

# Natural Resources Analysis



## **Green Bay Smart Growth 2022**

# Natural Resources Analysis

<b>Water Resources</b> .....	<b>3-1</b>
Fox River .....	3-2
East River .....	3-2
Baird Creek.....	3-4
Other Creeks.....	3-4
Bayfront .....	3-5
<b>Wetlands</b> .....	<b>3-5</b>
<b>Floodplains</b> .....	<b>3-6</b>
<b>Soil Resources</b> .....	<b>3-7</b>
<b>Sensitive Ecological Resources</b> .....	<b>3-7</b>
Vegetation .....	3-8
Wildlife .....	3-8
Endangered Species .....	3-8
<b>Summary of Major Natural Resource Issues</b> .....	<b>3-9</b>

## List of Figures

Figure 3-1: Major Natural Features .....	3-3
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# Natural Resources Analysis

This chapter of the plan describes the current pattern of land use and development in and around Green Bay. It summarizes the key opportunities and constraints in central and perimeter locations and concludes with a list of issues to be addressed in the plan.

## Water Resources

Water is a powerful asset for the community of Green Bay in terms of the natural environment, environmental, economic development and community character. Major streams include the Fox and East Rivers and Duck, Baird, Mahon, Willow and Beaver Dam Creeks. (Refer to Figure 3-1, Major Natural Resources, for the location of these and other features.)

Streams in the eastern United States streams have experienced damage to them because of steep peak of water volumes rushing to it over a short period of time from storm events. Since the City of Green Bay is rich in streams that have good water quality, they should have protection from stormwater events. To improve water quality of the rivers, the quality and quantity of water entering the rivers should be improved.

### Issues:

- **Protection:** To what level should streams, ponds and wetlands have protection measures such as a buffer, setback, and stormwater management plan?
- **Protection Techniques:** How should the city decrease the amount of water and spread the time of release to the rivers that mimics natural conditions? Does this mean allowing less impervious surface or other techniques to slow stormwater from entering the system?
- **Retrofitting:** Should the City retrofit existing impervious conditions throughout the city to improve water quality and quantity entering the streams?
- **Construction Projects:** Should water quality controls be enforced on all construction projects?
- **Non-Point Source Pollution:** What should the City do to improve the non-source point impacts to the rivers?

### 3. Natural Resources

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#### Fox River

The Fox River is an integral part of the city of Green Bay as both a natural feature and element of the local economy. Much of the natural environment of the river has been disturbed or modified for urban development and industry. It is also the most polluted river with in Wisconsin.

The river is managed by the US Army Corps of Engineers to maintain a navigable channel for river traffic. The river's floodplain has been minimized because of the bulkheads placed in the river and the channel that are maintained by the Corps of Engineers.

The sediments of the river are very toxic with mercury and PCB's. Swimming, eating fish from the river and many recreational activities within the Fox are restricted because of health concerns. The Wisconsin Department of Natural Resources and the US Environmental Protection Agency are working to remediate these problems.

In addition, some of the sites along the Fox have been redeveloped or redesigned to take advantage of the recreational and aesthetic features of the river. These changes provide more public access to the river as to celebrate it as both an economic and an environmental opportunity.

#### Issues:

- **Water Quality:** What actions should the City of Green Bay take to maintain the quality of water entering the Fox River?

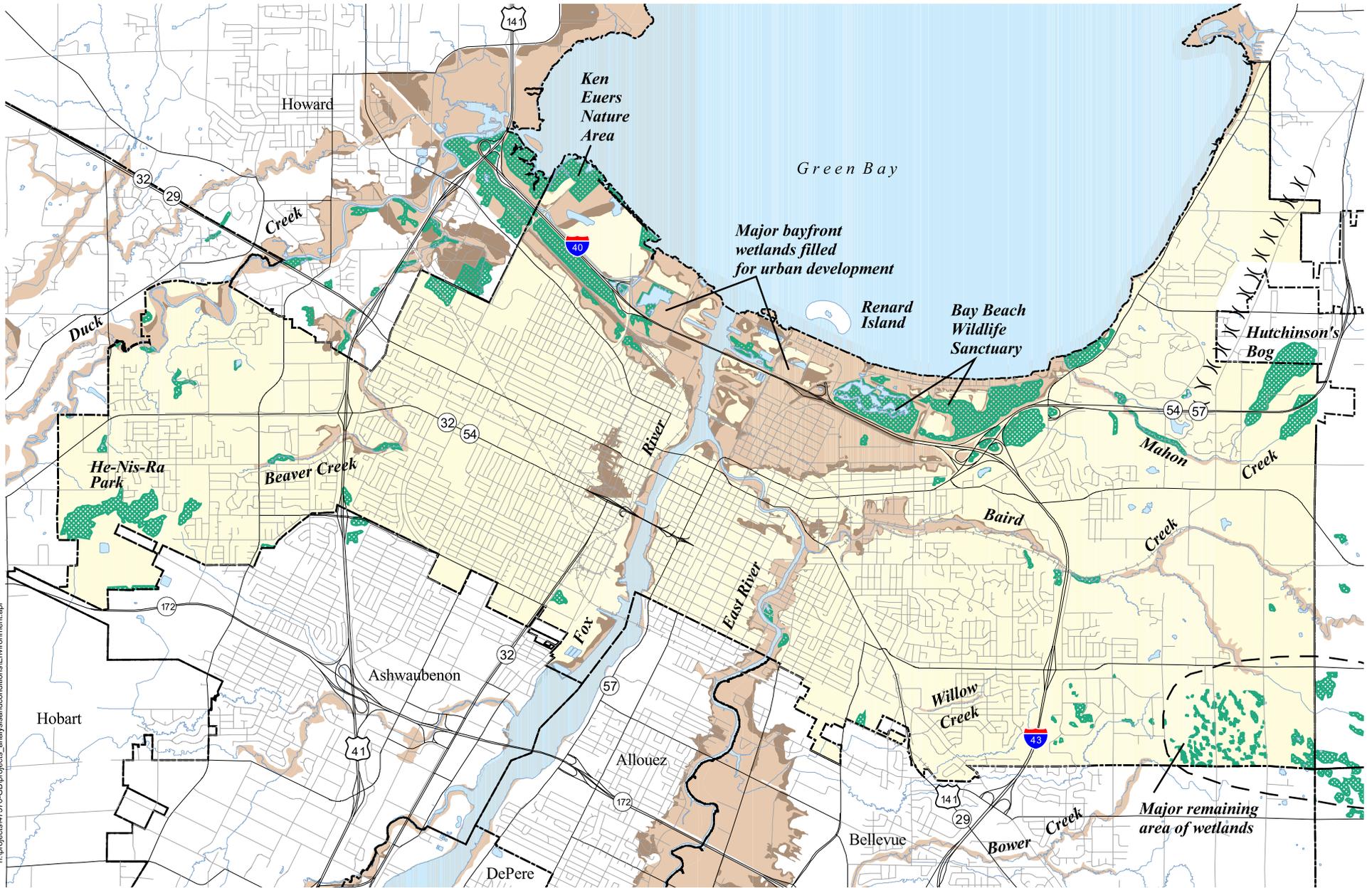
- **Peak Flow:** Does the peak flow of water that enters the Fox River need to be lowered to more closely mimic conditions prior to development of the river?
- **Bulkheads:** Should the bulkhead lines within the river be revoked if not already being used?
- **Bank Stabilization Techniques:** Should there be greater reliance placed on natural means of river bank stabilization as opposed to rip-rap or concrete?
- **Habitat Restoration:** Where should habitat and stream restoration be done?
- **Public Access:** Where should additional public access be added?

#### East River

The East River runs through the heart of Green Bay and includes an extensive flood plain. This is another environmental resource that has great potential to stimulate and guide development, recreation, and commerce; although environmental concerns need to be addressed. The habitat that has been preserved is being invaded with plants that are not native or are making areas a mono-culture.

#### Issues:

- **Restoration:** Should the City work to restore a more natural environment along the East River, including land redevelopment near Main Street and diversifying the plant community?

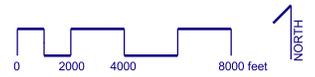


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- 100 year Floodplain
- 500 year Floodplain
- Wetland
- Niagara Escarpment

**Figure 3-1**  
**Major Natural Features**



### 3. Natural Resources

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- **Greenway Connection:** Should there be a greenway connection between the East and Fox Rivers?
- **Water Flow:** Should the peak flow of water entering the Fox River be reduced to more closely mimic conditions prior to development of the river?

#### Baird Creek

Baird Creek flows from the eastern edges of the Green Bay into East River. The wetlands and flood plain associated with the river are substantial as are the associated woodlands. The Baird Creek Area and Parkway has the greatest potential to guide development, recreation and provide strong identity to this portion of the City. This river may be the community's last unspoiled natural resource. Managing this resource will require much forethought before development pressures overcome the watershed.

#### Issues:

- **Parkway Design:** Should the previously-established pattern of public open space along Baird Creek be continued to the east? Should that open space include pedestrian and bicyclists paths? Should there also be a road for automobiles?
- **Parkway Design Criteria:** Will the City be able to plan and acquire public open space along Baird Creek on the basis of specific environmental standards like slope, soil conditions, wetlands, floodplain and quality woodlands? Should these standards be used on both the north and south arms of the creek?
- **Impervious Surface and Construction:** Should the City consider alternative "Best Management Practices" for the

watershed of Baird Creek, such as infiltration and redirection of stormwater? Can alternative methods of retaining stormwater be implemented or enforced within the watershed? Can the enforcement of sediment control and erosion at construction sites possible?

#### Other Creeks

The remaining streams in and near the City of Green Bay tend to be smaller and of varying water quality. All of them eventually contribute to the Bay, which has significance for wildlife, quality of life and economic activity in Green Bay. All of the creeks are associated with some wildlife habitat, although some habitats are low quality. These streams include these creeks: Barina, Beaver Dam, Deckner, Duck, Ellis, LaCount, Mahon, Newberry, Nicholson, Nicolet, Van Lanen, and Willow.

#### Issues

- **Erosion Control Regulations:** Are the City's current erosion control regulations sufficient to maintain water quality on these creeks?
- **Plan Review and Inspections:** Are plan review and inspections adequate to ensure that erosion control and stormwater management practices are followed?
- **Stormwater Handling:** Can more natural means of conveying stormwater be used?
- **Wildlife Habitat:** Are the City's regulations sufficient to maintain wildlife habitat or riparian zones?
- **Protection:** To what level should streams, ponds and wetlands have protection measures such as a buffer, setback, and stormwater management plan?

## **Bayfront**

The bayfront is overlooked as a natural resource; and many of the wetlands that were associated with it have long since been filled. Throngs of shorebirds formerly used the bayfront during annual the migration and breeding season. Most of the species do not stop anymore, although thousands of birds still use the bayfront, its sandbars and the Ken-Euers Nature Area wetland complex.

One of the largest concerns along the bayfront is the Bayport Industrial Tract, a large area west of the Fox River that has been filled with dredge spoils from the river, contaminating it with PCBs and mercury. The islands in the bay may also need some restoration, some of which has been begun.

### **Issues:**

- **Habitat Restoration:** Habitat restoration along the bay and islands have been identified by the US Fish and Wildlife Service for the Green Bay area. Should only native vegetation be used along the bay for wildlife habitat and sustainability? Should the Cat Islands continue to be funded for restoration and should Longtail Point (Town of Suamico) and the Bayport Industrial Tract be added to the restoration process?
- **Renard Isle:** Renard Island was created with dredge spoils from the Fox River, some of which were polluted. How should that island be used in the future?
- **Landfill Sites:** Can the brownfields that were created by filling bayfront wetlands with Fox River dredge materials be remediated? Is the community willing to pay for that cleanup? Can a permanent moratorium of filling wetlands and a buffer of potential park/open space be implemented along the bay? Can restoration along the bayfront become a high priority of the city?

## **Wetlands**

All but 3 percent of Green Bay's original wetlands have been lost, including 465 acres along the bay. The remaining wetlands are a valuable resource that provides opportunities for protection and enhancement. They provide a means of improving water quality, slowing the flow into the streams and ponds, and providing wildlife habitat.

The long-term protection of the remaining wetlands may require additional zoning restrictions or local ordinance adoption for wetland buffers. There is a need to rank in priority the acquisition of wetland and upland areas that are ecologically significant to the habitat. The priority of the acquisition should favor coastal areas regardless of habitat type. Some of those wetlands are of high quality, so preservation is preferred over restoration of other locations.

The US Fish and Wildlife Service has determined that injuries to fish and birds in the vicinity of Green Bay exceed acceptable limits. Those injuries, which include physical deformities, reproduction problems and behavioral abnormalities, were determined to be a result of exposure to PCBs in the lower Fox River and Green Bay. Those waters continue to exceed acceptable injury thresholds. Additionally, certain species of fish from those waters are unsafe for humans to eat. **This is the greatest natural resource problem facing Green Bay.**

In response to this challenge, the US Fish and Wildlife Service determined, among other things, that wetlands and other water resources should be improved and restored in and around Green Bay to compensate for the losses. Among the projects that should be accomplished to restore lost habitat are acquiring, preserving and enhancing wetlands and creating new wetlands. Restoration can be accomplished by improving degraded wetlands or by replacing the undamaged equivalent of the impaired wetland.

### 3. Natural Resources

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The Fish and Wildlife Service prepared in August 2000 a report entitled “Wetland Habitat Restoration Opportunities in the Green Bay Area.” That document described:

- The types of wetlands found in and around Green Bay
- The legal framework for protecting wetlands
- Development pressures and permits for filling wetlands
- Factors involved in deciding whether to preserve versus restore wetlands given funding limitations
- Habitat restoration and management techniques
- Wetland restoration techniques
- Estimated costs for wetland restoration.

That report will be a good asset to the City of Green Bay in setting policy in this comprehensive plan and for ranking wetlands in priority for preservation, enhancement or restoration.

#### Issues:

- **Bayfront Wetland Restoration:** Should restoring the freshwater marsh that once dominated the bayfront be a high priority of the City? Should more of the Ken-Eurs wetland complex be restored and enhanced?
- **Eastern Wetlands:** Should the wetlands east of the I-43 Business Park be preserved or should they be replaced with other retention areas or wetland mitigation sites that would enhance the expansion of the Business Park? Can urban development occur around those wetlands without compromising their quality?
- **Other Wetlands:** Many other wetlands across the city have been identified for restoration by the US Fish and Wildlife Service. To what extent, if at all, should those sites be acquired by the City and restored? What actions should the City take to maintain the quality of water leaving the

remaining wetlands across the city?

- **Hutchinson’s Bog and He-Nis-Ra Park:** Hutchinson’s Bog and He-Nis-Ra Park and its associated wetland complex is of great quality. What measures should the City take to protect those resources?

### Floodplains

The floodplain along the bay is temporarily less of a concern because of the low lake level and the ability to add to the dike. However, the floodplain along the rivers though is of prominent concern and will affect land use near the rivers.

#### Issues:

- **Bayfront Floodplain:** Should the Federal Emergency Management Agency be encouraged to reduce the size of the area mapped as 100-year floodplain along the bay?
- **River Floodplains:** Should more stringent measures be enforced for the river floodplains to help enhance water quality, especially along the East River, Baird Creek and Duck Creek which have the largest floodplains?
- **Development in the Floodplains:** Portions of potential developments are within the 100-year flood plain of those streams. Should new development be allowed in the flood plain if protected or flood proofed?

## Soil Resources

Much of the remaining undeveloped land in the City falls within the Kewaunee-Manawa soil association: deep, well drained to somewhat poorly drained, nearly level to steep soils that have a dominantly clayey subsoil, on glacial till. These soils are classified as prime agricultural soils. Prime agricultural land is defined as being most suitable for farming with minimal limitations and requiring minimal input for successful production. Prime farmland is regulated on the federal level through the Farmland Protection Policy Act, which requires that federally-funded projects be reviewed by the Department of Agriculture to ensure that farmland impacts are considered and mitigated.

The clayey subsoil of this association is not well suited for the operation of on-site sewer systems (septic tanks), and may have erosion problems on steeper slopes.

Soils around the Niagara Escarpment and on the east side of the City are of the Namur-Summerville-Kolberg association. These are very shallow to moderately deep, nearly level to moderately steep soils that have a loamy and clayey subsoil, underlain by limestone bedrock, on glacial till plains. In most locations in Green Bay the bedrock is within one foot of the surface, making urban development costly and difficult and precluding the use of septic system drainfields.

Steep slopes can be defined as having a grade in excess of 20 percent. The Wisconsin DNR regulates slopes of 30 percent or greater. Steep slopes limit development and require more technical engineering practices to develop. Steep slopes are not currently regulated by the City.

In Green Bay, slopes that warrant consideration are the Niagara Escarpment, a small area near Baird Creek, and portions of the bayfront along Nicolet Drive.

### Issues:

- **Farmlands:** Active farming has historically been an essential part of the Green Bay economy and landscape. Is preservation of farmland within the City important? If so, what protections should be implemented? Which prime farmlands, if any, should be planned for conversion to urban use?
- **Steep Slopes:** Steep slopes are few within the city although still important in regards to erosion control and water quality. To what degree, if any, should the City regulate development on steep slopes?
- **Shallow Soils:** How should sanitary sewer and stormwater be managed on the perimeter of the community, since the soils there are shallow in places and have low permeability in others? Is erosion a concern because of the shallow soil depths in many areas?
- **Niagara Escarpment:** To what extent, if any, should the Niagara Escarpment be protected from development?

## Sensitive Ecological Resources

Information for sensitive ecological resources and endangered species in Green Bay has been received from the DNR Natural Heritage Inventory. The following information is based on discussions with the DNR, information provided by the US Fish and Wildlife Service, the US Army Corps of Engineers, City staff and field review of the project area. The biological resources that need to be addressed are wildlife, vegetation, and endangered species.

### 3. Natural Resources

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#### Vegetation

The City of Green Bay has typical urban landscaping with significant large trees scattered throughout residential, university, hospital and some industrial areas. Some significant scattered natural areas and sanctuaries remain. Most undeveloped areas are wetlands, old woodlands or turf parklands. The more rugged topography in the east has mostly mature woodlands where development has not occurred. This undeveloped area has some significant opportunities of retaining the integrity of the woods for wildlife and interest for a park or parkway. The City does not have requirements on development or redevelopment projects in regards to preservation, restoration, enhancement, or management.

#### Issues:

- **Inventory:** Should the City prepare an inventory of major vegetation as a baseline for preservation?
- **Preservation:** Should the City increase its requirements for preserving major trees during land development? To what extent should high quality vegetation areas be preserved, and how should these areas be characterized? Should the City consider including a requirement to use native species in the existing landscaping requirements?
- **Priority:** What should be the priority of protecting and restoring ecological resources? For instance, when a railroad line is abandoned, it could be reused as either a bicycle trail or a corridor for native plantings.
- **Parklands Management:** To what extent, if any, should the City seek opportunities for restoring native vegetation in its parks?

- **Public Education:** To what extent should public education about ecology and natural systems be a City priority?

#### Wildlife

Wildlife species in Green Bay include game and non-game species that typically occur in urban environments such as deer, raccoon, squirrels, songbirds and geese. In Green Bay, wildlife is abundant in the many sanctuaries, refuges and reserves. Some of the species have become a problem, yet most are on the brink of loss because of the loss or fragmentation of habitat.

#### Endangered Species

Ninety-one observations of endangered plants and animals are recorded for Green Bay. Endangered species include those recognized by the state and federal governments as having severely declining populations that are in jeopardy of extinction. Many species are located in concentrations in remaining “natural areas” and need some special provisions to allow them to survive and enhance the natural environment in the City. Because of Wisconsin Law, the identity and location of protected species can not be disclosed. Migratory birds are regulated by the Migratory Bird Act. Generally, state-defined Environmentally Sensitive Areas and most of the specific areas addressed above provide much of the habitat for endangered species in Green Bay.

#### Issues:

- **Endangered Species:** Federally listed species are protected by the Endangered Species Act, state listed species have lesser protections with management recommendations. Are existing regulations adequate or should the City consider additional requirements? What, if any, additional requirements for preservation be placed on land developers?

- **Habitat Fragmentation:** Habitat fragmentation is a concern for species that have a large territory or for species that are not compatible with human intrusion, such as shorebirds, wetland animals, and many migratory songbirds. Should the City promote development that is clustered so as to limit habitat fragmentation, particularly in Baird Creek Parkway and surrounding woodlands and bluffslands?
- **Priority:** What should be the priority of protecting or restoring ecological resources and function? To what extent is preservation of habitat for wildlife important?
- **City Parkland Management:** Should the City seek opportunities to acquire land to provide wildlife corridors in conjunction with pedestrian or bicyclists that connect existing natural areas?

protection of high quality natural resources? What additional requirements, if any, should be placed on land developments that may affect high quality natural resource areas?

4. **Multi-Jurisdictional Solutions:** Can or should a multi-jurisdictional approach be taken to ecological protection? In what subjects or locations might this be most feasible, if any?

## Summary of Major Natural Resource Issues

The major natural resource issues to consider during the comprehensive planning process include:

1. **Water Quality:** What priority do the citizens of Green Bay place on improving water quality in the Fox River and the bay?
2. **Importance of Natural Resource Protection:** To what extent is natural resource preservation important to the citizens of Green Bay? What should be done, if anything, to restore, preserve or enhance the natural resources in Green Bay? How much is the community willing to pay for such protection?
3. **Urban Development and Resource Protection:** What should be the balance between urban development and