Natural Features

Introduction

Bloomfield Township is blessed with an abundance of natural resources that contribute to its desirability as a place to live. There are numerous lakes, large areas of wetland and woodland, and several watercourses that are enjoyed by residents for a variety of recreational pursuits and are home to numerous species of plants and animals. Prior to the influx of people to the region, large areas of the Township were altered by clearing to accommodate agriculture. As agriculture became a less important land use, these areas were converted to residential and other uses.

The residents of the Township have long expressed their desire to maintain these unique resources and protect them from broad-scale destruction. This chapter outlines the characteristics of the Township's environmental features and, where applicable, makes suggestions for how to ensure their protection for future generations. Included are discussions of the following:

Topography and Soils
Water Features (Lakes, Watercourses, and Watersheds)
Wetlands
Woodlands
Other Unique Environmental Features

Topography and Soils

Soils

Like all of southeast Michigan, glaciers are responsible for the geology and topography of Bloomfield Township. The topography of the Township varies from expanses to fairly flat topography to other areas of rolling hills. The glaciers also carved out the many depressions in the Township that now comprise the numerous lakes and wetlands, along with the ravines that contain the various watercourses. The soils laid down by the glaciers as they retreated north are quite variable but generally rich and excellent for farming and to support the variety of plant species currently present in the Township.

There are a number of soil types in the Township (see Soils Map). A number of variations of some soil types are based on different slopes. Six soil types (excluding water) account for the great majority of soil types in the Township, with each exceeding five percent coverage. The soils and corresponding acreage totals are shown in Figure 1.

Figure 1 - Bloomfield Township Soils and Acres of Coverage.

Soil Type	Total Acres	Percent of Total Acreage
Aquents	867.9	5.2%
Arkport loamy fine sand	80.3	0.5%
Blount loam	94.3	0.6%
Brookston and Colwood loams	165.8	1.0%
Capac sandy loam	373.7	2.2%
Cohoctah-Fox association	225.1	1.4%
Cohoctah fine sandy loam	18.0	0.1%
Dixboro loamy fine sand	150.1	0.9%
Fox-Riddles sandy loams	10.9	0.1%
Fox sandy loam	912.5	5.5%
Gilford sandy loam	9.4	0.1%
Glynwood loam	291.1	1.8%
Houghton and Adrian mucks	326.1	2.0%
Kibbie fine sandy loam	104.8	0.6%
Lenawee silty clay loam	20.0	0.1%
Marlette loam	434.6	2.6%
Marlette sandy loam	1699.9	10.2%
Matherton sandy loam	181.7	1.1%
Metamora sandy loam	62.4	0.4%
Metea loamy sand	104.1	0.6%
Oakville fine sand	87.7	0.5%
Ormas loamy sand	109.5	0.7%
Oshtemo-Boyer loamy sands	399.8	2.4%
Owosso sandy loam	55.4	0.3%
Pits	7.8	0.0%
Riddles sandy loam	81.9	0.5%
Sebewa loam	67.9	0.4%
Selfridge loamy sand	30.5	0.2%
Sisson fine sandy loam	138.5	0.8%
Sloan-Marlette association	138.9	0.8%
Sloan silt loam	117.7	0.7%
Spinks loamy sand	139.4	0.8%
Tedrow loamy sand	9.9	0.1%
Thetford loamy fine sand	56.6	0.3%
Thomas muck	41.7	0.3%
Udipsamments	172.2	1.0%
Udorthents	595.8	3.6%
Urban land	755.8	4.5%
Urban land-Blount-Lenawee complex	80.0	0.5%
Urban land-Capac complex	1167.9	7.0%
Urban land-Marlette complex	3016.7	18.1%
Urban land-Spinks complex	1546.2	9.3%
Urban land-Thetford complex	613.3	3.7%
Wasepi sandy loam	76.6	0.5%
Water	986.2	5.9%

Source: USDA Soil Conservation Service.

Steep Slopes

There are relatively few areas in the Township that contain slopes that would be considered too steep on which to construct a building. The few that do exist are primarily located along the flowing watercourses and drains, discussed later in this chapter. Generally, slopes steeper that 25% are difficult to maintain by mowing. Slopes this steep or steeper, when comprised of poorly consolidated soils types, are also prone to erosion and should be left undisturbed. The areas of the Township that contain both steep slopes and soils prone to erosion or other constructability issues are shown on the Steep Slopes Map. Of special note for concern are slopes that exceed 50%, as these slopes, when subjected to heavy moisture or if vegetation is removed, can quickly erode or slump. These slopes should be protected to the extent possible.

Water Features

Bloomfield Township, like much of Oakland County, includes a number of lakes and watercourses within its boundaries. There are a total of 19 lakes in the Township, with numerous other large ponds and created stormwater ponds. There are approximately 3.6 miles of watercourses, including rivers, streams, and drains that flow into the Great Lakes system via one of two major rivers. The Township lies within two watersheds; the Rouge River and the Clinton River.

Bloomfield Township has long been committed to protecting water quality, as evidenced by efforts to regulate soil erosion and sedimentation, alternatives to fertilizer usage, and an extensive public education and outreach program aimed towards educating residents on how they can play a part in protecting these valuable natural resources.

Aerial view looking south from Telegraph/Orchard Lake intersection at Bloomfield Township's many lakes.
Source: Google Earth

Lakes

The 19 lakes and numerous additional smaller ponds are utilized by Township residents for a number of recreational pursuits, including boating, swimming, and fishing. The lakes vary from being shallow, warm water nutrient-rich systems to deeper, cool lakes with little plant growth. Most of the lakes have been impacted by human activity to some degree. All lakes within Bloomfield Township are private, with none providing access to the public for either boating or swimming. Recognizing the importance of the lakes related to

protection of property values, many lakes have organized lake boards or associations that actively address the specific issues pertinent to their situation. Lakes entirely or partially within the boundary of Bloomfield Township include:

Adams Lake – 4.5 acres
Chalmers Lake – 16.6 acres
Crest Lake – 3.2 acres
Forest Lake – 49.7 acres
Fox Lake – 13.5 acres
Gilbert Lake – 63 acres
Haines Lake – 9.4 acres
Hammond Lake – 79.4 acres
Island Lake – 110.7 acres
Kirkwood Lake – 7.0 acres
Lower Long Lake – 190.2 acres
Upper Long Lake – 130.5 acres
Meadow Lake – 18.6 acres
Minnow Lake – 10.2 acres
Mirror Lake – 3.12 acres
Orange Lake – 31.8 acres
Robbin Lake – 5.4 acres
Sodon Lake – 6.7 acres
Square Lake – 89.5 acres
Turtle Lake – 41.3 acres
Wabeek Lake – 28.1 acres
Wing Lake – 110.7 acres
Wood Lake – 7.9 acres

There has always been, and likely will be, conflict between man's desire to be close to the water and the need to protect water quality on our lakes. Like many other lake-rich communities in the area, the waterfront properties were the first to develop, first with cottages and cabins for weekend users coming out to the suburbs from Detroit. These small homes were generally built on small lots, often on less than desirable soils or slopes. As the population moved out from the inner city with improvements to the transportation network and the greater distribution of job centers in the region, these cottages were converted to homes for families to live in year-round. These homes often covered a significant percentage of the lot area, increasing the quantity of stormwater runoff.

With this change in intensity of use, several of the lakes were impacted severely by overburdened septic systems designed for seasonal weekend use and fertilizer runoff on lawns that were now much more manicured, often to the edge of the lake. The impacts on the lakes that are most apparent from this would be an increase in nutrient input, which fosters the accumulation of organic sediments and growth of aquatic plants and algae. Construction of sanitary sewer within the Township has since alleviated much of the concern related to septic systems, though not entirely. As of 2005, there were still 51 properties adjacent to lakes and waterways not integrated into the sanitary sewer. There is generally no need to be concerned about properly sized, modern septic systems provided they are adequately maintained and constructed.

One of the most desired aspects of the lakes is the added value being on the water, or having access to the water, has to homes. Generally, a home with lake frontage has a significantly higher value than a similar home not on a lake. This is understandable given the limited amount of waterfront property available and further demonstrates the need to protect water quality of the lakes, and subsequently, property values of homes within the Township.

One major conflict between lakefront property owners and the environment is the desire to be "on the water", meaning that it is typical for lakefront homes to have a beautifully manicured lawn all the way to the waters edge. On properties that have been developed for a number of years, this is very common and unlikely to change dramatically. However, the natural vegetation buffer along the edge of the lake provides a number of important functions in filtering runoff prior to discharge to the lake and providing important wildlife and fisheries habitat functions. Homeowners interested in turning back at least part of their waterfront to a native landscape can find a number of publications on how to choose plant species native to the area and that meet their aesthetic desires for their waterfront. Newer homes generally are prohibited by ordinance and statute from clearing adjacent to watercourses, including the lakes.

Watersheds

Bloomfield Township is located within two of southeast Michigan's watersheds – the Rouge River Watershed and the Clinton River Watershed. The Rouge River Watershed comprises approximately 98% of the Township, including a portion of the headwaters. Within the Rouge River Watershed, Bloomfield Township lies within the Main 1-2 subwatershed, which includes the main branch of the Rouge River. Bloomfield Township comprises approximately 25% of the Main 1-2 subwatershed, demonstrating the importance the Township plays in maintaining and improving water quality within the watershed.

The only portions of the Township within the Clinton River watershed are along the north and east boundary of the Township (see the Watershed Boundaries Map). While small in area, the Township continues to be active participants in the Clinton-Main Subwatershed Advisory Group.

Watercourses

The topography of Bloomfield Township varies between expansive, relatively flat areas to rolling hills. At the base of many of these hills there are a variety of watercourses ranging from permanent rivers and streams to intermittent or ephemeral watercourses. Intermittent and ephemeral watercourses contain flowing water only during certain times of year or following precipitation events. Drains have been constructed to facilitate the movement of water to its ultimate destination – the Great Lakes. There are approximately 3.6 miles of watercourses in Bloomfield Township. Bloomfield Township is an active participant in a variety of organizations and efforts whose sole aim is to protect these watercourses and their watersheds and improve them when necessary to reverse some of the damage that has been done historically by man's activities.

While many of the watercourses are unnamed, there are a number of more significant watercourses within the Township. These include:

Franklin Branch of the Rouge River
Rouge River
Sunken Bridge Drain
Sprague Drain
Amy Drain
Daly Drain
Sodon Lake Drain
Forest Lake Outlet

Wetlands

Wetlands are generally legally defined as ". . . land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh." Wetlands are an important environmental feature in the Township, serving a number of important functions including:

Typical forested wetland in spring.

Flood and storm control by their hydrologic absorption and storage.
Wildlife habitat by providing breeding, nesting, and feeding grounds and cover for many forms of wildlife, waterfowl, including migratory waterfowl, and rare, threatened, or endangered wildlife species.
Protection of subsurface water resources and provision of valuable watersheds and recharging ground water supplies.
Pollution treatment by serving as a biological and chemical oxidation basin.
Erosion control by serving as a sedimentation area and filtering basin, absorbing silt and organic matter.
Sources of nutrients in water food cycles and nursery grounds and sanctuaries for fish.

Bloomfield Township has long recognized the importance of wetlands in preserving the character of the community and protecting water quality of the water bodies within the Township. Wetlands can be very sensitive to changes in land use and be severely impacted. Bloomfield Township has provided protection of wetlands with a local ordinance that not only supplements the protection of wetlands offered by state and Federal statutes, but also goes further by protecting wetlands that are not protected by these agencies. These smaller wetlands can be the most sensitive to changes around them and without protection and education efforts would quickly disappear.

The types of wetlands in the Township vary tremendously, and ranges from fringe wetlands around the perimeter of water bodies to larger systems independent of surface water connections. The Township has approximately

1,460 acres of wetlands, all unique and different in their own way. The most common wetland types include:

Emergent – includes a variety of plants, primarily grasses and grasslike species (i.e. cattails)

Scrub-shrub – includes primarily woody bushes, with or without grasses and other non-woody plants

Forested – dominated by large trees that provide shading and generally not wet all year

One of the most dramatic impacts to wetlands not directly attributable to land use changes is the introduction of species that are not native to the area. These exotic species are typically very aggressive and can quickly take over a wetland, significantly changing the very character of the site. Of most concern are a number of plant species, including:

Purple loosestrife (Lythrum salicaria) – Purple loosestrife is a rooted, erect flowering plant with an attractive purple flower spike from mid-July to August. Purple loosestrife has the ability to reproduce from both seed and by spreading out of its roots. Purple loosestrife is very aggressive and can quickly crowd out more valuable, sensitive wetland plants and change the character of a wetland.

Purple loosestrife infested wetland. Photo: Catling.

Giant reed (Phragmites australis) – Less of a concern than the previous species, giant reed tends to be more confined to wetland edges. Growing to over eight feet in height, it is very recognizable and easy to spot and, therefore, control. Giant reed does provide excellent cover for wildlife.

Reed canary grass (Phalaris arundinacea) – Another very aggressive species with multiple ways of reproducing, reed canary grass often becomes the only plant species in wetlands that it becomes infested with.

Eurasian watermilfoil (Myriophyllum spicatum) – Eurasian watermilfoil is a submerged plant species that can grow from the bottom of a waterbody to the surface in over eight feet of water or more. It creates a dense, sometimes impenetrable mass along the shoreline of lakes and is generally the number one species of concern to lakefront property owners. Can become so dense that swimmers can become entangled, though this is not typically allowed to occur on lakes with active and aware residents.

Glossy buckthorn (Rhamnus frangula) – The only shrub on the list, glossy buckthorn is a medium height shrub that produces dark purple berries in late summer. Spread is most commonly performed by birds, whose droppings carry seeds.

There are other, less important exotic plants found within wetlands in southeast Michigan. The key to preventing the spread of these species is not only control and suppression when needed but also public awareness and education. Many of these species are spread by man, by either planting due to their attractive flowers (purple loosestrife) or from lake to lake on boat trailers, etc. (Eurasian watermilfoil). Residents interested in finding out more about these or other exotic species can easily do so by searching the internet using the common name of their species of interest.

One impact to wetlands that may not be readily apparent is changing the hydrology. Wetlands evolve based on the timing, quantity, and quality of the water directed into or through them. Changes to these parameters, either by increasing or decreasing water, can dramatically change wetlands. While once considered a perfect place to "dump" runoff, we now know that without proper pre-treatment and study of the ability of a wetland to absorb the water, a wetland can be significantly altered by using it as a detention basin. Some wetlands, particularly those that have permanent water, permeable soils, or a defined outlet that regulates the level of water, are able to receive this water with little or no impact. Others, however, can suffer impacts from changing the plant community entirely (especially leading to the death of trees in previously seasonally ponded wetlands), changes to animal life, bad odors from dying algae, introduction of sediment, and others.

Public Education

The process of educating the general public about the importance of wetlands has been an on-going task by a number of governmental and non-governmental agencies. It is not uncommon for wetlands to be referred to as "swamps" or "mosquito breeding areas" by the general public. While both of these narrow definitions may apply to certain wetlands, there is so much more to a wetland. The most important step in gaining public support for wetland protection is education, which Bloomfield Township has been very successful at.

A variety of publications produced by the Township or other interest groups has and will continue to be of great value in providing information to residents on the importance of wetlands in Bloomfield Township. The Township has also offered workshops where participants can learn the principles of lakescaping for wildlife and water quality. At these workshops residents have been permitted to review several sample lakefront landscape plans to learn what a native plant buffer is and how it can reduce geese problems, the plants used to create them along with where they can be obtained locally, and how to get started on their own native plant buffer project. Environmentally friendly lawn care practices especially designed for lake property owners have also been covered.

Woodlands

As with other natural resources previously described, Bloomfield Township has an abundance of forested areas. While few have been untouched by man, the variety that exists is impressive for a suburban area. The former practice of clear-cutting a parcel to make way for new homes is no longer the norm. Developers and homeowners alike have realized the benefits of trees, both from the practical (reduced development costs, increased value of property, lower cooling costs in summer) and the aesthetic (large native trees provide variety to landscaping) points-of-view. These factors, combined with the maturation of trees planted at the time of home construction 30 or more years ago, have contributed to the large expanses of trees that currently exist in Bloomfield Township.

Few areas of the Township are devoid of trees, even along the Telegraph Road corridor lined with commercial and office buildings. While the Township does not have an ordinance that specifically protects trees, the success of working cooperatively with developers and homeowners alike by stressing the importance of preserving these natural resources through education is obvious. There has been interest from the residents of the Township recently in adding protection to trees by adopting an ordinance that regulates tree removal. Besides man, there are other threats to the trees of the Township.

Gypsy Moth

The gypsy moth (Lymantria dispar) is an exotic species introduced to the United States in 1869 and has been a problem in Michigan since the 1950s. In its larval (caterpillar) stage, it can cause significant defoliation of forests as the larvae feed on the leaves of trees. While the gypsy moth shows a preference for oak tree leaves, they will feed on more than 600 species of trees, shrubs and vines. Bloomfield Township's forests and neighborhoods include a number of susceptible trees, including oak, birch, willow, crabapple, maple, aspen, basswood, and linden. Upon emerging from their cocoon, the adult moths mate and the female lays her egg mass containing anywhere from 100 to 1,200 eggs on almost any firm surface. The gypsy moth is believed to have spread via transport of firewood, mobile homes, and outdoor household items unknowingly moved from infested areas that contained these egg masses. The following spring a new generation of gypsy moth caterpillars hatches on these items in a previously uninfested area and begin to feed. The gypsy moth has been known to defoliate entire areas when at high levels, creating the appearance of fall in early summer when trees should be fully leafed out. While a single year of defoliation is not likely to dramatically

impact the health of most trees, repeated years of impact can kill even the largest oak.

Bloomfield Township, like many other southeast Oakland County communities concerned about the potential impact of gypsy moths, assumed an active role for gypsy moth management with help from a consultant. Since 1993 Bloomfield Township has been actively monitoring the gypsy moth infestation in the Township and implementing an integrated pest management approach to reduce and contain the gypsy moth problem. The goal of this suppression program is to maintain the gypsy moth population at low levels and minimize the economic, social and environmental costs. Components of the program include: public education, intensive biological monitoring and treatment plus evaluation.

Each fall, egg mass surveys are performed to monitor the population and determine which areas could be impacted the following spring if suppression is not implements. These surveys are conducted at permanently established survey locations throughout the Township. When populations are projected to be high based on these fall surveys, areas have been targeted for spraying with a biological agent that is specific to only the gypsy moth. If determined necessary a spray application of Bacillus thuringiensis (Bt is a naturally occurring bacterium) by a private firm is combined with inoculation of the fungus Entomophaga maimaiga to kill the gypsy moth caterpillars before they have the chance to impact the trees. Through this constant monitoring, Bloomfield Township has been extremely aggressive and successful in protecting the wooded areas of the Township.

Emerald Ash Borer

A more recent and devious threat is the emerald ash borer (Agrilus planipennis). Another exotic species, the emerald ash borer, or EAB, was discovered in southeastern Michigan near Detroit in the summer of 2002. Since this time it has spread throughout southeast Michigan, feeding on only ash trees, a common tree used in landscaping and found naturally in wetlands. Since its discovery, it is thought to have killed over 20 million ash trees in Michigan, Ohio, and Indiana. As with the gypsy moth, it is the larval stage of this insect pest that causes the damage. The larvae burrow under the bark of ashes and feed on the tissues that conduct water and nutrients. Once infested with feeding larvae, the ash tree quickly begins to show signs, usually starting with a die-back of the leaves in the canopy the first year, and progressing to the death of the tree in the second or third year. Upon emerging as adults, they chew their way through the bark of the ash tree, leaving a D-shaped hole in the bark.

Adult Emerald Ash Borer

There are treatments that can be done to uninfected ash trees to kill the larvae before they impact the trees. There is information on both the Township web site and the internet on these treatment options. Unfortunately, these treatments are not practical on a large scale and a number of wetlands populated with ash trees are seeing large mortality, which is likely to lead to the near total demise of ash trees from our wetlands.

Other Tree Pests

Fortunately, few other pests as destructive as the gypsy moth and EAB exist. Additional information about these pests can be found on the Township web site or the internet. Only pests that pose a real threat at this time are presented. Many other tree pests and diseases exist that present only minor or cosmetic impacts to trees.

Eastern Tent Caterpillar – The Eastern tent caterpillar (Malacosoma americanum) spins webs for protection as they feed on the leaves of primarily apple and cherry trees. Identified by the characteristic white stripe down the back, this pest tends to be more of a minor threat to individual trees. If residents notice the silken webs on a tree, they should be checked to ensure that the caterpillars are inside (they venture out to feed during the heat of the day). If so, the branch can be cut and disposed of with minor impact to the tree.

Mimosa Webworm - The mimosa webworm (Homadaula anisocentra) is a more recent pest in southeast Michigan, as it has spread north from its normal range due to several consecutive mild winters. The caterpillar of this species webs the leaves of honeylocust together and strips them. While heavy infestations are rare currently, residents should be aware of this pest and its potential to defoliate and kill honeylocusts, another common landscaping tree.

Pine-Wilt Disease – Pine-wilt disease is caused by the pinewood nematode (Bursaphelenchus xylophilus), a microscopic worm that burrows into the wood of evergreens, especially scotch and Austrian pines. If infected, the needles of the tree will turn yellow then brown and the tree will die. There is no cure for this pest but homeowners can best protect their trees by watering during dry periods and keeping them healthy by fertilizing.

Other Environmental Features

Natural Beauty Roads

The goal of the Road Commission for Oakland County's Natural Beauty Road Program is to preserve in a natural, essentially undisturbed condition, certain

county local roads having outstanding or unusual natural beauty by virtue of native vegetation and/or natural features within or associated with the right-of-way. While generally these roads are not improved (paved), this is not a criterion for eligibility for the program. Bloomfield Township has two Natural Beauty Roads, both of which were nominated into the program in 1976. Surveys of each were performed in 2006 to compare the integrity of the existing roadway with that which made them eligible for listing in the program.

Echo Road – Located in Sections 17 & 20 of the Township between Lone Pine Road and Long Lake Road, 0.99 miles of Echo Road was designated as a Natural Beauty Road on October 5, 1976. The trees along Echo Road form a nearly continuous canopy cover over the roadway. The vegetation along the roadway appears to have changed very little in the past 30 years and there have been limited impacts associated with construction of homes in the area.

Wing Lake – The portion of Wing Lake Road located in Section 29 of the Township between West Maple Road and Quarton Road (0.96 miles) was designated as a Natural Beauty Road on January 20, 1976. Unlike Echo Road, surveys in 2006 found more dramatic changes to the vegetation along Wing Lake Road. There are extensive areas where lawns and landscaping have been installed and are maintained to the edge of the roadway. In addition, there appears to be a number of areas where trees have been removed over the past 30 years, which has changed the character of the roadway. All of these changes are contrary to the goal and intent of the program. These changes to Wing Lake Road should be further investigated to determine the reason for the changes in the vegetation and what can be done to prevent additional changes. In addition, making property owners along Wing Lake Road more aware of the unique qualities that exist and preventing additional changes is in the best interest of all Township residents.

Wildlife Corridors

While there is an abundance of wildlife and wildlife habitat in Bloomfield Township, much of this habitat is isolated and has become fragmented. Large areas of habitat have been fragmented by construction of homes and other development. While this has likely had little impact, and may actually benefit, many small mammal and some bird species, other larger mammals and birds will travel between various habitats. The "corridors" that these animals select will usually include as much cover as possible to hide their movements. These corridors may link woodland to woodland, woodland to wetland, wetland to wetland, or a river corridor to either a woodland or wetland. Identification of these corridors and implementing what protection can be provided to preserve these areas of potential wildlife movement is vital to protecting these species.

By identifying habitats and reviewing aerial photographs to identify potential linkages between them, potential wildlife corridors have been identified (see Wildlife Corridor Opportunities Map). The corridors can be narrow areas of brushy vegetation, hedgerows, old fencerows, heavily landscaped yards of

homes, or various other growths of vegetation tall enough or dense enough to hide their movements. Protection of these corridors can assist in funneling wildlife road crossing where they can be concentrated in specific locations rather than scattered randomly, thus introducing opportunities to reduce car mortality when crossing roadways. This can be done by signing with "Wildlife Crossing Ahead" signs or by introducing wildlife crossing culverts that facilitate animal movement under the road rather than across it. Residents interested in learning more about these "critter crossings" can visit the web site about these at http://www.fhwa.dot.gov/environment/wildlifecrossings/main.htm.

Summary

The natural environment of Bloomfield Township provides numerous opportunities to residents to enjoy their surroundings. While there are protections offered for some resources and a genuine interest in protecting them by the residents, public education and awareness should be a primary goal to facilitate this protection and inform residents of what they have available to them in their own community.

Recommendations

To accomplish the items discussed in this chapter, there are a number of recommendations that will guide the Township in its planning efforts to protect the environmental features within its boundaries.

Action	When	Responsibility
Establish standards and practices for review of all building permits on properties that contain slopes that exceed 25%. This review should include a requirement for a slope analysis by a geologist or structural engineer verifying the stability of the soils and slope for any improvement in this area.	Midterm	EESD, PBD
Consider including steep slopes as a natural feature subject to setback requirements of the zoning ordinance. Setbacks from steep slopes should be increased to 50 feet for slopes that exceed 50%.	Short term	PBD
Continue to educate residents on the importance of proper fertilization of lawns, encouraging them to get soils tested to determine if fertilizer is even needed, and to water their lawns from the lake.	Ongoing	EESD, PBD
Work with lake associations, lake boards, and homeowner associations to educate them on the importance of preventing the introduction of exotic plants and animals into the lakes and managing species that are already present.	Ongoing	EESD, PBD
Encourage residents with septic tanks to properly maintain them by pumping them out at least every three years and to connect to the sanitary sewer as soon as possible.	Ongoing	EESD, PBD

Action	When	Responsibility
Develop a number of generic lakefront restoration planting plans that can be given to residents. These plans can include a combination of plant types and list of native species that can be planted to provide filtering buffer strips and wildlife habitat in place of lawn along lakefront properties.	Midterm	EESD
Continue to educate residents on the importance of maintaining the natural buffer strip of vegetation adjacent to lakes, wetlands, and watercourses as required by Township ordinance.	Ongoing	EESD, PBD
Continue working with the various watershed councils and groups to inventory the watersheds and continue to improve conditions within each.	Ongoing	EESD
Continuously refine wetland mapping in GIS to accurately depict wetland boundaries and allow all Township staff and the public to have the best information available on the potential location of wetlands.	Ongoing	EESD
Continue to educate residents on the importance of wetlands and that impacts to them may require permits from the Township and/or MDEQ.	Ongoing	EESD, PBD
Promote the voluntary donation of property or conservation easements on parcels with significant environmental features to protect them in perpetuity.	Ongoing	EESD, PBD
Consider additional requirements for preventing soil erosion and sedimentation, up to and including a local ordinance. By volume, soil is the largest pollutant in the waters of the U.S.	Short term	EESD, PBD

Action	When	Responsibility
Identify areas with significant exotic species coverage in wetlands and determine methods to prevent their spread.	Short term	EESD
Educate residents on exotic plant species and how they can help prevent their spread by not planting them, removing them if present on their property, etc.	Ongoing	EESD, PBD
Require an impact assessment on any wetland proposed to be used to receive stormwater inputs to ensure the hydrology changes will not have a marked impact on the wetland.	Short term, Ongoing	PBD, EESD
Encourage residents to implement rain gardens to filter runoff from their property and help in preventing wetlands from receiving stormwater discharges that may exceed their capacity.	Short term	EESD, PBD
Consider adopting regulations that better protect woodlands and significant trees from unregulated removal.	Short term	EESD, PBD
Update standards for landscaping to require the planting of large shade trees on all properties, including residential.	Short term	EESD, PBD
Provide a list of approved native tree species that are suitable to meet Township goals of maintaining native forests and can be used to replace trees removed for development.	Short term	EESD, PBD
Continue to monitor population of gypsy moth and suppression activities as warranted.	Ongoing	EESD
Work closely with surrounding communities and the Michigan Department of Agriculture to develop a program for removal of ash trees infested with EAB.	Short term, Ongoing	EESD
Consider sponsoring ash removal programs on private property, including wetlands, to further aid in preventing the spread of EAB.	Midterm	DPW

Action	When	Responsibility
Apply for all grants that the Township is eligible for to educate residents or implement various EAB suppression programs.	Short term, Ongoing	EESD
Continue to monitor new pest species that may become an issue for residents and promptly post information on each on the Township web site to educate residents and assist them with methods to minimize their impact.	Ongoing	DPW, EESD
Perform a detailed property-by-property assessment along Natural Beauty Roads, including photographs that can be included in GIS to document conditions.	Short term	IT, DPW, EESD
Encourage reestablishment of native vegetation along Natural Beauty Roads where lawns and landscaping have been placed, by establishing an overlay district.	Ongoing	PBD, EESD
Prioritize wildlife corridor opportunities and educate residents of their importance.	Short term, Ongoing	DPW, PBD, EESD
Identify significant wildlife crossing locations on Township roadways and consider placing signage to alert motorists or installing wildlife crossing culverts.	Midterm	DPW

PC= Planning Commission, IT= Information Technology, PBD= Planning & Building Department, DPW=Department of Public Works, EESD=Engineering & Environmental Services Department
*To a greater or less extent the Township Board may be involved in all of the above implementation.