



## **Chapter 3**

### **NATURAL RESOURCE BASE FEATURES**

#### **INTRODUCTION**

From a development planning standpoint, the character of the City of Franklin is tied to the natural resource base which contributes significantly to its character. The City's small lakes, ponds, streams, wetlands, drainageways, woodlands, steep slopes, and the resulting open spaces created by these features have all contributed to the character of the City. The policies embodied in this Plan recognize that maintaining and enhancing the character of the community is dependent on preserving the natural as well as cultural resources of the City.

The health, safety, and welfare of the community are also dependent upon the preservation of both its cultural and natural resources. Science does not yet have a full understanding of the complex interactions between living organisms and the environment. We lack the ability to accurately predict the consequences of our actions as the impacts move through food chains, alter natural cycles, and interact with various components of ecosystems. It has been proven beyond a doubt that we can poison our environment. Our ability to engineer our habitat with an accurate understanding of the probable resulting adverse side effects has not yet been proven. Therefore, sound planning practice dictates that the various natural resources of the City of Franklin should be held in high regard.

The cultural and natural resource base related issues in the City of Franklin are similar to those which exist throughout the nation. However, special emphasis must be given to the preservation of the City of Franklin's cultural and natural resources, because these resources play such an important role in actually defining the City of Franklin as both a suburban and rural community.

In order to form a rational approach to addressing these issues, natural resource base management should be based on the results of substantive environmental analysis and should distinguish between different resource categories and components of the resource base (i.e., floodplains and woodlands). Most crucial of all is an understanding of the systemic and cyclical aspects of the environment. Since each resource element or environmental unit is a component of one or more systems, protection of its function with that system is more important than protecting it for its own sake.

Yet, we continually recontour and reshape the environment to make it more "habitable"--actually, to make it less expensive to build or to fit more buildings onto a piece of land. There is a price to be paid for such action, however, and it is likely to take the form of engineering projects, such as flood control reservoirs, to correct the environmental damage done by the initial development. Various essential components of life move through a cycle whose operation must be understood in order to determine the necessary level of protection to be accorded each resource element. A more carefully considered and cautious approach to urban, suburban, and rural planning and site design evaluates the resource elements inherent in the area being planned, in order to properly determine their function and role in the environment, and respects the preservation objectives associated with each resource element.

The public role to be played in environmental and cultural resource base protection logically follows from the essentially public character of these resources. This public character, coupled with the fact that the private market often does not adequately consider or allocate the costs of protecting these resources, compels the government--in this case, the City of Franklin--to use its police powers to protect the environment insofar as public health, safety, and welfare are concerned.

This chapter defines the significant natural resource base features of the City of Franklin and their functions. This chapter forms the factual basis, in part, from which the City's natural resource protection objectives, principles, and standards set forth in Chapter 6 of this Plan are based. Relevant natural resource base protection standards will also be presented for inclusion into Chapter 6 of this Plan for use by the City of Franklin in the protection of its natural resources. If the natural resource base protection standards advanced in this Plan are to be realized, the City's zoning and land division ordinances will have to be modified and amended to be used as the primary Plan implementation tools.

An appropriate and legally defensible basis is required for zoning in order to incorporate resource protection standards, and it is essential that the standards be soundly grounded in scientific fact. It is also essential that resource protection standards recognize that development is not necessarily injurious or detrimental to various resources, but rather, that the form of development, given careful attention, can ensure that resource protection objectives are achieved.

Obviously, natural resources or limitations such as floodplains or wetlands are constraints on the development of the City as well as specific sites. The presence of these features may dramatically alter the development potential of certain sites within the City and surrounding area. Indeed, these resources have already done so. A natural resource which cannot be developed always has the effect of reducing a community's buildable area. However, numerous other resources also require protection. It must be understood that

emphasis should be placed on working with the environment and avoiding construction in unsuitable areas. Because the presence of natural resources tends to make some sites harder to develop efficiently while still profiting from development, there are intense economic pressures working against environmental protection.

Such standards will enable the City when reviewing development proposals, to make environmentally sensitive decisions that are both consistent and rational.

The natural resources that will be emphasized in this chapter include: soils resources; upland resources including steep slopes, woodlands and forests; and water resources including lakes and ponds, stream corridors, floodplains, drainageways, wetlands, and shoreland wetlands.

In addition to the protection of the individual natural resource base characteristics, the concept of environmental corridors and isolated natural areas, as advanced by the Southeastern Wisconsin Regional Planning Commission (SEWRPC), formed another element of the natural resource base framework for the preparation of this Plan. The concept of environmental corridors and isolated natural areas will be detailed later in this chapter.

### **THE CONCEPT OF NATURAL RESOURCE BASE PROTECTION STANDARDS**

The "natural resource protection standard", sometimes referred to as the "open space ratio," concept will be used to develop the standards presented in this Chapter, and Chapter 6, of this Plan for the protection of the following resources: water bodies including lakes, ponds, and streams; floodlands including 100-year recurrence interval floodplains and floodways; wetlands (including State of Wisconsin defined shoreland wetlands); both mature and young forest or woodland areas; and steep slopes (ranging from 10 to over 30 percent). The "natural resource protection standard," or "open space ratio" as used in this Plan, measures the proportion of the natural features of a site (excluding land occupied by public street rights-of-ways), which will remain undeveloped and protected and is specifically designated for natural resource protection. Natural resource features preserved through this method are intended to benefit the City as a whole by protecting the natural resource base features, providing (in some instances) passive privately-owned recreational and open space areas, and setting forth or maintaining the intrinsic natural character of an area.

The "natural resource protection" or "open space ratio" standards are intended to allow for the reasonable development of property while still preserving, in an equitable fashion, those natural resource features which are important to the City. In this respect, the

“natural resource protection standard” can be defined by the following simple equation as it relates to a single natural resource feature:

$$\begin{aligned} & \text{(Natural Resource Protection Standard)} \quad X \\ & \text{(Acres of Land In Resource)} = \text{Amount of Resource to be Protected} \end{aligned}$$

An example of how this equation would work, for instance, for the protection of mature woodlands on a site 20 acres in size with 12 acres of such mature woodland areas is shown below. Under this scenario, it is assumed that the mature woodlands would be protected under a natural resource protection standard of 0.70.

Where,

$$\begin{aligned} \text{Natural Resource Protection Standard} & = 0.70 \\ \text{Acres of Land in Resource} & = 12.0 \end{aligned}$$

Then,

$$0.70 \quad X \quad 12.0 = 8.4 \text{ acres of mature woodlands to be protected}$$

In situations where more than one natural resource element are present on the same area of land, only the most restrictive natural resource protection standard is used for the purposes of protecting the affected resource features.

These standards for the City of Franklin will serve as the policy basis for creating the necessary Plan implementing ordinances. Various methods for achieving these levels of protection have been presented and discussed in Issues Paper Number 1 titled “Natural Resource Base Features Protection” dated July 25, 1989, and prepared by Lane Kendig, Inc. Also, Chapter 12 of this Plan, titled “Plan Implementation Recommendations,” presents implementation recommendations pertaining to this matter. Implementation discussions will address the use of such concepts such as mitigation, land division, deed restrictions and protective covenants, and zoning to achieve these desired levels in an equitable fashion.

## **SOIL RESOURCES**

Soil properties exert a strong influence on the manner in which man uses land. Soils are an irreplaceable resource, and mounting pressures upon land are constantly making this

resource more and more valuable. The publication titled Soils of Southeastern Wisconsin (Waukesha, WI: SEWRPC, June 1966) and its subordinate 1" = 1000' soils inventory maps, indicate the soil types found in the City of Franklin. In addition, the U.S. Department of Agriculture's Soil Survey of Milwaukee and Waukesha Counties, Wisconsin (Washington, D.C.: U.S. Government Printing Office, July 1971) also identifies and maps the soil types located in the City of Franklin. These two areawide surveys identify locational, physical, and chemical properties of the City of Franklin's soils and interpret these properties with respect to land use and facilities planning as well as vegetation and agricultural purposes.

Within the City of Franklin, four different soils associations are identified by the U.S. Soil Conservation Service report. These are the Ozaukee-Morley-Mequon, the Pella, the Fox-Casco, and the Montgomery-Martinton-Hebron-Saylesville associations. These are generally described here.

The Ozaukee-Morley-Mequon association is found as the dominant series found in the City and is located on both the east and west sides of the Root River. This series, in general, exhibits well-drained to somewhat poorly drained soils that have a subsoil of silty clay loam and silty clay. These soils are formed in thin loess and silty clay loam glacial till or moraines.

The Pella association is found predominantly in the northeast quarter of U.S. Public Land Survey Section 6 of the City. This association is a moderately shallow variant-Knowles association and is characterized by poorly drained and well-drained soils that have a subsoil of silty clay loam or clay loam, moderately shallow over dolomite bedrock.

The Fox-Casco association soils are found predominantly along that portion of the Root River located generally north of Ryan Road (STH 100). The association is characterized by well-drained soils that have a subsoil of clay loam. They are moderately deep to shallow over sand and gravel located on outwash plains and stream terraces.

The Montgomery-Martinton-Hebron-Saylesville association soils are found predominantly along that portion of the Root River located immediately adjacent to Ryan Road (STH 100) on the north and extending south of this location, along the Root River, to the southern limits of the City. This association is characterized as poorly drained to well-drained soils that have a subsoil of clay to clay loam. The association is formed in silty clay or silty clay loam sediments, in old lakebeds.

Soils types in the City were rated and mapped based upon the surveys mentioned above, as well as the suitability ratings for residential development with public sewer for these soils specified in Table 8 of the Soil Survey of Milwaukee and Waukesha Counties, Wisconsin published by the U.S. Soil Conservation Service in July 1971. This rating and

mapping was accomplished by SEWRPC in 1989, in conjunction with the City's comprehensive master plan preparation, for all of Township 5 North, Range 21 East which includes the City.

Table 3.1 indicates those soils types and the amount of land they occupy which exhibit severe characteristics for residential development served by public sanitary sewer in all of Township 5 North, Range 21 East. Table 3.1 indicates that of the 23,122.83 acres of land in Township 5 North, Range 21 East, about 3,566 acres, or 15 percent of the U.S. Public Land Survey Township, has soils which exhibit severe characteristics for the provision of public sanitary sewers. In order for sewered development to take place in some of these areas, further soils investigations should be done by the prospective developers of these areas. Indeed, many of these areas may even preclude development at all based upon the results of further soils investigations. Wherever such development does take place in areas of severe soils, however, sound engineering practice should be followed to alleviate any adverse impacts.

Map 3.1 illustrates the extent and location of those soils in the City of Franklin, on a City-wide basis, which exhibit severe characteristics for residential development served by public sanitary sewer facilities. As can be noted from the Map 3.1, a significant amount of such severe soils is located along the Root River Parkway corridor with additional scattered locations throughout the City but especially west of the Root River Parkway corridor. Twenty-two of the seventy-eight types of soils found in Township 5 North, Range 21 East exhibit such severe characteristics.

The suitability of soils for the provision of public sanitary sewer types is important in order to identify the facility or utility planning and expansion implications.

Table 3.1

**SOIL TYPES EXHIBITING SEVERE LIMITATIONS FOR RESIDENTIAL DEVELOPMENT SERVED BY PUBLIC SANITARY SEWERS IN T5N, R21E**

<u>Soil Code</u>	<u>Soil Name</u>	<u>Area (acres)</u>	<u>Percent of T5N,R21E</u>
Ac	Adrian muck	4.54	0.02
Am	Alluvial land	20.41	0.09
AsA	Ashkum silty clay loam, 0 to 3 percent slopes	1648.88	7.13
CrD	Casco-Rodman complex, 12 to 20 percent slopes	2.53	0.01
CrE	Casco-Rodman complex, 20 to 30 percent slopes	11.01	0.05
Cw	Colwood silt loam	4.04	0.02
Dt	Drummer silt loam, gravelly substratum	191.55	0.83
Lo	Lawson silt loam	296.30	1.28
Mzb	Montgomery silty clay loam	212.47	0.92
MzdD2	Morley silt loam, 12 to 20 percent slopes (eroded)	318.65	1.38
Mzg	Muskego muck	20.61	0.09
Mzk	Mussey loam	1.86	0.01
Na	Navan silt loam	34.16	0.15
Oc	Ogden muck	85.40	0.37
OuD2	Ozaukee silt loam, 12 to 20 percent slopes (eroded)	6.71	0.03
Pa	Palms muck	9.90	0.04
PrA	Pistakee silt loam, 1 to 3 percent slopes	16.23	0.07
RIA	Ritchey silt loam, mottled subsoil variant, 1 to 3 percent slopes	4.49	0.02
Sg	Sawmill silt loam, calcareous variant	196.71	0.85
Sm	Sebewa silt loam	17.81	0.08
Wa	Wallkill silt loam	65.29	0.28
Ww	Wet alluvial land	265.23	1.15
Water	Water	<u>131.57</u>	<u>0.57</u>
	<i>Total Severe Soils</i>	3566.35	15.42
	<i>All Other Soil Types</i>	<u>19,556.48</u>	<u>84.58</u>
	<b>Total Soils in T5N,R21E</b>	<b>23,122.83</b>	<b>100.00</b>

Source: U.S. Soil Conservation Service, SEWRPC, and Lane Kendig, Inc.

## UPLAND RESOURCES

### Steep Slopes

Slope, to a considerable extent, determines the land uses practicable on a given parcel of land. Slope is directly related to water runoff and erosion hazards. Therefore, the type and extent of land uses should be carefully adjusted to the slope of the land. In general, slopes of ten percent or more are unsuitable for development and most agricultural uses; they should be maintained as essentially natural, open areas for wildlife habitats and erosion control. Lands with less severe slopes may be suitable for certain open space uses, such as pasturelands, and for certain development, such as carefully designed low-density residential areas. Lands which are gently sloping or nearly level are, typically, best suited to development. However, for detailed site and land planning purposes, all slopes should be determined from on-site topographic surveys prepared and graphically shown with at least a two-foot contour interval. The natural resource protection standards to use as a policy guideline for determining the necessary protection levels for various degrees of steep slopes are as shown in Table 3.2.

Table 3.2

### NATURAL RESOURCE PROTECTION STANDARDS FOR PROTECTING STEEP SLOPES IN THE CITY OF FRANKLIN

<u>Percent Slope</u>	<u>Development or Zoning District Type</u>		
	<u>Agricultural</u>	<u>Residential</u>	<u>Nonresidential</u>
10-19%	.00	.60	.40
20-30%	.65	.75	.70
+30%	.90	.85	.80

*Source: Lane Kendig, Inc.*

### Woodlands and Forests

Woodlands and forests have important roles in many of the biological cycles, such as the energy, oxygen, nitrogen, and carbon cycles. They provide essential wildlife habitats for numerous varieties of plants and animals. Woodlands also serve as important moderators by buffering the potential impacts of damaging phenomena such as soil erosion, pollution, and severe weather. They are especially important in areas where they aid in

slowing water flows, providing a soil that minimizes runoff, breaking wind velocities, absorbing pollutants, and moderating solar radiation.

With all these important functions, woodlands must be preserved or established wherever possible. Land to be developed that was previously farm field should be landscaped with trees in order to provide the subdivision with its own source of woodland protection and benefits. Developable land with existing woodlands should be strictly regulated so that there is as little disturbance to the woodland as possible.

A detailed tree species inventory of all the remaining woodland and forest areas in the City of Franklin has not been undertaken. However, both Milwaukee and Waukesha Counties were once typified by 84 percent of the land area in forest. The main species of trees in these early forest areas were sugar maple, basswood, beech, red oak, elm, and ash. The clearing of the land of the forested areas in both Counties began about 1850 and reached its peak in the early 1900s. In recent years, oak has been the principal species found in the remaining forested areas of both Counties, accounting for about two-thirds of the total tree volume in the woodland areas. Other woodland species which are typical in both Counties are elm, hickory, red maple, sugar maple, basswood, and cherry.

The City of Franklin has only a limited amount of forest and woodland cover remaining. In fact, in 1985, the City only had about 1,384 acres of woodland area, or about six percent of the total 22,181 acre area of the City. The existing land use Map 4.1 in Chapter 4 of this Plan indicates the extent and location of these remaining woodland areas. It can be noted from Map 4.1 that these existing woodland and forest areas are located primarily in scattered locations throughout the City. It can also be noted that since these woodlands are in limited amounts and scattered, that their preservation becomes critical.

These wooded areas serve as sanctuary for many different types of animals and organisms. Aesthetically, the wooded areas provide beautiful areas which define the City of Franklin as a suburban community with many rural attributes. This resource, as limited as it now is, has played an important role in defining the character of the City of Franklin, and special preparations should be made to see that it is used and protected wisely.

Where residential areas are allowed to occur in woodland areas, they should occur using residential lot clustering so as not to disrupt the environment any more than necessary. Natural resource protection standards should be placed on Franklin's woodlands and forests in order to assure that these resources are afforded the level of protection from destruction of which they are worthy.

Woodlands and forests can be either mature woodlands or young woodlands. For the purposes of this Plan, a mature woodland is defined as an area or stand of trees whose total combined canopy covers an area of one acre or more and at least fifty (50) percent of

which is composed of canopies of trees having a diameter at breast height (DBH) of at least ten (10) inches; or any grove consisting of eight (8) or more individual trees having a DBH of at least fifty (50) percent of the area encompassed by the grove. However, no trees grown for commercial purposes should be considered a mature woodland.

A young woodland is defined as an area or stand of trees whose total combined canopy covers an area of one-half (0.50) acre or more and at least fifty (50) percent of which is composed of canopies of trees having a diameter at breast height (DBH) of at least three (3) inches. However, no trees kept or grown for commercial purposes shall be considered a young woodland.

Disturbance of mature woodlands should be kept to a minimum due to their sensitivity and their importance in maintaining the character of the City of Franklin. Generally, no more than 30 percent of a mature woodland should be allowed to be disturbed. Young woodlands are also valuable, but they are more tolerant of disturbance since they have not yet reached a climax succession. Thus, disturbance of 50 percent of young woodlands may be permitted. In practice, however, all developers should be encouraged to preserve as much woodland as possible on their property, regardless of the permitted disturbance ratio.

Natural resource protection standards to use as a policy guideline for preserving both mature and young woodlands are indicated in Table 3.3.

**Table 3.3**

**NATURAL RESOURCE PROTECTION STANDARDS FOR  
PROTECTING WOODLANDS AND FORESTS  
IN THE CITY OF FRANKLIN**

<u>Woodland/ Forest Type</u>	<u>Development or Zoning District Type</u>		
	<u>Agricultural</u>	<u>Residential</u>	<u>Nonresidential</u>
Mature	.70	.70	.40
Young	.50	.50	.30

*Source: Lane Kendig, Inc.*

The City recognizes that the use of the aforementioned natural resource protection standards for the preservation of mature woodland and forest areas in residential areas may not always lead to good design and, under some circumstances, may be difficult to achieve. Therefore, the zoning ordinance amendments which will be necessary in order to implement these standards shall address both mitigation and lot size flexibility alternatives within specified residential zoning districts.

Among those alternatives shall be the inclusion of provisions for either on-site or off-site replacement of those mature woodland and forest areas which may be destroyed due to residential development activities. Such mitigation measures shall be made available to all landowners so affected by the residential mature woodland and forest resource protection standard. In no case, however, shall such mitigation be allowed to exceed twenty-eight (28) percent of the total mature woodland area to be preserved under the 0.70 resource protection standard in residential areas.

In addition, alternative strategies shall be set forth in the implementing zoning ordinance amendments which will allow for lot size flexibility within residential zoning districts while not exceeding the overall permitted gross site density of the applicable residential zoning districts. Such lot size strategies shall promote the preservation of natural resource characteristics including open space and woodland and forest areas. More detailed discussion of these lot size flexibility strategies is set forth in Chapter 12 of this Plan.

## **WATER RESOURCES**

In the City of Franklin, protecting the City's water resources can be approached from at least two perspectives. The first requires the protection and management of wetlands. While typical wetland areas only represent a portion of wet soils as identified in the Milwaukee County soils surveys, there are wetland environments whose boundaries are better identified by vegetation than by soil types alone.

Secondly, a cohesive surface drainage system needs to be maintained. This is typically accomplished through the floodland protection regulations so necessary for the protection of the health, safety, and welfare of City residents.

For the purposes of this Plan, water resources include lakes and ponds, stream corridors, floodplains, drainageways, wetlands, and shoreland wetlands. In 1985, surface waters in the City (excluding wetland areas) accounted for only about 220 acres of land, or about one percent of the total area of the City. Each of these is presented in detail in the following sections, and the relative natural resource protection standards are set forth.

## **Lakes and Ponds**

Lakes and ponds are natural or artificial water bodies that retain water year-round. For the most part, the characteristics and natural processes identified apply to both natural and artificial water bodies. Lakes are defined as any body of water two acres or larger in size; ponds are all bodies smaller than two acres. The size of the lake or pond is measured by the shoreline at its maximum condition rather than the permanent pool condition, if there is any difference.

In City of Franklin, there are several named lakes which must be protected, including Bishop Lake (now known as Koepmier Lake located in U.S. Public Land Survey Section 3), Dumkes Lake (in Section 19), Monastery Lake (in Section 8), Mud Lake (located in Grobschmidt Park in Section 1), the Root River Parkway Pond (in Section 3), and the Whitnall Park Lake (in Section 5).

Lakes and ponds serve a very important function as retention areas for controlling runoff during seasonal flooding and during periods of high rainfall. These water bodies also play important roles in the oxygen, nitrogen, and water cycles.

Lakes and ponds are most sensitive to filling, either directly through deliberate dumping or indirectly by siltation. Upstream development may create problems to which lakes and ponds are sensitive; sedimentation is a most critical problem. In areas of the City where topography has been disturbed, the revegetation and stabilization of these slopes should be accomplished in a timely fashion in order to prevent soil erosion resulting in lake or stream sedimentation. Further, lakes are susceptible to high nutrient loads. Regulation is needed to prevent land uses from increasing the flow of both sediments and nutrients into lakes and ponds.

The natural resource protection standard for all lakes and ponds in the City of Franklin is 1.00.

## **Stream Corridors**

The City of Franklin lies within three separate watersheds--the Oak Creek, Root River, and Fox River Watersheds. In fact, the dividing line between the Fox River Watershed and the Root River Watershed is actually the subcontinental divide and is located in Franklin's U.S. Public Land Survey Sections 30 and 31. The subcontinental divide traverses both of these Sections of Franklin. That part of the City lying east of this divide is tributary to the Great Lakes-St. Lawrence River drainage system, while that part of the City lying west of this divide is tributary to the Mississippi River drainage system.

The two major perennial streams in the City are Oak Creek and the Root River. Perennial or intermittent streams are important sources of water for wildlife. Perennial streams are defined as watercourses which maintain, at a minimum, a small continuous flow throughout the year except under unusual drought conditions. Intermittent streams are defined as those watercourses that do not maintain a continuous flow throughout the year. These stream corridors generally would include floodways, floodplains, shorelands, wetlands, and all but the smallest drainageways. These features are overlapping and form a continuous system of drainage. The corridors not only accommodate drainage flow but also provide shelter to wildlife.

When viewed as corridors, there is need to buffer the floodways, floodplains, and shoreland wetlands from residential environments. Natural landscaping should be encouraged in these areas to the maximum degree possible. Lawns are fertilized and are less effective than natural landscapes in filtering out nutrients and pollutants before they reach streams. There is a variety of planting techniques--native groundcovers or woodlands--that can be used in these areas. This will not only protect and maintain wildlife, but also encourage the maintenance of water quality. Encroachment on these valuable stream corridors should be prohibited.

The natural resource protection standard for streams in the City of Franklin is 1.00. For the purpose of this Plan, appropriate standards have also been developed to use as a policy guideline for determining the level of natural resource protection necessary for preserving floodways, floodplains, and shoreland wetlands. The standards for these features are presented in the following sections of this chapter.

### **Floodplains**

The floodplains of a river or stream are the wide, gently sloping areas contiguous to, and usually lying on both sides of, the river or stream channel. Rivers and streams occupy their channels most of the time. However, during even minor flood events, stream discharges increase markedly, and the channel may not be able to contain and convey all of the flow. As a result, stages increase and the river or stream spreads laterally over the floodplain. The periodic flow of a river onto its floodplains is a normal phenomenon and, in the absence of costly structural flood control works, will occur regardless of whether or not urban development exists on the floodplain.

For planning and regulatory purposes, floodplains are normally defined as the areas, excluding the channel, subject to inundation by the 100-year recurrence interval flood event. This is the event that would be reached or exceeded in severity once on the average of every 100 years. Stated another way, there is a one percent chance of this event being

reached or exceeded in severity in any given year. Floodplain areas are generally not well suited to development, not only because of the flood hazard, but also because of the presence of high water tables and of soils poorly suited to such use. However, the floodplain areas generally contain important elements of the natural resource base, such as woodlands, wetlands, and wildlife habitat. Therefore, floodplains constitute prime locations for needed open space areas. Every effort should be made to discourage indiscriminate and incompatible development on floodplains, while encouraging compatible open space use.

In January 1982, the Federal Emergency Management Agency (FEMA) and the Federal Insurance Administration (FIA) published the Flood Insurance Study, City of Franklin, Wisconsin. The purpose of this study was to investigate "the existence and severity of flood hazards in the City of Franklin...." The results of that particular study formed the basis of the City's floodplain zoning districts. These floodplain districts, as they existed in 1990, are illustrated in the various maps in Chapter 5 of this Plan.

In the City of Franklin, the 100-year recurrence interval floodplain areas, which have been formally studied in detail and mapped, are associated with the following streams: the Root River, the East Branch of the Root River, portions of Tess Corners Creek, Oak Creek, portions of Ryan Creek, and other unnamed streams.

The study further stated that:

*"The areas studied by detailed methods were selected with priority given to all known flood hazard areas, and areas of projected development or proposed construction through 1982. Approximate methods of analysis were used to study those areas having a low development potential or minimal flood hazards."*

Since that time, however, development proposals have been made for portions of the areas of the City where floodplains were determined only by approximate methods. Excluded from detailed study in the 1982 study are floodplain areas along the unnamed tributary to the Root River which lies generally between W. Forest Hill Avenue to S. 68th Street; the Tess Corners Creek area located in Whitnall Park; areas surrounding Monastery Lake north of W. Woelfel Road; Ryan Creek located south of Ryan Road (STH 100); an unnamed tributary to the Root River lying south of W. Oakwood Road west of the Root River; and an unnamed tributary near W. Oakwood Road and east of the Root River. However, since 1982, the unnamed tributary to the Root River, which lies generally between W. Forest Hill Avenue to S. 68th Street, has become a rapidly developing area and will be set aside for suburban development during the planning period as indicated later in Chapter 8 of this Plan. If development is to continue in this area during the planning period, it will be crucial for the City to have a more detailed floodplain study

conducted of this area in order to better plan for the implications of the existing floodplain. The balance of the floodplain areas of the City, determined by the use of approximate methods, is to remain in predominantly rural or low intensity suburban uses through the planning period.

An appropriate standard to use as a policy guideline for determining the natural resource protection standard necessary for preserving 100-year floodplains is 1.00. This would allow for the effective preservation of all floodplain areas and can be used in conjunction with the floodplain zoning districts already used in the City with minor revisions.

### **Drainageways**

Drainageways are minor watercourses. They allow for water flow typically during and immediately after either a rain storm or periods of snow melt; otherwise, they are dry most of the year. Drainageways are usually located at the headwaters of a drainage area, but they may be adjacent to and flow directly into a main intermittent or perennial stream channel.

The City of Franklin's drainageways, stream corridors, and channels serve a number of important functions which form the basis for their inclusion as a resource to be protected through City policies. The obvious function of these drainageways is to permit the flow of water into wetlands and lakes where it can be held with little damage.

Drainageways, as defined in this context, are delineated either by soil type or by the presence of an intermittent or perennial stream. Within the context of this Plan, areas of the City which can be classified as drainageways include (in those areas for which detailed large scale topographic maps exist) the land (except for areas designated as floodways or floodplain) on either side of and within 50 feet of the centerline of any intermittent or perennial stream shown on these maps; or, in areas of the City for which such maps have not been prepared, the land (except for areas designated as floodways or floodplain) on either side of and within 50 feet of the centerline of any intermittent or perennial stream shown on the U.S. Geological Survey topographic maps.

In some areas of the City, the City Engineer may determine that certain intermittent streams may not be needed for stormwater management purposes. Under these circumstances, landowners may be allowed to disturb these areas to a degree, in favor of preserving other natural resources on the property, if such disturbance is not detrimental to the City. The type of development, however, will affect the degree to which disturbances of these areas are permitted. Small areas of the drainageway soils can be part of the usable lot area and even filled for building purposes, as long as development

can ensure there is a system for conveying and storing water, and specific design criteria furnished by the City Engineer are followed.

The objective of this increased flexibility to landowners is to demonstrate that the drainageway function is sometimes more important than the classification of the soil. In special cases, restrictions on drainageway soils may be dropped in favor of restricting development of other more important features, such as mature forests, provided the drainage system can be maintained.

Using these minor drainageways creatively as part of a development's landscaping and the siting of buildings and improvements is also possible. In these cases, a developer or builder needs to take care in the project's design and engineering to ensure that the drainageway system is workable and that water will move through the system without damaging the yard or buildings.

As stated, however, specific drainage design criteria or standards must be met by the landowner to the satisfaction of the City Engineer in order to receive City permission to disturb the drainageway system. The following elements need to be addressed in the establishment of such criteria:

1. New wetlands and properly designed retention or detention facilities should be created to increase water storage capacity on the site whenever possible.
2. The slope of the stream or swale should be decreased. The drainageway feature should be meandered to slow the rate of water flow, thus decreasing potential soil erosion hazards. This will require more creative engineering of development plans.
3. The rate of water discharge from the site should be reduced to provide settlement time and reduce flood peaks down stream.
4. Positive drainage should be assured so that if farm tiles are broken or fail, or other disruptions occur, there is a viable release outlet or channel for water conveyance.
5. If the stream has previously been channelized, all fill material should be removed and the channel meandered or flattened to a wetland.
6. Stream channels should be designed with pools and riffles to decrease the rate of runoff, increase aeration, and increase recharge.

An appropriate standard to use as a policy guideline for determining the level of natural resource protection necessary for preserving drainageways is 0.30.

## **Wetlands and Shoreland Wetlands**

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and with a duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, sedge meadows, and similar areas. Precipitation, in the form of rain or snow, provides water to wetlands, becoming surface water runoff or percolating through the soil to become groundwater seepage. Wetlands may receive mostly surface water--direct precipitation, overland flow, and floodwaters--or mostly groundwater precipitation that infiltrates and moves through the ground. The location of the wetland in the landscape affects the type of water received. Wetlands can occur on slopes as well as in depressions. In 1985, wetland areas in the City accounted for about 1,588 acres of land, or about 7.2 percent of the City's total area. Wetland areas in the City are illustrated in the various maps indicating existing land use in Chapter 8 of this Plan. Also, shoreland wetlands zoned in the City's SW Shoreland Wetland Overlay District in 1990 are illustrated in the various maps in Chapter 5 of this Plan.

Wetlands have an important set of natural functions which make them a particularly valuable resource. These functions may be summarized as follows:

1. Wetlands enhance water quality. Aquatic plants change inorganic nutrients such as phosphorus and nitrogen into organic material, storing it in their leaves or in the peat which is composed of their remains. The stems, leaves, and roots of these plants also slow the flow of water through a wetland, allowing suspended solids and related water pollutants to settle out. Thus, the destruction of wetlands may be expected to adversely affect the quality of surface waters in the area.
2. Wetlands regulate surface water runoff, storing water during periods of flood flows to release such waters during periods of dryer weather. Thus, wetlands help to stabilize stream flows.
3. Wetlands provide essential breeding, nesting, resting, and feeding grounds and predator escape cover for many forms of wildlife. Thus, they contribute to the overall ecological health and quality of the environment of the area, as well as providing recreational, research, and educational opportunities and adding to the aesthetic quality of the community.
4. Wetlands may serve as groundwater recharge and discharge areas, although other areas may be more effective in the City of Franklin.

Wetlands must be protected because of their role as water-flow managers and wildlife habitats. The U.S. Army Corps of Engineers and the Wisconsin Department of Natural Resources identifies wetlands by vegetation type--this is more effective than identification by soils and is required by Federal law.

All wetlands need a certain amount of maintenance when their natural maintenance mechanisms have been removed by the encroachment of development. In certain instances, periodic burning is recommended. Natural diversity also needs to be restored; thus, the community is encouraged to introduce additional native species into wetlands. There must be a willingness to be flexible in design so that developers are encouraged to preserve open spaces around wetlands in order to minimize encroachment by development. Wetlands should be protected, and there should be minimal development permitted for a distance of approximately 50 feet from the edge of the wetland.

Quality of design, careful planning, and environmental concern and awareness will be the keys to solving problems created by development pressures. The recent public recognition of the importance of wetland areas to the preservation of clean waters, as well as the Federal mandate as implemented by the U.S. Army Corps of Engineers 404 review and permit process, will make the promiscuous filling of large wetland areas nearly impossible today.

Recently, an inverse condemnation lawsuit involving wetlands in Kenosha County fronting on an Interstate Highway 94 service road in the Town of Somers was the subject of a landmark decision handed down by the Wisconsin Supreme Court in November of 1987 (M&I Bank v. Town of Somers, 141 Wis.2d 271). In effect, this decision made it clear that local governments have a legal right--if not a duty--to prevent a public harm through their enactment of soundly based land use regulations. The wetlands in question had been down-zoned from industrial to conservancy use by Kenosha County and the Town of Somers.

The definition of shorelands, pursuant to the Department of Natural Resource's "Wisconsin Shoreland Management Program," states that shorelands are;

*"lands within the following distances from the ordinary high-water mark of navigable waters: 1000 feet from a lake, pond, or flowage; and 300 feet from a river or stream or to the landward side of the floodplain, whichever distance is greater."*

"Shoreland wetlands" are wetlands (as described above) located within these shoreland areas. State laws mandate that shoreland wetlands be protected.

Due, in part, to both the Federal and State mandates regarding the protection of wetlands, as well as the established ecological reasons and recent Wisconsin Supreme Court decision, an appropriate standard to use as a policy guideline for determining the open space necessary for preserving wetlands--including shoreland wetlands--is a natural resource protection standard of 1.00. This standard, as well as current zoning district regulations, will ensure the sound protection of wetlands in the City of Franklin.

## **ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL AREAS**

Using the individual resource protection standards approach to natural resource protection, as advanced by this Plan, will assist the City in developing the necessary zoning and land division ordinance amendments to implement these policies. In order to provide this Plan with an overall environmentally sensitive structure for land use plan development, the environmental corridor and isolated natural areas concept advanced by SEWRPC is also embraced. Neither approaches is mutually exclusive of the other, and they shall work interdependently.

SEWRPC's delineated environmental corridors and isolated natural areas in the City of Franklin encompass those areas containing concentrations of recreational, aesthetic, ecological, and cultural resources, and those which should generally be preserved and protected in essentially natural open uses. Such areas normally include one or more of the following seven elements of the natural resource base which are essential to the maintenance of both the ecological balance and natural beauty of an area: 1) lakes, rivers, and streams and their associated shorelands and floodlands; 2) wetlands; 3) woodlands; 4) prairie; 5) wildlife habitat areas; 6) wet, poorly drained, and organic soils; and, 7) rugged terrain and high-relief topography. Five additional elements which are also considered include: 1) existing park and open space sites; 2) potential park and open space sites; 3) historic sites; 4) scenic areas and vistas; and, 5) natural and scientific areas. In general, the delineation of these twelve natural resource and related elements for the City of Franklin on a map (Map 3.2) results in an essentially linear pattern of relatively narrow, elongated areas which have been termed "environmental corridors" by SEWRPC. A detailed description of how environmental corridors and their subordinate isolated natural areas are delineated is presented in SEWRPC's Technical Record (Vol. 4, No. 2, pp.1-21). Also, detailed delineations of these corridors, as they relate to each of the Franklin delineated planning subareas are illustrated in Chapter 8 of this Plan.

Environmental corridors are of two types: primary and secondary. Primary environmental corridors include a wide variety of the important natural resource and resource-related elements and are at least 400 acres in size, two miles in length, and 200 feet in width. Secondary environmental corridors generally connect with the primary environmental corridors and are at least 100 acres in size and one mile in length. In addition,

isolated natural areas are at least five acres in size and consist of those smaller concentrations of natural resource base elements that are separated physically from the environmental corridors by either open land or development.

### **REDUCING THE NEGATIVE EFFECTS OF DEVELOPMENT ON THE REMAINING NATURAL RESOURCE BASE FEATURES OF THE CITY**

Some of the past development trends that have occurred in the City of Franklin have severely impacted wetlands, woodlands, steep slopes, and other natural resources features. These decreasing resources are an important land use which gives the City its community character. With increased development pressures, development and the environment are competing with each other for land area. The impacts of urban and suburban development on the City's environment have often resulted in the natural resources giving way in those areas where urban and suburban development has totally encompassed them, as the remaining resources are no longer in an environment suitable for their existence.

City officials must realize that they have an obligation to mitigate further natural resource base losses. Mitigation, such as the mitigation of wetlands and woodland areas, is an alternative approach (although less favorable than the alternative of finding another location for new development) to the total destruction of natural resources in predominately urbanizing and suburbanizing areas of the City.

The burden of removing and then replacing natural resources in a more suitable location should be placed on the developer. Once this has been done, space can be made available for the roads, utilities, services, and other infrastructure needed to allow these relatively new areas to prosper. As these areas grow, good urban design practice and criteria can be implemented (as the objectives, principles, standards, and urban design criteria of Chapter 6 provide) to lessen the potential harmful effects on the precious natural environment. For example, under some circumstances, the stormwater drainage of off-street parking lots can be so designed to allow the pollutants to be soaked up and filtered effectively by the natural areas surrounding the parking lot. This eliminates the need for an expensive storm sewer system which collects the pollutants and transfers them into a lake or stream totally unfiltered. In addition, this type of design encourages open space in the area which serves as a relief area or buffer from visual pollutants like the overwhelming cement and signs which are typically abundant in these areas.

By placing new development and important resources in places suitable to their furthered growth and enhancement, we create a more balanced community in which some semblance of order exists. It is in this way that natural resources and new development can co-exist without threatening each other.