

Chapter Six: Environmental Conditions

The environment is a critical element of the physical basis upon which the community develops. Various components of the environment function, change, and interact as part of the ecosystem. These functions need to be maintained in a balanced state, while still allowing the community to grow in a controlled manner. Development within the City should take into account the physical condition of the landscape, and should complement the community's natural balance. Areas not suitable for development and other valuable community resources should be protected.

Existing Conditions

Geology and Topography

The geology of Grayling was directly affected by glacial movements which occurred during the Ice Age. Specifically, the landforms in Crawford County and the City of Grayling were affected by Wisconsin glacialiation, which created the gently sloping topography and sandy soils of the area. However, this gentle topography is interrupted by larger moraines that contain the highest elevation within Crawford County, 1,524 feet above sea level. While the majority of the Grayling area contains less than a 25% slope, the high elevations of the moraines have indirectly contributed to the current character of Grayling. They attracted the early developers of Hanson Hills and the toboggan runs which have helped shape the recreational nature of the area. This combination of topography has facilitated general growth in the area by allowing easy access to most of the early timber. However, the topography was varied enough to provide the unique landscape that has made Grayling such an attractive place to live and visit.

*The **Highest Elevation** in Crawford County is 1,524 feet above sea level.*

Hydrology

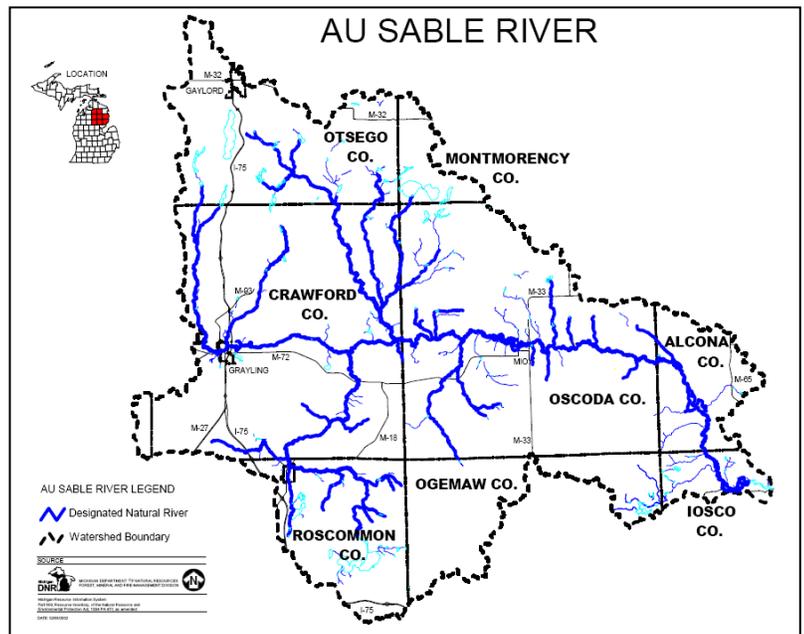
Perhaps one of the most significant resources in Grayling is the presence of the AuSable River. The AuSable generally flows from west to east through the City of Grayling and continues east where it converges with the South Branch near the Crawford County/Oscoda County line. The significance of the river has influenced settlement patterns by providing navigable watercourses for early settlers and Indian tribes, valuable riparian habitat for aquatic life and water fowl, which in turn provided

needed food sources, and most recently for the recreational opportunities it provides.

The AuSable River Watershed drains an area of 1,932 square miles, which includes all of the City of Grayling. The watershed boundary includes many tributaries, and includes areas of Crawford, Otsego, Montmorency, Oscoda, Ogemaw, Alcona, Iosco and Roscommon Counties. Water collects from these areas and travels east via the AuSable until it eventually drains into Lake Huron.

As it flows through Grayling, the AuSable is relatively shallow and not especially fast moving. However, as it travels east toward Mio, water flow increases and the water deepens, providing some of the more popular fishing opportunities known in Michigan. These “holy waters” are common destinations for anglers, but the river corridor is highly regulated by the Natural Rivers Act. Therefore, Grayling is a more common gathering spot for fisherman seeking these exceptional fishing resources.

Arguably one of the most significant features of the area, the AuSable River is consistently threatened by sedimentation and increasing water temperatures as a result of development. Responding to these pressures, local advocacy groups are continuously employing new techniques to maintain the high water quality currently enjoyed. These techniques include use of detention basins and rain gardens, planting of native vegetation, use of alternative paving materials, and modified land use practices, especially in the upland areas that contribute runoff to the river. The AuSable has been the focus of a \$758,000 Clean Michigan Initiative grant, provided through the Michigan Department of Environmental Quality. The Grayling Storm Water Project will use many of the techniques listed above to help maintain and improve water quality. As with most State grants, local “match” funding was provided by several local agencies, businesses, organizations and individuals, including the City of Grayling. While the waters of the AuSable may be under threat of degradation, widespread community support for its protection will ensure this high-quality resource will be around for generations to come.



Soils

According to the Natural Resources Conservation Service and Forest Service, soils in Grayling consist generally of sands and loams and display gentle sloping characteristics. These soils are known for their moderate to excessive permeability, and most possess high drainage capabilities. Such soils are conducive to physical development where drainage is desirable, but is not well suited for agricultural purposes. The gentle slope of the area is also attractive for development purposes, since large excavation of soil is not needed to establish level grades. Exceptions to these soil types are found along the AuSable River, where more organic and poorly drained soils are prevalent.

Wetlands

Wetlands are scarcely found in the area, except where they are associated with the AuSable River. Within the City limits, the largest wetland areas are found in Section 18, located in the extreme southwest quadrant of the City. Even larger areas of wetlands exist to the east of the City that surround the AuSable as it flows under the I-75 expressway and toward Mio.

Wetlands act as transitional areas between the aquatic ecosystems and the surrounding upland areas. They are low areas which are intermittently covered with shallow water and underlined by saturated soils. Vegetation which is adapted to wet soil conditions, fluctuation in water levels and periodic flooding can be found in wetlands. Wetlands are linked with the hydrologic system, and as a result, these wetland systems are vital to the environmental quality of Grayling's resources.

Wetlands provide fish and animal life habitat, maintain and stabilize groundwater supplies, reduce the dangers of flooding and improve water quality.

Wetlands serve a variety of important functions which not only benefit the natural environment but also the community. They are working landforms that provide wildlife habitat, water purification and flood containment, and can enhance the tourist and recreational environments. Some of the primary values which wetlands contribute are as follows:

- Mitigate flooding by detaining surface runoff
- Control soil erosion and sedimentation loading in rivers and lakes
- Provide links with groundwater
- Improve water quality which is degraded by nutrients and chemicals from fertilizers and pesticides; polluted urban runoff from roads, parking lots, industrial and other commercial activities; treated effluent

from waste water treatment facilities; and erosion and sedimentation resulting from agricultural and construction activities

- Function as highly productive ecosystems in terms of animal life habitat and vegetation
 - Serve a variety of aesthetic and recreational functions

Woodlands help moderate ground and water temperatures, reduce air and noise pollution, reduce soil erosion, and provide wildlife habitat.

As noted above, development in areas surrounding the AuSable and its associated wetlands can significantly impact water resources. Therefore, developers and City officials should evaluate alternative site designs to minimize potential impact. This is best done by initially

considering wetland resources as constraints to development. The relative weight of these constraints must also account for other environmental and socio-economic constraints. If impact is unavoidable, then mitigation should retain or enhance the wetland values being lost.

Any wetlands greater than five acres in size or contiguous with a waterway are regulated by the Michigan Department of Environmental Quality (MDEQ) through the Goemaere-Anderson Wetland Protection Act, Public Act 203, as amended. Any activity which requires these regulated wetlands be filled or drained 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.

Wetlands greater than 5 acres in size, or those contiguous to a waterway are regulated by the MDEQ.

Woodlands

Historically, all of the area in and around Grayling was wooded with hardwood trees. Once the early logging activity had depleted most of these resources, very few large woodlots remained in the City; however, substantial forest and woodland exists in the greater Grayling area. Appropriately so, the City is largely developed as an urban center, and does not include substantial stands of in-tact woodlots. However, trees and other vegetation do exist throughout the City, but is found in more abundance at the periphery of the City. Significant riparian vegetation is found along the banks of the AuSable River, many contained in wetland or upland areas associated with the river. However, where the river crosses the I-75 Business Loop, and where it flows through the urban residential areas, this vegetation has been removed for more residential enjoyment.

Woodlands act to moderate certain climate conditions, such as flooding and high winds and protect watersheds from siltation and soil erosion

caused by storm water runoff or wind. Woodlands also improve air quality by absorbing certain air pollutants, and are beneficial for buffering excessive noise generators. Woodland areas can provide the following benefits:

- Improve quality of life by contributing to an area's natural character and providing a visual barrier between individual properties
- Influence the micro-climate by moderating water and ground-level temperatures
- Reduce air pollution by absorbing carbon dioxide and filtering ozone, chlorine, hydrogen fluoride, sulfur dioxide and other pollutants from the air
- Reduce soil erosion by absorbing the energy of falling rain; tree roots help hold soil particles in place and provide the additional benefit of trapping and holding storm water runoff, which can help slow flood surges and flows
- Provide wildlife habitat by offering essential shelter and food for deer, raccoon, rabbits, pheasants and other birds and animals

Natural Features Protection Plan

This plan consistently emphasizes the importance of the City’s natural resource base. Consideration of natural features during the site planning and development process will help improve and protect the area’s existing natural resources.

Protection of City resources requires the adoption of policies directed toward the specific resource issue including drainage, groundwater quality, natural topography, and vegetation. Resource protection regulations can be incorporated in subdivision, zoning, and other special purpose regulations. Some of the options for protecting natural features while development occurs are described below:

Natural Feature Setback

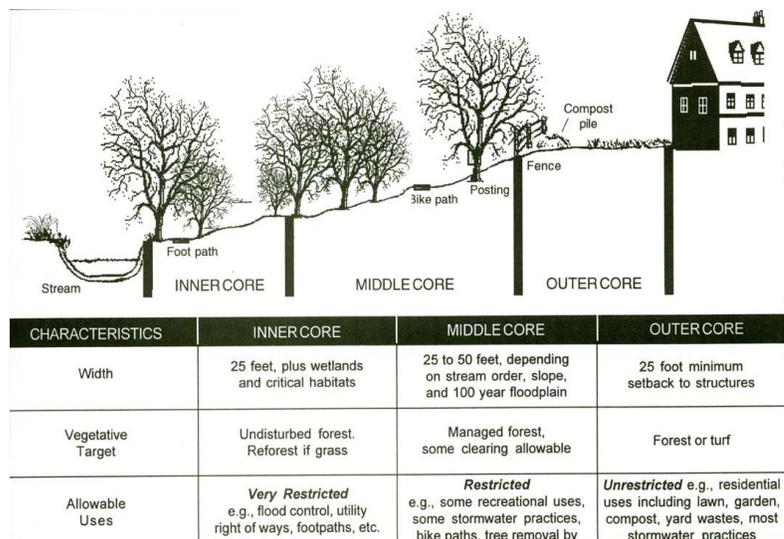
The City should ensure local zoning standards require an appropriate setback from the AuSable River, and other streams and wetlands. Although the majority of the City is already developed, some large tracts of land exist that, if developed or redeveloped, should respect the AuSable River. The Grayling Country Club and golf course, as well as the Fred Bear Archery site both have considerable frontage on the river.

Key Recommendation:
The City should ensure local zoning standards require an appropriate setback from the AuSable River.

The function of water features can be affected by development around it. Wetlands in particular are dependent on an interaction between the wetland and the surrounding upland. Development adjacent to a water feature can disturb the ecosystem and reduce its natural function.

Alternatively, maintaining a protected buffer from these features can help reverse some impacts of development by improving the natural systems that filter sediment and nutrients and slow the speed of water runoff. Natural buffers also help maintain cold water temperatures, which is critical to sustaining aquatic life. Where possible, wider buffers have been proven to help counteract narrower natural buffers or areas where vegetation is largely removed. On

**Figure 6-1:
Tiered Buffering System**



average, natural feature setbacks should be 100 feet from the high water mark, or wetland boundary, and should be managed through Tiered Buffering System, as shown in Figure 6-1. This will allow for reasonable use as residential yards or green space, in the outer edges of the buffer, with gradually more restrictions on removal of natural vegetation and fertilizer use closer to the water's edge. Education of waterfront property owners may encourage some to re-vegetate their property frontage along the river; however, the best efforts will be to preserve a larger buffer if the golf course or Bear Archery site is redeveloped.

Storm Water Management

Increased development activity places additional burden on existing natural drainage systems. The overtaxing of drainage systems leads to localized flooding, environmental damage and costly storm drainage improvements to be borne by taxpayers. Storm water drainage can be managed by installation and improvements to storm water drainage systems. Another way to manage storm water is through preservation of natural drainage ways and providing onsite storm water detention with controlled discharge. Wet ponds and storm water marsh systems should be used for detention instead of deep detention ponds that require security fencing, which should not be permitted. Storm water facilities should be landscaped with plantings adapted to hydric conditions to create a system that emulates the functions of natural wetlands and drainage ways both in terms of hydrology and natural habitat. Rain gardens, using native vegetative species, as a tool for pre-treatment of storm water before it reaches the AuSable River or the groundwater supply has been successful.

Key Recommendation:
The City should not abandon the concept of natural detention and rain gardens but, rather, should reconsider their design.

Acknowledging that some impacts must be anticipated, a comprehensive approach to storm water management should encourage the preservation of existing natural features that perform storm water management functions, minimization of impervious surface, direction of storm water discharge to open grassed areas and careful design of erosion control mechanisms. A large detention pond, located at the fish hatchery on N. Down River Road, receives approximately a quarter of the City's storm water runoff. It is managed by Crawford County, which allows for ideal monitoring and maintenance.

Overlay Zoning District

The interrelation of the environmental component of the master plan with the land use component is most visible with the establishment of land use

categories. While most of the City is already developed, the possibility of development at the Fred Bear Archery site and Grayling Country Club and Golf Course presents the potential for larger-scale development. Both sites are located along the AuSable River; therefore, any development efforts should be considerate of the river as well as any associated wetlands. Within areas identified as having significant and fragile natural resources, lower impact/density development is recommended, used in conjunction with clustered development.

The impact to these areas can be minimized through overlay zoning districts that limit the intensity of development and require clustered development to preserve these critical natural areas. Other regulations, such as protection of significant woodlots, vegetative corridors, or other significant environmental areas can also be incorporated into the overlay district, or may become part of a general ordinance.

Utilizing clustered development is one of the most effective means of preserving existing vegetation and other valuable natural features. Specific standards can be applied to Planned Unit Development (PUD) regulations and site plan review to require preservation of open space, vegetative cover and natural topography. Clustering should also be utilized to preserve greenway corridors, buffers and natural open space. In addition to preserving natural features, the regulations can require the provision of landscaping and buffer strips to enhance the natural character of a site.

Key Recommendation:
Clustered development is one of the most effective means of preserving existing vegetation and other valuable natural