

Natural Resources Inventory and Mapping Study

Franklin Township, Summit County, Ohio

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Introduction

Urban growth is not inherently bad. Growth is a positive sign of a healthy community, unless it occurs at the expense of the natural landscape, community character, and overall livability. Growth that significantly diminishes environmental quality, community character, and ecological systems is short-sighted and is a poor legacy to leave the next generation. However, if we build, pave, and develop the landscape without an awareness of the environment, fewer natural areas will be left to provide public health and safety functions. Such practices in the past have made those remaining areas with high ecological integrity even more critical. These resources are an important part of the quality of life. It is critical that we have a thorough inventory and understanding of these resources. Preserving the ecological health and function of our natural areas depends on more people being informed and knowledgeable about the impacts of developments.

Davey Resource Group conducted an inventory of natural resources within Franklin Township, Summit County to provide the basis for wise land use decisions. This report presents a baseline of data and analysis regarding Franklin Township's existing environmental conditions. This document is intended to inform the planning process and serves as a resource of environmental planning data about the Township. All available secondary source natural resource data were reviewed in order to identify important natural resources and environmental issues. Key issues are presented in a table which were drawn from the following sections:

- Vegetation and land cover
- Watersheds and surface waters
- Floodplains and riparian corridors
- Topography and steep slopes
- Wetlands and hydric soils
- Glacial geology and groundwater resources
- Rare, threatened, and endangered species
- Environmental constraints to development and environmentally sensitive lands

This report is a working document for the Franklin Township Comprehensive Plan. The plan will be a tool that establishes an important framework for making decisions concerning the Township's future. Because of the proposed merger, New Franklin will be included in the study area.

This report is also the first in Summit County to utilize the data being created for the County's Natural Resource Study.

Land and Vegetation Cover

Map 1 shows an overview of land use in Franklin Township showing 2000 orthophotography. It features significant wetland systems and remaining farmland resources.



Franklin Township has the most significant remaining open space in Summit County, but is undergoing significant large lot frontage development.

Map 2 shows land cover data developed from satellite imagery derived from the early to mid-1990s processed using an unsupervised clustering algorithm. Both leaves-off and leaves-on data sets were analyzed. The resulting clusters were then labeled using aerial photography and ground observations.

The data were classified into the general land cover categories of:

- **Forested Upland** - Areas characterized by tree cover (natural or semi-natural woody vegetation, generally greater than six meters tall); tree canopy accounts for 25-100% of the cover.
 - *Deciduous Forest* - Areas dominated by trees where 75% or more of the tree species shed foliage simultaneously in response to seasonal change.
 - *Evergreen Forest* - Areas dominated by trees where 75% or more of the tree species maintain their leaves all year. Canopy is never without green foliage.
 - *Mixed Forest* - Areas dominated by trees where neither deciduous nor evergreen species represent more than 75% of the cover present.

- **Wetlands** - Areas where the soil or substrate is periodically saturated with or covered with water.
 - *Wooded Wetlands* - Areas where forest or shrubland vegetation accounts for 25-100% of the cover and the soil or substrate is periodically saturated with or covered with water.
 - *Emergent Herbaceous Wetlands* - Areas where perennial herbaceous vegetation accounts for 75-100% of the cover and the soil or substrate is periodically saturated with or covered with water.
- **Water** - All areas of open water or permanent ice/snow cover.
- **Planted/Cultivated** - Areas characterized by herbaceous vegetation that has been planted or is intensively managed for the production of food, feed, or fiber, or is maintained in developed settings for specific purposes. Herbaceous vegetation accounts for 75-100% of the cover.
 - *Pasture/Hay* - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.
 - *Urban/Recreational Grasses* - Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.
- **Developed** areas characterized by a high percentage (30% or greater) of constructed materials (e.g. asphalt, concrete, buildings, etc.).
 - *Low Intensity Residential* - Includes areas with a mixture of constructed materials and vegetation. Constructed materials account for 30-80% of the cover. Vegetation may account for 20 to 70% of the cover. These areas most commonly include single-family housing units. Population densities will be lower than in high intensity residential areas.
 - *High Intensity Residential* - Includes highly developed areas where people reside in high numbers. Examples include apartment complexes and row houses. Vegetation accounts for less than 20% of the cover. Constructed materials account for 80 to 100% of the cover.
 - *Commercial/Industrial/Transportation* - Includes infrastructure (e.g. roads, railroads, etc.) and all highly developed areas not classified as High Intensity Residential.

These land cover categories have been grouped in undeveloped lands (natural lands and agricultural lands) and developed lands in Table 1.

Table 1. Land and Vegetation Cover

DESCRIPTION	% OF TOWNSHIP
UNDEVELOPED LANDS	84%
Natural Lands	46%
<i>Woodland Resources</i>	33%
Forest-Deciduous	31%
Forest-Evergreen	1%
Forest-Mixed	1%
<i>Wetlands Resources</i>	13%
Wetlands - Wooded	8%
Wetlands - Emergent Herbaceous	1%
Open Water	4%
Agricultural Lands	38%
Pasture/Hay	28%
Row Crops	10%
DEVELOPED LANDS	16%
Low Density Residential	16%
High Density Residential	<1%
Commercial/Industrial/Transp.	<1%
Urban/Recreational Grasses	<1%

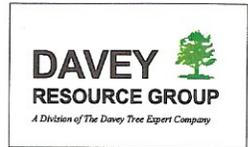
Source: USGS

This land cover information can be used for planning purposes to identify general patterns of developed/undeveloped areas. The dataset provides a snapshot of these conditions across the Township. Within certain limitations, land cover datasets are useful in determining general areas such as canopy cover.

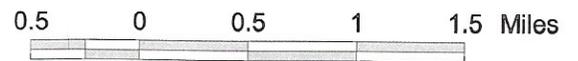
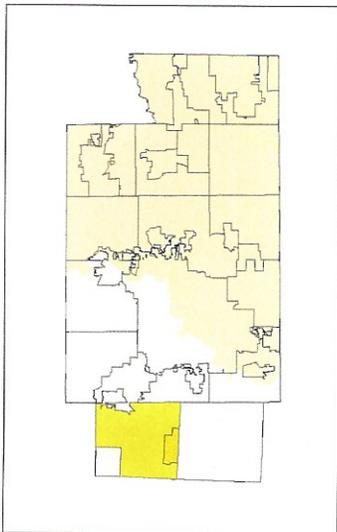
Franklin Township Summit County

Map 1

Overview



Data Source: Summit County, 2000



Map Projection: Ohio State Plane North; NAD 83

Franklin Township Summit County

Land Cover

Map 2

Undeveloped Lands

Developed Lands

Natural Lands
Woodland Resources

- Forest - Deciduous
- Forest - Evergreen
- Forest - Mixed

Natural Lands
Wetlands Resources

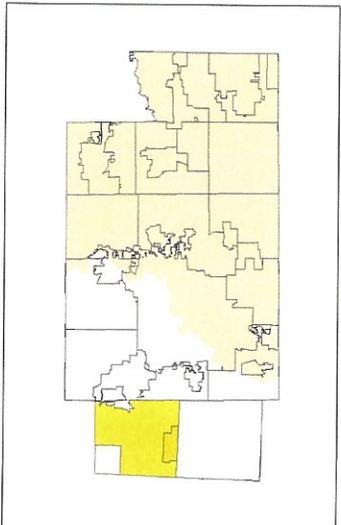
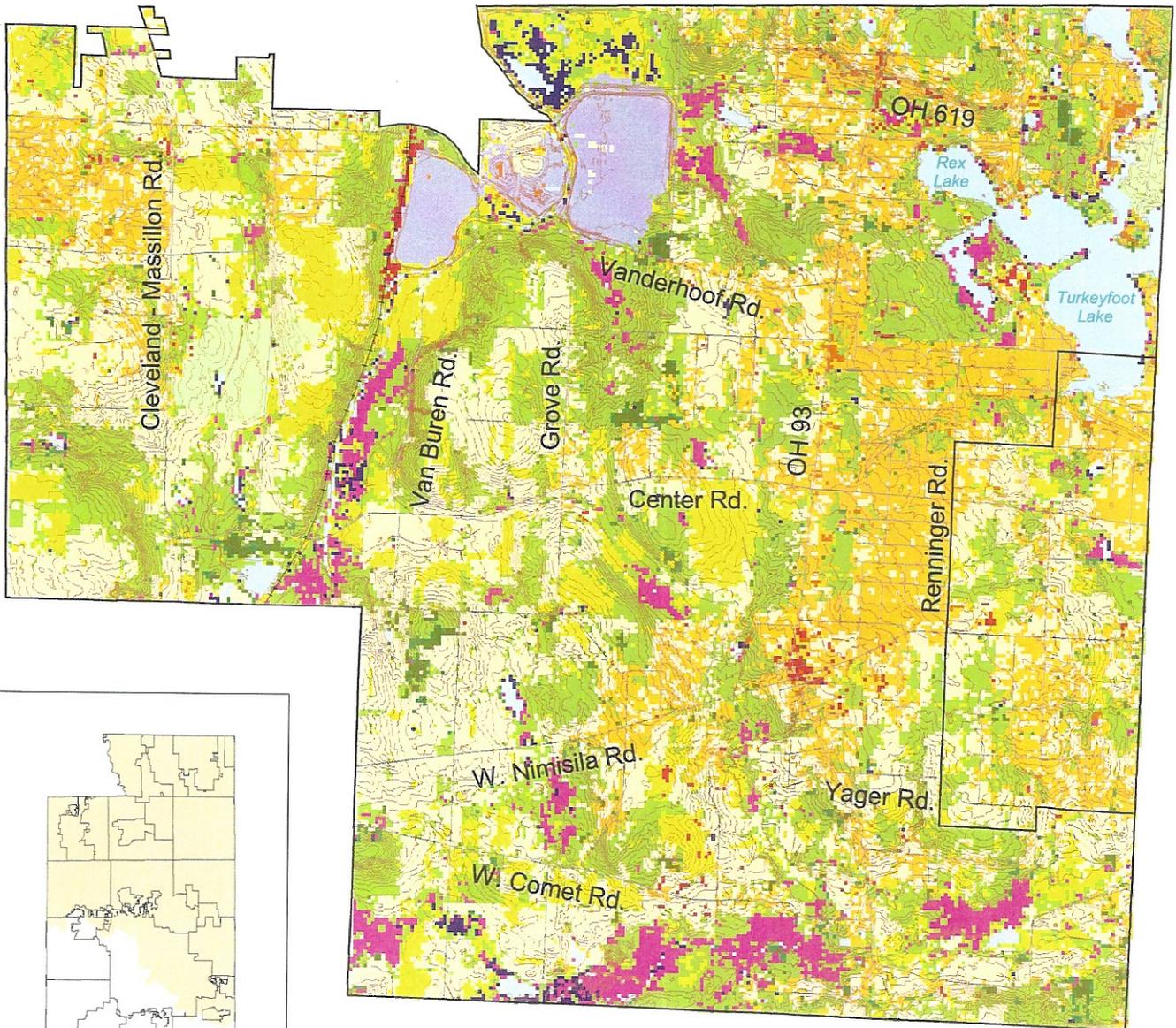
- Wetlands - Wooded
- Wetlands - Emergent Herbaceous
- Open Water

Agricultural Lands

- Pasture / Hay
- Row Crops

- Low Density Residential
- High Density Residential
- Commercial / Industrial / Transp.
- Transitional
- Urban / Recreational Grasses

Data Source: USGS, mid 1990s



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Map Projection: Ohio State Plane North; NAD 83

Map 3 shows current land use in Franklin Township according to state land use codes assigned to parcels in Summit County to be used for appraisal purposes for taxation. According to the classification, 42% is residential; 7% commercial; 3% industrial; 5% public; 1% utility; 30% agricultural; and 7% vacant. If vacant and agricultural parcels are combined as potential development areas, then 37% of Franklin is subject to potential development.

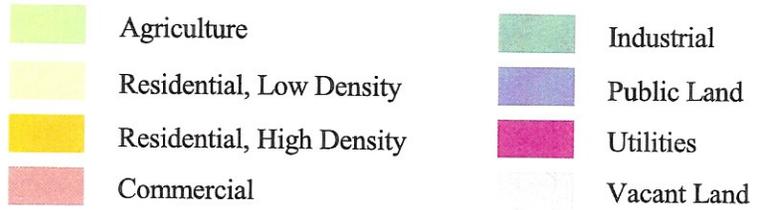


Lot splits and frontage development exemplify the kind of development occurring in Franklin Township.

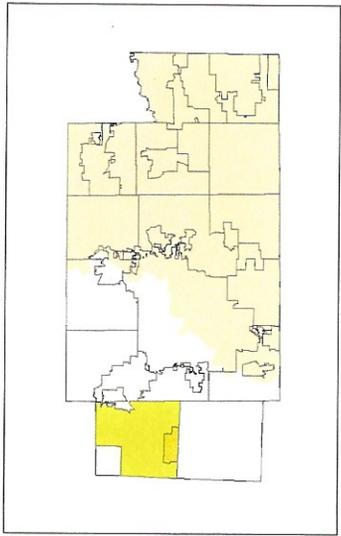
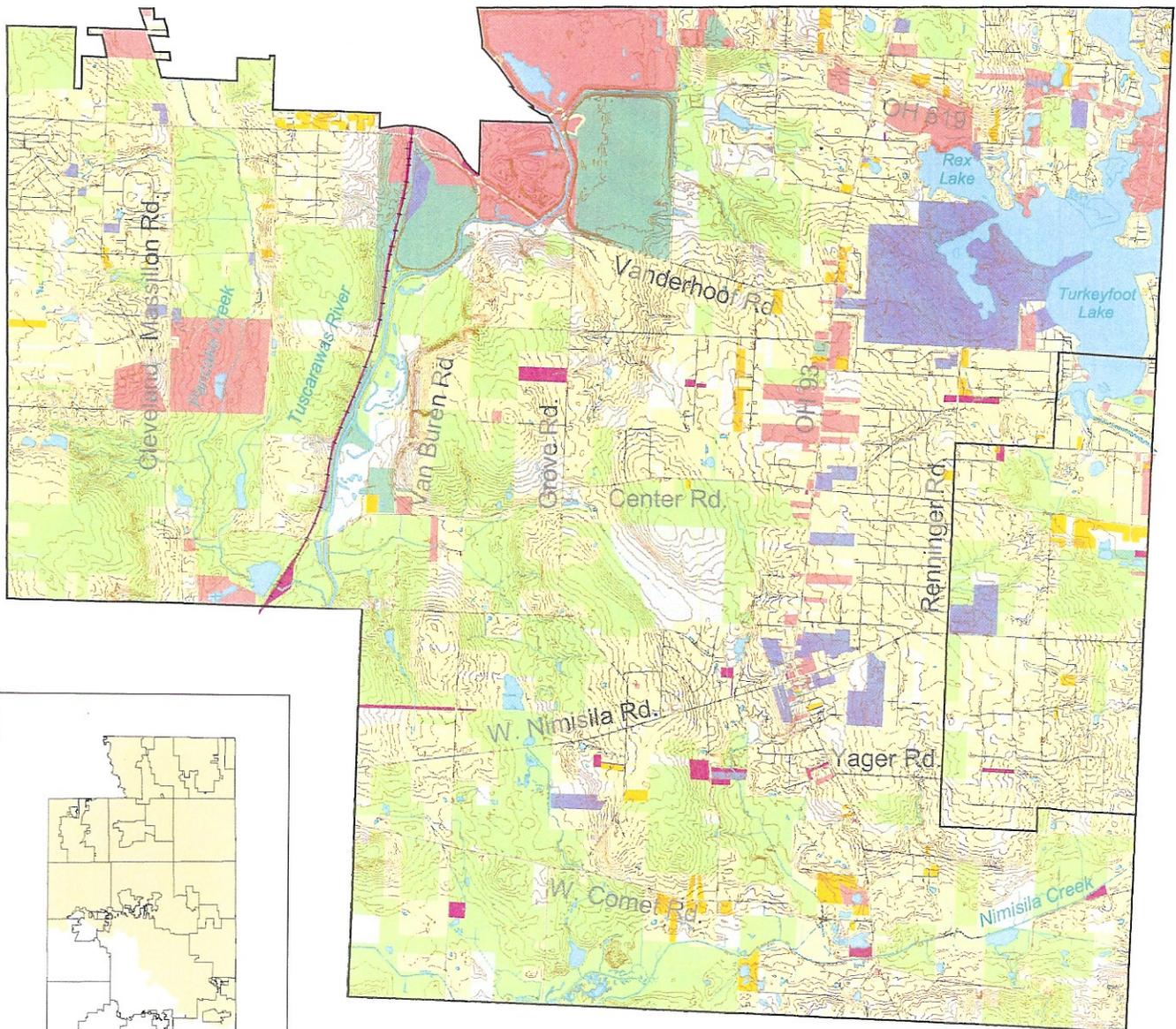
Franklin Township Summit County

Map 3

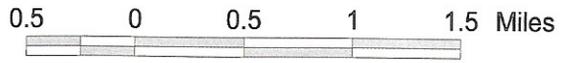
Current Land Use



Data Source: State Land Use Code



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Map Projection: Ohio State Plane North; NAD 83

Urban Forestry and Woodland Resources

Trees and related urban forest resources are a critical component of Franklin Township's ecological health, environmental quality, aesthetics, and livability. Franklin Township has embarked on some ambitious community planning and visioning efforts, and the woodland resources within the Township limits should be a major consideration of any future plans.

A recent forest canopy study was completed using a computer analysis program called "City Green." This study analyzed current and past canopy cover over the Akron-Canton region. Generally, it was found that over a recent 24-year period, there was a 43% decrease in high and moderate levels of canopy cover with a corresponding 41% increase in areas detected as having low amounts of vegetative cover. This can only be attributed to the pressures of development and urbanization.

Residents across the state and the nation are voicing their concern for the apparent and ongoing loss of trees and open space within their communities. Many people and businesses rate trees and parks high on the list of amenities they enjoyed most about the areas in which they live and work.

Community forest resources are not limited to the street trees and parks. These resources are also found on private property and on institutional properties like schools and churches. The collective benefits Franklin Township receives from its urban forest can only be derived from careful planning, protection, and management of these valuable resources on all properties.

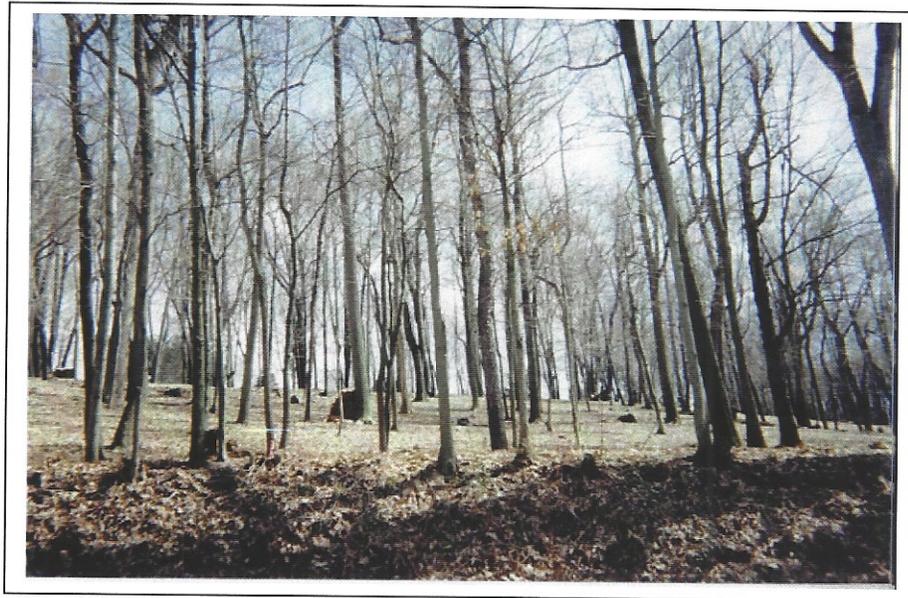
Trees, their canopy cover, and associated plant and animal communities contribute many benefits and much value to Franklin Township far in excess of the time and money invested in them for planting and maintenance. They help stabilize soil by controlling wind and water erosion, reduce noise levels, cleanse pollutants from the air, produce oxygen and absorb carbon dioxide, provide wildlife habitat, and improve water quality by filtering soil and pollutants. Urban forests also provide significant economic benefits through increased real estate values, improved settings for business activities, and reduced energy costs for heating and cooling. The aesthetic value of trees in urban settings is reflected in civic pride, a healthy community image, and economic vitality.

Analysis of current satellite imagery shows that 33% of Franklin Township is forested or has a canopy cover to some degree. The breakdown of this canopy coverage is 31% deciduous trees, 1% coniferous trees, and 1% mixed species. The national average is 27% canopy cover. Franklin Township's canopy cover slightly exceeds the national average, but that does not mean that is good.

The American Forestry Association, through research and numerous studies, has determined that an average of 40% canopy cover should be achieved and maintained by most urban and suburban areas. The American Forestry Association further breakdown the 40% canopy cover average by making these recommendations specifically for the Franklin Township area: a 50% canopy cover in low-density residential areas, a 25% canopy cover in high-density residential areas, and 15% cover in highly-urbanized, downtown areas. These statistics are good goals and should be set as the benchmark to obtain the many benefits of urban forests. Given the general land uses and character of Franklin Township, a goal should be to achieve an average 40% canopy cover.

Franklin Township should consider and develop programs and policies to protect, support, and expand its urban forest. Such tasks could include:

- Becoming a Tree City, USA as recognized by the National Arbor Day Foundation
- Creating a Franklin Township Tree Commission, which would be active in planting and tree maintenance projects, and educating the public
- Creating a system and putting procedures in place for residents who wish to plant, prune, or remove a public tree
- Adopting tree preservation measures for public road and other civic improvement projects
- Providing incentives for tree preservation on private property during development



Woodland resources are being cleared to accommodate residential development.

Significant woodland resources were mapped using the Summit County GIS aerial photos from 2000. Natural forests as well as areas of planted trees (mostly conifers) were mapped. In general areas greater than an acre were mapped. Fencerows and very narrow strips of trees were not mapped, and urban forest with lawn and landscape plantings were not mapped. Analysis of the larger tracts of woodland cover reveals that Franklin Township has only 16% woodland resources. It is the large tracts of woodlands that provide the most public health and safety benefits, as well as aesthetic and ecological benefits.

In natural settings, the most important role of forests is habitat for wildlife and biodiversity. Natural forests support plants and animals that are dependent on the structure of the woodlands. Trees provide habitat for birds, reptiles, amphibians, and arboreal mammals. Woodlands also contribute to overall biodiversity by harboring bacteria, fungi, and many species of insects and other invertebrates. Vegetation includes many species of trees, shrubs, herbaceous (including wildflowers), and other understory plants such as ferns, mosses, liverworts, and lichens.

In particular, riparian woodlands should be protected. Riparian woodlands are the narrow strips of treed vegetation along the sides of rivers and streams. When these areas are biologically healthy—full of trees and shrubs—they provide the best option for stream or river system protection. Riparian woodlands provide many benefits to the nearby waterways including: absorption and removal of pollutants from runoff, reduction in temperature extremes, and a source of organic matter to provide carbon nutrients (the most basic link in the food chain of a river ecosystem).

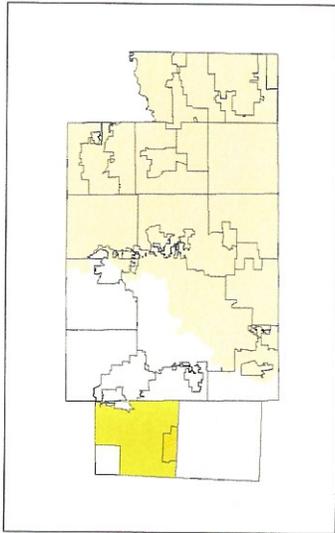
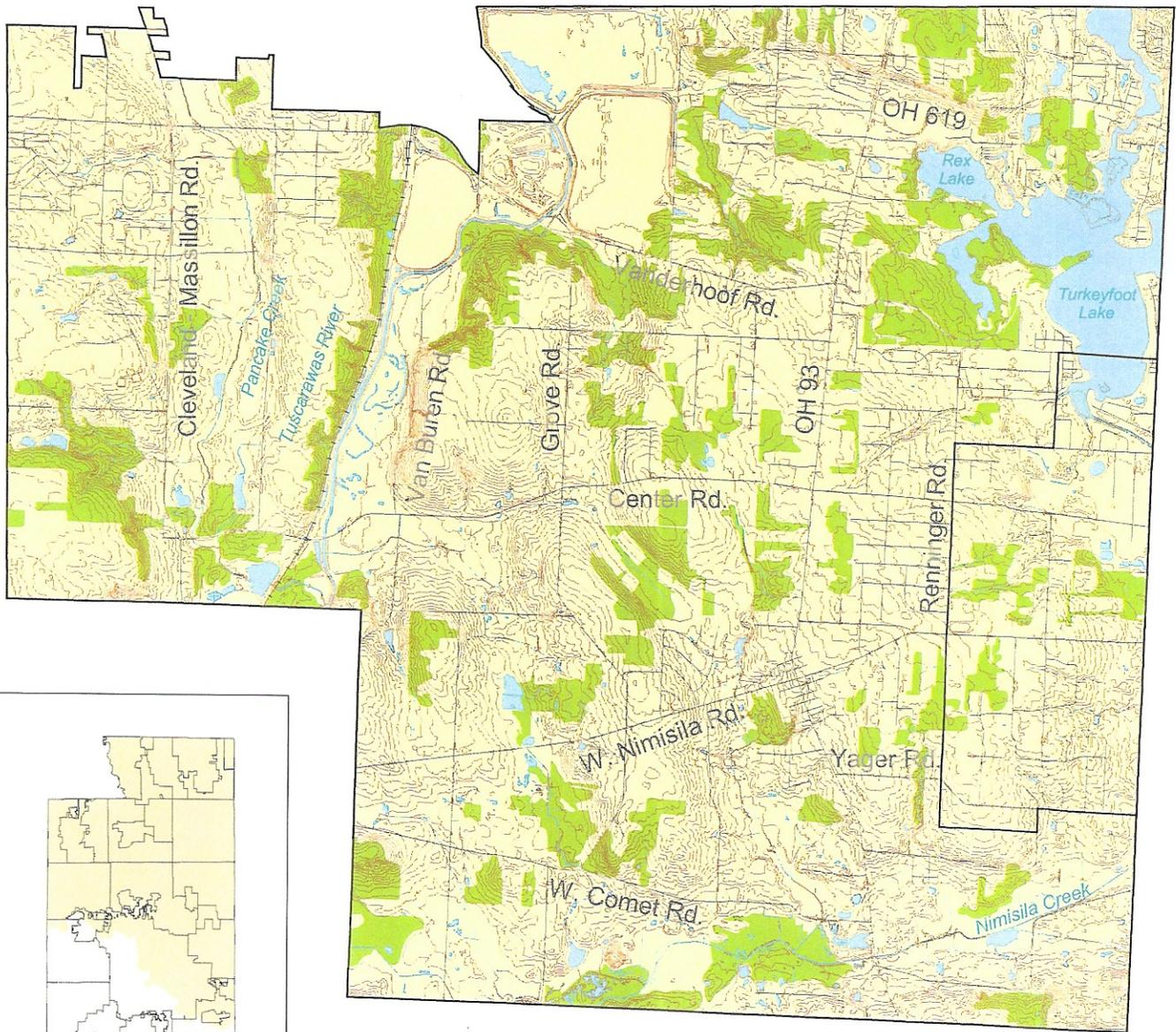
Franklin Township Summit County

Map 4

Woodland Resources

 Woodland Resources

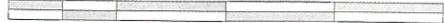
Data Source: Davey Resource Group



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Map Projection: Ohio State Plane North; NAD 83

Watersheds and Surface Waters

A watershed is the drainage basin or the land draining to a water body. It is a system that includes land, soils, plants, wetlands, water bodies, land cover, and people. These all affect the water flowing down through the watershed to the streams and rivers, influencing flooding, erosion, water quality, water temperature, and habitat.

Map 5 show watersheds based on data provided by the Ohio Department of Natural Resources (DNR). Franklin Township falls within the Tuscarawas River watershed which is part of the Ohio River drainage basin. The Ohio DNR also maps two subwatersheds of the Tuscarawas River: Nimisila Creek and Nimisila Reservoir.

Watersheds are currently being delineated for Summit County to support proposed revisions in the subdivision regulations to incorporate stream setbacks using a tiered approach based on watershed size: greater than 300 square miles; greater than 20 square miles and up to 300 square miles; greater than ½ square mile and up to 20 square miles; and less than ½ square mile.

These data are good for planning purposes. In disciplines such as resource management, storm water planning, flood management, and land use planning, watersheds are increasingly recognized as key geographic units for analysis and planning. Alterations to watershed characteristics affect downstream landscape, water bodies, land uses, and habitat. By examining features within a watershed, resource managers can identify potential sources of problems and potential effects of alteration, and may develop strategies to minimize or reduce problems related to alteration.



The construction of the Ohio & Erie Canal altered the natural drainage patterns on the Portage Lakes.

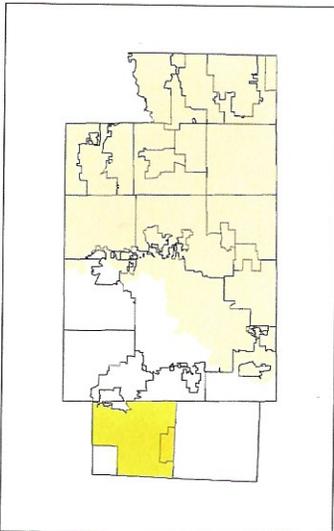
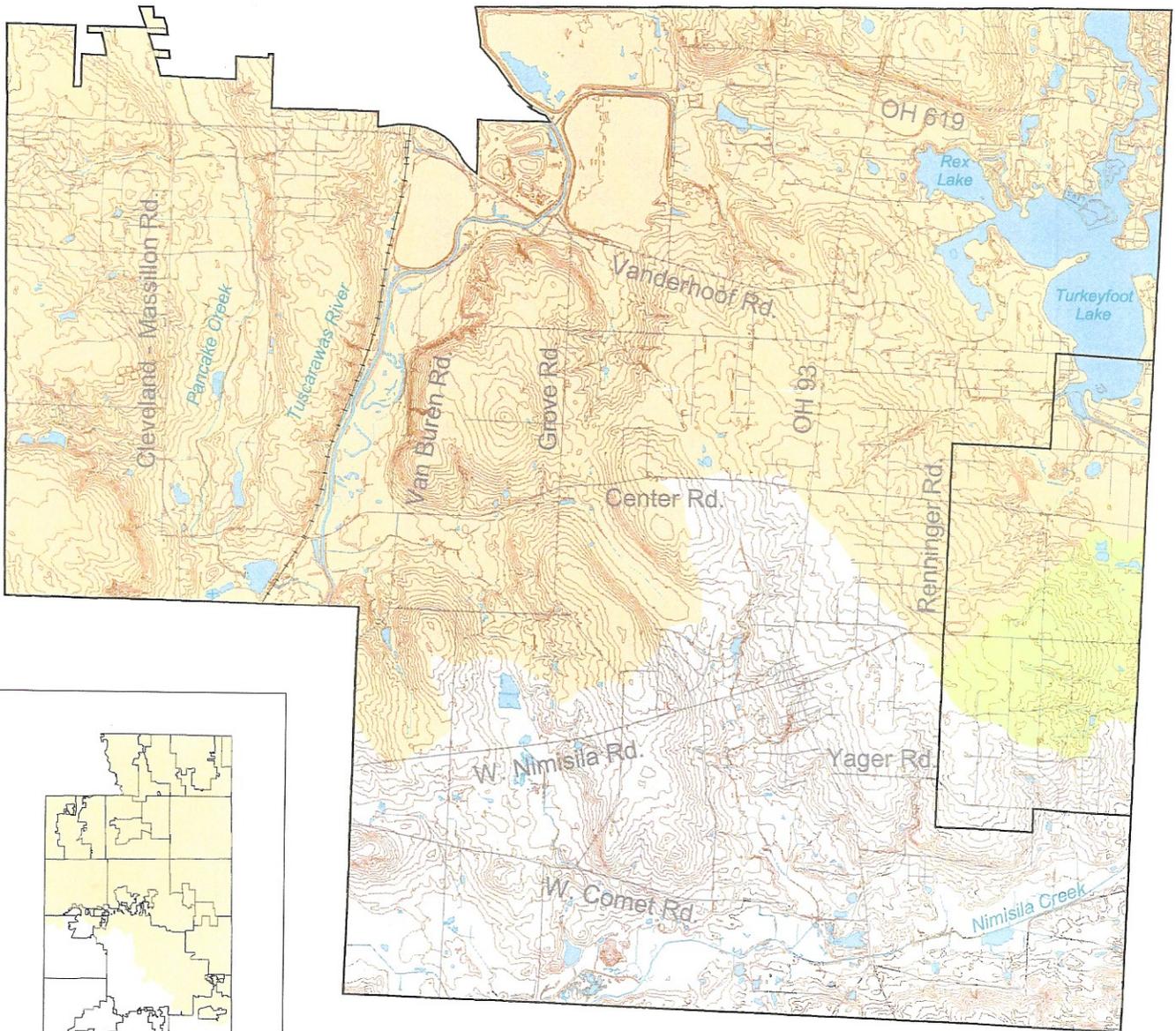
Franklin Township Summit County

Map 5

Watersheds

-  Tuscarawas River
-  Nimisila Creek
-  Nimisila Reservoir

Data Source: Ohio DNR



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Map Projection: Ohio State Plane North; NAD 83

Aquatic Features

The waters of the United States provide numerous valuable functions, including drinking water, habitat, recreation, transportation, waste disposal, and other industrial uses. Recognizing the needs for multiple uses of water bodies and adequate water quality to support these uses, the federal Clean Water Act requires that each state designate the optimal feasible use and quality for each water body and watercourse. These designations represent water quality/water use goals that are realistically achievable, but which meet the Clean Water Act goal of restoring the “chemical, physical, and biological integrity” of the nation’s waters (i.e., attaining “fishable, swimmable” waters). To remedy pollution problems, state and federal agencies are constantly striving to improve the water quality of the waters under their jurisdiction. Inherent in the water quality designations for each watercourse and water body are physical, chemical, and biological standards that the water must meet in order to be in attainment of the designation.

Various states use different classification systems to identify the designated uses and the water quality standards that will support that use. Ohio designates uses based on public use and the quality of habitat required for certain species types, recognizing that characteristics of habitat are directly related to water quality, and the fish and wildlife populations, which are very sensitive to habitat, can be relatively easily monitored. The Ohio Environmental Protection Agency (EPA) uses biological monitoring and biological indices to monitor water pollution (and polluters), rank the quality of Ohio streams, and regulate various water and land use permit applications (requests to consume a natural resource).

All named streams that are shown on U.S. Geological Survey maps have been given aquatic life use designations by the Ohio EPA. These designations describe the physical, chemical, and biological quality that each drainage way is capable of achieving. The highest use designation that most streams can be assigned is Exceptional Warmwater Habitat (EWH). These streams are relatively non-impacted and support excellent natural habitat. Warmwater Habitats (WWH) are considered “average” streams that are relatively non-impacted and maintain marginal natural habitat. A third category—Coldwater Habitats (CWH)—is extremely sensitive and rare for Ohio. These streams support coldwater organisms such as sculpins, redbreast dace, and trout that have adapted to these unusual and unique habitats. Because these habitats are so uncommon in the state, the biological criteria are not defined as well as are those for EWH and WWH. There are no known EWH or CWH habitats in Franklin Township.

The fact that a stream has been given a particular designation does not imply that it has been thoroughly sampled or investigated by the Ohio EPA. The Ohio EPA uses biological criteria primarily to monitor the effects of larger aquatic pollution sources such as industrial and wastewater treatment facilities that hold NPDES permits. Smaller streams that do not receive polluted effluent are often assigned an aquatic life use designation based on visual observations or quick surveys. In many situations these observations may underestimate the potential of a stream to attain a higher use designation (and stricter regulatory status). Smaller drainageways that are not named on USGS maps, or those that may not appear on maps, are often undesignated. Although these streams must still meet certain minimum standards, they may harbor unique organisms or habitat that would qualify them for greater protective status. Stream surveys would have to be conducted to determine their correct designation.

Ohio EPA defines the following use designations:

- *Warmwater Habitats (WWH)* are waters capable of supporting and maintaining a balanced, integrated, adaptive community of warmwater aquatic organisms having a species composition, diversity, and functional organization comparable to the 25th percentile for identified reference sites within each of Ohio's ecoregions.
- *Exceptional Warmwater Habitats (EWH)* are capable of supporting and maintaining a balanced, integrated, adaptive community of warmwater aquatic organisms having a species composition, diversity, and functional organization comparable to the 75th percentile for identified reference sites within each of the state's ecoregions. All publicly owned lakes and reservoirs are automatically designated EWH.
- *Coldwater Habitats (CWH)* are capable of supporting populations of coldwater fish and associated vertebrates, and invertebrates, and plants on an annual basis.
- *Agricultural Water Supply (AWS)* are suitable for irrigation and livestock watering without treatment.
- *Industrial Water Supply (IWS)* are suitable for commercial and industrial uses, with or without treatment. Criteria for the support of IWS designation varies with each type of industry.
- *Primary Contact Recreation (PCR)* during the recreation season, these are suitable for full-body contact recreation such as, but not limited to, swimming, canoeing, and scuba diving with minimal threat to public health as a result of water quality.
- *Bathing Waters (BW)* are swimming areas with lifeguard, bathhouse, and regular water testing.
- *State Resource Water (SRW)* are surface waters of the state that lie within national, state, and metropolitan park systems, wetlands, and wildlife refuges, areas, and preserves and are designated in Ohio Water Quality Standards (Ohio EPA, 1997).

Water quality designation indicates how sensitive certain waters are to alteration and contaminants. These are used by state agencies to permit certain uses that could affect water quality, such as discharges. The use designation helps resource managers identify especially sensitive waters and monitor how well water quality goals are being met.

Water quality designations reflect water quality goals for water bodies and watercourses. Water quality designation does not necessarily reflect existing conditions or imply that it has been thoroughly sampled by the Ohio EPA. Map 6 shows water quality designations in Franklin Township.

Stream segments within Franklin Township and the corresponding aquatic life use designations are shown in Table 2 and Map 6.

Table 2. Water Use Designations for Waterbodies in Franklin Township, Summit County

Waterway	Ohio EPA River Code	Aquatic Life Habitat Use Designation	Water Supply Use Designations	Recreational Use Designations
Tuscarawas River Watershed				
Tuscarawas River	17-500	WWH	AWS, IWS	PCR
Nimisila Creek	17-538	WWH	AWS, IWS	PCR
Pancake Creek	17-539	WWH	AWS, IWS	PCR

Sources: Ohio Environmental Protection Agency Division of Surface Water, Appendices to the Year 2000 Ohio Water Resource Inventory (305(b) Report), Ohio Environmental Protection Agency Division of Surface Water State of Ohio Water Quality Standards Chapter 3745-1 of the Administrative Code



The Tuscarawas River has been channelized. Oldfields are often found adjacent to it.

Franklin Township Summit County

Map 6

NPDES Discharge Permits and Water Quality Designation / Attainment

● NPDES Discharge Permits

Rivers & Streams

Lakes & Ponds



Modified Warm Water Habitat



Full Use, Threatened Attainment

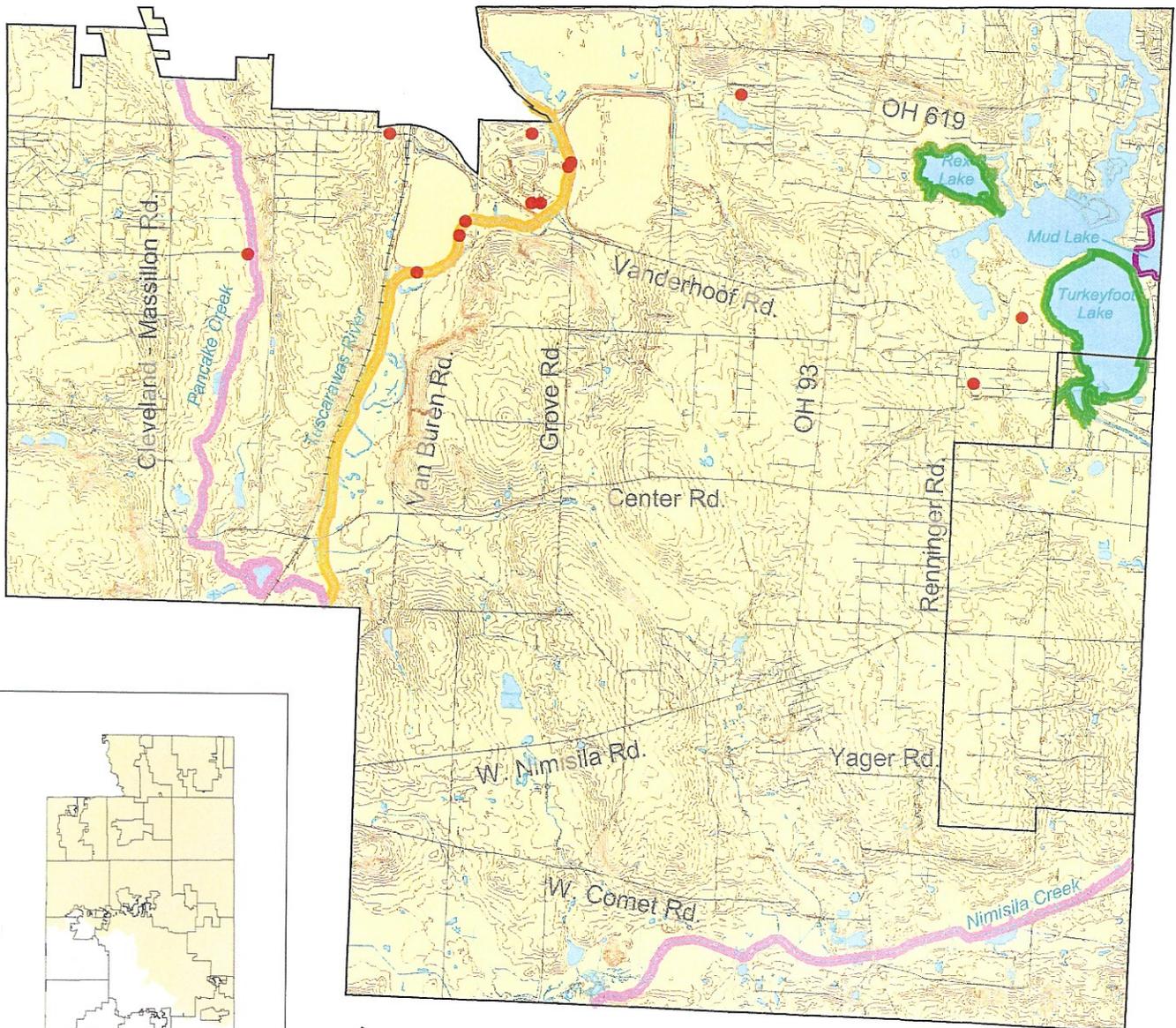


Warm Water Habitat



Partial Use, Non-Attainment

Data Source: Ohio EPA, 2000



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Map Projection: Ohio State Plane North; NAD 83

Lakes, Ponds, and Reservoirs

There are four water use designations applied to *all* lakes, ponds, and reservoirs over five acres in size: (1) aquatic life (Exceptional Warmwater Habitat); (2) public drinking water (Public Water Supply); (3) recreation, *i.e.* swimmable waters; and (4) fish tissue consumption. Different combinations of eight specific parameters are used to evaluate attainment of the designated uses. Shown below is a breakdown of each use designation and the level to which that waterbody is supporting its use. Map 6 shows water use designations.

Table 3. Water Use Assessments for Lakes in Franklin Township, Summit County

Lake Name	Ohio EPA Lake Identification Number	Use Attainment	Aquatic Life Habitat Use Designation (EWH) Support:	Public Water Supply Use Designation (PWS) Support	Recreational Use Designation Support:	Fish Tissue Consumption Support:
Mud Lake	OH10 33-365	Partial use, non-attainment	Partial use, non-attainment	Partial use, non-attainment	Partial use, non-attainment	Insufficient data
Rex Lake	OH10 33-363	Full use, but threatened attainment	Full use, but threatened attainment	Full use, but threatened attainment	Full use, but threatened attainment	Insufficient data
Turkeyfoot Lake	OH10 33-364	Full use, but threatened attainment	Full use, but threatened attainment	Full use, but threatened attainment	Full use, but threatened attainment	Full use, full attainment

Sources: Ohio Environmental Protection Agency, Division of Surface Water, Year 2000 Ohio Water Resource Inventory (305(b) Report), Ohio Environmental Protection Agency, Division of Surface Water, 1996 Ohio Water Resource Inventory: Volume 3: Ohio's Public Lakes, Ponds, & Reservoirs (305(b) Report)

It is a preliminary recommendation that Franklin Township work to ensure that watercourses in the Township are in attainment of their designations.

Water Quality Monitoring

In Ohio, the Ohio EPA uses biological monitoring and biological indices to monitor water pollution (and polluters), rank the quality of streams, and regulate various water and land use permit applications (requests to consume a natural resource). Stream biota are very sensitive to habitat changes and water quality degradation and are easily monitored.

The Ohio EPA uses biological criteria primarily to assess the effects of larger aquatic pollution sources such as industrial and wastewater treatment facilities that hold National Pollutant Discharge Elimination System (NPDES) permits. The data can be used to assess the overall health of the waterway and identify potential problems or other trends. Adverse impacts to aquatic habitat (and thus water quality) may stem from point sources (discreet discharge points such as municipal sewage treatment systems or industries) or non-point sources (dispersed sources such as road or agricultural runoff). Having identified potential problem areas, resource managers can then begin to assess target watersheds for sources of degradation and possible solutions.

The biomonitoring reports, individually, provide accurate snapshots in time of the current condition of portions of selected waterways. Most sampling sites are chosen for their proximity to effluent dischargers. Unusual conditions such as lower/higher than average water levels, spills, or cold/heat spells occurring during the sampling season could affect scores either positively or negatively. However, when all of the indices are evaluated together, using professional experience, these provide an important tool in assessing the improvement or decline of water quality over time.

NPDES Discharge Permits

National Pollution Discharge Elimination System (NPDES) permits are required for any discharge of pollutants into the waters of the United States. These permits limit the quantities of pollutants discharged in wastewater and require water quality monitoring and reporting to ensure the discharge does not lower water quality or impact people's health. The permits currently issued in Franklin Township include:

- *Industrial*—commercial and manufacturing facilities;
- *Municipal*—Publicly Operated Treatment Works (POTWs), discharging wastewater from sewage treatment or industries connected to the drainage system; and
- *General*—including construction or industrial storm water, coal-mining, non-contact cooling water discharge, discharges from petroleum-related corrective action sites, and small sanitary dischargers. These are not included in the mapping compiled here.

NPDES permits indicate potential sources of water quality degradation. Map 6 shows NPDES permits in Franklin Township. Generally, dischargers meeting permit requirements meet water quality standards for that watercourse. Some discharges may have effects beyond the permitted constituents, e.g., temperature or nutrients, which can harm water quality or habitat. Dischargers that do not meet permit requirements may be contributing to water quality problems and will be required to improve their operations. In some cases, such as small-scale privately operated sewage treatment facilities that fail to operate correctly, alternate solutions may be required, such as connecting to a municipal sewer system. Each individual (other than general) NPDES permit specifies the constituents that may be discharged. To further investigate potential sources of water quality problems, resource managers can research the individual permit limits and permit compliance. An additional use of this information is to identify potential conflicts with water use. NPDES permits are based on the discharger having a certain volume of water to dilute the discharge. Changing the volume of the watercourse (e.g., through drought or water use) may affect the water quality and the operations and permit requirements for the discharger. For example, withdrawing water from a stream may increase the concentration of constituents on the watercourse, reducing water quality.

Impaired Waters/TMDL Listed Stream Reaches

The Clean Water Act requires states to monitor the quality of their waters to determine whether they are attaining their designated uses. Waters not attaining their designated use standards are noted as "impaired," and listed in accordance with Section 303d of the Clean Water Act. Impaired waters are listed based on the likely contaminants and prioritized for Total Maximum Daily Load (TMDL) development based on the type of impairment and designated use, among

other factors. The TMDL process involves intensive sampling and modeling to determine the contaminants of concern, the amounts that the stream can assimilate and still meet water quality standards, and measures to reduce pollutant loads from point or non-point sources. Because TMDL recommendations may involve major changes to land use, discharges, or stream use/characteristics, the TMDL process involves considerable public participation. Because of the labor-intensive nature of these studies, it may take many years from listing to TMDL development. Where water quality improves to the degree that the water body attains its designated use, it can be removed from the Section 303d list.

Listing for TMDL development indicates that the waterbody or watercourse does not support its designated use. The TMDL list parameters usually provide some general information concerning likely sources of impairment. Resource managers can use this information to identify likely problems within the watershed and begin to address them, improving the water quality and habitat of the watercourse or waterbody long in advance of completion of the TMDL process. Often, TMDL-listed waters are given priority for water quality improvement funding.

Table 4. Section 303(D) TMDL-Listed Waters, Franklin Township, Summit County

Waterbody	U.S. EPA Basin	Segment ID#	Parameter of Concern	Potential Sources of Impairment
Tuscarawas River	Tuscarawas	OH10- 26-1998	Unknown toxicity Metals Chlorine Salinity/TDS/Chloride Habitat alteration	Industrial point source, Urban runoff/Storm sewers, Channelization, Removal of riparian vegetation, Contaminated sediments
Nimisila Creek	Tuscarawas	OH10 12-360-1998	Flow alteration, Habitat alteration, Unknown	Land disposal, On-site wastewater systems (septic tanks), Upstream impoundment
Rex Lake	Tuscarawas	OH10 33-363-1998	Metals, Other inorganics, Siltation, Organic Enrichment/low dissolved oxygen, Noxious aquatic plants	Municipal Point Sources, Land Development/ Suburbanization, Urban Runoff, Onsite wastewater systems (septic tanks), Flow regulation/ modification, Spills, Natural
Turkeyfoot Lake	Tuscarawas	OH10 33-364-1998	Metals, Other inorganics, Siltation, Organic Enrichment/low dissolved oxygen, Noxious aquatic plants	Municipal Point Sources, Land Development/ Suburbanization, Urban Runoff, Onsite wastewater systems (septic tanks), Flow regulation/ modification, Spills, Natural

Source: United States Environmental Protection Agency SECTION 303(d) LIST Year 1998,
Ohio Environmental Protection Agency Division of Surface Water, Appendices to the Year 2000
Ohio Water Resource Inventory (305(b) Report)

Nonpoint Source Impacts to Water Quality

To identify one source of nonpoint source pollution, large areas of impervious surfaces were mapped. Areas such as parking lots, industrial areas, schools, high density residential areas, and shopping centers were included. Small areas were not mapped. In general, areas larger than several acres were mapped. Many of these areas have inclusions of pervious areas, mostly lawn and landscape plantings. Percentages of impervious surfaces within these areas were estimated based on visual inspection.

Over the past two decades, improvements in treating point sources of pollution, such as municipal and industrial wastes, have led to major improvements in water quality. However, increases in intensive land use (development, urbanization, agriculture, and deforestation) have occurred simultaneously. These activities create a different kind of pollution known as nonpoint source (NPS) pollution. Pesticides and fertilizers, eroded sediment from developing areas, increased impervious surfaces, and urban and agricultural runoff are generally considered greater threats to water quality today than industrial and municipal waste.

Unlike point sources of pollution, NPS pollution is difficult to identify, manage, and quantify. There are no pipe or outflow sources to monitor, and it can be difficult to locate sources and the pathways these pollutants travel into downstream receiving waters. Because nonpoint source pollution can arise anywhere in a watershed, and is a direct result of land use activities and practices, there is a growing trend to address water quality issues from a watershed perspective. This approach treats streams and rivers as a part of a larger ecosystem. Water quality is reflective of the surrounding landscape and any efforts to preserve, protect, or improve the integrity of rivers, streams, and lakes should address the long-term management of watersheds. Lack of perviousness is one of the indicators of NPS pollution.

Impervious Surfaces

Large areas of impervious surfaces were mapped. Areas such as parking lots, industrial areas, schools, high density residential areas, and shopping centers were included. Small areas were not mapped. In general, areas larger than several acres were mapped. Many of these areas have inclusions of pervious areas, mostly lawn and landscape plantings. Percentages of impervious surfaces within these areas were estimated based on visual inspection. Map 7 shows impervious surfaces in Franklin Township.

Limiting impervious surface area serves to reduce storm water runoff volume. The greater the area of impervious surfaces, the more runoff will occur, carrying water downstream and out of the Township. To the extent possible, the Township should encourage the occurrence of *run-on*. Runoff is defined as the direction of storm water flow from pervious cover to impervious cover (for example, sloping lawn to paved road); whereas, run-on can be defined as the flow of storm water from impervious cover to pervious cover. If sites are graded to produce run-on, water is much more likely to infiltrate the soil and reduce storm water runoff. Some examples of run-on include: rooftop discharge that travels through downspouts and across grassed yards, road drainage that is directed into swales rather than curbs and gutters, small parking lots that drain into forests or fields, and isolated sidewalks and bike paths.

Floodplains

Floodplains are the areas adjacent to rivers and streams that are subject to periodic or regular flooding. They are defined by designated recurrence intervals at which a storm of a given magnitude could occur. For example, the 100-year flood has a one-in-one-hundred chance of occurring in any given year. Due to periodic scouring of the areas, floodplains are very unstable and potentially dangerous areas for human use; however, they form a unique ecological niche, and support biotic communities that are adapted for occasional inundation. Floodplain wetlands absorb large volumes of water during high flows, reducing local flooding and delaying the release of water downstream.

Floodplains support a diverse assemblage of plant and animal life. In addition, they serve an important role in water quality protection, since stream bank vegetation can filter pollutants from runoff before they enter a waterway. In some instances, the established riparian zone, or the land adjacent to the stream, extends beyond or does not have a mapped 100-year floodplain boundary.

According to the Federal Emergency Management Agency (FEMA) floodplain map (Map 8), approximately 6% of the Township lies within the 100-year flood zone and <1% in the 500-year flood zone. FEMA provides low-cost flood insurance in participating communities throughout the country. FEMA commissions modeling and mapping of the flood hazard areas for the major storms: 100-year storms (1% chance of occurrence each year) and 500-year storms (0.2% chance of occurrence each year).

The FEMA-mapped floodplains represent the areas most likely to flood during the most severe storms. Flood insurance rates paid by property owners are based on risk level as determined by their location relative to floodplains and floodways. It is wise to restrict development in these areas to reduce the risk of flood damage and to preserve their flood-storage capacity. Communities are required to develop appropriate standards for development in floodplains and floodways, and may restrict development there, to minimize safety hazards and preserve flood storage capacity.

These maps reflect flood modeling for the date of the map (1978). Development in the floodplain or watershed may change flooding characteristics. In addition, the FEMA map is a modest representation of where flooding is likely to occur. Therefore, it is important to protect all lands adjacent to watercourses.

It is a preliminary recommendation that the Township exclude all development from occurring in the floodplain areas. Because the floodplain provides significant protection to water quality and flood prevention, filling in the floodplain should be discouraged.

Flooding is an important function of streams and water bodies. Areas that flood upstream in the watershed actually protect properties downstream, in addition to providing important habitat, groundwater recharge, and sediment deposition areas. Flooding occurs in the context of water traveling through a watershed. Flooding in the middle or lower reaches of a watershed may be influenced by factors well upstream, including soil permeability, slope, stream channel, land use, vegetative cover, wetlands, and obstructions. Problems arise where flooding conflicts with and threatens land use.

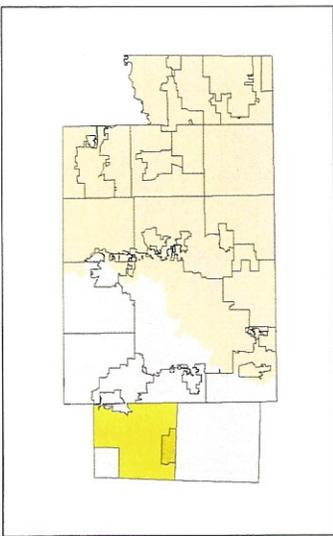
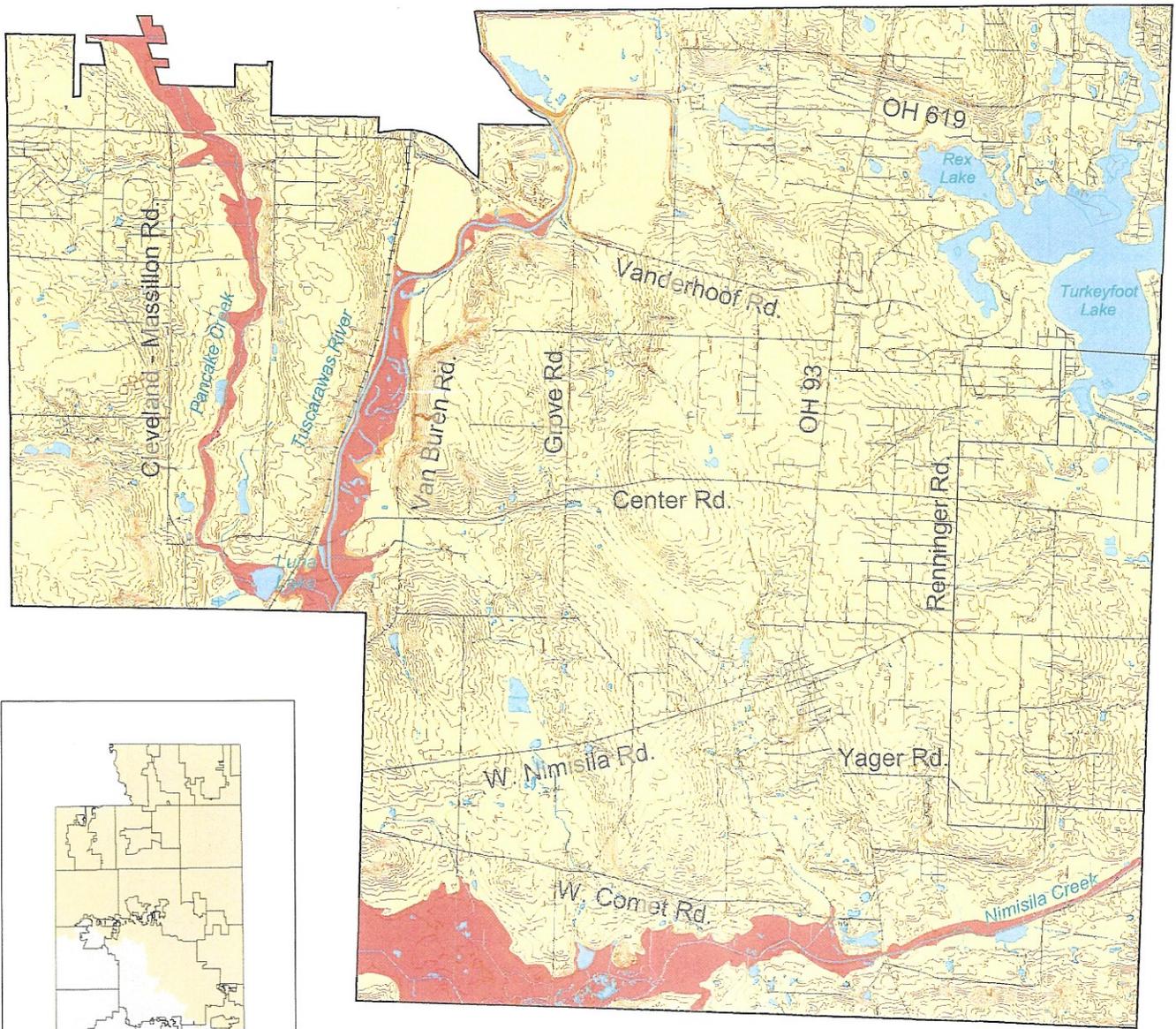
Franklin Township Summit County

Map 8

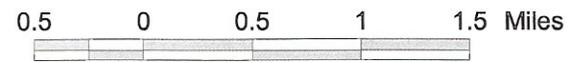
Floodplains

-  100 - Year Flood Zone
-  500 - Year Flood Zone

Data Source: FEMA, 1978



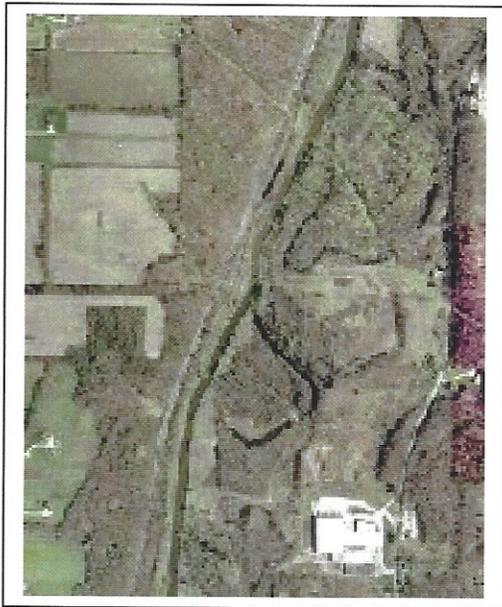
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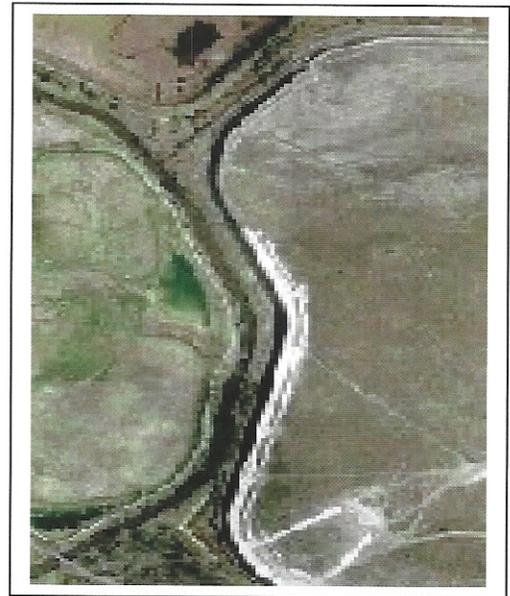
Map Projection: Ohio State Plane North; NAD 83

Riparian corridors within Franklin Township were delineated based on aerial photographs, topographic maps, and mapped water features. The riparian corridor includes all floodplains, steep slopes, and wetlands adjacent to streams or within the floodplains. The top of the valley slope was used as the riparian boundary in areas with well-defined topography. All small tributaries mapped as streams were included within the riparian corridor. In addition, other small, unmapped streams with obvious, well-defined valleys were included.

Map 9 depicts the riparian corridor delineated for Franklin Township. Riparian areas make up 55% of the Township. Of the total riparian area, 21% is wooded, 13% has wetlands, and less than 1% has significant impervious surfaces.



This section of the Tuscarawas has a wooded riparian corridor.



This section of the Tuscarawas has no riparian corridor.

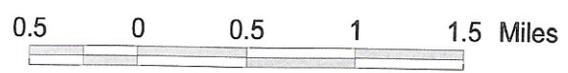
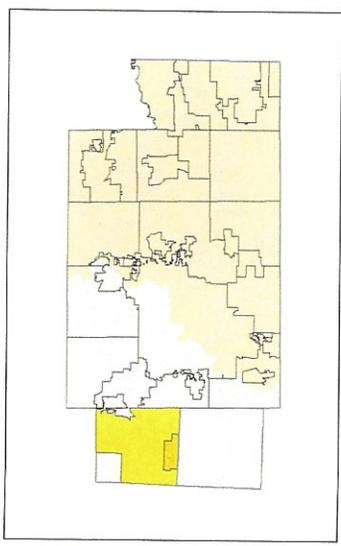
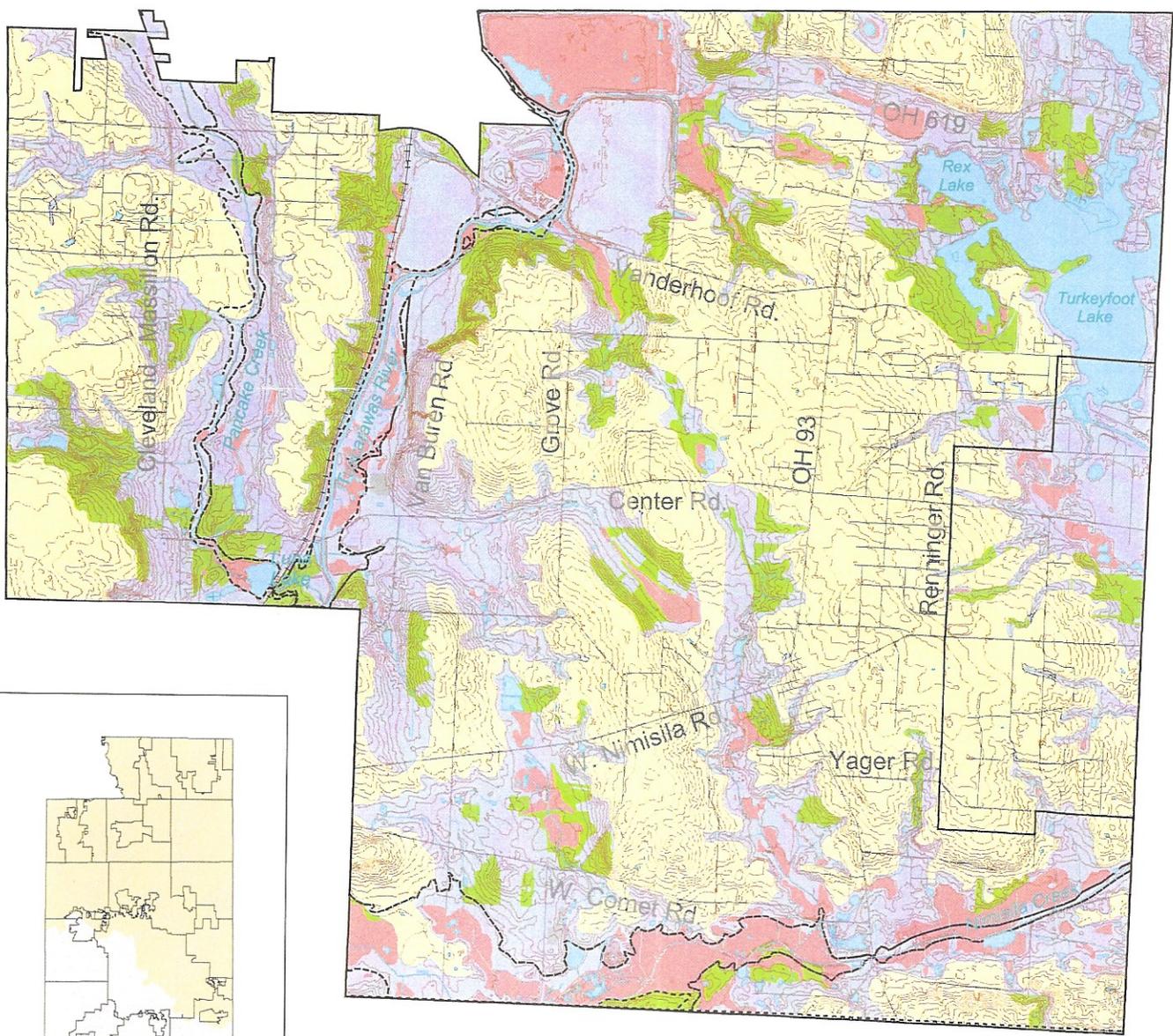
Franklin Township Summit County

Map 9

Riparian Corridors

-  Riparian Corridor
-  Riparian Wetlands
-  Riparian Woodlands
-  Impervious Surfaces in the Riparian Corridor
-  FEMA Floodplain

Data Source: Davey Resource Group



Map Projection: Ohio State Plane North; NAD 83

Acquiring or protecting these valuable strips of green space along stream or river corridors with conservation easements is recommended. This standard should be integrated into zoning review provisions.

The width of setback or buffer zone can vary according to the characteristics of the floodplain and adjacent steep slopes. Buffers have been designated as wide as 300 feet based on areal nutrient dilution models. The Ohio Department of Natural Resources recommends a minimum buffer of 120 feet; this guideline is based on the minimum width needed to establish a mature forest - the most effective vegetative buffer. For habitat preservation, buffers have been established as wide as 600 feet; however, this number has never been used for regulations as it is not based on public health and safety issues.

The Summit Soil and Water Conservation District is currently writing legislation for a riparian setback based on the size of the watershed:

1. A minimum of 300 feet on each side of all watercourses draining an area greater than 300 square miles.
2. A minimum of 120 feet on each side of all watercourses draining an area greater than 20 square miles and up to 300 square miles.
3. A minimum of 75 feet on each side of all watercourses draining an area greater than ½ square mile and up to 20 square miles.
4. A minimum of 50 feet on each side of all watercourses draining an area less than ½ square mile with a defined channel and bank area.

Where the 100-year floodplain is wider than the Riparian Setback on either or both sides of the watercourse, the Riparian Setback is being extended to the outer edge of the 100-year floodplain.

Because the gradient of the riparian corridor significantly influences impacts on the stream, the following adjustment for steep slopes is being integrated into the Riparian Setback formula for width determination:

Average % Slope	Width of Setback
15% - 20%	Add 25 feet
21% - 25%	Add 50 feet
> 25%	Add 100 feet

Where wetlands protected under federal or state law are identified within the Riparian Setback, the Riparian Setback will also consist of the full extent of the wetlands plus a 50-foot setback extending beyond the outer boundary of a category 3 wetlands and a 30-foot setback extending beyond the outer boundary of a category 2 wetlands. Category 2 and 3 wetlands are defined by Ohio EPA using a qualitative assessment form.

Some communities consider a flexible buffer determination based on where the actual existing riparian corridors are. Buffers or setbacks are determined based on a number of site specific factors such as:

- Slope: Steep slopes would be included within the buffers when in close proximity to streams. This situation is most common in headwater streams.
- Stream Order: Stream order can be used to determine the effectiveness of removing sediments and pollutants.
- Vegetation: Mature forests with undisturbed understory vegetation will be the preferred buffer vegetation type. Buffers can only be reduced if the current vegetation is mature forest. Mowed and disturbed areas should have the maximum buffer width.
- Soil Type: Moderate and well-drained soils are effective at absorbing surface runoff, while fine-textured soils (usually somewhat poorly drained and poorly drained soils) are better at denitrification. Buffers can be increased or decreased based on soil type and the most important buffer function based on surrounding land use. Denitrification will probably be most important in residential areas with chemically treated lawns.
- Adjacent Land Use: Both current and anticipated land use should be considered in determining buffer width and desired buffer functions.
- Sustainability: Narrow buffers cannot maintain a healthy forest ecosystem.

These flexible buffer criteria also require proof of the following buffer functions:

- Nitrogen Removal: Most nitrogen removal occurs within the first 35 to 90 feet of the buffer. Woody plants are the most effective at removing nitrogen.
- Sediment Removal: Buffers of 50 to 100 feet are required to adequately remove sediments.
- Pesticide Removal: Buffers of 45 feet or more are generally required to provide some removal of pesticides.

In general, to provide a variety of buffer functions, the 120-foot setback is ideal. The vegetation goal should be mature forests. In head water streams, a reduction in the setback should be avoided and should never be less than 40 feet. Adopting a fixed-width policy for a single buffer type is common, but can lead to unnecessarily large or small buffers which may deny landowners the use of a portion of their land, or can compromise protected areas. However, although a flexible-width policy would allow the consideration of site-specific conditions, it would require greater expenditure of resources and offer less predictability for land use planning.

Vegetative goals for each buffer area should be determined as part of any resolution. For example, the ultimate vegetation target near protected streams may be riparian forest cover, yet grassy meadows may be sufficient near impacted streams where water quality maintenance, not improvement, is important.

Riparian setback zoning requires a strong education and enforcement program. Two primary goals are to make the setback visible to the community by mapping boundaries, and to encourage greater buffer awareness and stewardship among adjacent residents.

In terms of prohibited and permitted uses in a setback:

- All development activities should be prohibited. This includes such land use activities as single-family homes, commercial development, parking lots, any construction, dredging or dumping, roads or driveways, as well as surface and subsurface disposal or treatment areas.
- Recreational trails and related crossings may be appropriate, when resilience to trampling is low, and when part of a greenway trail system. Because a trail system would reduce the buffer's impact on water quality and habitat, trails should be constructed of ecologically friendly materials such as wood mulch. These trails should be set back at least 10 to 30 feet from the ordinary high water mark areas.
- Pasturing of livestock should be discouraged.
- Selective tree removal could be permitted for maintenance purposes, such as to clear dead or dying trees that could pose a public hazard or interfere with the water flow of the watercourse. Log jams and other obstructions to water flow should be removed to prevent flooding. Removal of existing trees with a diameter greater than nine inches (diameter at breast height) should be prohibited.
- Cutting, mowing, brush hogging, clearing, burning, or poisoning of existing vegetation should be discouraged. However, removal of invasive and non-native species is recommended.
- Crossings of the stream buffers should be restricted to no more than one crossing per 1,000 linear feet of the watercourse. Outfall culverts should discharge at the stream invert elevation to allow for upstream fish passage. Bottomless culverts are preferred.
- Only trees, shrubs, and herbaceous vegetation native to the area should be planted. Formalized landscaping plantings, using non-native, invasive species should be discouraged.
- Altering, dumping, filling, or removal of riverine materials or dredging should be prohibited.

Other communities, such as Bath Township in Summit County, have created a riparian overlay district to prohibit certain uses within the riparian corridor. In terms of uses for a riparian district:

- Structures are not recommended. If buildings and structures are permitted, they should be set back an additional 10 feet from the inner zone.
- Impervious surfaces should be discouraged.
- Land use activities that could be appropriate include conservation and forest management, lawns and gardens, passive and active recreation, and open space. The use of pesticides, herbicides, and fertilizers should be discouraged. Allowing natural ecological succession to occur is encouraged. Removal of existing trees with a diameter greater than 18 inches (diameter at breast height) should be discouraged.
- Prohibited land uses should include asphalt plants; dry cleaners; gasoline service stations, car washes, and other auto-related uses; junkyards, landfills, transfer stations, and recycling facilities; oil and gas wells; storage or discharge of hazardous materials and chemicals, commercial storage and petroleum storage, sales and distribution; quarries and borrow pits; sand and gravel extraction; and transportation facilities (exclusive of highways, roads, and alleys), road maintenance facilities, and road salt storage.

- The alteration of existing contours should be discouraged. On slopes of 15 to 20%, no more than 30% of the slope may be cleared. A setback of 15 feet must be maintained from the crest of the slope to any structure. No on-site sewage disposal systems should be allowed on any slope exceeding 20%.
- Underground storage tanks should be prohibited.

It is a preliminary recommendation that Franklin Township protect riparian corridors, creating a riparian overlay district and limiting use of vegetative setbacks to passive recreation, nature trails, wildlife management, hunting, and fishing. In addition, the Township should consider conservation development (open space subdivision design) to allow for the preservation of natural features by minimizing the impacts of development on riparian corridors, green space, scenic waterways, slopes, trees, and wildlife areas.

Topography and Steep Slopes

Map 10 shows topography steep slopes. Steep slopes occur in small areas throughout Franklin Township, but are concentrated along the Tuscarawas River valley. Other concentrations of steep slopes occur along Nimisila Creek and Portage Lakes.

When development takes place on steep slopes, vegetative cover is greatly reduced. Loss of this vegetative cover on steep terrain significantly increases soil instability, and thus the risk of erosion. Soil erosion and sedimentation into waterways poses several threats to public health and safety, which are difficult and expensive to correct. Property damage is commonly associated with development on steep slopes. Soil erosion and sedimentation into nearby waters increase the potential for flooding.

For these reasons, steep slopes along stream valleys should be maintained with a vegetative cover to prevent soil loss and siltation. Existing patterns of vegetation should be retained on all slopes over 12% to avoid erosion or slippage.

It is a preliminary recommendation that clearing and grading of forests and natural vegetation on slopes over 20% should be prohibited and on slopes over 12% should be avoided. Development on areas with slopes between 12 and 20% should be conditional. The need to protect these slopes is site specific. It should be subject to criteria based on percent slope, the length of that percent slope, soil erodibility, percent of vegetation, and proximity to streams or wetlands.

This proposed protection is needed to focus on influencing the design of new subdivisions and the location of soil disturbing activities. Depending on the site, mitigation plans should be conducted to describe proposed additional protective measures. The maximum retention of natural topographical features such as natural drainage swales, slope ridge lines, and trees and other natural plant formations should be encouraged.

Steep slope protection will conserve and promote public health and safety by minimizing problems due to water runoff and soil erosion incurred in adjustments of topography to meet developmental needs. In addition to public health and safety concerns, protecting steep slopes preserves the unique scenic resources and habitats of Franklin Township.

One approach to dealing with the problem of development on steep slopes is to simply make any construction of a principal use on property with natural slopes greater than 12% a conditional use in Franklin Township. Conditional use approval could be predicated on the applicant demonstrating that concern over both environmental and structural issues are addressed.

Evidence that structural issues are adequately addressed could include the requirement that the applicant provide foundation plans approved by a Professional Engineer. This would verify that the foundation and structure will be stable and will not slide down to adjacent property. Most professional engineers would not approve such foundation plans without the benefit of some type of geo-technical evaluation of each building site.

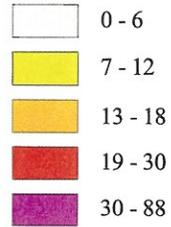
Evidence that erosion and sedimentation issues are addressed could include imposing the requirement that a Storm Water Pollution Prevention Plan (SWPPP) be submitted when construction of a principal use on slopes greater than 12% is proposed.

Franklin Township Summit County

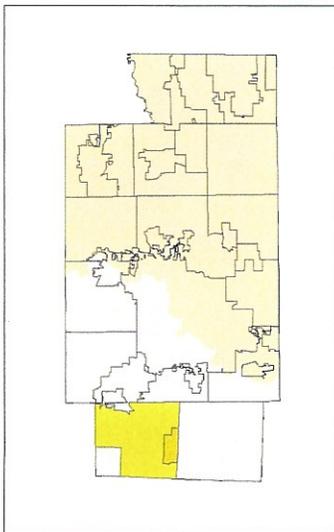
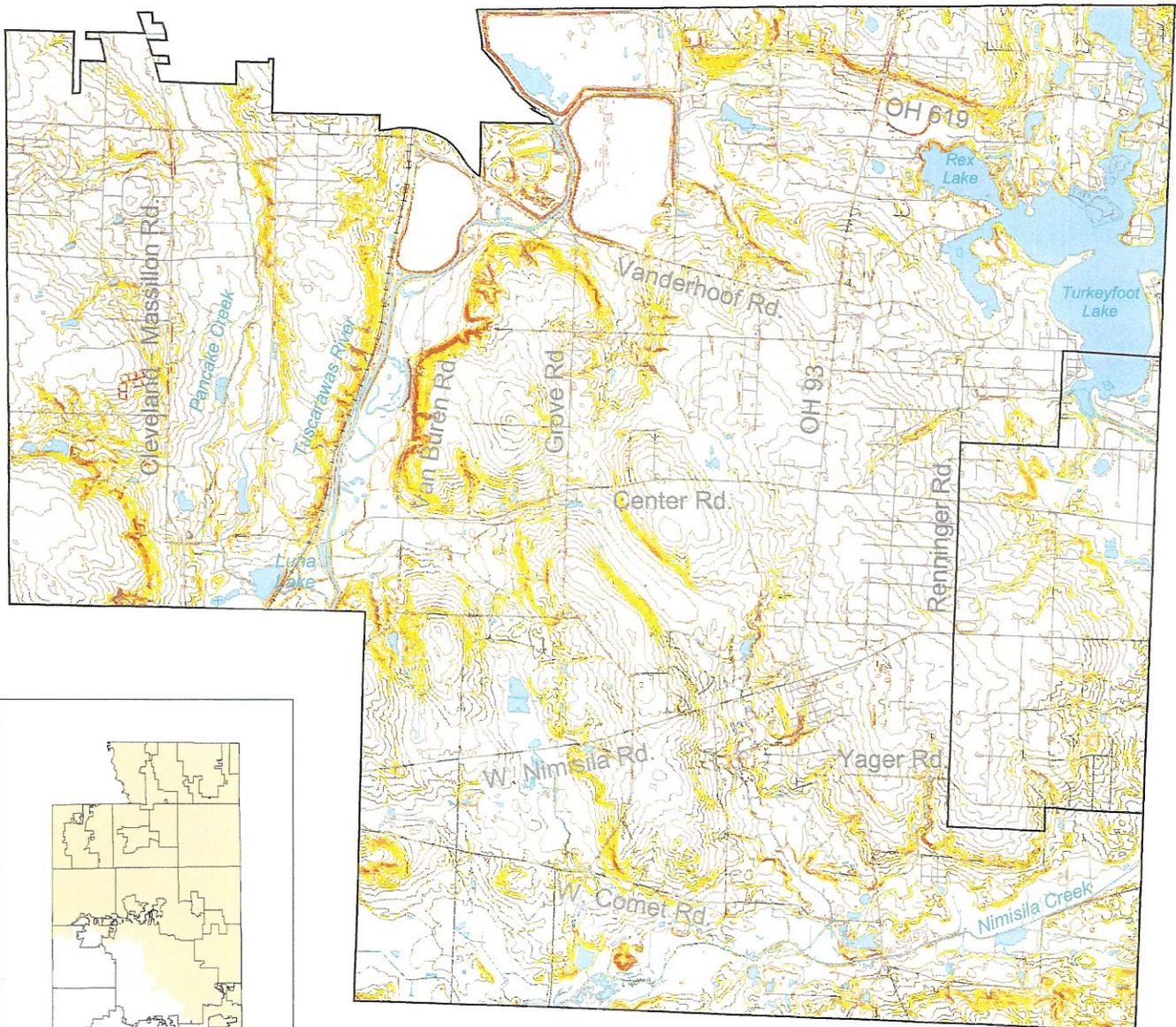
Topography and Steep Slopes

Map 10

Slope Percentage



Data Source: Summit County, Davey Resource Group



DAVEY 
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0.5 0 0.5 1 1.5 Miles



Map Projection: Ohio State Plane North; NAD 83

Wetlands

Traditionally, wetlands were viewed as marginal areas with no value unless drained and filled. These perceptions led to alteration, draining, and filling of many wetlands, including some in the study area. Such perceptions are rapidly changing. The current thinking generally is that wetlands provide valuable environmental functions and social benefits that include water filtering, flood storage, and supporting diverse communities of flora and fauna.

Wetlands are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration to support a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands are important for floodwater storage, filtration and purification of water, ground water recharge, wildlife use, recreation (hunting and fishing), and commercial use (fur and fish harvesting). It is reported that 40% of endangered species and 60% of federally listed threatened species utilize wetlands at some point in their life cycle.

We basically have five types of wetlands in Ohio:

- Wet meadows (assorted herbaceous grasses)
- Marshes (reeds and rushes such as cattail)
- Scrub/shrub wetlands (dogwood, alder, swamp rose, buttonbush)
- Lowland woods (pin oak, swamp white oak, ash)
- Bogs and fens (sphagnum moss, pitcher plants, sumac, tamarack)

The presence of wetlands often coincides with the occurrence of hydric soils and non-hydric soils with hydric inclusions. Wetlands are delineated based on hydric soils, the presence of wetlands hydrology, and the dominance of hydrophytic vegetation. Hydric soils, as identified in the Soil Survey of Summit County, were also used as part of the study.

To date, the State of Ohio has lost over 90% of its original wetlands and significant wetland acreage has been lost or degraded in Northeast Ohio due to draining, dredging, filling, excavating, and other acts.

Wetlands protect the public health and safety of Franklin Township residents by:

1. Reducing peak flood flows, storing flood waters, and maintaining stream flow patterns.
2. Minimizing streambank erosion by reducing runoff volume and velocity.
3. Protecting ground water quality by filtering pollutants from storm water runoff.
4. Recharging groundwater reserves.
5. Maintaining surface water quality by minimizing sediment pollution from streambank erosion, and trapping sediments, chemicals, salts, and other pollutants from flood waters and storm water runoff, and,
6. Providing habitat for aquatic and terrestrial organisms, many of which are on Ohio's endangered and/or threatened species listings.

Wetlands cannot continue to provide these functions unless protected from the effects of fluctuations in storm water flow; urban pollutants; disposal of fill or dredged materials; and other impacts of land use change. Furthermore, the replacement of the public health and safety benefits of wetlands including flood control, erosion control, ground water recharge, and water quality protection, if possible, will require significant public expenditure.

Because wetlands hold exceptional environmental value, Federal law regulates the discharge of dredged or fill material into waters of the United States, including wetlands. These regulations are found under Sections 401 and 404 of the Clean Water Act. In Ohio, the Ohio EPA and the U.S. Army Corps of Engineers are in charge of the wetlands regulatory program.

Most wetlands fills will require some form of mitigation. Mitigation is the creation and/or restoration of wetlands to replace wetlands that are lost to development. Assessments of the function and quality of wetlands are required in order to determine the appropriate level of mitigation that should be required. To assess wetlands, Ohio EPA has developed the Ohio Rapid Assessment Method for Wetlands (ORAM) which categorizes wetlands into categories:

- *Category 1 Wetlands* – Characterized by low species diversity, no significant habitat, limited potential to achieve beneficial wetland functions, a predominance of non-native species, and hydrological isolation.
- *Category 2 Wetlands* – Wetlands that support moderate habitat or hydrological or recreational function but are generally without the presence of, or habitat for, rare, threatened, or endangered species.
- *Category 3 Wetlands* – Wetlands with superior habitat and hydrological of recreational functions which contain habitat for rare, threatened, or endangered species such as mature forested wetlands, vernal pools, bogs, and fens.

Map 11 shows wetlands in Franklin Township. Wetlands were mapped using Summit County GIS aerial photos with two-foot contours and water features. The Summit County Soil Survey was also used to assist in determining wetlands areas. All wetlands that could be seen on the GIS mapping were mapped. Large wetlands, as well as small wetlands that had standing water at the time the aerial photographs were flown, were easily mapped. Other wetlands, such as lowland woods and wet meadows with saturated soils, were more difficult to discern. Ground truthing would be needed to more accurately determine the status of many of these areas. The mapped wetlands represent only a portion of the total amount of wetlands within Franklin Township. This mapping should be considered an approximation of wetlands locations and sizes within the Township. It is intended for planning purposes to give Franklin Township an idea of where wetlands might be.

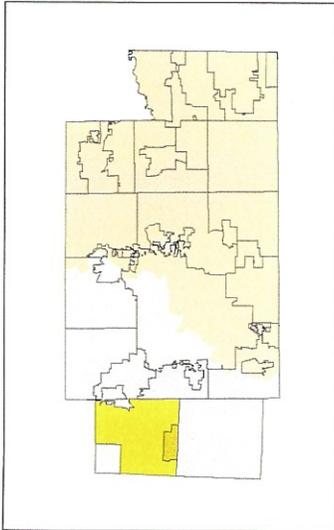
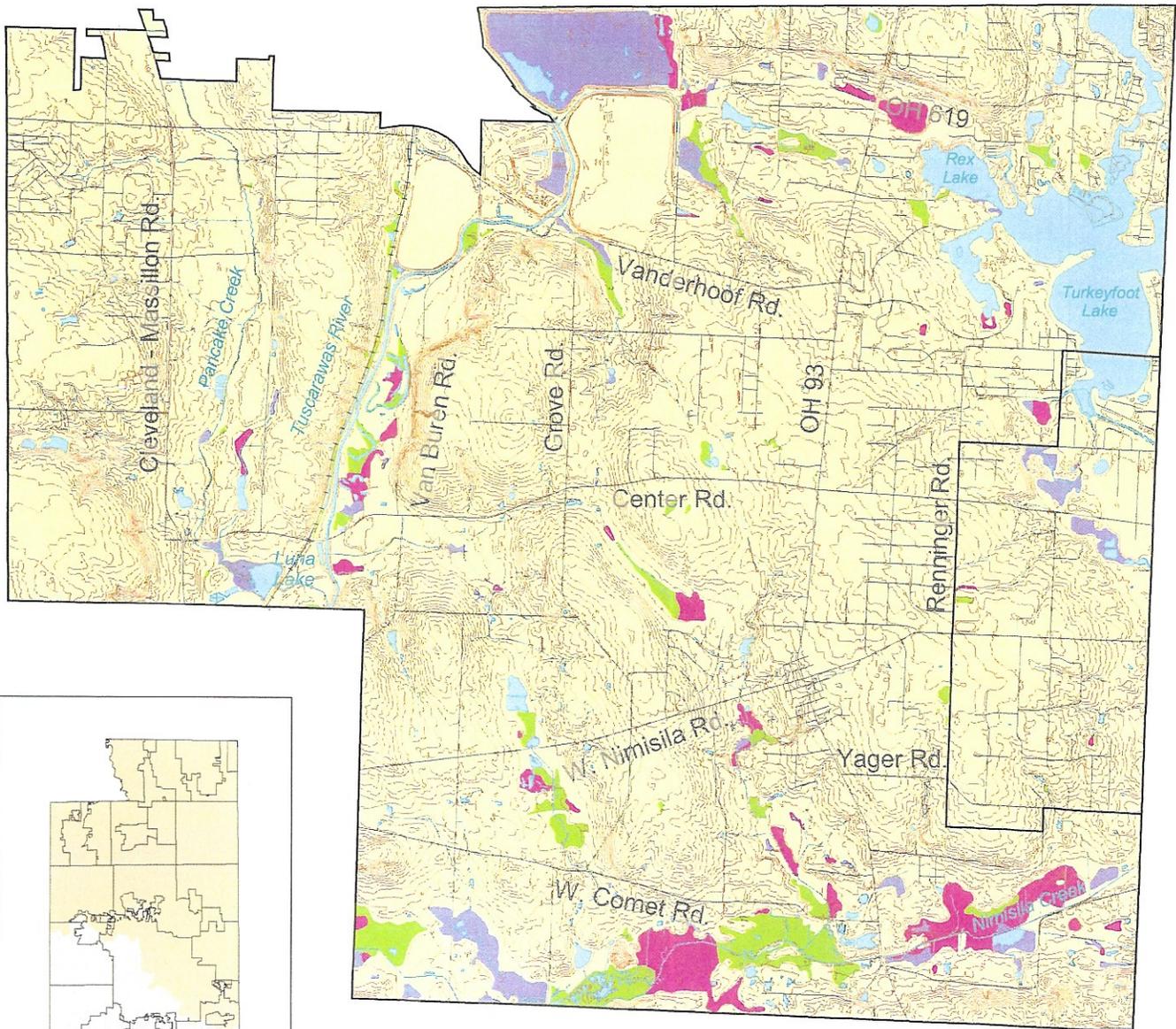
Franklin Township Summit County

Map 11

Wetlands

-  Marsh
-  Lowland Woods
-  Shrub / Scrub

Data Source: Davey Resource Group



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A Division of The Davey Tree Expert Company



0.5 0 0.5 1 1.5 Miles



Map Projection: Ohio State Plane North; NAD 83

Seven percent of Franklin Township is covered by wetlands —3% emergent marsh, 2% lowland woods, and 2% scrub/shrub wetlands.



This wetland system is made up of marsh, lowland woods, and scrub/shrub wetlands.

Franklin Township has extensive wetlands areas along the Tuscarawas River and particularly along Nimisila Creek. Many of these wetlands are large and consist of lowland woods, scrub/shrub wetlands, and marshes. Other wetlands occur along and near Portage Lakes. The larger wetlands are generally diverse and relatively high quality. These areas provide important flood control, water purification, ground water recharge, and wildlife functions. There are relatively few small, isolated wetlands above the valleys due to the steep topography found throughout the Township.



Extensive wetlands are found along Nimisila Creek.

Current wetlands regulations do not require that buffer zones be maintained around preserved wetlands. It is a preliminary recommendation that Franklin should enact legislation to establish wetlands setback of its remaining wetlands. Suggested wetland setbacks:

- a minimum of 120 feet surrounding all Ohio EPA Category 3 Wetlands
- a minimum of 75 feet surrounding all Ohio EPA Category 2 Wetlands

It is a preliminary recommendation that Franklin Township adopt a policy of no net loss of wetlands within the Township for mitigation required for destroyed wetlands. Wetlands regulations can be combined into one or more general conservation or sensitive lands zone districts. The purpose is to preserve and protect existing riparian areas and wetlands from degradation and environmental damage, to restore the quality of degraded and damaged wetlands, and to plan and control development around wetlands with acceptable levels of quality and ecological character.

It is also a preliminary recommendation that Franklin Township restore wetlands. Potential approaches include:

- *Restoration*—Restoring an area that was historically wetlands back to its original state; e.g., removing field tile or diverting drainage to allow water back into a characteristically poorly drained soil or removing fill from a wetlands area that was previously filled in.
- *Enhancement*—Improve the functioning of an existing wetlands by removing non-native nuisance species from a wetlands or supplying additional water into marginal wetlands.
- *Preservation of existing wetlands*—Typically the wetlands to be preserved are exceptionally high quality ecosystems that provide good wildlife habitat, recreation, or flood storage.
- *Creation*—Wetlands can be created where no wetlands previously existed by excavating a shallow basin and diverting a known source of water into it, spreading appropriate soil over the bottom of the basin, and then planting with native wetlands vegetation.

Hydric Soils

Hydric soils are formed over time under conditions of inundation and/or saturation. The soils will retain hydric characteristics even after draining; therefore, the areas of hydric soils are often more extensive than the associated wetlands. Drainage can be a result of land use, such as tiling and dredging of stream channels, or natural causes such as the natural down cutting of stream channels over long periods of time. Some non-hydric soils contain small wetlands and “inclusions” of associated hydric soils in depressions, along drainage ways, and in other areas, that are too small for mapping on the soil survey maps.

Twelve percent of the Township has hydric soils and four percent has non-hydric soils with hydric inclusions (see Map 12). These soils are non-hydric, but can have small hydric soils in depressions, along drainage ways, and in other areas. Hydric soils are generally limited to areas along larger streams and drainage ways, and generally correspond with wetlands areas. Non-hydric soils with hydric inclusions are scattered throughout the Township, especially on the relatively level, higher ground above the streams. Small, isolated wetlands can be expected to occur in these areas.

Hydric soils and non-hydric soils with hydric inclusions are often not suitable for building because of stability concerns, frequent association with wetlands, permeability characteristics that preclude septic tank use, and other septic system problems. Hydric soils affect development by their poor drainage. These soils can be developed if proper drainage is provided. Ditching and tiling are usually necessary. Most of these soils will pond surface water, so proper grading is also important. Heavy clay soils tend to swell when wet and shrink during dry periods. This can result in cracks and settling in foundations and concrete roads and driveways.

It is a preliminary recommendation that Franklin Township require specific soils information as part of the development review process.

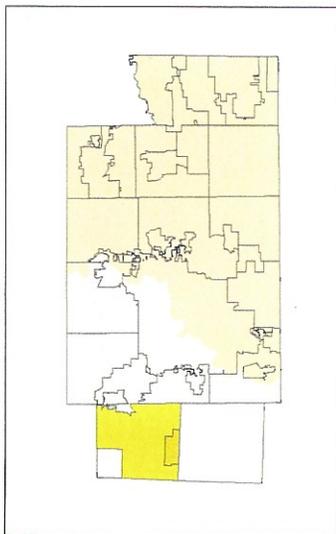
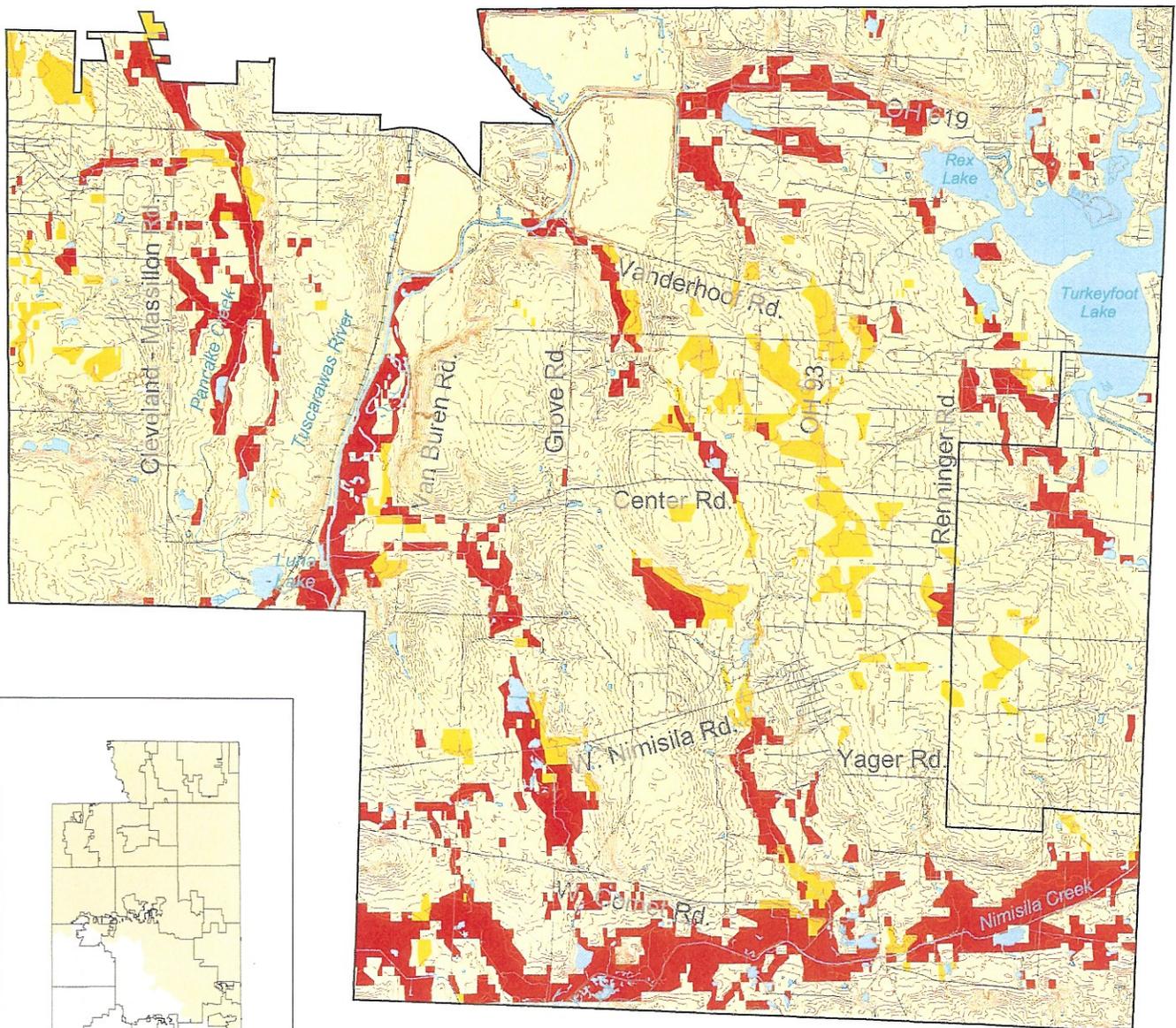
Franklin Township Summit County

Map 12

Hydric Soils

-  Hydric Soils
-  Non Hydric Soils with Hydric Inclusions

Data Source: Soil Survey of Summit County, 1990



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Map Projection: Ohio State Plane North; NAD 83

SOILS SUITABLE FOR SEPTIC

Less than 1% of the land within Franklin Township has soils which are suited for septic tank absorption fields, and 23% of the soils have moderate limitations. Common limitations include a seasonal high water table, restricted permeability, poor natural drainage, the hazard of flooding, excess slope, and a shallow depth to bedrock. Soils with very slow or moderately slow permeability are rated as having severe limitations for septic system use. Restrictive layers such as bedrock are also a severe limitation. Septic systems placed on slopes greater than 12% may result in erosion and seepage downslope. The high seasonal water table, common within somewhat poorly drained, poorly drained, and very poorly drained soil types, prevents the proper functioning of septic disposal fields for varying time periods.

Unfortunately, many of the soils suitable for septic are located on alluvial soils near streams and drainage ways, particularly the Tuscarawas River and Nimisila Creek. These alluvial soils tend to be sandy and well-drained, which is good for septic systems, but these areas pose other problems for septic tank absorption fields such as flooding and groundwater contamination.

Septic systems rely on the soil for treating waste. An accurate evaluation of the soil is needed to ensure that a septic system will not fail. Information on the depth of the soil and how quickly it will absorb water is required to determine the suitability for septic systems.

Septic systems placed on soils which have a sand or gravel substratum may result in groundwater contamination. Map 13 shows soils suitable for on-site septic systems.

Proper siting, maintenance, and operation of home sewage disposal systems are critical to ensure proper functioning. Leaks from these systems can travel through the subsurface soils and can contaminate groundwater supplies. Regular inspection, maintenance, and pump-out is necessary to avoid failing septic systems, yet local governments often refrain from aggressive enforcement of these activities in privately owned systems. Educating homeowners on the importance of these activities is a first priority. Some jurisdictions have charged homeowners a maintenance fee in exchange for inspection, maintenance, and education programs. Others have instituted revolving loan programs to provide low-cost loans to repair failed systems. At a minimum, stringent siting and technology criteria should be enforced and followed by a post-installment inspection.

Franklin Township Summit County

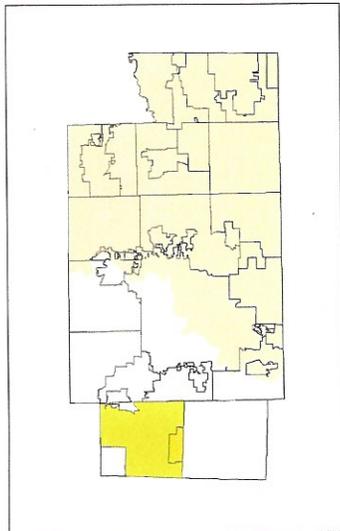
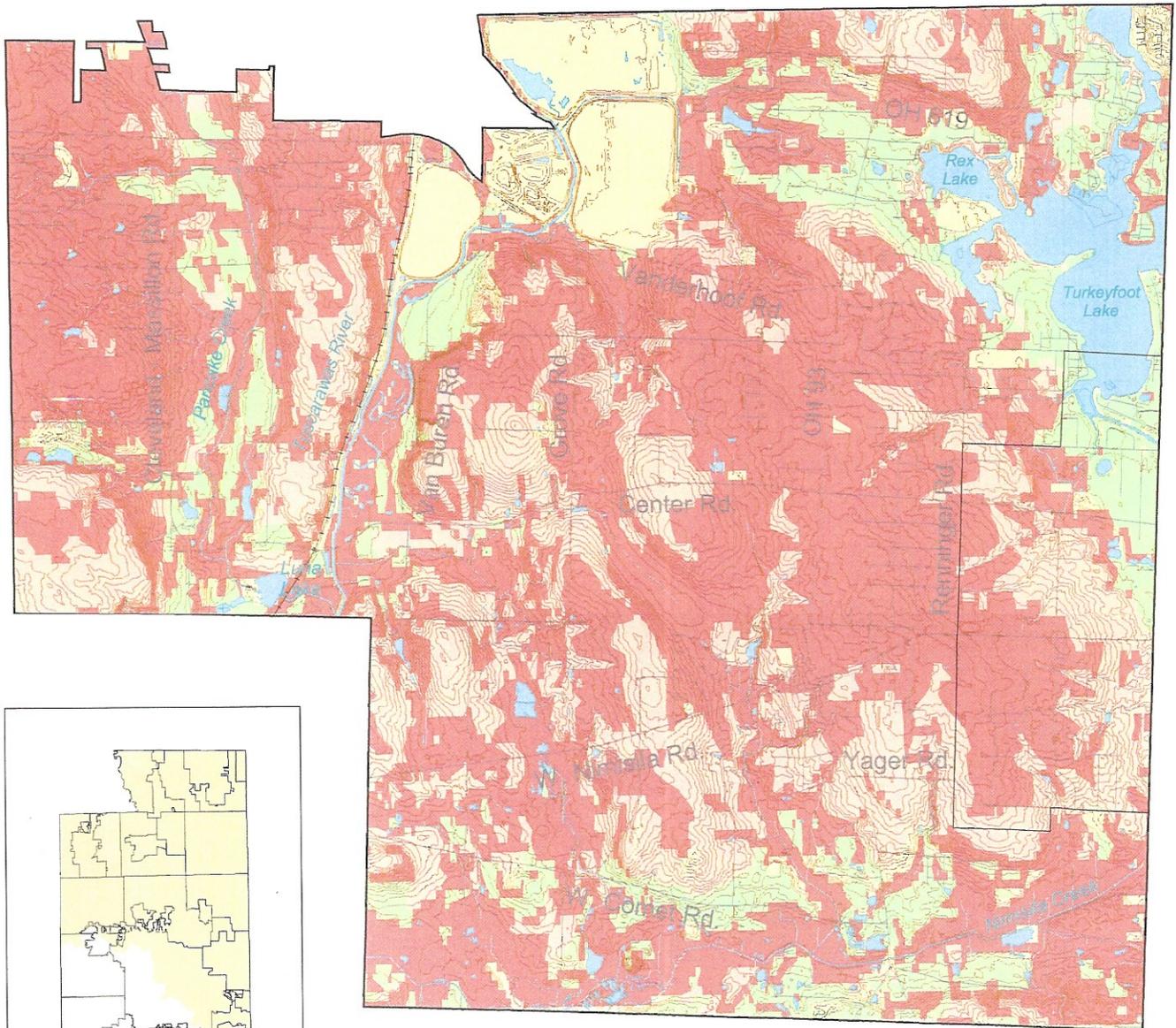
Map 13

Soils Suitable for Septic

Soil Limitations for Septic

- Slight
- Moderate
- Severe

Data Source: Soil Survey of Summit County, 1990



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Map Projection: Ohio State Plane North; NAD 83

Glacial Geology and Groundwater Resources

Groundwater resources are important to understand because of their potential to supply public drinking water and also their hydrologic connection to surface waters. Groundwater flows through surficial sediments and bedrock. Where the groundwater is near the surface, it often interacts with surface waters, flowing through streams, wetlands, and water bodies. Groundwater often provides water to surface water resources and may also be recharged by water from surface water bodies.

Groundwater most easily flows through and is stored in materials that have interconnected pore space between particles, such as well-sorted sands and gravels of glacial outwash and certain sandstones. Geologic formations capable of yielding substantial groundwater supplies are considered aquifers. Groundwater in surficial deposits, especially sand and gravel, is most susceptible to pollution.

Map 14 presents the groundwater resources of Franklin Township. Much of the study area is underlain by the moderately-yielding Sharon conglomerate,¹ with yields of 25-50 gallons per minute (up to 72,000 gallons per day), adequate to support wells supplying several hundred people.² Map 14 indicates that the aquifer supports numerous public wells, with several serving more than 200 people. Along Nimisila Creek is a relatively narrow band of high-yielding outwash (well-sorted sand and gravel deposited by glacial streams), with yields greater than 100 gallons per minute (144,000 gallons per day). Although it is not currently used for public water supplies, this outwash deposit could represent a substantial water source for portions of the Township.

Groundwater represents an important source of potable water, which can become seriously contaminated from pollution sources at the ground surface. Cleanup of groundwater contamination can be extremely costly and difficult. Map 14 presents two identified sites of toxic release. There are likely other potential sources of contamination within the Township, ranging from major hazardous materials sites to leaking underground storage tanks. The Nimisila Creek aquifer is most susceptible to contamination because it occurs in the well-sorted surface deposits of sand and gravel. Bedrock groundwater supplies are less susceptible to contamination than surface supplies, but bedrock aquifers can become contaminated if pollutants can flow into the bedrock, e.g. along fissures or layers.

To protect the water supply of Franklin, it is recommended that the Township promote appropriate handling and storage of potentially toxic materials, including household hazardous waste. Protecting the Nimisila Creek corridor through land use controls would help protect the Township's high-yielding sand and gravel aquifer in addition to the numerous other important resources found along the riparian corridor of Nimisila Creek.

¹ Throughout much of the Township, the Sharon Conglomerate is found 100 feet below the surface, underlying a lower-yield formation that is only adequate for domestic or farm use.

² Domestic water use requires approximately 65-75 gallons per person per day. Groundwater supplies yielding from 3 to 10 gallons per minute are considered adequate for domestic and farm use.

Franklin Township Groundwater Resources

Map 14

Groundwater Yields (Gallons per Minute)

- Greater than 100 gpm
- 25 - 50 gpm
- Less than 25 gpm
- Seldom greater than 3 gpm

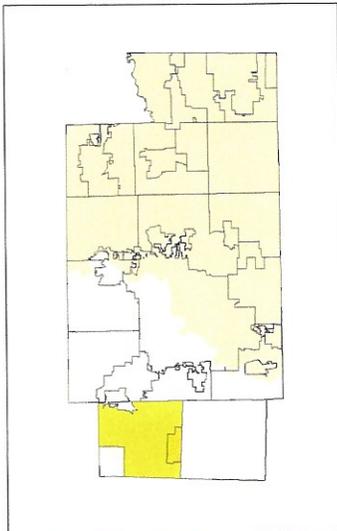
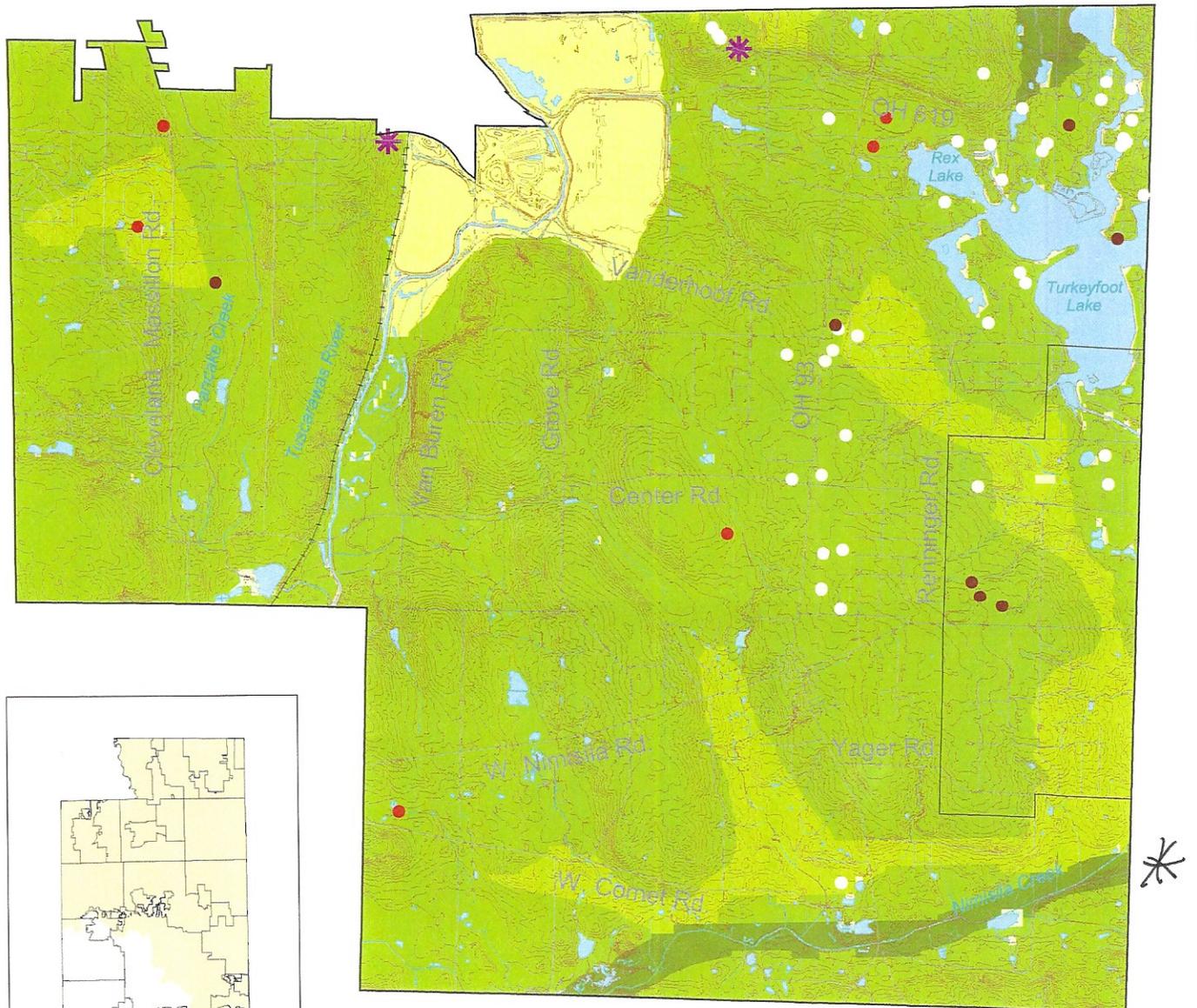
Public Water Supply (Population Served)

- 409 - 600
- 217 - 408
- 25 - 216

Toxic Release Inventory (TRI) Sites



Data Source: Ohio DNR, U.S. EPA



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Map Projection: Ohio State Plane North; NAD 83

Clean water is essential to life. Watercourses are the circulatory systems of our communities. Given Franklin Township's dependence upon groundwater wells for drinking water, the quality of its groundwater resources has a direct impact upon public health and safety. In so protecting its watercourses, the groundwater resources that ultimately receive recharge from these sources are also protected.

By recognizing and incorporating the interchange between surface water and groundwater, a healthy environment will be provided to all citizens of the Township. Specifically, the quality and composition of groundwater can be affected by both natural processes and human activity. As water infiltrates the ground and moves through the aquifer systems, it picks up minerals and other natural or man-made substances that may seep from the surface and carries them in the solution.

By working together, the residents of Franklin Township can take steps to preserve and protect their groundwater, helping to ensure that an adequate supply of good quality groundwater will continue to be available for future generations. A comprehensive groundwater protection policy should be published in a document clearly defining the Township's policy with regards to its groundwater resources. The overall goal of the resolution should be to protect Bath's potable water supplies from the dangers of drought, contamination, overdraft, and mismanagement. This resolution may include such items as development limitations over vulnerable parts of the aquifer, guidelines for underground storage tank installation, maintenance, and removal, and the safe storage of hazardous chemicals.

Public participation in groundwater resource protection can be fostered by a community education program that encourages good stewardship of the aquifers. A variety of community outreach and education programs are possible. Some may include:

- Formation of a township-wide drinking water protection committee
- Education programs for homeowners (for example, education on the link between residential activities and groundwater impacts and in the proper use/maintenance of septic systems and water wells)
- Education programs for children (fostering good stewardship of drinking water sources among children is critical and leads to adult education via parent-child discussions)
- Implementation of a semi-annual residential waste collection day; many communities have initiated waste collection days to encourage homeowners to properly dispose of hazardous materials

Threatened, and Endangered Species

Certain species and habitats are rare or threatened in Ohio or nationally. They are important to protect and are afforded some protection through federal, state, and local regulations. Protection of species generally requires protection of the habitat in which they live, minimizing impacts from disturbance, and provision of adequate migration routes.

These data may be used to identify areas for protection, impact minimization, or restoration. It may be used as an initial assessment of impacts of large proposed projects or other landscape alterations, but is no substitute for field investigation for potential habitats and species of concern.

The Ohio DNR Division of Natural Areas and Preserves (DNAP) Natural Heritage Data Services was queried for any records of rare, threatened, or endangered species in Franklin Township. The databases from which this information was gathered are incomplete and only represent observed occurrences within the Township.

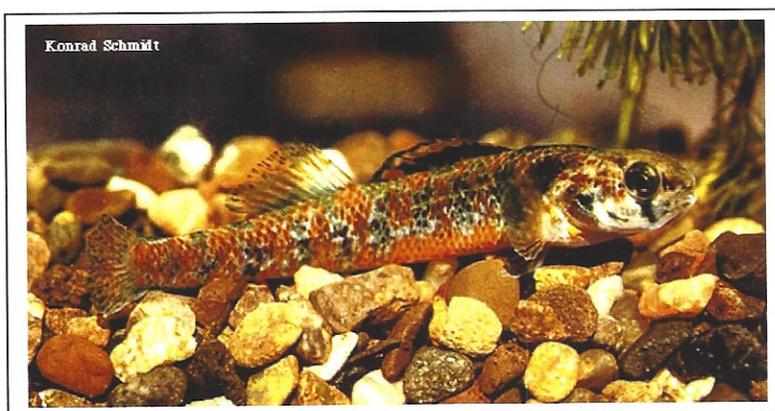
Map 15 shows the location of special interest animals and endangered and threatened plants. It should be noted that the databases from which this information was gathered are incomplete. The DNAP inventory program relies on information supplied by individuals and organizations; not all areas have been surveyed. Many of the noted species are found in Portages Lakes State Park. It is possible that additional rare species are present in Franklin Township, but have not yet been identified.

Table 5 lists special interest animals in Franklin Township, Summit County.

Table 5: Special Interest Animals

Scientific Name	Common Name
<i>Anas crecca</i>	Green-winged teal
<i>Oxyura jamaicensis</i>	Ruddy Duck
<i>Gallinago gallinago</i>	Common Snipe
<i>Etheostoma exile</i>	Iowa Darter

Source: Ohio Division of Wildlife



The Iowa darter is a slow-water species that occurs among vegetation and often cover flocculent bottoms in lakes.



The green-winged teal on the left and the common snipe on the right are two special interest animals that make the wetlands and open water areas in Franklin Township their habitat.

Table 6 lists state endangered and threatened plants in Franklin Township.

Table 6: State Threatened and Endangered Plants

Status	Scientific Name	Common Name
T	<i>Helianthemum bicknellii</i>	Plains Frostweed
P	<i>Helianthemum canadense</i>	Canada Frostweed
T	<i>Lechea intermedia</i>	Round-fruited Pinweed
E	<i>Hypericum canadense</i>	Canadian St. John's Wort
P	<i>Castanea dentate</i>	American Chestnut
P	<i>Larix laricina</i>	Tamarack
P	<i>Deschampsia flexuosa</i>	Crinkled Hairgrass
P	<i>Panicum laxiflorum</i>	Pale-green Panic-grass
E	<i>Potamogeton friesii</i>	Fries' Pondweed
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed
P	<i>Potamogeton zosteriformis</i>	Flat-stem Pondweed

Key :

E = State Endangered

T= State Threatened

P = Potential Threatened

Source: Ohio Division of Natural Areas and Preserves

In addition to the species named above, three federally listed species are known to range over Summit County: the federally endangered Indiana bat (*Myotis sodalis*), the federally threatened bald eagle (*Haliaeetus leucocephalus*), and the federal candidate for listing Eastern massassauga (*Sistrurus catenatus catenatus*). There are no records of these species within the Township. However, efforts should be made countywide to preserve any remaining habitat suitable for these species.

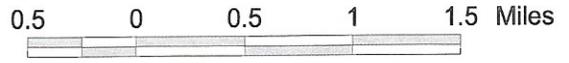
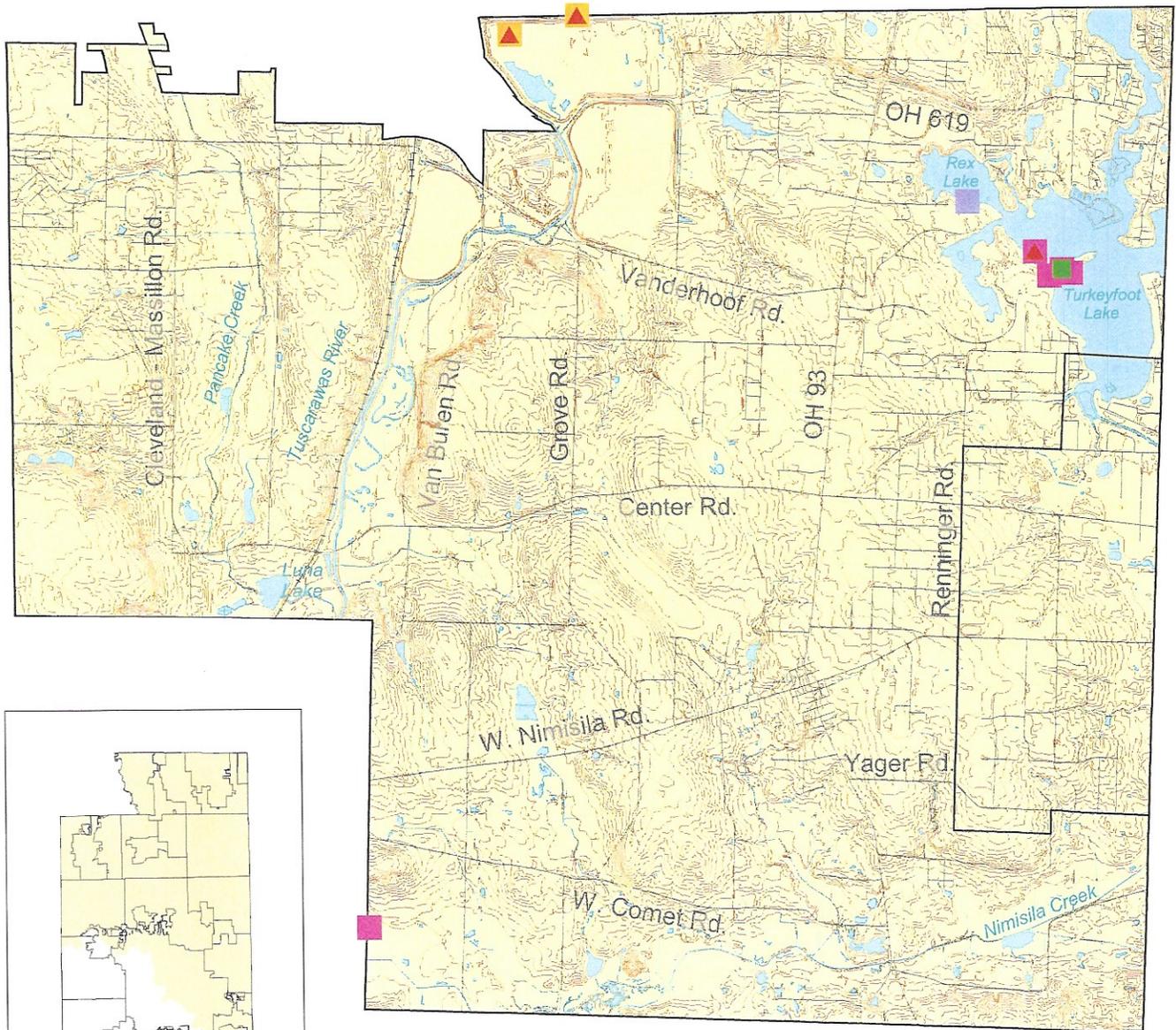
Franklin Township Summit County

Map 15

Rare, Threatened, and Endangered Species

- State Endangered Plants
- State Threatened Plants
- State Potentially Threatened Plants
- Special Interest Animal and Potentially Threatened Plants
- Special Interest Animals

Data Source: Ohio DNR



Map Projection: Ohio State Plane North; NAD 83

As concern for this species grows, many state and federal regulators have begun to take protective measures. Many projects that require the acquisition of state or federal permits or that are funded via public money are now restricted in that construction and tree clearing may not be conducted during the summer season when this species is vulnerable to disturbance.

The best way to restore most wildlife habitat and corridors is to allow natural succession to take its course, with very limited planting and maintenance. Non-native, invasive plant species such as *Phragmites australis* (common reed) and *Polygonum cuspidatum* (Japanese knotweed) may need to be removed in some areas. Even a narrow corridor will provide continuity through urban and disturbed areas and allow many plant and animal species to move and migrate.

Open spaces that are left in a natural condition should be adequately connected with neighboring riparian corridor areas. In order to ensure the health and vitality of wildlife corridors, zoning standards should incorporate provisions that recognize the need for connected open space corridors. Provisions within zoning standards and open space subdivision design regulations can recognize the importance of connecting these open spaces. In particular, provisions have been made to conserve parallel open spaces as well as adjoining and existing rights-of-ways. In so doing, further promoting unfettered movement of local plant and animal species.

Conservation development, or open space subdivision design, is one of many tools for preservation of open space that is critical for habitat. Conservation development provides for partial open space preservation while allowing for development to occur. Environmental benefits are maximized by dedication of sensitive lands as open space that is in large contiguous zones linked together, with minimum fragmentation.

Conventional development produces house lots and streets, but conservation development or open space subdivisions create the same overall density while also preserving 50% or more of the site in open space. This creates a more attractive and pleasing built environment that will sell for more money, easier and faster than traditional development. Conservation development projects are simply better places to live and to work. It is a preliminary recommendation that Franklin consider making conservation development the preferred land use pattern.

To make conservation development a reality, Franklin Township should make it the easiest way possible to develop. With PUDs and conditional use, there is no guarantee that anyone will ever do one of these projects. Bath Township in Summit County decided to make conservation development the permitted use and conventional development the conditional use – a flip-flop of what other communities are doing. To do this, preferred open space dedications for all undeveloped lands in the community were mapped based on ecological integrity – saving the best of the last – and on function – in terms of public health and safety issues. The idea was to make clear which elements of the landscape to maintain. Clear design guidelines were written, and all of these data are being put up on the Internet to be downloaded by applicants. So now, if you want to develop in Bath, conservation development is permitted. You are required to preserve 50% in open space. There are no minimum lot requirements. All the data that you need to do a good project is provided. Time consuming public hearings are eliminated, making conservation development the easiest way possible to develop. So this is one solution to enable developers to do open space subdivision design.

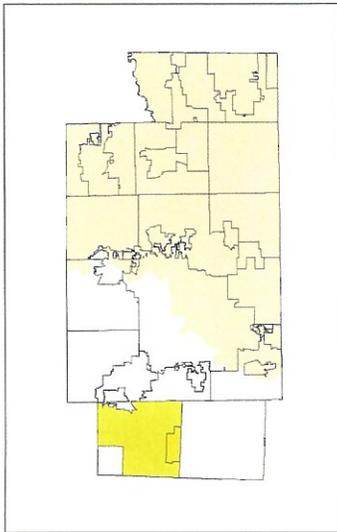
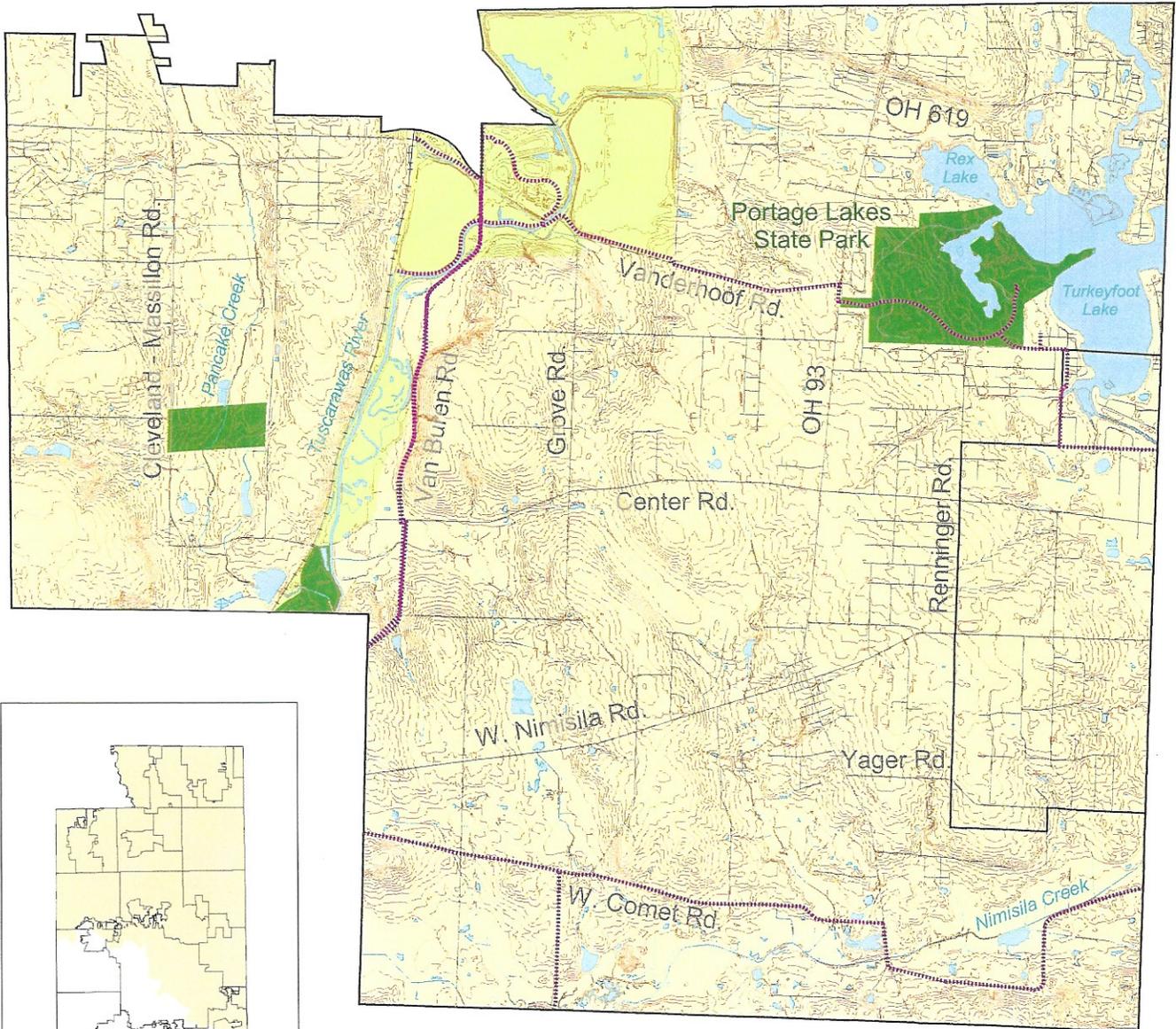
Preferred open spaces should be mapped and linked to existing and proposed parks, trails, and greenway (See Map 16.) In addition, Franklin Township might want to consider adding other riparian corridors to its proposed greenways.

Franklin Township Summit County

Parks and Greenways

-  Parks
-  Proposed Greenways
-  Proposed or Existing Trails

Data Source: Summit County Trails & Greenway Plan



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Map Projection: Ohio State Plane North; NAD 83

Environmental Constraints to Development

Map 17 shows a composite of environmental constraints to development (wetlands, floodplains, hydric soils, and steep slopes). This map suggests that 20% of the Township is environmentally constrained.

In addition, about 60% of the Township contains environmentally sensitive areas (woodland resources, riparian corridors, and high groundwater resources). Of the remaining potential development areas, 62% is environmentally sensitive.

Environmental constraints to development and environmentally sensitive lands are critical to determining buildout of Franklin Township. Using existing land use in the Township and considering undeveloped parcels and parcels in agricultural use and parcel over 20 acres as potential development areas, buildout can be estimated by multiplying the land area for the potential development by the minimum lot area requirement for the zoning district. Ideally, development should be directed to the 2,165 acres of the Township that is neither environmentally constrained nor environmentally sensitive.



There are numerous large agricultural lots that are potential development areas.

If we remove environmentally constrained lands from potential development areas, buildout changes. Based on environmental public health and safety issues, the number of people supported can be changed via land use controls and acquisitions and easements.

To determine buildout, Franklin Township will need to look at supply and demand:

1. Deriving Location Requirements (how current zoning and subdivision regulations specify where land use is to be located)
2. Mapping Land Suitability (guidelines for usage based on physical characteristics of land)
3. Estimating Space Requirements (determining demand for space given population & employment trends)
4. Analyzing Holding Capacity (ability to accommodate functions based on characteristics of land and density you want to develop)
5. Designing Alternative Land Use Designs (standards for balanced supply/demand and quantity/location)

This necessitates assumptions about future population and employment levels and the characteristics of future residential, industrial, and commercial development.

Summit County is currently using these data and *What If?* planning support system software to exploring alternative community development scenarios and depicting possible future land use patterns.

What If? is a software modeling and mapping program that allows us to visualize potential land use patterns. The program depicts *what* could happen *if* certain policy choices are made, such as land use controls or provision of infrastructure (sewer, water, roads) and assumptions about the future prove to be true (e.g., growth patterns continue).

The software models land use scenarios by assigning projected *demand* for the land (e.g., housing, commercial development) to *supply* of available land, as affected by factors such as infrastructure, land suitability, open space acquisition, and land use controls. The program uses Geographic Information System (GIS) software, which allows us to include available electronic mapping and change the outcomes based on the assumptions we apply to the different mapped features. For instance, we can show the effects of developing or preserving floodplains or farmland or changing density near a groundwater resource or highway.

Summit County will be modeling the following three alternative scenarios to depict possible impacts of land use measures on future land use patterns:

- No change to current land use controls and open space protection
- Use of as many measures as possible for environmental protection and open space acquisition
- A middle-ground scenario that incorporates certain resource protection measures that the steering committee feels might realistically be implemented

Each scenario will be depicted in maps, charts, and tables. These will represent *examples* of how land use could change under different scenarios, not necessarily as policy recommendations.

The model will incorporate the following *assumptions*:

- *Future growth trends* based on projections of population and employment
- *Potential development areas* such as existing undeveloped and agricultural land
- *Growth patterns* based on historical observations

The modeling will evaluate policy choices, including:

- Type, density, and distribution of land use through zoning and other land use controls appropriate to each scenario. Land use allocation under each scenario will be determined by dividing the land area for the potential development by the minimum lot area requirement for the zoning district. *What If* also allows the order of development to be specified (e.g., commercially zoned land immediately adjacent to an interchange might be shown as developed before land further away)
- Restrictions based on natural resources or constraints
- Removing land from development by open space acquisition or other means
- Provision of infrastructure

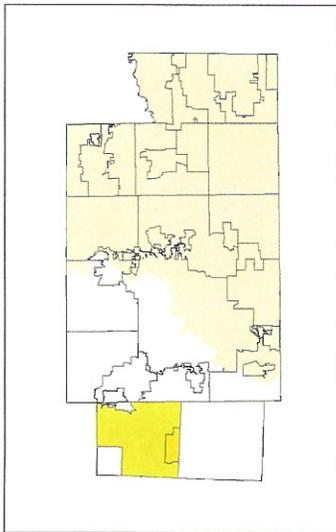
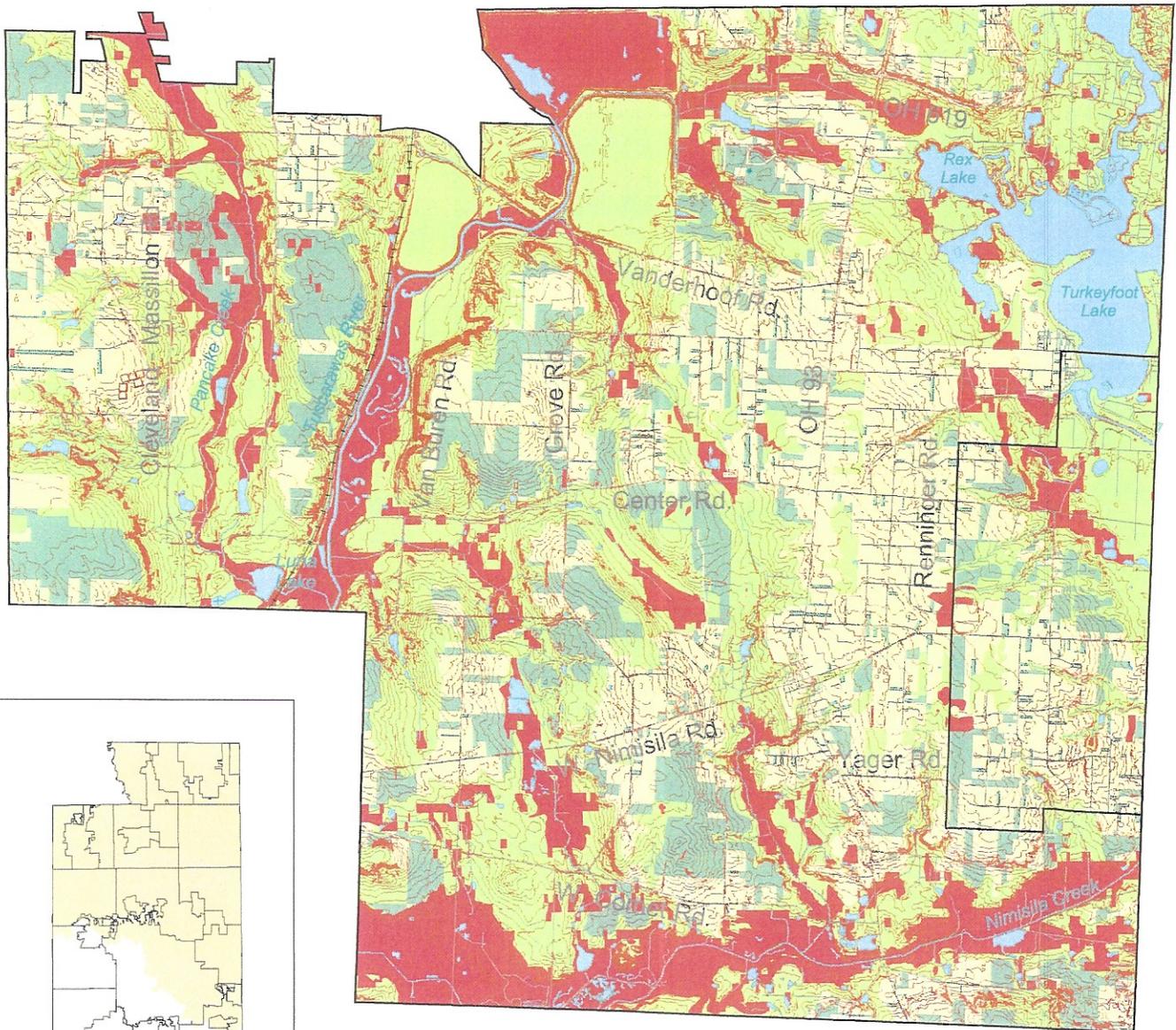
Franklin Township Summit County

Map 17

Environmental Constraints to Development and Environmentally Sensitive Lands

-  Environmental Constraints to Development
-  Environmentally Sensitive Lands
-  Unconstrained Potential Development Areas

Data Source: Davey Resource Group



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Map Projection: Ohio State Plane North; NAD 83

Key Issues

Key issues are identified in Table 7. Protecting resources will help ensure the provision of public health and safety functions. In addition, these natural features improve the quality of life in the community and translate ultimately into economic viability.



Development in Franklin Township should be planned to occur in areas that do not contain sensitive natural resources.

Natural areas that can be protected based on public health and safety values include flood plains, wetlands, changeable ground surfaces, areas with high water tables, and areas subject to landslides. Other zones that can be protected include wetlands and wetlands transition areas, steep slopes, high ground water pollution potential areas, and aquifer recharge areas. In addition, developed canopy cover and permeable surfaces reduce the incidence and severity of floods, reduce soil erosion, and improve surface and groundwater quality.

Protecting natural resources will help ensure the provision of valid public health and safety functions and avoid the costs of environmental degradation. In addition, these natural features improve the quality of life in the community and translate ultimately into economic viability.

Table 7: Key Issues and Recommendations

Key Issues	Recommendations	Rationale	Implementation
Protection of riparian corridors	Protect remaining vegetated riparian corridors Revegetate impacted riparian corridors	To protect steep slopes and critical habitat, improve water quality, and reduce flooding	Encourage stream bank tree planting and acquire riparian easements Secure funding to restore riparian corridors Consider riparian setbacks, conservation/cluster zoning, especially along streams
Protection of wetlands	Include verification of wetlands permits in the site design review process	To conserve remaining wetlands	Ensure that the site design review addresses wetlands issues Consider wetlands setbacks
Development compatible with natural resource protection	Require environmental site design review process Encourage open space developments Encourage green best management practices and other low impact development incentives	To avoid adverse impacts on remaining sensitive environments To maximize natural areas and benefits	Map and prioritize undeveloped lands based on ecological evaluation Formulate site design guidelines
Protection of urban and community forests	Strengthen tree preservation ordinance Expand duties of tree board Allocate more funding to forestry program Educate the public Develop planting program for private and public properties	Canopy cover provides numerous public health and safety benefits	Require developers to prepare tree preservation plans Provide incentives for tree planting and development Conduct public educational seminars Give preference to open space developments
Protection of steep slopes	Protect remaining vegetated slopes over 12% Revegetate steep slopes	To protect steep slopes and improve water quality	Consider making development on slopes greater than 12 % a conditional use Encourage conservation/cluster development
Protection of groundwater supplies	Regulate land use within the high pollution potential water resources	To protect groundwater supplies	Create an environmentally sensitive overlay district Consider a wellhead protection plan

Table 7: Key Issues and Recommendations (Cont'd.)

Key Issues	Recommendations	Rationale	Implementation
Degradation of stream habitat	Restore stream systems Protect remaining stream systems	To improve surface water quality	Public education Assess storm drain system for potential enhancements Consider riparian setbacks, conservation/cluster zoning, especially along streams
Nonpoint source pollution	Educate the public Include verification of stormwater pollution prevention plans (SWP3) in the site design review process Maximize vegetative cover and pervious areas	To prevent sedimentation of surface waters To decrease amount of pollutants in runoff and slow the flow of the runoff	Ensure that the site design review includes a SWP3 to specify BMPs and structural controls to minimize erosion and transportation of sediment Public education of BMPs for the general public and village administration Educate and/or require residents to stop mowing and using chemicals within riparian corridor
Protection of watershed	Participate in watershed management plan efforts	To protect from flooding	Public education of BMPs
Protection of greenways, parks, and open space	Develop greenway linkages and open space plans that provide multi-use functions and enhance the sense of community and protect sensitive natural resources	To serve the community's active and passive recreational needs To protect habitat for flora, fauna, and water quality To reduce flooding	Map contiguous open spaces and other potential corridor linkages Develop a strategy for acquisitions or easements

4

It is a preliminary recommendation that Franklin Township consider the following tools and strategies for preserving the environmental integrity of the landscape while allowing for smart growth.

Setting aside land from development:

- 1) Acquisitions
- 2) Conservation Easements
- 3) Conservation Development – preferred open space reserves (conservation development as a permitted use and traditional development as conditional)
- 4) Transfer of Development Rights

Regulating Environmental Constraints to Development:

- 1) Riparian setbacks
 - 2) Wetlands setbacks
 - 3) Limitations or conditional uses for development on steep slopes
 - 4) Prohibiting or regulating development in floodplains
 - 5) Overlays to regulate uses or limit density to maintain groundwater recharge and quality
 - 6) Overlays to regulate uses in Riparian corridors to prevent nonpoint source pollution, flooding, erosion, and sedimentation
 - 7) Overlays to regulate development in hydric soils, soils unsuitable to septic, prime farmland
 - 8) Clearing permits
 - 9) Density and intensity based zoning
- ←

Low Impact Development:

- 1) Environmentally sensitive storm water and surface water management
 - 2) Reduce residential street width, length, right-of-way widths; minimize cul-de-sacs
 - 3) Use vegetated open channels
 - 4) Lower parking ratios and parking lot imperviousness; encourage structured and shared parking; provide storm water treatment for parking lots with bioretention areas, filter strips, and other landscaped traffic islands
 - 5) Shared driveways
 - 6) Direct rooftop runoff to pervious areas
 - 7) Minimize native vegetation clearing and conserve trees
 - 8) Performance zoning
 - 9) Erosion control
- 9

It is also a preliminary recommendation that Franklin Township measure the ecological integrity and public health and safety functions of significant remaining undeveloped lands and environmental sensitive landscapes. By modeling ecological health, using the Environmental Health Matrix (EHM), lands can be prioritized for acquisition and for protection as open space dedications. By adding a relative ranking of each ecosystem based on ecological integrity, more information will be available to make decisions regarding acquisition and land use controls. Values can also be assigned to an ecosystem based on the variety of functions the land currently provides, including flood abatement, water quality protection, environmental functions such as storm water retention, and functions of urban vegetation such as oxygen production, carbon sequestering, and capture of airborne particulates.

Conclusion

As we develop the landscape, fewer natural areas are left to provide public health and safety functions, making those remaining areas with high ecological integrity more critical. Over time, as communities reach build-out, unconstrained lands that can easily accommodate development demand a premium relative to environmentally sensitive lands. As a result, developers are turning their attention more and more often to these sensitive sites.



The data collected in the secondary source review provides key issues that set the stage for environmental planning by using these analyses of natural resources to determine where development should be targeted and where preservation efforts should occur.

Environmental data is necessary to foster a grounded, solid understanding of the relationship between natural and human systems. A commitment to understanding ecosystems and our relationship to them will enable us to make more informed decisions about how to live sustainably in harmony with nature. How we use this data should reflect our connection to, and dependence on, the natural systems that surround us. Our decisions should commit us to the improvement of our stewardship of these systems.

With these data, Franklin Township can move in a better direction by:

- Developing a deeper understanding of natural landscapes, ecological health and the public health and safety functions associated with natural systems
- Incorporating natural resource data into the local land use planning in a more meaningful way
- Developing land use controls that directly implement local preferences for environmental protection

Livability benchmarks can be defined to determine what constitutes a livable community based on public attitudes. For example, benchmarks could include increasing canopy cover from 33% to 50% or attaining use designations of all watercourses.