

TENMILE ENVIRONMENTAL TRAIL

#375



A COOPERATIVE PROJECT BETWEEN THE
HELENA NATIONAL FOREST AND THE
MONTANA DISCOVERY FOUNDATION

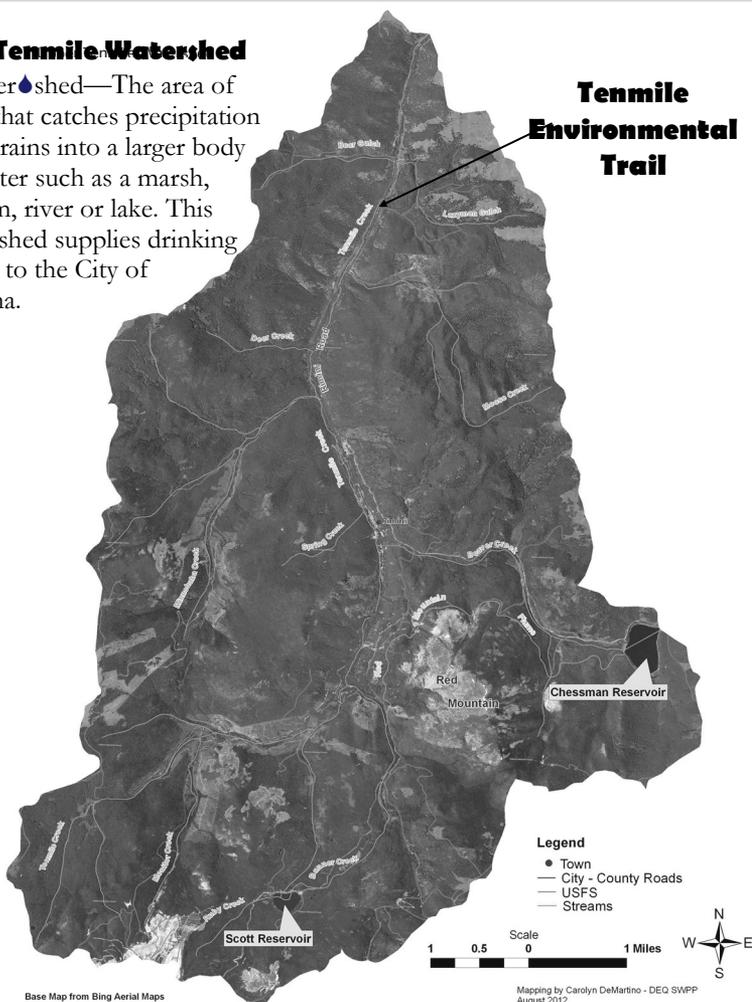
As you hike this trail, remember, the forest belongs to everyone, so stay on the trail, leave only footprints, and take only pictures, notes, and memories.



The Tenmile Watershed

Water**shed**—The area of land that catches precipitation and drains into a larger body of water such as a marsh, stream, river or lake. This watershed supplies drinking water to the City of Helena.

Tenmile Environmental Trail



Tenmile Creek is a perennial, fourth order stream which drains approximately 200 square miles of mountainous and valley terrain of the Upper Missouri river Basin. The upper part of the Tenmile Watershed starts on the east side of the Continental Divide and flows approximately 12 miles through a steep, forested canyon of about 50 square miles. **It is the watershed for the City of Helena.**

The upper watershed has a 100-year history of hardrock mining with numerous inactive mines and waste-rock piles that have affected water quality within the watershed. An infestation of Mountain Pine Beetle caused mortality in large stands of Ponderosa and Lodgepole pines. Threats from environmental pollutants and catastrophic wildfire bring a need for increased education and stewardship for this critically important community asset. Take the time to find out where your drinking water comes from!



WELCOME

Originally built in 1975, the trail illustrates cultural and natural features in a forest environment. The trail has been maintained through cooperative efforts of the Helena High Excel Class, Helena National Forest, and the Montana Discovery Foundation.

Sometime around 1870, miners came to this area in search of gold, silver and lead. Many succeeded and built successful mines. In the 1880s, the town of Rimini, about 5 miles south of this trail, grew up to serve the miner's needs. As you travel the hills in this area, you will see many signs of prospects and developed mines scattered about.

Tenmile Creek flows across the road from the trailhead. The stream collects water from approximately 86 square miles of surrounding forest land. The City of Helena stores a significant amount of water from this drainage in the Chessman Reservoir located on Beaver Creek above Rimini and purifies it for use as city water at the Tenmile Water Treatment Plant near the intersection of Rimini Road and U.S. Highway 12. On the other side of the creek, you can see the remains of a railroad that once ran from Helena to Rimini.

As you walk the trail, pay attention to how the plant life changes with the exposure of the terrain to sun and water. This trail covers both north and south facing slopes as well as dry hillsides and places with water closely beneath the surface. Think about how the forest habitats vary with these changes.

A wide variety of birds and mammals also live in this area. Some animals may live here all or part of the year. Others may move through the area staying for only a short time.

The exposure of a location to sunlight, rain, snow and all of the plants and animals that live there defines the environment of that area. As you walk through this site, use all your senses and your mind to observe what is here and how things change from place to place along the trail. Really look at the forest and notice things you have never seen before.

STATION I: LICHENS & ROCKS

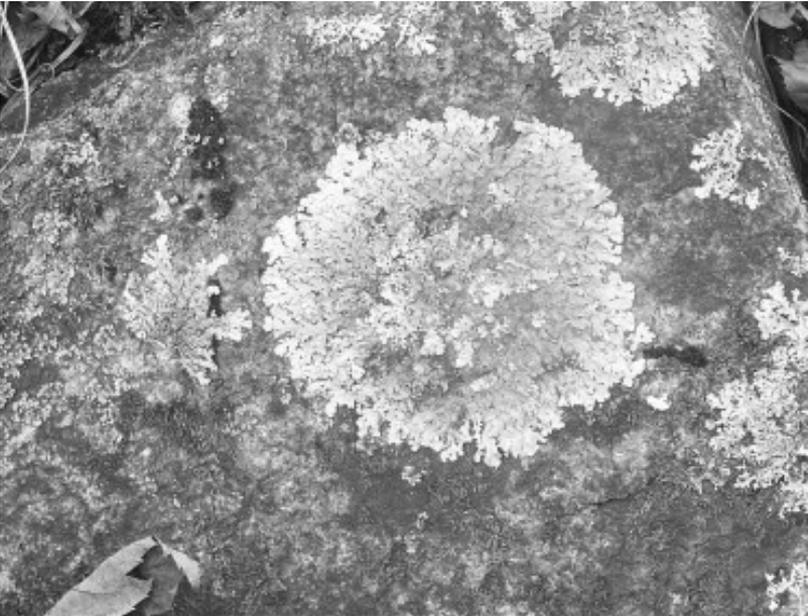
Note the large rock off to the right. The rock is covered with a variety of lichen, each with its own colors and textures. Lichen is a combination of a fungus and an alga, or some other single cell organism that always live together. The fungus provides a structure that can dissolve the surface of the rock and cling to it while the alga captures energy from the sun and uses it to break apart CO₂ from the air and attach the carbon to water to make sugar that both the alga and fungus can use for energy to live. Capturing the sun's energy and storing it in sugar this way is called photosynthesis. We'll see this again in later stations.

Lichen could take a hundred years or more to grow to the size of a quarter on the surface of the rock. Please don't scrape it off! To absorb the minerals it needs from a rock, lichen secretes a mild acid that eventually breaks the rock apart. Lichen will also catch and hold water on the rock surface. When water on the surface of the rock finds its way into even the smallest crack and freezes, it expands with such great pressure that it can break the rock. Lichens thus promote the weathering of rock into smaller and smaller pieces that eventually become the mineral component of forest soil. Soil is not dirt, but a complex living structure composed of decomposed rock, decomposing plant and animal bodies, water and a wide variety of microorganisms and other living things. Rocks and soil are extremely important parts of the environment.

Look at the rocky hillside above you to the south. Notice the pile of rock that apparently tumbled from a cliff above. A slope of broken rock like this is called a talus slope. A talus slope may consist of earth, sand, gravel and larger rock fragments. This is another sign of the process of weathering that breaks down the rocks into soil.

Our lichen-covered rock is a form of igneous rock called granite pushed up from deep underground. Minerals are often found where granite is found. Notice the small crystals of various minerals embedded in the surface of the rock.

This rock is very different from the sedimentary limestone you see on Mt. Helena or the gravels of the valley deposited by years of stream erosion. As you take a few steps up the trail through the fence, you will see a big, round, open pit area. In 1981, there was a big flood on Tenmile Creek that washed out a lot of the road and caused damage to things people had built all the way out into the Helena Valley. This pit resulted from the mining of gravel used to help rebuild the road after the flood. Notice how plants are slowly establishing themselves. Lots of people like to come to this area to go sledding in the winter.



Lichen on Rock

STATION 2: WHAT'S A DRAW?

Station 2 stands in the bottom of a draw. Water flowing down the hill over many thousands of years carved out this depression that still “draws” or collects snowmelt and rainfall from the land above and carries it downhill with small amounts of soil, rock and vegetation. Imagine how different the water flow down this draw would be if there was no vegetation to break up and slow down the flow of water and mineral sediment. Most of the year, the water in Tenmile Creek is very clear and clean. Upstream areas like this where water starts its long journey flowing to the sea are called “watersheds.” Watershed protection is an important function of a healthy forest.

Note that this draw lies on a north-facing slope where it is shaded from direct sun most of the day. As a result, the surface remains cooler than many surrounding areas that are more exposed. A cooler surface means less evaporation and a moister environment. Plant species vary with the amount of moisture. As you move along the trail, try to notice how the species mix changes with small changes in their immediate

environment—what we call their “microenvironment.”

Plants growing in the draw include Douglas fir, common juniper, Rocky Mountain maple, snowberry, spirea, arnica, twinflower. Wildflowers vary with the season; you may see lady slipper or fairy slipper orchids early in the wildflower season.



Mountain Lady's Slipper



The Draw

STATION 3: CYCLES OF NATURE

What we think of as the forest environment results from the interaction of many natural cycles including the seasons, plant and animal life cycles, the water cycle, nitrogen cycle, and oxygen/carbon cycle. At station 3 you can see evidence of a vegetative cycle ranging from seedlings and smaller trees up to larger shrubs and trees. Think about how the forest changes as the individual organism living there change.

A forest-based cycle we seldom that about is the calcium-antler cycle. A soil mineral, calcium is absorbed into forest plants along with water and other minerals used by the plant. When animals such as deer and elk eat the plants, calcium is among the nutrients gained by those animals. Bone in our bodies and in the antlers of deer and elk contains a lot of calcium. The antlers grow each year and are shed each winter. Rodents chew on the antlers and weather softens them. By these actions, the calcium in the antlers is scattered and returned to the soil where it is once again ready to be absorbed by the plants and recycled through forest creatures.

Plants evident at and near Station 3 include lodgepole pine, supalpine fir, kinnikinnick and lupine. Look for buffalo berry and willows along the path to station 4.



Kinnikinnick



Vegetative Cycling



Antler Shed

STATION 4: BIRDS OF THE FOREST

The forest is home to a variety of birds. Some seldom venture out from under the trees; others spend only part of their time there. The space each bird or other animal uses in the environment defines that organism's "niche." The forest offers many niches to its inhabitants. Some niches are very narrow and specialized while others are more general.

The chickadee nests in tree holes made by woodpeckers. It feeds on the seeds it finds in pine and fir cones. Chickadees sport black bibs and caps. Their nasal call is a "chick-a-dee dee" or just "dee-dee." Woodpeckers might include flickers, a brownish-red bird that flies in a distinctive looping pattern—a bit like a line hanging from a series of poles.

The nuthatch is a small black and white or (or blue and white) bird that also nests in tree holes. Climbing up and down tree trunks head first, it probes for insects with its pointed bill. Its call is like a kazoon: "yank, yank, yank, yank."

A small, gray, seeding-eating bird with a black hood is a junco. It nests in hidden nooks on the forest floor. Juncos are fond of the forest edge and may venture out into nearby fields. Listen for their soft call "tik, tik, tik, tik."

Large, black ravens croak and caw as they pass through the forest. They nest in treetops and fly far in search of food. Ravens look much like crows, but are larger and soar on the wind. When a raven extends his tail, it is rounded while a crow's is square or diamond shaped.

American robins also may be found here just as they are in town. Often they build grass nests in trees along the edge of the forest and forage for worms and insects in short grass or other open spots on the ground.

Plants you may see around Station 4 include spirea, yarrow and aspen. How many trees and flowers grow here that you have seen at previous stations?



Black-capped Chickadee



Northern Flicker



Hairy Woodpecker



Dark-eyed Junco



Red-breasted Nuthatch



Raven



American Robin

STATION 5: FOREST MAMMALS

A variety of mammals also make the forest their home all or part of the time. Squirrels are very active little creatures that you may often see scurrying around on the ground or up in the trees.

Columbian ground squirrels are small, brown rodents that live in this area. Some people call them “gophers,” but they are more closely related to other squirrels and prairie dogs. Look around and you may see holes in the ground that are doorways to ground squirrel burrows. The burrows provide shelter from the weather and protection from predators such as coyotes and hawks. Burrows also serve as nurseries where the young are born. Each burrow has several doorways providing different routes in and out in an emergency.

Abandoned burrows may be used by other wildlife, chipmunks, weasels, snakes and toads. Sometimes a badger will dig into a burrow trying to catch a squirrel. If you don’t see ground squirrels here, keep looking as you hike along. The meadow at Station 9 may be a very good chance to see them.

Another squirrel you may see in the trees is the American Red Squirrel, also called a Pine Squirrel. These little guys like to run up into trees and scold any forest visitor who passes by. Tree seeds are among their favorite foods, and they gather and store seeds in caches in order to have food for the winter. Some of these seeds remain in the ground and grow, so squirrels are sort of natural foresters. Here and there you may also see large piles of material squirrels tear off of pine and fir cones as they collect the seeds. These signs of squirrel activity are called “middens.”

We’ve mentioned some of the other mammals already. Of course, deer, elk, bears and lions also may pass through this area. They are very shy in this wild country, however, and won’t be around long if they know you are near. Other mammals such as mice are common, but live under the leaves or even underground or mostly come out at

night so you may have a hard time seeing them as well. Still, they are important members of the forest environment.

Some plants you can see at this station include wild rose, cottonwood, and aspen.



Chipmunk



American Red Squirrel



Wild Rose



Wild Rose in fall (rosehips)

STATION 6: FOREST SUCCESSION

At this station you can easily see trees in different age classes. Many of the older trees in this area were harvested (cut down) in 1975. Some large old trees were left to provide seed stock and cover. Trees that are around 30 years old now form another group of shorter trees. Most of these are Lodgepole pine. Eventually, these will be replaced by Douglas fir which are prominent in the under story among the pines.

The very large, old Douglas fir growing at this station is much older than all the other trees. It sprouted around 1830 in the days of the Montana fur trappers when the only people who lived nearby were Piegan Blackfeet. You can see lichens growing on the north side of this old tree. Why would these organisms grow only on one side like this? People used to say that “moss” grew only on the north side of trees, so you could use that like a compass. How reliable is that idea?

The life-cycle process a forest goes through as trees such as our old Douglas fir are eventually replaced by younger lodgepole pine and then

more Douglas fir is called succession. New cycles of succession begin when the forest trees are harvested, killed by fire or killed by insects.

The trees harvested here were used to make lumber some of which was used to build houses and other buildings in the Helena area. Supplying wood and wood fiber is one of the important functions a healthy forest offers us. Good forest management works with the principal of forest succession to keep the forest young, healthy and production.



Pitch tubes are evidence of Mountain Pine Beetles which killed many trees in this drainage during the Helena-area epidemic in 2006 through 2011.



The Old Douglas Fir

STATION 7: TREE IDENTIFICATION

We've mentioned several different trees so far along the trail. Here are some things to help you identify the kind of trees you are seeing as you walk along. One thing to notice first is what kind of leaves does the tree have—are they broad and flat or are they narrow and round like a needle?



Quaking Aspen

they flap back and forth in the wind looking like the tree is trembling or quaking. Hence the common name.

Ponderosa pine — A large specimen with very yellow bark is right behind you. The majestic Ponderosa pine is

Montana's state tree. Pine trees grow their needle-shaped leaves in bundles (fascicles) of 1, 2, 3 or 5 leaves. The number of leaves in a bundle helps identify what kind of pine tree you are looking at. Ponderosa pines have long dark needles 10 to 25 cm long, almost

Quaking aspen — Notice the grove of broad-leaved trees in front of you a little to the left. The bark on the lower trunk is black and rough lower down and greenish white and smooth with rough black spots and lines higher up. The leaves are oval to round 2 to 8 cm long and pointed at the tip — a very distinct shape. The shape of the leaf contributes to instability in a breeze, so



Ponderosa Pine

always in bundles of 3. The bark, which smell like vanilla (especially on a hot day) flakes off the tree in pieces like a jigsaw puzzle.

Lodgepole pine — This tall, narrow pine has short dark green needles 2 to 6 cm long growing in bundles of 2. The bark is gray with many shallow grooves. The tree often grows in dense stands and loses its lower branches as it ages



Lodgepole pine

and receives sunlight. Lodgepoles only live well for about 70 years. Most of their seeds need the heat of a fire to be released from the cones. Lodgepoles are usually the first needle-leaf trees to grow up after a fire. Fire either maintains the stands or forest succession replaces the older trees with other species. The long, straight trunk of lodge poles growing in thick stands made ideal support poles for the tipis or lodges of native Americans, hence the common name for this tree in the northern Rocky Mountains. Along the Pacific coast the species grow twisted and contorted and are called beach pine.

Douglas fir — This tree has single, short, flat needles 2 to 3 cm long. The needles are soft to the touch. Douglas fir is not a “pine” tree and despite its name, it is not a “fir” tree either — just a Douglas fir. It is native to northwestern North America, but because it is one of the best lumber trees in the world, it is now grown world-wide in cool, moist forest to produce wood for building.



Douglas fir

STATION 9: WHO'S THE "WISE ACRE?"

This park is affectionately called the "Wise Acre" because of its approximate size. The area of a football field between the goal lines and out of bounds is about 1.1 acres. People who work on the land become proficient at estimating parcel sizes — this could become an important skill for you if you decide to work in land or natural resource management.

Think about this meadow. Calling it a meadow describes the fact that it is an open area with few trees. Meadows may be found in both steep, usually warm slope with stony, poorly-developed soils or on wetter, gentle terrain with adequate snow cover. Do you think this meadow is as dry as the surrounding forest or wetter? If you look around and think of where the trail led you to get here, can you think of some sources of water for this meadow? How do you imagine the soil under foot here might differ from the forest soils on the hills around you? Meadows are complex and variable ecosystems that may be maintained by fire, grazing, subsoil moisture and acidity or harsh weather. The plants are primarily grasses, sedges, and forbs (annual or perennial broadleaf plants that have no woody tissue and die back to ground level at the end of each growing season.)



View of the "Wise Acre"

STATION 10: JUNIPERS

The trail now proceeds west on this south-facing slope. It is warmer and drier here than on the first half of the trail because the exposed hillsides receives more sunlight and less precipitation over the course of the year. Notice that the amount, growth patterns and types of vegetation are different on this part of the trail.

Common juniper is a low, spreading shrub with spiny needles 5 to 12 mm long. A common characteristic is the white line on the underside of the leaves. A “shrub” is a plant with several woody stems. They differ from trees in that a tree has a clearly prominent main stem or trunk while a shrub does not.

Rocky Mountain juniper usually grows as a small tree or an upright shrub with scale-like needles lying flat against the branch. The wood is soft and durable, has a pleasant scent and a lovely red color. It is often used for fence posts, carving or other small projects. Junipers are related to cedar trees common in wetter climates and many old timers referred to them as cedar or scrub cedar because of their similarity.



Rocky Mountain Juniper
(small tree to mid-sized shrub)



Common Juniper
(low-growing ground cover)

STATION 8: EDGE, ECOTONE, AND GRAZING

You are now entering a meadow (open area like this is the forest are often called “parks.”) Notice that along the edge of the meadow, there is a gradual transition in vegetation. A transition between one predominant form (meadow/park) and another (forest) is called an ecotone. Edges and ecotones often have a greater variety of wildlife and vegetation than either of the forms on either side. As you look near the edge of the meadow, you will see the growth of new trees. Over time, adjacent forests naturally reseed many meadows.

In this area and throughout many of the national forests, ranchers obtain permits to graze their cattle. Along with soil and moisture characteristics, grazing is one factor that maintains meadows as the animals eat the shoots of invading trees. Grazing animals also can bring seeds of plants eaten elsewhere when they are driven on to the land. Weed seed can be spread in this way. The meadow is now predominantly populated by timothy grass and creeping thistle. Both of these are introduced species most likely brought in by livestock. Timothy grass is now extremely common, and although not native, is used by wildlife and livestock as nutritious feed. The creeping thistle (also called Canada thistle) is a serious noxious weed with deep roots that is illegal to grow or allow to grow on your property. Livestock owners are now much more careful than in the past to avoid the spread of weed seeds.



Edges and Ecotones



**At certain times of the year, be careful where you step—
cow patties abound**

GIVE A HOOT!



Please help take care of public lands. Remember, they belong to you. If you pack it in, pack it out. Be sure to wear proper footwear and clothing suitable for the weather conditions expected. Binoculars are handy for spotting wildlife, and a camera might capture an unexpected critter. Respect the wildlife you see. Stay a safe distance away and remember: you are a visitor in their home.

We hope you enjoy your hike on the Helena National Forest!

AFTERWORD

We hope this brochure has enhanced your enjoyment of the Tenmile Environmental Trail. Students at Helena High School, in association with the US Forest Service, produced the first edition of this brochure. The Montana Discovery Foundation and the US Forest Service continue to revise and update brochures as needed.



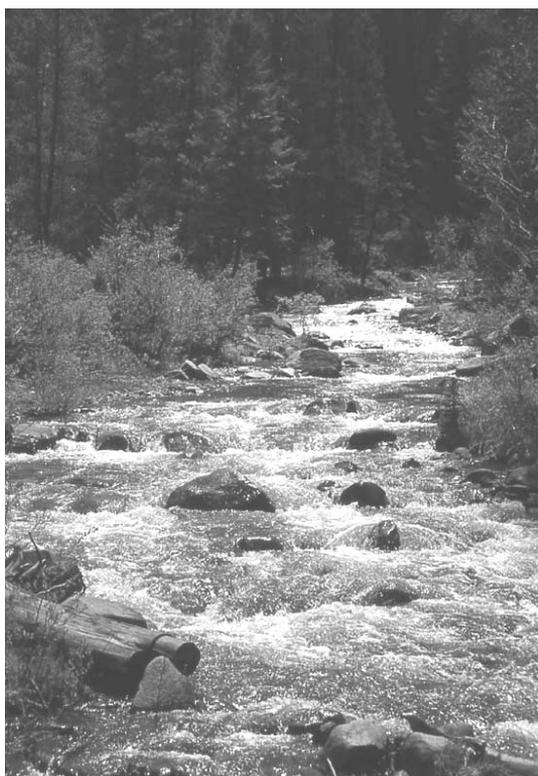
As you return home, please feel free to keep this guide as a souvenir or return it to the kiosk, pass it on to a friend, or otherwise reuse or recycle. If you have questions or comments, please contact the Montana Discovery Foundation at 406.495.3711 or the Helena Ranger District at 406.449.5201.

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TENMILE ENVIRONMENTAL TRAIL #375

How to Get There:

The Tenmile Environmental trail is located adjacent to the Rimini Road. Proceed approximately 8 miles west of Helena on Highway 12. Turn south on the graveled Rimini Road and drive about 4 miles to the trail head.



Tenmile Creek



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Montana
Discovery
Foundation