



Chapter 3: Natural Resources Inventory

Introduction

Located in the heart of an agrarian land base, the City of Midland has developed into a mature ‘green’ city through thoughtful planning. With 83 city parks, 5,442 acres of woodlands, and miles of natural waterway, residents have an opportunity to get outside and enjoy nature in almost every section of the City. The presence of existing woodlands and wetlands in Midland has been shaped over the course of time by the development of new streets, residential subdivisions, new businesses and industries which are customary metropolitan uses of land.



Many prominent natural features are found throughout Midland, such as the confluence of the Tittabawassee and Chippewa Rivers, Sturgeon Creek, and various wetlands, wooded areas, and open space. These natural features help define the character of the City. Therefore any development on the remaining vacant areas should be considerate of the existing natural features.

An inventory of existing natural features was conducted to identify potential opportunities for conservation and open space developments, and also to identify areas where natural features can be improved upon. Site design should take advantage of the benefits that natural features provide and minimize any disruptions or loss. Map 3.1: Natural Features, illustrates the general locations of wetlands, woodlands, and water in the City and MUGA, and floodplain boundaries in the City, based on available State and Federal data.

Regional Scope

A watershed is an area of land that drains into a common body of water. Midland is located within Michigan’s largest watershed, known as Saginaw Bay, which encompasses over 8,500 square miles of land. The watershed is known as America’s largest contiguous freshwater coastal wetland system, and drains approximately 15% of Michigan’s land area. Preserving natural water features, and their adjacent lands, is one of the most practical ways to protect water resources

Figure 3.1: Existing Land Cover

Midland’s Land Cover**		Source
Coverage	Acres **	
Woodlands	5,442	National Land Cover Dataset (NLCD), Michigan Center for Geographic Information (M-CGI), 1992.
Wetlands	2,034	National Wetlands Inventory (NWI), Michigan Center for Geographic Information (M-CGI), 1994.
Water	1,117	Michigan Center for Geographic Information (M-CGI), 2005.
Floodplain	3,933	LSL generated data for City of Midland digitized polygons, 2006.
Midland Total City	22,514	Michigan Center for Geographic Information (M-CGI), 2005.

** Each acreage calculation is from a different dataset and does in many cases overlap with other calculations. For example, each acre of forested or wooded wetlands in the floodplain area are counted as an acre in each of those three categories.



and manage storm water.

Promoting low-impact development and preventing excess storm water runoff is a main priority for Midland's immediate land area and also for the watershed that eventually drains into Lake Huron. By providing standards for natural feature improvements, Midland can improve the natural aesthetic of its northern city atmosphere, while providing low-cost natural infrastructure that can enhance local water quality, control flooding and improve the overall health of the watershed. While Lake Huron is not within a close distance to Midland, it is the source of drinking water for all Midland residents.

Soils

The physiographic conditions within the Midland region is characteristic of many eastern mid-Michigan communities, which as a result of glacier activities 15,000 years ago created a low and level terrain known as Lake-border plains. Elevations within the area range from 600 to 675 feet above sea level.

What the glaciers left behind lies beneath the surface in our soils. A soil survey reveals a significant amount of information about an area that is not visible from the landscape. Soil surveys assist in identifying areas that due to existing soil structures can either accommodate development or are unsuitable for development.

Soil deposits found in the area are a combination of loamy and sandy soils which are suitable for most development. Soils are ranked in a variety of ways to assist communities on how to best manage growth and development and will influence future development in areas where there are large portions of undeveloped lands, especially the northern boundaries of US-10 and adjacent Larkin Township.

Areas of poor soil suitability tend to concentrate in low and level terrain near areas of water where there is little natural drainage. Midland has a number of areas where frequent flooding and standing water occur along the waterways due to poorly drained soils. Implementation of best management practices to reduce the amount of impervious surfaces and preserve the native vegetation that grows within these areas can assist in the soils ability to manage storm water and prevent excess runoff.

The predominant soils in the City are classified as very limited for development. Due to the limited soils and area slopes of 0% to 6%, the natural resource base limits the ability to develop properties without a substantial amount of engineering and related infrastructure.

Midland's urbanization has engineered the landscape to accommodate development through the use of storm sewers, gutters, and surface ditches to drain area lands. As a result, dependence on soil types to limit or design future development will have little influence in the urban areas of town; however, attention to development restrictions in undeveloped areas should be carefully evaluated to protect the areas ability to natural infiltrate rain water and prevent excess storm water runoff. For example, construction activities can be staged to minimize the amount of soil exposed to reduce the amount of erosion and runoff potential that may occur.



Wetlands

Wetlands are vital to the environmental quality of Midland and serve a variety of important functions that benefit the community such as:

- mitigating flooding by detaining surface runoff;
- controlling soil erosion and sediment loading in rivers and lakes;
- providing links with ground water and improving water quality, and;
- providing important wildlife, flora, and fauna habitats.

Wetlands may include areas that are seasonably wet, by a surface or ground water influence, to areas that are more permanently saturated throughout the year. An additional aesthetic benefit to the City is the unique habitat it provides for migratory and resident wildlife.

Wetlands are scattered throughout the City, with the majority of wetlands found along the edge of water ways. There are some isolated wetlands in the northeast corner of the City, as well as within the designated floodplain area.

Currently, the Michigan Department of Environmental Quality regulates all wetlands that are contiguous with (within 500 feet of) a waterway or any wetland that is greater than five acres in size through Part 303 of the Natural Resources and Environmental Protection Act (NREPA). Any dredging, excavating, construction on or making use of a wetland (such as for storm water) requires a permit from the MDEQ. Permits will generally not be granted unless the issuance is in the public interest and necessary to realize the benefits derived from the activity. If a wetland fill permit is granted, mitigation, such as creating new wetlands within the same drainage way or enhancement of existing wetlands is required. Refer to Map 3.1: Natural Features for an illustration of the location and type of wetlands located in the Midland area.

Vegetation

The Midland area was originally covered with hemlock and white pine forests. Marshes and swamps were present in many of the low lying areas and served as excellent habitat for Michigan's native wildlife. Much of the surrounding landscape was timbered and utilized for agricultural activities. Second growth forests emerged as a mixture of hardwoods and pine that surround the perimeter of the City.



The predominant vegetation within the City consists of a manicured, urban landscape of grass, lawns and landscaping plants. Woodlands within the City limits can be found in street trees and are being managed and planted with a variety species. A diversity of tree species along the street right-of-way is important for a safe and healthy urban forest.

Woodlands influence the micro-climate by moderating ground-level temperatures, reduce air pollution and soil erosion, provide effective noise and wind screens, and provide important wildlife, flora, and fauna habitats.



A significant wooded feature within Midland is the City Forest. The Midland City Forest is roughly a square mile of Saginaw Valley woodland bisected by Newell Creek in the northern portion of the City. It is a mixture of wetland and low land covered with mature pines and mixed hardwoods and provides a source of natural cover for local wildlife, as well as low-impact public recreation opportunities. The City Forest is within close proximity to portions of the Au Sable State Forest, creating opportunities for the City to provide links to wildlife corridors.

A wildlife corridor is defined as an area of natural or semi-natural habitat that has been linked to nearby areas of habitat to form a corridor of undeveloped land that can maintain movement of wildlife through an urban setting. Wildlife corridors also provide additional privacy for area residents and allows for a 'greening' of neighborhoods by linking habitats and woodlands. These can be either inland or along a water way.

Vegetated systems along the waterfront provide habitat for aquatic wildlife and allow room for floodwater to be absorbed without damaging residential structures. Known in many urban areas as green infrastructure, these areas are defined as an interconnected network of green space and other environmental assets that conserve the function of the natural ecosystem and provide associated benefits to people. River and creek side vegetation cover also varies throughout the City, with portions of Jacobs Drain running through large portions of commercial land uses, with a large amount of impervious surface, to areas of Sturgeon and Snake Creek running through manicured residential neighborhoods.

Streamside buffers with native vegetation can be a low-cost and natural enhancement for the stabilization of the bank. In addition, an evaluation of City park lands along the Tittabawassee River should be measured and monitored for improvement to vegetated buffer strips along the waterways to prevent fertilizer and sediment runoff and stream bank erosion.

Northern portions of the City which are still undeveloped provide for opportunities to properly integrate natural features within a new development, such as open space developments. By preserving large portions of natural vegetation within an open space design development, unique habitats can be preserved. From an environmental perspective, open space preservation can help protect air, land, and water resource quality. Residential development can be accommodated without disrupting woodland stands, enhancing neighborhood developments and improving the overall aesthetic look the community.

A significant resource just outside of Midland is the Chippewa Nature Center. Over 1,200 acres of land has been preserved for the general public to experience a varied array of ecosystems, from wetlands, woodlands and a interpretive farm. Located on the south side of Chippewa River, the property provides low impact recreation and learning opportunities for area residents, while also preserving a system of open land that buffers the waterway.

Consistent with the ecosystem theme, preserving open spaces in a manner that promotes linking systems through naturally occurring corridors can improve the natural feature base. Ensuring that green space, parks and pathway access is readily available creates a vital city core for thriving residents and a clean environment. Urban green space provides significant benefits including



improving overall quality and attractiveness of neighborhoods; improving human health; increasing property values; reducing heating and cooling costs; and helping to stabilize city weather. For coordination of the long-term stewardship and management of preserved natural areas and corridors, partnerships with area land conservancies that have inventoried these systems would be beneficial.

Water

Rivers and streams are integral elements of a community. They provide an aesthetic residential and recreation element, as well as serve the needs of area wildlife. Three main rivers flow through Midland County, the Pine, Chippewa and Tittabawassee Rivers. The most notable natural resource in the City of Midland is the presence of the confluence of the Tittabawassee and Chippewa Rivers along the banks of downtown. The headwaters of these rivers stretch inland and are a part of the greater Saginaw Bay Watershed system with coverage in all or parts of 22 counties.

The presence of these waterways has created a large area of riparian ecosystem within the City important for wildlife habitat, riverside vegetation and public recreation. Their connection to area wetlands and floodplains makes them an important part of the water storage and filtration process. The river environment also presents a natural environment for civic gatherings, for both residents and tourists.

Areas where land and water interface, riparian areas, tend to be fragile environments. Midland has many City parks that have protected riparian areas. For consistency throughout both public and private landholdings, riparian buffers that follow all waterways can be measured and catalogued to find a recommended distance that appears to be consistent along the entire waterway. Riparian buffers provide protection from erosion and sedimentation, as well as removing pollutants associated with manicured park lands from area storm water runoff. Buffer strips are areas of vegetation located adjacent to streams or rivers, lakes, ponds and wetlands. These buffer strips can be a low maintenance alternative to flood control if plantings are done using native vegetation that is acclimated to area weather conditions and can stabilize themselves in area soils.

Floodplains

The floodplains associated with the Tittabawassee and Chippewa Rivers occupy a significant area within the City. The nearly level alluvial plain that borders these waterways has created a substantial floodplain within the City that encompasses nearly 3,900 acres of land. Within these floodplains, a large percentage of the City's wooded lands and wetlands are also present. Indeed, a portion of the Midland downtown area lies within the floodplain and approximately 1,000 parcels are located within the designated floodplain. The floodplain boundary within the City of Midland is delineated on Map 3.1: Natural Features.

Floodplain land receives some measure of protection under state and federal regulations. Areas designated as a flood hazard area include land, which on the basis of available floodplain information is subject to a 1% or greater chance of flooding in any given year. Despite these existing regulations, Midland still has a key role to play in maintaining the integrity of the floodplain. Loss of floodplain land or a change in its use can cause diminished water quality and increased flooding downstream.



Areas located within the 100 year floodplain are approximate and should be used for general planning purposes only; the Flood Insurance Rate Map (FIRM), published under the Federal Emergency Management Act, is the official source. The City of Midland is an active participant in the Community Rating System (CRS) which was created by the National Flood Insurance Program (NFIP) to encourage communities to establish floodplain management practices that exceed the minimum federal standards required for NFIP participation. The better the rating received in a 10 point scale, the lower the insurance rates are for property owners and renters. The Michigan Department of Environmental Quality (MDEQ) is responsible for regulating floodplains and approving any alternatives.

Land Quality

Midland has a long history of industrial development along its riverfront. As a result, a number of sites have become contaminated from operations occurring years ago when environmental protection measures were not a high priority. Many funding opportunities exist to stimulate reuse and redevelopment of these sites which can remediate soils found on many of these properties.

A 'brownfield site' means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. A single property or a city can, under state regulations, be designated as a brownfield – the City of Midland has received this designation, which provides certain advantages in responding to contaminated properties and their cleanup. The Michigan Brownfield Program provides opportunities for remediation of environmental problems on-site to make them competitive with non-contaminated and/or "Greenfield" sites. Funds are targeted to projects that promote economic development and reuse of brownfield properties, and may serve to reinvigorate existing urban areas in Midland that have been neglected.

The Michigan Department of Environmental Quality maintains a listing of contaminated sites through their Environmental Response Division. Michigan's Public Act 451 of 1994 (the Natural Resources and Environmental Protection Act), also known as NREPA, provides for the identification, risk assessment, funding, remediation and priority evaluation of environmental contamination sites in the state.

Part 201 of this act, Environmental Remediation, discusses the details of remediation of contaminated sites, and Midland has sixteen sites documented as Part 201 sites. Part 213 of NREPA addresses Leaking Underground Storage Tanks, known as LUST sites, and Midland has 48 designated open LUST sites. An Open LUST site means a location where a release has occurred from an underground storage tank system, and where corrective actions have not been completed to meet the appropriate land use criteria. LUST sites are also classified as brownfields for purposes of economic development and can be remediated through new development opportunities and available grant funding. Because water resources are interconnected, many uses on the land and within the soils have a long-term affect on the area watershed and water quality. Improvements and clean up of all know sites can make dramatic improvements to area water quality and the City's quality of life.