Introduction

A primary variable in Henry County's overall quality of life is its vast base of agricultural and other natural resources. The benefits of these natural resources are many. While the County's prime soils have assisted Henry County farmers to harvest "bumper" crops, the Maumee River and access to other water resources have provided residents with ample water supplies and a source by which to recreate. It is important that these resources are preserved during periods of growth and development, and that future planning take into account their overall healthy functioning and coexistence.

Planning Issues

Additional county and local planning is absolutely necessary if the county's inventory of natural resources is to be preserved in the future and managed properly. Water issues should be addressed through expanded or new sanitary sewer service. Soils limitations relative to on-site water treatment and disposal must be more effectively addressed to protect public health, groundwater, and soils. Development should continue to be sensitive to ground water availability as well, and wetlands and woodlands should be preserved when feasible. Because planning and zoning functions in the county are primary functions of local jurisdictions, it is important that local officials have a good understanding of the location of these natural resources that may exist within their jurisdictions and pursue the feasibility of utilizing additional conservation development techniques within their overall subdivision and zoning programs.

One notable conservation group is the Henry County Pheasant's Forever, which promotes conservation buffer strips in conjunction with other county and state conservation agencies. Henry County Pheasants Forever Chapter was recognized in 2003 for outstanding work in collaborating with the Henry Soil and Water Conservation District in starting a new project called the Henry County Wildlife Habitat Improvement Project. This project promotes the sign-up and establishment of buffer strips in targeted townships with financial and seeding incentives. The Pheasants Forever chapter has committed $45,000 over three years for this program. The Henry County Pheasants Forever Chapter was recently recognized as one of 10 statewide Buffer Ohio Award Winners.

Goals and Objectives

Goal: Promote the conservation of Henry County's vast array of natural resources by:

- ✓ Developing an inventory of the County's natural resource areas, or other areas of natural or pristine significance;
- ✓ Utilizing existing federal and state programs and incentives to conserve and promote significant natural resource areas;
- ✓ Preparing standards or "model" development guidelines to minimize the impact development may have on existing woodlands, wetlands, floodplains, and other significant natural areas;

- ✓ Discouraging development in the 100-year base floodplain, as well as minimizing the alteration of existing floodplain boundaries;
- ✓ Encouraging the use of natural and man-made buffers along waterways and tributaries;
- ✓ Ensuring groundwater quality by promoting pollution prevention methods;
- ✓ Promoting proper stormwater management practices and tools;
- ✓ Promoting development patterns sensitive to the county's natural resources, floodplains, watersheds, and other areas of natural or historic importance.

Trends and Analysis

A. Water Resources

Water is a resource often taken for granted. In recent years, water availability and quality have become important public concerns in Henry County. The Henry County is predominantly rural and 60% of the residents rely on ground water for their water supply.

An average of approximately 34.7 inches of precipitation falls on Henry County annually. Based on this 30-year record, the average precipitation is 2.9 inches per month, with February (1.7 inches) typically being the driest month, and July (3.9 inches) the wettest. However, there can be extreme variations in some years and in certain months within a year. Such seasonal and yearly extremes may have serious consequences and are not always apparent from the long-term precipitation information.

Surface-Water Resources

Henry County's surface waters ultimately flow into Lake Erie through the Maumee River. The northwest corner of the county drains westerly through the Tiffin River basin that enters the Maumee River upstream from Defiance. The southeast corner of the county (near Deshler) drains northeast through Beaver Creek entering the Maumee River on the western edge of Wood County. The south central area of the county drains north through South Turkeyfoot Creek into the Maumee River near Texas. The north central area of the county drains south through Turkeyfoot and Bad Creek into the Maumee River also near Texas. Various smaller streams enter directly into the Maumee River at various points.

Surface waters are affected by the soil type, geology, topography, and land usage of adjacent land. Land use, such as residential development and agricultural production, may increase the amount of sediment and other pollutants entering a body of water. Residential and urban areas contain many impervious surfaces, such as streets and parking lots that increase the amount of runoff. The soils and terrain also influence the amount of runoff because of infiltration, percolation, and water holding characteristics. With some soils, rainfall is more likely to run off, while other soils allow water to infiltrate more readily.

The county contains approximately 266,240 land acres, of which roughly 90.6% is farmland. Ninety-five soil types have been identified in the county; however, 53.6% of the soil is mapped as Hoytville clay. Henry County can be grouped into 10 soil associations, the majority being Hoytville, Hoytville-

Nappanee, and Millgrove-Mermill-Haskins. The drainage quality for these associations ranges from very poorly drained to somewhat poorly drained soils on nearly level slope. The soils are naturally wet in winter and spring, but artificial drainage has helped to lower the seasonal high water table. Maintenance of artificial drainage systems is the major management need in this association. Slow permeability and high seasonal water tables, including problems with septic tank leaching systems and wet basements, limit non-farm use on these soils. These types of soils are the primary reason that over 248,000 acres (93%) within Henry County have severe septic system constraints.

Runoff and sediment from residential development, construction sites and agricultural lands may enter the county's streams and lakes. Also, runoff may carry pollutants such as lawn and agricultural chemicals (pesticides and fertilizers), oil and gas from spills, and industrial wastes.

Through the Ohio Nonpoint Source Assessment and Water Resources Inventory, the Ohio Environmental Protection Agency (Ohio EPA) has identified 13,000 stream miles in Ohio that have been affected by nonpoint source pollution. Based on the findings of the Assessment and Inventory, the Ohio Nonpoint Source Management Program has been implemented to help improve the quality of the state's waters.

Water quality monitoring indicates that all or parts of the following Henry County streams are affected by nonpoint source (NPS) pollution: Lost Creek and the Maumee River. One or more of the following NPS pollution categories affects these streams: agriculture, crop production, urban runoff, and hydro modification. Other county streams are affected by point source pollution (municipal and/or industrial wastewater). Point source affected streams include: Bad Creek, North Turkeyfoot Creek, and the Maumee River. Henry County also contains streams that have good water quality and are attaining chemical and biological water quality standards. Monitoring has shown that Brush Creek (headwaters to Jackson Cutoff Ditch) has good water quality.

It is important to note that as of June 1996 less than half of Ohio's streams have been evaluated by the Assessment. As water quality monitoring continues statewide, the list of Henry County affected streams and streams with good water quality will change. Residents have a major challenge to protect water resources from pollutants that could affect the quality of the water supply.

There are no natural lakes in Henry County. The county water acreage consists of the 23-acre City of Deshler Reservoir and Gould Inc. Lake, which is five acres in size. There are numerous farm and residential ponds that are less than one acre, which provide recreation or potable water resources for residents. The county contains approximately 374 linear miles of major streams and rivers (estimated from river basin maps, Ohio Department of Natural Resources (ODNR) Division of Water). In addition, 364 miles of county-maintained ditches and numerous miles of privately maintained ditches are used for land drainage.

Ground-Water Resources

Henry County's primary ground-water source is the carbonate aquifer composed of limestone and dolomite. This aquifer is located beneath 40 to 85 feet of glacial drift. Wells developed at depths exceeding 200 feet may yield in excess of 150 gallons per minute (gpm) in the southern and eastern parts of the county. The second most common ground-water source is the sand and gravel aquifer, which is productive in the central and northwest parts of the county. In this region, thin lenses of sand and gravel are located beneath thick layers of fine sand and silty clay; well yields are less than 10 gpm.

The yield of a well will vary considerably depending on the age and depth of the well, well construction, the diameter of the casing, pump capacity and age, and more importantly, properties of the geologic formation. Specific information on ground-water availability and wells can be obtained by contacting the ODNR Division of Water. **(see Map: Ground Water Resources**)

Water Use

Water use for each of Henry County's public water-supply systems is given is highlighted in the Infrastructure chapter. The county's largest public-water system is the City of Napoleon, which uses water from the Maumee River for its supply. The City of Napoleon supplies water to other villages in the county including Liberty Center, Florida, and Malinta. The Village of McClure uses water from the Maumee River through its own intake. The remaining public water systems in the county utilize ground water to supply water needs.

Ground water is a major water source for rural households in Henry County. Approximately 45% of the population obtains their water from private wells. Based on an estimated usage of 75 gallons per person per day, 1,009,800 gallons per day (gpd) from private wells are used. Additional private water uses include livestock use (220,000 gpd), mostly from ground-water supplies. The remaining households use public-water supplies.

Some water users in Ohio must register their withdrawals with the ODNR Division of Water. Through the Water Withdrawal Facility Registration Program, owners of facilities capable of withdrawing 100,000 gpd (70 gpm) or more must register those facilities. Information collected through this program includes withdrawal capacity, type of water sources, location and use, and location of discharge points. The program is for registration only, and not for allocation or permission. Registered withdrawers file annual reports of their water use. This information helps planners at ODNR to determine the availability of water for projected needs and to better manage and protect Ohio's water resources. Documenting water use also provides official records for individual uses. For more information, contact the ODNR Division of Water.

Water Quality

Human activities and natural processes affect the quality of our water supplies. Throughout Ohio, human activities contribute to both point and nonpoint source pollution. Point source pollution is the introduction of impurities into water (ground water or surface water) from an identifiable, known location. Examples of point sources can include industrial plants, power plants, commercial businesses, and wastewater treatment facilities.

Nonpoint source pollution also involves the introduction of impurities into a surface-water body or an aquifer, except the route is usually non-direct and the sources are diffuse in nature. A major

portion of the sediment, nutrients, acids and salts, heavy metals, toxic chemicals, and pathogens enter the state's water resources through nonpoint pollution sources, affecting both ground and surface water. Examples include automobile emissions, runoff from parking lots, and runoff and drainage from agricultural fields, feedlots, home lawns and gardens, residential development, construction, mining, and logging activities.

Ground Water

Human activities, such as agricultural production, domestic waste disposal, and lawn and turf care, may have some influence on the county's ground-water quality. A study by Heidelberg College sampled 82 wells in the county for nitrate-nitrogen content, an indicator of water quality. Results showed that 68 wells (83% of total) contained nitrate-nitrogen concentrations in the range of 0 to 0.3 parts-per-million (ppm). This range is assumed to represent natural background levels. Ten wells (12%) tested in the range of 0.3 to 3.0 ppm, values that may or may not indicate human influence. The 2 wells (2 percent) that tested in the range of 3.0 to 10 ppm, may indicate elevated concentrations resulting from human activities. Only 2 wells (2 percent) tested over the safe drinking-water standard of 10-ppm nitrate-nitrogen.

The average nitrate-nitrogen concentration for the 82 wells tested was 0.74 ppm. The design, location, and condition of a well, combined with the characteristics of the soils and geologic formations in which the well is constructed, influence the potential for pollutants to enter the well. The Henry County Department of Health provides bacteriological water sampling for local citizens, and results of these tests generally indicate that the water meets current bacteriological standards.

B. Soils

Each soil type in the Henry County has unique characteristics that may make it better accommodating to specified land uses. Each soil also has features that have moderate or severe limitations to various types of development. These ratings and the limitations are helpful in land use planning, although today's engineering practices-when used properly- may mitigate any problems affiliated with each of the soil's limitations.

In Henry County, the land is dominantly used for farming, but the county lies southwest of the large metropolitan area of Toledo, Ohio, and suburban areas are expanding. At present several miles of farmland in Lucas County separate encroaching residential areas from Henry County. This changing land use may increase after road improvements now underway or programmed for the next few years are completed. A gradual enlargement of the towns in the county and the city of Napoleon is producing a mixture of town and country uses near these population centers. These uses include residential, industrial, transportation, and recreational facilities.

In Henry County most of the nearly level soils have other properties that are limitations to development. These soils have limitations to their use for farming that are easily overcome, and they are important to farming in the county and in the State. Hoytville, Mermill, Millgrove, and Toledo soils are of this kind.

Comparisons can be made among the soils in the county for any particular planning problem. From the estimated degree and kinds of limitations of soils for selected land uses, knowledgeable alternatives can be chosen as a basis for long-range planning and zoning. Because extensive

manipulation of the soil alters some of its natural properties, the ratings for some uses may not apply in areas where there has been extensive cutting and filling.

Any one soil may impose a degree of limitation for a specified land use. However, this same soil property can be more, or less, limiting for some other specified land use. To provide a comparative scale, the estimated degree of limitation for each soil and specified land use is rated as slight, moderate, and severe. A rating of *slight* indicates that the soil presents no important limitation to the specified use. *Moderate* shows that the soil has some limitations to the specified use. The limitations need to be recognized, but they can be overcome or corrected. *Severe* indicates that the soil has serious limitations for the specific use. These limitations are difficult and costly to overcome. A rating of severe does not mean that the soil cannot be used for the specific use, but it suggests that applicable engineering practices (to mitigate future problems) should be used or that an alternative site or sites with slight or moderate limitations be pursued. Choice of a site rated severe for a particular use commonly may result in expensive, continuing maintenance and upkeep, especially if the site is without public utilities.

Most of the land in Henry County is used for farming. Most changes in land use involve the conversion of farmland to town and country uses. Such changes in land use tend to be irreversible. In **Map: Soil Productivity**, the soils have been rated based upon soil productivity. The rating is based on such limitations as slope, erosion, wetness, and droughtiness. The use of the soils for cultivated crops is rated in this table to aid land-use planners who are considering farming as a sound land use to promote the local and regional economy.

The suitability of soils for disposal of effluent from septic tanks depends on permeability, slope, natural drainage, depth to the water table, and the hazard of flooding. The permeability of each soil in the county is shown in **Map: Soil Constraints for Septic Systems**. If filter fields for septic tanks are located on slopes of more than 12%, erosion and seepage downslope can be a hazard or the soil may be unstable when saturated. A severe limitation is imposed by a restrictive layer, such as solid bedrock, a layer of dense, compact material, or a layer of clay that interferes with adequate filtration and the removal of the effluent from the soil.

Some soils in the county have a gravelly and sandy substratum through which effluent that is inadequately filtered can contaminate ground water or nearby springs, lakes, or streams. Before a septic tank system is installed, an onsite investigation should be made at the proposed site to evaluate related site factors other than the soil properties discussed in this section.

Sewage lagoons are shallow ponds that are built to dispose of sewage through oxidation. They may be needed in an area if septic tanks or a central sewage system is not feasible or practical. Among the features that control the degree of limitation is the hazard of flooding, percent of slope, and permeability of the soil.

Ratings for homesite location for homes of three stories or less that have a basement also apply to sites for small industrial, commercial, and institutional buildings (**see Map: Soil Constraints for Homesites**). Most of the acreage being converted from farming to other uses is largely in due to new residential developments. These areas generally surround present urban areas. Individual houses or small groups of houses also are being built throughout the county. Ratings are based on soil properties and related site characteristics, such as slope, natural drainage, and hazard of flooding.

Homes on such naturally wet soils as Hoytville, Napanee, Toledo, Fulton, Granby, and Lenawee are likely to have wet basements if adequate drainage is not provided. In many areas in the county, well-developed systems of tile and open-ditch drains have been installed for cropland drainage. Excavations in these areas for structures, such as homesites, can disrupt the established drainage system and change it back to its natural condition of wetness.

On soils that are subject to flooding, there is a special hazard to life and property if the soils are used for building sites. Buildings on flood plains tend to restrict the flow of floodwater and can result in higher flood crests upstream.

Some of the soils, such as Colwood, Kibbie, and Tuscola soils, have a high content of silt. Such soils are not so favorable for supporting structural foundations as soils that are coarser textured, such as Oshtemo or Haney soils. Soils having a high shrink-swell potential are likely to heave and crack foundations unless special precautions are observed. A high shrink-swell potential also affects the alignment of sidewalks, patios, and rock walls. To minimize this effect, a subgrade or layers of sandy or gravelly material directly below the structure is desirable. On soils that have slopes of more than 12%, erosion is a hazard and excavating and leveling are difficult.

Recreation is becoming increasingly important in Henry County. Potentially, all the soils of the county are suitable for one or more kinds of recreational development. Some soils on flood plains are well suited to some kinds of recreation because they generally occur in long, winding areas along streams and are adjacent to scenic hills. Use of these soils for homes, highways, and other nonfarm uses are severely limited by flooding, and construction in these areas may hold back the natural flow of floodwater. Among the kinds of recreational facilities that can be developed in some areas on flood plains are extensive play areas. Also suitable are such intensive play areas as ball diamonds, picnic areas, and tennis courts that are not used during the normal period of flooding and are not subject to costly damage by floodwater. Flooding can cause costly damage to recreational facilities. A determination of flooding frequency and duration in a local area is needed to properly evaluate the limitations for recreational uses.

Athletic fields and other intensive play areas are fairly small tracts used for baseball, football, tennis, volleyball, badminton, and other sports. Because the areas must be nearly level, considerable shaping may be needed. Consequently, slopes of more than 2 percent are a limitation. The texture of the surface layer, permeability, natural drainage, and hazard of flooding are also important.

Parks and extensive play areas can be located on many kinds of soil. Areas consisting of different kinds of soil provide a variety of wildlife and natural vegetation. Considered in rating the soils for picnicking, related hiking, nature study, and similar uses are degree of slope, texture of the surface soil, natural drainage, and hazard of flooding. Paths in picnic and play areas should be constructed and maintained in a way that helps to control erosion.

Deep, well-drained, loamy soils that are nearly level and slowly permeable have the fewest limitations for use for sanitary landfills. Few soils, however, have this combination of properties. Limitations that affect the use of soils for sanitary land fills are slope, somewhat poor to very poor natural drainage; clayey or sandy texture, rapid permeability, and hazard of flooding. Sanitary land fills present a hazard to underground water supplies and nearby springs and streams unless they are developed in soils that minimize this hazard.

For use as cemeteries, soils that have the fewest limitations are deep, are well drained or moderately well drained, and have slopes of less than 12%. Soils that are somewhat poorly drained to very poorly drained have a seasonally high water table that limits use for cemeteries. Flooding also is a limitation to cemetery use. If the water table is permanently lowered, limitations are only slight or moderate on some soils. A clayey sandy surface layer is a limitation to the development of a good grass cover.

C. Floodplains

The purpose of this policy is to prevent losses associated with flooding by protecting the floodplain ecosystem and deter development that will individually or cumulatively have an adverse effect on the health, safety and general welfare of present and future residents of Henry County and the citizens of adjoining/adjacent drainage areas. For the general location of floodplains within Henry County, please see **Map: Floodplains and Hydrography**.

The preservation and maintenance of floodplains and their associated water and land ecosystems in their natural condition represent important natural functions and values that provide both opportunities and limitations for certain uses and activities. It is the goal of the Plan to protect the citizens of Henry County and minimize public and private property damage by controlling development which will, when acting alone or in combination with other development, cause flood losses and create additional burden to public services, public infrastructure, and other utilities, and to the health and safety services. It is currently estimated that roughly 3.2-3.75 percent of Henry County's total acreage is in the 100-year floodplain or flood hazard area (8,624-10,000 acres).

The regulatory floodplain is made-up of the floodway and the flood fringe. It is the area adjoining a river, stream, watercourse or lake that is inundated by the regulatory-flood. The area subject to flooding (regulatory floodplain) shall be:

1. As determined by the U.S. Army Corps of Engineers most recent data, designating the area subject to a 100-year flood, 100-year floodplain - there is a one percent chance of annual occurrence; and/or
2. As shown on Federal Emergency Management Act (FEMA) the Flood Boundary and Floodway Map, usually called the Floodway Map; and/or
3. Areas possessing alluvial-type soils along existing streams according to information provided by the Ohio Department of Natural Resources, Division of Land and Soil and the U.S. Department of Agriculture, Soil Conservation Service.

The floodway is the unobstructed portion of the floodplain consisting of the channel of the water body and those portions of the floodplain adjoining the channel that are capable of conveying and discharging the flood water while keeping it within designated heights and velocities. The floodway is intended to carry the deep and fast moving water.

The relative unpredictability of flooding causes a problem in itself. This may lull some to think that it is "SAFE" to erect structures within the floodplain since it has not flooded in years. While most categories of floodplain management strategies are orientated towards dealing with existing problems, our main focus is on the future. Trying to keep the problem from getting worse by ensuring that future development in the floodplain does not increase flood damages and by maintaining the floodplain system capacity.

D. Wetlands

It is in the public's interest to protect against development that will adversely affect important county/municipal planning and development goals. Development, which is not in harmony with the character of the area in which it is located, can destroy important physical, ecological, social, recreational, aesthetic, and economic assets/qualities necessary to promote the health, safety and general welfare of present and future residents and the unique character of Henry County (**see Map: Natural Resource Areas**).

The preservation and maintenance of wetlands in an undisturbed and natural condition will protect the wetlands' functions of: water purification and aeration; sedimentation control; floodwater storage; and public and private water supply enhancement. Wetlands area also areas of significant plant, bird, fish, amphibian and mammal habitat, areas of species diversity, unique recreation, open space, and educational resources.

It is the intent of this policy to protect the citizens of Henry County by providing for the protection, maintenance, and use of its wetlands by permitting and encouraging a coordinated land and water management program together with the retention of open space land uses which will locate structures and site improvements so as not to divert or obstruct the natural flow of waters or disturb the wetlands and the functions they perform.

The U.S. Army Corps. of Engineers (ACOE) under Section 404 of the Clean Water Act regulates activities within waters of the United States, including wetlands. The ACOE defines wetlands as:

> Those areas that are inundated or saturated by surface or groundwater as a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, marshes, and similar areas (Federal Register, Vol. 42, p. 37128).

According to the ACOE criteria, wetlands are defined by three (3) parameters (The ACOE requires that under normal circumstances, all three of these parameters must exist for an area to be defined as wetlands).:

1. The land supports predominantly hydrophytes (hydric plants);
2. The substrate is predominantly un-drained hydric soils; and
3. The substrate is saturated with water or covered by shallow water at some time during the growing season (time is the issue).

Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities in the soil and on its surface. Different kinds of wetlands are identified by the characteristic types of plants that grow there and water depth. The Ohio Department of Natural Resources and the Division of Wildlife have identified the following wetlands as the most common types of wetlands in Ohio:

> **Wet Woods:** Wet woods are dominated by trees taller than 15 feet. Tree species such as green ash, swamp white oak, pin oak, hackberry, red maple, and silver maple are prevalent. Soils are usually saturated or ponded with less than three inches of water.

Scrub/Shrub Wetlands: These wetlands are dominated by shrubs such as silky, gray and red-osier dogwood, buttonbush, common alder, willow, and elderberry, and hardwood trees less than 15 feet tall.

Web Meadows: Have water depths of less than six inches for an extended period of time during the growing season. Vegetation consists primarily of grasses and sedges.

Shallow Water Marsh: This type of wetland has a water depth between six inches and two-feet for an extended period during the growing season. Some open water is usually mixed with vegetation such as cattail, bulrush, arrowhead, bur reed, and water plantain.

Deep Water Marsh: A deep-water marsh has an estimated water depth greater than two feet for an extended period during the growing season (but is not a pond or lake). The area is primarily open water, sparsely vegetated with floating and submergent plants such as water lily, lotus, and pond-weed.

E. Topography

Henry County is one of the flattest areas in Ohio. The total relief of the County is only 125 feet, with the lowest point being the bed of the Maumee River at the Henry-Lucas County line (elevation 625 feet). The highest point is in central Ridgeville Township, with an elevation of 750 feet. The land surface slopes both gently and regularly to the northwest and southeast of the Maumee River Valley. The maximum slope is to the northwest of the City of Napoleon, where the overall slope of the land rises at about 12 feet per mile toward Ridgeville Township.

The ridges of two ancient lakes beaches are prominent in Henry County. Lake Whittlesey beaches at an elevation of 735 feet occur in Ridgeville and Freedom Townships. Beach ridges of Lake Warren are found at an elevation of 680 feet in Liberty, Napoleon, Harrison, Damascus, and Washington Townships.

The topography of the County has had a great effect on drainage, erosion and soils development. There are four general topographic positions in the County: (1) Beachridges, (2) Lake plain uplands, (3) Terraces, and (4) Floodplains. Soils on slopes are generally thinner than soils on the more level areas.

Topographic surveying prior to land development becomes extremely important where the differences in elevation are relatively small. The largest portion of the land in the two most southern tiers of townships has changes in elevation that are relatively small. The largest portion of the land in the two most southern tiers of townships has an elevation change of only approximately one foot in height for each one thousand feet of distance. This, when examined in relation to the soils permeability, definitely limit the manner in which residential subdivisions should be developed.

Strategies and Recommendations

To ensure the variety of natural resources and amenities remain healthy, the Plan recommends that a variety of additional programs be pursued.

Minimize the Impact of Development on Henry County's Natural Resources

Henry County should consider developing a framework to minimize the impact the future development might have on the county's various natural resources. This type of development activity could include the building of residential housing units, commercial and industrial structures, as well as other public infrastructure necessary to promote these types of land uses. Many federal and state regulations already currently exist that mitigate the development impacts on wetlands, floodplains, and endangered species. These regulations supercede local regulations, if any, and thus help to encourage the coexistence of growth and natural resources.

Development should be compatible with natural conditions. Residential development lacking public utilities is especially affected by natural constraints. County development regulations should be reexamined to discourage development from inappropriate locations because of the following natural constraints:

- ✓ Floodplains and Flood Hazard Areas
- ✓ Significant slopes (12% or higher)
- ✓ Woodlands
- ✓ Prime agricultural areas
- ✓ Severe soil constraints for septic systems and leach fields
- ✓ Inadequate groundwater yields
- ✓ Species habitats

Because residential development is primarily regulated by local regulations, the county's development regulations should be strengthened to discourage future development from inappropriate locations because of the natural resources constraints identified in this chapter. In particular, the county should examine the use of:

Buffer Zones: Buffer zones are a useful site planning tool to help mitigate development impacts. If a development site includes or is contiguous to special natural resource areas, a minimum buffer should be established. Within this buffer no development activity, including grading, should take place. Buffer widths could range from ten to 50 feet, depending on the natural resource in question. Henry County Pheasants Forever Chapter, in collaboration with the Henry Soil and Water Conservation District, has helped to promote buffering through new project called the Henry County Wildlife Habitat Improvement Project. This project promotes the sign-up and establishment of buffer strips in targeted townships with financial and seeding incentives.

The Pheasants Forever chapter has committed $45,000 over three years for this program. This financial incentive is a sign-up bonus for landowners establishing buffer strips through the Conservation Reserve Program or the Conservation Reserve Enhancement Program. The chapter allocates $15,000 in bonus money each year. The funds are raised through the non-profit organization's memberships and its annual banquet, which will be held on April 5 this year.

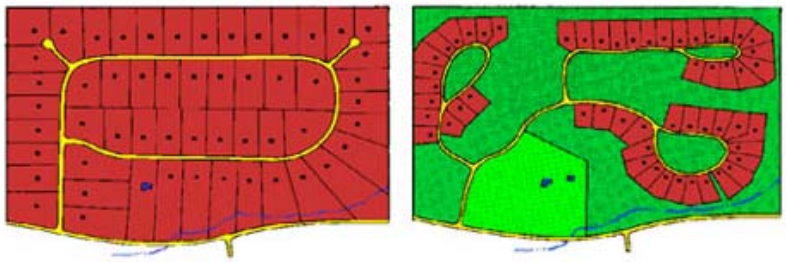
In 2002, the organization concentrated on the south and east areas of the county, or the Deshler area, and this year concentrating on the Napoleon area. In 2003, the Henry County Pheasants Forever will target the Liberty Center and Grand Rapids areas. The project boosted signup in 2002 as 74 landowners signed up over 280 acres of buffer strips in the targeted area. This compares to 80 acres signed up for the same area in 2001. The Henry County Pheasants Forever Chapter also offers the use of its no-till grass seeder to the Henry Soil and Water Conservation District. This allows the Soil and Water Conservation District to offer free seedlings to landowners in the targeted townships.

Surface Drainage: A secondary issue is ensuring that surface drainage patterns that are impacted by development do not alter the existing environment of the "protected" natural resource (s). Changes in drainage could alter water levels that are necessary to the resource. Effective site planning can help to mitigate these impacts by ensuring surface water rates and directions don't change dramatically.

The Henry County Health Department should also strengthen its rules to ensure that development approvals are decided based upon community-wide benefits and not only in the best interests of individual property owners. In addition, the department should strengthen its inspections of on-site septic systems during installation to ensure contractors are installing the systems properly. Follow-up inspections should be scheduled on a regular basis to ensure these systems are functioning as designed.

Encourage Planning and Design Methods That Protect Groundwater Resources

There are many possible design solutions to protect open space or natural resources are possible: residential clustering, buffering streams (and other buffering techniques), stormwater infiltration, and built wetlands to treat wastewater and stormwater. On many sites, these solutions may result in lower net development costs, especially if standards are clear from the beginning or preliminary plan stages. According to EPA, nonpoint source pollution is the nation's largest water quality problem. While there are many "nonpoint" origins of pollution, sediments and nutrients carried by stormwater from construction sites, urbanized areas, and other sites of disturbance are likely candidates for reduction.



Local political subdivisions can use guidelines or established zoning to encourage developers to incorporate design techniques that minimize stormwater runoff from new development projects. Innovative site designs that involve natural vegetation and existing wetlands can control stormwater runoff effectively. Such standards are usually adopted as zoning, subdivision, or design regulations, and could include conservation design tools like:

- ✓ Cluster development and other concentrated development patterns
- ✓ Reduction in setbacks
- ✓ Minimum disturbance site development

- ✓ Reduction of impervious surfaces and permeable paving
- ✓ Natural drainage measures (such as grass swales) and natural detention basin designs
- ✓ Vegetated filter strip
- ✓ Other biofiltration/bioretention techniques
- ✓ Berming and special grading techniques

A traditional site design for a development project increases the amount of stormwater runoff and associated pollutants due to the increase in impervious surfaces (streets, parking lots, and buildings) and soil compaction. Often a developer will construct a large detention basin to hold the water temporarily, and then pipe the runoff to a nearby stream or river. This solves the problem of removing runoff from the site as quickly as possible; however, such stormwater facilities are expensive to construct and maintain, and do not necessarily address the impacts downstream.

Conservation design is an approach that incorporates natural features for stormwater management into the site design of a development project. The objective of this approach is to scale back the level of impervious surface area at the site, thereby reducing runoff in the first place. In addition, this approach utilizes the landscape to naturally filter runoff before it leaves the development site. Not only can conservation design techniques substantially reduce the volume of runoff from a site, and the level of pollutants being washed into adjacent water-bodies, they also can reduce costs associated with site development, infrastructure maintenance and replacement. Applied research also has shown that conservation design strategies may retain or even increase property values, over a conventional site design, because the properties open up to natural areas and scenic vistas instead of someone else's backyard.

Promote Additional Site Development Planning to Conserve Natural Resources
Model site planning development principles can provide public and private officials and developers with additional design guidance for development projects within environmentally sensitive areas. The main objective of these principles is to provide planners, developers, and local officials with benchmarks to investigate where existing ordinances may be modified to reduce impervious cover, conserve natural areas, and prevent stormwater pollution. These development principles are not national design standards. Instead, they identify areas where existing codes and standards can be changed to better protect streams, lakes and wetlands at the local level. The development principles are divided into the three following areas:

- ✓ Residential Streets and Parking Lots
- ✓ Lot Development
- ✓ Conservation of Natural Areas

<u>Residential Streets and Parking Lots</u>

1. Design residential streets for the minimum required pavement width needed to support travel lanes; on-street parking; and emergency, maintenance, and service vehicle access. These widths should be based on traffic volume.
2. Reduce the total length of residential streets by examining alternative street layouts to determine the best option for increasing the number of homes per unit length.
3. Wherever possible, residential street right-of-way widths should reflect the minimum required to accommodate the travel-way, the sidewalk, and vegetated open channels.

Utilities and storm drains should be located within the pavement section of the right-of-way wherever feasible.

4. Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
5. Where density, topography, soils, and slope permit, vegetated open channels should be used in the street right-of-way to convey and treat stormwater runoff.
6. The required parking ratio governing a particular land use or activity should be enforced with both a maximum and a minimum in order to curb excess parking space construction. Existing parking ratios should be reviewed for conformance taking into account local and national experience to see if lower ratios are warranted and feasible.
7. Parking codes should be revised to lower parking requirements where enforceable shared parking arrangements can be made.
8. Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas where possible.
9. Provide meaningful incentives to encourage structured and shared parking to make it more economically viable.
10. Wherever possible, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips, and/or other practices that can be integrated into required landscaping areas and traffic islands.

Residential Lot Development

1. Advocate open space design development incorporating smaller lot sizes to minimize total impervious area, reduce total construction costs, conserve natural areas, provide community recreational space, and promote watershed protection.
2. Relax side yard setbacks and allow narrower frontages to reduce total road length in the community and overall site imperviousness. Relax front setback requirements to minimize driveway lengths and reduce overall lot imperviousness.
3. Promote more flexible design standards for residential subdivision sidewalks. Where practical, consider locating sidewalks on only one side of the street and providing common walkways linking pedestrian areas.
4. Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
5. Clearly specify how community open space will be managed and designate a sustainable legal entity responsible for managing both natural and recreational open space.
6. Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Conservation of Natural Areas

1. Create a variable width, naturally vegetated buffer system along all perennial streams that also encompasses critical environmental features such as the 100-year floodplain, steep slopes and freshwater wetlands.

2. The riparian stream buffer should be preserved or restored with native vegetation. The buffer system should be maintained through the plan review delineation, construction, and post-development stages.
3. Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots, allow access, and provide fire protection. A fixed portion of any community open space should be managed as protected green space in a consolidated manner.
4. Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native plants. Wherever practical, manage community open space, street rights-of-way, parking lot islands, and other landscaped areas.
5. Incentives and flexibility in the form of density compensation, buffer averaging, property tax reduction, stormwater credits, and by-right open space development should be encouraged to promote conservation of stream buffers, forests, meadows, and other areas of environmental value. In addition, off-site mitigation consistent with locally adopted watershed plans should be encouraged.
6. New stormwater outfalls should not discharge unmanaged stormwater into jurisdictional wetlands, sole-source aquifers, or sensitive areas.

Expand Floodplain Programs to Minimize Flood Hazards

Due to Henry County's vast abundance of open water resources (roughly 8,600-10,000 acres are located in flood hazard areas), specific locations in the county remain at risk of flooding and suffering flood damage. A variety of resources[a] have been developed that offer political subdivisions and property owners the ability to create proactive floodplain management programs. These two FEMA-sponsored mitigation programs are the *Flood Mitigation Assistance Program* and the *Hazard Mitigation Program*. The Hazard Mitigation Program is especially helpful as it provides financial resources to communities for acquisition of properties located in the floodplain.

The National Flood Insurance Program's (NFIP) *Community Rating System* (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. The National Flood Insurance Reform Act of 1994 codified the Community Rating System in the NFIP. Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance. With better CRS ratings, individual communities within Henry County or Henry County itself (unincorporated areas) may be able to reduce the flood insurance premiums for their respective residents.

Application to the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply for a CRS classification better than class 10. The applicant community submits documentation that it is doing activities recognized in the CRS. A community applies by sending completed application worksheets with appropriate documentation to its FEMA Regional Office.

A community's CRS classification is assigned on the basis of a field verification of the activities described in its application. The Insurance Services Office, Inc. (ISO) conducts these verifications.

[a] The Henry County Planning Commission is currently in the process of developing a natural hazards mitigation plan.

ISO is the entity that has been conducting community grading for fire insurance for many years and is now performing the grading of communities under the newly implemented Building Code Effectiveness Grading Schedule. There are ten CRS classes by which political subdivisions can receive points:

Class 1 requires the most credit points and gives the largest premium reduction; ***class 10*** receives no premium reduction. The CRS recognizes 18 creditable activities, organized under four categories numbered 300 through 600: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness.

Public Information
This series credits programs that advise people about the flood hazard, flood insurance, and ways to reduce flood damage. These activities also provide data needed by insurance agents for accurate flood insurance rating. They generally serve all members of the community and work toward all three goals of the CRS.

Mapping and Regulations
Credits will be given to political subdivisions for programs that provide increased protection to new development. These activities include mapping areas not shown on the FIRM, preserving open space, enforcing higher regulatory standards, and managing storm water. The credit is increased for growing communities. These activities work toward the first and second goals of the CRS, damage reduction and accurate insurance rating.

Flood Damage Reduction
This series credits programs for areas in which existing development is at risk. Credit is provided for a comprehensive floodplain management plan, relocating or retrofitting flood zone structures, and maintaining drainage systems. These activities work toward the first goal of the CRS, damage reduction.

Credit Points	Class	SFHA*	Non-SFHA**
4,500+	1	45%	5%
4,000 – 4,499	2	40%	5%
3,500 – 3,999	3	35%	5%
3,000 – 3,499	4	30%	5%
2,500 – 2,999	5	25%	5%
2,000 – 2,499	6	20%	5%
1,500 – 1,999	7	15%	5%
1,000 – 1,499	8	10%	5%
500 – 999	9	5%	5%
0 – 499	10	0	0

*Special Flood Hazard Area

**Preferred Risk Policies are available only in B, C, and X Zones for properties that are shown to have a minimal risk of flood damage. The Preferred Risk Policy does not receive premium rate credits under the CRS because it already has a lower premium than other policies.

Although they are in SFHAs, Zones AR and A99 are limited to a 5% discount. Premium reductions are subject to change.

Flood Preparedness
This section consists of flood warning, levee safety, and dam safety programs. These activities work toward the first and third goals of the CRS, damage reduction and hazard awareness

Continue to Identify and Inventory Henry County's Natural Resources
It is very important that public and private officials throughout Henry County have knowledge of the proper whereabouts of the county's natural resources so that they may properly promote and implement, as warranted, the several natural resources strategies highlighted in this section. One such tool to promote the conservation and protection of these resources is to utilize the various

natural resources maps located within this section that highlight groundwater resources, floodplains, wetlands, and soils. To ensure these maps reflect the most current data, it is important that public and private officials contact the Henry County Planning Commission.

The Planning Commission recently acquired the necessary geographic information systems (mapping) software to assist local decision makers and developers to identify the location of the county's natural amenities.