

Creek Bed Habitat

Location:

This habitat is found in the adjacent, low lying areas, depressions, and banks along Four Mile Creek in the Kasey Hartz Natural Area. This is characterized as a riparian zone along the creek that houses many plant species unique to this portion of the natural area. There are many places where the trail comes very close to this habitat and you may get an up close and personal view of the vegetation, while in other places the trail takes you up a slope where a general overview of the area may be seen such as the many fallen trees along the creek.

General Appearance:

Upon first entering the Creek Bed Habitat in the summer the foremost noticeable difference in the atmosphere is the cooler temperature and deeper shade. You will also notice that the elevation along the creek is for the most part much flatter compared to the surrounding slopes. As you survey the area along the creek you will see the riparian zone or floodplain type of wetland which includes the creek banks and all the nearby vegetation which happens to be very diverse and abundant (Giller). This area is characterized by the dominance of woody plants (Wetlands: U.S. EPA). Plant types are very diverse: there are trees such as red maple, white pine, and red oak, shrubs like spice bush, herbaceous plants such as skunk cabbage, mayapple, solomon-seal, and other simple plants like liverworts and many types of ferns such as cinnamon, royal, and sensitive ferns (Wetlands: U.S. EPA). Nutrient deposits from the stream, soil saturation, and high organic soil matter all contribute to this species diversity.

General Climate:

Overall there is a distinguishable difference between the general climate of the Creek Bed Habitat and the Upland and North Facing Slope Habitats (See Measurement Graphs for the Kasey Hartz Natural Area). For instance the Creek Bed Habitat gets less light content coming through the canopy than the Upland Habitat in the late winter and early spring (Graph: Light Content of Kasey Hartz Natural Area Habitats 3/10-4/11/2008). Also, a majority of the time the temperature of the air and soil are lower in the Creek Bed Habitat than in the Upland Habitat during the late winter and early spring (Graphs: Soil Temp at 15, 0, 15, and 137 cm of the Kasey Hartz Natural Area Habitats 3/10-4/11/2008). Particularly in the summer, this area is usually shadier, cooler, and moister than the Upland Habitat and the North Facing Slope Habitat; these environmental conditions result in an abundance of species that are particularly shade and moisture loving. Also due to low topography and high water levels, the area warms more slowly than higher topographic areas. This allows for certain species to compete and survive that could not in the higher areas. Slower warming also helps to miss late frosts that could kill sensitive plants (Tepley).

Creek Bed Habitat

2

You may also notice that the stream is found in a depression and is surrounded by higher slopes. Water from the higher ground then drains down into the creek habitat. There also may be seasonal flooding, which results in a cycle of erosion and sediment deposition (Tepley). This all contributes to very moist soil. It is also unusual to see the number of fallen trees along the creek. This higher number is due to erosion and soil saturation (Tepley). The high soil saturation can cause shallow rooting of trees which leads to windfall (Weber). Wind throw leads to a pit and mound type of microclimate topography, topography which allows for greater habitat diversity (Weber). The nutrient rich soil exposed by fallen trees and the decaying stumps allow for many species to germinate in otherwise nutrient poor soil (Slaughter). You may find under many exposed tree roots that different plant species have moved in to take advantage of the exposed nutrients. The fall of a large tree also makes a break in the canopy, which allows more sun to hit the forest floor. This gives saplings or other plant types such as shrubs or herbaceous species a chance to grow uninhibited by a lack of sunlight (Wilson).

The tension zone that the Muskegon area falls in helps to allow for the survival of many northern and southern species at the extent of their range. There is particularly a mix of deciduous and conifer forest species. The tension zone runs about 43 degrees North Latitude across the state or from Muskegon to Saginaw (McCann 24). This may also be a cause of high species diversity.

Seasonal Changes:

Winter: Loss of total canopy except for evergreen species such as white pine, amounts most of sunlight year round filtering through the tree tops, temperature is very cold, and snow covers for much of the season.

Spring: Snow melts as temperatures begin to rise. Rain takes place of snow and sun shines brighter. Plants emerge and many bloom. The water table in spring is at its highest due to heavy rains and snow melting; this may result in areas where the water level is above the surface of the soil (Daniel 264). This sometimes occurs in places along the creek where the soil is water logged and water rises slightly above the soil to form a wet, mucky area.

Summer: Temperatures continue to rise and rain is usually less frequent. The canopy fills out, shading the ground level more. In general area is drier than in spring. Swamp or flood plain forest areas may become dry over the summer months ("Wetlands"-MDNR).

Fall: Temperatures fall. Rain usually becomes more frequent. Deciduous trees and plants lose/ change color and drop their leaves. Snow may fall as temperatures drop below freezing.

High Season:

Spring: High season for blooming flowers; early March for skunk cabbage to late May, early June.

Creek Bed Habitat

3

Summer: High season for green scenery.

Fall: High season for fall colors.

Winter: High season for bird watching; you may see more easily into the trees to see the different bird species

General Soil Type:

The soil type of this area is characterized as a Saranac loam (Soil Survey of Muskegon County, Michigan 31-2). The Saranac Series are normally found along level stream and floodplain bottomland and depression areas. The corresponding native vegetation is mostly lowland hardwoods. The surface layer is dark gray loam at ten inches thick. The subsoil consists of dark gray and gray silty clay loam about nine inches thick. Under the subsoil are layers of clay loam, silty clay loam, thin layers of sandy loam, loam, silt loam, and loamy sand that are gray with mottled yellow brown and gray or dark gray (Soil Survey of Muskegon County, Michigan 31). The soil is wet, fertile, with a moderately slow permeability, and high moisture capacity. There is a high chance of flood due to the stream proximity. Slopes are 0 to 2 percent, but due to depressions there may be 2 to 6 percent slopes in certain areas (Soil Survey of Muskegon County, Michigan 31-32).

Here the stream has greatly affected the soil of the Creek Bed Habitat, which in turn affects the plants growing here. Deposits of sediment made by the stream may be found along the banks and adjacent areas. Usually heavier sediment is closer to the stream and finer sediment farther away (Tepley). Sediment carried by a stream can be very nutrient rich which allows for many plants to grow. You will also notice that the soil has a high water content here. A measured soil moisture content of this habitat was 24.75% +/- 11.36% (See Sample Procedures sheet for sampling techniques). Near surface levels in the water table and occasional seasonal flooding are the most likely factors of the highly water saturated soil. Poor soil drainage from finer sediment may also result in soil saturation (Tepley). There is also a high percentage of organic matter in the soil. A measured percentage of organic matter of the Creek Bed Habitat is 59.22% +/- 2.64% (See Sample Procedures sheet for sampling techniques). Organic matter forms when there is poor soil drainage, high water saturation, seasonal flooding, and when dead plant matter is present. Areas farther away from the stream that do not experience washing away of sediment by the stream can result in a layer of organic matter due to high water saturation levels in the soil (Tepley). A layer of saturated muck may also be present (Kost).

Dominant Plants:

Liverworts (phylum *Hepatophyta*) found particularly on fallen logs along the creek, mosses (phylum *Bryopsida*), mayapple (*Podophyllum peltatum*), skunk cabbage (*Symplocarpus foetidus* (L.) Nutt.), cinnamon fern (*Osmunda cinnomomea*), sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis* var. *spectabilis*), wintergreen (*Gaultheria procumbens* L.), starflower (*Trientalis borealis* (Faf.)), Canada mayflower (*Maianthemum candaense* Desf.), spice bush (*Lindera benzoin* (L.) Blume), red maple (*Acer rubrum* L.), red oak (*Quercus rubra* L.), white pine (*Pinus strobus*), marsh

Creek Bed Habitat

4

marigold (*Caltha palustris*), equisetum (horsetail), goldenrod (*Solidago* spp.), round-lobed hepatica (*Hepatica americana* (DC.) Ker (H. triloba)), Solomon-seal (*Polygonatum pubescens* (Willd.) Pursh), poison ivy (*Toxicodendron radicans* (L.) Kuntze) beware of patches of this species along the path.

Uncommon Plants:

Jack-in-the-pulpit (*Arisaema triphyllum*) was seen in the spring/summer season of 2007 near the southern bridge on the trail.

Common Animals Anecdotally Observed in Past 10 Years:

Macroinvertebrates may be seen in the creek such as water striders and scuds, muskrat (*Ondatra zibethicus*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), chipmunk (genus *Tamias*), you may see evidence of raccoons (*Procyon lotor*) from the tracks in the wet sand on the creek banks, deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), owl species, northern water snake (*Nerodia sipedon*), and common woodland song birds can be seen and heard in the trees.

Corresponding Section of Trail:

Between markers 10 to 13 according to the old trail guide map along the north bridge and near marker 20 along the south bridge. Any section of trail that gets relatively close to the creek itself most likely has plant species that are common to this habitat.

Interesting Features:

The skunk cabbage is the first plant to flower in late winter, early spring. The flowers are enclosed in a purplish red cup. Sometimes they may be seen before the snow has even cleared away.

Some of the edible plants found in this habitat include the mature fruit of the mayapple that ripens July to August, and the fiddle heads that emerge in early spring of the cinnamon and sensitive ferns.

Benefits of Stream Riparian/Wet Habitats ("Wetlands"-MDNR):

- Reduce flooding by absorbing precipitation runoff while slowly releasing water into the stream.
- Works as a filter for runoff pollutants such as fertilizers and pesticides; breaks them down into safer forms.
- Helps to recharge the water supply of the aquifer.
- Produce many nutrients via biological cycles such as oxygen.
- Provides a habitat for many species, especially protected ones.