

## **HUDSON'S SENSITIVE LANDS**

Sensitive lands refers to those areas which still retain a high degree of ecological integrity. Therefore these areas are especially sensitive to primary and secondary impacts from development, pollution, and other forms of encroachment. No areas within Hudson are truly "pristine." However, the sensitive lands identified herein are either those areas least disturbed, areas which have had long time frames with relatively little disturbance within which to recover from past severe disturbances, or areas which present significant opportunities to restore at least a semblance of past conditions.

### **Surface Hydrology**

The City of Hudson is drained by five tributaries of the Cuyahoga River. All of the southwestern quadrant and much of the southeastern quadrant are drained by Mud Brook and its tributary, Powers Brook. Most of the northwest quadrant is drained by Brandywine Creek. Most of the northeast quadrant is drained by Tinkers Creek. A small area in the extreme southeast corner of the City is drained by small headwaters tributaries of Fish Creek.

The amount of surface runoff from the drainage basins that ultimately ends up as streamflow in the above-named streams is based on the amount of precipitation in the area, time duration of precipitation events, water loss due to evaporation and type of ground cover, and the permeability or infiltration capacities of the soils. According to the Hydrologic Atlas for Ohio (Ohio Division of Water, 1991) the average annual precipitation in the Hudson area is 39 inches (from 1931 to 1980). This precipitation is in the form of rain and snow. The average annual water loss in the area is 26 inches. Water loss is dependent upon evaporation rates (which is directly correlated to temperature), and transpiration by trees and vegetation. Water loss is defined as the difference between the precipitation over a drainage area and the streamflow from the area. The total net contribution of precipitation to actual streamflow in Hudson is 13 inches. Due to the fact that there are no gauging stations located along these streams within Hudson, no stream data are available from the ODNR.

Other factors controlling runoff, (and ultimately streamflow) include the topography of the area, and the infiltration capacity of soils in the basin. The topography of the area controls the amount of actual "residence time" of runoff, or rate of flow across the ground surface. The infiltration capacity is dependent upon the vertical permeability of the soil. Factors affecting permeability include the degree of compaction of the soil particles, shrink/swell coefficients based on clay content, and the porosity of the soil.

### **Topography**

The lowest areas in Hudson, ranging from 980 to 990 feet above sea level, are along Brandywine Creek, Mud Brook, and Tinkers Creek, where those streams exit the City. A few scattered areas, mainly in the northern half of the City, reach 1150 feet or more, the highest elevations in Hudson. Therefore, total relief within the City is about 170 feet. For the most part, the topography of Hudson can be characterized as level to gently sloping (< 6 percent slopes). The only area with steep topography occurs above Tinkers Creek in the northeast corner of the City where elevation differences of greater than 100 feet occur within 500 linear feet (> 20 percent slopes).

### **Glacial Geology**

Northeastern Ohio is covered by a broad band of Pleistocene glacial deposits, principally represented at the surface by the late Wisconsinan ice contact and proglacial sediments. These glacial deposits are part of a broader belt extending from western New York across northwestern Pennsylvania, Ohio, and into Michigan and Indiana.

The ice responsible for the deposition of these sediments entered from the Lake Erie Basin and swept south onto the Appalachian Plateau over the Paleozoic sandstones and shales. A rich variety of geomorphological features resulted from the deposition of the thin veneer of glacial materials over the underlying, strongly developed topography dominated by bedrock.

Large blocks of slowly melting, stagnant ice were left behind as the last ice sheet receded. These massive ice blocks compacted underlying materials and formed irregular depressions in the drift, especially in outwash or kame field areas. Mud Lake, Wyoga Lake, Crystal Lake, Silver Lake and the Twin Lakes are “kettle lakes” that formed in the area from meltwater in these kettle holes.

“Kettle bogs” formed from kettle holes or kettle lakes that became filled with organic matter or sediment. Many kettle bogs are found in northeastern Ohio. All gradations of kettle lakes and kettle bogs may be seen in Summit and Portage Counties, from fairly deep lakes to lakes which have a swampy marginal zone of vegetation, to bogs now completely filled with organic matter. Organic matter in kettle bogs turns into peat, or if mixed with clay or silt, turns into muck.

The Mud Brook drainage system formed as a connection between kettle lakes (Mud Lake and Wyoga Lake). The drainage system extends to the south from Boston Heights through Hudson, Stow, Northampton Township and into northern Akron, where Mud Brook forms a confluence with the Cuyahoga River. North of State Route 303 in Hudson, an extensive wetlands area in outwash deposits forms the headwaters of Mud Brook. These

wetlands drain into Mud Lake. Mud Lake drains into Mud Brook, which courses to the south through lacustrine kame terrace and outwash deposits. The stream channel and floodplain of Mud Brook are lined with alluvium deposits.

**Sensitive Lands Through Watershed**

Mud Brook Watershed - The Mud Brook watershed contains the largest areas of land considered sensitive in Hudson. The large wetland complex along Mud Brook from north of SR 303 to the City of Stow line was described as “Mud Lake Bog” by Alfred Dachnowski in his *Peat Deposits of Ohio* (1912). Dachnowski recorded this “bog” as about five miles long and ranging from one-quarter to one and a half miles wide. It stretched from what is currently known as District 6 between SR 303 and Boston Mills Road to south of Wyoga Lake (formerly known as Turtle Lake) (Figure 2??). Table 1 presents the plant species listed by Dachnowski for this extensive wetland.

**Table 1. Plants of Mud Lake Bog, Hudson, Ohio (from Dachnowski, 1912).**

**Herbs**

Swamp loosestrife	<i>Decodon verticillatus</i>
Cattail	<i>Typha latifolia</i>
Arrow-leaved tearthumb	<i>Polygonum sagittatum</i>
Arrowhead	<i>Sagittaria sp.</i>
Wood mint	<i>Blephilia ciliata</i>
Willow herb	<i>Epilobium coloratum</i>
Hairy grass	<i>Agrostis hyemalis</i>
Common everlasting	<i>Gnaphalium polycephalum</i> (probably <i>uliginosum</i> )
Bluebell	<i>Campanula americana</i>

**Shrubs**

Swamp fly honeysuckle	<i>Lonicera oblongifolia</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Pussy willow	<i>Salix discolor</i>
Red-osier dogwood	<i>Cornus stolonifera</i>
Gray dogwood	<i>Cornus paniculata</i> (probably <i>racemosa</i> )
Alder	<i>Alnus incana</i> (probably <i>rugosa</i> )
Arrowwood viburnum	<i>Viburnum dentatum</i> (probably <i>recognitum</i> )
High-bush blueberry	<i>Vaccinium corymbosum</i>

Wild cherry	<i>Prunus virginiana</i>
Spicebush	<i>Benzoin aestivale (Lindera benzoin)</i>
Elderberry	<i>Sambucus canadensis</i>
Heath	<i>Vaccinium pennsylvanicum</i>
Heath	<i>Vaccinium vacillans</i>
Gray dogwood	<i>Cornus paniculata</i> (probably <i>racemosa</i> )

**Trees**

Red maple	<i>Acer rubrum</i>
Elm	<i>Ulmus fulva</i> (probably <i>americana</i> )
Ash	<i>Fraxinus quadrangulata</i> (probably <i>pennsylvanica</i> )
Black ash	<i>Fraxinus nigra</i>
Walnut	<i>Juglans nigra</i>
Yellow birch	<i>Betula lutea</i>

It is highly likely that even by 1912, numerous disturbances to the vegetation and hydrology of this large wetland complex for agricultural purposes had by that time altered the character of the wetland. It is apparent from topographic maps, soils maps, National Wetland Inventory maps, and aerial photography that the largest remaining wetland complexes in Hudson, including District 6, are remnants of this once larger wetland.

Many of these wetlands are slowly recovering from these past disturbances, many with the help of the engineering work of re-invading beavers. This recovery process can be greatly speeded through the use of ecological restoration techniques. In addition to the sensitive wetlands around Mud Lake and along Mud Brook, this area contains the City's drinking water wellfield, and thus its importance for the function of groundwater recharge is greatly enhanced.

Powers Brook, a Mud Brook tributary, has its headwaters in the southeast quadrant of the City, in the vicinity of Stow, Barlow, and Ravenna Roads. The lands in this vicinity are significant because of their size as well as the quality and diversity of natural areas found here. Upland forests with small high quality wetlands, and small meandering drainageways cover much of this area.

Tinkers Creek Watershed - The Tinkers Creek watershed contains some of the highest quality natural areas remaining in Hudson. In the vicinity of Ravenna and Stone Roads, occur mature upland forests surrounding many small marshes and scrub-shrub wetlands. The forests have not been logged in many years, and natural drainage patterns have not been altered. Although the wetlands here do not perform as many physical functions (such as flood control and ground water recharge) as the larger wetlands in the Mud Brook drainage, they provide quality habitat for many plants and animals.

Farther downstream in the watershed, the floodplain of Tinkers Creek contains extensive stands of upland forests as well as many wetlands that are important for flood control. The meandering channels of Tinkers Creek and its small tributaries provide high quality wildlife habitat. These areas are hydrologically connected to the extensive wetlands in Streetsboro to the east which are partially protected in three State Nature Preserves.

Brandywine Creek Watershed - Brandywine Creek originates in the southeast quadrant, flows through the heart of the City and then exits in the northwest quadrant. A wide variety of upland and wetland communities occur along the stream's mainstem and tributaries. Some of the small wetlands are very high quality.

