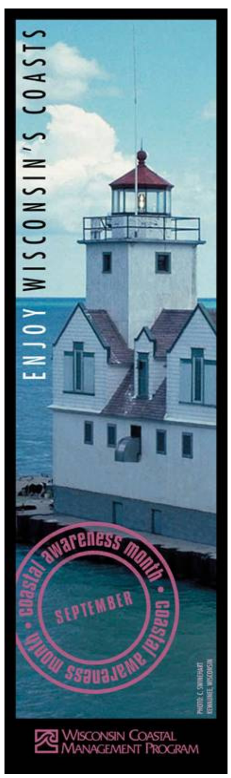
A Guide to Planning For Coastal Communities in Wisconsin



A Guide to Planning For Coastal Communities in Wisconsin

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I. INTRODUCTION

Starting in 2010, Wisconsin's local and regional governments must base decisions that affect land use on an adopted comprehensive plan. As a result there is an increase in planning activity as communities adopt new plans or update existing plans to be consistent with the new laws.

According to §66.1001 Wis. Stats., a local comprehensive plan includes at least the following nine elements: Issues and Opportunities; Housing; Transportation; Utilities and Community Facilities; Agricultural, Natural and Cultural Resources; Economic Development; Intergovernmental Cooperation; Land Use; and Implementation. The comprehensive plan definition is the same for cities, villages, towns, counties, and regional planning commissions. The definition is intended to provide local governments with a broad policy framework for addressing many of the issues that local governments confront on a daily basis. The definition is important because beginning on January 1, 2010, any program or action of a local government that affects land use must be consistent with that local government's comprehensive plan.

This comprehensive planning guide is for communities in Wisconsin within the coastal zone of the state. Coastal communities face unique challenges within the state when they prepare their comprehensive plans. Since the comprehensive planning statute does not address the preparation of a coastal element of a comprehensive plan, this guidebook is intended to help Wisconsin communities focus on coastal issues within each of the nine elements of their local Comprehensive Plans. This guidebook provides additional information for addressing coastal related issues within their plan. It provides reference information to the many resources available through federal, state, regional, county, and local programs that can help communities make informed decisions. It is not intended to constrain or dictate the manner in which local governments prepare their local comprehensive plan.

Other guides available for the required elements of a comprehensive plan include:

- **Guide to the Housing Element -** Available from the UW Dept. of Urban and Regional Planning at (608) 263-2627 or the Division of Intergovernmental Relations at (608) 267-2707. • Available on the Division of Intergovernmental Relations web site at http://www.doa.state.wi.us/.
- **Guide to the Transportation Element -** For more information, contact Bobbi Retzlaff, Wisconsin Department of Transportation, at (608) 264-7266 or bobbi.retzlaff@dot.state.wi.us. • Available on the DOT web site at http://www.dot.state.wi.us/dtim/bop/ planning-index.htm.
- **Guide to the Natural Resources Element -** For more information, contact Dreux Watermolen, Wisconsin Department of Natural Resources, at (608) 266-8931 or dreux.watermolen@dnr.state.wi.us . • Available on the DNR web site at http://www.dnr.state.wi.us/org/es/science/landuse/smart_growth/urbplan_bk.pdf.
- **Guide to the Intergovernmental Cooperation Element -** For more information, contact Erich Schmidtke, at (608) 264-6102 or erich.schmidtke@doa.state.wi.us. • Available on the Division of Intergovernmental Relations web site at http://www.doa.state.wi.us/.
- **Guide to the Economic Development Element - In progress.** • Target date for completion: Fall 2002. • For more information, please contact Roger Nacker, Wisconsin Economic Development Institute, at (608) 661-4626 or rnacker@msn.com;
- **Guide to the Historic/Cultural Resources Element -** For more information, contact Rick Bernstein, State Historical Society, at (608) 264-6506 or raberstein@mail.shsw.wisc.edu. Available on the State Historical Society web site at http://www.wisconsinhistory.org/
- **An Overall Guide to Completing a Comprehensive Plan compliant with §66.1001 and the Land Use Element - In progress.** • Targeted completion date: Summer 2003. For more information, contact Joanna Schumann, Division of Intergovernmental Relations, at (608) 264-6117.

Coastal resources relate to most, if not all, of the comprehensive plan elements. As a result, coastal resources may be addressed in numerous places in the comprehensive plan.

II. PLANNING FOR COASTAL RESOURCES

Coastal Management in Wisconsin

Wisconsin established its Coastal Management Program (WCMP) in 1978. The program leverages the abilities of state agencies, regional planners, universities and local governments for the management of resources along the state's 820 miles of Lake Michigan and Lake Superior shoreline. If left unmanaged, pressures from coastal populations would degrade water quality and wetlands, reduce sensitive habitats and limit opportunities for access to public waters. Coastal management fosters balance between development and natural resource protection in both urban and rural Wisconsin communities. The program employs a variety of means to meet its objectives:

Financial Assistance. Coastal management grants encourage the protection and wise use of Wisconsin's shoreline resources and increase the public's opportunity to enjoy the waters of our Great Lakes. The program emphasizes wetland protection and habitat restoration, nonpoint source pollution control and coastal land acquisition. It also promotes education, public access and historic preservation, and community planning.

Regulatory. The CZMA provides state coastal management programs with authority to review proposed federal government activities in the coastal zone. These reviews ensure federal actions along Wisconsin's coasts take place in harmony with state law and policies. The program also develops a sound base of information used by state and local officials to guide resource management decisions.

Research. The University of Wisconsin System – including UW- Sea Grant, UW-Superior, UW-Green Bay and the UW-Milwaukee Water Institute – lead in the study of critical coastal issues. Recent research addressed shoreline erosion, invasive species, coastal restoration and water quality. Coastal management connects local government with academic research to improve the Great Lakes environment.

Education. Great Lakes protection and preservation require the involvement of an enlightened citizenry. Coastal management informs the public of coastal issues and increases opportunities for citizen participation in decisions affecting Lakes Superior and Michigan. *Wisconsin Great Lakes Chronicle* demonstrates one way coastal management fosters public discussion.

Coastal Network. Wisconsin takes a networked program approach to its coasts. The WCMP acts as a facilitator among state agencies (e.g., Department of Natural Resources, Department of Transportation), local governments (including regional planning commissions) and others in the management of shoreline resources.

What is a Coastal Community?

In Wisconsin, an area is considered to be a coastal community if it is within a county having a shoreline on Green Bay, Lake Michigan or Lake Superior.

Local governments, including towns, villages and cities, often have limited experience with community planning. Communities in the Great Lakes' coastal regions of the state are additionally challenged by unique geographical and economic circumstances. A recent study by the University of Wisconsin-Madison, Land Tenure Center found a need for more training of coastal residents and officials on planning for the protection of coastal natural resources.

Wisconsin has about a third of its population residing in coastal counties. There are 15 coastal counties in Wisconsin with a total population of 2,470,435 people (2000) and a total land area of

> Section 304(1) of the Coastal Zone Management Act (CZMA) identifies the "coastal zone" as "the coastal waters (including lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelines of the several coastal states, and includes islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. The zone extends, in Great Lakes waters, to the international boundary between the United States and Canada."
>
> By definition, the zone "extends inland from the shorelines only to the extent necessary to control shorelands and the uses which have a direct and significant impact on the coastal waters. Excluded from the coastal zone are lands, the use of which is by law subject solely to the discretion of or which is held in trust by the federal government, its officers or agents" (CZMA, Section 304(l)).

15,394 square miles. Nine of the 20 largest counties and six of the ten largest cities in the state are located in coastal areas, including Milwaukee County, the most populated county in the state. During the last decade, four of the ten fastest growing counties were located along the coast. In addition:

- Wisconsin's fifteen coastal counties contain 40 percent of the state's population.
- A major portion of Wisconsin industry is located within the Great Lakes basin because of the abundant supply of clean, fresh water.
- Approximately 23 percent of Wisconsin's 5.3 million acres of wetland are located in the fifteen coastal counties.
- Approximately 2 million Wisconsin residents draw their drinking water from the Great Lakes.
- Many of Wisconsin's state parks are located on the Great Lakes.

Develop a Coastal Planning Team

To be most effective in identifying issues relating to coastal resources, it is vital to have a broad representation of interested parties participating in the development of the coastal element. To be most effective, represented interests to the coastal planning team should comprise the following: elected officials; developers or contractors; natural resource experts from WDNR, Wisconsin Coastal Management Program, Regional Planning Commissions; University of Wisconsin-Extension; local zoning officials and environmental organizations. Local universities may also have key faculty members with experience in coastal resources and research that could serve on the planning team.

- Establish legal framework for planning
  - Adopt written citizen participation procedures
  - Create a Plan Commission
- Data Collection
  - Complete a community facility inventory
  - Develop an inventory of existing regulations that affect land use
  - Inventory and review existing land use regulations that apply to the community
  - Document intergovernmental cooperation agreements
  - Compile past Comprehensive Plan documents - Outdoor Recreation Plan, Zoning Ordinance, Development Plan, Facilities Plan, etc.
- Educational Activities
  - Review successful grant applications for the Wisconsin Planning Grant program
  - Attend educational sessions on land use planning
  - Participate in adjoining communities' intergovernmental cooperation meetings
- Prepare and submit grants for planning work
  - State Planning Grant Program - http://www.doa.state.wi.us/
  - Wisconsin Coastal Management Program Grant - http://coastal.wisconsin.gov/
- Other Activities
  - Establish membership, duties and roles of planning sub-committees

Questions to ask about whom to involve include:

- How well are the coastal resources of the areas represented on these various bodies?
- Is there broad public representation?
- Is there representation of all or most sectors of the community?
- Are the ranges of people who will be impacted by this plan represented?
- Is there a need for a subgroup to study certain coastal issues?
- Should professional assistance, either in the form of a facilitator or a lead consultant to spearhead the process, be used?

Organize a Planning Team

The coastal planning team should begin their process with establishing important procedures towards developing information for the coastal element. What is the time duration for the team to accomplish its task? Who will run the meeting? Who will notify members of upcoming meetings and provide meeting summaries. After establishing the procedures the team should identify specifically their responsibility. Is the team developing background information for the coastal element or actually drafting the coastal element narrative as well?

Due to a diverse interest of parties on the coastal planning team, it is important that all sides have an opportunity to contribute. There are often differing views and opinions relating to issues. It is these views that lend to greater discussion and analysis of issues confronting the coastal resource you are planning for.

Visioning

Many planning processes will begin with a task referred to as "visioning". This task enables participants to identify values and issues they see relating to the coastal community, resulting in a list of direct topics the process will address. By identifying a vision, the direction the planning team and process will lead is identified.

Developing a vision relating to coastal resources may include asking questions such as:

- What are the critical coastal resources in our community?
- What are the coastal issues our community is facing now or may face in the future?
- Twenty years from now, what should our shoreline look like?
- Do we preserve or enhance the coastal resources in our community?

Coastal Resource Assessment

Once a community has established a vision for its coastal areas, the planning team should then undertake an inventory and assessment of the coastal resources in the community. The following chapters provide a description of coastal issues than may be addresses under each of the elements of a comprehensive plan. Each section provides a list of issues, a description of what the issue is and why it needs to be addressed. In addition, strategies for addressing the issue and a list of resources for further assistance and information are provided.

III. AGRICULTURAL, NATURAL, AND CULTURAL RESOURCES

Introduction

This element is a compilation of objectives, goals, policies, maps and programs for the conservation and promotion of the effective management of natural resources such as groundwater, forests, productive agricultural areas, environmentally sensitive areas, threatened and endangered species, stream corridors, surface water, floodplains, wetlands, wildlife habitat, metallic and nonmetallic mineral resources, parks open spaces, historic and cultural resources, community design, recreational resources and other natural resources.

Agricultural, natural and cultural resource issues in coastal areas affect many people and cover a variety of topics. As a community prepares its comprehensive plan, it needs to conduct an inventory of the issues it currently faces and anticipates facing in the next 20 years. Coastal issues can affect the shape and use of the shoreline, the effects of development on the coast, whether or not the community needs to put setback ordinances in place, and whether there are critical habitats and/or species that need special protection. This guide is designed to give an indication of the larger coastal issues facing communities and to offer some strategies for protecting or mitigating the impacts on them. These issues include: shore erosion, coastal wetlands, invasive species, lakes levels, non-point pollution, public access, and unique historic and archeological resources.

Issues

Shore Erosion

Shoreline erosion is a considerable problem along Wisconsin's great lakes coastlines. This natural process has been occurring for thousands of years, forming the unique and varied features of our Great Lakes coasts. In Wisconsin, the three general erosion types most prevalent are beach erosion, dune removal, and bluff retreat. The erosion process is often exacerbated by land use and land disturbing activities, which remove stabilizing vegetation, and expose coastal features to wave action. Problems can occur when structures are placed in close proximity to eroding beaches and cliffs.

Photo: UW Sea Grant, 2000.

Nearly 80 percent of the Great Lakes shoreline in Wisconsin suffer from shoreline erosion and/or bluff recession. Erosion rates in the sandy banks and unprotected high till bluffs of the Great Lakes shores are generally higher than that of the less vulnerable rocky coastal areas.

Identifying Shore Erosion

At this stage of the planning process, it is important to define and describe how local erosion processes impact shorelines and identify local areas of concern. A key to understanding local erosion problems is determination of the causes of shoreline erosion. Depending on shoreline type, location, and coastal geomorphology, these factors may include wind and wave action, upland runoff or ice and frost action. Local shoreline erosion may also be impacted by specific events such as storms. Long-term shoreline recession rate information is available from the Wisconsin Coastal Management Program's *Shoreline Erosion Study Technical Report*. Recent shoreline recession rate studies combining Geographic Information Systems (GIS) technology and aerial photography have yielded additional information about recession rates in some coastal areas.

In some cases, it will be possible to determine this through the interpretation of historical photography, shoreline recession records, or benchmarks. The inherent complexity of the natural systems at work in the coastal change process combined with a lack of data can often make the determination of normal erosion rates difficult.

Programs and Actions

The community has the option to regulate the use of shorelands and coastal areas beyond the minimum standards required under state law. Future planning should consider the existing shoreland regulations and identify future needs based on planning goals and objectives.

Under § 62.234 of the Wisconsin Statutes, cities and villages may enact a construction site erosion control and storm water management zoning ordinance. The purpose of such an ordinance is to protect water quality and to minimize the amount of sediment and other pollutants carried by runoff or discharged from construction sites to lakes, streams, and wetlands.

The authority to enact and enforce shoreland zoning provisions is set forth in Chapter 59.692 of the Wisconsin Statutes and Wisconsin Administrative Codes NR 115, 116, and 117. These standards apply to all lands within 1,000 feet of the ordinary high water line of a lake, pond or flowage or within 300 feet of a river or stream or the landward side of the floodplain whichever distance is greater. Sections NR 115 and NR 117 contain the standards for lot size, buffer strips, setback requirements and non-conformities. Individual cities and villages are required to adopt the general standards under NR 117, although many choose to adopt standards at least as restrictive as the state's. Wisconsin counties may choose to adopt their own shoreland standards, which must be at least as restrictive as the state standards.

Shorelines

Additional Sources of Information

- *Shore Erosion Study Technical Report*, Wisconsin Coastal Management Program (1977-1980, varies by county)
- *A Resource Guide for Great Lakes Coastal Hazards in Wisconsin*, University of Wisconsin Sea Grant Institute, http://www.seagrant.wisc.edu
- *Lake Michigan Shoreline Recession and Bluff Stability In Northeastern Wisconsin: 1996*, Bay-Lake Regional Planning Commission, 1997.
- Resources for Shoreland Restoration http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/restoration.htm

Photo: Bay-Lake RPC, 2001.

There are a variety of general shore-types in the Great Lakes region: High and low rocky bluffs (cobble & bedrock beach), low floodplains and coastal marshes (coastal swamps and Great Lakes marshes), high and low sand/till bluffs, sand dunes (sand beach & open dunes and wooded dune & swale), and artificial coastlines. Of the erodible shore-types, the two most common are sand/till bluffs and sand dunes. These shore-types are comprised of material deposited by glaciers over ten thousand years ago.

The various shore-types influence how the shoreline can best be managed and what options are available to a community for management of present and future development on the shoreline. Development is not necessarily restricted on the shoreline once an adequate setback has been established and the "shoreline" regarding development is redefined.

Shoreline Types

Cobble & Bedrock Beach

The Great Lakes limestone that forms cobble-bedrock beaches is part of a large geologic formation called the Niagara Escarpment. This formation is responsible for the cliffs of the Door Peninsula and Niagara Falls in New York. Limestone is chalky and calcium-rich and erodes to make soils that are highly alkaline. Such soils help provide habitat for a number of rare plants, some found only along Lake Michigan. Only certain plants can survive in the chalky, calcium-rich soil on these rocky beaches, which are constantly exposed to wind, ice, changing lake levels and lapping waves. Birds perch in nearby trees from which they can fly to feed on insects, frogs or fish in neighboring marshes, swamps or forests. Animals utilize cobble-bedrock beach for many reasons, such as a travel and feeding corridor.

Conifer Swamp

Conifer swamp is a wooded wetland dominated by coniferous trees such as Northern white cedar, tamarack, balsam fir, and black spruce. Conifer swamps contain a waterlogged soil that is rich in nutrients and organic matter. Since conifer swamps are typically found in the floodplains of rivers and lakes, their soils frequently receive nutrients from early spring flooding. Conifer swamps are common on shorelines adjacent to Great Lakes marsh as well as inland around ponds, streams, and lakes. The plant life of the conifer swamps supports a variety of animals. Birds enjoy the density and variety of trees to feed, rest, and nest. The shallow waters in this natural community are also good feeding, breeding and egg-laying areas for amphibians.

Great Lakes Marsh

Great lakes marsh is an increasingly rare freshwater natural community of the Great Lakes watershed. This natural community can extend over several square miles and usually occurs in protected or semi-protected bays or at the mouth of a river. Freshwater marshes are the third most productive ecosystem on earth (in terms of vegetation biomass), after tropical rainforests and saltwater estuaries. Great Lakes marshes include submerged plants, emergent plants and terrestrial plants, all of which are dependent on natural water level fluctuations. A line of trees is usually found at a marsh's high water mark. The high productivity and variety of bulrushes, sedges, and other plant life in a marsh make it an important habitat for numerous insects. They in turn serve as the base of the food chain for larger animals like fish, songbirds, waterfowl, and mammals. Marshlands have a high production rate of plant and animal life. Emergent and submerged plants provide essential cover, spawning grounds and feeding areas for many native fish. The reeds, rushes and sedges in a Great Lakes marsh provide cover for the nesting of several kinds of birds.

Sand Beach & Open Dunes

The collection of freshwater sand beaches and open dunes in the Great Lakes watershed is the largest in the world. Sand beaches and open dunes are closely linked ecologically and in the way they are formed. Sand beaches form when small pebbles and sand are deposited on sheltered shores and bays by wind, waves, and near-shore currents. Dunes form above the sandy beach as winds blow eroded and dried sands inland. These sandy areas are subject to constant change from erosion. Although erosion is a natural process, overuse of these areas, particularly dune areas, accelerate erosion and destroy plant life. This is a highly dynamic natural community based on sand. The movement of sand ranges from free-blowing sand to sands that have become stabilized by plants. Despite strong wind, blowing sand, waves and severe extremes of drought and flooding, many plant species have specialized adaptation to these conditions. As early colonizing grasses develop and begin to hold more sand on dune ridges, woody plants such as white pine trees can grow. Despite inhospitably hot, cold, dry, wet and windy conditions, insects inhabit this area. Sandpipers, plovers, and other shorebirds feed on the insects and plants at the water's edge and in interdunal wetlands. Several kinds of shorebirds also nest along the beach or in the dunes.

Wooded Dune & Swale

Wooded dune and swale is a natural community that began developing in certain sheltered, shallow, sand-receiving bays when Great Lakes water levels were higher than they are today. As lake levels dropped, new dunes formed in front of older ones, creating long, parallel ridges a mile or more deep. Slowly, over thousands of years, dune and swale habitat formed through the combined processes of water level changes, sand deposition, and wind. Today the higher, gently-rolling dunes are covered by a mixture of conifer and deciduous trees, while the low-lying swales contain conifer swamps, wet meadow and marshes. Swales are low troughs between two successive dunes, forming a marsh that often resembles a Great Lakes marsh but is less dependent on lake-level fluctuations to maintain itself. Dry lands and wetlands sit side by side in a wooded dune and swale community, which provides a unique concentration of homes for plants and animals. The wetlands of this habitat are often close to Great Lakes shorelines and consequently support many insects and small amphibians that provide food for area birds, mammals, reptiles and fish within the shoreline ecosystem.

The geomorphology of a coastal area affects, or influences, how waves interact with the coast. As waves that are generated in deep water enter the shallow water region near the shoreline, they begin to dissipate, or lose, energy through contact with the bottom. How and where the wave energy is dissipated depends on such hydrographic factors as the shape of the beach profile, and bottom composition.

Programs and Actions

Just as with erosion, the community has the option to regulate the use of shorelands and coastal areas beyond the minimum standards required under state law. Future planning should consider the existing shoreland regulations and identify future needs based on planning goals and objectives.

Under § 62.234 of the Wisconsin Statutes, cities and villages may enact a construction site erosion control and storm water management zoning ordinance. The purpose of such an ordinance is to protect water quality and to minimize the amount of sediment and other pollutants carried by runoff or discharged from construction sites to lakes, streams, and wetlands.

Additional Sources of Information

- *Design Recommendations for Riparian Corridors and Vegetated Buffer Strips*. US Army Engineer Research and Development Center. 2000.
- *Vegetated Stream Riparian Zones: Their Effects on Stream Nutrients, Sediments, and Toxic Substances, An Annotated and Indexed Bibliography of the world literature including buffer strips, and interactions with hydroporheic zones and floodplains* . Smithsonian Environmental Research Center. April 1999.
- *A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation*. University of Georgia, Institute of Ecology, Office of Public Service and Outreach. March 1999.
- *Chesapeake Bay Riparian Handbook: A Guide for Establishing and Maintaining Riparian Forest Buffers*. USDA Forest Service. June 1998.

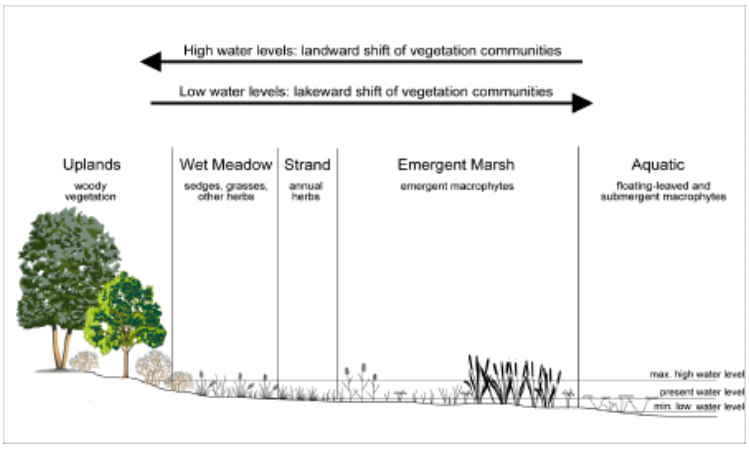
Coastal Wetlands

Coastal wetlands are highly productive natural systems that sustain a wide variety of plant and animal life and provide critical ecological services. Coastal wetlands vary in size and type; with each having its own physical and chemical characteristics, wildlife, and plants. Wetlands not directly adjacent to coast can be categorized as coastal due to their hydrologic connectivity to lake and the fact that they provide habitat for coastal species. Common wetland types found within the Great Lakes region include: marshes, bogs, fens, sedge meadows, shrub swamps, hardwood swamps, coniferous swamps, spring seeps and others. Wetland communities specific to the coasts of the Great Lakes include freshwater estuaries, interdunal wetlands, ridge and swale systems, and lakeplain prairies. Coastal wetlands serve many critical functions such as: runoff and flood control, water quality and quantity protection, nutrient storage, and habitat for plants and animals, including several threatened and endangered species. Coastal areas serve as migratory corridors for birds, and wetlands provide habitat requirements for these seasonal visitors.

Identifying Coastal Wetland Areas

The Wisconsin Department of Natural Resources – Bureau of Endangered Resources recently completed a project to assess existing coastal wetland information and determine ecologically significant coastal wetland sites in the Lake Superior and Lake Michigan basins of Wisconsin.

The 3-phase study resulted in the identification of 64 primary coastal wetland sites (36- Lake Superior, 28 –Lake Michigan). The significance of the sites was determined based on the current level of information available, and was based in part on the presence of NHI (National Heritage Inventory) related information including: rare plants, animals, communities and other natural features. Coastal wetlands were given a "prioritization ranking", based on ecological significance. The result is a list of the top ten coastal wetland sites for both basins, which are referred to as "priority coastal wetlands".



Source: WDNR, 2002.

A key to understanding local wetlands is to understand the composition (species, communities, natural features) of local wetlands and the natural processes occurring. This should include identification of rare, threatened or endangered species present at the local level and seasonal species (i.e. migratory birds). Additionally, the relationships between these wetlands, water quality and land use should be examined in order to identify required protection measures. Finally, threats to local wetland communities should be assessed (existing and future) as a means of further identifying the protective measures which may be needed given changes in land use.

Programs and Actions

The State of Wisconsin and the federal government regulate activities that may adversely impact wetlands. Authority to regulate wetland activities depends on the locational characteristics of the wetland. "Isolated" wetlands, those not connected to a larger body of water are regulated by the Wisconsin Department of Natural Resources (2001 Wisconsin Act 6); all others are under federal jurisdiction (Section 404 of the Clean Water Act). The United States Army Corps of Engineers makes a determination whether a wetland is under federal or state jurisdiction.

Cities and villages in Wisconsin are required to protect at least all unfilled shoreland wetlands within their municipal borders that are larger than five acres and identified by the WDNR's final wetland inventory maps. Local jurisdictions do have the authority to regulate wetlands through zoning ordinances as long as the ordinances are not less restrictive than state requirements under 61.351 and 62.231 Wisconsin State Statutes and NR 117 Wisconsin Administrative Code.

Counties in Wisconsin are required to include wetland protection provisions for wetlands within shoreland areas as part of their county shoreland zoning ordinances.

Additional Sources of Information

- *A Data Compilation And Assessment Of Coastal Wetlands Of Wisconsin's Great Lakes,* Wisconsin Department of Natural Resources, N. Merryfield (2000) http://www.dnr.state.wi.us/org/land/er/publications/cw/
- Epstein, E., W. Smith, and E. Judziewicz. 1997. *Priority Wetland Sites of Wisconsin's Lake Superior Basin* Wisconsin Department of Natural Resources - Bureau of Endangered Resources. Madison, WI. 66 pp.
- Epstein, E., W. Smith, and E. Judziewicz. 1997. *Wisconsin Lake Superior Coastal Wetlands Evaluation* Wisconsin Department of Natural Resources - Bureau of Endangered Resources. Madison, WI. 330 pp.
- Shideler, G. 1992. *Critical Coastal Wetland Problem Areas along the Michigan-Wisconsin Shoreline of Lake Michigan, and Their Prioritization for Further Study*. U.S. Geological Survey. Denver, CO. 10 pp.
- A variety of information about coastal wetlands is available from the United States Environmental Protection Agency web page at http://www.epa.gov/glnpo/ecopage/ in the 1998 EPA publication *Biodiversity Investment Areas, Aquatic Ecosystems,* available for download at http://www.epa.gov/glnpo/ecopage/index. html.
- *Between Sky and Shore: Wisconsin's Coastal Wetlands* http://www.wnrmag.com/supps/1996/apr96.htm - A special section of the April 1996 issue of *Wisconsin Natural Resources* magazine. Briefly describes coastal wetland ecology and identifies areas where you can tour a coastal wetland.
- *Protecting Wetlands Along the Great Lakes Shoreline* http://web4.msue.msu.edu/mnfi/pub/pdfs/wetland.pdf - A brochure produced by the Michigan State University Extension. Describes why coastal wetlands are important.
- *Great Lakes Fact Sheet: Great Lakes Coastal Wetlands* http://www.on.ec.gc.ca/wildlife/factsheets/fs_coastal_wetlands-e.html – This site by Environment Canada provides an in-depth look at coastal wetlands.
- *A National Strategy to Restore Coastal and Estuarine Habitat* http://www.estuaries.org/downloads.php - Restore America's Estuaries is a national nonprofit organization dedicated to preserving the nation's network of estuaries by protecting and restoring the lands and waters essential to the richness and diversity of coastal life. Chapter 4 of this document contains a section that analyzes estuarine habitat in the Great Lakes region.
- *Door County Coastal Wetlands* http://www.madisonenvironmental.com/cwres.htm - Many of the resources available for Door County are applicable to the Upper Green Bay Basin. The site contains links to a wide range of useful publications and web sites.
- *Lake Huron Centre for Coastal Conservation* http://www.lakehuron.on.ca/biodiversity/coastal-wetlands.asp Coastal Wetlands page - This page describes how fluctuating water levels can affect coastal ecosystems, and describes some of the other important roles coastal wetlands play in supporting Great Lakes ecosystems.
- *Great Lakes Coastal Wetlands Consortium of the Great Lakes Commission* http://www.glc.org/wetlands/year1overview.html - Read the latest news about the Great Lakes Coastal Wetlands Consortium. This group is developing a long-term strategy for monitoring Great Lakes coastal wetlands.
- *Wetlands in the Great Lakes Region* http://www.great-lakes.net/envt/air-land/wetlands.html - The Great Lakes Information Network maintains a page devoted to Great Lakes Wetlands - find the latest news and lots of great links!
- *The Wetlands Initiative* http://www.wetlands-initiative.org/pages/page51.html - The Wetlands Initiative provides an excellent publication, entitled "Living with Wetlands," at this web page. The Wetlands Initiative is a nonprofit corporation based in northeast Illinois.
- *Great Lakes Coastal Wetlands* http://www.miseagrant.org/wetlands/index.html - This site is maintained by Michigan Sea Grant. Many useful publications are available at this site, including "Great Lakes Wetlands: A Field Guide" (available to order for $10).
- *Wisconsin Wetlands Association* http://www.wiscwetlands.org/index.htm - Learn about the different types of wetlands found in Wisconsin, keep up to date on local wetland events and educational opportunities, and find a variety of wetland resources (including web sites, journals, and guides) at the Wisconsin Wetland Association's web site.

Invasive Species Management/Mitigation

Over 140 species of non-indigenous (exotic) plants and animals have become established in the Great Lakes. These species typically enter the Great Lakes through the ballast water of commercial vessels. Exotic species are nearly impossible to eradicate, although some species may be controlled to a limited extent through the use of barriers, chemicals, physical removal and education. Exotics such as the sea lamprey, zebra mussel and Purple Loosestrife are examples of non-native species that quickly adapted to survive in the Great Lakes region. Environmental and economic problems caused by exotics include: displacement of native species, impairment of water-based recreation such as fishing, navigation and flood control problems; degradation of water quality and fish and wildlife habitat.

Identifying Invasive Species

Coastal communities need to be aware of exotic species that exist in their area, those which may infiltrate coastal waters in the future (i.e. Asian Carp) and the potential economic, social and recreational impacts these species present. Identify species known to be present and document the spatial distribution of these species. This information can be used to assist resource managers and local decision-makers in defining eradication and control strategies.

This shopping cart was left in zebra mussel-infested waters for a few months. The mussels have colonized every available surface on the cart. Source: Wisconsin Sea Grant

Programs and Actions

In Wisconsin, it is illegal to introduce non-native fish or wild animals without receiving a permit from the Wisconsin Department of Natural Resources. A range of state and federal legislation exists to control the spread of non-native aquatic and terrestrial plants and animals. State legislation of invasive species pertains to all state waters, including the Great Lakes. State statues related to invasive species in Wisconsin are §23.23 Purple Loosestrife, §23.235 Nuisance Weeds, §30.715 Placement of boats, trailers, and equipment in navigable waters and §60.0407 Noxious Weeds.

Federal requirements include the Non-indigenous Aquatic Nuisance Prevention and Control Act (NANPCA), passed in 1990 and reauthorized under the National Invasive Species Act (NISA) of 1996. In May of 1993 the U.S. Coast Guard (USCG) issued mandatory exchange regulations for vessels wishing to enter the Great Lakes that carried ballast water and had operated on waters outside the U.S. Exclusive Economic Zone (EEZ).

Examine local level regulatory requirements related to the use of exotic plants in landscaping. Consider regulatory approaches related to the translocation of exotic plant and animal species in order to prevent the further spread of non-native organisms.

Additional Sources of Information

- The Wisconsin DNR has established a web site citing almost 100 invasive species, both native and exotic, that are currently found in the state, http://www.dnr.state.wi.us/org/land/er/invasive/
- Sea Grant National Aquatic Nuisance Species Clearing House, http://www.cce.cornell.edu/programs/nansc/nan_ld.cfm
- U.S. Geological Survey Upper Midwest Environmental Sciences Center, http://www.umesc.usgs.gov/invasive_species.html
- Minnesota Sea Grant, http://www.seagrant.umn.edu/exotics/
- Sea Grant National Aquatic Nuisance Species Clearing House, http://www.cce.cornell.edu/programs/nansc/nan_ld.cfm
- The Ohio State University Sea Grant, http://www.sg.ohio-state.edu/publications/topics/ts-nuisance.html
- Great Lakes Information Network, http://www.great-lakes.net/envt/flora-fauna/invasive
- U.S. Fish & Wildlife Service and National Oceanic and Atmospheric Administration Aquatic Nuisance Species Task Force, http://anstaskforce.gov/

Develop low-cost materials to help lake-users identify new plant or animal invaders as soon as possible, when eradication is still possible without tremendous expense.

Control and management of invasive species will require a coordinated approach. Participate in educational sessions, open forums and discussion with other units of government in the lake basin and support state and federal programs and legislation to prevent and control exotic species.

Lake Level Fluctuations

Lake level fluctuations in the Great Lakes are a direct result of natural climatic cycles. This natural process is important to the health and viability of coastal ecosystems, such as wetlands, but may pose problems for coastal property and development.

Lake levels in the Great Lakes have been steadily decreasing since the late 1990s, with Lake Michigan achieving its lowest levels in nearly 35 years. Present low lake levels are primarily the result of lower precipitation levels coupled with higher average temperatures, which lead to increased evaporation. Low lake levels may impact commercial shipping, harbors and marinas, and the disposal of dredging materials. Conversely, higher than normal lake levels pose additional problems for coastal areas, including coastal flooding. Elevated water levels expose new portions of the shoreline to erosive power of wave action, greatly contributing to shoreline erosion. Erosion problems are exacerbated by storm surges and wind, which further increase wave action.

Lake Level Impacts

Lake level fluctuations can have a variety of impacts at the local level. Low lake levels can have an impact on shipping requiring more dredging and requiring lighter loads; marinas are impacted by the need to keep channels clear and to extend docks and piers impacting both commercial fishing and recreational boats. High water levels can increase damage from wave run-up, flooding and storm surges as well as impacting the location, magnitude and potential damage associated with coastal flooding. Coastal wetlands, and fish and wildlife habitat are impacted by both high and low water levels. Low water levels increase the exposure to coastal hazards. High water can affect coastal recession rates.

At a local level, it is important to assess the relative degree of flood risk for coastal areas as part of the planning process as well as the impact of low water on the socio-economic resources of the community.

Programs and actions

Future development and land use activities in coastal areas should be regulated in accordance with the degree of flood risk in order to protect human life, safety and to protect coastal investments. Procedures for determining flood risk are outlined in the Coastal Processes Manual, published by the University of Wisconsin Sea Grant Institute.

Comm. 21.33 of the Wisconsin Administrative Code regulates the construction of dwellings in floodplains while Comm 21.34 regulates all dwellings constructed in coastal floodplains and indicates that they “shall be designed by a registered architect or engineer and shall meet the requirements of this section and s. Comm 21.33.”

Additional Sources of Information

- Data related to Great Lakes water levels can be found at the US Army Corps of Engineers (USACOE) web page http://huron.lre.usace.army.mil/levels/hmpglv.html and the National Oceanic and Atmospheric Administration (NOAA) web site http://www.glerl.noaa.gov/data/now/wlevels/levels.html
- *Coastal Processes Manual, A Training Manual for Evaluating Coastal Property*, by J. Philip Keilor and Allen H. Miller, University of Wisconsin Sea Grant Institute, WIS-SG-87-430 (1987)

Nonpoint Source Pollution

Nonpoint source pollution is defined as pollution that comes from many different diffuse sources. It is the principal cause of water quality problems in the State of Wisconsin and a significant problem in the Great Lakes. Runoff containing contaminants and sediments from agricultural and urban land uses are washed into the Great Lakes and into tributaries choking wetlands and waterways and degrading fish and wildlife habitat. Atmospheric deposition of chemicals such as mercury and acidic compounds also contribute to nonpoint source pollution problems in the Great Lakes.

Economically, nonpoint pollution costs millions of dollars each year through lost recreational opportunities, tourism and jobs, flooding, dredging, reduced agricultural production, and higher industrial and municipal water pretreatment costs.

Though soil erosion and sedimentation are natural processes, their rates can be significantly altered by land use practices. When rural and urban land-use and development activities are not addressed properly, the processes can be greatly accelerated. Intensive agricultural production, timber harvesting, mining, construction and other land disturbing activities greatly increase the impact of erosion and sedimentation on Great Lakes waters.

Photo: Brown County Land Conservation, 2001.

The physical impact of soil erosion and sedimentation is further magnified when rural and urban land runoff carries with it other contaminants, such as oxygen demanding organic wastes, phosphorus and nitrogen, toxic chemicals from manufacturing and industrial processes, pesticide and herbicide residues and heavy metals. Many of these pollutants are transported into the Great Lakes, their tributaries and their bodies of water in the basin.

Assessing and Identifying Nonpoint Pollution

Local nonpoint source pollution sources in coastal waters include agricultural activities, urban runoff, faulty septic systems, forestry, marinas and recreational boating, physical changes to stream channels, and habitat degradation, and the destruction of wetlands and vegetated areas near streams and coastal shoreline. This inventory should include coastal and estuary NPS discharge locations (municipal, industrial) toxic release sites, hazardous waste sites, Superfund sites, PCS (water discharges). Further investigation could include an examination and analysis of:

- beach closures
- contaminated coastal dredge materials associated with harbor development/improvement
- fish consumption advisories
- excessive aquatic vegetation

Runoff Management Program

- NR120: Priority Watershed and Priority Lake Program
- NR151: Runoff Management defines agricultural performance standards and prohibitions, non-agricultural performance standards, transportation facility performance standards and a process for the development and dissemination of non-agricultural technical standards.
- NR153: Targeted Management Grant Program: policies and procedures for administration of urban portions of priority watershed and lake projects and a newer grant program.
- NR155: Urban Nonpoint Source and Storm Water Management Program: procedures and criteria for a grant program to control polluted urban runoff. Note: Proposed NR 153 and NR 155 are combined under one order. Page numbering from NR 153 continues in NR 155.
- NR154: Best Management Practices, Technical Standards, and Cost-Share Conditions: lists acceptable best management practices, technical standards, and cost-share conditions for projects outlined in NR 120, NR 153, and NR 155.
- NR216: Storm Water Discharge Permits: requires certain municipalities, industries, and construction sites to follow the non-agricultural performance standards as part of their storm water permits.
- NR243: Animal Feeding Operations: adds the NR 151 performance standards and prohibitions to the Manure Management Program.
- ATCP 50: A companion administrative rule, developed by the Department of Agriculture, Trade and Consumer Protection (DATCP).

Programs and Actions

Wisconsin's Coastal Nonpoint Source Pollution Control Program integrates nonpoint source (runoff management) programs developed by the Wisconsin DNR with the Wisconsin Coastal Management Program. Wisconsin's runoff management regulations are designed to minimize pollution of the Great Lakes and its tributaries by implementing design standards and best management practices for agricultural, urban and stormwater management activities. Coastal communities can use grants from Wisconsin DNR to assist with implementation of state runoff management measures, and will benefit from improved water quality.

The governments of the United States and Canada entered into an agreement related to trans-boundary air pollution. The agreement set emission limits and emissions reduction standards for the US and Canada boundary regions. International water quality programs include the Great Lakes Water Quality Agreement of 1978. The agreement was designed to restore and enhance water quality in the Great Lakes system through the elimination or reduction of pollution discharges into the Great Lakes System. Finally, the North American Agreement on Environmental Cooperation between the US, Canada and Mexico was signed by all three nations in order to promote pollution prevention policies and practices.

Emissions limitations and air quality protection are governed under the Clean Air Act of 1972 and the Clean Air Act amendments of 1990, which were designed to curb three major threats to the nation's environment and to the health of millions of Americans: acid rain, urban air pollution, and toxic air emissions. The proposal also called for establishing a national permits program to make the law more workable, and an improved enforcement program to help ensure better compliance with the Act. The Clean Water Act of 1972 posed sweeping measures aimed at water pollution prevention and control and established the framework for regulating discharges of pollutants into the waters of the United States. The Act gives the EPA the authority to implement pollution control programs such as setting wastewater standards for industry.

The State of Wisconsin has a Runoff Management Program which are covered under a set of eight Administrative Rules.

To meet the requirements of the federal Clean Water Act, the Wisconsin DNR developed the Wisconsin Pollutant Discharge Elimination System (WPDES) Storm Water Discharge Permit Program which is regulated under the authority of NR 216, Wis. Adm. Code. As part of the EPA National Pollutant Discharge Elimination System, the WPDES Storm Water Program regulates discharge of storm water in Wisconsin from construction sites, industrial facilities, and selected municipalities.

Beyond regulatory storm water management, the Department also supports a wide variety of voluntary storm water management activities. These include projects funded through the Urban Nonpoint Source and Storm Water and Targeted Runoff Management Grant Programs. The University of Wisconsin Extension and EPA Office of Wetlands, Oceans, and Watersheds have additional information available about storm water management from the scale of a residential rain garden through construction site erosion control plans for multi-acre construction sites.

At the local level, communities can undertake a number of activities to help control nonpoint source pollution. These activities include promoting awareness through education programs to increase landowners' knowledge of nonpoint source pollution issues and conservation practices they can apply to reduce pollution providing training opportunities for local officials and road supervisors to address runoff from rural roads, promoting awareness of "best management practices" (BMPs) related to the protection of water quality, and undertaking stormwater management planning. The Wisconsin Coastal Management Program provides grant funding for nonpoint source pollution control to communities within the Coastal Zones of Lake Michigan and Lake Superior on an annual basis.

Best Management Practices

Best Management Practices (BMPs) are defined as techniques or measures which are determined to be the most effective means of preventing or reducing pollutants generated from nonpoint sources. Best Management Practices and upland erosion control may decrease the amount of sedimentation and pollution to a community's rivers, harbors and ports.

Different BMPs are used depending on whether an area is rural or urban. In rural areas, BMPs may range from alterations in farm management to engineered structures. Rural BMPs are generally specific to landowner situations. The Brown County Land Conservation Department, as an example, will assist owners, managers and renters of agricultural lands in constructing and implementing BMPs. In urban areas, control practices may range from alterations designed to detain pollutants or slow flows to housekeeping practices to governmental controls. The Wisconsin Department of Natural Resources assists local units of government in the development of urban nonpoint pollutant source control measures. Cost-share programs also exist to help landowners and municipalities with the cost of implementation. Eligibility for the cost sharing of BMPs will depend on whether pollutant loads from their lands fall into the established pollutant reduction ranges set for each nonpoint source category. Cost-share funds are available through the Wisconsin Nonpoint Source Water Pollution Abatement Program.

In urban areas, there are both non-structural and structural BMPs. Non-structural practices involve individuals' actions and behaviors. This would include prevention methods that are less expensive and improve the environment.

Structural practices involve devices that can be designed and built to improve water quantity and quality.

Structural BMPs

- Stormwater detention ponds (ponds that remain wet and store water from storms);
- Dry basins (ponds that dry out between storms);
- Artificial wetlands;
- Water quality inlets;
- Oil and grease trap catch basins;
- Infiltration practices;
- Vegetative practices; and
- Construction site erosion controls.

Non-Structural BMPs

- Conservation of lands;
- Protection of stream banks;
- Preservation of wetlands;
- Street sweeping that collects harmful particles from cars;
- Keeping leaves and grass clippings out of the storm sewers;
- Recycling toxins, such as oil and pesticides;
- Washing municipal vehicles so that wastewater is collected and properly disposed;
- Enforcing ordinances about pet waste and construction erosion;
- Directing downspouts to grassy areas;
- Covering piles of coal and salt;
- Properly discard pet waste; and
- Traveling together in car pools.

Best Management Practices for rural areas are those identified in Wisconsin Administrative Code Chapter NR 120 which are determined in the watershed plan to be the most effective controls of the nonpoint sources of pollution. Rural BMPs include:

- Contour Farming
- Contour and Field Stripcropping
- Reduced Tillage
- Critical Area Stabilization
- Grassed Waterways
- Grade Stabilization Structure
- Livestock Exclusion from Woodlots
- Shoreline and Streambank Stabilization
- Terraces
- Field Diversions
- Barnyard Runoff Management
- Manure Storage Facility
- Agricultural Sediment Basins
- Animal Lot Relocation
- Roofs for Barnyard Runoff Management and Manure Storage Facilities
- Nutrient Management
- Pesticide Management
- Wetland Restoration
- Shoreline Buffers

Stormwater Management

Successful stormwater management projects employ a variety of small and relatively inexpensive corrective measures that can cumulatively make a very large difference by reducing flooding, enhancing groundwater recharge, and improving water quality in lakes and streams. These measures include:

- Require better erosion controls during construction
- Improve litter control
- Increase strategic street sweeping
- Direct roof downspouts to lawns
- Infiltrate water through raingardens
- Reduce lawn compaction
- Plant prairie vegetation
- Install porous pavement and pavers

Additional Sources of Information

Nonpoint source pollution information:

- http://www.ecn.purdue.edu/runoff/documentation/nps.htm
- http://www.dnr.state.wi.us/org/water/wm/nps/
- http://www.dnr.state.wi.us/org/water/wm/nps/rules/NRrules.html
- Stormwater pollution in your home and community, - http://www.epa.gov/owow/nps/dosdont.html
- Wisconsin Coastal Management Program - http://coastal.wisconsin.gov

Coastal Historical/Archeological Resources

Coastal communities are often rich in cultural heritage resources. These resources include sites, structures or landscapes of historic or archaeological significance. Cultural heritage resources serve as significant components of the coastal tourism and recreation base. Planning within coastal communities should address the preservation, restoration, and enhancement of these resources. These resources can include historic structures along the coast such as a lighthouse or a submerged structure such as a shipwreck in addition to archeological sites found in caves and beach areas.

Programs and Actions

Photo: Port Washington Historical Society

Protecting both archeological and historic structures can be accomplished through many different means. Subdivision ordinances can contain a clause regarding archeological or historic finds during excavation. Another way to build with historic structures and archeological sites is to promote conservation/cluster designs around those sites. The purchase of development rights, conservation easements, and the outright purchase of sites are all valid means of protection for these sites. In addition, as a means to help provide a link to the area's heritage, public education must be provided for a better understanding regarding the importance of archeological and historic sites and how they relate to today's world.

Section 106 of the National Historical Preservation Act of 1966, as amended requires federal agencies to insure that their actions (grants, funding, permits, activities such as highway building, etc.) do not adversely affect archaeological sites on or eligible for the National Register of Historic Places.

In Wisconsin, there are many laws pertaining to historic properties (including archeological sites, historic buildings and other structures, landscapes, human burial sites and statuary). Several statutes prescribe review processes when governmental actions may affect historic properties. While other statutes provide for the establishment of ordinances and commissions by local units of government, allowing their direct involvement with and review of historic preservation issues in their communities. Still other statutes establish incentive programs for preserving or rehabilitating historic properties. Finally, other laws criminalize certain activities affecting historic properties and prescribe the penalties that may result. The State Historical Society of Wisconsin has compiled a listing of the primary state historic preservation laws in Wisconsin.

In addition to regulatory programs, the Wisconsin Coastal Management Program is dedicated to preserving and making accessible the natural and historic resources of Wisconsin's Great Lakes Coasts. The program provides funding to communities for protection and preservation of historic coastal resources.

As part of the development of a comprehensive plan within a coastal area, a community should conduct an inventory of the historic and archeological resources in the area. The Wisconsin architecture & history inventory lists buildings and structures that have catalogued by the State Historical Society. In addition, the inventory should include:

- Shipwreck sites
- Location(s) of marinas or port facilities of historical significance
- Historic and archeologically important sites related to indigenous peoples
- Historical trade routes

Once the inventory is complete, the planning team can then analyze the historical significance, protective status and identify any threats to the resources. Resource protection strategies can then be developed to help address these threats.

Additional Sources of Information

- Wisconsin Coastal Management Program - http://coastal.wisconsin.gov
- *A Guide to Smart Growth and Cultural Resource Planning,* Wisconsin Historical Society
- Wisconsin's Major Historic Preservation Statutes - http://www.wisconsinhistory.org/histbuild/handouts/statutes.pdf
- Wisconsin Architecture & History Inventory (AHI) - http://www.wisconsinhistory.org/ahi/index.html

Education

To lessen harm to coastal resources, Wisconsin relies on a combination of regulation, education, and landowners' voluntary conservation efforts. These efforts include DNR, UW-Extension and private sector experts conducting workshops for landscapers and contractors on ways to minimize damage to shoreline habitats, making available videos and publications for landowners interested in protecting their shorelines, and DNR staff working with local governments who seek help in protecting vulnerable coastal areas. Communities need to promote awareness through education programs to increase landowners' knowledge of shoreland development issues and what landowners can do to reduce their impact on the natural features and ecosystems of shorelands. Local communities may provide low-cost training sessions and materials for residents and developers.

In addition, communities can promote awareness through education programs to increase landowners' knowledge of nonpoint source pollution issues and conservation practices they can apply to reduce such pollution. Local communities should promote awareness of "best management practices" (BMPs) related to the protection of water quality.

Coastal communities and residents need to be aware of exotic species that exist in their area, those which may infiltrate coastal waters in the future (i.e. Asian Carp) and the potential economic, social and recreational impacts these species present.

A program of education in coastal communities can greatly enhance the communities' efforts to protect their coastal resources.

IV. HOUSING

Introduction

The housing element is a compilation of objectives, goals, policies, maps and programs to provide an adequate housing supply that meets existing and forecasted housing demand within the community. The element shall assess the age, structural, value and occupancy characteristics of the community's housing stock and provide a range of housing choices, recognizing local and regional housing needs for all income levels and for all age groups and special needs. The element shall also identify specific policies and programs that promote the availability of land for the development or redevelopment of low and moderate income housing, and policies and programs to maintain or rehabilitate the community's existing housing stock.

Housing development in coastal areas can have an impact on the wildlife, aquatic life, water quality, and landscape of an area. More structures in the watershed typically lead to greater land disturbance, runoff, and pollutants. The features that draw people to coastal areas begin to disappear. Many homeowners and visitors seek out coastal areas as places to enjoy natural beauty in a peaceful setting, yet the number of users and riparian landowners can cause use conflicts and create stress on limited resources.

While some owners build homes with respect for the shoreline and coastal resources, others do not. They build concrete patios on top of coastal marshes, clear-cut trees for straight-shot views, and blast driveways through dunes and bluffs. This kind of development can harm the natural environment, the local economies that rely on clean water and land, and neighboring residents who want a natural shoreline. Wild animals that once roamed coastal woodlands and wetlands retreat to less disturbing places. Stormwater, which rushes off roofs and driveways, erodes bluffs and contaminates the water.


Source: Lake Michigan Land Use Institute.

The natural processes that occur in the coastal zone, combined with shoreline development, create the potential for a wide range of impacts to the natural environment of the coast. Construction and development in sensitive coastal areas can have severe impacts on coastal landforms, coastal processes and coastal terrestrial and aquatic habitats. The coastline is truly a finite resource; coastal ecosystems are dynamic and complex; and intensity of coastal development can have a significant impact on the sustainability of the coastal ecosystem.

As demand for Wisconsin waterfront remains high people are increasingly seeking to develop in wetlands and other critical fish and wildlife habitats. Property owners in growing numbers are challenging state decisions that reject their projects. Research in Wisconsin and elsewhere is increasingly documenting the collective harm to fish and wildlife populations and water quality from individual activities that clear away vegetation from the lake shore, or shade or simplify shallow water habitat by placing piers, mooring boats and installing large structures in the riparian and near-shore region. A lakeshore home of 3,350 square feet, with a paved driveway, annually sends 18 times as much sediment to the lake as undeveloped land does, and four times as much as the typical 700 foot, 1940s-style cottage did. In addition to the home building, the number of formal proposals to the DNR to alter waterways by such activities as dredging lake bottoms to create a sandy beach, to build a seawall, and install a large pier has tripled since 1990.

Issues

Shoreline Residential Development

Shoreline residential development can have an impact on the wildlife, aquatic life, water quality, and landscape of an area. More structures in the watershed typically leads to greater land disturbance, runoff, and pollutants. The features that draw people to coastal areas begin to disappear with increased development. Many homeowners and

visitors seek out lakes and rivers as places to enjoy natural beauty in a peaceful setting, yet the number of users and riparian landowners can cause use conflicts and create stress on limited resources.

Shoreline residential development is not only destructive to the natural features but may also detrimental to the landowner. Development in floodplains and then implementing stormwater control can cause water to overflow riverbanks in other locations, often creating floods of a greater magnitude and danger. Building on floodplains increases the risk of property damage and life-threatening situations. Some home builders forget to factor the powerful natural forces of the Great Lakes into their plans. High winds and waves continue to shape the coastline today, just as they have for ages. Homes are vulnerable to the dramatic effects of weather. Wind and rain — and construction disturbance and stormwater runoff — can erode bluffs out from under residential foundations.

Source: UW Sea Grant

Programs and Actions

As part of the comprehensive plan, communities can establish guidelines for programs or design action steps regarding shoreline residential development. Erosion control ordinances, setback ordinances and stormwater management ordinances can all help to control the detrimental affects of residential development in coastal areas. Stricter enforcement of setback ordinances would allow for changes in lake levels, and reduce erosion and damage to property associated with high water levels. Enforcing subdivision ordinances which provide access to the shoreline during the development of a subdivision, or the purchase of shoreline for recreation and access addresses the need for public access to coastal areas.

Under § 62.234 of the Wisconsin Statutes, cities and villages may enact a construction site erosion control and storm water management zoning ordinance. The purpose of such an ordinance is to protect water quality and to minimize the amount of sediment and other pollutants carried by runoff or discharged from construction sites to lakes, streams, and wetlands.

The authority to enact and enforce shoreland zoning provisions is set forth in Chapter 59.692 of the Wisconsin Statutes and Wisconsin Administrative Codes NR 115, 116, and 117. These standards apply to all lands within 1,000 feet of the ordinary high water line of a lake, pond or flowage or within 300 feet of a river or stream or the landward side of the floodplain whichever distance is greater. Sections NR 115 and NR 117 contain the standards for lot size, buffer strips, setback requirements and non-conformities. Individual cities and villages are required to adopt the general standards under NR 117, although many choose to adopt standards at least as restrictive as the state's. Wisconsin counties may choose to adopt their own shoreland standards, which must be at least as restrictive as the state standards.

The community has the option to regulate the use of shorelands for residential development beyond the minimum standards required under state law. Future planning should consider the existing shoreland regulations and identify future needs based on planning goals and objectives.

Additional Sources of Information

- *Margin of Error? Human Influence on Wisconsin Shores: A Production of the Wisconsin Lakes Partnership* (PowerPoint presentation). Robert Korth and Paul Cunningham. Wisconsin Department of Natural Resources and University of Wisconsin - Extension. http://www.dnr.state.wi.us/org/water/fhp/papers/p2/index.htm. 1999.
- *Planning for Natural Resources: A Guide to Including Natural Resources in Local Comprehensive Planning.* Department of Urban & Regional Planning, University of Wisconsin - Madison/Extension and Wisconsin Department of Natural Resources. 2002.
- *Water Classification in Wisconsin: Annual Report for 2001.* Wisconsin Association of Lakes, Inc. 2001.
- *Yours to Protect: A Guide to Sensitive Shoreline Development.* Michigan Land Use Institute. http://www.mlui.org/pubs/specialreports/shoreline/shoreline_01.html. 2001.

Housing Density

Housing and population density are indicators of the amount of development occurring within a community. A community can assess the density of housing through a measure of the number of housing units compared to land area. There are a number of different measures that can be used for determining the density of housing development in a coastal community. These measures can include: a comparison of Census housing counts over time; a comparison of the size and number of residential lots along the shoreline to size and number of lots in inland areas; an inventory of the number of residential permits issued over time; and, a comparison to regional standards for lot sizes and densities. Much of the information needed for these assessments can be collected through a field inventory of land uses then analyzed using a geographic information system.

Programs and Actions

Every community has the option to regulate the development density of shorelands in their locale beyond the minimum standards required under state law. The community should map out sensitive coastal resources and require all allowable land uses to take shoreline protection precautions. Future planning should consider the existing shoreland regulations and identify future needs based on the planning goals, objectives and policies. The community can establish minimum standards for the future use, subdivision and development of their shorelands. Existent developments will be unaffected by a change in the ordinance as they will be "grandfathered" into compliance. However, when repairs, replacements, improvements or expansions are proposed to an existing development, the community can require the alterations to be as consistent as possible with the intent of the newly established ordinances. As the population increases in coastal communities, enforcing subdivision ordinances which provide access to the shoreline during the development of a subdivision, or the purchase of shoreline for recreation and access can address a need for public access to coastal waters. In order to allow people to continue to enjoy the coastal views and reduce the density of development, a height restriction on buildings and larger minimum lot sizes can be considered.

Additional Sources of Information

- 1990 and 2000 US Census information – www.census.gov
- *Population: Distribution, Density and Growth.* NOAA's State of the Coast Report. Thomas J. Culliton. National Oceanic and Atmospheric Administration (NOAA), Silver Spring, MD. http://state-of-coast.noaa.gov/bulletins/html/pop_01/pop.html. 1998.
- *Planning for Natural Resources: A Guide to Including Natural Resources in Local Comprehensive Planning.* Department of Urban & Regional Planning, University of Wisconsin - Madison/Extension and Wisconsin Department of Natural Resources. 2002.
- *Yours to Protect: A Guide to Sensitive Shoreline Development*. Michigan Land Use Institute. http://www.mlui.org/pubs/specialreports/shoreline/shoreline_01.html. 2001.

Second Tier Development/Replacement of Structures

Second tier development occurs when new housing is developed at a size and height along the shoreline that may either block the view of the water

Source: Bay-Lake Regional Planning Commission

Programs and Actions

As part of the comprehensive plan, communities can establish guidelines for programs or design action steps regarding shoreline residential development. Setback ordinances and subdivision ordinances can help to control the detrimental affects of residential development in coastal areas. Enforcing subdivision ordinances which provide access to the shoreline

during the development of a subdivision, or the purchase of shoreline for recreation and access addresses the need for public access to coastal areas.

In order to allow people to continue to enjoy the coastal views and reduce the density of development, a height restriction on buildings and larger minimum lot sizes can be considered. The community can establish minimum standards for the future use, subdivision and development of their shorelands. When repairs, replacements, improvements or expansions are proposed to an existing development, the community can require that the alterations be as consistent as possible with the intent of the newly established ordinances.

Additional Sources of Information

- *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks.* Arendt, Randall. Island Press. 1996.
- *Planning for Natural Resources: A Guide to Including Natural Resources in Local Comprehensive Planning.* Department of Urban & Regional Planning, University of Wisconsin - Madison / Extension and Wisconsin Department of Natural Resources. 2002.
- The Wisconsin Lake Partnership's Shoreland Management and Lake Classification Fact Sheet Series. Wisconsin Department of Natural Resources. 1998. http: / / www.dnr.state.wi.us / org / water / fhp / lakes / facts.htm.

Seasonal Housing Development

Seasonal housing development in coastal communities can be a major issue due to the impact on the resources of the community. In coastal areas with a high seasonal population, there is an increased need for housing to accommodate this population on a short-term basis. While seasonal homes have important impacts statewide, their impacts are particularly significant throughout the coastal areas of the state, where they contribute to local economies, affect land use patterns and property values, and generate tax revenues and demands for local services.

Wisconsin's coastal areas, water, forest, wildlife and related natural resources are important factors in seasonal home location decisions. Seasonal home owners prefer waterfront and / or forest settings, where they have direct access to the scenic, recreational, and other amenity services of the state's natural resources. Because outdoor recreation is an important reason for owning seasonal homes, they contribute substantially to demands for boating, fishing, wildlife-related recreation and a variety of outdoor recreation pursuits.

Seasonal homes also have substantial economic impacts. One estimate is that spending by seasonal homeowners and guests can account for up to a third of all economic activity a coastal community. Seasonal homes add considerably to local property tax bases, while also increasing demands for many local services. Seasonal homes are also linked to retirement and elderly migration to communities with amenities.

Seasonal homes are an important part of the lifestyle and quality of life for their owners. They influence the character of local communities through seasonal fluctuations in area populations and activity. Differences in backgrounds, values, attitudes and patterns of behavior between seasonal home owners, tourists and permanent residents are frequent sources of conflict over resource management and community development issues.

Because of their waterfront and forest locations, seasonal homes can also have significant environmental impacts on both water quality and shoreline fragmentation. Demographic trends indicate that seasonal homes may become more important in the future as baby boomers reach the prime age for buying seasonal homes for recreation and retirement.

Programs and Actions

One technique for insuring a range of housing is to provide a range of densities and lot sizes. Traditional zoning ordinances may only allow a limited variety of lot sizes throughout a community for single-family residential development.

Land costs can be 25 percent or more of the total cost for a home. One way to reduce land costs is to reduce lot size. First, lot prices are less expensive for smaller parcels. Second, land development costs are less because they may be spread over a larger number of units. Third, less infrastructure is needed because development on smaller lots requires fewer miles of roads, sidewalks, gutters, and shorter utility runs. In a competitive market, reduced land development costs are passed on to consumers.

Smaller lot sizes which seek to increase overall density within the community can also be linked to other community planning objectives. For example, higher density development can (1) preserve farmland, open space, and environmentally sensitive areas by reducing the overall amount of land needed for housing; (2) improve the viability of mass transit, provide opportunities for residents to live near their jobs, and thereby help reduce vehicle miles traveled; (3) use existing infrastructure more efficiently than less compact development thus reducing service costs and saving tax dollars.

Increasing density may meet with opposition from existing area residents. To address these concerns attention must be given to site design characteristics. For example, design elements such as the layout of streets, lots, mixing of lot and house sizes, variation in building setbacks and elevations, variation in exterior designs, and quality landscaping to provide privacy. The development must be attractive if it is to be accepted by the larger community.

Many communities have zoning and / or subdivision ordinances that contain building requirements that may unnecessarily increase the cost of housing thereby limiting the range of housing choices available in the community. These include requirements setting forth minimum floor area size. By removing minimum floor area sizes, communities can increase the range of housing opportunities.

Many local subdivision regulations also include standards for how subdivisions are designed (e.g., road widths, sidewalks, tree plantings, setback, materials, land dedication, sidewalks or paths, location of the structure on the site, garages). Communities should review their subdivision ordinances to identify provisions that constrain housing. Old ordinances in particular may be in need of revision to meet current needs. Current neighborhood design emphasizes social, economic, and environmental aspects and endeavors to create neighborhoods that are more energy efficient and that have a greater range of housing options.

Additional Sources of Information

- *Removing Regulatory Barriers to Affordable Housing in Wisconsin: A Report,* Governor's Task Force on Regulatory Barriers to Affordable Housing, 1994.
- *Affordable Housing Techniques: A Primer for Local Government Officials*, Municipal Research and Services Center of Washington, 1992.
- *Changing Development Standards for Affordable Housing,* Welford Sanders and David Mosena, American Planning Association, PAS Report # 371, 1982.
- *Planning for Affordable Housing,* Vermont Department of Housing and Community Affairs, 1990.
- *A Citizen's Guide to Conserving Land and Creating Affordable Housing,* Burlington Community Land Trust and the Vermont Land Trust, 1990.
- *Smart Growth: Creating Communities for People*, Allison Semandel and Mike Kinde, Citizens for a Better Environment, 1999.
- *Model Code Provisions - Urban Streets & Subdivisions,* Washington State Department of Community, Trade and Economic Development, 1998.

Education

To lessen harm to lakeshore habitats, Wisconsin relies on a combination of regulation, education, and landowners' voluntary conservation efforts. These efforts include DNR, UW-Extension and private sector experts conducting workshops for landscapers and contractors on ways to minimize damage to shoreline habitats, making available videos and publications for landowners interested in protecting their shorelines, and DNR staff working with local governments who seek help in developing more protective zoning for their vulnerable lakes. Communities need to promote awareness through education programs to increase landowners' knowledge of shoreland residential development issues and what landowners can do to reduce their impact on the natural features and ecosystems of shorelands. Local communities may provide low-cost training sessions and materials for residents and developers.

- Encourage the use of cluster developments with density bonuses in accordance with conservation easements in order to minimize the visual impacts upon the shoreline from the water.
- Water quality protection measures should be initiated by means of adopting or updating Sewer Service Area Plans, preparing a Construction Site Erosion Control Ordinance, a Stormwater Management Plan, and a Wellhead Protection Plan;
- Wetlands can be protected from development through the comprehensive land use planning process and zoning ordinance;
- Environmental corridors should be adopted as part of a conservancy zone;
- Floodplain and shoreland development should be limited in order to minimize risk, and buffer areas should be established along waterways to improve water quality;
- Prime fish and wildlife habitats should be protected from development;
- Historical and cultural features should be protected; a Historic Preservation Ordinance can be developed to ensure the integrity of existing historic structures.
- Local units of governments should continually educate themselves, and the general public, on planning related issues by attending seminars, conferences, and other workshops;
- Information should be obtained from local organizations and agencies when making planning related decisions. Several sources for this type of information exist, including, but not limited to:
    - County and Local Government Planning and Zoning Departments
    - Regional Planning Commissions
    - UW-Extension Community Development Center
    - Wisconsin Department of Natural Resources
    - Wisconsin Department of Transportation
    - Wisconsin Department of Commerce
    - Wisconsin Counties Association
    - Wisconsin Towns Association
    - American Planning Association (APA)

V. ECONOMIC DEVELOPMENT

Introduction

The economic element will be a compilation of objectives, goals, policies, maps and programs to promote the stabilization, retention or expansion of the economic base and quality employment opportunities in the local governmental unit, including an analysis of the labor force and economic base of the local governmental unit. This element of the plan will assess categories or particular types of new businesses and industries that are desired by the local governmental unit and will assess the local government's strengths and weaknesses with respect to attracting and retaining businesses and industries, and will designate an adequate number of sites for such businesses and industries. This element will also evaluate and promote the use of environmentally contaminated sites for commercial or industrial uses. Also the community should identify county, regional and state economic development policies and programs that apply to the community.

Development, in whatever form it may take, usually conveys progress and prosperity. It is a natural result of economic growth. Jobs are created, buildings are constructed, and human communities are sustained. However, some aspects of development merit continual scrutiny because of their implications for society and the environment. Economic growth-related development should be sustainable.

Issues

Marina Capacity and Expansion Analysis

The marina industry is rapidly becoming a dominant coastal business. Typical large marinas in the Great Lakes now have annual sales in excess of $5 million each. Economic impact can be defined for the marine trades in two different ways - as economic valuations based upon intangibles like the enjoyment of boating, or tangibles like the flow of marine-industry-based dollars through the entire economy. To gather data that would reveal something significant for either type of economic impact is difficult because of the broad range of people involved in the industry - from young to old, from manufacturer to user, from boater to water-skier, from a one-dock, gas-only marina to a multi-service marina associated with a resort or a park. Each of these groups identifies both tangibles and intangibles in different ways. Thus, economic analysis uses a variety of data and different methodologies. In the end, economic impacts are uniquely local.

Environmental impacts to surrounding surface waters from marina-related activities can cause toxicity in water, dissolved oxygen depletion, and contamination of fish. Economic impacts of water quality degradation extend to the commercial fishing industry, water-related tourism, and nearby real estate. Marinas should attempt to enhance the health and appearance of the shoreline. The appearance of a marina can also become a very effective marketing tool for the facility.

Programs and Actions

For long-range planning purposes, communities need to take the broad view of the industry as a provider of experiences in the marine environment instead of the traditional approach of merely being a service provider for boaters. Such a view includes consideration of changing demographics, competition for the waterfront, modern management techniques, and environmental changes in devising operating plans, maintenance and marketing strategies.

Communities need to consider that every marina construction or expansion causes more of the shoreline to be inaccessible to the majority of Wisconsin residents who cannot afford docking privileges or to those who just want to enjoy the waters of Wisconsin from the shore. Private marina expansions into public waters restrict the use and enjoyment of the Great Lakes. Additionally, the combination of dredging and increased disruption of water flow along the shore could result in decreased water quality problems and odors for residents and anyone else hoping to enjoy that stretch of the lake. The U.S. Army Corps of Engineers is charged with protecting the public resource

waters and they advise that when marinas expand, it should be done by going shoreward into private land or by reconfiguring boat use within existing marina boundaries -- not by expansion into Great Lakes bottomlands.

Clean water and a clean environment are essential to good boating and the marina industry. There are many benefits to becoming a cleaner marina: protecting and improving water quality; reducing waste disposal costs; attracting boaters who keep a tidy craft; meeting stormwater and other pollution control; and building a positive reputation. The first step is to pinpoint potential problems and review ways to minimize them. Each marina will want to tailor a plan based on the number of slips, the types of boats moored, services provided, the surrounding habitat, and the amount of runoff it faces.

Additional Sources of Information

- *The Boating Business - 1994 Annual Industry Review*. Boating Industry Magazine. 1994.
- *Clean Marinas.* Environmental Protection Agency. Timothy J. Tyrrell, Ph.D. 1995. http://www.epa.gov/owow/nps/marinas/appxa.html
- *Inside one marina.* Wisconsin Natural Resources Magazine. Natasha Kassulke. 2002. http://www.wnrmag.com/supps/2002/aug02/tour.htm

Port and Harbor Development/Redevelopment

The Great Lakes serve many practical needs for the citizens of Wisconsin, including the large-scale transport of bulk commodities and manufactured goods, recreational opportunities, and coastal living environments. The utilization of lake resources involves the construction and maintenance of many structures, such as harbors, and the capability to operate ships and marine equipment in all kinds of weather conditions. Wisconsin's commercial ports handle approximately 50 million tons of cargo annually with a value of more than $7 billion.

The harbors are essential to boating, fishing, tourism, and the local and regional economies of the region. The combination of dredging and increased disruption of water flow along the shore could result in water quality issues that extend out to the entire Great Lakes region in a number of ways, including economically.

Programs and Actions

A harbor development/redevelopment study should investigate demand for boat anchorage, evaluate the physical constraints of the site, study the site's development possibilities, analyze financial feasibility, and assess its environmental impact.

The use of Comprehensive Harbor Management Plans should be utilized to reach consensus on water quality restoration plans, dredging strategies, maritime economic development activities and public waterfront uses. Harbors provide the connection between land use activities and water resources as well as a complex overlay of agencies, regulations and competing economic, social and political interest that come into play with most management issues.

Since 1980, Wisconsin's Harbor Assistance Program (HAP) has provided financial aid to harbors along both the Great Lakes and the Mississippi River. HAP grants fund projects that improve transportation efficiencies. Several other grant sources are available for harbor improvement projects.

Additional Sources of Information

- Wisconsin Harbor Towns Association, Packer Country Regional Tourism Office at (920) 405-1111, or toll-free at (888) 867-3342.
- Wisconsin Coastal Management Program – http://coastal.

Commercial Fishing

The Great Lakes are the world's largest freshwater system. Lake Michigan is the second largest Great Lake by volume and the sixth largest freshwater body in the world. Lake Michigan is the only Great Lake located entirely within the United States. Since fish readily migrate between Lake Michigan and Lake Huron via the Mackinac Straits, the welfare of Lake Michigan directly impacts the entire system. Various geological features throughout the region create habitat suitable for numerous species of sport and commercial fish. However, human activities have significantly altered and continue to change the present ecosystem structures found throughout the region. Over-harvesting, stocking programs, and exotic invasions have dramatically changed species present.

The Great Lakes fishery consists of a blend of native and introduced species, some of which are regularly restocked. Common catches include lake trout, salmon, walleye, perch, white fish, smallmouth bass, steelhead and brown trout. The greatest commercial fishing harvests were recorded in 1889 and 1899 at about 147 million pounds (Great Lakes Information Network). Since then, the fishery has been threatened on three fronts: overfishing, pollution and non-native invasive species.

Commercial fishing is under continuing pressure from several fronts. Toxic contaminants such as PCBs and heavy metals have limited the commercial uses of several species. Invasive species are believed to either directly or indirectly impact the populations of native species. Several decades of over-harvesting have, in part, caused some species to fall to alarmingly low levels during the 1900's. Recently, fisheries biologists have set quotas to regulate fish harvests.

Over-exploitation of fish has caused closure or limitations on many commercial fishing seasons in the Great Lakes region. Despite the focus on overfishing, the declines also reflect destruction of fish habitat, particularly of wetlands and rivers on which many fish depend for breeding and spawning. Over-fishing, pollution, political squabbling, poor public policies, and commercial exploitation combined to damage the fish populations even before many invasive species began to cause more damage to fish populations. The Great Lakes sport and commercial fishing industry, valued at almost $4.5 billion annually, is at risk due to the growing numbers of exotics such as the zebra mussel, spiny water flea, sea lamprey, ruffe and round goby that prey on clams and mussels, invertebrates of all sizes, as well as fish eggs and small fish.

Changes in water clarity, lake levels, and prevailing wind directions can all affect the composition and behavior of fish and the effectiveness of fishing techniques for commercial fisheries.

The decline in the economic impact of commercial fishing is illustrated by the decline in numbers of people employed in commercial fishing on the Great Lakes from a total of over 6,900 in 1930 to less than 1,200 in 1975. By comparison, about 2.8 million recreational anglers were active on the Great Lakes in 1975 (Thunder Bay National Maritime Sanctuary). Aquaculture is an emerging industry of growing importance to Wisconsin, the United States, and the world. More than 330 Wisconsin fish farmers raise fish for food products, stocking, bait, and for-fee fishing. With a current estimated value of $8.8 million a year, the Wisconsin aquaculture industry is growing at an annual rate of about 11 percent. This far exceeds the poultry industry, the next fastest growing food industry, which is experiencing a 4.2 percent growth rate (University of Wisconsin Sea Grant).

Programs and Actions

Wisconsin commercial fishing regulations have been established under s. 29.519 of the State Statues. The Wisconsin Department of Natural Resources (WDNR) is charged with the management of fishery resources in Wisconsin. Its stated goal is to provide opportunities for the optimum use and enjoyment of Wisconsin's aquatic resources for both sport and commercial purposes. The Legislature has given the WDNR broad authority in this area under NR 25. Regulation of commercial fishing is among the key components of the WDNR's regulatory and management programs.

Many people that have depended on commercial fishing in the past are receiving training on aquaculture practices to revitalize the fishing economy after the lake they fished is closed to commercial fishing. Aquaculture has been helpful for many to boost local economies, and establish a model of fish farming for other entrepreneurs to follow.

A municipality situated on a navigable waterway may create a board of harbor commissioners to exercise the powers and perform the duties conferred upon such boards by law.

Lake bed leases may be granted to municipalities, who are riparian owners, for public recreational facilities related to navigation. The Board of Commissioners of Public Lands has the authority to lease submerged lands after a review by the Department of Natural Resources determines that development from the lease will be in the public interest.

Enacted by the state legislature, lake bed grants are laws which relinquish the state's interest in certain specifically defined lake bed areas. The legislature thus grants state jurisdiction over these areas to a municipality for certain agreed upon purposes.

Bulkhead lines are established by local ordinance with the approval of the Department. The purpose is to "regularize" the shore. Riparian landowners have the right to fill behind the established bulk head line. Bulkhead lines are generally established along the ordinary high water mark. However, many bulkhead lines were established years ago and are now located in the water some distance from shore.

Municipalities may also adopt local plans for the development of their harbors and waterfronts. These plans include comprehensive plans, waterfront plans, recreation plans, redevelopment plans, land use plans, and industrial development plans.

Additional Sources of Information

- *Wisconsin Aquaculture Resource Guide*. Miller, A.H. 1998. http://aquanic.org/publicat/state/wi/wis.pdf.

Waterfront/Coastal Capital Improvements

The Waterfront/Coastal Capital Improvements addresses the facilities and financial components of the comprehensive plan. It prescribes what new facilities will be needed to correct existing deficiencies, accommodate new growth, and plan for repair and renovation needs of existing facilities. It also outlines the financing needed to pay for the various capital facilities.

Shorelands in the State of Wisconsin are regulated under chapter 59.692 Wisconsin State Statutes and section NR 115, Wisconsin Administrative Code. These standards require each county to zone by ordinance all shorelands in its unincorporated areas. Shorelands include areas within 1,000 feet of a lake or pond and 300 feet of a navigable river or stream or to the landward extent of the floodplain (whichever is greater). Therefore, coastal capital improvements in the form of development are restricted to this shoreland zone. Cities and villages are not required to adopt these general development standards. However, many municipalities choose to adopt similar regulations regarding shoreline setbacks, lot size, construction site activities, and shoreline vegetation. Wisconsin counties may choose to adopt their own shoreland standards; these standards must be at least as restrictive as the state standards.

Programs and Actions

Coastal communities should ensure that public facility expenditures do not unnecessarily subsidize development in sensitive coastal areas. Additionally, expenditures can be budgeted for public land acquisition or enhancement of natural resources.

Much of the shoreline in Wisconsin is already densely developed. Wetlands and other natural habitat areas within the near-shore ecosystem are threatened from destruction and alteration by increasing coastal development. Shore-hardening caused by development interferes with natural shoreline processes and, in some cases, results in the irreversible loss of beaches. A specific effect of development on the near-shore area is the disruption to the natural process of beach creation and replenishment by interference with the process of sand supply and distribution. The construction of harbors, marinas, erosion control structures, and other coastal capital improvements form barriers to wave-induced littoral drift and cut off the supply of sand.

Coastal communities need to see capital improvements as a method to provide citizens recreational experiences in the marine environment instead of the traditional approach of merely being a service provider to the marine businesses and commerce industry. Such a view includes consideration of changing demographics, competition for the waterfront, modern management techniques, and environmental changes in devising operating plans, maintenance and marketing strategies.

Coastal communities are faced with the challenge of balancing environmental protection, taxpayer interests, and adherence to current land use restrictions. The community has the option to regulate the use of shorelands for development beyond the minimum standards required under state law. Future planning should consider the existing shoreland regulations and identify future needs based on planning goals and objectives.

Additional Sources of Information

- *The Economics of Protecting Wisconsin's Shorelands.* Wisconsin Department of Natural Resources. 2002.

Land Values

Waterfront development in Wisconsin has caused property values to significantly increase for some counties in the state. A limited and shrinking supply of available waterfront land, coupled with a large demand has created soaring prices. Lake front property values on popular lakes in southeastern and northern Wisconsin can be extremely high.

Waterfront development is growing in northern Wisconsin, with property values increasing up to 400% in the early 1990's for some counties in the region. The soaring prices are the result of supply and demand – a shrinking supply, and a big demand. Lakefront property values have gone up 100% to 400% from 1990 to 1994. Lake front property values on popular lakes in southeastern Wisconsin can be especially costly. For example, property values for select Waukesha County lakes typically range from $300,000 to more than $700,000. This phenomenon is creating a situation where the waterfront is becoming an elite locale for those with high incomes. An increasing percentage of lakefront lots have become vacation properties for out-of-state residents.

Escalating land value makes it difficult to preserve waterfront land. Without preserved waterfront land, future generations will be denied the experience of natural shoreline unless they are among the few to own waterfront property. Additionally, the tourism industry will be greatly affected as waterfront access disappears. According to the Wisconsin Department of Tourism, scenic beauty and relaxation were the top reasons tourists gave for visiting Wisconsin. This industry generated $11.4 billion in revenues for the state in 2001. Tourism supported 380,000 full-time jobs and generated nearly $1.8 billion in revenues for state and local governments. Without state and local revenues yielded from travel expenditures, each household would have to pay an additional $932 in taxes to maintain existing services. Swimming and fishing are the predominant activities visitors mentioned to researchers in a 1997 - 1998 summer study by the Department of Tourism. Each year more than 1.5 million anglers spend 17 million days fishing in Wisconsin. They spend $1.1billion directly on fishing related expenses which generates more than $2.1 billion in economic activity. Sport fishing supports 30,000 jobs and generates more than $75 million in tax revenues for the state for use on critical services like education and health care (U.S. Fish & Wildlife Service, 1998).

Programs and Actions

Prioritize funding to favor land purchases that protect those resources most threatened by land use changes. Lands that offer the greatest potential for providing recreation should be preserved now, especially those near urban centers, before land values escalate even higher. Waterfront parcels throughout the state are under pressure for development and should also be a high priority in acquisition plans. A growing body of research shows that waterfront property owners, local governments, economies and taxpayers receive economic benefits as a result of the amenities shoreland zoning preserves: clean water, wildlife, scenic beauty, and peace and quiet.

Wetlands and other natural habitat areas within the near-shore ecosystem are under threat of destruction and alteration by increasing coastal development. The addition of nutrients and sediments from near-shore developments to lakes can seriously impair water quality. Prevention of nutrient and sediments from reaching lakes

is the rationale behind shoreline zoning regulations. Shore-hardening caused by development interferes with natural shoreline processes and, in some cases, results in the irreversible loss of beaches. A specific effect of development on the near-shore area is the disruption to the natural process of beach creation and replenishment by interference with the process of sand supply and distribution.

For many residents, access to waterfront is a defining component of value in housing. A home's value is ultimately determined by two factors: the home as a physical place, and its geographic location. There are three dimensions to location: the neighbors, accessibility, and the neighborhood. A neighborhood is defined by its natural environment, its views and vistas, green spaces, and waterfront. For all reasonable purposes, the amount of waterfront is fixed; its limits are defined by the interface between land and water. As this state's population grows, the amount of waterfront will remain the same. Homes that have access to waterfront are, each year, going to be an ever-smaller portion of the region's housing stock. It is this key factor that will continue to define their value.

Zoning requirement that preserve clean water, natural scenic beauty, and serenity can often generate an economic gain that offsets the economic loss resulting from the constraints on development. Surveys consistently document that water-based recreation is an important factor in attracting recreational and retiring homeowners.

Additional Sources of Information

- *The Economics of Protecting Wisconsin's Shorelands*. Wisconsin Department of Natural Resources. 2002.

Downtown Core Connections/Parking/Public Nodes

People and businesses in coastal communities are rediscovering their downtown and waterfront districts and the benefits of connecting the two. Development and investment projects in downtown connections can transform entire neighborhoods. Developments can create new jobs and increase opportunities for additional housing and retailing. These exciting elements, including the development of the waterfront, will build on the economic and social foundations of tourism, retailing, transportation, education and cultural centers that already play a prominent role in many coastal communities. Such downtown and waterfront revitalization investments connect the community with the waterfront.

While many coastal communities originated at the edge of a water body, that relationship was all but forgotten for almost a half century or more. Communities throughout America are rediscovering their relationship to long-neglected waterfronts. Historically active waterfronts with cargo ships, docks and uplands transitioned into warehousing districts, fish processing plants, waste treatment facilities, and other related industries. These uses are transitioning to new commercial and recreational developments based on the valuable amenities of a relationship to the water, attractive views, and open space.

Programs and Actions

Coastal communities need to help plan and direct activities to preserve, develop and enhance the economic, social and cultural quality of life in downtown and waterfront cores. Clearly defined pedestrian connections between the downtown core area and the waterfront should be established. Enhancements to the core area of downtown must assure a mix of mutually supportive uses as well as a human scale for any new development. Celebrate the waterfront setting by reorienting the downtown to the water.

Retail activities, eating establishments, a variety of housing products, office space, public facilities, parks, esplanades, marinas, and other urban elements are part of the myriad of interlocking uses that create an exciting and unique place dependent on a connection to water.

Inventory and Identify the Problem

Many waterfronts are obstructed from the downtown cores by industrial land use. Industrial land use exerts a high impact on waterfront corridors, both in terms of the intensity of the land uses themselves and of the transportation infrastructure needed to serve them. The prevalence of industrial uses in waterfront districts tends to discourage major investment in other more sustainable and economically beneficial land uses like commercial, residential and office complexes that would otherwise be attracted to the waterfront. If this trend continues, further industrial development will occur on vacant land, thus exacerbating the problem. However, revitalization plans need to recognize that waterfront industry is an integral part of many coastal communities' heritage. Redevelopment plans must explore ways to encourage mixed land uses important to the future of the waterfront corridor. New transportation plans need to include planning for safe and convenient pedestrian travel since many existing transportation systems in waterfront corridors are heavily geared towards serving industrial land uses.

Often coastal communities do not fully realize the huge potential public benefits of a waterfront parks and public open space. Public events at waterfront parks are usually well attended by residents and tourists. These large crowds generate income for the surrounding retail properties. However, for many communities, the existing waterfront retail industries often fail to capitalize on the lake's economic potential. Additionally, coastal communities should make sure that parking lots do not act as a barrier between the downtown and the waterfront. Successful retail requires an adequate supply of parking that is convenient and affordable. On-street parking and nearby structured parking with good access are critical for retail success. Centralized, shared parking facilities will be more effective and efficient than requiring each facility to provide its own off-street parking. The community should play a leadership role in providing parking in the downtown area that is consistent with these principles.

The community should map out sensitive coastal resources and require all allowable land uses to take shoreline protection precautions. Future planning should consider the existing shoreland regulations and identify future needs based on the planning goals, objectives and policies. The community can establish minimum standards for the future use and development of their waterfronts.

Additional Sources of Information

- *Marinas, Parks and Recreation Developments: Proceedings of the International Conference.* Marshall Flug (Editor), Fred A. Klancnik (Editor), Fred A. Klanchik (Editor). 1994.

Brownfields

The economy of the Great Lakes region is completing a transition from heavy manufacturing to a more diverse and increasingly service-oriented economy. Brownfields have been a consequence. The Great Lakes basin contains thousands of former industrial sites or brownfields where once-thriving manufacturing operations have now become blighted areas of neglect and, in many cases, sources of continuing toxic pollution. These problem places, particularly in the central urban areas, have thwarted efforts at redevelopment. New development is rejected for many reasons, including cleanup costs and lingering uncertainty over liability issues, thus encouraging such development to migrate to outlying undeveloped areas or greenfields.

To date, there have been two major legislative initiatives in Wisconsin to deal with brownfields properties. The first set of brownfields initiatives was contained in the Wisconsin's Land Recycling Law, passed in May 1994. This law took the initial steps to clarify the liability of lenders, municipalities and purchasers of property who meet certain requirements. The next set of brownfields initiatives was passed as part of the state's 1997-99 biennial budget. These incentives built upon, and greatly expanded, the brownfields initiatives in the Land Recycling Law. In 1998, the Brownfields Study Group was formed to provide direction for the future of brownfields redevelopment in Wisconsin. Wisconsin's Brownfields Initiative is supported by federal and state funding. As a result of these initiatives, a number of properties have been successfully redeveloped in Wisconsin.

Programs and Actions

One of the policy issues facing Great Lakes basin states, provinces, and communities is whether and how brownfields redevelopment and greenfields protection can be linked. A potential linkage already exists in that development of a brownfields site may reduce the pressure for a greenfields site to be developed. Impact fees and development charges, by which developers pay for the costs of new infrastructure for development, may also serve as an incentive for the redevelopment of brownfields. A surcharge on these fees could be scaled and put into a brownfields redevelopment fund for that purpose. This approach would forestall sprawl and development in rural areas by encouraging greater use of metropolitan sites. Alternatively, a portion of the "tax increment" from new metropolitan development could be used to purchase open / green space or, in the case of farmland, the purchase of development rights.

Contamination at a waterfront site is often more complex than at landlocked sites because of the potential for the contamination to move, infiltrate or spread. Direct links among surface and groundwater systems, as well as movement of airborne soil particles into rivers, lakes, and oceans, can contribute to water and waterfront contamination. Any contaminated property, whether on a waterfront or not, can create the potential for extensive regional land and water pollution through overland flow to streams and water table infiltration. Furthermore, the fluid physical properties of water increase the potential that suspended contaminants will be carried to the far reaches of a region, thereby dispersing and compounding the effects of contamination. Point and nonpoint source pollutants are the primary sources of water and waterfront contamination. These pollutants may arise from traditional waterfront industries, such as heavy metals extracted in petroleum refining, or migrate from distant sources, such as pesticides and herbicides used in agricultural operations. Regardless of the source, contamination at waterfront properties is associated with toxic, particulate compounds in the soils or sediments above and below the waterline and with contaminants suspended in nearby surface water and ground water resources.

To clean up contamination at waterfront brownfields, coastal communities must consider two issues: (1) How to clean up contaminants in the soil and water at the brownfields site; and (2) How to conduct cleanup activities without exacerbating existing on-site contamination and without creating contamination at sites and waters "downstream" from the project area. In order to achieve site cleanup under these two criteria, it is ideal to clean soils and waters *in situ* (in its original place), in the ground or along the bottoms of waterways, without stirring up and spreading pollutants and without injecting additional foreign chemicals into the setting.

Historically, many industries were situated along the shore to provide water access for transportation, power, and cooling, thus many brownfields are located in coastal communities. This is especially true in older industrial areas of the Great Lakes regions. As regional economies have changed from heavy manufacturing to more diverse, service-oriented economies, many industries have abandoned these waterfront sites. All levels of government and private businesses have recognized that brownfield redevelopment is of prime importance and a great opportunity to convert neglected properties into productive residential, commercial and industrial sites.

Emerging technologies in brownfields remediation have helped to reduce costs of and uncertainty in cleanup programs. New technologies detect contamination with reduced excavation and labor costs, and they provide increasingly reliable assessments that reduce uncertainty in projecting cleanup expenses. In addition to detection, innovative technologies can perform cleanups more quickly and effectively. Some chemical and biological treatments can neutralize contaminants *in situ* without having to remove and dispose of large quantities of polluted soil. New tools may also remove multiple contaminants simultaneously, instead of repeated, incremental treatments to remove one contaminant at a time.

Waterfront brownfields present another redevelopment challenge: how to clean up and revitalize a property with great economic potential without exacerbating existing site contamination. Redeveloping waterfront brownfields, like other land use decisions, must be considered carefully. Uncontrolled development can lead to the destruction of the resources that attract people and businesses to waterfront communities. Thus, if long-term uses are not considered when redeveloping waterfront brownfields, properties can be caught in a cycle of use, contamination, neglect, remediation, reuse, and recontamination. It is essential, therefore, to study and understand the complex nature and history of waterfront properties. Waterfront brownfields must be approached according to their dynamic hydrologic setting, the presence and nature of pollutants present, and the innovative remediation and land use strategies that may be utilized to counteract site contamination. With such knowledge, coastal communities are able to decide the most effective course for remediation and redevelopment.

The Wisconsin Department of Commerce Brownfields Initiative program offers a variety of brownfields redevelopment assistance programs that promote economic development and have a positive effect on the environment. Programs include several grants, tax credits, and an online mapping and query system.

Commercial Shipping

Commercial shipping ports play a significant role in the state, regional and local economy. Water transportation of bulk commodities continues to be cost efficient and environmentally beneficial. The Port of Green Bay transported 1,866,867 metric tons of cargo in and out of the Port in 2002. The activity creates more than 550 jobs, an estimated $18 million in income, more than $28 million in gross state product and nearly $60 million in direct and induced economic benefit.

Both commercial shipping and the water-dependent industries that utilize ports and harbors continue to play a significant role in the economic development and vitality of coastal communities. Although total tonnage shipped to and from the major ports has steadily declined or ceased altogether at smaller facilities over the past three decades, the economic benefits realized through port activity continue to justify continued public support of commercial shipping activity.

Programs and Actions

Coastal communities with commercial shipping activities need to focus on several activities to continue to support the viability of their ports. These communities can support expansion of economically feasible water related commercial and industrial activity adjacent to the ports. Determine the economic benefit of port operations utilizing the MRAD Port Kit or similar model.

Promote and educate the public as to the economic impacts of waterway transportation. Without promotional activity the public may view waterfront terminals and port dependent industries negatively and believe that the port industries are utilizing valuable space on land that could be put to more aesthetically pleasing uses.

Maintain rail access in order to facilitate intermodal shipment. Institute a program and or policy similar to "rails to trails" wherein abandoned rail right-of-way is preserved in publicly owned open space, for future transportation purposes. Underutilized dock space and lands adjacent to the facilities would be preserved in open space for future water related transportation purposes.

Port users and port related industries must take an active role in development and implementation of waterfront development plans. In many cases waterfront development plans may tend to favor recreational uses and access and advocate the relocation of waterfront industries or modification of landside access that is detrimental to commercial port users.

Public spaces and access should be integrated into and coexist with commercial port activities and should not negatively impact commercial uses or landside access for industries utilizing the port.

Establish specific waterfront zoning districts. Water transportation dependent industries operate under conditions that may differ significantly from non water dependent industry. A specific "waterfront zoning district" could address the operational aspects of water related industries specific to those types of uses thereby providing better protection for the public and the industry.

To help support these activities, state and federal agencies have grant and financial aid programs available that communities may wish to explore.

Additional Sources of Information

- *The Financial Resource Guide for Cleanup and Redevelopment*. Wisconsin Department of Natural Resources and Wisconsin Department of Commerce. 2002.
- *Navigating the Waters: Coordination of Waterfront Brownfields Redevelopment*. Thomas Groeneveld. International City/County Management Association. 2002. www.icma.org.

Funding Sources

Wisconsin Department of Transportation Programs

Harbor Assistance Program

The Harbor Assistance Program (HAP) provides grants provide funds for up to 80% of the total project cost. Grants are justification based on the improvements and impacts the project will have on commercial cargo-handling / transportation efficiencies. Applicants must be local government and improvements must be publicly owned (www.dot.state.wi.us). Most port authorities will submit proposals annually. Each annual proposal includes projects for the next three calendar years. Typically, projects will include dockwall rehabilitation / construction, dredging / disposal, mooring structures, or roads and rail within a port area.

Transportation Economic Assistance Program

The Transportation Economic Assistance (TEA) grants provide funds for up to a 50 percent of total project costs. The grants are justification based on jobs created or retained ($5,000 / job up to a maximum of $1 million). Applicants can be private or public entities. Typically funds road, rail, harbor and airport improvements (Contact Gati Grundmanis 608 / 266-3488)

State Infrastructure Bank Program

The State Infrastructure Bank Program provides low interest loans, loan guarantees, interest rate subsidies, lease-buy options and other financial leveraging instruments that help communities provide for transportation infrastructure improvements. WisDOT charges 4 percent interest on the loan principal with project amortized up to 25 years. The grants are justification based on improved transportation efficiency and mobility. Applicants can be public entities, a private non-profit organization (sponsored by an eligible community), Transit Commissions, or Amtrak.

Freight Railroad Infrastructure Improvement Program

The Freight Railroad Infrastructure Program provides loans up to 100 percent of the project costs. Funds are awarded on a justification basis; improvements must be made on cargo-handling / transportation efficiencies. Applicants can be public or private entities. Typically projects include rail spurs, rail loading facilities and storage and handling facilities related to rail use. (Contact Frank Huntington 608 / 267-3710)

Freight Railroad Preservation Program

The Freight Railroad Preservation Program provides grants up to 80 percent to purchase abandoned rail lines or to rehabilitate facilities on publicly-owned rail lines. Purchases must either help continue freight rail service or preserve the opportunity for future service. Typically, projects include purchasing or repairing tracks or bridges. Funds are awarded on a justification basis; improvements must be made on cargo-handling / transportation efficiencies. Applicants must be public entities (Contact Ron Adams 608 / 267-9284).

Wisconsin Department of Commerce Programs

Community Development Block Grant–Blight Elimination and Brownfield Redevelopment

These grants cover up to 75 percent of the total project costs. A maximum of $100,000 is dedicated for site assessments and $500,000 for remediation. Applicants must be municipalities or counties. Typically, projects include environmental site assessments and remediation of contaminated sites (www.commerce.state.wi.us).

CDBG Public Facilities for Economic Development

These grants are awarded for up to 75 percent of the overall project costs ($10,000/job up to a maximum of $1 million/year). Awards are given on a justification based on job creation or retention by the benefiting business. The benefiting business must make capital investments at least equal to the size of the grant. Applicants are municipalities or counties. These grants help create infrastructure for economic developments; typical projects include public water, sewer, and roads. (Contact Jim Frymark, 608/266-2742)

Education

Enhanced research and education capabilities and expanded public information and outreach efforts need to be supported as a basis for improving decision-making about water resources. Marine water pollution emanating from harbor activities must be as an integral part of water policy including stormwater management practices and support for local and state initiatives to implement smart growth land-use and planning strategies. Harbors will face some of the most challenging management issues in the next decades as shipping increases, competing uses of waterfront intensifies, and water quality is recognized as economically valuable.

By providing training on alternative to traditional commercial fishing techniques, such as aquaculture techniques, fisheries can learn a more sustainable method of commercial fishing. On-site aquacultural services have been provided continually by UW Sea Grant Advisory Services to more than 100 Wisconsin businesses since the aquaculture program began in 1987. Hands-on workshops provide fish farmers with training and actual experience under the watchful eye of skilled specialists, while regional workshops offer the industry specific technical information on individual fish species and methods.

Communities need to collect, organize and disseminate information about the coastal related development projects value and impact on the economy, environment, and sustainable use of the shorelines. Use this information to support wise decision making about facility siting, expansion and management and to build general awareness about the impacts on coastal resources.

The waterfront is the zone of interaction between the community and the water. It is here that the needs of the waterfront, the community, and its inhabitants come together. There is a unique opportunity to apply waterfront revitalization energies to engage the public and help bring communities and shores back to health. As coastal communities rediscover their connection to the water, there is a rare opportunity to repair past damage and prevent new injury, to reconnect to what is special and remarkable about the water, and to achieve a more sustainable and enjoyable quality of life. Imbedded in this approach is the belief that development along a waterfront should meet human needs and shore needs. Communities can find better, more appealing, and more sustainable solutions by integrating waterfront considerations up front.

VI. TRANSPORTATION

Introduction

This element of the plan will have a compilation of objectives, goals, policies, maps and programs to guide the future development of the various modes of transportation, including streets, roads and highways, transit, transportation systems for persons with disabilities, bicycles, walking, railroads, air transportation, trucking and water transportation. This element will compare the community's objectives, policies, goals and programs to state and regional transportation plans. The element will identify highways and streets within the community by function and incorporate other applicable transportation plans, including transportation corridor plans, county highway functional and jurisdictional studies, urban area or rural area transportation plans, airport master plans and rail plans, that apply to the community.

Issues

Ports and Harbors

Wisconsin's Ports and Harbors not only provide recreational access to the Great Lakes but support local business and employment opportunities. Future land use developments, whether on land or water, will continue to impact area coastal resources. Transportation related developments to consider include commercial port activities, ferry services, and marina docking. Associated with these types of developments are guidelines from which to follow.

Transportation related developments are regulated by various state and federal agencies. The U.S. Army Corps of Engineers, Wisconsin Department of Natural Resources, and Wisconsin Department of Transportation provide requirements and guidelines in which to follow for transportation related facilities on land and in water. Officials from the local zoning department should also be contacted regarding applicable zoning restrictions and permits needed for development.

Activities associated with ports and harbors may require a permit from the U.S. Army Corp of Engineers under the Section 404 permit as required by the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. Section 404 permits are required for the discharge of dredged or fill material into waters of the U.S. and Section 10 permits regulate the discharge of dredged and fill material and the placement of structures in, under, and over the ordinary high water mark of navigable waters of the U.S. In addition to U.S. Army Corps of Engineer review, proposed projects must be reviewed for compliance with the National Environmental Policy Act (NEPA), Section 7 of the Endangered Species Act and Section 106 of the National Historic Preservation Act.

Wisconsin State Statutes Chapter 30 provides detail on the requirements pertaining to permits needed for activities such as enclosures, dredging, grading on the shoreline bank, development of piers and wharves.

Critical to commercial ports of Wisconsin is the "Wisconsin Public Trust Doctrine". This doctrine relates specifically to the Wisconsin State Constitution where it protects filled waterfront land for the general public. This program is administered by the Wisconsin DNR. More specifically, within the Public Trust Doctrine, all filled land within the waterfront cannot be developed for non-maritime commercial uses. This doctrine is important for all of the commercial ports where available land is often very limited and the desire to develop shoreline areas for non-maritime use is ever increasing.

Programs and Actions

Local transportation projects in coastal shoreline areas can potentially have negative impacts to the fragile natural resources along both Lake Superior and Lake Michigan. With nearly 80 percent of the Great Lakes shoreline in Wisconsin suffering from erosion and/or bluff recession, the new development or improvements to existing ports and marinas is critical to examine potential long term changes that may impact these improvements.

Within some ports and harbors, coastal related problems are present. These problems could be the result of man-made structures adversely impacting the coastal resources or natural occurrences such as erosion or bluff recession. Prior to making any improvements, it is important to examine the existing or modeled problems currently

impacting the area. In some cases, technical models can assist in determining future problems associated with existing or new improvements to the area.

Improvements to local ports and harbors may have no, little, or significant impact to the coastal resources. Based on sound engineering practices, existing or future developments should carefully identify the impact to the natural resources along the coastal area. In many areas, the critical resources that are present may be only located in that one area or in only a few other locations. The impact to the coast resources should be limited in ways in which they are preserved and enhanced.

Where local problems associated with the ports and harbors exist, it is important that the community and users of the facilities understand the importance of the particular problem and how the problem may impact the coastal resources. Without an understanding of the problem, local decisions may not adequately address remedies in which to limit future problems or the decisions may only create a problem that does not currently exist.

In some cases, an assessment of past bluff recession rate data or shoreline erosion information can assist in assessing impacts to the coastal resources. All available data should be reviewed in an effort to realize the full impact of a proposed project. This review will guide the community in making a decision that will minimize the negative impacts on the coastal resources of the Great Lakes.

Additional Sources of Information

- www.dnr.state.wi.us/org/water/fhp/waterway/rights.htm.
- Chapters 30 and 31 of the Wisconsin State Statutes
- www.usace.army.mil/inet/functions/cw/cecwo/reg/

Marinas

Marinas provide an important function in the storage of recreational boats and provide an access point for the general public to enjoy the Great Lakes of Wisconsin. In addition, marinas can also act as centers upon which local land use development may occur. Local communities should examine land use activities in and around marina development as it relates to potential impact to the overall coastal resources.

The U.S. Army Corps of Engineers and the Wisconsin Department of Natural Resources both provide guidelines relating to the development of marinas. These guidelines include information relating to the types of development within the water body to the removal and disposal and/or placement of dredged material. Local zoning officials should also be contacted regarding any permits required for construction.

Section 404 permits are required from the U.S. Army Corps of Engineers for most work associated with development or improvements surrounding marina development. Chapter 30 of the Wisconsin State Statute relates to structures, including piers.

Programs and Actions

The physical characteristics associated with the coastal shoreline are important attributes to the development of local marinas. In many cases, the development of a marina is not simply the placement of a boat ramp with slips. Shoreline development of parking areas, restaurants, out-buildings, and other support services generally accompany marina development. Expansion or development of new marinas must examine the characteristics of the local shoreline.

In areas where new developments or improvements to existing facilities is planned, an analysis of the areas should be completed in an effort to inventory coastal resources and identify any existing or potential shoreline problems, such as existing or future shoreline erosion. This is an important step that will avert continued problems in the future.

A thorough review of existing coastal resources and shoreline problems will provide a more comprehensive evaluation of potential impacts to the shoreline as a result of marina development. It is important to identify both water and land impacts that could result from proposed developments.

As a result of a technical review associated with marina development, it is important that problems identified as a result of the marina development are reviewed and discussed. Marina developments are a long-term investment and stay in operation for many decades. Where problems are identified, it is important that if the development continues, corrective measures be taken early to resolve the problem.

An assessment of the coastal resources and problems associated with a potential development are important for a community to review. Action as part of the development will have long-term implications relating to land use and shoreline development patterns. It is important that if shoreline problems are present, the development adequately address the problem. In some cases, problems may prevent full development of shoreline areas due to negative impacts to the coastal resources.

Recreational harbors play a significant role in the state and local economy. The provide citizens with recreational boating, fishing, and several other leisure activities. The revenues generated by these activities are critical to several smaller communities.

Public access to recreational boating opportunities must be maintained or increased throughout the region. Since waterfront properties are highly sought, private ownership along coastal shorelines is rapidly increasing. Although several communities benefit from public access boat launches, additional opportunities must be made available to the public. Municipalities could generate additional revenues through nominal boat launch fees. Several private resorts and restaurants already charge nominal fees for boat launch usage, but these opportunities could be increased by other private establishments also.

Low water levels may hamper recreational boating. The increased dredging costs faced by municipalities may increase boat launch fees. Even worse, low water levels may face smaller recreational ports to close.

Since no published data exists detailing the impacts recreational boating and other activities have on local economies, municipalities should conduct these studies. These studies will not only demonstrate how recreation impacts local economies, but also assist communities in planning increased infrastructure and facilities for these activities.

Additional Sources of Information

- *A Model Local Ordinance to Regulate Piers, Wharves and Berths in Wisconsin: A Guide for Land Management Organizations*, by William P. O'Connor, Wisconsin Association of Lakes (1996).
- www.usace.army.mil/inet/functions/cw/cecwo/reg/rw-bro.htm
- *Ship Shape* - http://www.wnrmag.com/supps/2002/aug02/intro.htm

Dredging

Local dredging is often an important component associated with commercial ports to maintain shipping channel depths. In addition to dredging commercial ports, dredging is frequent within many marinas throughout the Great Lakes. Periodic maintenance of channels is necessary due to the deposit of material in the shipping channel.

The removal of dredged material is regulated by both state and federal agencies. The U.S. Army Corps of Engineers and Wisconsin Department of Natural Resources require permits to remove dredged materials from the Great Lakes.

Programs and Actions

Local dredging projects often result in the need to allow for the continued use of ports and harbors due to a build-up of sediments in the navigation channel. Other dredging projects are necessary to accommodate proposed projects.

Although dredging projects may appear to have no coastal impacts, dredging projects could have significant impacts to coastal resources below the water line. An examination of coastal resources potentially being impacted should be examined.

Upon the determination that coastal resources may be impaired by a dredging project, an assessment of the impacts must be undertaken. The assessment should include potential mitigation factors in which existing resources may be enhanced or new resources may be created at a different location. This assessment will provide the community with a better understanding of the proposed project and potential impacts to the coastal resources.

Along the Lake Michigan coastline, hundreds of thousands of cubic yards of sediment are dredged from small ports and marinas each year to keep Wisconsin's harbors open for both recreational and commercial purposes. For nearly a century federal legislation has controlled and regulated dredging and the disposal of the dredged materials within the navigable waters of the United States. Many states, including Wisconsin, have imposed their own dredging legislation and regulations which compliments and strengthens the federal laws and rules. The following is an overview of federal regulations and laws pertinent to the dredging and disposal of contaminated sediments.

Rivers and Harbors Act of 1899 and 1910

Some of the earliest pieces of legislation controlling dredging in the waters of the United States are the Rivers and Harbors Acts of 1899 and 1910. The Rivers and Harbors Acts authorized the US Army Corps of Engineers to construct harbors and implement plans related to waterborne commerce. The Corps of Engineers can also ensure operation and maintenance of these harbors and waterways. Their operation and maintenance authority carries out the bulk of Great Lakes dredging projects. Each year, Congress funds the Corps for each of the areas it is authorized to maintain, and that funding is based upon the amount of commerce that the particular water body supports. Generally, the funding is used for excavating, dredging and sediment disposal for navigation maintenance.

The Diked Disposal Program for the Great Lakes started in 1970 under the Rivers and Harbors Act. It was implemented to explore alternatives to the open water disposal of dredged sediments. The program advised the Corps to construct Confined Disposal Facilities (CDFs), in which the sediments from maintenance dredging would be disposed. This was approved under the assumption that treatment technology for contaminated sediments would be available by 1980.

National Environmental Policy Act (NEPA)

In 1969, the National Environmental Policy Act (NEPA) was approved which states that all federal agencies must prepare an Environmental Impact Statement (EIS) for all applicable federal projects. An EIS must detail several different alternate plans for each project and discuss the environmental and socio-economic impacts each plan would have; a plan of no action must be included in the EIS. The U.S. EPA, U.S. Fish & Wildlife Service, an appropriate state agency, and the public must then review the EIS. Guidelines under NEPA require public disclosure for review, as well as public comment on EISs and relevant information concerning any alternative courses of action.

Clean Water Act

Section 118 of the *Clean Water Act*, originally approved in 1977, affects only the Great Lakes. The most current amendments to Section 118 grant a five-year study on the control and removal of toxic pollutants in the Great Lakes, with special emphasis on the removal of contaminated sediments. The legislation empowers the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers to conduct the study.

Section 404 is a primary component of the Clean Water Act. Section 404, originally approved in 1977, requires property owners to obtain a permit in order to discharge dredged or fill materials into navigable waters. The U.S. Army Corps of Engineers (with assistance from the U.S. EPA) issues the permits, and monitors the dredging activity. Although Section 404 originally was enacted to protect wetlands by monitoring where and how the dredged material was disposed, it has also become one of the most influential regulations relative to dredging activity. There are two types of Section 404 permits. Both cover a five-year time frame before they must be renewed, as general permits or as individual permits. "General blanket permits" are used for projects that have minimal adverse effects on the environment (such as water gauges, navigation markers, etc.), while "individual permits" are used for dredging that involves contaminated sediments. In evaluating these permits, the Corps assesses the impact the project will have on environmental quality and if the project is in the publics interest.

Because Section 404 guidelines are the determining factor in issuing permits, they are binding on the recipient of the permit. Additionally, the Corps cannot issue itself a Section 404 permit. Instead, they must file an EIS and

obtain state certification under Section 401 of the Clean Water Act. Section 401 was originally approved in 1977. It addresses anyone applying for a permit to discharge dredged material into US waters. The legislation requires the Corps to first obtain "certification" from the state in which the project will occur. This means that the state water quality agency must determine that the disposal of dredged material will not violate state water quality standards and will not cause a significant degradation of water quality. This certification must be obtained before a 404 permit can be granted. The Corps, while not required to issue themselves a Section 404 permit, must receive Section 401 certification from the affected state and must show to the state that its discharges will not result in violations of state water quality standards.

Clean Air Act and Superfund Act

Two additional pieces of more federal legislation that briefly deal with dredging and disposal of dredged material include the Clean Air Act Amendments of 1980, and the Superfund Act of 1980. Section 309 of the Clean Air Act requires the U.S. EPA to review and comment in writing on the EISs from an air quality perspective. Within the Superfund Act of 1980, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) was approved. CERCLA was enacted to direct the U.S. EPA to investigate and respond to releases of hazardous substances that could endanger public health and the environment.

Wisconsin Dredging and Disposal Regulations

There is no single piece of dredging or disposal legislation that can be presumed suitable for an entire region or group of projects. The cumulative impacts of dredging and disposal of sediment requires methods to change as environmental conditions change. Regional dredging and disposal methods (exhibited in state legislation) offer greater opportunities for environmental protection, cost-effective disposal, and public understanding of dredged material disposal and its impacts.

The Wisconsin Department of Natural Resources' (WDNR) specific role in dredging and dredged material disposal is outlined by several major laws and sections of administrative code. The preservation of public rights or interests (including unobstructed waterways and acceptable water quality) was the legislature's main goal in approving the laws which regulate dredging.

Wisconsin's laws and regulations pertinent to dredging and the disposal of contaminated sediments complement and strengthen similar federal laws and regulations. The following is an overview of state of Wisconsin regulations and laws pertinent to the dredging and disposal of contaminated sediments.

Wisconsin Pollution Discharge Elimination System

Chapter 283 of the Wisconsin State Statutes addresses a pollution discharge system. This system was created to eliminate the harmful effects of pollutants on waters and the organisms depending on them. The legislature directed the WDNR to establish limits of effluent discharges. No one may discharge a pollutant to a waterway without a permit. The WDNR must review the application for dredging discharge, and in doing so, they may determine that the project can be authorized by a "general permit" which establishes basic effluent limitations that must be met. For dredging projects not receiving the general permit, a permit is processed and individual effluent limitations are established.

Removal of Material from Beds of Navigable Waters

Section 30.20 of the Wisconsin State Statutes addresses removal of sediment from beds of navigable waters. This legislation states that the removal of any material from any navigable lake or streambed requires a permit from the WDNR. Dredging contracts and permits specify methods of disposal. This helps minimize the potential adverse effects of dredging on water quality, habitat, and recreation.

Uses of Dredged Materials

Dredged material often has significant value if applied for beneficial uses. Disposal alternatives are always examined for possible beneficial applications. Beneficial uses of dredged material include beach nourishment/shore stabilization, habitat development, parks and recreation, agriculture, construction/ industrial and development use, and road sanding in the winter. Each project is individually tailored to accommodate the particular needs and logistics taking into account the physical and chemical characteristics of the material. These benefits occur through proper planning and coordination between the District and potential users of dredged material.

Capping

Clean dredged material is used to cover areas of contaminated sediment. This process is called "capping." The clean sediment serves as a barrier to the further spread of contaminated sediments and reduces potential threats to human health and the environment. This procedure is not always recommended for aquatic environments. However, the procedure is a viable option for reclamation of several terrestrial based activities. Several nonmetallic mines have been "capped" to restore the land to its original condition.

Beach Nourishment

Most prominent among beneficial uses of dredged material is beach nourishment. Beach nourishment is a low cost, beneficial option for operation and maintenance of dredging projects in the District. Many of the District's harbors provide clean, sandy material from the navigation channels. This material is transferred to nearby beaches in order to diminish normal erosive effects of wind, waves and weather.

When developing dredging plans for a particular project, areas of erosion are considered. Since this directly affects the cost of the operations, the distance from the dredging areas is also considered. Other important factors are locations of parks and public facilities. Both natural shorelines and man-made features are included in this analysis.

Beach nourishment is beneficial in several other ways. It returns sediments trapped between breakwaters into the littoral drift process. It also aids in the stabilization of beaches. Beach nourishment also helps to forestall the erosion occurring in the area of depletion.

Beach nourishment will continue to be a routine option for many projects in the Detroit District. Material not suitable for placement on a beach could be evaluated for other uses such as construction and industrial fill and habitat development.

Habitat Development

One type of beneficial use that is often overlooked is the development of wildlife habitats or nesting meadows in nearshore and upland disposal areas. The provision of living space for whitetail deer, small mammals, geese, songbirds and other species has been developed by the Corps.

Recreational fishing and hunting are very important elements of the Pointe Mouillee project. This is a CDF built in a state wildlife management area. This project is the result of a partnership between the District, State of Michigan Department of Natural Resources and Ducks Unlimited. The Corps is stressing multipurpose, long term beneficial use of disposal sites. Twenty six CDF facilities have been constructed upland, in-water and nearshore in the District. CDFs develop various habitats during the filling process depending on the construction site (aquatic, wetland, or upland). In most cases the final state of the CDF will be upland habitat. These sites provide additional upland habitat, as well as, recreational opportunities when completed. In urban areas, upland habitat creation is a unique resource.

Island Creation/Enhancement

Prior to the Corps' authority to construct CDFs, material was mainly deposited in deep water sites. Several projects were developed to utilize dredged material for island creation and enhancement.

Some sites provided upland habitat and unique waterfowl nesting habitat in heavily developed or industrialized areas. For example, the CDF in Saginaw Bay has become a primary nesting site for birds, including the state endangered Caspian tern.

Some sample projects:

- Gull Island: A popular swimming and recreation island for boaters, Gull Island, located in Lake St. Clair, was created from sandy dredge material from the St. River.
- Grand Haven Confined Red Disposal Facility: A completely filled CDF that is used by the city for parking and a yearly festival.
- St. Mary's River: Rock and sandy material from the St. Mary's River was placed adjacent to the Federal channel in several locations to enhance existing islands, and creation of new islands, which are popular breeding grounds for waterfowl.
- Renard Isle: Renard Isle CDF is located just off-shore of the city of Green Bay, Wisconsin. This island is a popular breeding ground for waterfowl.

Agriculture

Dredged material, high in nutrients, removed from Frankfort Harbor, Michigan, was utilized to reclaim land for farming purposes. The land owner planned to develop an orchard over the reclaimed 20 acres. Topsoil enhancement and composting projects such as this often require the addition of manure or other biosolids.

Construction

Several projects in the Detroit District have utilized dredged material in construction or industrial use. These include fill material, dike construction, urban and industrial use parking lots, roads and road sanding. To extend the capacity of the nearly filled Erie Pier CDF, Duluth, Minnesota, a project was developed where dredged material was washed with on-site water to wash away the fine material leaving clean sand, which is used for various construction and industrial applications. Dredged materials can also be used as an ingredient in the manufacture of bricks, ceramics, and concrete.

Regulations of Dredging Projects on the Beds of Waterways

Chapter NR 347 of the Wisconsin Administrative Code addresses regulations concerning waterway dredging projects. Chapter NR 347 provides legal definitions of dredging-related terms, lists required project and environmental information, and specifies the implementation (as it applies to dredging) of the wastewater treatment facility plan approval program, the solid and hazardous waste management programs, and the Wisconsin Pollution Discharge Elimination System.

Solid and Hazardous Waste Management Programs

Chapters 289, 291 and 299 of the Wisconsin State Statutes address solid and hazardous waste management programs. This legislation directed the WDNR to develop standards and definitions for permitting and licensing the construction and operation of solid and hazardous waste disposal facilities. Following initial discussion of a proposed dredging project, the WDNR determines what technical information is required for permitting; this information is based on the amount of dredged material and the potential for contamination of the sediments. These laws provide for county-level solid waste management planning to be coordinated on the basis of the dredged material and the disposal site.

Permitting Process

In accordance with state and federal regulations that must be followed concerning dredging, a permit must also be obtained. All private and municipal dredging projects require a permit or contract under Section 30.20 of the Wisconsin Statutes and Chapters NR 346 and NR 347 of the Wisconsin Administrative Code. In addition, Section 10 of the federal Rivers and Harbors Act requires a permit from the U.S. Army Corps of Engineers in order to carry out specific dredging activities. This is also stated in Section 404 of the federal Clean Water Act. Both federal and state permits are required for dredging projects. In addition, all dredging projects are reviewed under Sections 1.11 and 23.11 of the Wisconsin Statutes and Chapter NR 150 of the Wisconsin Administrative Code for compliance with the Wisconsin Environmental Policy Act. Federal permits are obtained from the U.S. Army Corps of Engineers, but state regional and general permits are obtained from the WDNR for navigable waters under Section 30.20 of Wisconsin Statutes. In order to obtain a federal dredging permit for a large project, a full public interest review is needed. For small dredging projects, a letter of permission is needed.

Confined Disposal Areas

The continued use of confined disposal facilities (CDF) will be necessary to remove accumulating sediments. A CDF is a diked enclosure having structures that retain dredged material; there main purpose is to prevent dredged materials from re-entering a waterway,. Although the design for each CDF is site specific, steel pilings or stone are utilized to outline the frame for the CDF; the overall design will depend on the end use of the CDF (habitat restoration, etc.) and contaminants found in the dredged material. Specialized containment barriers such as plastic sheeting may also used. Dikes for in-water CDFs are constructed in layers. Most often, larger riprap are used towards the bottom and outside of the unit. Smaller stones may be used towards the surface. When material is placed into a CDF, water will evaporate while sediments settle out. Various engineering practices are used to minimize the amount of sediment that re-enters the waterway as a CDF is filled to capacity.

CDFs are an acceptable measure to contain contaminants that pose significant threats to the environment and human health. Although on-site remediation of small scale contaminations is technically feasible, the extent of PCB and heavy metal contamination may prove to be cost prohibitive. CDFs will serve as an economically viable option to clean-up efforts. Treatment methods should still be utilized on sediments once they are placed into CDFs. Many environmental studies have been conducted at CDFs throughout the Great Lakes to determine the fate of contaminants. The Times Beach CDF near Buffalo has had extensive testing done. Researchers have found that heavy metals have accumulated in the plants and invertebrates found in the CDF. Organic contaminants have not been found in upland or adjacent areas. Additional research will be done to determine the long-term degradation pathways of environmental contaminants in CDFs throughout the Great Lakes basin (www.glc.org)

Research & Monitoring

The Corps also maintains several research facilities including the Waterways Experiment Station (WES) in Vicksburg, Mississippi. Scientists study the various aspects of dredged material and develop and evaluate different disposal techniques.

In addition, the Corps of Engineers is developing a research program at the Coastal Engineering Research Center at

WES, which will address the engineering and mechanical aspects of dredging. Research focuses on the development of modern, cost-effective techniques and equipment for beneficial applications.

Additional Sources of Information

- www.dnr.state.wi.us/org/water/fhp/waterway/dredging.htm

Multi-Modal Facilities

Certain coastal areas along the Great Lakes provide potential development for multi-modal transportation facilities incorporating rail, water, and highway facilities. These facilities allow for the shipment of goods between transportation modes.

Development of multi-modal facilities along the coastal areas may require permits from the Wisconsin Department of Transportation, Wisconsin Department of Natural Resources, U.S. Army Corps of Engineers, U.S. Coast Guard, and the local zoning department. Depending on the activities associated with development of the multi-modal facilities, Section 404, Section 10 and Section 7 permits may be required.

Programs and Actions

Through inventorying coastal resources present at an existing or proposed site for a multi-modal facility, local communities can often identify potential impacts to particular coastal resources. The impacts associated with the development should be reviewed during the planning stage to ensure other alternatives are reviewed and considered. Where possible, impacts affecting the coastal resources should be minimized and if necessary the mitigation of impacted coastal resources should then be planned.

Photo: Schneider National, 2003.

Impacts associated with the improvement to or development of multi-modal facilities to the coastal environment can have wide reaching implications. Throughout the coastal resources of Wisconsin, many coastal resources are found in only a few specific locations due to site specific structures, vegetative cover or shoreline type and may not be able to be reproduced elsewhere. Where that is the case, it is import to understand the significance of the coastal resource and its value to the natural environment.

In assessing the conditions present along the shoreline, it is important that factors concerning the problem are reviewed. In many cases, shoreline development can be constructed to minimize impacts to the natural environment. Without the review of alternative construction designs, an assessment of only one alternative may provide inadequate analysis as to the overall impact to environmental and social aspects along the shoreline.

Additional Sources of Information

- http://www.dot.wisconsin.gov/projects/state/connections2030.htm

Bridges

Local or state sponsored bridges provide an important transportation link to local residents and visitors of Wisconsin. Bridges are designed to provide for the safe and efficient movement of the traveling public. However, bridges must also allow persons the ability to navigate under the bridges whether for pleasure or commercial purposes.

Development of local bridges may require permits by the Wisconsin Department of Transportation, Wisconsin Department of Natural Resources, U.S. Army Corp of Engineers and the U.S. Coast Guard. Activities associated to Section 404 are required to be obtained from the U.S. Army Corps of Engineers.

An exception to the permitting process relates to the development of bridges. Under current law, the U.S. Coast Guard is responsible for permitting under Section 10 as it relates to bridges over all navigable waters.

The Wisconsin Department of Transportation Trans 207 "Design and Construction of Municipal Highway Bridges in or over Navigable Streams" provides guidance relating to standards and specifications for the design and construction of bridges over navigable streams. Many of these streams have a direct influence to the coastal resources found in both Lake Superior and Lake Michigan.

Programs and Actions

Due to the varied soil structure, existing or potential shoreline erosion, and potential impact to water resources, the development of bridges spanning local rivers and streams must be reviewed. Local units of government must consider existing conditions before the development of any bridge or culvert. The physical characteristics of the surrounding environment will dictate the type and design of bridge construction. The same is true for all bridges built with supports in the waterway.

During design phases, it is important that potential problems associated with the development are discussed publicly. Through a complete inventory of the coastal resources present on site or near the proposed project potential problems will only then be identified before the project has begun.

Identified problems can often be defined to specific impacts associated to coastal resources or the natural environment. Where specific coastal impacts are identified, efforts must be taken to minimize or mitigate the impact. Construction designs can be developed to positively impact the coastal and environmental resources. Community input is critical to assist in providing guidance towards projects having the least impact to the coastal resources.

Additional Sources of Information

- www.dnr.state.wi.us/org/water/fhp/waterway/bridges.htm

Education

The waterfront is the zone of interaction between the community and the water. It is here that the needs of the waterfront, the community, and its inhabitants come together. There is a unique opportunity to apply waterfront revitalization energies to engage the public and help bring communities and shores back to health. As coastal communities rediscover their connection to the water, there is a rare opportunity to repair past damage and prevent new injury, to reconnect to what is special and remarkable about the water, and to achieve a more sustainable and enjoyable quality of life. Imbedded in this approach is the belief that development along a waterfront should meet human needs and shore needs. Communities can find better, more appealing, and more sustainable solutions by integrating waterfront considerations up front.

Communities need to collect, organize and disseminate information about the coastal related development projects value and impact on the economy, environment, and sustainable use of the shorelines. Use this information to support wise decision making about facility siting, expansion and management and to build general awareness about the impacts on coastal resources.

VII. PUBLIC AND COMMUNITY FACILITIES

This element will have a compilation of objectives, goals, policies, maps and programs to guide the future development of utilities and community facilities in the community such as sanitary sewer service, stormwater management, water supply, solid waste disposal, on-site wastewater treatment technologies, recycling facilities, parks, telecommunications facilities, power-generating plants and transmission lines, cemeteries, health care facilities, child care facilities and other public facilities, such as police, fire and rescue facilities, libraries, schools and other community facilities. This element will describe the location, use and capacity of existing public utilities and community facilities that serve the local governmental unit, shall include an approximate timetable that forecasts the need in the community to expand or rehabilitate existing utilities and facilities or to create new utilities and facilities, and shall assess future needs for governmental services within the community that are related to such utilities and facilities.

PUBLIC AND COMMUNITY FACILITIES

Source: Bay-Lake Regional Planning Commission, 2000.

To maintain a high level of public services, a community must continually monitor and upgrade its existing facilities to address changes in population. As time goes on, the community will need to collect updated information regarding services as it looks to modify them. In some cases, greater detail of information on the service should be gathered. As developments grow within the community, there may be a need to increase the number of services for those types of developments. Likewise, the possible growth within the area may result in additional development pressures within the community, to more isolated areas of the planning area. The general recommendations contained in this section are based on general long-range planning considerations and should not be substituted for detailed architectural or engineering studies required before expending substantial community resources and undertaking specific public works projects.

Community Facilities

Community facilities within a community can include both the services provided by the community as well as the facilities housing those services. Coastal communities should conduct an inventory of community facilities including the size, location, capacity and future needs of the following services with a focus on the special characteristics of these facilities. For example, emergency services may need to include special equipment and training for water rescue. The following facilities and services should be inventoried:

- Fire
- Police
- Emergency Services
- Library
- Post Office
- Schools
- Child Care
- Elderly and Health Care
- Cemeteries
- Administrative Services and Buildings
- Maintenance Facilities

Parks and Recreation Areas

Public parks and recreation areas provide opportunities for participation outdoor activities, learning and leisure. The economic benefits of recreational opportunities have, in many cases, eclipsed those derived from traditional uses. Recreation has generated additional demand for supporting businesses and services, which provides added economic benefit to local communities. In some cases, the annual influx of visitors strains local infrastructure and threatens to diminish the quality of the experience. Planning can help resolve these concerns and assist in preserving the character of coastal resources, while accommodating the requirements of visitors.

Inventory of Existing Parks and Recreational Facilities

In order to understand and evaluate coastal recreational resources and their significance to the local economy, a comprehensive resource inventory should be conducted. This inventory should include detailed information about the following resources:

National / State / County / Community parks, forests, lakeshores, preserves or other lands providing public access to coastal resources.

What to Inventory

- Public parks
- Public beaches
- Public campgrounds
- Recreational trails
- School system facilities
- Lighthouses
- Public recreational facilities such as playgrounds, rinks and public fishing docks
- Public boat landings / access points

Analysis

As part of the inventory, detailed information should be collected about the physical size, distribution and use characteristics of recreation resources. Management, planning and policy development responsibilities should also be defined. Maps should be developed to assist in visualization and planning.

Some public recreation lands and facilities will likely be operated and managed by jurisdictions other than the local community. State, federal, tribal and county government may be responsible for management, policy development, implementation and planning for these areas. It is important that relationships, responsibilities and goals are clearly defined and that local planning is coordinated with the jurisdiction responsible for resource management

The analysis should also focus on the local recreational resource supply-demand relationships, and identifying future needs. The community may desire to expand opportunities and / or improve or expand existing facilities.

What to Analyze

- The size and distribution of the facilities in the community
- Available facilities
- Access points and parking
- Handicapped / Disabled Accessibility
- The number of visitors using the facility and variations in visitor numbers from year to year.
- Management, policy and planning

Furthermore, evaluation of recreational potential of an area should be based on the economic and demographic attributes. The community should work to identify landscape resources, key activities (what do people want to do?), service facilities and accommodations, and the number of people within a reasonable driving distance to the area.

Sources of Grant Funding

The Federal Highway Administration, Department of Transportation offers project grant funds (Recreational Trails Program) to the states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Funds from this program may be used for maintenance or restoration of existing trails or for the development of new trails.

RTP funds may only be used on trails which have been identified in or which further a specific goal of a local, county or state trail plan included or referenced in a statewide comprehensive outdoor recreation plan required by the federal Land and Water Conservation Fund Program (LAWCON).

The Wisconsin Coastal Zone Management Program also offers grants to encourage the protection and wise use of Wisconsin's coastal resources and to increase public access to the waters of the Great Lakes.

The Wisconsin DNR's Bureau of Community Financial Assistance (CFA) administers grant and loan programs to local governments and interested groups that protect public health and the environment, and provide recreational opportunities. Land & Recreation Financial Assistance provides grant programs for conservation, restoration, parks, acquisition of land and easements for conservation purposes and for the development of recreational facilities and trails. In addition, Wisconsin Stewardship Local Assistance Programs (WDNR) provide grant funds to local communities to expand outdoor recreation opportunities.

Additional Sources of Information

- http://www.dnr.state.wi.us/org/caer/cfa/lr/stewardship/stewardship.html
- www.coastal.wisconsin.gov

UTILITIES AND INFRASTRUCTURE

Infrastructure and local utility systems are the backbone of our communities. These systems can have a significant impact on future growth and development and to the quality of the natural environment.

Water Supply

Groundwater extraction is the source of both public and private water supply in most of Wisconsin's coastal communities. As residential growth expands in the coastal zone and the population increases additional clean, fresh water will be needed.

Wisconsin requires a permit for high capacity wells (100,000 gallons per day or greater) under Chapter 281.17(1), Wisconsin State Stats. A diversion or consumptive use of Great Lakes water at 5 million gallons per day or greater requires consultation with the other Great Lakes states. The standards for public supply wells (design, construction, and operational standards) are regulated under NR 811 Wisconsin Administrative Code. Private wells in the State of Wisconsin are regulated under NR 812.

The Wisconsin Department of Natural Resources has adopted maximum contaminant level (MCL) standards, which apply to all public water supplies in the state. The standards regulate concentrations of pollutants in public water supplies (NR 809) and nitrate removal from public drinking water (NR 122).

Under Wisconsin's Groundwater Standards Law (NR 160), state programs for landfills, hazardous wastes, spills, wastewater, septic tanks, salt storage, fertilizer storage, pesticides, and underground storage tanks must comply with the standards. In addition, Wisconsin Administrative Code chapters NR 140, 141, and 142 regulate groundwater quality, groundwater monitoring well requirements and water management and conservation.

Local government has the authority to protect groundwater resources through the use of planning and zoning. Many local units of government (primarily counties) have developed wellhead protection ordinances, regulations of private sewage systems and chemical storage.

Sanitary Sewer

Wisconsin Pollution Discharge Elimination System

Chapter 283 of the Wisconsin State Statutes addresses a pollution discharge system. This system was created to eliminate the harmful effects of pollutants on waters and the organisms depending on them. The legislature directed the WDNR to establish limits of effluent discharges. No one may discharge a pollutant to a waterway without a permit. The WDNR must review the application for dredging discharge, and in doing so, they may determine that the project can be authorized by a "general permit" which establishes basic effluent limitations that must be met. For dredging projects not receiving the general permit, a permit is processed and individual effluent limitations are established.

Compliance Maintenance Annual Report (CMAR)

The WDNR designed a rating system called CMAR that is a self-evaluation annual report used by municipal wastewater treatment facilities in Wisconsin to assess a treatment plant's performance and wastewater management activities. This diagnostic annual report helps ensure ongoing compliance with Wisconsin Pollutant Discharge Elimination System (WPDES) conditions and effluent standards. Sections of the CMAR include Influent Loading, Effluent Quality, Biosolids Quality and Management, Sanitary Sewer Collection Systems, Lagoons/Ponds Liner Integrity, Groundwater Quality, Operator Certification/Education, Preventative Maintenance/Staffing and Financial Management. The CMAR rates various components of wastewater treatment and gives an overall rating ranging from 0 to over 540 points to a facility. The annual report has three range categories for determining

recommendations for the treatment plant: voluntary range (0-70 points), departmental recommendation range (71-120) and departmental action range (greater than or equal to 121).

Private On-Site Sewer Systems

Private Onsite Wastewater Treatment Systems (POWTS) are systems that receive domestic quality wastewater and either retain it in a holding tank, or treat it and discharge into the soil, beneath the ground surface. Any system with a final discharge exposing treated wastewater upon the ground surface, or discharging directly into surface waters of the state, is subject to DNR regulation. The POWTS program protects public health and the waters of the state by regulating onsite wastewater treatment and recycling systems, and by promoting the use of the best available technology to provide onsite sewage treatment system solutions for property owners. POWTS are regulated by the Wisconsin Department of Commerce through COMM 83.

Additional Sources of Information

- http://www.commerce.state.wi.us/SB/SB-POWTSProgram.html
- The Wisconsin Fund Grants is a program that provides grants to homeowners and small commercial businesses to help offset a portion of the cost for the repair, rehabilitation, or replacement of existing failing POWTS.
- The Small Scale Waste Management Project. SSWMP is an interdisciplinary University of Wisconsin research group formed in 1971 to develop methods to treat and dispose of wastewater in unsewered areas. www.wisc.edu/sswmp

Stormwater Drainage

Many storm sewer systems are comprised of storm sewers, culverts, open ditches, and drainage basins that drain directly to coastal lakes and streams. Under Phase II of the Clean Water Act, many stormwater systems will need treatment to reduce the amount of sediments and contaminants flowing into lakes and streams. The idea behind stormwater management is that a variety of small and relatively inexpensive corrective measures can cumulatively make a very large difference by reducing flooding, enhancing groundwater recharge, and improving water quality in lakes and streams. Communities may enact stormwater management ordinances, establish stormwater utilities and charge impact fees to help pay for the cost of some of these improvements.

Additional Sources of Information

Nonpoint source pollution information:

- http://www.ecn.purdue.edu/runoff/documentation/nps.htm
- http://www.dnr.state.wi.us/org/water/wm/nps/
- http://www.dnr.state.wi.us/org/water/wm/nps/rules/NRrules.html
- Stormwater pollution in your home and community, - http://www.epa.gov/owow/nps/dosdont.html
- Wisconsin Coastal Management Program - http://coastal.wisconsin.gov

Solid Waste Disposal and Recycling Facilities

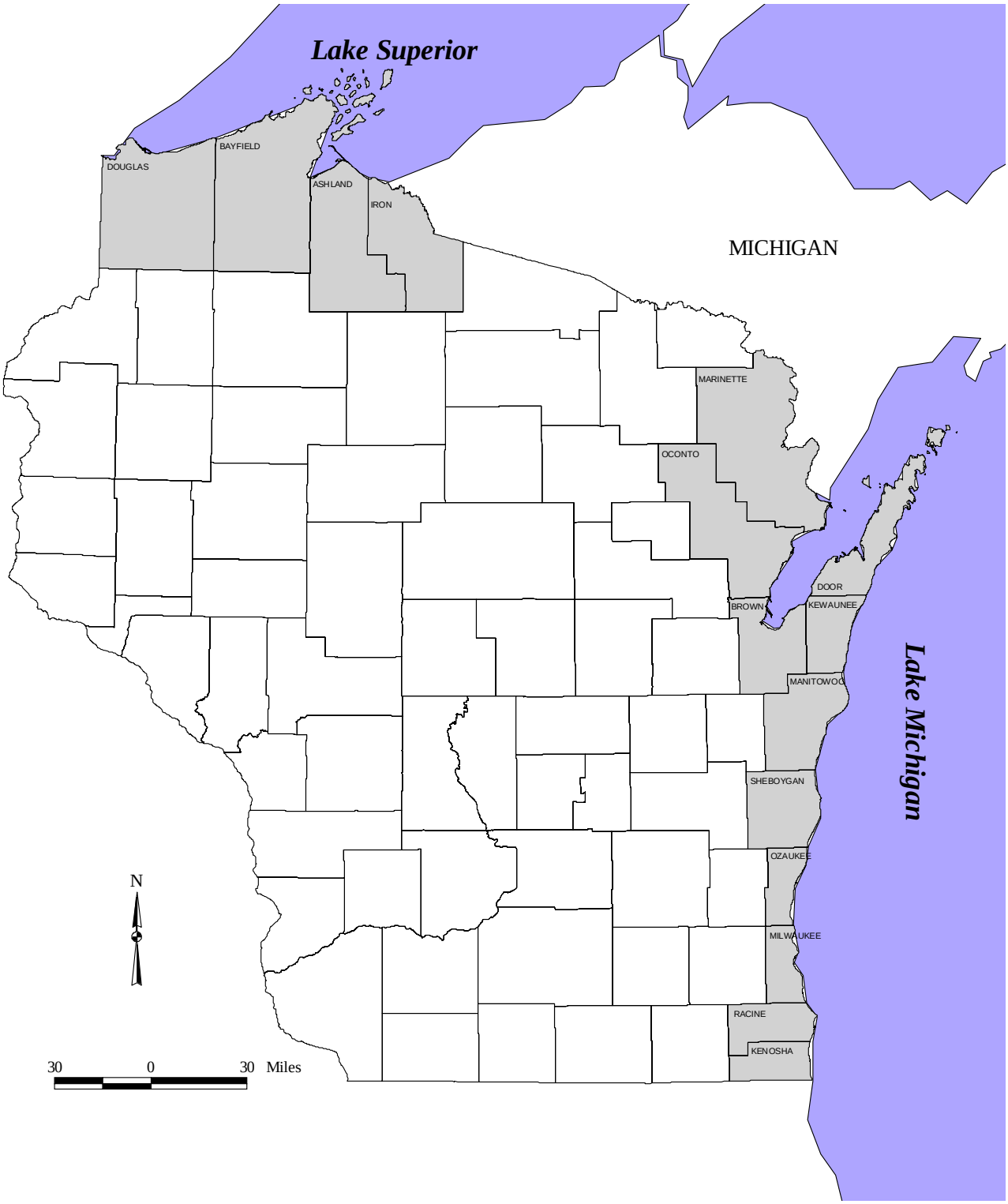
Solid and Hazardous Waste Management Programs

Chapters 289, 291 and 299 of the Wisconsin State Statutes address solid and hazardous waste management programs. This legislation directed the WDNR to develop standards and definitions for permitting and licensing the construction and operation of solid and hazardous waste disposal facilities. Following initial discussion of a proposed dredging project, the WDNR determines what technical information is required for permitting; this information is based on the amount of dredged material and the potential for contamination of the sediments. These laws provide for county-level solid waste management planning to be coordinated on the basis of the dredged material and the disposal site.

Education

- Examine options other than conventional sanitary and storm sewer systems for the transport of waste and stormwater runoff;
- Prepare a local or regional *Stormwater Management Plan*;
- Develop a study examining the regional effects the expansion of sanitary sewer service has on land use and water quality.
- Provide adequate police and fire protection as well as educational and recreational opportunities;
- Provide for safe and sanitary sources of drinking water; a *Wellhead Protection Plan* can assist in accomplishing these goals;
- Further develop parks such to take full advantage of their locations on the bay shore;
- Prepare a *Capital Improvement Program* to assist in long-term budgeting for public facilities.

Coastal Counties in Wisconsin



VIII. INTERGOVERNMENTAL COOPERATION

Introduction

This element will be a compilation of objectives, goals, policies, maps and programs for joint planning and decision making with other jurisdictions, including school districts and adjacent local governmental units, for siting and building public facilities and sharing public services. This element will analyze the relationship of the communities to school districts and adjacent local governmental units, and to the region, the state and other governmental entities. This element will incorporate any plans or agreements to which community is a party under s. 66.023, 66.30 or 66.945. The statement shall identify existing or potential conflicts between the community and other governmental units that are specified in this paragraph and describe processes to resolve such conflicts.

A community's relationship with neighboring communities, federal, state and local agencies can impact residents in terms of planning, the provision of services, and siting of public facilities. An examination of these relationships and the identification of existing or potential conflicts can help the community address these situations in a productive manner. In coastal communities, intergovernmental cooperation can be even more significant when communities share coastlines or resources. The activities of one community can have a direct impact upon its neighbors.

Issue Identification

As part of the issue identification process a community can hold an issues identification workshop or conduct a survey of other jurisdictions. This process should seek to answer some of the following questions:

1. What are some examples of Positive Intergovernmental Cooperation in the Area?
2. Identify Intergovernmental Cooperation "Geographic Hot Spots" or "Targets". What are the Existing or Potential Conflicts and Conflict areas?
3. What Other Issues and Opportunities are there that require Intergovernmental Cooperation to be Successfully Handled?
4. Do you have any examples of Methods to Foster Intergovernmental Cooperation? What are your future plans? Future collaboration?

The results of the workshop can then be used to develop strategies for communities to cooperate more effectively.

Potential Participants

State Agencies
University of Wisconsin - Extension
Wisconsin Department of Transportation
Wisconsin Department of Natural Resources
Wisconsin Department of Commerce
Wisconsin Coastal Management Program
Local Government
Counties
Cities
Villages
Towns
Governmental Planning Agencies
Regional Planning Commissions
Utilities
Sanitary Districts
Water Districts
Electric Companies
Gas Companies
School Districts\Educational Institutions
Public Schools
Technical Schools
UW-System
Other Groups
Chambers of Commerce
Economic Development Corporations
U.S. Army Corps of Engineers

Management Authorities

Management of coastal resources occurs at many levels. Local control of shoreland areas is administered by both local governments and counties under county and local shoreland / wetland / floodplain and setback ordinances.

Wisconsin Department of Natural Resources

The Wisconsin Department of Natural Resources is dedicated to the preservation, protection, effective management, and maintenance of Wisconsin's natural resources. The agency has authority to recommend, implement, and enforce both state and federal laws designed to protect or enhance coastal areas. An inter-disciplinary

approach is used to coordinate the mixed land use decisions that face the state. The department oversees several programs that monitor water quality, ecosystems management, and other environmental issues.

The DNR issues permits for several commercial and recreational activities. Fisheries biologists set recreational fishing bag limits and commercial fishing quotas; they also regulate state statutes and issue recreational, charter, and commercial licenses for these activities. All commercial and recreational boats within the state must be registered with the DNR. The DNR issues licenses and permits for several water related activities; these activities include, but are not limited to dredging, aquatic plant control and barriers, piers and related structures, dams, irrigation systems, and habitat enhancement projects.

Wisconsin Department of Transportation

The Wisconsin Department of Transportations regulates all major transportation systems within the state. The department is responsible for planning, building, and maintaining the state and federal highways within Wisconsin. The department also oversees other transportation modes including pedestrian and bicycle routes, air travel, rail systems, and waterborne traffic. The department assists in creating and implementing legislation governing waterborne traffic and commerce. Projects are performed to minimize detrimental impacts on both terrestrial and aquatic natural resources. The department oversees waterborne commerce at 15 commercial ports throughout the state. The DOT operates the Harbor Assistance Program which helps maintain and improve waterborne commerce. Typical projects funded by this program include dock reconstruction, mooring structure replacement, dredging, and construction of confined disposal facilities. Several programs regulate private commercial enterprises including cruise ships, car ferries, and recreational boating (marinas and yacht clubs).

United States Army Corps of Engineers

The U.S. Army Corps of Engineers is a division of the Department of the Army and has an extensive array of responsibilities related to wetlands, navigation, and the nation’s dams and locks systems. The Corps derives its authority from several laws among which are the following:

1. The River and Harbors Act of 1899, 1902, 1968
2. The Outer Continental Shelf Lands Act of 1953
3. The Federal Water Pollution Control Act of 1972 (Section 404)
4. The Marine Protection research and Sanctuaries Act of 1972

Supporting navigation by maintaining and improving channels was the Corps of Engineers' earliest Civil Works mission. Federal laws dating to 1824 authorized the Corps to improve safety on the Ohio and Mississippi Rivers and several ports through channel maintenance; this process keeping them at specified depths and widths by dredging and other means. Maintaining also means removing impediments, like logjams. Improvements involve creating deeper or wider channels.

Today, the Corps maintains more than 12,000 miles (19,200 km) of inland waterways and operates 235 locks. These waterways are a system of rivers, lakes and coastal bays improved for commercial and recreational transportation. This system carries about one-sixth of the nation's inter-city freight, at a cost per ton-mile about 50% of rail or 10% of trucks. The Corps also maintains 300 commercial harbors which handle 2 billion tons of cargo a year. The Corps also maintains an additional 600 smaller harbors. With more than 13 million American jobs dependent on our import and export trade, these ports are vital to our economic security. Detailed information on the commerce handled by the Nation's ports and waterways is available from the Corps' Navigation Data Center.

The Corps has been involved in regulating activities by others in navigable waterways through the granting of permits since passage of the Rivers & Harbors Act of 1899. At first, this program was meant to prevent obstructions to navigation. An early 20th century law gave the Corps regulatory authority to oversee the dumping of trash and sewage. Passage of the 1972 Clean Water Act greatly broadened this role by giving the Corps authority over dredging and filling in the "waters of the United States," including many wetlands.

A major aspect of the Regulatory program is determining which areas qualify for protection as wetlands. The Corps uses its 1987 Wetland Delineation Manual to reach these decisions. In making decisions on whether to grant, deny

or set conditions on permits, District commanders are required to consider "all factors in the public interest." These factors include economic development and environmental protection.

The navigation program includes all of the nation's deep draft harbors. These waterways are a vital link to seaborne commerce; they handle much of the nation's international trade each year. In addition, hundreds of smaller harbors serve a variety of recreational and commercial purposes. The Corps has also built an intracoastal and inland network of commercial navigation channels, locks and dams for navigation.

The Corps of Engineers carries out shore protection projects at the request of local sponsors as authorized and funded by Congress. The Corps looks for the most economical, environmentally sound, and socially acceptable solutions to shore protection. The cost of replacing sand is significantly less than the cost of repairing property damaged by a storm. Corps shore protection projects are usually shared between the Corps, the state, the local jurisdiction where the project is located. In cases where the project involves beach nourishment, the cost sharing agreement usually calls for periodic re-nourishment, often over a 50 year period. The Federal Government has honored all such commitments. A 1996 study commissioned by the U.S. Office of Management and Budget concluded that Corps beach nourishment projects have performed generally as designed. Actual renourishment volumes, averaged over all projects, have been within five percent of predicted volumes. Actual costs have been one percent less than predicted costs for the initial beach restoration and ten percent less than predicted costs for periodic nourishment.

Requests for shore protection projects nearly always come from communities where intense development has already taken place. Federal policy is that the local project sponsor provides 100 percent of the cost to protect undeveloped shorefront lands within an area where a Federal project has been recommended.

Projects are performed only on publicly accessible beaches. A detailed cost-benefit study is performed prior to commencing a project; the study must determine a positive cost to benefit ratio exists. Although Corps projects provide benefits such as shoreline protection, habitat protection and renewal, and the tourism revenues, the primary purpose is always the protection of life and property (www.usace.army.mil).

United States Coast Guard

The United States Coast Guard is a branch of the military which performs several functions vital to national security and maritime safety. Since the Coast Guard was recently re-assigned to the newly created Department of Homeland Security, they are responsible for protecting the security of national borders. The Coast Guard performs routine vessel inspections, drug interdictions, and immigration duties. The Coast Guard also coordinates, operates, and maintains several maritime safety systems in interior coastal waters.

The United States Coast Guard Auxiliary was established in 1939 by Congress to assist the Coast Guard in promoting boating safety. The Auxiliary has more than 35,000 volunteer members from all walks of life who receive special training so that they may be a functional part of Coast Guard Forces. Auxiliarists assist the Coast Guard in non-law enforcement programs such as public education, vessel safety checks, safety patrols, search and rescue missions, maritime security, and environmental protection, and Coast Guard Academy introduction programs for youth. Auxiliarists volunteer more than two million hours annually to benefit other boaters and their families.

In 1967, the Bridge Program was transferred from the Army Corp of Engineers to the U.S. Coast Guard within the Department of Transportation. The Coast Guard approves the location and plans of bridges and causeways constructed across navigable waters of United States. In addition, the Coast Guard is responsible for approval of the location and plans of international bridges and the alteration of bridges found to be unreasonable obstructions to navigation. Authority for these actions is found in the following laws: 33 U.S.C 401, 491, 494, 511-524, 525 and 535a, 535b, 535c, 535e, 535f, 535g, and 535h (Note: these are all separate sections, not subsections of 535). Theses laws are popularly known as the International Bridge Act of 1972. The Implementing regulations are found in Title 33, Code of Federal Regulations Parts 114 through 118.

The Aids to Navigation System is a consistent system to mark the waters of the United States and its territories to assist boaters in navigation and alert them to obstructions and hazards. This system is similar to the safety signals and signs used in driving on streets and highways. The U.S. Coast Guard determines the placement and performs maintenance of Aids to Navigation in U.S. waters. These aids include lighted and unlighted beacons, ranges, leading lights, and buoys, as well as sound signals associated with these aids.

United States Department of Transportation

The United States Department of Transportation is divided into nine distinct agencies that govern specific modes of transportation. The three maritime divisions include the Saint Lawrence Seaway Development Corporation (SLSDC), the Maritime Administration (MARAD) and the Research and Special Programs Administration (RSPA) (www.dot.gov).

The SLSDC programs enhance the maritime commerce and international Intermodal transportation system from the port of Montreal to Lake Erie. Although the agency is regional in nature, it promotes all development that will enhance waterborne commerce throughout the Great Lake waterways.

MARAD regulates maritime industries and waterborne commerce. The agency promotes a safe and environmentally sound maritime transportation system that improves the competitiveness of American waterborne commerce. The agency strives to enhance American shipbuilding companies so that they are competitive in an international marketplace.

RSPA oversees Intermodal transportation. The agency researches new technologies and methods to make the various transportation sectors more integrated. The agency also governs the transportation of hazardous materials via all forms of transportation including pipelines.

Other agencies which affect Intermodal transportation within regional ports include the Federal Highway Administration and the Federal Railway Administration. All central offices are located in Washington, D.C. Information regarding specific departments and programs are located on the U.S. DOT web site.

Bi-National Issues

The Great Lakes Water Quality Agreement, first signed in 1972 and renewed in 1978, expresses the commitment of Canada and the United States to restore and maintain the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem and includes a number of objectives and guidelines to achieve these goals. It reaffirms the rights and obligation of each country under the Boundary Waters Treaty and has become a major focus of Commission activity.

In 1987, a Protocol was signed amending the 1978 Agreement. The amendments aim to strengthen the programs, practices and technology described in the 1978 Agreement and to increase accountability for their implementation. Timetables are set for implementation of specific programs. The Commission monitors and assesses progress under the Agreement and advises Governments on matters related to the quality of the boundary waters of the Great Lakes system.

These governments include the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Wisconsin, and the Commonwealth of Pennsylvania, and the Government of the Province of Ontario

The International Joint Commission was formed by a 1909 treaty between the United States and Canada. The IJC oversees regional and local land use decisions that affect lake, rivers, and other waterways which form a common boundary between the two countries or are located within both countries. The IJC has organized 20 different boards to discuss and resolve disputes that arise on land use decisions affecting the waterways. Several of the boards are specific to individual waterways while others discuss regional issues. The IJC resolves disputes and reviews land use proposals as an impartial entity within guidelines set forth by the 1909 treaty. The IJC reviews pertinent topics such as air and water quality, international commerce, water levels, and environmental issues.

The IJC has six members; three are appointed by the President of the United States, with the advice and approval of the Senate, and three are appointed by the Governor in Council of Canada, on the advice of the Prime Minister. The Commissioners must follow the Treaty as they try to prevent or resolve disputes. They must act impartially, in reviewing problems and deciding on issues, rather than representing the views of their respective governments.

The International Joint Commission publishes reports and studies on the progress made and the challenges that remain in restoring and protecting our boundary waters. Its newsletter, *Focus on International Joint Commission Activities*, is published three times a year. More information can be found at www.ijc.org.

TECHNICAL ASSISTANCE AND RESOURCES

Regional Planning Commissions

Regional planning in Wisconsin has evolved from a long tradition of state and local concern for land and water conservation, balanced economic development, and other concerns for the future of our state. The realization that many natural and human problems and activities often affect an area larger than a single city, town, village, or county led to the concept of an area-wide approach to planning. The Commissions are public agencies that were established to provide planning service on area-wide issues, to represent local interests on state and federal planning program activities, and to provide local planning assistance to communities. The Commissions were created by Executive Order at the request of the counties they cover and operate under s. 66.0309 of the Wisconsin Statutes.

University of Wisconsin Sea Grant

The University of Wisconsin Sea Grant Program is a state wide program dedicated to utilizing scientific research to address a multitude of problems encountered throughout coastal waters. University professors and students perform a variety of research projects of several scientific disciplines to provide insight to management of the Great Lakes system. Researchers are dedicated to develop management practices that promote the sustainable use of Great Lake resources (www.seagrant.wisc.edu).

The UW Sea Grant Program is a part of a nationwide network of 30 university based programs. The UW Sea Grant Program has offices at several UW campuses with the headquarters located in Madison.

National Oceanic and Atmospheric Administration (NOAA) and Wisconsin Coastal Management Program (WCMP)

The National Oceanic and Atmospheric Administration broad research programs seek to understand climatology, oceanography, and the interactions of these two fields. Several scientific disciplines focus on a myriad of research projects. Specific programs have been developed to maintain and protect coastal regions and fisheries (www.noaa.org). The Fisheries division is dedicated to the protection of marine and other coastal fisheries. Several programs promote the protection of endangered species and sustainable fisheries. NOAA is headquartered in Washington, D.C. and is affiliated with the Sea Grant Program.

The Coastal Management Program (CMP) assists local and state governments to manage and revitalize coastal areas for mixed use development. The competing goals of commercial and industrial development, tourism, environmental protection, transportation, and recreation are discussed in coastal management plans. The program seeks to maintain the economic welfare of coastal communities and ecosystems through inter-governmental cooperation. It supports states through financial contributions, technical advice, participation in state and local forums, and mediation.

The Wisconsin Coastal Management Program provides assistance to state and local governments, regional planning commissions and non-profit conservation organizations to protect wetland ecosystems, reduce non-point pollution sources, reduce erosion, provide public access and assist in meeting state and regional coastal goals (http://coastal.wisconsin.gov).

Great Lakes Commission (GLC)

The Great Lakes Commission is a binational organization dedicated to the preservation of the natural resources throughout the Great Lakes and St. Lawrence Seaway. Members represent eight states and two provinces in Canada. The commission promotes the development of healthy economies through sustainable use principles. The commission stresses the importance of developing adequate transportation systems, fisheries, and other mixed use developments while maintaining and preserving the integrity of our natural resources. The commission deals with several regional issues including invasive species management and public policy analysis to maintain the integrity of the Great Lake ecosystems. In addition, they focus on local issues and improvement projects (ww.glc.org).

The Great Lakes Commission operates its headquarters in Ann Arbor, MI. The commission offers research grants to university research programs.

Education

The University of Wisconsin Extension can help communities in holding educational and intergovernmental forums to discuss cross-border issues and ways of resolving them.

At a more global level, the International Joint Commission publishes reports and studies on the progress made and the challenges that remain in restoring and protecting our boundary waters. Its newsletter, *Focus on International Joint Commission Activities*, is published three times a year. Commission publications are free.

IX. LAND USE

Introduction

This element will be a compilation of objectives, goals, policies, maps and programs to guide the future development and redevelopment of the public and private property. This chapter will contain a listing of the amount, type, intensity and net density of existing uses of the land in the community, such as agricultural, residential, commercial, industrial and other public and private uses. This chapter will analyze trends in the supply, demand and price of land; opportunities for redevelopment; and existing and potential land use conflicts. This chapter will contain projections, based on previous chapters for 20 years to include future residential, agricultural, commercial and industrial land uses including the assumptions of net densities or other spatial assumptions upon which the projections are based.

The land use portion of a comprehensive plan is intended to present information on the current land use within a community and to articulate the direction for future growth and development. The future land use plan identifies the wishes of the community on how development should occur within the plan's timeframe and it provides direction to residents, the business community, and government officials. The land use plan serves as a detailed guide to the members of the governing body of the community in their decision-making process.

The land use element of a comprehensive plan should include an inventory and discussion of the land use controls which currently exist within the community, which may affect, or restrict, the use of land for specific purposes. The following land use issues are of particular importance to coastal communities. Many have already been discussed in greater detail under the appropriate element earlier in this document.

Issues

Land use issues cover every element of a comprehensive plan. These issues are then addressed through the land use plan for the community. Issues covered under a coastal community's comprehensive plan may include:

- Invasive Species
- Endangered Resources
- Bluff Setback / Recession Rates
- Regulatory Additions / Modifications
- Air Quality (Non-Attainment Areas)
- Housing Density
- Lot Size
- Shoreland Zoning
- Beach Safety / Health Hazards
- Riparian Rights
- Second Tier Development
- Conservation Easements
- Open Spaces
- Recreation Site Design Considerations
- Protective Covenants
- Cost of Development
- Water Resource Impacts
- Commercial Port Development
- Brownfields

This list is designed to be illustrative of the types of issues that may be addressed within the land use portion of a coastal community's comprehensive plan; other issues may arise not listed here.

Inventory

Existing Land Use Controls

This section inventories and discusses the land use controls which currently exist within the community, which may affect, or restrict, the use of land for specific purposes. These controls should be reviewed periodically to make sure that they assist in implementing the future land use plan for future development within the community. Special consideration should be paid to those regulatory controls effecting coastal resources such as setback ordinances, subdivision ordinances, and erosion control ordinances. Other land use controls include zoning ordinances, official maps, farmland preservation plans, comprehensive plans, and outdoor recreation plans. Park site master plans can also be an important part of a community's existing controls.

Existing Land Use

The most direct method for determining the resources a community has is through a land use inventory. A land use inventory includes collecting data on the uses of land within the community. Typically this involves using aerial photography. A classification of land use includes categories of human activities on the land and of active and passive management of the land, plus the identification of all water areas to account for the entire surface defined by the state's boundaries. The inventory should also include a count of the number of houses in the community and an inventory of the names and locations of all businesses.

In 1975 a land use classification was developed and endorsed by county planning agencies, regional planning commissions and state groups that handle land resource data. The classification developed a state Standard Land Use Classification for Wisconsin, one that was agreed to and usable by the various groups in Wisconsin that do land use inventories or benefit from them. The classification is being used by the three coastal regional planning commissions for land use inventories and has been adapted to work within a geographic information system environment.

Example Land Use Categories

Land Use Type	Total Acres	Percentage Total Land	Percentage Developed Land
DEVELOPED			
Residential	1,036.8	21.7%	35.5%
Single Family	911.3	19.1%	31.2%
Two Family	40.3	0.8%	1.4%
Multi-Family	41.6	0.9%	1.4%
Group Quarters	0.2	0.0%	0.0%
Mobile Homes	86.8	1.8%	3.0%
Commercial	229.6	4.8%	7.9%
Industrial	372.1	7.8%	12.7%
Transportation	823.0	17.3%	28.2%
Communications/Utilities	21.4	0.4%	0.7%
Institutional/Governmental	273.0	5.7%	9.3%
Recreational	120.5	2.5%	4.1%
Total Developed Acres	2,919.9	61.2%	100.0%
UNDEVELOPED			Percentage Undeveloped Land
Undeveloped Open Space	363.1	7.6%	19.7%
Natural Areas	1,213.2	25.4%	65.7%
Water Features	271.0	5.7%	14.7%
Total Undeveloped Acres	1,847.3	38.8%	100.0%
Total Land Area	4,767.2	100.0%	

Future Land Use Plan

Development and Public Utility Considerations

As the community prepares a future land use plan map, consideration should not only be given to the public input received for desired future development, but also include looking into both the future public utility options along with specific criteria deemed reasonable to apply to the community over the next 20 years. The type and density of development in coastal areas must be carefully evaluated to provide future residents with the ability to access and use the coastal resources. The housing projections found in the Housing Element of the comprehensive plan can be utilized to provide the community with an estimate of the number of acres that will be needed to accommodate future growth.

Environmental Considerations

Any undeveloped lands that exist within the community and its planning area containing wetlands and environmentally sensitive areas should be preserved and integrated into the overall development of the community. In coastal areas, the preservation of these features are important from both a water quality and an aesthetic value.

Planning Criteria

Planning criteria are developed in order to give a community a sense in which to base their land use recommendations. Criteria make the planning process defensible when presenting scenarios to the general public and when modifying or developing alternative sites for land use developments. The criteria used by the community, when developing the future land use plan, should be based upon values identified by the State (Smart Growth Criteria), and the community under each element's strategies section.

The following State of Wisconsin criteria are based upon Smart Growth criteria (s. 66.1001) and are highly encouraged within community plans:

1. Promotion of the redevelopment of lands with existing infrastructure and public services and the maintenance and rehabilitation of existing residential, commercial and industrial structures.
2. Encouragement of neighborhood designs that support a range of transportation choices.
3. Protection of natural areas, including wetlands, wildlife habitats, lakes, woodlands, open spaces and groundwater resources.
4. Protection of economically productive areas, including farmland and forests.
5. Encouragement of land uses, densities and regulations that promote efficient development patterns and relatively low municipal, state governmental and utility costs.
6. Preservation of cultural, historic and archaeological sites.
7. Encouragement of coordination and cooperation among nearby units of government.
8. Building of community identity by enforcing design standards.
9. Providing an adequate supply of affordable housing for individuals of all income levels throughout each community.
10. Providing adequate infrastructure and public services and an adequate supply of developable land to meet existing and future market demand for residential, commercial and industrial uses.
11. Promotion of the expansion or stabilization of the current economic base and the creation of a range of employment opportunities at the state, regional and local levels.
12. Balancing individual property rights with community interests and goals.
13. Planning and development of land uses that create or preserve varied and unique urban and rural communities.
14. Providing an integrated, efficient and economical transportation system that affords mobility, convenience and safety and that meets the needs of all citizens, including transit-dependent and disabled citizens.

Recommended Development Strategy

The classifications detail the type, location and density of use. This portion of the plan will detail further recommendations on the land uses within the community. The text should discuss each of the major future land use classifications as depicted on the future land use map.

Identified Smart Growth Areas

During the planning process, the Community Plan Commission should develop a recommended land use plan which identifies how the community will develop and preserve its lands throughout the planning period. During this process the Plan Commission will identify areas that are considered "smart growth areas". According to s. 16.965, Wis. Stats., a "smart growth area" is "an area that will enable the development and redevelopment of lands within existing infrastructure and municipal, state and utility services, where practicable, or that will encourage efficient development patterns that are both contiguous to existing development and at densities which have relatively low utility and municipal and state governmental costs."

The effect that this comprehensive plan will have on the community is twofold: (1) first, it identifies a responsible program to improve the overall condition and delivery of public facilities and services; and (2) second, it provides a future development scheme which is not only cost-effective but is also compatible with the community's existing development patterns and provides for the achievement of the community's vision and goals outlined within the plan.

In simple terms, the community must not only plan for new development that may occur, but must also plan on the timing and location of the new development that is within the general framework of the land use plan.

Additional Sources of Information

- Great Lakes and watershed planning - http://www.dnr.state.wi.us/org/water/wm/glwsp/index.htm

X. ISSUES & OPPORTUNITIES

This element provides background information on the community and contains a statement of overall objectives, goals, policies, and programs of the community to guide the future development and redevelopment of the community over the next 20 year planning period. Background information shall include population, household and employment forecasts that the local government unit uses in developing its comprehensive plan, and demographic trends, age distribution, education levels, income levels and employment characteristics that exist within the local governmental unit.

Visioning

A major element of the comprehensive planning process is the identification of community development goals, objectives and policies. This identification is often difficult, as values held by citizens can be highly elusive and complex. People vary widely in their choice of values and the degree to which they will accept or tolerate differing attitudes. When developing the goals, objectives and policies under each Element of a comprehensive plan, communities need to think about ways to address these topics as they relate to coastal resources.

Initially, a community needs to develop a vision for protection of its coastal resources. This vision statement can include the coastal resources that should be protected or preserved, the manner in which the resources are protected or preserved in the future, and whether the resource is enhanced in the future. The vision is a description of the community's coastal resources as envisioned 20 years into the future.

Goals, objectives and policies for protecting and preserving coastal resources will have a distinct purpose within the planning process:

- *Goals* describe desired situations toward which coastal resource protection efforts should be directed. They should be broad and long range. They represent an end to be sought, although they may never actually be fully attained.
- *Objectives* describe more specific purposes that should be sought in order to advance toward the achievement of the overall coastal resource protection goals.

Policies describe a specific approach to meeting an objective of the coastal resource protection goals.

In addition to development of a vision, goals, objectives and policies, a community can conduct other exercises to help visualize the effects of their policies.

A Viewshed Analysis can be especially useful in defining the community's future coastal resource vision. The viewshed analysis includes:

Visual impact assessment - examine spatial, qualitative and quantitative aspects of existing and future land use scenarios.

Spatial – where development is visible from, who can see development?

Qualitative – General visual character of development. Subjective, based on personal values, beliefs, and opinions. Analysis of how development affects continuity of the landscape and general compatibility with surroundings.

Quantitative – How much development is visible?

GIS map or model of the coastal area.

Focus Groups and Issues Forums

A Nominal Group Process is another useful planning tool to identify the key issues in a community. Coastal communities

can use the process either to identify coastal specific issues or larger community-wide issues.

A nominal group meeting should be held with the community to identify key issues that need to be considered in the comprehensive plan.

Planning sub-committees can be formed to address each element of the comprehensive plan. These sub-committees are then charged with identifying unique community features and developing goals and objectives for review by the plan commission.

Newsletter

A community newsletter can be used to inform citizens on the progress of the comprehensive plan as it is developed.

WEB Page

The community should post information on meetings, the status of the plan, and draft elements of the plan on its WEB site.

Surveys

Based upon issues identified from the results of the nominal group meetings, the community can choose to develop and mail a survey to citizens. The survey serves as further notice to the citizens of the area that the community is developing a comprehensive plan and their input is being sought to establish community needs and desires.

Open Houses

The community should hold open houses in order to present information regarding the comprehensive plan. At a minimum, the community should hold one open house at the "midway" point to present background data and the open house near the end of the process prior to the public hearing. The open houses will provide the public with an opportunity to review and comment on work that has been accomplished by the community in the development of its plan.

Additional steps may include informational meetings, mailings, focus groups, informational posters and pamphlets.

XI. IMPLEMENTATION

Introduction

This element contains a statement of programs and specific actions to be completed in a stated sequence, including proposed changes to any applicable zoning ordinances, official maps, sign regulations, erosion and stormwater control ordinances, historic preservation ordinances, site plan regulations, design review ordinances, building codes, mechanical codes, housing codes, sanitary codes or subdivision ordinances, to implement the objectives, policies, plans and programs contained in previous elements. This element will describe how each of the elements of the comprehensive plan will be integrated and made consistent with the other elements of the comprehensive plan, and shall include a mechanism to measure the community's progress towards achieving all aspects of the comprehensive plan. This element will include a process for updating the comprehensive plan. A comprehensive plan under this subsection shall be updated no less than once every 10 years.

The final element in a comprehensive planning program is the implementation of the approved Comprehensive Plan. Implementation can take the form of:

1. Carrying out the recommendations in the plan for specific projects, for example, creating an Official Map;
2. Using the plan as a guide to public and private decision-making on matters that relate to the development of the community, for example, a rezoning request or a capital expenditure, and;
3. Reviewing and amending the plan as changes in the demographics, economy or political climate changes.

The Implementation Element of the comprehensive plan should include a list of changes needed in existing land use controls and recommendations for additional controls.

Role of the plan

The comprehensive plan must be in conformance with land controls governing within the community. When reviewing any petition or when amending any land controls within the community, the plan shall be reviewed, and a recommendation will be derived from its identified statements, goals, objectives, vision statement and General Plan Design. If a decision is one that needs to be made in which it is inconsistent with the comprehensive plan, then before the decision can take effect, the comprehensive plan must be amended to include this change in policy.

Role of the Elected Officials

The elected officials must make their decisions from the standpoint of overall community impact-tempered by site specific factors. In this task they must balance the recommendations made by plans and policies, the objectives of the applicant, the technical advice of staff, and the politically neutral recommendations of advisory boards, with their own judgment on the matter at hand.

Implementation Tools

The types of control especially relevant to coastal communities include:

Zoning

Zoning ordinances are the primary regulator tool a community has to implement its comprehensive plan.

Subdivision Ordinance

A subdivision ordinance regulates the division of raw land into lots for the purpose of sale or building development. The subdivision ordinance is related to the zoning ordinance in that the zoning ordinance regulates the lot size, density, and use of the land, while the subdivision ordinance regulates the platting, or mapping, of newly created lots, streets, easements, and open areas. Most importantly, the subdivision ordinance helps implement the comprehensive plan. A basis of the approval of a subdivision is its conformance or consistency with

a local comprehensive plan (as well as the Official Map and Zoning Ordinance). The subdivision ordinance allows the city to encourage well designed neighborhoods and ensure the creation of adequate land records. In addition the subdivision ordinance allows the city to set construction standards and timelines for improvements such as streets, and parklands identified in the comprehensive plan and Official Map.

The subdivision ordinance may allow a fee-in-lieu of park land dedication in order to establish a funding source to purchase larger areas of lands instead of creating small scattered parklands.

The ordinance can require Area Development Plans by the subdividers to adjacent surrounding undeveloped areas in order to update and amend the Official Map. Area Development Plans will ensure that splits will be adequately served by future roads adjacent to them and also guide future development and infrastructure in an orderly systematic approach.

Official Map

Under §62.23(6), the city council / village board / town board (under village powers) "..may by ordinance or resolution adopt an official map showing the streets, highways, parkways, parks and playgrounds laid out, adopted and established by law." "The council / board may amend the map to establish the exterior lines of planned new streets, highways, parkways, parks, or playgrounds, or to widen, narrow, extend or close existing streets, highways, parkways, railroad rights-of-way, public transit facilities, waterways, parks or playgrounds. " Once an area is identified on an official map, no building permit may be issued for that site, unless the map is amended.

The official map serves several important functions:

1. It helps assure that when the community acquires lands for streets, etc., it will be at a lower vacant land price;
2. It establishes future streets that subdividers must adhere to unless the map is amended; and,
3. It makes potential buyers of land aware that land has been designated for public use.
4. Another option is to require Area Development Plans prior to the approval of certified survey maps or subdivision plats. Thus, developers would be required to ensure the community that their proposals will result in planned, orderly growth and development. In effect, roads and utilities would be planned to include areas beyond the land proposed to be platted. This would help the community avoid dead ends and looped streets that are characteristic of developments that have not considered adjacent lands owned by other parties.

Sign Regulations

Many communities are finding themselves having to regulate signage especially along transportation corridors, in order to preserve a sense of place and community character. As signs become more bold, have greater illumination placed on them, and have greater square footage, the sides of roadways and within community centers become places of growing confusion as each sign attempts to get your attention.

Erosion Control Ordinance

Under § 61.354 of the Wisconsin Statutes, communities may enact a construction site erosion control zoning ordinance. The purpose of such an ordinance is to protect water quality and to minimize the amount of sediment and other pollutants discharged from construction sites to lakes, streams, and wetlands.

Storm Water Control Ordinance

Under § 61.354 of the Wisconsin Statutes, communities may enact a storm water management zoning ordinance. The purpose of such an ordinance is to protect water quality and to minimize the amount of sediment and other pollutants carried by runoff to lakes, streams, and wetlands.

Historic Preservation Ordinance

Historic preservation ordinances can assist communities in protecting their culture and history. The ordinances provide identification, protection, enhancement, perpetuation and use of buildings, structures, objects, sites and districts within a community that reflect special elements of a communities historical, architectural, archaeological, cultural, or aesthetic heritage. The ordinances can also set standards for alterations, design, restoration, demolition or new construction, ensuring that the features / neighborhoods maintain their historical significance. In addition,

historic preservation can increase the economic benefits to a community and its residents, protect/increase property values, and enhance the overall visual character of a community.

Design Review Ordinance

Design review can accompany many different development aspects and will assist communities in achieving the identified look and character they expressed within their vision statements and goals. These ordinances however, need to be based upon well defined sets of criteria. The community may wish, in the future, to explore the use of such ordinances to promote a specific look for an identified area within the community. Such areas may be along lands designated as industrial or along areas that have established commercial businesses (which are identified in this plan). Signage, lighting, exterior building material types and colors would be specifically identified within the ordinance.

Building/Housing Codes

The community should work to continue its enforcement of all applicable building/housing codes to ensure that properties are adequately maintained to preserve the character of the community and to protect property values. This is important especially for those older areas and for properties that are not owner occupied. The community should review the codes with the county to determine their effectiveness within the community.

Floodplain Ordinance

Floodplain ordinances regulate development within the designated FEMA floodplain areas. These regulations will limit development within identified areas. In some instances it will be important to re-adjust the floodplain boundaries in specific areas or within the entire community. This process involves three steps:

1. Hire an engineering firm to conduct hydrologic and hydraulic engineering models to calculate floodplain boundaries for the specified area.
2. Submit the re-calculated floodplain boundaries to the WDNR Bureau of Watershed Management and the FEMA for their review.
3. If approved, amend existing zoning maps to reflect the re-calculated floodplain boundaries.

Regulatory Tools

- Zoning
  - Conditional Use
  - Overlay Zone
  - Incentive Zoning
  - Performance Zoning
  - Planned Unit Development
  - Resource Protection Zone
  - Setbacks
  - Site Plan
  - Vegetation Clearing Control
- Erosion Control Plan
- Non-Metallic Mining Ordinance
- Official Maps
- Sewer Service Area Plan
  - Environmentally Sensitive Areas
- Storm Water Drainage Plan
- Subdivision Regulations
- Conservation Subdivision
- Density Transfers

Acquisition Tools

- Non-Profit Conservation Organizations
- Land Acquisition
- Conservation Easements
- Purchase of Development Rights
- Eminent Domain

Fiscal Tools

- Capital Improvement Programs
- Impact Fees

State and Federal Grants Programs

- WDNR
- Wisconsin Coast Management Program

Source: Planning for Natural Resources, 2002.

Sanitary Codes

Communities are encouraged to adopt specific sanitary controls regulating sewer usage and sewer charges to ensure the greatest protections to the city residents. Groundwater protection is of great importance throughout the state. Uncontrolled waste can have detrimental and wide ranging impacts on health and property values.

Economic Development Committee

An Economic Development Committee (EDC) is a not-for-profit organization representing the interests of both the public and private sectors within a community. EDCs have been formed in a number of communities to handle the municipality's economic development activities and bridge the communication gap that oftentimes exists between the public and private sectors. Typical activities undertaken by an EDC include commercial and industrial development, business retention and recruitment, and tourism. EDCs consist of a Council of Directors and professional staff members. Council members typically depict a broad representation of the community's business, labor and educational sectors and are jointly appointed by the community and its Chamber of Commerce or other existing business associations. The Council sets policy for the EDC and is responsible for all actions undertaken.

Comprehensive Plan Internal Consistency

The comprehensive plan was developed sequentially in order to develop a plan with supportive goals, objectives, policies, and programs. Utilizing a community survey as a base, key issues were identified within each of the nine elements of the plan. Using these issues along with factual information regarding natural features, past population and housing data and infrastructure, a set of goals, objectives, policies and programs were developed in order to determine a desired vision which would be used throughout the planning period. The identified vision, goals and strategies expressed within this plan were utilized to determine the final General Plan Design as well as the specified implementation actions the community will undertake throughout the planning period. Any amendment to the plan shall be accompanied with an overall review of the nine elements along with their identified goals, objectives, policies and programs, in order to ensure that inconsistency within and between elements does not occur in the future.

Process for Updating Plan

As directed by s66.1001, any plan commission or other body of a local governmental unit authorized to prepare or amend a comprehensive plan may recommend the adoption or amendment of a comprehensive plan only by adopting a resolution by a majority vote of the entire commission (or governmental unit). This plan shall be amended / updated following s66.1001 (4)(b) and the adopted written community procedures for fostering public participation.

Action Plan

A summary of the key implementation activities that need to be followed to ensure initial progress is made after the adoption of the comprehensive plan should be developed at the end of the planning process. The Action Plan identifies the activity **(What)** and the appropriate body **(Who)** that would have the responsibility for carrying out the activity. The timeframe the activity needs to be initiated **(When)** should also be identified and should begin within the first year of the plan's adoption or reviewed for continued applicability.

Work Plan

The goals established in the comprehensive plan will be implemented over a twenty year planning period. They represent priorities for land use management for the community. The objectives provide more detailed and readily measurable steps toward reaching each goal. The following work plan is an example of a way to implement these goals and objectives. The plan outlines the entity responsible for each objective, cooperating agencies, expected funding source, and a timeline for implementation. The work plan should be evaluated and revised as needed an annual basis.

Sample Work Plan

Activity	Lead	Cooperators	Potential Funding Sources	Time Period
GOAL: ***Natural Resources*** Ensure that the Town's natural areas and resources: land, water and air as well as plant and animal life and habitat: are preserved, protected, conserved, restored, enhanced and maintained for future generations.				
Objective*: Protect and preserve environmental corridors, green space, forests, environmentally sensitive areas, endangered species, parks and wildlife habitat in the Town.*				
Identify, inventory and map environmental corridors, open space, forests, environmentally sensitive areas, wildlife habitat, vistas, archaeological sites and endangered species within the Town	Planning Commission	Town Board, County Soil & Water, EPA, WDNR	WCMP, WDNR	2-5 years
Develop a long-range, prioritized plan for the acquisition of land for parks and natural areas within the Town.	Planning Commission	County Soil & Water, WDNR	WCMP	2-5 years
Develop guidelines for property owners to maximize the protection and stewardship of wooded areas.	Planning Commission	County Soil & Water, EPA, WDNR	WCMP, WDNR, DATCP	2-5 years
Develop measures to preserve and increase public access to the Green Bay shoreline.	Planning Commission	County Soil & Water, EPA, WDNR	WCMP, WDNR	2-10 years
Develop Town ordinances to protect natural areas in the Town from invasive species. Educate residents and engage in eradication efforts.	Planning Commission	Town Board, County Soil & Water, WDNR	WCMP, WDNR	2-5 years
As a matter of Town policy, for the long term protection of natural resources in the Town, encourage public access to public and private lands for the purposes of deer hunting.	Planning Commission	Town Board, WDNR		On-Going