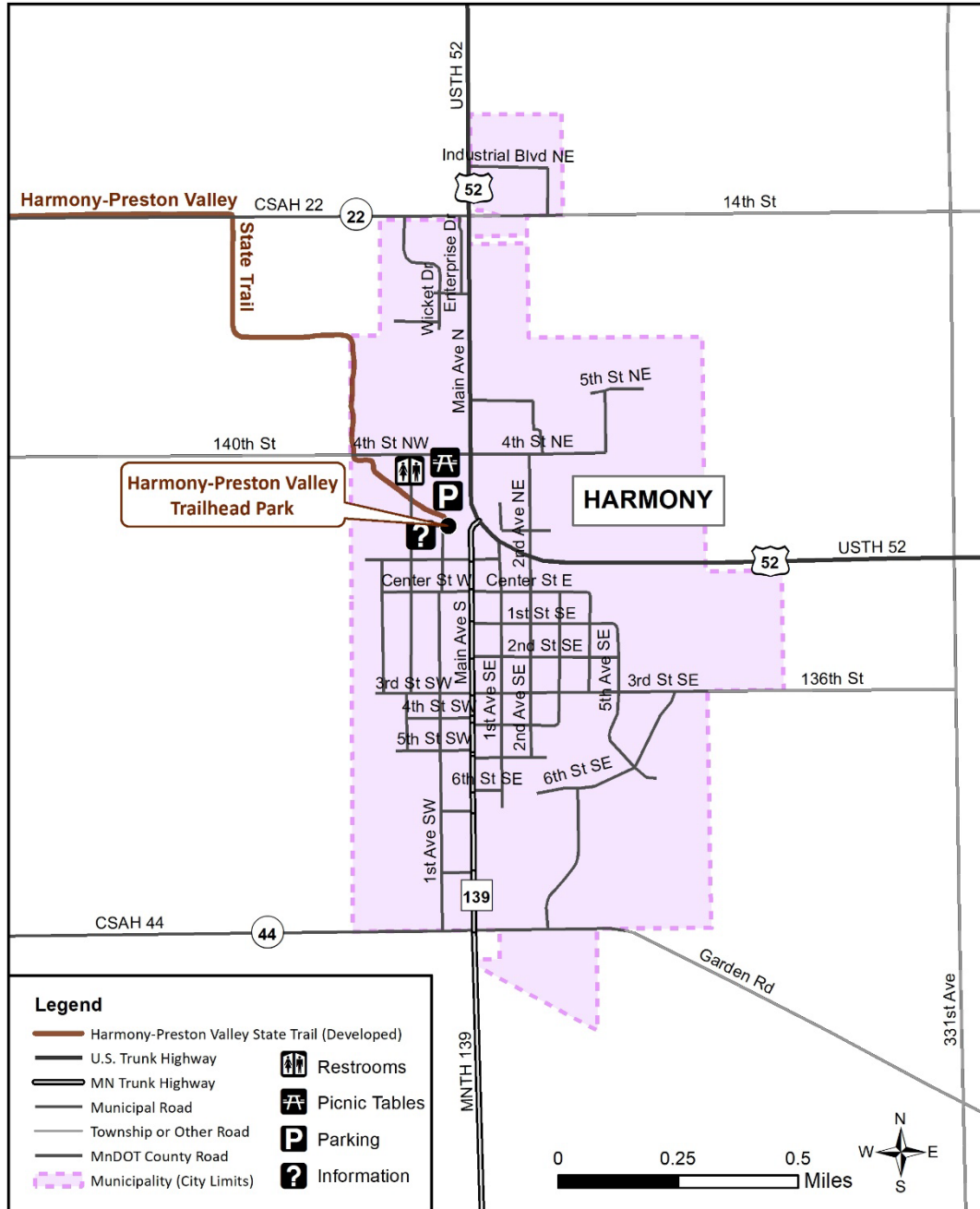


Figure 2. City of Harmony, Minnesota, street map.



Trail Development History

In 1989, the cities of Harmony and Preston developed trail plans for their respective communities. In 1990, the Harmony-Preston Area Trail Commission Joint Powers Board was established to initiate the development of a public, non-motorized recreational trail system that would connect the two communities, which was initially known as the Camp Creek Trail. Trail uses were envisioned to include hiking, biking and cross-country skiing.

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Local efforts continued to build interest and support for the trail. In 1992, the Minnesota Legislature authorized the Harmony-Preston Valley State Trail, by including language as part of the Blufflands Trail System, Minnesota Statutes 85.015, Subd. 7 (b).



Bicycling on the Harmony-Preston Valley State Trail.

After becoming an authorized state trail, state funding was secured through the Legislative Commission on Minnesota Resources (LCMR, 1992) and through state bonds (1994).

In 1993, DNR staff began developing the Harmony-Preston Valley State Trail Master Plan, and was then approved [completed] in April 1995. While the master plan was in progress, land acquisitions and appraisals were underway/completed, allowing for development to begin shortly after the approval of the master plan.

Construction of the trail segment began in 1997 and the bituminous (paved) trails surface was completed in 1998 from Harmony to the Root River State Trail, north of Preston. Also in 1998, the Trailhead Park was constructed in the City of Harmony, which serves the community, trail users and other visitors.

Minnesota Parks and Trails System Plan and Harmony-Preston Valley State Trail

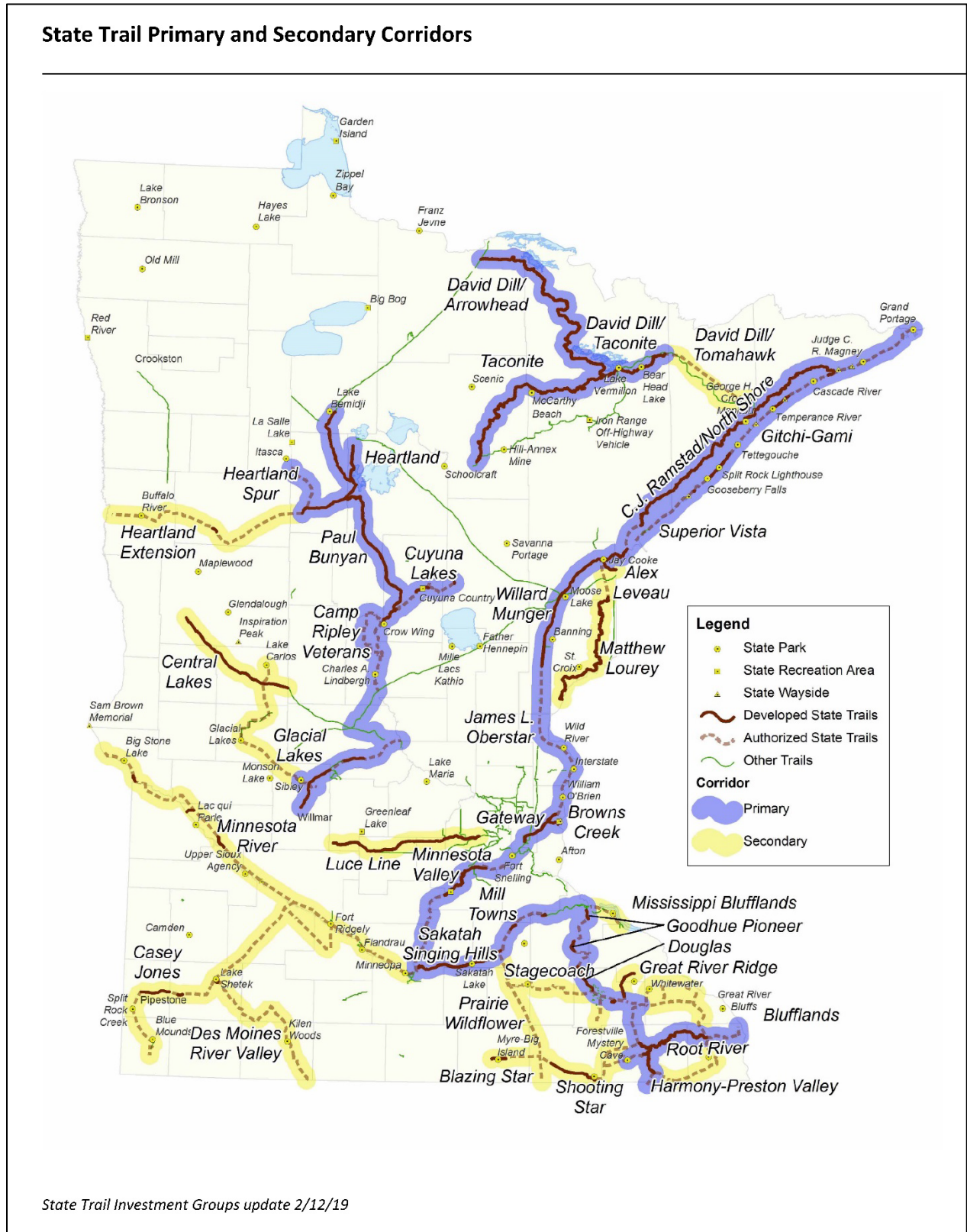
In 2015, the DNR Division of Parks and Trails adopted the Minnesota State Parks and Trails System Plan. The system plan advances new approaches for managing state parks, state recreation areas, state trails, forest recreation areas and water recreation. The plan recommended a differentiated approach to managing these recreation systems – to focus on providing different types of recreational experiences and a range of facilities and levels of services at units across the system. The intended outcome is that visitors will have a wider range of high-quality opportunities from which to choose those that best match their interests and expectations.

The Harmony – Preston Valley State Trail is designated as a Primary Corridor in the Minnesota State Parks and Trails System Plan (2015; and Updated 2019).

The system plan and implementation guidelines organized and prioritized state trails into primary and secondary corridors (2019). Each corridor contains multiple trails that together create long-distance trail connections and opportunities. Primary corridors are considered the first priority for investments that the division makes across the state trail system. Secondary corridors will be a lower priority for investment, whereas the division will seek partners to take a larger role in developing and managing these trails. The Harmony-Preston Valley State Trail, including the extension to the Minnesota-Iowa state border and Niagara Cave, is identified as a primary corridor. (See **Figure 3** on following page) As described by the system plan:

Primary corridors will be the first priority for investments that the division makes across the state trail system. These trails will be the highest priority for new development, rehabilitation and trailhead amenities. Trails may have additional amenities, interpretation, programs or events. Partners may complete some basic trail maintenance, and may provide trail amenities and services above the division's baseline level of service.

Figure 3. State Trail System Map, Minnesota State Parks and Trails System Plan, 2019 Updates.



Proposed Extension

Proposed Route

The existing Trailhead Park in Harmony serves as a trailhead facility for the Harmony-Preston Valley State Trail. This facility include a large parking lot, public restrooms, playground, picnic areas and is walking distance to local dining and the downtown business district.

A locally designated bike route is proposed to link this trailhead park and facility, at the northern edge of Harmony, with the continuation of the state trail at the intersection with County Highway 44, at the southern edge of the business district. This route is just under a mile long, approximately 0.9 mile.

The state trail extension begins near the intersection of County Highway 44 and 1st Avenue SW, then continues west approximately 0.6 mile before turning south. The trail continues south, across gently rolling terrain between active agricultural fields, crossing 120th Street and County Highway 30. Approximately 0.5 mile south of County Highway 30, the trail heads west again before one segment turns south to end at the Iowa Border, and one segment continues west then turns north to end at Niagara Cave and County Highway 30. (See **Table 1** for more details; **Figure 4** for a map of the proposed route.)

Niagara Cave

Niagara Cave is a privately owned and operated geological attraction in Fillmore County, located approximately 5 miles from Harmony. The cave features an underground stream, 60-foot waterfall, stalactites, stalagmites, and ancient fossils over 400 million years old. The temperature in the cave remains at a constant of 48 degrees Fahrenheit during the cave tour season, which runs from April to October. Niagara Cave receives about 25,000 to 30,000 visitors per year. Admission fees apply (note: this is not a state-owned or operated property). The proposed Harmony – Preston Valley State Trail extension will provide a safe recreational trail connection to Niagara Cave.



Niagara Cave, main passage.

Iowa Recreational Trails

Recreational trail systems in neighboring Iowa have expressed interest and provided support for connecting to the Minnesota state trail system. DNR will continue to coordinate with trail planning efforts in Iowa, which may provide additional recreational opportunities in the area and potential trail connections to the Harmony-Preston Valley State Trail.

Howard County, Iowa, includes an established system of recreational trails in and around the City of Cresco. The local community has expressed interest in connecting to other nearby communities, including Harmony, MN. The **Prairie Springs Recreation Trail** is a 3.5 mile paved, non-motorized trail, spanning from downtown Cresco to Vernon Springs (south of Cresco) along Prairie's Edge Nature Center. Howard County is actively leading a trail feasibility study to consider potential trail routes that could connect Cresco to Niagara Cave, including a possible connection with the Harmony – Preston Valley State Trail.

Winnesheik County, Iowa, includes City of Decorah which is located approximately 25 miles south of Harmony, along Highway 52. Decorah has a number of recreational parks and trails offering year round uses. **Trout Run Trail** is an 11-mile, paved loop that circles the City of Decorah The trail crosses trout streams five times, follows a segment of the Upper Iowa River (a trout stream), and passes Siewer Springs Trout Hatchery. Trout Run Trail is available for year-round recreational uses including biking, walking/hiking, inline skating and intermediate to advanced level cross country skiing. The **Prairie Farmer Recreational Trail** is a paved, multi-use recreational trail developed along the abandoned Milwaukee

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Railroad line, connecting the communities of Cresco, Ridgeway and Calmar, Iowa, for a length of approximately 20 miles. Potential connections to Minnesota have been discussed among trail users in Decorah, Iowa, with interest in connecting directly to the Harmony-Preston Valley State Trail, or to nearby communities, such as Harmony or Canton, Minnesota.

Trail Uses – Existing and Proposed

The Harmony-Preston Valley State Trail currently accommodates hiking, bicycling and in-line skating along its paved surface and is maintained and groomed for cross-country skiing from Isinours Junction to County Road 16, as conditions allow. Snowmobiling is not currently allowed on the Harmony-Preston Valley State Trail.

The proposed extension from Harmony to the Minnesota-Iowa state border will remain consistent with existing uses, allowing hiking, bicycling and in-line skating. This segment will also allow for cross-country skiing, as conditions allow. Snowmobiling is not allowed on the proposed extension from Harmony to Niagara Cave and the state border.

The following recommendations are added to the Harmony-Preston Valley State Trail Management Plan (1995):

Recommendation: Minnesota DNR will coordinate with communities and trail organizations in Iowa for potential trail developments at or to the shared state border, in support of a continuous recreational trail experience and system in this region.

Recommendation: Trail uses on the proposed extension should remain consistent with the existing recommended trail uses for the Harmony – Preston Valley State Trail, and will be managed in the same manner, as applicable and appropriate.



Adults and kids bicycling on the Harmony-Preston Valley State Trail, south of Preston.

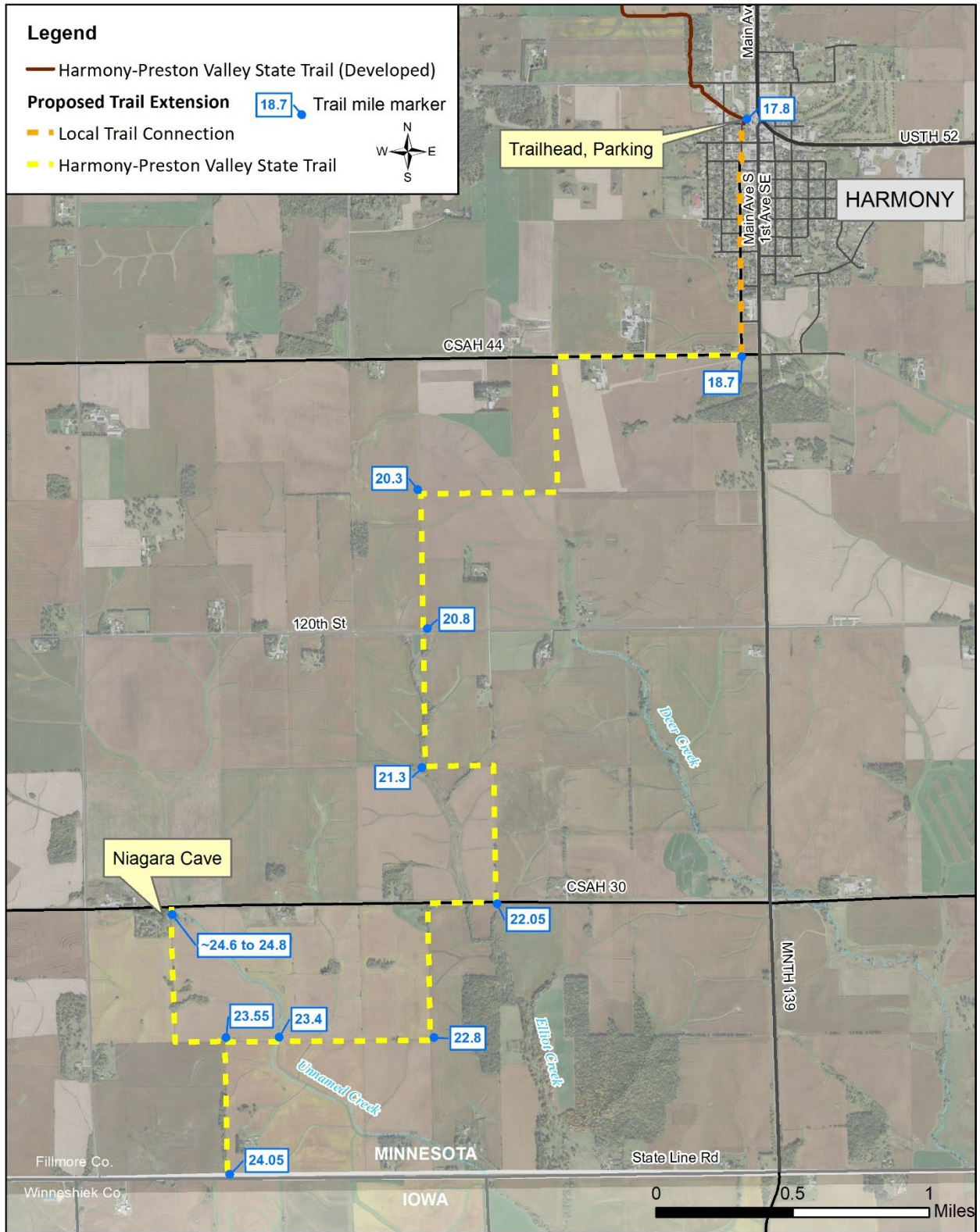
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The following description for the proposed trail extension from Harmony to the Minnesota-Iowa state border is a continuation of the “Proposed Development and Management Recommendations” from the Harmony-Preston Valley State Trail Master Plan (1995). *The proposed extension description begins in Harmony, at the Trailhead Park. (The master plan identifies this location as mile post 18.0, however, the developed trail ends at approximately mile 17.8.)

Table 1. Proposed Development, Management Recommendations and Features

Segment 4 (Approximate mile post)	Harmony to Minnesota-Iowa State Border (Proposed Extension)
Mile 17.8* – 18.7	Local Trail Connection. Proposed local trail connection from Harmony Trailhead Park (north end of the city) to County Highway 44 (south end of the city). This will be a City of Harmony Trail route, connecting the two segments of the Harmony – Preston Valley State Trail.
Mile 18.7 – 20.8	HPVST Extension. Proposed trail extension begins on south side of County Highway 44, west of MN Highway 139/Main Street. The proposed trail will be parallel to County Highway 44 for approximately 0.6 miles heading west, then turning south through agricultural fields.
Mile 18.7 – 20.8	Vegetation Management. This section includes wetlands and an agricultural landscape. Restoring native prairie through this section would provide visual interest for the trail user and help retain snow cover on the trail. In addition, the permanent vegetative cover would slow wind speeds and filter runoff, reducing erosion.
Mile 20.8	Road Crossing. A road crossing is required at 120 th Street. An at-grade crossing is proposed; alternatives may be considered.
Mile 20.8 – 22.05	Vegetation Management. The trail continues through an agricultural landscape. Retaining existing tree cover and planting native vegetation is recommended.
Mile 22.05	Road Crossing. An at-grade crossing is proposed across County Highway 30; alternatives may be considered. (Trail will parallel road for approximately 0.25 mi.)
Mile 21.3 – 23.8	Vegetation Management. The trail will be located along fencerows, road rights-of-ways (parallel), and avoids sinkholes. Restoring prairie through this section is recommended, where feasible.
Mile 23.4	Water Crossing Required. An unnamed creek (intermittent stream) is identified as public waters and may require infrastructure for the trail crossing. Appropriate infrastructure could include a type of culvert or bridge, as specified through engineering, design and resource considerations at the site.
Mile 23.55	Trail Junction. At this location, orientation signage is needed at the trail junction to identify two routes: west to Niagara Cave and County Road 30; and, south to the Minnesota - Iowa state border and Iowa trail systems.
Mile 24.05 [end point]	Iowa Stateline. Connection to recreational trail systems in Iowa. Recommendations include a Welcome to Minnesota interpretive sign.
Up to Mile 24.8 [end point]	Niagara Cave and County Highway 30. Proposed extension includes a trail connection to Niagara Cave, ending at County Highway 30.

Figure 4. Harmony – Preston Valley State Trail – Proposed Extension Route.



Justification

The proposed segment of the Harmony-Preston Valley State Trail from Harmony to the Minnesota – Iowa state border, including a connection to Niagara Cave, is consistent with the statutory language that was amended in 2015 ([M.S. 85.015, Subd 7](#)), as well as the criteria for state trail designation outlined in [86A.05, Subd. 4](#).

The Harmony Trail Commission was established with local community support in 1989. Over the past 30 years, various individuals have contributed support for trail extension possibilities, including: local communities, county staff, state and local elected officials, Howard and Winneshiek counties (Iowa) Business and Tourism; Prairie Springs Recreational Trail; and funding support from the Minnesota Legislature.

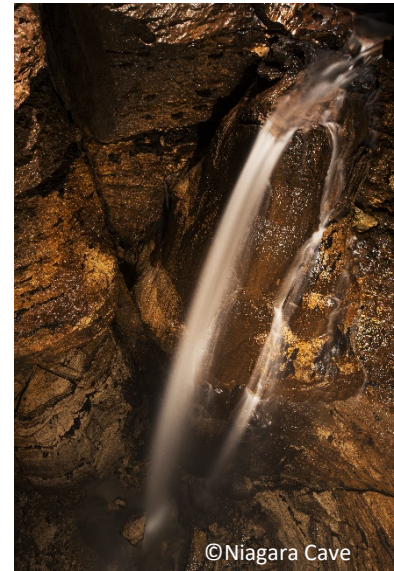
This proposed extension is consistent with the vision and goals presented in the Harmony – Preston Valley State Trail Master Plan (1995) with the following statement (page 33): “Future opportunities for trail connections include the Amish Hills Trail connecting Harmony to Mabel and Canton; Niagara Cave; and the trails in Iowa.”

The trail extension will provide additional recreational opportunities in Minnesota and is anticipated to connect with additional recreational trail systems in southern Minnesota and northern Iowa. Communities that support recreational trails and respond to the needs of trail users have experienced positive impacts on their local economies. DNR trail user surveys and studies indicate that trail users also use local facilities for eating, shopping and lodging. (Kelly, 2010)

Preliminary results from the 2019 State Trail Visitor Survey highlights the importance of recreational trails for local communities, with approximately 60% of tourists noted that a state trail was the primary or a significant reason why they visited a community or specific area.

(Wilder Research, 2020). This finding also supports previous trail studies conducted by MN DNR, which categorized the Root River and Harmony-Preston Valley state trails as high tourist use trails and reported 70% of trail users were visiting from over 50 miles away. (Kelly, 2010)

The Minnesota DNR Parks and Trails System Plan identifies the Harmony-Preston Valley State Trail corridor as a Primary Corridor, which is also generally known as a high-use corridor and networks of trails that link together to help create long-distance recreational connections. These trails are of the highest priority for new development, such as the proposed extension. Through formal agreements, partners may also provide basic maintenance and additional or enhanced trail amenities and services. (MN DNR, 2019)



Niagara Cave waterfall.

Trail Management

Trail Management

The proposed extension is intended to remain consistent with existing Harmony – Preston Valley State Trail management recommendations and updated department and division policies, as applicable and appropriate.

Information and Education

Incorporating art or sculpture within the trail right of way can be an attractive way to provide interpretive information about the resources and history of the trail. Practical and functional objects such as benches, gateways, bridges, water fountains and tables can be designed in a manner that are aesthetically pleasing while also providing information about the area through design or use of materials. Sculptures for purely aesthetic purposes may also be an attractive addition to the trail right-of-way. Local trail enthusiasts and stakeholders have expressed interest to incorporate art or sculpture along the Harmony Preston Valley State Trail.

The following Trail Management recommendations are added to the existing recommendations provided in the Harmony-Preston Valley State Trail Management Plan (1995):

Recommendation: When developed, the proposed trail extension should be managed consistent with the previously developed Harmony – Preston Valley State Trail, for a continuous recreational trail experience for trail users.

Recommendation: The DNR will coordinate with local communities and local organizations and groups to consider appropriate and meaningful ways to incorporate art, sculpture, and/or trail-related amenities within the trail right-of-way.

Natural Resources

Ecological Classification System

Minnesota updated its ecological classification system shortly after the original master plan was approved. The following description and map provides an update to pages 11-12 of the *Harmony-Preston Valley State Trail Master Plan, 1995*.

Minnesota uses an Ecological Classification System (ECS) that is part of a nationwide mapping initiative developed to improve DNR's ability to manage all natural resources on a sustainable basis. Both systems integrate climatic, geologic, hydrologic and topographic, soil and vegetation data. Minnesota lies at the center of North America where the prairie, boreal forest, and eastern deciduous forest meet. Four major ecological provinces are represented in Minnesota: Eastern Broadleaf Forest; Laurentian Mixed Forest; Prairie Parkland; and Tallgrass Aspen Parklands. All four are parts of much larger systems that cover major areas of central North America. The Eastern Broadleaf Forest Province, primarily consisting of deciduous forest, extends eastward from Minnesota all the way to the Atlantic Ocean. The Laurentian Mixed Forest Province, largely consisting of coniferous forest, extends northward into Canada. The Prairie Parkland Province extends westward into the Dakotas and across the Central Plains of the United States. The Tallgrass Aspen Parklands Province represents the southern tip of a larger province that extends north and west into the Canadian Prairie Provinces.

The ecological provinces are further divided into sections and subsections defined by vegetation, geology, and other resource criteria that make up distinct landscapes. The Harmony-Preston Valley State Trail is

located within the Blufflands and Rochester Plateau subsections of the Paleozoic Plateau Section in the Eastern Broadleaf Forest Province in southeastern Minnesota. The trail extension is located entirely within the Rochester Plateau subsection, described below, which supplements the landscape information provided in the *Harmony-Preston Valley State Trail Master Plan* (1995).

Rochester Plateau Subsection (southern portion of the trail, from just south of County Rd 16 to Minnesota-Iowa state border). This subsection consists of level to gently rolling older till plains. Topography is controlled by underlying glacial till along the western edge of the subsection, where loess is several feet thick. As glacial drift thins to the east, topography is largely bedrock controlled (Dept. of Soil Science, Univ. of Minnesota 1973). Sinkholes are common in the southwestern portion of the subsection.

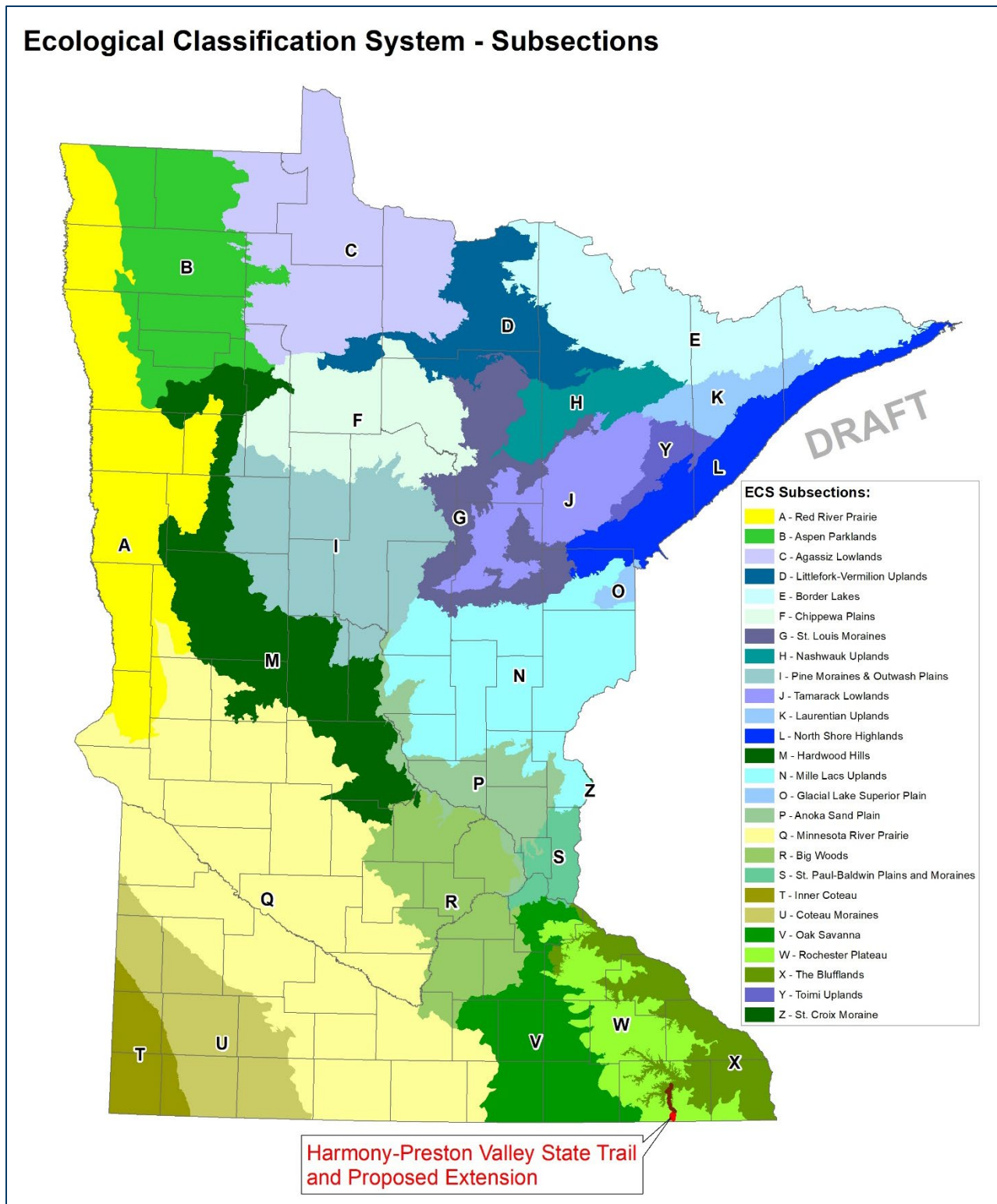
The Rochester Plateau Subsection is an area of level to gently rolling terrain. The subsection contains several headwaters, including the Root, Whitewater, Zumbro, and Cannon rivers, as well as some cold-water trout streams in the eastern portion. Before conversion to agriculture, the predominant vegetation was tallgrass prairie and bur oak savanna. Today, agriculture dominates the landscape, with 69 percent in cropland and 21 percent in pasture. Water quality is a concern in the subsection because of agricultural and urban development. In the center of the subsection, the city of Rochester and the corridor to the Twin Cities metropolitan area are projected to grow rapidly over the next decade.

According to *Tomorrow's Habitat for the Wild and Rare – An Action Plan for Minnesota Wildlife* (MN DNR 2006), 94 Species in Greatest Conservation Need (SGCN) are known or predicted to occur within the Rochester Plateau. These SGCN include 36 species that are federal or state endangered, threatened, or of special concern.

Highlights:

- Significant portions of this subsection have been developed for agriculture, but publicly owned forests and associated streams, rivers and wetlands support a diversity of wildlife.
- Wildlife present in this subsection includes a variety of reptiles, such as timber rattlesnakes, western foxsnakes, racers, Blanding's turtles and wood turtles; birds, including Louisiana waterthrushes, prothonotary warblers, cerulean warblers, blue-winged warblers, peregrine falcons; fish, including American brook lampreys and suckermouth minnows; and mussels, such as ellipse mussels.
- Areas important for SGCN include the Richard J. Dorer Memorial Hardwood State Forest; Oronoco Prairie, Racine Prairie, and Cherry Grove Blind Valley Scientific and Natural Areas; and Carley and Forestville Mystery Cave state parks.

Figure 5. Ecological Classification System for Minnesota - Subsections with Proposed Harmony - Preston Valley State Trail Location. (Updated Subsection Map of Minnesota, replaces map on page 12 of HPVSTMP)



Threatened, Endangered or Special Concern Species and Ecological Features

The Minnesota Natural Heritage Information (NHIS) database was queried to identify animal and plant species that are threatened, endangered or of special concern within the vicinity of the proposed trail corridor. These species are protected by state law, and protecting their habitat must be considered during trail planning, development and maintenance.

A query of the Natural Heritage Information System (NHIS) database in 2019, the following species and ecological features are known or expected to occur within one mile of the proposed trail extension route in Fillmore County. The following text supplements and updates information and recommendations provided in the HPVST Master Plan (1995):

- **Eastern spotted skunk (*Spilogale putorius*): Minnesota status: threatened; no federal status** Eastern spotted skunks are generally smaller than the more common striped skunk. Eastern spotted skunks are generally found in open lands with sufficient cover, such as fencerows, shelterbelts, thickets, brush, and riparian woodlands. In agricultural areas they use buildings, corncribs, trash piles, rock piles, and haystacks for cover and den sites. Once abundant and regularly taken throughout much of the state by trapping, the Eastern spotted skunk was assigned special concern status in 1984. Then, in 1996, it was reclassified as threatened. Special attention should be given to documenting sightings or accidental captures of the eastern spotted skunk.



Photo of Eastern spotted skunk.

- **Timber rattlesnake (*Crotalus horridus*): Minnesota status: Threatened; no federal status** Updated status since HPVST Master Plan was completed in 1995.) The timber rattlesnake is a large, heavy-bodied rattlesnake native to the bluffs of southeastern Minnesota. This snake has a wide, triangular-shaped, unmarked tan head and a narrow neck. Its background color can range from yellowish tan to brown to gray, and is marked with dark brown to black crossbands (chevrons). Its tail is black with a tan rattle, which is typically held perpendicular to the ground. In Minnesota, timber rattlesnakes typically have a rust-colored stripe down the center of the back. This color may vary throughout its range and within Minnesota. Newborn timber rattlesnakes are grayer in color and are born with a button rattle.

Timber rattlesnakes live among the steep, rugged bluffs of southeastern Minnesota. Historically, timber rattlesnakes occurred in eight counties in southeast Minnesota. However, recent surveys indicate many dens in the northern portion of its historic range are extirpated. The population's stronghold in the state has been reduced to the far southeastern counties of the state. Population declines are due to continued persecution, habitat deterioration, road mortality, and predation, particularly by birds of prey. Timber rattlesnakes overwinter in ancestral, communal dens in rock fissures and crevices that reach below the frost line. These dens are typically located on south to west facing bluff prairies.



Photo of Timber rattlesnake.

- **Western prairie fringed orchid** (*Platanthera praeclara*):
Minnesota status: Endangered; Federal status: Threatened
The Western prairie fringed orchid has a showy open raceme of up to 24 white to creamy white flowers, each with a long nectar spur. The lip, or lower petal, of each flower is deeply 3-lobed and fringed. The single, smooth stem is up to 85 cm (34 in.) tall. Flowering plants have 3 or more smooth, elongate leaves. Non-flowering plants have 1-3 leaves of similar appearance. The western prairie fringed orchid occurs almost exclusively in remnant native prairies and sedge meadows. The majority of sites occur in full sunlight on moist, calcareous till or sandy soils. It is rare today because of the widespread conversion of its native prairie habitat to agricultural uses. It is pollinated by moths and blooms in July.



Photo of Western prairie fringed orchid.

Water Resources and Karst

The proposed extension route intersects several intermittent streams where a culvert may be necessary to manage water flow and in some locations, such as where streams intersect roads, culverts are already in place. Water resources that intersect the proposed route include Deer Creek; Elliot Creek [flows under County Highway 30, trail will be parallel to road, culvert in place allows stream to flow under road]; and an Unnamed Creek [located near mile marker 23.4.]

Karst is a landscape-scale hydrologic system formed in soluble bedrock. Water chemically and mechanically enlarges passages, resulting in conduits through which it can rapidly, traveling at speeds of up to several miles per day. Certain bedrock layers (those that are limestone, dolostone or heavily cemented with calcium carbonate) are more prone to karst formation and the resulting aquifers are called karst systems.

Sinkholes are direct connections from the land surface to the groundwater system. Stream sinks are points where streams disappear underground into the groundwater system and sinking streams are reaches of surface watercourses which lose water to underground drainage. These are all critical connection points between the land surface and the groundwater systems.

The following Natural Resource recommendations are added to the existing recommendations provided in the Harmony-Preston Valley State Trail Management Plan (1995):

Recommendation: Avoid threatened, endangered and special concern species. Data from the Natural Heritage database was used to assess the location of threatened, endangered and special concern species. Parks and Trails Division staff will keep current with this data and conduct surveys as necessary, prior to development and construction activities.

Recommendation: Update existing vegetation management plans to incorporate the new trail extension route and keep up to date with best management practices along entire trail corridor.

Climate Change

This section provides an update to the Harmony-Preston Valley State Trail Master Plan (1995), and should be considered additional information about climate and planning for climate changes that were not addressed in 1995. Since 2014, it is DNR Policy to address climate change in master plans, per Operational Order #131.

Climate change in Minnesota is evidenced by patterns such as increased temperatures and precipitation levels, more frequent extreme rain events, and cold weather warming. Between 1895 and 2017, Minnesota became 2.7° Fahrenheit (F) warmer and 3.4 inches wetter. In southern Minnesota, the frequencies of -25° F readings have fallen by up to 90 percent, and 9 of the 10 warmest Minnesota winters took place between 1980 and 2018. Moreover, rains that would historically be considered within the largest 2% of rainfalls are becoming more common, and precipitation in Minnesota is projected to increase by more than 15% by mid-century.

The DNR aims to enhance ecosystem resiliency and reduce negative impacts of climate change by incorporating adaptation strategies, reducing or offsetting greenhouse gas emissions, cooperating with stakeholders, and developing employee knowledge. In accordance with Operational Order #131, "Climate Adaptation and Mitigation in Natural Resource Management," the DNR must use the best available science to develop and implement climate change adaptation strategies, and use water and land management practices that sustain Minnesota's natural resources while helping to reduce future climate change by mitigating the environmental impacts of increased carbon emissions.

Climate change may impact trail infrastructure, management, and recreational use:

- Rising temperatures and declining winter snowfall may affect seasonal use of the trail, potentially reducing the feasibility of winter (snow-based) recreation activities, while extending the spring and fall seasons for traditional summer uses.
- Wetter conditions, and more frequent extreme heavy rainfall may cause trout streams to become muddy, affecting trout populations and trout fishing in southeastern Minnesota.
- Increased precipitation and heavy rainfalls may damage trail infrastructure as ground saturation and flooding become more common.
- Shorter winters and declining snowfall may affect funding for cross-country skiing, and other winter recreation activities.
- Winter staffing may need to be adjusted if dedicated funds are impacted by changing climatic conditions.

The following Climate recommendations are added to the Harmony-Preston Valley State Trail Management Plan (1995):

Recommendation: Be adaptive to the changing climate and provide year-round, sustainable recreational uses of the trail corridor, ensuring outdoor recreation opportunities for future generations.

Recommendation: Follow Operation Order #131 and current Parks and Trails Division guidelines developed for climate change adaptation, mitigation, and management approaches specific to state parks and trails.

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Appendix A: Trail Usage Summary

The Parks and Trails Council of Minnesota (PTCMN) is a statewide non-profit organization dedicated to acquiring, protecting and enhancing critical land for the public's use and benefit. The P&TC started counting trail users on Minnesota state trails in 2015 as part of an ongoing project to provide useful data to managers, legislators, and the public. Results from the trail user counts from 2017 were summarized by the PTCMN in *The Minnesota State Trail User Count, 2018 Report*.

The data in *The Minnesota State Trail User Count* report was collected during 2017 on five state trails: the Gateway State Trail and Brown's Creek State Trail in the Twin Cities Metropolitan Area, the Paul Bunyan State Trail between Brainerd and Walker, and the Root River State Trail and Harmony-Preston Valley State Trail in southeast Minnesota. All traffic estimates presented in the report are for non-winter, non-motorized use. "Non-winter" is defined as April through November, to synchronize with the snowmobiling season, which is statutorily defined as December through March.

The state trail traffic estimates in the report are based on short-duration counts conducted by P&TC at 30 different counting sites along the five different state trails mentioned above. Short-duration counts ranged in length from 7 days to 25 days and took place between May 12, 2017 and October 24, 2017. All counts were conducted using automated trail counting equipment that differentiated users as bicyclists or pedestrians (including equestrians and inline skaters). All traffic estimates were estimated by extrapolating short-duration counts using the day-of-year factoring method. Estimates are subject to a margin of error of approximately 10-15%. Additional details regarding the methodology and specific trail user count data is provided in the report.

The estimated trail user count data specific to the Root River and Harmony-Preston Valley state trails provided in the PT&C report is summarized below.

The Harmony-Preston Valley State Trail included four different counting sites: South Root River Bridge, Mile Post 5, County Road 16, and County Road 22. The Root River State Trail included nine different counting sites between Fountain and Houston.

In 2017, the Root River and the Harmony-Preston Valley state trails received varied non-winter (April – November) traffic volumes, estimated between 10,332 (County Road 16) and 85,308 (Lanesboro) trail users. Non-winter traffic volumes above 30,000 were concentrated between Preston and Whalen, with the highest number of users (more than 75,000) near Lanesboro. (PTCMN, 2018)

Specific to the Harmony-Preston-Valley State Trail, non-winter trail counts were estimated to be between 36,997 and 10,332 from Isinours Junction to Harmony, with the highest traffic volumes most prominent just south of Isinours Junction, at the South Root River Bridge. (PTCMN, 2018)

According to DNR studies, the Root River and Harmony-Preston Valley state trails are historically categorized as high tourist use trails, with a reported 70 percent of trail users visiting from over 50 miles away. (Kelly, T., 2010)

The majority of non-winter trail system use, or 69%, happens during the summer (Memorial Day – Labor Day), with peak traffic (about 128 daily users) in July. Weekends are the busiest time of week during non-winter months, while mid-week (Wednesday) is the slowest. The average daily traffic count on Saturdays was measured at 146 users in the summer, and 68 users in the spring and fall. (PTCMN, 2018)

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Table A1. Harmony-Preston Valley State Trail Usage by Segment (2017)

(Source: Parks and Trails Council of Minnesota, 2018)

Trail Segment	Estimated Counts	Percent Traffic Volume	Percent Bicycling	Percent Walking
South Root River Bridge	36,997	40%	80%	20%
Mile Post 5	32,636	35%	83%	17%
County Road 16	10,332	11%	64%	36%
County Road 22	12,765	14%	51%	49%
Totals	92,730	100%		

Table A2. Tourist and Local Use of the Root River and Harmony-Preston Valley Trails (2008-09)

(Source: Kelly, 2010)

Trail & Year	Median miles of users from home	Percent of use from within 10 miles of the trail	Percent of use from over 50 miles from the trail
RR-HPV 2008-09	120	9%	70.00%

Table A3. Monthly Traffic Volumes of Root River and Harmony-Preston Valley Trails (2017)

(Source: Parks and Trails Council of Minnesota, 2018)

Month	Traffic at average counting site
April	30
May	97
June	132
July	222
August	161
September	167
October	72
November	7

Table A4. Weekly Traffic Volumes of the Root River and Harmony-Preston Valley Trails (2017)

(Source: Parks and Trails Council of Minnesota, 2018)

Day of week	Traffic at average counting site (summer)	Traffic at average counting site (spring/fall)
Monday	155	28
Tuesday	111	25
Wednesday	85	30
Thursday	108	46
Friday	166	69
Saturday	370	132
Sunday	382	93

Appendix B – Public comment summary

The Harmony-Preston Valley State Trail Master Plan Amendment addressing the trail extension from Harmony to the Iowa state border with a connection to Niagara Cave public review and comment period was held from July 27 through August 27, 2021. A 30-day public review period, including an open house, is required by state statute before a master plan amendment is adopted. The amendment draft was available for review from the DNR website throughout the public review period. Comments were submitted in person at the open house meeting, as well as by email and an online comment form.

On August 12, 2021, a public open house meeting was held in Harmony, Minnesota. The open house meeting had 21 attendees who signed the voluntary attendance roster. DNR staff were present to answer questions about the trail extension, state trail system, planning process and other topics as needed. Comments received during the public review period were supportive of extending the trail to the Iowa state border and connecting to Niagara Cave. Other comments, while still supportive of the trail extension, expressed questions or concerns for user (bicycle) safety, trail direction or signage through the City of Harmony, potential loss of some large oak trees in proposed route or right-of-way, and ongoing maintenance of existing state trail segments.

DNR staff engaged with individuals to address their questions and/or will continue to address concerns through final design work, which is beyond the scope of this amendment process. Communications between DNR staff and citizens, as well as ongoing coordination with city administrators and representatives, will continue throughout the development and operation of the trail.

Comments received during the public review period were taken into consideration during the final preparations of this amendment.