II. THE TOWN'S OPEN SPACE RESOURCES

This section provides an overall view of the physical, natural, and cultural resources of the town. It provides the context within which to view the analysis of the individual study areas contained in Section V of this report.

The first part of this section, *Geology and Water Resources,* describes how the town lies on the boundary between two topographic regions—the glaciated drumlin and marsh region, and the elevated, hilly glacial moraine region which indicates the farthest reaches of the last glacier in this area. This section also describes how the town is divided into several surface and subsurface drainage areas.

The second part, *Woodlands, Wetlands, Wildlife and Fisheries,* describes the distribution and character of the natural areas in the town—its woodlands, wetlands, and other areas, such as prairies and hedgerows. It also describes the wildlife that lives in these areas and the fish which populate the town's lakes, rivers, and streams.

The third part of this section, *Historic and Cultural Resources,* describes the historical heritage of the town and the physical signs of the past which still remain. Although the period of European settlement began little more than 125 years ago, Indians made the town their home for thousands of years before that.

While reading this section, keep in mind that the physical, natural, and cultural characteristics of the town are strongly interrelated. Soil and water qualities determine the health and diversity of plant life, which, in turn, affect the availability of wildlife habitat. Historic resources, too, are given meaning in the context of the natural and physical resources surrounding them. This is why it is useful to think of all of these resources as part of a system, which we call the town's open space system.

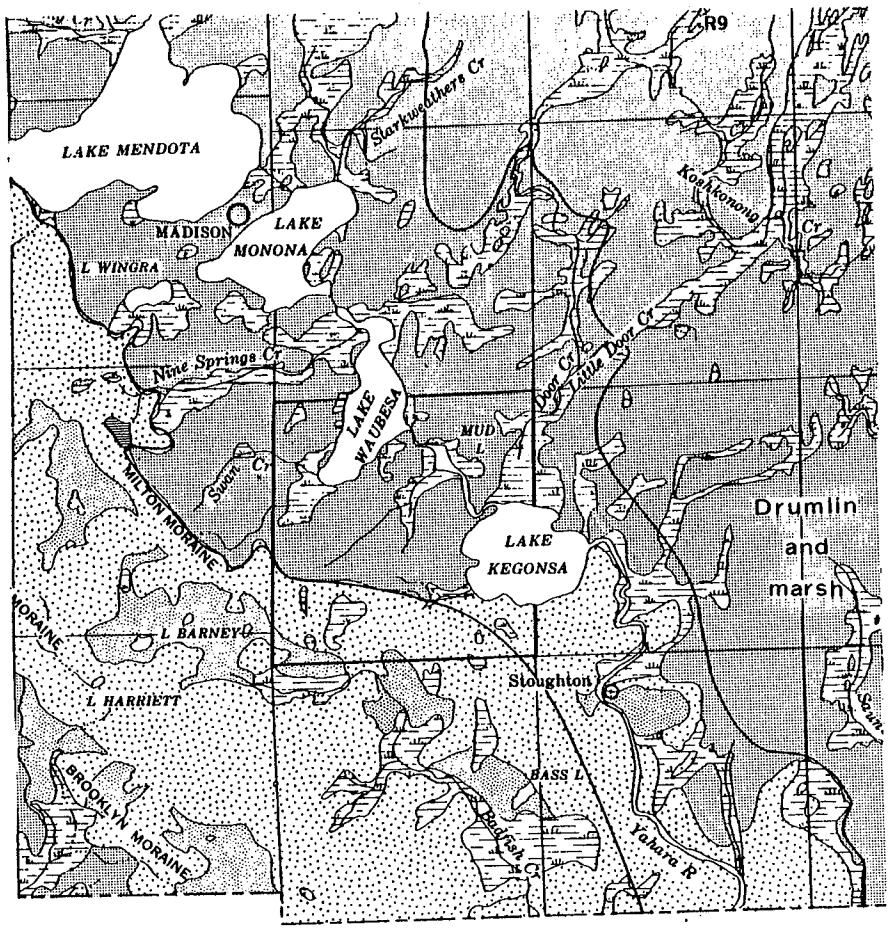
A. GEOLOGY AND WATER RESOURCES

The town's geology and water resources are an important part of the open space system. Glacial hills and moraines provide much of the town's visual quality. Surface water runoff—and the types of pollutants it carries—significantly affect the quality of the town's wetlands and water resources. In addition, ground water level and flow are important for the maintenance of the wetlands and water resources. For the purpose of brevity, the body of this discussion is not referenced. All sources of information are included at the end of this section.

SURFACE GEOLOGY

The Town of Dunn lies in two topographic regions—the glacial moraine area, which lies in the southern one-third of the town, and the Yahara River Valley area, which makes up the remaining northern two-thirds of the town.

The moraine area in Dane County is perpendicular to the south-southwest movement of the region's most recent glacier. It is made up of material that was pushed in front of the glacier as the glacier advanced southward, and represents the furthest reaches of the last glacial period that ended about 12,000 years ago. The moraine, which cuts through the town, extends from south-central Dane County to northwestern Dane County. Dunn's moraine area is part of a larger area called the Milton Moraine. To the west of the moraine lies the region known as the "Driftless Area."



Surface Geology and Glacial Deposits

EXPLANATION

QUATERNARY

Marsh deposits
Muck and peat

Glacial lake deposits
Stratified clay, silt, sand, and marl

Outwash and alluvium
Mostly sand and gravel, sorted and stratified

Morainal deposits
Clay, silt, sand, gravel, and boulders, mostly unsorted and unstratified

Undifferentiated glacial deposits mainly ground moraine
Clay, silt, sand, gravel, and boulders, unstratified to stratified, unsorted to sorted

Pre-Quaternary rocks
Quaternary deposits thin or absent

R4
Rock-sample site

(Source: Cline, Denzel R., GEOLOGY AND GROUNDWATER RESOURCES OF DANE COUNTY, WISCONSIN)

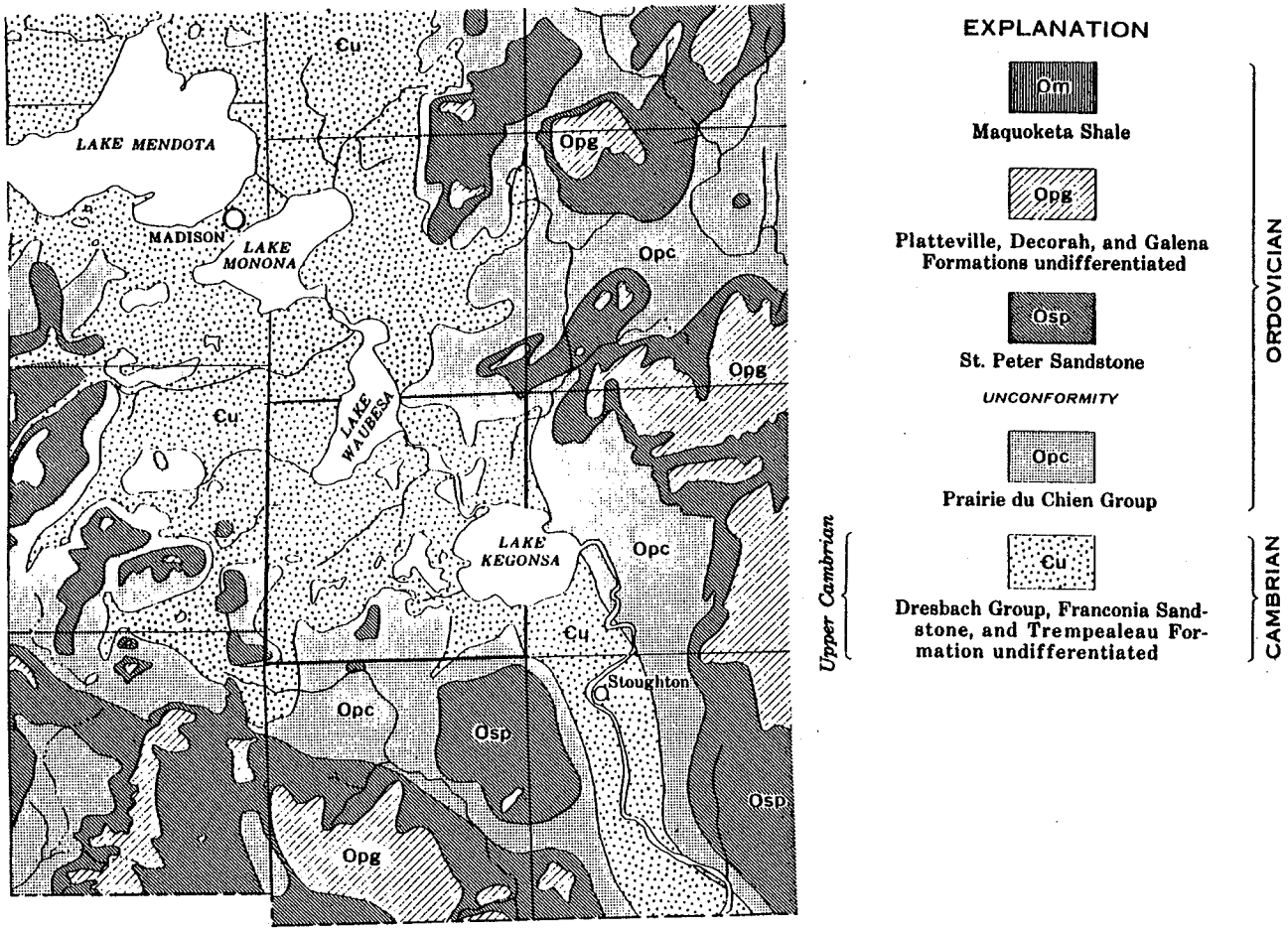
The moraine area in Dunn is characterized by knobby hills and ridges that consist of rock fragment ranging in size from clay to boulders. Layers of sorted sands and gravels that were laid down by glacial meltwaters also are evident in the area. Because these sand and gravel areas are poorly suited for septic systems and landfill sites, such facilities should be very carefully sited in this part of the town.

Some small kettle-holes exist in the moraine area. Most are less than 20 feet deep. These kettles were formed by the accumulation of glacial material around isolated ice blocks left behind from a glacial advance or retreat. The blocks, which slowly melted away, then left a depression in the ground. These depressions or kettles occasionally contain a small lake or wetland. An example of a kettle-hole lake is Hook Lake, located in the southwest area of the town. The island in Hook Lake is a glacial deposit. Several other small kettle-hole marshes exist just south of Grass Lake.

The Yahara River Valley area includes Lake Waubesa, Lake Kegonsa, and Mud Lake. The lowlands adjacent to these lakes and the Yahara are marshy while the upland areas are generally well drained. The topography of the area varies from flat and rolling to hilly and hummocky. Some drumlins are also evident. The drumlins, rounded cigar-shaped hills formed from glacial materials, were formed under glacial ice and lie parallel to the southwest movement of the glacier. A good example of a drumlin is found in the northwest corner of the town on what is now Fred Uphoff's farm. Eastern Wisconsin, northwestern New York, and eastern Massachusetts are the only three areas in the United States that can boast an abundance of drumlins.

SUBSURFACE GEOLOGY AND GROUND WATER

The ground water reservoirs, or aquifers, in the town are found at two levels: (1) the upper aquifer composed of fine wind-blown soil (loess), and glacial deposits, and (2) the lower aquifer composed of various rock types. These two aquifer levels lie above a base of impermeable rocks that were formed during the Precambrian age (over 570 million years ago). The rocks in the upper aquifer are of Quaternary age (which began about two million years



Subsurface Geology

(Source: Cline, Denzel R., GEOLOGY AND GROUNDWATER RESOURCES OF DANE COUNTY, WISCONSIN)

ago), and include morainal deposits as well as some outwash and glacial lake deposits. The rocks in the lower aquifer date from the Cambrian age (570 million years ago) and the Ordovician age (500 million years ago). The Cambrian age rocks, principally sandstone and dolomite, were deposited in shallow seas on the uneven surface of the dense crystalline rocks of the Precambian age. The porous and permeable sandstone provides a large ground water reservoir through which water moves easily.

Ground water in the town originates as precipitation and percolates downward to the zone of saturation (the area where all pores, cracks, and fractures in the aquifer are filled with water). This percolating water becomes part of the ground water reservoir. Ground water moves through fractures, joints, and pore spaces in response to gravity. Its movement through the bedrock aquifer is also dependent on permeability of the rock. Rock containing shale, clay, and dolomite will slow the downward movement of water. While the movement of water through sand and gravel is good, clays and silts slow the rate at which water moves downward through the upper sections of the aquifer.

The movement of ground water in the aquifer is from points of recharge, such as areas of high elevation, to points of discharge, areas of low elevation like springs, streams, lakes, wells, and drainage ditches. For example, rainfall percolating down from high areas in the southern part of the town moves to discharge areas, like the springs in the Waubesa Wetlands, which release water to the streams and lake.

Ground water is also depleted through the artificial means of pumping from wells. If water storage in the aquifer is to remain constant, recharge should equal discharge. Most water in the Madison metropolitan area is treated at the Madison Metropolitan Sewerage District Nine Springs Treatment Plant. From there it is discharged into the Lower Yahara River Basin via the Badfish Creek. This discharge amounts to about 35 million gallons per day. Because of this discharge out of the basin, ground water levels are declining.

Eventually the diversion of groundwater outside the Upper Yahara River Basin will cause a decline in surface water levels. This diversion could have a significant effect on the town's lakes, streams, and wetlands. In the long run, the problem could be solved by either returning treated water to the Upper Yahara River Basin, or by recharging the aquifer with the treated water.

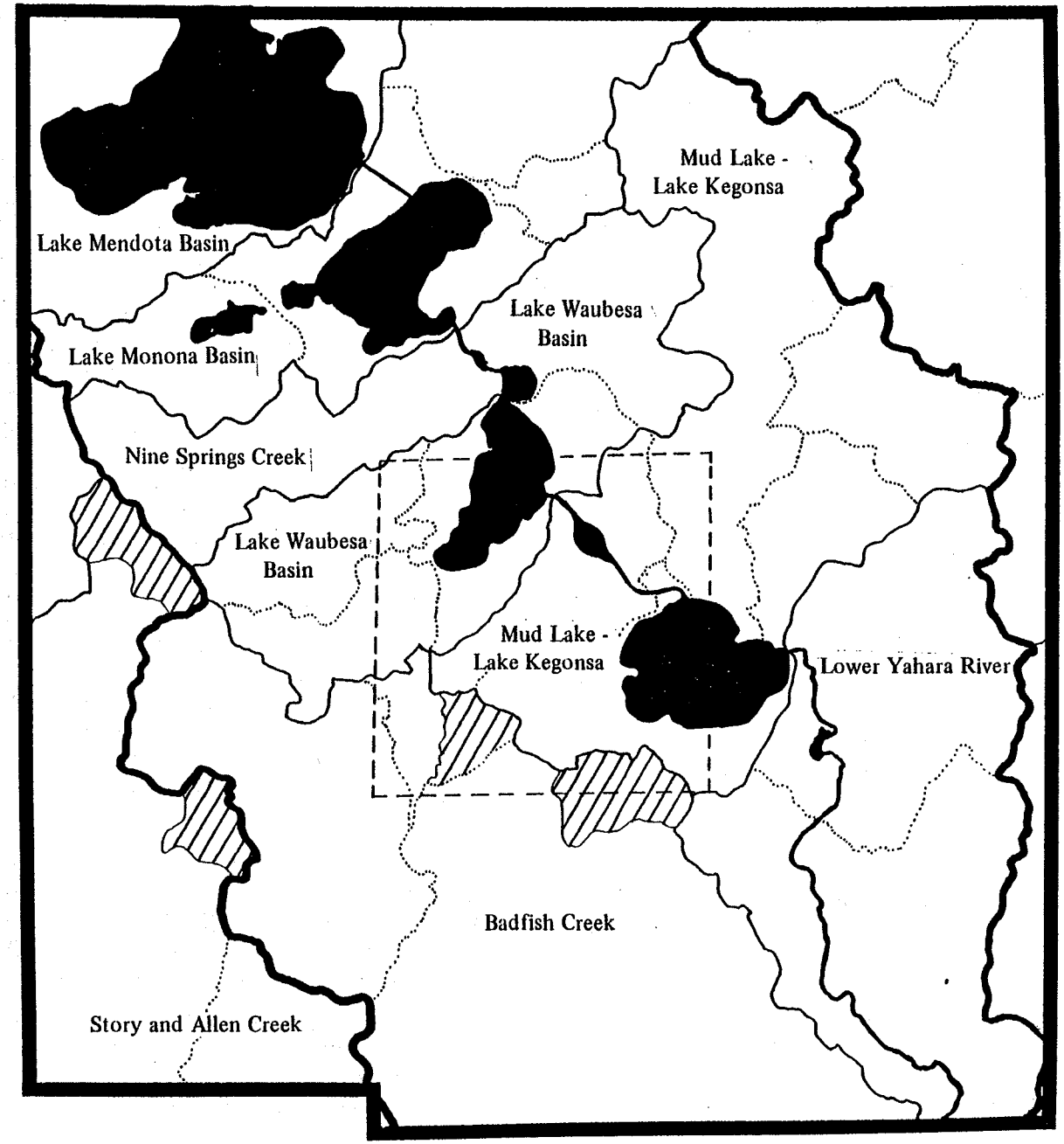
Ground water is the chief supplier of the primary plant growth nutrients of phosphorus and nitrogen to points of ground water discharge, including streams, lakes, and wetlands. Ground water concentrations of phosphorus and nitrogen may seem relatively low in comparison to springtime runoff concentrations. However, the flow that ground water provides to streams, lakes, and wetlands is greater than that from springtime runoff. Therefore, the total amount of nutrients provided by ground water to the aquatic systems may be greater than that provided by springtime runoff.

The sources of nitrogen and phosphorus in ground water are decomposed by-products of organic matter (crop residue, leaf litter, decaying animal and vegetative material) percolating downward with the recharge waters. Another source might include the leaching downward of fertilizers with the recharge water.

SURFACE WATER RESOURCES

The Town of Dunn's topography and drainage patterns were originally determined by the bedrock's varying resistance to the erosive action of past glaciers. Almost two hundred feet of relief are present in the area. The town lies within the Yahara River watershed which drains into the Rock River watershed.

The Yahara River originates in Columbia County, flows south through Dane County, and joins the Rock River in Rock County. The Yahara River watershed extends over 446 square miles, including about one-third of Dane County. As the river flows through Dane County, it changes from a meandering creek to a large stream connecting four major lakes —Mendota, Monona, Waubesa, and Kegonsa. The Yahara has relatively few tributaries, and flows through broad undrained areas containing large wetlands. The wetlands located in the Yahara River watershed and in the Town of Dunn are among the largest in Dane County. They include the South Waubesa Marsh, Upper Mud Lake Marsh, and Door Creek Marsh.



(Source: DANE COUNTY WATER DATA INDEX,
Dane County Regional Planning Commission, 1974)

Most of the industrial and municipal sources of pollution in the Yahara River Basin are now treated by the Madison Metropolitan Sewerage District at Nine Springs Treatment Plant. However, the Yahara River and the lakes are still affected by municipal and industrial pollution discharges which in the past deposited high levels of nutrients, organic matter, and toxic materials into the lakes and river system. Nutrients are still being released from the bottom sediments of the lakes and river. These contribute to the growth of nuisance algae and aquatic plant growth.

In addition to these "point" sources of pollution, "non-point" sources of pollution also affect the area. They include nutrients and soil sediments from farm fields, construction sites, and city streets. The result of these pollutants entering the Yahara River system includes shallow areas of lakes filling in with sediments, prolific weedbed growths, and algae blooms. All these conditions can make the lakes in the watershed unattractive for swimming and boating.

Surface Water Management Divide

Sub-Basin Divide

Major Basin Divide (Yahara River)

Internal Drainage Area

The following includes a brief description of the lakes and streams in the town:

Lake Waubesa (Study Areas A, B)

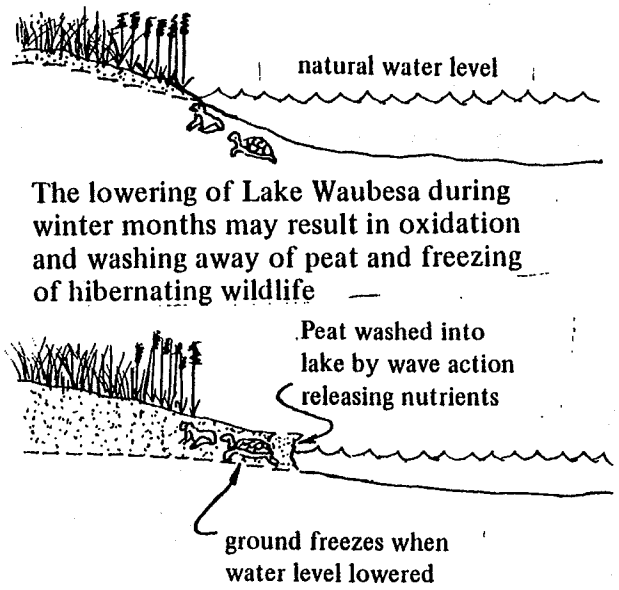
Lake Waubesa was formed when glacial moraines dammed the Yahara River Valley. A relatively shallow lake, Waubesa's maximum depth is 34 feet. It is 2,113 acres in size.

Since Lake Waubesa stopped receiving heavy loads of municipal wastewater from the Nine Springs Treatment Plant, its water quality conditions have recovered significantly. Nutrient levels are now lower than they were in the 1920s.

Current lake pollution sources are primarily agricultural areas (sediments and nutrients in surface water runoff from fields) and urban areas (sediments, stormwater, oil, etc.). A significant amount of pollution also is carried in by the Yahara River.

Nutrient recycling from bottom sediments is an important part of the lake's water quality situation. As lake bottom water and sediments undergo oxygen depletion during summer months, nutrients stored in bottom sediment from previous pollution are released and become available for plant growth throughout the lake. For this reason, as long as nutrients are recycled from bottom sediments, a reduced pollution load to the lake will result in only partial improvements to the water quality.

Pollution control in the lake's drainage basin will improve the lake's condition by reducing sediment loads which, in turn, will decrease the rate of shallow areas filling in, weed beds expanding, and dredging needs.



Lake Kegonsa (Study Areas E, G)

Lake Kegonsa was formed by the same kind of damming action that formed Lake Waubesa. Like Waubesa, it is relatively shallow, with a maximum depth of 31 feet. It is 2,716 acres in size.

Lake Kegonsa's water quality conditions are similar to those of Lake Waubesa. Most water quality parameters fall within the normal range for hardwater lakes in southern Wisconsin. However, depletion of oxygen in the lake bottom water and sediments cause nutrients to be released and circulated throughout the lake. This results in available nutrients for algae and plant growth.

The Yahara River and Door Creek are the primary sources of external pollution to the lake (The Cottage Grove municipal wastewater discharge is at Door Creek's headwaters). Another source of pollutants to the lake includes the often undersized, poorly located, and inefficiently designed septic tank systems that serve the cottages along the shores of the lake. Stormwater runoff from agricultural fields, too, brings nutrients and sediments to the lake.

Lake Kegonsa, like Lake Waubesa, showed significant improvements in water quality after the Nine Springs Treatment Plant discharge was diverted to Badfish Creek. However, Lake Kegonsa is more polluted than Lake Waubesa, as evidenced by its higher nutrient levels. During the summer, blue-green algae blooms are found in both lakes. As with Lake Waubesa, reduction in water pollution will reduce the rate of shallow areas filling in, weed beds expanding, and dredging needs.

Mud Lake (Study Area F)

Mud Lake is a natural widening of the Yahara River, located between Lake Waubesa and Lake Kegonsa. It is a shallow lake, with a maximum depth of five feet. It is 195 acres in size. Completely encircled by shallow marsh and sedge meadow, it is accessible only from the Yahara River.

The major source of pollutants to Mud Lake is from the nutrients and sediments carried by the Yahara River. These originate from agricultural and urban runoff that winds up in the river. Water quality in the lake significantly improved after the Nine Springs Treatment Plant discharge was diverted to Badfish Creek. The presence of algae blooms and excessive aquatic plant growth indicates that the lake is affected by past and present pollution discharges into the system.

In addition to river flow, water sources include ground water discharge by small springs and seepages in the surrounding marsh.

Door Creek (Study Area G)

Door Creek is a tributary stream flowing from the southeast corner of the Town of Burke, south 12 miles to Lake Kegonsa. Door Creek and its tributaries have a drainage area of 29.45 square miles. Agriculture is the predominant land use in this drumlin-marsh area. The creek has many water quality problems, both natural and man-made. Door Creek has a low base flow and velocity and is subject to high summer temperatures. Man's intervention in straightening the stream channel by ditching through the center of Door Creek Marsh has increased sediment and nutrient loads carried by the creek. The marsh no longer can serve as an effective nutrient and sediment filter for water carried down through the watershed. Cottage Grove's sewage effluent discharge (north of the town) further deteriorates the water quality in Door Creek by lowering oxygen levels and increasing phosphorus, chloride, and fecal coliform levels.

Few soil and water conservation practices are used in the Door Creek area. Data indicate that the creek carries one of the highest nutrient and sediment loads in the Yahara River Basin. Soil losses are often higher than levels considered tolerable by the Soil Conservation Service. Reductions in the nutrient and sediment loads would be beneficial to Lake Kegonsa's water quality.

Swan Creek (Study Area B)

Swan Creek is a small stream that flows into the southwestern end of Lake Waubesa. About three miles in length, its drainage area is approximately seven square miles. Swan Creek is fed from ground water (including marsh seepage) and from stormwater runoff within its drainage basin. The base flow is low compared to other streams in the drainage basin.

No municipal or industrial sources of pollution exist within the creek's drainage basin. Land use in the area is predominantly agricultural. The creek's major water quality problems stem from the natural fertility of the area and runoff from agricultural lands, which carries nutrients and sediments. Nutrient concentrations found in the creek are at the upper end of the normal range from streams in Dane County.

Murphys Creek (Study Area B)

Murphys Creek is a tributary stream with its mouth at the southwest corner of Lake Waubesa. It flows south of Swan Creek and has a drainage area of approximately five square miles. Where flow is intermittent, the water quality is poor. Base flow near Lalor Road increases due to inflow from springs, and water quality improves in this area.

The Oakhill Correctional Institute is a major source of pollution to Murphys Creek. Although their wastewater treatment has been good, water quality is severely deteriorated at the upper end of the creek due to intermittent flow conditions, which exist primarily in the summer.

Keenans Creek (Study Area F)

Keenans Creek is a small tributary stream flowing northwest through agricultural and wetlands, to the southwest side of lower Mud Lake. The creek drains approximately 3.6 square miles and is 4.4 miles in length. The major pollution source is stormwater runoff from agricultural fields. The creek contains a relatively high level of sediments and nutrients.

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B. WOODLANDS, WETLANDS, WILDLIFE, AND FISHERIES

The Town of Dunn has a long and rich natural heritage. Since the last glacier receded thousands of years ago, the town has possessed a mixture of prairie, woodlands, and wetlands, all teeming with game and fish. About 125 years ago, man replaced prairie grasses with rows of cultivated grain, and domesticated animals began to share the town with their wild antecedents.

Although the new agricultural pattern was, perhaps, the greatest change to occur in the town since the last glacial period, the change was not altogether out of harmony with what had already existed. Plants were being replaced by plants, and animals were being replaced by animals. There was still room for much of the natural life in the town. In fact, some animals benefited from the new agricultural crops and, with prairie fires under control, the number of trees in the town multiplied. Only the prairie, which lay over rich soil, was almost completely obliterated.

In recent years, another great change has begun. With the growth of the Madison metropolitan area, subdivisions and roads have started to replace crops and livestock. This is a profoundly different change from that which occurred in the mid-1800s. It is impossible to predict the extent to which this change will continue in the future. Much depends on national and international patterns of economics, resource exploitation, and energy supply. State and county development and growth policies will also influence the development of the town. At the town level, local commitment and a local planning program can help ensure that the town's natural heritage is not lost, regardless of what the future brings.

This section describes some of the parts of the natural system in the town. While reading about these individual pieces, it is important to keep in mind the system of which they are an integral part. It is important, too, to remember that changes that occur in one part of this system will affect the entire system.

There is one part of the town's natural heritage which, as mentioned, has almost completely disappeared. That part is the prairie. Today, scattered prairie plants occur on some roadsides and on the railroad right-of-way. However, there is only one small area, located in the southeast part of the town where prairie plants grow as a natural community.

This remnant prairie contains one of the only existing populations of wild hyacinth in the county. The size of compass plant and prairie dock stands is also somewhat rare. Other plants found in this location include cord grass, water hemlock, meadow rue, golden alexander, wild garlic, bittersweet vine, spider wort, brown-eyed susan, big-tooth sunflower, and stiff goldenrod. The area has been invaded by Canada thistle, a noxious weed. If the thistles are mowed, as required by law, many of the prairie plants could be destroyed.

Future road improvements in the town could be accompanied by prairie restoration projects, which can be assisted by a number of seed and technical assistance sources.

WOODLANDS

Wooded areas are an important part of the town's natural environment. Ranging from small hedgerows to woodlots over 80 acres in size, these areas provide wildlife habitat, recreational opportunities, firewood, and wood products. Some contain rare wildflowers. Indian mounds can be found in others. In addition, the woodlands are one of the most aesthetically important parts of the town's scenic landscape.

In the summer and fall of 1978, 78 woodlots were located and analyzed in the town.* (For the purposes of this study, a woodlot was defined as a continuous tract of woods three or more acres in size). In cases where permission to enter a woodlot was not granted, information was gathered from road surveys and from townspeople with knowledge of the area. By surveying the town's woodlots, important information was obtained, including types and qualities of trees, shrubs and plants, woodlot quality, slope, and the woodlot's relationship to other open space resources.

The surveyed woodlots were classified according to community type. The community type indicates the predominate tree and shrub varieties present in the woodlot. Approximately four-fifths of the woodlots were classified as a xeric dry hardwood type. A xeric dry hardwood community primarily contains white oak, red oak, and black oak tree species. Shagbark hickory and black cherry are also common. This woodland community is usually found on dry, well-drained sites.

*The town's woodlots were surveyed using a method developed under the direction of Professor Herman Felstehausen of the UW Department of Landscape Architecture. Further information on this method can be obtained by contacting Professor Felstehausen at the Department of Landscape Architecture, 25 Agriculture Hall, UW-Madison, Madison, Wisconsin 53706. Phone 262-6969.

WOODLAND EVALUATION FIELD SHEET

DATE_____ INV. _____

1. Wood Lot # ____
2. Woodlot Location:
   Road _____
   Section ____
3. Woodlot Size ____Acres
4. Common Plant Species:
   Trees: _____
   _____
   Shrubs: _____
   Ground: _____
5. (4") Sapling Species: _____
6. Canopy Cover ____%
7. Density of shrub layer: sparse ___, Medium ___, Dense ___,
   Foreign Invasion _____(Honeysuckle/Buckthorn)
8. Age of Stand: ____ Mixed ____ Even Age
9. Health of stand/disturbances: _____

Signs of physical damage:

___ storm damage (ie/snow)
___ grazing damage
___ logging damage
___ construction work

Signs of insect/disease damage:

___ hollow trunks
___ stem cankers
___ wood borers
___ wilted discolored leaves
___ eaten leaves

10. Location in relation to other natural resources:

___ wetland
___ stream (dry/running)
___ lake/pond
___ springs

___ rock outcroppings
___ hill with vista
___ bluffs, escarpments
___ ravines
___ ridge tops

___ % flat land
___ % rolling/hilly land
___ avg. slope
___ slope orientation(asnect)
___ archeological sites
___ historical sites

11. Wildlife:
12. Community type-quality rank: _____
_____

COMMENTS: _____
_____
_____

Evaluation Sheet Used to Survey Woodlots

Overall, the bur oak, black oak, white oak, and pin oak are the primary oak varieties found in the town. These oak trees grow very slowly and are sensitive to construction activities nearby. Soil compaction in an oak tree's root zone can cause the tree to die. Damage from machinery also can introduce insect pests and diseases. The shagbark hickory is the most common hickory present, with an occasional yellowbud hickory in a few woodlots. Black cherry, white and green ash, aspen, slippery and American elm, black walnut, red and silver maple, hackberry, a few native juniper, and basswood are other trees commonly found in the town's woodlots. Weedy tree species in the town include the box elder, black locust, and mulberry.

Common shrub types found in the understory of woodlots include dogwood, sumac (on woodlot edges), gooseberry, and the high bush cranberry. Honeysuckle, a weedy and undesirable shrub, has a very dense growth in some of the woodlots. Once honeysuckle starts growing, it can completely take over the shrub layer in a woodlot.

Common ground cover plants are strawberry, woodbine, wild grape, wild rose, Virginia creeper, Solomon seal, sweet cicely and violets.

Plants which occur only in woodlots without disturbances are dutchman's breeches, jack-in-the-pulpit, jacobs ladder, ladyslipper, orchids, trillium and the trout lily. These plants are rare and, if present in a woodlot, should not be disturbed. The duff layer, the lowest level of material lying above the ground level in woodlots, is composed of decaying organic matter.

After the town's woodlots were surveyed, each was assigned a quality rank of excellent, good, or fair. These ratings were assigned to give an overall indication of the quality of the woodlot itself and its importance as part of the town's open space system. Because of the many variables that went into each ranking decision, these judgements should not serve as a basis of specific planning decisions without further examination. The individual woodlot field survey sheets, containing detailed information describing each surveyed woodlot, are found in the appendix volume to this report.

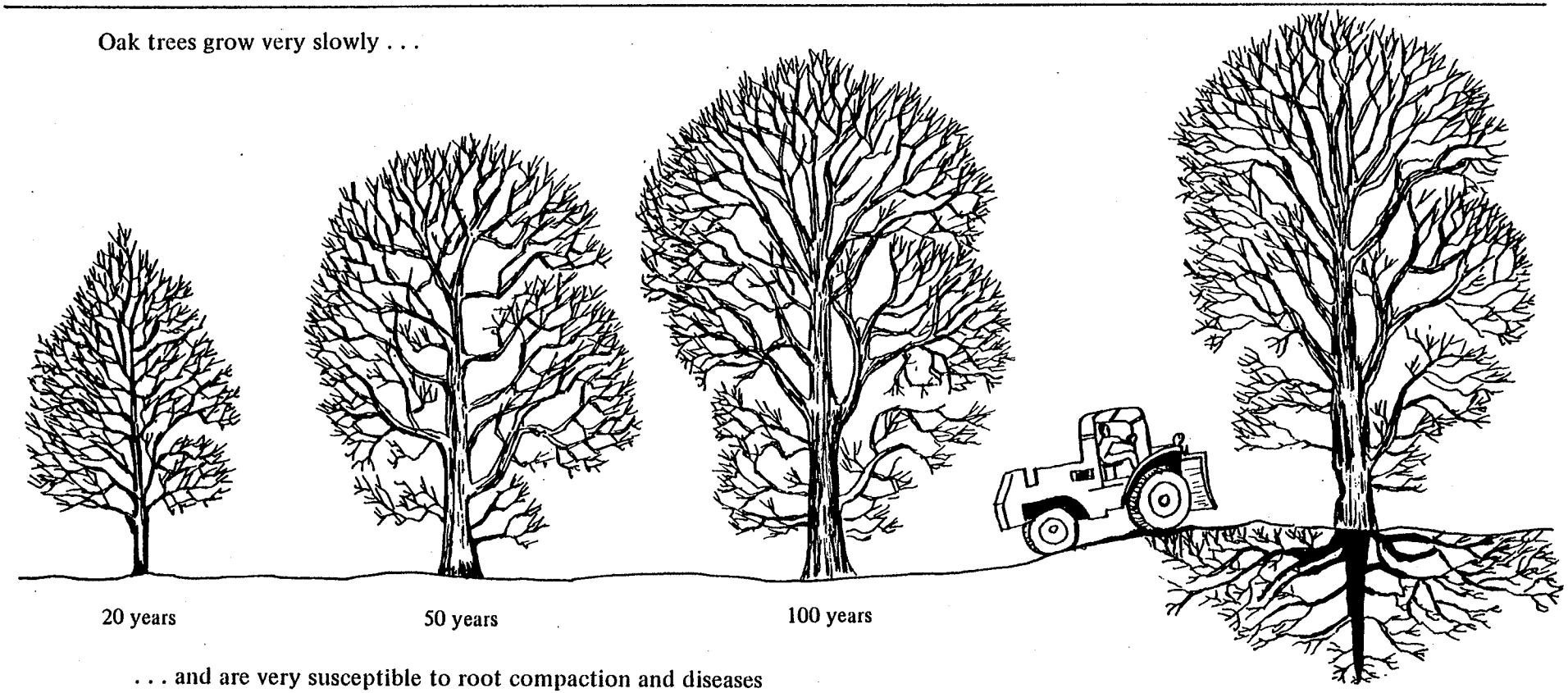
A woodlot given an "excellent" quality rating was found to have a healthy character and a large variety of plants. Few disturbances were present in these woodlots. A ranking of excellent also indicated that the woodlot fulfilled important open space functions.

Of the woodlots surveyed, about 30 percent were ranked excellent. Most with the excellent quality rank adjoined or were near a wetland, stream, or lake, thereby providing wildlife habitat and an aesthetic quality. Some contained archaeological features, primarily Indian mounds.

A woodlot was assigned a "good" quality rank if it was found to have a near-natural character and balance of plant types. The effects of moderate disturbances to the health of the woodlot were evident. For example, logging may have removed trees of a certain type and age class, or grazing, although discontinued, was evident by the thin growth in the woodland ground cover, plant, and shrub layers. About 40 percent of the woodlots surveyed were assigned a good ranking.

A "fair" quality ranking was assigned if the health of the woodlot was found to be declining and where the natural character and balance has been severely disturbed. About 20 percent of the woodlots in the town came under this ranking. The kinds of disturbances encountered in woodlots were from grazing, logging, junk yards, construction, and storm damage. A rank of "fair" does not necessarily

Oak trees grow very slowly . . .



. . . and are very susceptible to root compaction and diseases caused by root or trunk damage

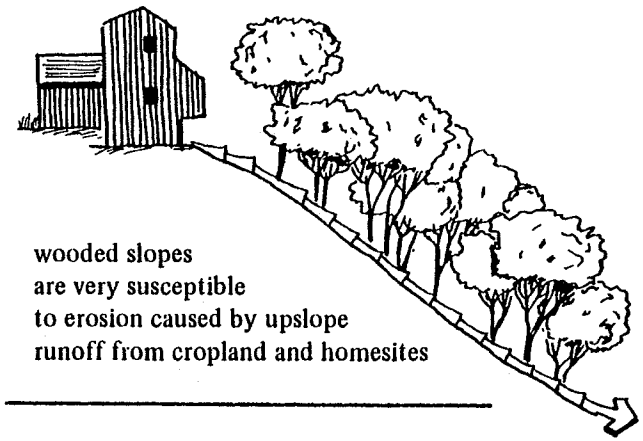
indicate that the woodlot contains no important qualities or that its quality cannot be improved through proper woodlot management.

The 78 woodlots surveyed ranged in size from three acres to 88 acres, with the average size being about 20 acres. Almost 50 percent of the woodlots border on a wetland, 25 percent are adjacent to streams, and 20 percent border lakes.

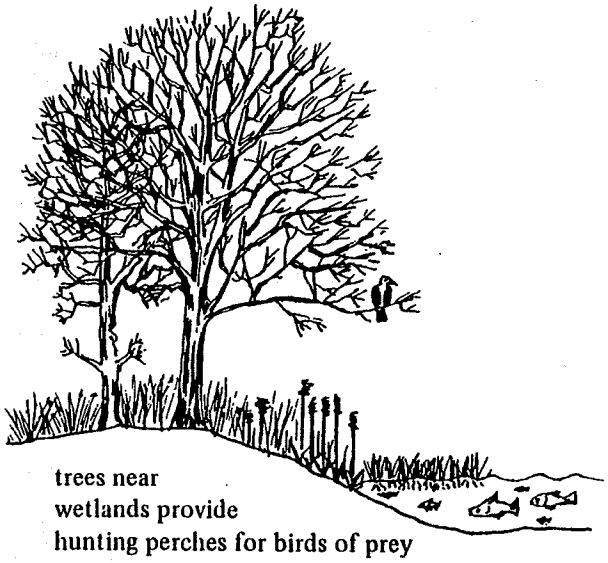
The survey conducted as part of this study included only woodlots three acres or larger in size though the town contains many smaller wooded areas which also perform important functions. These areas include hedgerows, "odd areas" in fields, and trees which line streams and wetland boundaries. As with larger woodlots, they help control erosion, add to the visual quality of the rural landscape, and provide valuable wildlife habitat. Therefore, these areas should receive attention when development projects are evaluated.

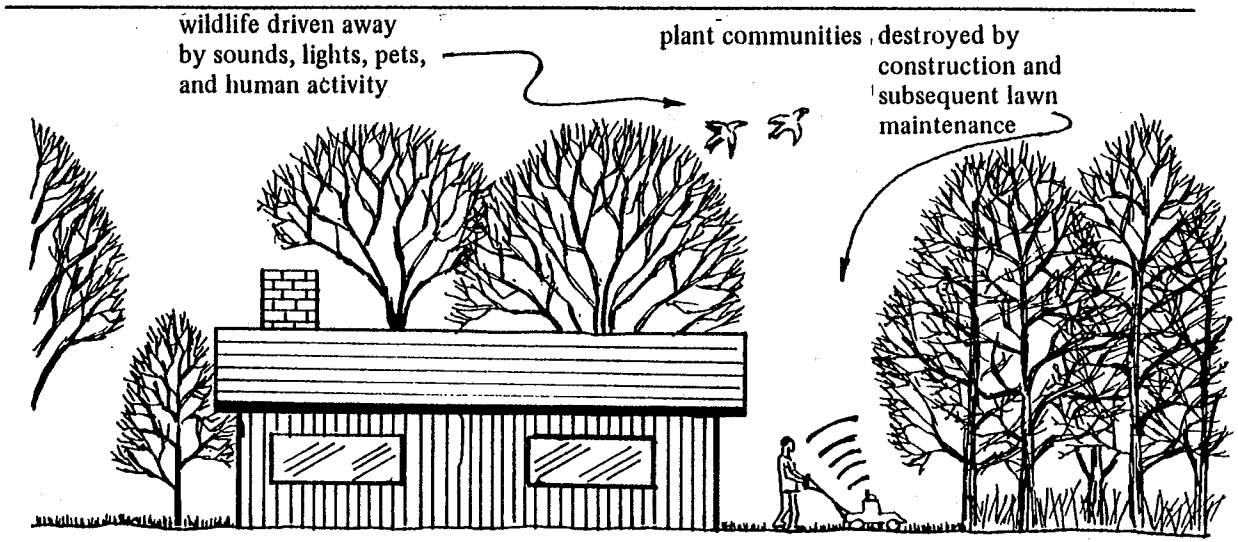
If grazing or other traffic disturbances occur in a woodlot, the ground cover plants are the first to be destroyed. Next the shrub layer and young trees are damaged. Most woodlots in the Town of Dunn have experienced livestock grazing. More than one-third of the woodlots in the town are currently grazed or have been grazed in the recent past. Landowners with disturbed woodlots might enjoy undertaking a woodlot rehabilitation project. After grazing, unwise logging is the second greatest cause of damage to woodlot quality in the town.

A woodlot management program can maintain woodlot quality and productivity. Of course, the meaning of quality depends on the landowner's objectives. Woodlot management objectives which focus only on wood products may sometimes have a negative effect on wildlife values. For example, red-headed woodpeckers require dead standing timber as part of their habitat.



Wooded areas can either help prevent soil erosion or be the source of severe erosion. A healthy woodland in a natural state contains a thick layer of ground plants and duff (the layer of decayed organic matter). These layers absorb water and reduce the impact of rain. However, if significant runoff enters a wooded area from upslope, severe erosion will occur, because wooded areas are not able to





Development in woods drives out wildlife and destroys plant communities

handle large amounts of overland flow. Therefore, it is important to control runoff on hilltops before it reaches wooded slopes.

If a woodlot is in a disturbed condition from grazing, snowmobile activity, or poor logging practices, the duff and plant layer will be destroyed. This leaves the woodlot very susceptible to erosion. Besides removing vegetation, livestock cause soil compaction, especially when walking on soil after a rain. After compaction occurs, the soil no longer absorbs rain water.

In conclusion, then, woodlands serve a number of vital functions in the town's open space system. By following wise woodlot management principles, woodlot owners can enjoy their benefits while preserving the functions of the woodlot. Most of the wooded areas around lakes Kegonsa and Waubesa have already been developed. In recent years, woodlots in the rest of the town have come under development pressure. Several have been lost to development. It is up to the town to decide the extent and nature of further woodlot development. This information should help the town weigh the values that will be lost against the benefits received from future development.

WETLANDS

The Town of Dunn has a greater concentration of high quality wetland areas than any other township in Dane County. The five major wetland systems and several smaller ones in the town are an important part of the town's open space system because:

1. They provide habitat or food for a majority of fish and wildlife species in the town.
2. They store flood waters and release them slowly.
3. They filter sediments and pollutants from runoff entering lakes and streams.
4. They serve as groundwater recharge and discharge areas.
5. They are an important part of the town's scenic landscape.

The town's wetlands are the results of glacial activity. The last glacier dropped a layer of material (glacial till) in varying thicknesses across the landscape. The material often blocked the path of rivers and streams, creating lakes and marshes of varying size, shape, and distribution. The Yahara River Valley topographic region is characterized by this type of wetland formation. Pre-glacial drainage lines were blocked, re-routed, or slowed by deposits of glacial material. Wetlands in this area are large, interconnected, and surrounded by low hills. In glacial moraine areas, which include the southern one-third of the town, kettle-hole lakes and marshes are found.

The following discussion briefly describes the major wetland systems in the town. Most of this information was taken from *Wetlands of Dane County, Wisconsin,* published in 1974 by the Dane County Regional Planning Commission and written by Barbara Bedford, Elizabeth H. Zimmerman, and James H. Zimmerman. More detailed maps and information from the wetlands study are in the appendix volume of this report. They provide a detailed analysis of plant communities and disturbances within the wetlands, and provide a discussion of wetland management principles.

Waubesa Wetlands (Study Area B)

The Waubesa Wetlands lie at the southwest corner of Lake Waubesa and are made up of more than 400 acres of a variety of wetland types. The wetland complex includes fens, sedge meadows, shallow marsh, deep marsh, and shrub carr—all of which lie on a deep bed of peat. This peat bed is one of several important large peat deposits on the Yahara River system.

The Waubesa Wetlands contain a variety of wetland vegetation types and conditions. The calcium-rich waters in the area support unique communities, such as the southern sedge meadow and the fen. A fen is a grassland located on a water-logged alkaline organic soil (peat), which is composed of characteristic sedges, forbs, and grasses.

The sedge meadow is also located on water-logged wet soils, and consists primarily of certain sedges and grasses. Nearly all the plants in these two wetland communities are native to the area. The diversity of vegetation types indicate the natural condition of the wetland.

Both Murphys Creek and Swan Creek flow through the wetland. Nine large springs and seepages maintain high water quality in the wetland and in Murphys Creek, which in turn contributes to the water quality in Lake Waubesa. Seepages and springs indicate that the wetland here is a ground water discharge area.

The wetland also provides excellent habitat for waterfowl, small marsh birds, sandhill cranes, hawks, and owls. Cooper's hawks, rough-legged hawks, red-tailed hawks are found in the area. The large springs keep water open and provide an over-wintering area for several hundred ducks.

The primary threat to the Waubesa Wetlands is the potential for additional development on adjacent uplands. A combination of urban development and road construction could change the source of water from springs and seepage to overland runoff. This change would mean that the wetlands would receive large amounts of nutrients and soil sediments. This would result in degradation of the water quality and fisheries in Lake Waubesa. Spring action, therefore, should be protected in order to maintain present water quality. Land uses in adjacent uplands should be limited to low-intensity activities, and woodlots should be maintained to provide buffer zones.

Lower Mud Lake Wetlands (Study Area F)

The Lower Mud Lake Wetlands that surround the natural widening of the Yahara River (Mud Lake) are part of the many large peat deposits along the Yahara River. A large peat bed underlies the marsh on the west side of the lake. The marsh is fed directly by springs and partially from overland runoff. The open water area, Mud Lake, is an extremely important resting area for migrating waterfowl during the spring. Ducks, geese, herons, and swans will stop to rest and feed here. Since the water opens early on the river, the area is especially good for early migrating waterfowl.

The east side of the wetland is primarily sedge meadow lying upon peat, and is drier than the west side. Shrubs and trees are invading the area, along with reed canary grass. Breeding and feeding habitat areas are used by woodcock and snipe.

Threatening the lower Mud Lake wetlands is development on hillsides adjacent to the marsh. Disturbance of natural physical and plant features, increased runoff and erosion, and greater human activity would decrease waterfowl use in the area for migration, nesting, and feeding habitat. Further pond digging, dredging, and ditching will also effect waterfowl use, along with decreasing the flood control and water quality protection function of the marsh.

Door Creek Marsh (Study Area G)

Door Creek Marsh, a shallow marsh with stands of cattail, also sits on a major peat deposit of the Yahara River Valley. The north end of the peat deposit is drier than the southern area, with sedge meadow and shrubs. Even further north, Door Creek's ditched water course is lined with sedge meadow and disturbance vegetation. The upper reaches of Door Creek have been ditched and farmed extensively. Because Door Creek is channelized, the wetland can no longer act as a filter. Therefore, nutrient and sediment input into Lake Kegonsa is very high from this source.

The primary threat to Door Creek Marsh is continued drainage for agricultural purposes. If muck farming were to occur, the wildlife value of the marsh would be destroyed. Rehabilitation of the wetland (partially closing ditches allowing water to slow and spread throughout the marsh) would increase the value of the area for wildlife habitat, and improve the quality of water in the wetland and the water flowing into the Yahara River and Lake Kegonsa.

Hook Lake (Study Area D)

Hook Lake, located in the moraine region of the town, is a bog and shallow marsh of several hundred acres in size. A bog is a community containing characteristic sedges, forbs, shrubs, trees, and sphagnum mosses which grow in acidic organic soil. Hook Lake, which contains emergent floating and submerged aquatic plants existing in shallow waters, is one of the most unusual wetlands in Dane County. The soft water condition of this remarkably undisturbed wetland is rare in southern Wisconsin. Water sources for the lake are nutrient-poor rainfall and limited surface runoff.

Only a small area of open water exists in Hook Lake. A well developed tamarack stand is in the southwest corner and an extensive leather leaf bog exists between the tamarack and open water.

Hook Lake appears to be located in the ground water recharge area for the Waubesa Wetlands and Lower Mud Lake. The elevation of the lake is 20 to 40 feet above the bedrock surface and 20 feet above the water table. This indicates that there is no significant flow of groundwater to the lake, which is a unique condition.

A large variety of cover and habitat is available in the bog and shallow marsh due to the diversity of its vegetation, which includes sedge mats, weed beds, cattails, shrubs, deciduous, and coniferous woods.

Common nesting birds include the snipe, woodcock, sora, green heron, wood duck, and mallard. The red-tailed hawk and great blue heron use the area for feeding. Muskrat and mink inhabit the area and are trapped there.

Housing development, the major threat to Hook Lake, could result in disruption of internal water flows and wildlife habitat, the loss of its aesthetic qualities, and a decrease in water quality. Since the vegetation, wildlife (especially the sandhill crane), and physical attributes of the bog are so rare, dredging, blasting, digging, or peat removal should not be allowed.

Grass Lake (Study Area C)

Grass Lake, also located in the moraine region, is one of the few deep water marshes found in Dane County. It contains characteristic emergent, floating, and submerged aquatic plants. The water in a deep water marsh is usually permanent except during extreme drought. Grass Lake, with its irregular edge between open water and cattails, provides good nesting sites for marsh birds. The marsh, with open water in the central area, is heavily used by surface-feeding and diving ducks during migration periods. Birds which use the area for nesting include wood ducks, pie-billed grebes, green herons, black terns, and, occasionally the gallinule. The marsh is also maintained as a licensed fur farm.

The Madison Metropolitan Sewerage District maintains a large ditch along the marsh that carries the district's sewage effluent to Badfish Creek. This ditch cuts across the northwest corner of the marsh and runs along its western boundary. Development and possible water contamination from the effluent ditch are the primary threats to Grass Lake. If development occurs in the area, strict erosion control measures must be enforced and a buffer zone should be maintained between the marsh and development area.

Several smaller kettle-hole marshes are common in the southern third of the town, which provide additional feeding and nesting areas for waterfowl.