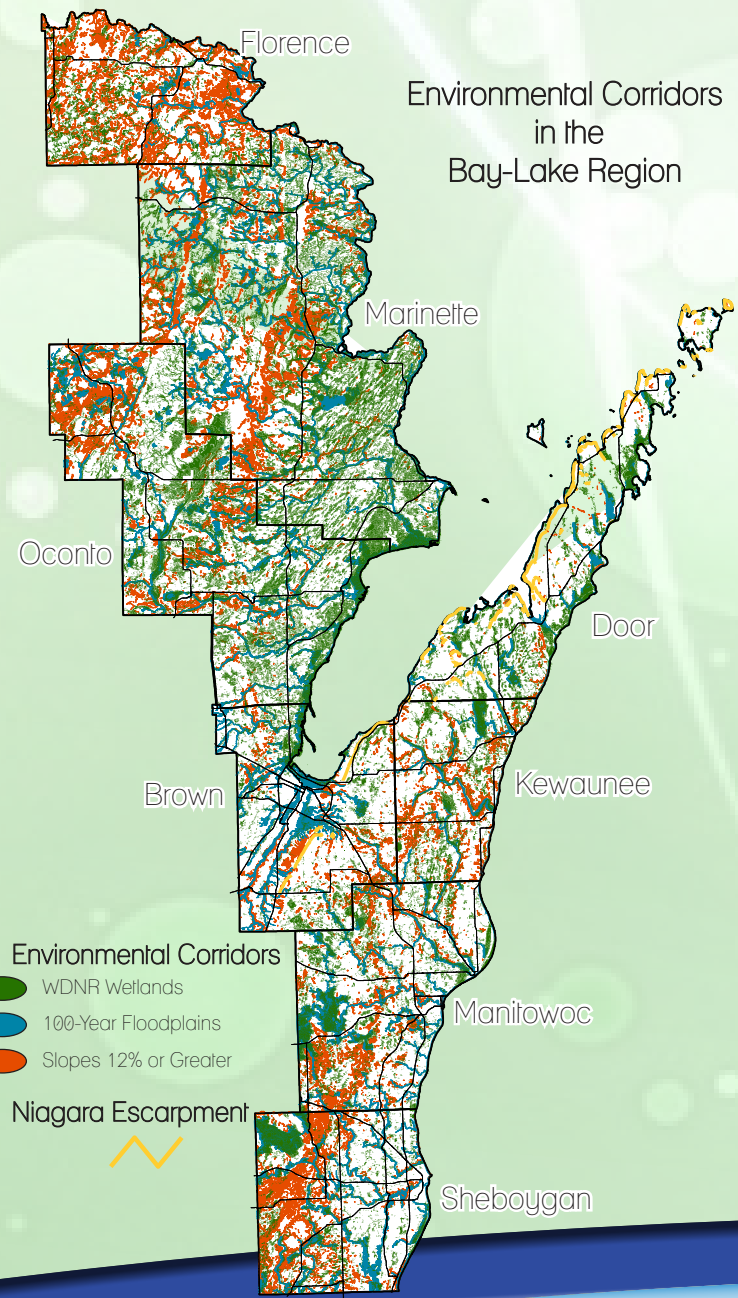


# Environmental Landscape

## Significant Natural Resources Summary:

- Refer to the Bay-Lake Regional Planning Commission Regional Comprehensive Plan, 2005, which contains data and maps regarding the Region's unaltered natural resources including geology, topography, general soils and soil limitations.
- Environmental corridors refer to several natural features (i.e., wetlands, floodplains, and slopes 12% or greater) that serve as a guidance tool to promote protection of areas with environmental significance from other land use influences. These areas are mapped by individual components in the following map.



## Loss of Natural Resources

Poorly planned and/or executed residential and commercial development threatens ecological resources, contiguous natural habitat, species, and access to public recreation opportunities.



## Woodlands / Forestry Goal:

- Objectives:**
- Promote the economic, ecological, and social benefits of public and private woodlands.
  - Encourage the sound management of the Region's woodlands through cooperative planning that conserves biological diversity, minimizes the threat of invasive species, minimizes recreational use conflicts, and enhances the urban forests.
  - Consider establishing monitoring sites for forest ecosystems. These complex communities are most likely to experience climate change impacts and will provide the means to track the rate of change, including changes in wildlife species, trees, shrubs, and herbs.
  - Encourage sound management and/or preservation of the Region's woodland forests.
  - Assist counties and municipalities with securing funding to manage and enhance urban and woodland forests.
  - Coordinate with the U.S. Forest Service regarding future forest related issues that may impact communities within the Region.

## Significant Natural Resources Goal:

- and protect the significant natural resources that characterize the Region's natural landscape.
- Objectives:**
- Encourage communities to preserve natural areas within growth areas by steering developments away from areas with sensitive environmental features.
  - Ensure the preservation of the scenic and natural beauty of the Region for future generations by encouraging the protection of scenic views, features, and landscapes.
  - Provide education on, and assistance toward, practices that encourage the sustainable use of resources for future development within the Region.
  - Preserve water resources including watersheds, stream corridors, shorelands, floodplains, wetlands, and recharge areas.
  - Protect the night sky from excessive light pollution.
  - Encourage the preservation of natural corridors for wildlife movement between habitats.
  - Consider the continued development and enforcement of zoning regulations, erosion control regulations, stormwater, and best management practices that preserve and protect wetlands, floodplains, natural areas, and other environmentally sensitive areas from the adverse effects of development.
  - Cooperatively work with federal, state, county, and tribal entities, along with other non-governmental organizations to establish invasive species management programs, education, and outreach for control of non-native invasive species (e.g., Emerald ash borer, Gypsy moth, Wild parsnip, Phragmites, etc.).
  - Support the cleanup and improvement of the Region's 300+ sites that contain contaminated soils and/or groundwater as identified by the WDNR.
  - Protect the Region's natural and agricultural resources as business and industrial growth occurs.
  - Consider the presence of the many karst features such as sinkholes, caves, swales, exposed bedrock, and fracture traces located within the Region prior to any development or other land use activities.
  - Encourage land use planning that limits sprawl, reduces emissions from driving, preserves habitat, limits fragmentation, and reduces the amount of paving and impervious surface.
  - Support efforts to mitigate climate change by encouraging more carpooling, biking, or walking which helps reduce greenhouse gas emissions from vehicles.
  - Encourage the protection and preservation of forests and wetlands which play important parts in capturing and storing greenhouse gases.
  - Explore efforts that will assist with adapting to a changing climate. Examples include updating stormwater infrastructure to handle larger floods and rezoning floodplains to reduce property damage due to increased flooding.
  - Support green infrastructure practices such as extended detention wetlands, retention ponds, use of rain barrels, installation of pervious pavement, and rain gardens.
  - Consider adaptive plant selections for forestry, stream buffers, and urban trees through climate matching (i.e., selecting species for the anticipated climate).
  - Continue to work with advocates to protect and preserve the Niagara Escarpment.
  - Encourage communities to reference the Niagara Escarpment Overlay Zoning Guide that was prepared by the BLRPC in 2011 as a tool to assist coastal communities and counties to delineate, develop, implement, and enforce Niagara Escarpment protection overlay zoning consistent with the laws of the state of Wisconsin.

## Resiliency Goal:

- Promote resilient communities, fostering a region able to withstand and recover from natural hazards.
- Objectives:**
- Assist counties in maintaining hazard mitigation plans that address the impacts of climate change.
  - Assist counties and municipalities with securing funding to improve resilience and sustainability through the implementation of projects.
  - Provide outreach on, or encourage the integration of, resilience best practices and strategies into county and municipal programs and operations.

## Woodlands / Forestry Summary:

- Prominent Forested areas in the Region include the Chequamegon/Nicolet National Forest, the Peshigo River State Forest, and Point Beach State Forest.
- As of January 2016, the WDNR identifies 324,043 acres of private land in the Bay-Lake Region being properly managed for timber, wildlife, water quality and a healthy environment through the forest tax law programs: the Managed Forest Law (MFL) and the Forest Crop Law (FCL).
- From 2013 to 2015, 90% of the 12,577 acres of forest land transactions in the Region were for land to continue as forest rather than diverted to other uses.

## Water Resources Summary:

- The Bay-Lake Region contains 1,314 lakes, over 300 major rivers and streams, and has over 400 miles of coastal shoreline along Lake Michigan and Green Bay.
- The Region contains 12 major watershed areas draining into the waters of Green Bay and Lake Michigan.

## Invasive Species

Invasive species have a wide range of adverse effects on the Region's environment and citizens including negative impacts to natural resources, costs of damage and management costs, aesthetics, and harm to human health, and the problem continues to grow with each new invasive species found. Invasive species impact core economic sectors including agriculture, forestry, manufacturing, and tourism.



## Polluted Runoff

Polluted runoff from agricultural lands, urban areas, industrial areas, and construction sites adversely impacts water quality in the Region causing toxic algae blooms, dead zones, fish kills, harmed ecosystems, impaired waterways for recreation, and human health threats.



## Outdoor Recreation Summary:

- The Bay-Lake Region boasts some of the most popular park and recreation facilities in the state. 13 state parks/recreation areas can be found in the Region, five of which are in Door County.
- The Region contains a number of popular local, state, and national trail facilities including the Old Plank Road Trail, Mountain Bay State Trail, Ahnapee State Trail, Nicolet State Trail, Fox River State Trail, Oconto River State Trail, Devil's River State Trail, and the Ice Age National Scenic Trail.



## Outdoor Recreation Strategy:

**Open Space Goal:** Provide for open space within the Region through the preservation of natural resources and the development and retention of parks and recreational lands.

- Objectives:**
- Encourage communities to provide and maintain parks and recreation and open spaces which are interconnected, accessible, well maintained, and safe.
  - Support the implementation of park and open space planning and encourage coordination of recreation planning between counties and communities.
  - Consider innovative development techniques such as Conservation by Design and open space development that will minimize land consumption for development and preserve open space in the Region.
  - Provide a variety of active and passive recreational opportunities.
  - Maintain an inventory of public access areas to the waters of the Region in order to facilitate preservation.

## Public Access Goal:

Provide public access to the many beautiful inland lakes, as well as Lake Michigan and the bay of Green Bay.

- Objectives:**
- Work with local units of government to maintain, enhance, and increase the level of public access so that all residents and visitors can enjoy these resources.
  - Assist with securing funds to purchase additional public access and protect and enhance existing access.

## Water Resources Goal:

Preserve, enhance, and improve surface water quality of the inland and coastal wetlands, lakes, rivers, and streams within the Region.

## Objectives:

- Work cooperatively with local communities, local associations, and state and federal agencies to ensure protection, restoration, and improvement of surface water resources.
- Monitor Lake Michigan water levels and work with communities and other stakeholders to study the physical impacts on shorelines and related socioeconomic impacts due to low and increased lake levels.
- Consider utilizing historic Lake Michigan level fluctuations as a basis for estimating future impacts and desired policy actions related to presumed future climate changes.
- Assist in efforts to maintain the natural beauty and integrity of Lake Michigan and the bay of Green Bay, while providing for sustainable public use and access.
- Work with state and local governments to identify areas of high erosion risk in Lake Michigan/Green Bay shoreline areas. Encourage the development of a coastal erosion management program which reduces developments and land use activities that could be at risk due to shoreline erosion and bluff recession.
- Support educational efforts that promote sustainable land use practices within the Region's watersheds.
- Work cooperatively with local communities, as well as state and federal agencies, to address known and potential contamination problems and to pursue additional protection and remediation measures.
- Consider resizing of stormwater drains and related infrastructure to accommodate increased storm flows and protect water quality.
- Encourage developments to identify any environmental constraints and plan environmental features into site plans.
- Support efforts that promote erosion control, buffer strips, easements, land use controls, flood controls, nutrient and sediment reductions.
- Encourage the protection of the Lake Michigan and the bay of Green Bay shorelines from negative impacts that may be associated with increased development.
- Manage riparian vegetation to promote stream bank and channel stability, reduce erosion and siltation, and protect streams from damage from high-flow events.
- Cooperatively work with federal, state, county, and tribal entities, as well as with other non-governmental organizations to establish invasive species management programs, education, and outreach for control of aquatic and wetland non-native invasive species (e.g., Phragmites, Zebra mussels, Eurasian water milfoil, Purple loosestrife, etc.).
- Work cooperatively with local communities, local associations, state and federal agencies, universities, etc. to educate and develop management strategies to reduce nutrient inputs (i.e., nitrogen and phosphorus) into coastal waters. Excessive nutrient pollution can result in hypoxia or "dead zones", which occur when levels of dissolved oxygen drop to a point where aquatic life cannot be sustained. Several causes of nutrient pollution include agricultural runoff, industrial waste, residential runoff, and wastewater treatment effluent.
- Stay informed of potential funding options with state and federal agencies for the development of hypoxia forecasts for Green Bay/Lake Michigan.
- Stay informed of changes in both global and regional climates and the potential of coastal and marine ecosystems becoming more vulnerable to hypoxic conditions as result.
- Continue to assist in monitoring and mitigation efforts to improve the health of the beaches in the Region.

## Groundwater Resources Summary:

- The Region's principal groundwater aquifers include the sand and gravel aquifer, the eastern dolostone aquifer, the sandstone and dolostone aquifer, and the crystalline bedrock aquifer.

## Groundwater Resources Goal:

Protect and improve the quantity and quality of the Region's groundwater resources.

**Objectives:**

- Support studies that monitor the number of wells being constructed or closed, and that measure the level of general water quality.
- Promote and support the development of wellhead protection plans and ordinances that prohibit uses with the potential to contaminate municipal wells.
- Support communities in the maintenance of existing sanitary districts and in the establishment of sanitary districts in more densely developing areas.
- Monitor the potential impacts of water table levels and the possible implications due to several municipal systems piping water from Lake Michigan versus extracting from groundwater aquifers.
- Work cooperatively with local communities, as well as state and federal agencies, to address existing and potential contamination problems and to pursue additional protection and remediation measures.
- Encourage riparian and watershed land use practices that promote infiltration of precipitation and recharge of groundwater to maintain or enhance groundwater inputs into springs, ponds, and streams.
- Work to provide information and education regarding Best Management Practices, water testing, and other measures local communities and property owners can implement to improve water quality.
- Promote the use of sound agricultural and soil conservation methods to minimize groundwater contamination.
- Encourage communities to consider the area's geologic make-up (e.g., bedrock type, soil composition, soil depths, topography, etc.) that can make soils susceptible to erosion and groundwater contamination or have an impact on surface water drainage.

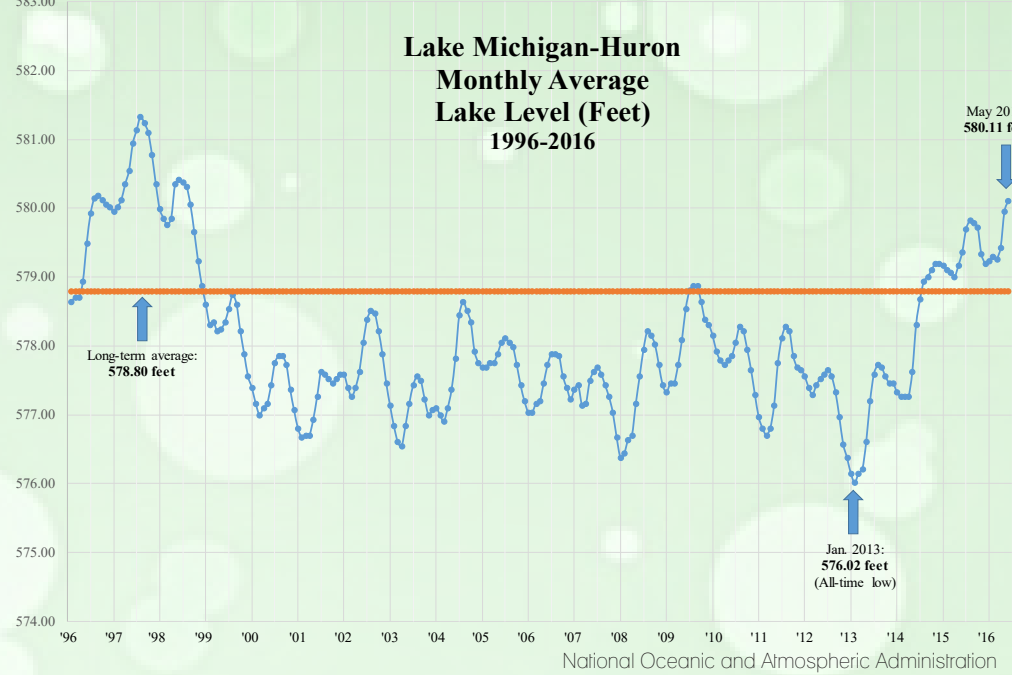


## Coastal Hazards

Coastal communities in the Region are faced with coastal hazards including flooding, storm surges, ice shoves, landslides, bluff and shoreline erosion, annually fluctuating lake levels, and coastal development pressure.



## Lake Michigan Water Levels



Lake Michigan water levels have risen dramatically since an all-time low of 576.02 feet in January 2013. This rebound is primarily due to the springs of 2013, 2014, and 2015 experiencing more precipitation than normal, more ice cover, and less evaporation. According to the U.S. Army Corps of Engineers, in May of 2016, Lake Michigan was 14 inches above the long-term monthly average of May.

- Fluctuating lake levels influence the shape and usage of the water and shoreline areas in various ways including:
  - shoreline developments;
  - shoreline/bluff and beach erosion;
  - impacts to coastal wetlands;
  - increased nonpoint pollution;
  - economic impacts (tourism, shipping, and recreation);
  - wildlife habitats; and
  - the unique historic and archeological resources of the area.

## Groundwater Resources Summary:

- The Region's principal groundwater aquifers include the sand and gravel aquifer, the eastern dolostone aquifer, the sandstone and dolostone aquifer, and the crystalline bedrock aquifer.

## Groundwater Resources Goal:

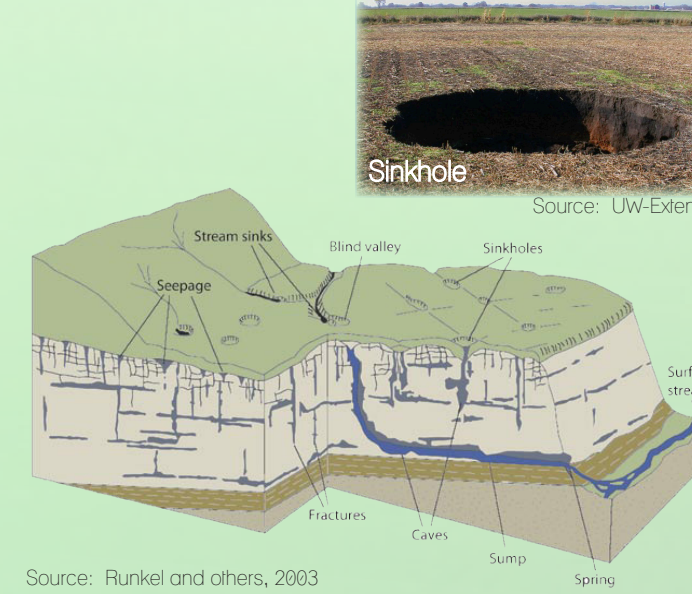
Protect and improve the quantity and quality of the Region's groundwater resources.

**Objectives:**

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- Promote and support the development of wellhead protection plans and ordinances that prohibit uses with the potential to contaminate municipal wells.
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- Work to provide information and education regarding Best Management Practices, water testing, and other measures local communities and property owners can implement to improve water quality.
- Promote the use of sound agricultural and soil conservation methods to minimize groundwater contamination.
- Encourage communities to consider the area's geologic make-up (e.g., bedrock type, soil composition, soil depths, topography, etc.) that can make soils susceptible to erosion and groundwater contamination or have an impact on surface water drainage.

## Land Management on Karst Landscape

Areas of karst landscape and thin soils in the Region are conducive to the spread of animal and human waste and environmental contaminants from the surface into groundwater. Therefore, land management activities on karst landscapes can have a direct impact on groundwater quality.



## Mining Goal:

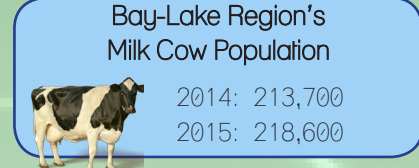
Present and future mining sites should not adversely affect the natural resources, transportation network, or the well-being of residents in the Region.

- Objectives:**
- Encourage communities working with mining operations to protect scenic views, local aesthetics, and the health of the natural environment when undertaking mining activities.
  - Promote efforts to provide information and education regarding the extraction of non-metallic resources.
  - Work cooperatively with local communities and state agencies to minimize the impacts of mining operations by ensuring the timely reclamation of abandoned mining operations through enforcement of non-metallic mining reclamation requirements.
  - Assist local communities with land use options for reclaimed mining locations.

# Agriculture

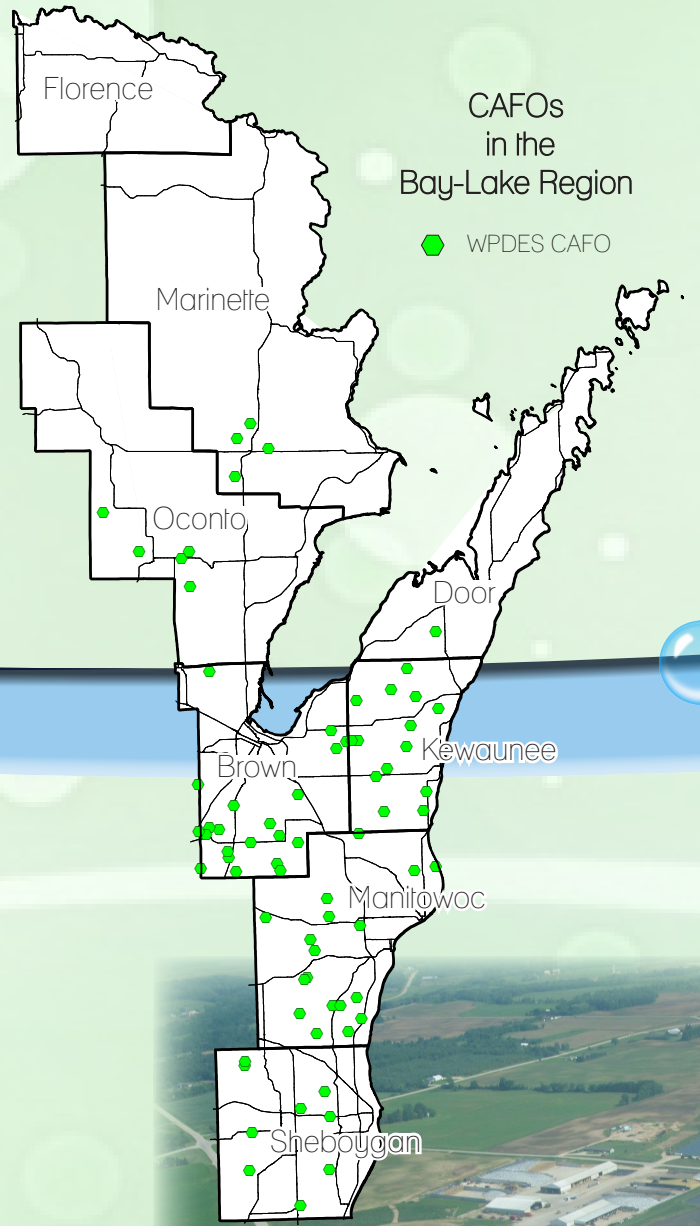
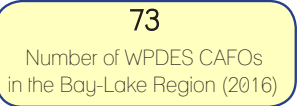
## Agriculture Summary:

- According to the 2012 USDA Census of Agriculture, 6,412 farms in the Bay-Lake Region manage and maintain over 1,245,600 farm acres (approx. 36% of the Region's total land).
- 97% of the 26,819 acres of agricultural land transactions in the Region from 2013 to 2015 was for continued agricultural use rather than converted to non-agricultural uses.
- The number of farms in the Region has declined by approximately 13 percent since the 2007 census of agriculture while the amount of farm acres also declined by nearly 5%. The average acreage of farms, however, increased over 9% percent from 2007 to 2012 (177 acres to 194 acres per farm).



## CAFOs

Wisconsin has become home to an increasing number of Concentrated Animal Feeding Operations (CAFOs). The WDNR defines a CAFO is any livestock or poultry operation with 1,000 or more animal units. The WDNR requires that CAFOs have a Wisconsin Pollutant Discharge Elimination System (WPDES) CAFO permit to ensure proper planning, construction, and manure management to protect water quality from adverse impacts.



# Cultural Resources

## Cultural Resources Summary:

Cultural resources are typically sites, structures, features, events, districts, and/or objects of some importance to a culture or community for scientific, aesthetic, traditional, educational, religious, archaeological, architectural, or historic reasons. The preservation of the Region's historic and cultural sites offers residents and visitors a special sense of place and a feeling of continuity and association with the past.

- The Bay-Lake Region and adjacent waters contain 218 sites, structures, features, shipwrecks, etc. listed in the State and National Register of Historic Places.



## Agricultural Resources Strategy:

**Goal:** Preserve existing productive agricultural resources and support the continuation of agricultural operations and agricultural support operations while minimizing environmental impacts.

## Objectives:

- Support coordinated efforts that identify the needs of local agricultural operators and ways of retaining and improving their farming operations through integration of nutrient management practices.
- Advocate for the use of sound farming and soil conservation methods to minimize surface and groundwater contamination and soil erosion. Encourage the adoption of local erosion control ordinances.
- Support and promote coordinated efforts with UW-Extension, DATCP Center for Land Use Education, and others to provide educational and technical materials to aid preservation and promotion of the agriculture industry in the Region.
- Work with state and federal regulatory agencies on the siting and impacts of large scale farming operations and provide assistance to local communities, as necessary.
- Work with communities to identify areas with prime agricultural soils that are most vulnerable to conversion to non-farm land uses.
- Encourage communities to designate orderly and well-planned growth areas which minimize scattered development that can cause conflicts with farming, including increased vehicular traffic and land use incompatibilities.
- Support the implementation of the certified farmland preservation plans by counties within the Region.
- Continue to support farmland preservation initiatives such as the Working Lands Initiative, through educational programs and workshops.
- Promote the economic importance of agriculture in the Region.
- Provide communities with information about adapting to climate change along with other evolving factors that could affect the future of farming, such as changes in agricultural practices and technology.
- Minimize the impacts of confined animal feeding operations on the ground and surface water resources in the Region.
- Monitor legislation on policies related to the size of farms and the number of livestock allowed within a certain area.

## Goal:

Minimize the potential for conflicts between rural landowners and farming.

- Advocate for non-farm development to occur in recommended development areas and not on productive agricultural soils.
- Limit land-use conflicts by communicating with prospective non-farm developments regarding the importance of agriculture in relevant areas and the related activities, farm equipment, noises, and odors, that they will likely experience living in an agricultural area.

## Cultural Resources Goal:

Encourage the protection, preservation, and enhancement of the Region's historic and cultural resources and their surroundings.

## Objectives:

- Support the efforts of local and county historic preservation groups to continue identifying and protecting historic resources.
- Work with the Wisconsin Historical Society to maintain and update the Region's inventory on historic and cultural resources.
- Encourage the preservation of recognized historic sites and structures while discouraging inappropriate development in historic and cultural areas.
- Encourage impact studies for development near important historic resources and encourage mitigation of potential adverse impacts to historic resources.
- Preserve historic landscapes and viewsheds that protect the context of the history of the Region.
- Encourage the development of design guidelines to preserve historic architecture and design patterns.
- Assist communities with linking historic and cultural resources to recreational areas to encourage access to the sites and knowledge of their significance, where appropriate.
- Assist communities with efforts to increase a sense of place through the incorporation of art in the community.
- Assist communities with intergovernmental collaboration to create more comprehensive promotion of cultural resources.