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## Chapter Four: Natural Resources

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### NATURAL RESOURCE RECOMMENDATIONS SUMMARY

- Build an ethic of progressive surface and groundwater management using a variety of tools and approaches, and consider different ways to improve stormwater management associated with redevelopment projects.
- Protect environmental corridors and other environmentally sensitive lands.
- Advance the clean-up and restoration of Trippe and Cravath Lakes.
- Advance sustainability by developing a Whitewater-specific approach.
- Preserve and enhance the City's urban forest resources.

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### Chapter Introduction

A survey of the Whitewater area's natural resources provides an important framework for guiding the *Comprehensive Plan*. As a growing community, such information can help identify the appropriate locations for development, and can pinpoint areas that should be preserved and managed for recreational purposes, stormwater management, and groundwater protection. Maintenance of these natural features is also important for community appearance and for the functions they perform for natural communities. Map 3 depicts the area's key natural areas, described in detail below.

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### Ecological Landscape

An ecological landscape is defined as a region characterized by a unique combination of physical and biological attributes such as climate, geology, soils, water, or vegetation. Understanding the distinct attributes of each of these landscapes will be important when identifying future land management and land use goals. The City of Whitewater falls within the Southeast Glacial Plains Landscape. Many of the attributes of this landscape are identified in the following sections.

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### Topography and Steep Slopes

The topography in Whitewater was shaped over 10,000 years ago by Wisconsin's most recent period of glacial activity. The landscape is characterized by gently rolling moraines and drumlins that were formed by material deposited along the edges of the ice sheet during the glacier's retreat.

As shown on Map 3, slopes exceeding a 12 percent grade are located between Trippe and Cravath Lakes and in a small area just north of East Main Street. More significant areas with steep slopes are located east and southeast of the City in the Kettle Moraine State Forest. Generally, slopes that have between 12 and 20 percent grade present challenges for building site development, and slopes that exceed a 20 percent grade are not recommended for any disturbance or development.

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### Metallic and Non-Metallic Resources

There are no metallic mining operations in the City of Whitewater. The Whitewater Limestone, Inc., is located directly south of the City in the Town of Whitewater. While there are no active mineral extraction sites located within the City of Whitewater, under State Statutes (295.20), landowners who want to register their property as a nonmetallic mining deposit are required to notify each county, city, village and/or town

that has zoning authority over their property. Registrations must be recorded at the County Register of Deeds in the county where the mineral deposit is located.

## Groundwater

Groundwater is comprised of the portion of rainfall that does not run off to streams or rivers and that does not evaporate or transpire from plants. This water percolates down through the soil until it reaches the saturated zone of an aquifer. Groundwater supplies all of the water for domestic, commercial, and industrial uses in the City of Whitewater.

The quality of groundwater in the City is good; however, groundwater contamination is a concern in areas around the City that are served by private wells. In these more rural areas, a common groundwater contaminant is nitrate-nitrogen, which can come from many sources including improperly functioning on-site wastewater systems, animal feedlots, sludge and septage application, lawn and agricultural fertilizers, and decaying plant debris.

## Watersheds and Surface Waters

The City is located within the Whitewater Creek Watershed in the Lower Rock River Basin. The Rock River Basin covers approximately 3,777 square miles and incorporates ten counties in southern Wisconsin. Water from the Rock River Basin enters the Mississippi River via the Rock River and eventually ends up in the Gulf of Mexico.

Whitewater Creek, Cravath Lake, and Trippe Lake are the City of Whitewater's most prominent surface water features. Whitewater Creek traverses the center of the City, flowing from south to north. Cravath Lake and Trippe Lake are connected by a short segment of Whitewater Creek, and are maintained by dams at the north ends of each lake. The Wisconsin Department of Natural Resources (WisDNR) has identified a portion of Whitewater Creek from Bluff Creek to Willis Ray Road (1.9 miles) at the southern edge of Whitewater that has the potential to become a Class II trout stream, meaning that the trout population has some natural reproduction, but some stocking occurs to supplement natural recruitment. Additional land acquisition and habitat improvement would be necessary to achieve this potential use.



*Whitewater Creek*

In its Whitewater Creek Watershed report, WisDNR indicated that comprehensive stormwater management planning that emphasizes water quality and reduction of peak stormwater flow, in addition to updates to the City of Whitewater's floodplain zoning map (completed), would provide additional protection to Whitewater Creek, Cravath Lake, and Trippe Lake. In this report, WisDNR also recommends that the City take advantage of federal, state, and private funding opportunities to acquire public access points and lands on Cravath and

Trippe Lakes. In addition, WisDNR recommended the City, potentially in conjunction with Walworth County, apply for a lake planning grant to investigate water quality issues for Cravath and Trippe Lakes, which the City had already done at the time this *Plan* was written.

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## **Floodplains**

The Federal Emergency Management Agency (FEMA) designates floodplains. These are areas predicted to be inundated with flood waters in the 100-year storm event (e.g., a storm that has a one percent chance of happening in any given year). Development within floodplains is strongly discouraged to avoid property damage. Map 3 shows the 758 acres of land in the City classified as floodplain, comprising approximately 13 percent of the City's total land area. Floodplain areas in the City are located primarily around Trippe and Cravath Lakes and the Whitewater Creek in the central portion of the City. The National Flood Insurance Rate (FIRM) program maps produced by the FEMA should be referenced for official delineation and elevations of floodplain boundaries. These maps were updated in 2014 and 2015 and adopted by the City, and the City's floodplain ordinance has been revised accordingly.

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## **Wetlands**

According to the WisDNR Wetland Inventory Maps, wetland habitats comprise approximately eight percent (471 acres) of the City's total land area. Wetland ecosystems play significant roles in maintaining the quality of groundwater and surface water and provide valuable habitats for fish, birds, and other wildlife.

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## **Woodlands and Natural Vegetation**

The City of Whitewater's native vegetation consists of a mix of prairie lands, oak forests, maple-basswood forests, savannas, wet-mesic prairies, southern sedge meadows, emergent marshes, and calcareous fens. Agriculture and development have significantly changed vegetative cover in this part of the state. Much of the natural vegetation has been removed and undeveloped areas are dominated by croplands. Today, larger stands of woodlands are mainly located outside the City limits.

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## **Rare Species Occurrences/Natural Areas**

WisDNR's Natural Heritage Inventory program maintains data on the general location and status of threatened or endangered plant and animal species and natural communities and species of special concern. To find out if a proposed project may impact rare species, developers may request from WisDNR an Endangered Resources Review. Through this process WisDNR will identify for the applicant rare species, high-quality natural communities, and significant natural features in or near the proposed project area.

Occurrences of aquatic endangered species in the City can be found in the southeastern portion of the City around Trippe Lake. More specific information on location and type of species is available from the State's Bureau of Endangered Resources.

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## **State Natural Areas/Wildlife Areas**

State Wildlife Areas are intended to preserve wild lands for hunters, trappers, hikers, wildlife watchers, and all people interested in wildlife preservation and recreation. Furthermore, these areas help protect and manage important habitat for wildlife and help prevent draining, filling, and destruction of wetlands and the private blocking of important waterways, game lands, and lakes. Whitewater is fortunate to be located in an area surrounded by numerous state natural and wildlife areas:

- The Southern Unit of the Kettle Moraine State Forest consists of 21,000 acres forest land of parallel, steep-sided ridges, conical hills, kettle-like depressions, and flat out-wash plains. Recreational activities in

the forest include bicycling, hiking, camping, swimming, nature study, horseback riding, cross-country skiing, hunting, and fishing.

- Bluff Creek Natural Area is located approximately three miles southeast of the City of Whitewater. Bluff Creek features a series of springs and seepage slopes that originate at the base of a morainal ridge. Bluff Creek is also home to numerous rare plant and animal species including tussock bulrush, beaked spike-rush, false asphodel, prairie straw sedge, Ohio goldenrod, slender bog arrow-grass, and the state-endangered queen snake.
- Clover Valley Fen features a series of peat mounds that were formed about 11,500 years ago by accumulations of partially decayed vegetation around slowly flowing springs. Clover Valley Fen and camping area is located south of the City of Whitewater.
- Lima Marsh Wildlife Area, located to the southwest of the City in the Town of Lima in Rock County, is a 2,048-acre park consisting of emergent marsh, restored prairie, and remnant tamarack swamp. Restoration of the Lima Marsh began in 1956, as a Federal Fish and Wildlife Restoration project. Recreational activities include bicycling, berry picking, wildlife viewing, hunting (waterfowl, deer, pheasant), trapping, and bird watching.
- Prince's Point Wildlife Area is located off of County Highway D three miles northeast of the City of Whitewater. This wildlife area consists primarily of riparian wetlands associated with the confluence of Spring Creek, the Scuppernong River, and the Bark River. Activities at Prince's Point include cross country skiing, snowmobiling, hiking, trapping, hunting (waterfowl, pheasant, deer, turkey), canoeing, fishing, wildlife viewing, bird watching, and berry picking.
- The Koshkonong Wildlife Area, located to the northwest of the City, is a large marsh, just west of Highway 26 along the mouth of the Rock River. It encompasses 844 acres and is home to waterfowl, deer, turkey, pheasants, grassland songbirds, and sandhill cranes. A boat ramp is available on Groeler Road under the Highway 26 Bridge. Snowmobiling, cross-country skiing, and bird watching are other activities. The WisDNR also has a boat ramp and a small natural area on Vinnie Ha Ha Road providing access to the Wildlife Area.

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### Glacial Heritage Area Project

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The Glacial Heritage Area Project is an effort led by the WisDNR to establish a network of conservation areas, recreational facilities, and recreation trails in the Glacial Heritage Area in Southeastern Wisconsin. This area is centered on western Jefferson County, but includes portions of Dane County, Dodge County, Rock County, and Walworth County—including Whitewater. The primary goal of the project is to help meet the demand for outdoor, nature-based, land and water recreational activities by setting aside lands for hiking, biking, wildlife watching, camping, horseback riding, hunting, fishing, boating, and other activities. The portion of Southeastern Wisconsin that is known as the Glacial Heritage Area already boasts one state park, 11 large State Wildlife Areas, 12 State Natural Areas, the Glacial Drumlin and Glacial River trails, numerous county parks, and lands owned by private conservation groups. These resources provide the foundation for establishing an intricate network of “strings and pearls,” in which conservation areas and parks represent the “pearls” and trails represent the “strings.”

This project also seeks to directly connect these outdoor recreational resources with the numerous communities located within the Glacial Heritage Area. The northern portion of the City of Whitewater is located within the project's study area. The Glacial Heritage Area Proposed Plan identifies a future linking trail along Whitewater Creek connecting Whitewater with Fort Atkinson and eventually continuing all the way up to Lake Mills.

## Natural Resource Goals, Objectives, and Policies

### Goal

*Preserve our natural resources—including Whitewater Creek, the two lakes, and the Kettle Moraine—to support the strength of the economy, local quality of life, and the health of natural communities in and around Whitewater.*

### Objectives

1. Continue to recognize how significant natural features such as the Whitewater Creek, Cravath Lake, and Trippe Lake help to shape Whitewater's character and identity.
2. Protect natural features including wetlands, rivers, woodlands and mature specimen trees, wildlife habitats, and other environmentally sensitive areas, consistent with state and federal laws.
3. Protect groundwater and surface water quality, specifically associated with the lakes and Whitewater Creek.
4. Link natural resource preservation with recreational opportunities, economic health, and a broader approach to community sustainability.
5. Work with surrounding towns; Walworth, Jefferson, and Rock Counties; non-profit land conservation agencies; property owners; and other interested parties on the long-term preservation of farmland and natural areas in mutually agreed areas.

### Policies

1. Encourage a compact development pattern, mixed use development, infill, and redevelopment in the City to preserve open spaces and natural resources.
2. Utilize subdivision review, zoning, and official mapping authority to limit new construction in environmental corridors (see Map 5), archeological resources, and significant environmental features within the City's planning area.
3. Recognize that mapped environmental corridors are taken from generalized sources, and that actual conditions may vary. Refine the boundaries of environmental corridors as development projects are proposed near these areas, with refinements based on actual site conditions.
4. Use environmental corridors depicted on Map 5 to define the edges of development groupings, serve multiple natural and recreational functions (e.g., passive park sites), and enhance neighboring property.
5. Recognize that soil and bedrock conditions and location in certain areas may form constraints for the development that is anticipated by this *Plan*, which is particularly challenging in

#### CITY'S INVOLVEMENT IN STATE AND NATIONAL SUSTAINABILITY INITIATIVES

In 2005, the City of Whitewater signed the U.S. Mayors Climate Protection Agreement. This agreement is intended to advance the principles of the Kyoto Protocol on a local level in order to address global climate change. The agreement commits the city to the following:

- Strive to meet or beat the Kyoto Protocol targets in the City, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns;
- Urge Wisconsin and the federal government to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol (seven percent reduction from 1990 levels by 2012); and
- Urge the U.S. Congress to pass the bipartisan greenhouse gas reduction legislation, which would establish a national emission trading system.

In October 2009, the City took the additional step of passing a resolution to become a Wisconsin Energy Independent Community. Communities who pass this resolution commit to advancing the State's goal of generating 25 percent of its electricity and 25 percent of its transportation fuels from renewable resources by the year 2025.



and around Whitewater. Adjustments to private development plans may be necessary based on more detailed soil and environmental studies at the time of development.

6. Identify and protect rare, threatened, and endangered plant and animal species, relying on data provided by WisDNR and requiring identification of such species as part of development approvals (i.e., through completion of “site assessment checklist”).
7. Create a stormwater management system in accordance with the City’s stormwater management plan and ordinance; consistently enforce that ordinance; and make that ordinance more widely available and accessible to the public, developers, and property owners.
8. Promote the dedication and acquisition of park lands within and/or adjacent to natural areas, if consistent with the City’s Park and Open Space Plan.
9. Encourage neighborhood and site designs that are sensitive to and help connect nearby environmental features, and recognize the potential impacts from and to nearby farming.
10. Use low-impact street design techniques for roads crossing and adjacent to environmental corridors to minimize surface water pollution and runoff.
11. Protect groundwater quality by encouraging the clean-up of environmentally contaminated sites, monitoring uses that may cause contamination in the future, identifying and protecting wellhead protection areas for municipal wells, and maximizing infiltration in groundwater recharge areas.
12. Map wellhead protection areas for all City wells as part of the recommended update to the City of Whitewater Zoning Map (see Land Use and Implementation chapters).
13. Complete lake management plan for Cravath and Trippe Lakes and implement the recommendations from those plans (see more detailed recommendation later in this chapter).
14. Work to preserve and restore shoreline areas around Trippe and Cravath lakes and Whitewater Creek.
15. Discourage the establishment of new mineral extraction operations within the City limits, except where they are associated with a development project on the same site and are operated according to safe and clean standards.
16. Practice a program of community sustainability, including continued implementation of the City’s commitments under the Mayors Climate Protection Agreement (see sidebar above).

## Natural Resource Programs and Recommendations

### Build an Ethic of Progressive Surface and Ground Water Management



Various strategies may be used to mitigate stormwater runoff.

Generally, the best strategies are designed to manage runoff onsite, facilitating the infiltration of water back into the ground, or allowing it to evaporate back into the atmosphere. Such approaches typically decrease the quantity of runoff and improve the quality of the runoff that does end up in streams and lakes. The City encourages the following practices for addressing stormwater runoff:



*Example of how native landscapes can be integrated into a development site to provide both aesthetic and stormwater management benefits.*

- Maximize permeable surface areas. This technique focuses on reducing the impervious footprint of development sites and breaking up large paved areas with permeable surfaces and/or natural ground cover and vegetation. Where paved surfaces are necessary, these areas should be graded so they drain to infiltration areas. This approach also includes the incorporation of narrower street widths into neighborhoods, where possible, and the development of smaller lots, which are typically associated with less impervious surface per lot (e.g., less street frontage needed per lot).
- Preserve and enhance environmental corridors. Since the impacts of stormwater runoff are far more effectively managed by natural systems, such as wetlands and forest ecosystems, than by pervious ground cover that has been altered by construction or other human impacts such as lawns, the preservation of environmental corridors will go a long way in mitigating stormwater impacts.
- Install native landscaping. Natural landscapes and vegetation are far better at managing stormwater than manicured groundcover or grounds that have been altered by construction. To save dollars on lawn maintenance and provide better stormwater management, native vegetation and landscaping (e.g., prairie, wetland, woodland) can be installed on appropriate sites.
- Consider unique infiltration and retention areas. Where stormwater basins are necessary to effectively manage runoff, such basins and associated conveyance routes should be carefully integrated into the surrounding development pattern and should incorporate native/natural edge vegetation whenever possible to ensure the aesthetic and functional integrity of the site. Aside from more traditional techniques like stormwater basins, other possible infiltration techniques include:
  - *Rain gardens:* A rain garden is a landscaping feature that is designed, located, and installed for the purposes of capturing stormwater runoff and allowing it to infiltrate back into the ground. The City may consider codifying rain garden design standards and allowing the construction of rain gardens to apply toward meeting City landscaping requirements, provided these features are installed in appropriate locations in the City.



*Top: A rain garden located outside the Village of DeForest Municipal Center provides attractive landscaping, as well as a location for stormwater to filter back into the ground. A rain barrel has also been installed to directly collect rainwater from the roof.*

*Bottom: The Village takes advantage of an opportunity to educate the public by integrating educational signage into its rain garden.*



- *Rain Barrels*: A rain barrel collects and stores the water that drains from rooftops to prevent it from running off-site. A hose can be connected to the barrel and the collected rain can be used to water the lawn or garden, or to wash the car. Barrels can also be set to slowly empty themselves, allowing the water to filter back into the ground. The City may actively promote this program and provide residents with information about how and where they can purchase their own rain barrels.
- *Green (vegetated) roofs*: Green roofs effectively act like sponges, absorbing water from rain storms that would otherwise run off the roof. Green roofs also function as filters, removing pollutants from rainwater. The City will consider installing green roofs on new municipal buildings constructed in the future, and promote them in private developments.
- *Vegetated buffer strips and berms*: Locating areas of vegetation either alone or in combination with landscaping berms around properties helps restrict the off-site flow of water. Also, the addition of organic material to soil aids in the decomposition and filtration of pollutants. The City may seek funds from programs that are designed to assist in efforts to protect and enhance surface water quality in key areas, such as near the Whitewater Creek and the lakes. Programs include the WisDNR Target Runoff Management Program and the WisDNR River Protection Grant Program.
- *Grassy Swales*: Grassed swales function by slowing runoff as it comes off an impervious surface (such as a parking lot). The grassed swale can remove sediments and other pollutants and provides some infiltration into the soil. Still, grassy swales can be ineffective at absorbing and treating runoff during a large rain event.
- Enforce progressive construction site erosion control practices. Construction sites generate a significant amount of sediment runoff if not managed properly. Under current state laws, erosion control plans are required for all construction sites that are larger than one acre. Working with WisDNR, the City will consistently enforce erosion control ordinances and techniques for the protection and continued improvement of water quality. In particular, progressive erosion control systems should be components of new development sites. These techniques include providing silt fencing surrounding the construction project, minimizing the amount of land area that is disturbed throughout the construction process, and quickly reestablishing displaced vegetation.

#### URBAN DENSITY AND WATER QUALITY

Urban development has negative impacts on water quality by decreasing natural ground cover and increasing the amount of stormwater runoff that enters streams and lakes. Water bodies can become impaired when just ten percent of the adjacent land is impervious. As a result, some communities have concluded that lower-density development patterns will have less of an impact on water quality by spreading out development and allowing for more pervious surface around and between buildings, roads, driveways, and parking lots.

However, when the quantity of stormwater runoff in a given area is measured per building, versus per acre, higher density developments generate less stormwater runoff than lower density developments and consequently have less of a negative impact on the overall watershed.

Nevertheless, it should be recognized that with denser development comes localized increases in impervious surfaces, which, over time will contribute to the impairment of waterways. Therefore, in addition to promoting compact development patterns, communities should take additional measures to mitigate the impacts of stormwater runoff.

*Source: USEPA report "Protecting Water Resources with Higher Density Development"*



- Foster a compact, mixed use development pattern. The City intends to promote a compact development pattern, focusing on techniques that minimize the amount of land required for additional growth such as infill development, redevelopment, mixed use neighborhoods, and neighborhood design principles described in the Housing and Neighborhoods chapter. Not only will compact development benefit regional water quality (see “Urban Density and Water Quality” sidebar), but it will also facilitate walking and biking, help keep development out of agricultural and natural areas, and be less expensive to serve with public utilities and services.

### **Consider Different Approaches for Stormwater Management for Redevelopment Projects**



By the year 2013, municipalities subject to the municipal stormwater permit requirements of NR 216 Wis. Admin. Code, which include the City of Whitewater, are required to implement a 40 percent reduction in the amount of total suspended solids found in stormwater runoff that enters “waters of the state,” when compared to a situation in which no controls would be used. This requirement is under NR 151.13 (2) Wis. Admin Code.

Meeting this requirement will not be easy and not be without significant City expense. To accomplish this directive and to preserve the City’s surface water and groundwater resources, the City will practice progressive stormwater management techniques and require these techniques of private developers, addressing both water quality and water quantity.

At the time this *Plan* was written, only development projects disturbing one acre or more of land in Whitewater were required to meet certain stormwater standards. However, many redevelopment projects in Whitewater involve less than one acre of disturbance and a significant percentage of development activity in Whitewater occurs as a result of redevelopment of previously-developed sites. The large number of redevelopment projects taken together will have a significant impact on stormwater quantity and quality in the City. Therefore, the City will consider amendments to its stormwater management ordinance to reduce the minimum threshold at which stormwater management is required for redevelopment projects and/or to establish unique water quality standards for redevelopment projects. The City, in consultation with its engineering consultant, will also consider other approaches for mitigating the cumulative effects of incremental increases in impervious surfaces in the City.

### **Protect and Refine Environmental Corridors**

Preserving natural areas and environmentally sensitive lands provides significant ecological, recreational, and aesthetic benefits to a community. Such areas add considerably to the ecological integrity of a region, contribute to the aesthetic value of neighborhoods, offer natural stormwater management and flood control, and protect and improve water and air quality. In addition, these areas often consist of wetlands, floodplains, steep slopes, and other specific environmental features, which present severe limitations for development. At the time this *Plan* was written, SEWRPC had not yet updated its environmental corridors to account for recent changes in FEMA



*Many undeveloped lands in and around the City are characterized by floodplains and wetlands.*

floodplain and WisDNR wetland boundaries. For the purposes of this *Plan*, a “working environmental corridor” layer has been developed and mapped (see Map 5), and is comprised of the following features:

- Water bodies and wetlands as mapped in the WisDNR Wetlands Inventory, most recently amended in 2005. These are subject to regulations at several levels of government.
- FEMA designated floodplains. The County and City are required to limit development within the 100-year floodplain as shown on FEMA’s Flood Insurance Rate Maps, amended in 2014.
- Seventy-five-foot setbacks from navigable waters and well-defined drainageways.
- Lands with steep slopes of 20 percent or greater.

Under one or more of the following circumstances, the City intends to refine this “working environmental corridor” layer to assist in its review of development proposals and future *Comprehensive Plan* amendments:

- When SEWRPC updates its digital environmental corridor layer and provides it to the City. Note, however, that SEWRPC has not typically mapped environmental corridors located significantly beyond the designated Southeast Region (i.e., not in Jefferson or Rock counties).
- When more detailed study reveals that the characteristic(s) that originally resulted in its designation as an environmental corridor no longer exists, never existed, or exists in a different location or configuration on the site.
- When approvals from appropriate agencies are granted to alter a property so that the characteristic which resulted in its classification as an environmental corridor will no longer exist.
- When a mapping error has been identified.

#### **Take a Leadership Role in the Clean-up of Trippe and Cravath Lakes**



At the time this *Plan* was written, the City was in the process of preparing a lake management plan that would outline best management practices for improving water quality in Trippe and Cravath Lakes. The City’s process to evaluate the lakes was funded by a WisDNR Lake Management Planning Grant. A citizen survey administered in conjunction with the study suggested community-wide concern that the environmental quality of the lakes has degraded considerably in recent years, and that a more concerted and formalized effort should be made to restore the lakes.

One possible strategy being explored is the formation of a lake district. If formed, the lake district boundary might encompass the entire city and would be led by a five- to seven-member commission. The commission would be charged with developing and recommending a work plan to advance the clean up of the lakes, as well as an annual budget. Monies obtained through grants, donations, and a possible lake district tax could be used to fund lake clean up and maintenance.

In addition, the City will practice and require developers to practice a variety of progressive erosion control and stormwater management strategies, such as those identified above to help manage and treat stormwater as close to where it hits the ground as possible, thereby reducing the amount of water, pollutants, and sediment that enters the Whitewater Creek and the Lakes. This will also involve taking measures to reduce the amount of erosion occurring in Whitewater Creek.

Since the City of Whitewater is surrounded by active farmland, another significant source of lake pollutants is agriculture, more specifically fertilizers, pesticides, animal waste, and soil erosion. To the extent possible, the City will support the efforts of the surrounding towns; Walworth, Jefferson, and Rock counties; and UW-Extension offices to reduce soil erosion, nutrient runoff, and animal waste runoff from surrounding farms particularly those near the Whitewater Creek.

### **Design a Whitewater-specific Approach to Community Sustainability**



Based on the recommendations in this *Plan*, the City will consider new ways to more

directly and proactively advance sustainability. This may involve partnering with the University to brainstorm and implement initiatives. Other organizations also offer advice in this area, including UW-Extension and 1000 Friends of Wisconsin. The City will consider opportunities to work with such organizations to identify a specialized approach to achieving its sustainability goals. Many local and regional “eco-municipality” movements (see sidebar) have also cropped up around the state, including several in Jefferson County. The eco-municipality movement is designed to achieve a more organized effort towards advancing sustainability. The City may consider evaluating how this movement has functioned in other nearby communities to identify opportunities to better organize its own initiatives.

#### **WHAT IS AN ECO-MUNICIPALITY?**

An eco-municipality is a community that has adopted *The Natural Step* framework as a guide to a more sustainable future. Using this framework, sustainability is defined by the following four system conditions:

In a sustainable society...

1. Nature is not subject to systematically increasing concentrations of substances extracted from the Earth’s crust;
2. Nature is not subject to systematically increasing concentrations of substances produced by society;
3. Nature is not subject to systematically increasing degradation by physical means; and
4. People are not subject to conditions that systematically undermine their capacity to meet their needs.

*The Natural Step* advises a bottom-up approach to community decision-making and emphasizes the value of educating residents and decision-makers about the benefits of sustainable practices. Instead of prescribing universal courses of action that all communities must follow to achieve sustainability, *The Natural Step* framework encourages communities to use a method called “back-casting.” Using this approach residents and decision-makers envision a future in which all of the above system conditions have been met, and then identify specialized ways to move toward achieving that vision.

*Source: The Natural Step for Communities: How Cities and Towns can Change to Sustainable Practices, by Sarah James & Torbjorn Labti*

### **Preserve and Enhance Whitewater’s Urban**

#### **Forest**



The City recognizes the important value in preserving and enhancing Whitewater’s urban forests (see call-out box).

The community’s established neighborhoods boast beautiful tree lined streets and the City has been a member of Tree City, USA for 15 consecutive years. To preserve this important legacy, the City will continue to manage and maintain its urban trees and work with other partners such as UW-W to enhance and expand the size and diversity of forested areas, as well as opportunities to utilize such areas for education, recreation, and rejuvenation.



*Whitewater’s neighborhoods boast beautiful tree-lined streets.*

**WHY PRESERVE URBAN FORESTS?**

An urban forest is comprised of all the trees and associated vegetation and ecosystems found in an urban area. Urban forests are, by their very nature, characterized by the unique interaction between the natural world and the man-made environment. In 2001, it was estimated that urban trees covered approximately 25 percent of Wisconsin's urban areas. Interestingly, this is somewhat lower than in other Midwest States (30 percent in Michigan, 37 percent in Minnesota, and 34 percent in Illinois). The City of Whitewater wishes to preserve and enhance its urban forest amenities, recognizing that higher percentages of tree and vegetative cover in urban areas are associated with tremendous benefits to the community. These benefits include the following:

- Enhancements to air quality
- Management of stormwater runoff and flooding
- Reductions in ambient noise levels
- Improvements in water quality
- Preservation of wildlife habitat
- The moderation of ambient temperature
- Reductions in energy use
- Contributions to community aesthetics
- Increases in property values
- Opportunities for recreation
- Enhancements in the connections between people with the natural environment
- Opportunities for education
- Enhancements in overall human well-being

*Source: People and Trees: Assessing the US Urban Forest Resource. David J. Nowak, Mary H. Noble, Susan M. Sisinni, John F. Dwyer. 2001. Journal of Forestry. 99(3)*



**Map 3: Natural Features**

# NATURAL FEATURES

WHITEWATER, 2017



## Land Features

- 12 - 20% Slopes
- Greater Than 20% Slopes
- Forest & Woodland

## Water Features

- Rivers
- Lakes
- Wetlands
- Floodplain
- Watershed Boundary

## Political Features

- Roads
- Railroad
- Parks
- City of Whitewater
- Townships
- Counties

Source: USDA NRCS, 2002, USGS, 2016  
US Census Bureau, 2009

