



Upland Habitat

Location:

The area of the Kasey Hartz Natural Area discussed here as the Upland Habitat is the level section at the entrance to the Nature Trail, trending north and south, and extending to where the Nature Trail turns to sue the east stairs to reach the Creek Bed Habitat. The section of the Upland Habitat located on the west side of the Kasey Hartz Natural Area is not included in this discussion.

General Appearance:

The appearance of this habitat is sometimes described as open parkland, in that most of the mature trees are fairly widely spaced, forming an open canopy, with a non-continuous sub-canopy, and with a mostly very low shrub layer. It never appears as the green tunnel path as would be found in a closed canopy forest. The soil of this area is what controls this appearance (David Wilson, personal communication).



Dominant Plants:

The Upland Habitat canopy layer is dominated by oak species, primarily black oak (*Quercus velutina* Lam.), with frequent white oak (*Q. alba* L.), and occasional red oak (*Q. rubra* L.) and red maple (*Acer rubrum* L.). The sub-canopy consists of white pine (*Pinus strobus* L.), flowering dogwood (*Cornus florida* L.), and sassafras (*Sassafras albidum* [Nutt.] Nees). The shrub layer is primarily blueberry (*Vaccinium angustifolium* Aiton) interspersed with huckleberry (*Gaylussacia baccata* [Wangenh.] K.Koch), with occasional patches of greenbrier (*Smilax rotundifolia* L.). The herbaceous layer consists primarily of Pennsylvania sedge (*Carex pensylvanica* Lam.) with grasses (*Graminaceae* sp.) interspersed; scattered bracken fern (*Pteridium aquilinum* [L.] Kuhn var. *latiusculum* [Desv.] Underw). Among this layer are found a few broad-leaved plants, among them asters (*Aster* sp.), goldenrod (*Solidago* sp.), the evergreen wintergreen (*Gaultheria procumbens* L.) and Pipsissewa or Prince's pine (*Chimaphila umbellata* [L.] W.P.C. Barton). Lichens are ubiquitous, growing on tree bark and soil, and mosses can be found in the less doughty places.

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Animals:

What would an oak habitat be without squirrels? Observed here, in a general, non-studious manner, have been: eastern fox squirrel (*Sciurus niger* L.); gray squirrel (*S. carolinensis* Gmelin), frequently seen here in its melanistic color phase - all black or black with a brown tinge; and eastern chipmunk (*Tamias striatus* L.). While tracks of raccoon (*Procyon lotor* L.) are frequently seen in the sand along Four Mile Creek and not seen in this upland area (perhaps only due to lack of bare sand), raccoons can be assumed to at least move through it searching for acorns, as they are an important food source for this animal as well as the squirrel family. There are anecdotal reports within the past ten years of deer and wild turkeys being seen - and they also may have been looking for acorns, which form a generally reliable, and nutritious, food source when other types of food are difficult to find. Many common woodland birds can be expected: among those species identified have been: white-breasted nuthatch (*Sitta carolinensis* Oberholser), robin (*Turdus migratorius* L.), black-capped chickadee (*Parus atricapillus*), northern cardinal (*Cardinalis cardinalis*), eastern phoebe (*Sayornis phoebe*), and tufted titmouse (*Parus bicolor*). Owl pellets have been found, attesting to the presence of one or more species. Invertebrates also find the habitat suitable, among them mosquitoes and the oak and goldenrod gall forming insects. The numerous species present await further studies.

Soil:

The soils of the upland area are Rubicon sand, 0-6 percent slopes, which is a soil type described by the Soil Conservation Service as: containing “only a small amount of plant nutrients”; having “low available moisture capacity”; and its “second-growth forest consists of black oak, white oak, and a few large white pines” (U.S.D.A. 1968 p. 30). It is “very droughty” and on it “vegetation (is) difficult to establish” (U.S.D.A. p. 75.) Soil formation is dependent on five interrelated factors, and a coherent discussion requires discussion of all five. Those factors are: parent material, climate, plant and animal life, relief and drainage, and time, or age. (U.S.D.A. p. 82). While this paper is not the appropriate place for a complete discussion, certain points do need to be made in support of the earlier statement that soil is *the* critical factor in the composition of the Upland Habitat within the Kasey Hartz Natural Area.

The parent material of the upland area being glacial deposits - sand and gravel, and the area being essentially flat, drainage is downward and fast, due to its open structure. The process of podzolization occurs as a result, as the draining water becomes somewhat acidic as it moves through leaf litter, and leaches “minerals and organic matter” downward, where they accumulate in what is known as the *B* soil layer, or subsoil (Brewer *et al.* 1991) where deep roots are required to reach the nutrients (Dickmann and Leefers 2003).

The climate of the Muskegon area, labeled as “*humid continental cool summer*” in the Köppen system (Eichenlaub 1979 p. 194), describes it as “an area characterized by cold, snowy winters, cool or moderately warm summers, and evenly distributed precipitation. To these common characteristics we should add that variability is also a climatic keynote within the region” (Eichenlaub 1979 p. 196) with Lake Michigan markedly affecting local climate in various ways (Eichenlaub 1979). The developmental time frame of all of Muskegon County’s soils is relatively quite short due to the multiple glaciations of the area and the completion of

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deposition of parent material around four thousand years ago, as the last of the glaciers retreated, giving final form to Lake Michigan in the process. The youthfulness of the land is particularly important when it comes to the amount of organic matter to be found in the soil.

Interesting Feature:

How soil generally affects vegetation has been discussed briefly, but which plants might be found together has not. The plant community found in the upland area closely resembles the description of the Ecological Landtype Phase 10 (ELTP 10) of the Huron-Manistee National Forest, whose southern boundary is but a few miles north of Muskegon. Their brief description is “black oak - white oak - *Vaccinium* plant association on excessively well drained sands of outwash plains: (U.S.D.A. 1993, p. 7:15). White pine is absent from their description while prominent here, an example of how chance affects so strongly the outcome of disturbance. The likely seed source of all other white pines in the natural area is a large white pine (now a “leaner”), estimated to be about 150 years old located in the Creek Bed Habitat. It was not cut during Muskegon’s logging era, perhaps because it was too small and/or too inconvenient, being right next to the creek, and is probably a fire survivor as well (David Wilson, personal communication 4-3-2008). One must also keep in mind that the “present oak-dominated forest is likely to be what was left after white pine was logged out” (McCann in Brewer *et al.* p. 28).

The U.S.D.A. description of the understory includes witch-hazel and red maple; red maple is seen with some frequency in our Upland Habitat - do we need to look more closely to find the witch-hazel? It could be absent from the area discussed, and be present in the upland area above the north-facing slope. It could also be slowly moving up the south-facing slope edging the upland area discussed, and appear there in the future. Further work is called for.

An important reason for finding certain species together is *Homo sapiens* - humankind. Logging has already been mentioned, but not that it was frequently followed by very hot, soil damaging fires in the slash left behind. A current very destructive human interference is mountain bike riding off authorized trails. Picking of wildflowers can love them to death, as it not only removes source of seeds - the flower, but also often results in destruction of the plant as roots are disturbed. In some cases of disturbance, we may never know what we are missing.

Prepared by: Barbara Lukacs Grob April 2008