IV. ENVIRONMENTAL RESOURCES

Winnebago County has a diverse assortment of environmental resources that are critical to the economic base, quality life and the environmental health of its citizens. The following chapter outlines the countywide goals and objectives for the preservation and enhancement of these resources. Following this is an analysis of current environmental resources within the County and recommendations for their long-term preservation and enhancement.

These policies are not intended to replace more detailed planning documents covering the county’s environmental resources, such as the Winnebago County Land and Water Management Plan: 2005, or The Winnebago Comprehensive Management Plan (for the Management of the Lake Winnebago System): 1989.

A. Countywide Agricultural and Natural Resource Goals and Objectives

Agricultural policies and programs in Winnebago County are to achieve maintenance and development of the agriculture industry through agriculture diversification, protection of economically viable tracts of arable land, and the prevention of conflict between agriculture and incompatible uses.

Objectives:
1. Preserve large, contiguous tracts of farmland in rural areas.
2. Separate the agriculture industry from incompatible uses.

Natural and cultural resource policies in Winnebago County are to achieve a clean and attractive environment through the protection of natural resources, land use stewardship, development of recreational opportunities, and preservation of historical assets.

Objectives:
1. Protect surface and ground water resources through lake, steam, and river corridor preservation and development policies.
2. Prevent non-point pollution through construction site erosion control, stormwater management, and development that sustains resources.
3. Protect aquatic and wildlife habitat by managing development away from environmental corridors, riparian areas and woodlands.
4. Protect air resources through development that encourages pedestrian traffic and minimizes vehicle miles traveled.
5. Protect and develop passive and active recreational resources (e.g. parks, biking/hiking trails, hunting & fishing opportunities).
B. Agricultural Resources Inventory and Analysis
Farming is a significant activity in the County and an important component of the local economy.

Soils
Individual soil types, with specific and unique characteristics, directly influence land uses. Soil type is the primary factor that affects the selection of the types and extent of agricultural practices and management techniques that may be used to sustain high productivity levels (see MAP 10). There are 74 different soil types found throughout Winnebago County. These are grouped into seven major soil associations that have distinct soil patterns, relief, and drainage features. The Winnebago County Soils Survey contains detailed descriptions for each soil type including information on suitability and limitations of various types of land use and land management. The Winnebago County Land & Water Conservation Department extensively uses the soils information and related data in determining cropland soil erosion estimates and sediment load calculations.
Agricultural Trends

Since 1987, agriculture in Winnebago County has transitioned from predominantly dairy to predominantly cash grain production. The percentage of dairy sales in total cash receipts from farm markets has dropped from 60% in 1987 to about 45% in 1998. Conversely, cash grain receipts have risen sharply in the same period. According to the 1980 to the 2000 WDATCP Agriculture Statistics Reports, the following changes have impacted agriculture in the county during the past 20 years:

- There are 340 fewer farms (27% decrease);
- Land in farms has decreased by approximately 29,000 acres (14% decrease);
- The average size of farms has increased from 161 acres to 197 acres (18% increase);
- Cash crop acres decreased 16% from 115,000 acres to 96,900 acres;
- Alfalfa and hay land decreased by 23,400 acres (48% decrease);
- Total cattle (all cattle) numbers decreased 11,900 (25% decrease); a
- Total dairy cow numbers decreased by 7,500 (31% decrease).

Economic, political, and social factors will continue to impact farmland and related rural areas. It is expected that the number of farms in the county will steadily decline, while the size of the remaining farms will increase. Overall cattle numbers will decline as well however; the size of the remaining herds is expected to increase substantially. These changes pose a challenge to all stakeholders in terms of the planning for and sustaining of agricultural economic stability, diversifying farming operations, and protecting natural resources.

It should also be noted that there is a growing trend in active farmland being converted to permanent grassland cover, wooded acreage, and wetland areas through restoration projects. This is a positive trend from the standpoint of providing increased erosion control, water quality improvements, and wildlife habitat and it is expected to continue. Various USDA, state and county programs have assisted landowners in planning for and implementing conservation practices on their lands. It is important that these programs and activities continue.
C. Agricultural Resources Recommendations
Winnebago County’s Agricultural Policies are intended to preserve and enhance the rural character, support rural economic viability and lifestyles, scenic beauty, storm water management, preservation of natural resources and preservation of real property values. These recommendations are intend to supplement, support, and enhance more detailed planning documents covering the County’s natural and agricultural resources.

1. Minimize nonagricultural development in farming areas.
   There are several approaches to minimize the amount of residential development in farming areas. Large amounts of residential development in farming areas make farming difficult to continue. The numerous conflicts, which exist due to incompatible land uses include; use of roads, noise, odors, and hours of operation. Encouraging local communities to plan residential development with careful attention to viable farming operations, utility and community facilities will be critical. In addition, the use of conservation neighborhood design principals will minimize the physical impact of residential development and preserve the rural character of the community.

2. Support the continuation of the ‘Family’ Farm
   Farmers, local governments, and the County have little control over the price of agricultural products. However, interested parties can work locally on a variety of efforts to improve farm income. These may include, working with UW-Extension and County staff to increase efficiency in farm operation, provide technical support including alternative farming techniques, and providing advice on other financial and technical support opportunities.

3. Promote Non-farm Home Businesses
   Promote flexibility in zoning regulations to allow non-farm home businesses that have little or no impact on surrounding properties.

4. Promote Specialty Agriculture
   Work to promote specialty agriculture, directed primarily to providing food and products for the local market. On the demand side, work with local stores to promote sales of local products and help develop farm markets.

5. Protect the needs of agricultural support businesses.
   Agricultural support businesses play an important role in an agricultural economy. The County should review its ordinances, and encourage local municipalities to do the same, for inclusion of these types of businesses in rural areas.
D. Natural and Cultural Resources Inventory and Analysis

Environmental Resources
To fully understand the importance of natural resources in Winnebago County and the surrounding region, it is essential to recognize that, in addition to the countless environmental benefits they provide, those resources generate millions of dollars in revenue to local communities throughout the County each year. That revenue comes from the vast array of recreational users of the resources. Protecting these significant resources is not only critical to the long-term economic vitality of the County but to the quality of life enjoyed by the County's residents. MAP 11 shows the geographic arrangement of various environmental resources in Winnebago County. These are explained in more detail on the following pages.

The Following information on natural resources of Winnebago County was obtained from the Winnebago County Land and Water Management Plan, prepared by the Winnebago County Land and Water Conservation Department in 1998.

Geology and Topography
The entire landscape of Winnebago County reflects the influences of glacial activity. The most recent glacier to cover the county occurred about 10,000 years ago. It covered all but the southwestern part of the county and deposited the reddish clay seen there today. Southwestern Winnebago County was covered by older glacial activity that deposited brownish loamy till.

The topography is nearly level or gentle rolling slopes of 6% or less over 90% of the terrain. Two escarpments run northeasterly across the county ranging from 750 to about 950 ft. above sea level owing to land relief on the order of about 200 feet. The most prominent features are the broad expanses of lakes and adjacent marshes. Topographic features are controlled by the surface geology, which is mainly sandstone and limestone positioned equally throughout the western and eastern parts of the county. A varying thickness of glacial till overlies the irregular surface of these rock formations. The glacial material over the limestone formations is, however, much thinner than the material over the sandstone.
Surface Water Resources

The county is entirely within the Fox-Wolf River Basin and contains 84,000 acres of surface water. Its network of lakes, rivers, and streams make up the major portion of what is known as the ‘Winnebago System’. The system includes the ‘Pool’ lakes of Winnebago, Buttes des Morts, Winneconne, and Poygan along with the main tributary waters of the Upper Fox and Wolf Rivers.

Water levels of the lakes are controlled by dams located at each of the two outlets of Winnebago at Neenah and Menasha. These two dams date back to the 1850's, and raised the water levels of the lakes 2.5-3.0 feet to form what is known as the Winnebago Pool. The dams were originally constructed to manage water levels for commercial navigation, as the system was an important trade and exploration route for early settlers.

The Fox River enters Winnebago County near Eureka, flows northeasterly through Lake Buttes des Morts and Lake Winnebago, flows over the dams at Neenah and Menasha, and continues down through little Lake Buttes des Morts. It outlets into Green Bay 39 miles downstream from Lake Winnebago after it follows a meandering course with a vertical drop of 168 feet. Lake Winnebago divides the Fox River into the Upper and Lower Fox.

The Wolf River enters the county in the northwestern corner, flows southeasterly through Lakes Poygan and Winneconne, and then converges with the Fox River at the west end of Lake Buttes des Morts. Of the inflow to the Winneconne Pool from the Fox and Wolf Rivers combined the Wolf River accounts for approximately 60%.

Two lakes in the County that are not located in the pool are Rush Lake and Little Lake Butte des Morts. Rush Lake is a natural and unique prairie pothole about 3,000 aces in size and is situated in the southwest corner of the county. It contains large bog areas and lake adjacent wetlands and receives direct runoff from much of the surrounding agricultural watershed through streams and man made drainage ditches.
It flows out to the Fox River by way of Rush/Waukau Creek and it is used for hunting, fishing, trapping and canoeing.

Little Lake Butte des Morts, about 1,300 acres in size, is situated in the northeast part of the county immediately downstream from the dams at Neenah and Menasha. The 15,000-acre Neenah Slough Watershed also outlets into the south end of the lake downstream from the dam at Neenah. The lake receives additional runoff from a mixed agricultural and urban watershed to the west. Primary uses of the lake include boating, fishing, and hunting. It is impacted by point and nonpoint source pollution and it contains beds of PCB contaminated sediments that are included in remediation planning efforts between industries, the WDNR, and the USEPA.

The Lake Winnebago System is one of Wisconsin's most significant water resources. Composed of Lakes Winnebago, Butte des Morts, Winneconne and Poygan, plus their main tributary waters of the upper Fox and Wolf Rivers, the system comprises 17% of the states surface water acreage. The lakes average 7 feet in depth, and receive water from 6000 square miles of watershed. At 137,700 acres, Lake Winnebago is the States largest inland lake. The system located in the east central Wisconsin, is within 75 miles of over 2 million people and receives heavy recreation use by boaters, anglers, swimmers, hunters and trappers. The waters of the system are also heavily used for industrial and domestic water supply, waste assimilation and disposal, and hydropower. In addition, aquatic plants such as wild celery and sago pondweed tubers are harvested commercially, and there is active commercial setline fishery for catfish. Lake Winnebago alone provides drinking water to over 100,000 people in the cities of Oshkosh, Neenah and Menasha.

Before the dams at Neenah and Menasha were constructed, the system supported massive areas are emergent and submergent rooted aquatic plants. Lake Winnebago contained great numbers of bays and marshes. Lake Butte des Morts, Winneconne, and Poygan were characterized as river marshes. Through the decades, high water levels combined with erosive actions from wind, wave, and ice have lead to the destruction of tens of thousands of acres of wetland habitat within the Pool. This has resulted in the loss of natural filtration capabilities that once served to trap sediment and nutrients. Shoreline and stream bank erosion is a continuing problem in most areas of the system where wetlands once flourished and helped to buffer erosive forces. Left unprotected the problems only worsen.

Given the natural characteristics of the Winnebago System, it is likely that the waters were always fertile; however, they are now described as being highly eutrophic. This is the direct result of impacts from
nonpoint pollution. Excessive nutrient and sediment delivery into the System from agricultural and urban sources contributes towards massive algae blooms that occur with increasing frequency. The algae and sediments increase turbidity, hinder growth of beneficial aquatic plants, and deplete important fish spawning areas.

**Wetland Resources**

Approximately 51,400 acres of wetland still exist in Winnebago County (source: Winnebago County Land and Water Resource Management Plan). This is less than half of the total wetland acreage that existed in the county prior to the late 1800’s. Most of the wetlands are located in the western and northern parts of the county. The largest areas are associated with Lake Poygan, Rush Lake, Rush/Waukau Creek, and the Fox, Rat and Wolf Rivers.

At present, over 6200 acres of wetland is located outside of shoreland zoning and Federal and State ownership. These wetlands are currently not regulated or managed by Winnebago County.

As the result of high water levels along with draining and filling in the system, the greatest and most rapid loss of wetlands has occurred during the past 75 years, although, there were extensive areas of wetlands that were lost during the 1880’s and early 1900’s. The primary causes for wetland destruction in the county have been seasonably high lake levels coupled with accelerated agricultural drainage and filling for urban development. This has resulted in degraded water quality, loss of natural filtration and storage areas, increased localized flooding, and loss of important fish and wildlife habitat.

There are three wetland habitat types found in Winnebago County, the Emergent Wetland, the Scrub-shrub Wetland, and the Forested Wetland. Each of these represents a unique ecosystem based on hydraulic conditions, vegetation, and location in relationship to other wetlands, drier upland areas or adjacent water bodies.

In addition to providing habitat for fish, waterfowl, and other wildlife species, the remaining wetlands are important for the recharge of aquifers and the protection of groundwater quality. They are extremely
efficient at trapping and filtering out nutrients and sediments contained in runoff and they provide highly effective flood storage areas. It is critical that the remaining wetland resources in Winnebago County be protected from further destruction. Existing county, state and federal regulatory protection mechanisms need to be integrated and enforced to a greater extent than they are now. In addition, for the protection of wetlands adjacent to lakes and rivers, technical and financial resources for stream bank and shoreline erosion control measures need to be expanded.

**Woodland Resources**

Prior to settlement, the vegetation in Winnebago County was mostly forest and oak savanna. Area of sedge meadow and prairie grass in the northern and western parts of the county covered the balance of the land. Most of the forests were cleared for agricultural crops and today roughly 20,000 acres are still in woodland cover. The composition of species is: oak-hickory; 7,000 acres, maple-beech-birch, 6,000 acres; ash-aspen-cottonwood, 5,000 acres, and mixed conifers, 2,000 acres.

Although the woodland acreage of the county is relatively small it provides a considerable source of timber and related products for private use. The woodlands are also very important in terms of providing habitat for a variety of wildlife species. More importantly, from an agricultural perspective, are the soil conservation benefits from wind and water erosion reduction. Improved woodland management will be necessary in order to maintain these benefits. Programs that promote tree planting and sustained management of woodland resources help landowners accomplish this objective. These include Federal Conservation Reserve Program and the Wisconsin Managed Forest Law Program.

A disturbing trend affecting the woodland resources in the County comes from development pressure that results in fragmentation or outright destruction of wooded areas. Protection is needed through effective implementation of land use planning.

**Fishery Resources**

Despite the losses of aquatic habitat within the Winnebago System, it continues to be known throughout the Midwest for its excellent walleye and white bass populations, as well as its world class population of lake sturgeon.

The lower 125 miles of the Wolf River and 37 miles of the upper Fox River contain the spawning and nursery grounds for the Winnebago Pool sturgeon and walleye populations. In addition to lake sturgeon, walleye and white bass, the major species of the Winnebago Pool fisheries
community include freshwater drum, sauger, yellow perch, largemouth and smallmouth bass, panfish, troutperch, and emerald shiner. Seventy-eight species of fish are found with the Winnebago Pool Lakes. The recreational fishing opportunities supported by this diverse fishery provide for over one million angler hours annually. That equates to tens of millions of dollars being pumped back into the local economy each year.

Wildlife Resources
The lakes, marshes, rivers and adjacent uplands in Winnebago County have provided prime waterfowl habitat for centuries. Sharp decline in duck populations throughout the U.S. during the 1970's and 80's reflected the dramatic use of the Winnebago System by ducks and coincided with the loss of important aquatic food sources such as wild celery. In recent years, DNR staff and local sporting clubs have been working cooperatively to restore celery beds in Lake Poygan - once known as the 'Canvasback Capital of the World'. Duck populations are currently on the increase and waterfowl hunting, as always, remains an important recreational activity in the county. Other important hunting activities in the county include bow and gun deer hunting and pheasant hunting. Wild Turkeys have been restored to the western half of the county and are now providing additional hunting opportunities.

Because Winnebago County is located in what was formerly one of the best regions of the state for duck and pheasant production, the Department of Natural Resources initiated the Glacial Habitat Restoration Area project in the southwestern part of the county. This project is designed to restore wetlands and grasslands on private land and public and to benefit mallards, blue winged teal, pheasants, and grassland songbirds.

The county also has many special concern resources that require protection and recognition in planning and implementing land and water resources management. Many natural communities exist around the county that are associated with private and public lands and the waters of the county. These include various wetland, prairie, forest and oak-savanna communities. Two State Natural Areas have been designated in the county. Both of these are prairies associated with public recreational trails. Three species of endangered plants and three species of threatened plants have emerged in Winnebago County. Four endangered aquatic bird species have emerged in the county, three breed here annually. Other species of concern include two threatened fish, one endangered fish, one threatened mussel, and two threatened turtles that have been documented to occur in the county.
Groundwater Resources

The following is taken from the "Winnebago County Land and Water Resource Management Plan", dated December 1998:

Groundwater resources in Winnebago County are, for the most part, of very good quality and in plentiful supply. There are three aquifers that supply potable groundwater. The sandstone aquifer is the most extensive and the only one of the three that can sustain high capacity pumping wells for municipal and industrial uses. The Platteville-Decorah-Galena aquifer is composed primarily of dolomite, which is present in the eastern third of the County and provides adequate private water sources. Local problems in this aquifer include high sulfate and iron concentrations along with hardness that results from geochemistry of the dolomite formation. The water table aquifer is composed of varying thickness of glacial sediments, primarily sand and gravel, whose seams transmit adequate amounts of water for private wells.

All of the groundwater in the County originates from local precipitation that infiltrates through the soil into recharge area of the aquifers. Contamination risks from land use practices are the greatest threat to groundwater resources. The potential sources of contaminants are from old unregulated landfills, underground storage tanks, on-site waste disposal systems, livestock manure handling and storage, and septic disposal. All of these sources are presently regulated or are being addressed through ordinances and/or technical assistance service by various county and state agencies.

Future availability of potable water is also a concern that is receiving attention. For the present time, based on a volume of demand from agricultural, industrial and residential uses, those concerns center on the Fox Cities, from northeastern Winnebago County, downstream to Green Bay. A "U.S.G.S. Fox Cities Water Study" was recently completed. It indicates that existing potable water supplies will be adequate to meet projected demand through 2050. However water treatment costs may be higher for communities that depend on groundwater due to a significant lowering of the prime use aquifer. Other conservation and protection options that are being considered include regulatory mechanisms and development of groundwater withdrawal management program.

Waste Disposal Sites

To address some of the potential concern regarding groundwater contamination from landfill and waste disposal sites (abandoned and existing) the DNR created a "Registry of Waste Disposal Sites in Wisconsin" (see APPENDIX-PART 2 for Winnebago County sites). The Registry was last updated in June 1999.
This is a listing of known sites that have been reported to WDNR where solid or hazardous wastes have been or may have been deposited. Inclusion of a site on the Registry is not intended to suggest that environmental problems have occurred, are occurring, or will occur in the future. Its intended purpose is to serve as an informational tool for the public, as well as local and state officials, regarding the location of waste disposal sites in Wisconsin. The DNR local office can be contacted for more information and updates on this list, phone: 920-303-5447.

In addition to the Registry, the DNR regulates private wells and development activity on or near these sites. They are as follows:

**LANDFILLS** (Closed or active, including closed municipal landfills - town, city, village or county):

- Private wells near landfills - The private well code (NR 812) prohibits drilling a private well for drinking water within 1200 feet of a landfill. A DNR variance is required if a well is desired to be drilled within the 1200-foot setback.
- Development on Landfills - The solid waste code (NR 500) prohibits the disturbance of a landfill cap. Disturbance includes construction of any building, excavation of the cap, and planting of agricultural crops. A DNR exemption is required for development of historic landfills.

**Arsenic in Groundwater**

In addition to the groundwater issues described above, major concerns have arisen regarding arsenic levels in groundwater supplies. Primary concerns are in areas where groundwater is exposed to the St Peter Sandstone. An Arsenic Advisory Area map has been prepared by the Wisconsin DNR, which corresponds to a roughly 5-mile buffer zone around the St Peter Sandstone as it runs southwest to northeast through Winnebago and Outagamie Counties (see MAP 12).

According to DNR, the arsenic found in Wisconsin is naturally occurring, deposited in the bedrock layers millions of years ago. Arsenic is being released into the groundwater because people are using more water than ever before. Increased water demands have lowered the water table that has allowed oxygen to get into the aquifer, creating chemical reactions that release arsenic into the water.

Initial efforts to address the arsenic issue include the following:

- In 2002, the U.S. Environmental Protection Agency established a new arsenic standard of 10 parts per billion for public water systems. The old standard was 50 parts per billion.
- In 2004, the Wisconsin DNR established special well casing depth requirements on wells drilled within the arsenic advisory area. Well
drillers are required to follow the new requirements to ensure that arsenic levels in drinking water are minimized. The goals of the "Special Well Casing Pipe Depth Area" are to (source: WisDNR website):

- Allow for the construction of wells that will withdraw groundwater from the aquifers that contain water with low concentrations of arsenic.

- Specify the use of well construction methods that eliminate the introduction of oxidants in the aquifer systems.

- Specify grouting methods that provide a dense, competent and impermeable annular space seal for the casing pipe.

In general, the DNR has expressed concern that water drawn from aquifers near the St Peter Sandstone are not reliable sources of drinking water, as development continues into the future. Land use policies that address development activity in these areas is a consideration that communities should pursue to ensure that the reliance on drinking water within these areas is minimized.
Additional information regarding the Special Well Casing Depth requirements in Winnebago County can be found by accessing the DNR website at [www.dnr.state.wi.us/org/water/dwg/GW/index.htm](http://www.dnr.state.wi.us/org/water/dwg/GW/index.htm). This website also contains a variety of additional information on arsenic and other groundwater issues as it relates to the quantity and quality of our drinking water supplies.

**Mineral Resources**

The geological and glacial history of the county is reflected in its mineral resources that provide a substantial volume of the total aggregate material used in construction activities throughout the county and region. Estimated acreage of those mineral resources that occur within 5 feet of the surface is: limestone, 5,500 acres; sand and gravel, 6000 acres; and mason sand, 3,000 acres. These mineral resources are distributed more or less equally around the county.

With the passage of NR 135 in 2001, owners of active nonmetallic mining sites are now required to register their sites with Winnebago County (see current list of registered sites under Winnebago County jurisdiction in the APPENDIX - PART 3). Currently there are 40 registered (active) sites under Winnebago County jurisdiction, encompassing 651 acres. Another 1447 acres are under future reserve. Additional registered sites are under the jurisdiction of the Town of Menasha, and the various incorporated communities in Winnebago County. Most (32) of the registered sites under County jurisdiction produce sand and/or gravel, with the remaining producing limestone (5 sites) and clay (3 sites).

Some of the best quality limestone is found in Winnebago County. This material is an excellent source of rock riprap that is used extensively for shoreline and stream bank protection throughout the Winnebago System. It should also be noted that a number of inactive pits and quarries have filled with water and provide unique fish and wildlife habitat.

It is important from an economical and environmental standpoint that these mineral resources be protected from encroaching development and contamination. Town boards in Winnebago County and private enterprises have taken proactive approach in that direction through the development of applicable zoning ordinances that include restrictions on development and mineral extraction, as well requiring reclamation.

**Federal and State Conservation Land Ownership and Easement Programs in Winnebago County**

- **WDNR Ownership**- State owned lands purchased for conservation benefits and public recreation. These lands are
generally open to public use such as hiking, hunting, and bird watching.

- **WNDR Conservation Easement** - A State easement program aimed at enhancing the conservation benefits of certain lands. These are privately owned lands, open to public use only with permission from the landowner. Certain rights were purchased from the landowner by the Department to enhance conservation of the property and these may include development rights, vegetation management rights, water management rights, and other conservation related rights.

- **WDNR Managed Forest Law (MFL) Lands** - Privately owned forested lands where the landowner gets a tax break in exchange for creating a Forest Stewardship Plan for the property. These contracts last either 25 or 50 years and preclude development of the property during the contract period. The property may be open or closed to public, with a higher tax break going towards land that is open for public use. As part of the Stewardship Plan, 5% of the profits from forest harvest returns to the State.

- **Federal Wetland Reserve Program (WRP) Easements** - A Federal easement program aimed at restoring previously drained wetlands. These are privately owned lands, open to public use only with permission from the landowner. The Federal government has purchased the development rights and the water and vegetation management rights to these properties. These properties are managed in the best interest of wetlands and their associated wildlife.

- **Federal Waterfowl Production Areas (WPA’s)** - Federally owned lands purchased and managed for waterfowl wetland and nesting habitat along with all other associated wildlife. These lands are open for public use such as hiking, hunting, and bird watching.

### E. Natural Resources Recommendations
Natural resources have immeasurable environmental, ecological, passive recreational, storm water management, groundwater protection and recharge, erosion control, wildlife, timber, and scenic value. Environmental areas are included in the environmental corridor district of the Winnebago County Land Use Policy Framework. They include: Wisconsin DNR-identified Wetlands as mapped in the Wisconsin Wetlands Inventory and subject to County Shoreland Zoning.
1. **Designate and Map Environmental Corridors**
   Updating and maintaining an accurate environmental resource map is essential to the long-term protection of these features. Environmental areas are included in the environmental corridor district of the Winnebago County Land Use Policy Framework. They should include:
   - Wisconsin DNR-identified Wetlands as mapped in the Wisconsin Wetlands Inventory and subject to County Shoreland Zoning.
   - Wisconsin DNR-purchased land and other privately owned land deeded for preservation.
   - Federal Emergency Management Association (FEMA) designated floodplains subject to existing County Zoning. These general floodplain delineations represent the areas potentially subject to the 100-year flood. Not all areas of the County subject to flooding are necessarily reflected in mapped flood plains.
   - Lands with steep slopes of 15 percent or greater, as determined from the Winnebago County Soil survey. Due to instability of these soils and erosion concerns, development of these steep slopes is not advisable.
   - Soils with a majority of hydric content.

2. **Implement the Winnebago Co. Land and Water Management Plan**
   The Winnebago County Land and Water Management Plan, was prepared by the Winnebago County Land and Water Conservation Department in 1998. This is the most detailed land and water resource management plan in the county. Recommended policies and programs should be implemented and the plan evaluated and updated periodically.

3. **Develop performance standards for agricultural and non-agricultural nonpoint sources of pollution.**
   Certain land use and land management practices are known to impair surface and groundwater resources. The goal will be to establish at what point certain activities begin to adversely impact the resources. The Wisconsin Department of Natural Resources (WDNR) and the Department of Agriculture, Trade and Consumer Protection (DATCP) has been directed by the State Legislature to develop performance standards for agricultural and non-agricultural non-point sources of pollution. Until those performance standards are developed Winnebago County will rely upon existing standards and other relevant methodologies to assist in directing

4. **Explore opportunities to expand natural and cultural resources**
   Work closely with Wisconsin DNR and local property owners to acquire land for preservation.
5. Establish a natural resource citizen advisory subcommittee
   The county should establish a citizen advisory subcommittee to advise the county on a regular ongoing basis. The charge of the citizen subcommittee should be to advise the County of existing and possible use opportunities and conflicts with natural resources.

6. Support continued enrollment in the Managed Forest Land (MFL) Program
   The county should encourage private landowners to participate in the State's Managed Forest Land (MFL) Program as a way to promote multiple goals and objectives of the Winnebago County Comprehensive Plan. Enrollment is open to all private landowners owning ten or more acres of contiguous forestland. Adhering to a forest management plan—prepared for each piece of MFL enrolled property—is a requirement of the program. Property owners must allow public access to all but 80 acres of MFL-enrolled land to be a single town for hunting, fishing, cross-country skiing, hiking, and sightseeing. Owners have the option of posting up to 80 acres per town as closed for recreational activities. Landowners with 'closed' MFL land pay a higher annual property tax than those who allow their land to be 'open' for public recreation.

7. Protect Environmentally Sensitive Areas
   The County should pursue oversight of wetlands that are outside of County shoreland zoning and are outside of wetlands owned by Federal and State agencies. These wetlands are currently unregulated by Winnebago County. Furthermore, the County should use funds from state programs designated to assist in efforts to protect and enhance surface water quality in key areas, including:
   - The DNR Targeted Runoff Management Program
   - The DNR-River Protection Grant Program, which aims to prevent the deterioration of water quality, fisheries habitat, and natural beauty as the number of homes, recreational activities, and their uses increases along rivers.

8. Protect Shoreland Areas
   Under State Law Winnebago County currently regulates development within 300 feet of all rivers or streams, and 1,000 feet of all lakes, ponds, and flowages. The Counties Shoreland Zoning ordinance should be evaluated for consistency with the Comprehensive Plan goals and objectives, and needs of waterfront property owners. In addition, the County should monitor anticipated proposed changes to NR 115.

9. Protect Groundwater Quality and Quantity
   - County should develop land use, development, and public health strategies, policies, and ordinances for addressing arsenic in drinking water to protect public health.
• County should develop a countywide groundwater management plan to include policies and strategies for long range protection of groundwater quality and quantity.
• County should develop policies to separate incompatible uses from landfills and quarries that may cause concern about quality drinking water.
• County should pursue involvement in regional approaches and efforts regarding groundwater issues.

10. Develop tools for protecting environmentally sensitive areas
• Overlay Zoning Districts - an overlay-zoning district would not change the underlying zoning of the property but it may impose additional standards, which a development must meet in order to protect any site-specific natural resources.
• Natural Resource Identification Standards - The identification of site-specific natural resources should be the first step in planning any site development, and a prerequisite for receiving development approval. The county should amend its zoning and subdivision ordinance regulations to require such mapping on preliminary subdivision plats, with certified survey map submittals, and with site plans for larger commercial and industrial projects. These plans should also identify natural resource features that are proposed to be disturbed, and any mitigation, which is proposed.
• Purchase or Transfer of Development Rights - Working with local governments and nonprofit groups, Winnebago County should consider other innovative techniques to preserve open space where fee simple acquisition is either impractical or undesirable.
• Land Trusts and Environmental Conservancies - These are non-profit organizations set up by local people to acquire through purchase or donation, environmentally sensitive land. Acquisitions may be for fee simple title, conservation easements (development rights), or other means.

F. Mineral Resource Recommendations
The County's mineral resources have potentially significant economic, community and environmental impacts on local areas and the County as a whole.

1. Implement standards for reclamation of nonmetallic mineral extraction sites
Wisconsin has administrative rules on the reclamation of nonmetallic mines (NR 135). The rules require virtually all nonmetallic mines operating on or after September 1, 2001 to obtain a nonmetallic mine operation and reclamation permit.
Recently, Winnebago County joined other counties in the Fox Valley to implement a multi-county nonmetallic mining program administered by East Central Regional Planning. Permitting and inspection fees support the administrative costs of the program.

2. Nonmetallic mineral reserve identification
   The State reclamation program provides procedures for mineral producers and landowners to register the location of marketable nonmetallic mineral reserves. The effect of the reserve is to prohibit the granting of zoning-type permission for any land use activities that would permanently interfere with the future extraction of the mineral deposit. The County should accurately record all registration and share this information with the towns. In addition, the County should develop policies to protect shallow bedrock, nonmetallic mining resources from development (to include identification and mapping).

G. Cultural Resource Recommendations

The preservation of historic, archeological, and cultural resources in Winnebago County has many benefits. This preservation will foster a sense of pride in a community, improve quality of life, contribute to the preservation of rural character, encourage low-impact tourism, and provide an important sense of social and cultural continuity between the past and the future.

1. Protection of known historic and archeological sites
   The County and local municipalities should work together to locate and map known historical and archeological sites.

2. Other preservation techniques
   Preservation for historical or archeological resources may include renovation design guidelines, historic preservation ordinances, demolition controls, and amendments to subdivision regulations, and/or registration on the State and/or National Register of Historic Places. Such registration makes properties eligible for restoration funding and tax credits.

3. Heritage Tourism
   The County should work to promote tourism opportunities that celebrate and take advantage of the county's historic, archeological and scenic resources. The Industrial Development Board and/or the County should explore state grant opportunities to study, establish, and fund a 'heritage tourism' program in Winnebago County.