PRAIRIE CREEK
MASTER PLAN
2007

a Muncie-Delaware County Comprehensive Plan
implementation measure

PRAIRIE CREEK
MASTER PLAN

2007

Executive Summary

The future of Prairie Creek Park and Reservoir is of great importance to the citizens of Muncie and Delaware County. It is also a serious responsibility. To ensure that this unique community resource continues to be available for human enjoyment and use by future generations it is important to plan ahead. This plan is a guide for public policy, actions and investments. The plan is not limited in scope to government, but includes many suggestions that can only be implemented by other organizations, private individuals and community groups including those not for profit.

The Prairie Creek Master Plan has been a joint effort between the Delaware-Muncie Metropolitan Plan Commission and the Delaware County Soil and Water Conservation District with input from multiple government and private stakeholders, and the public. This plan elaborates upon key elements set forth in the Comprehensive Plan and has been mindful of the need to protect private property rights. It should be interpreted as a dynamic document frequently updated to incorporate the ongoing changes both at Prairie Creek and in the community at large.

Key elements in the Prairie Creek Master Plan-

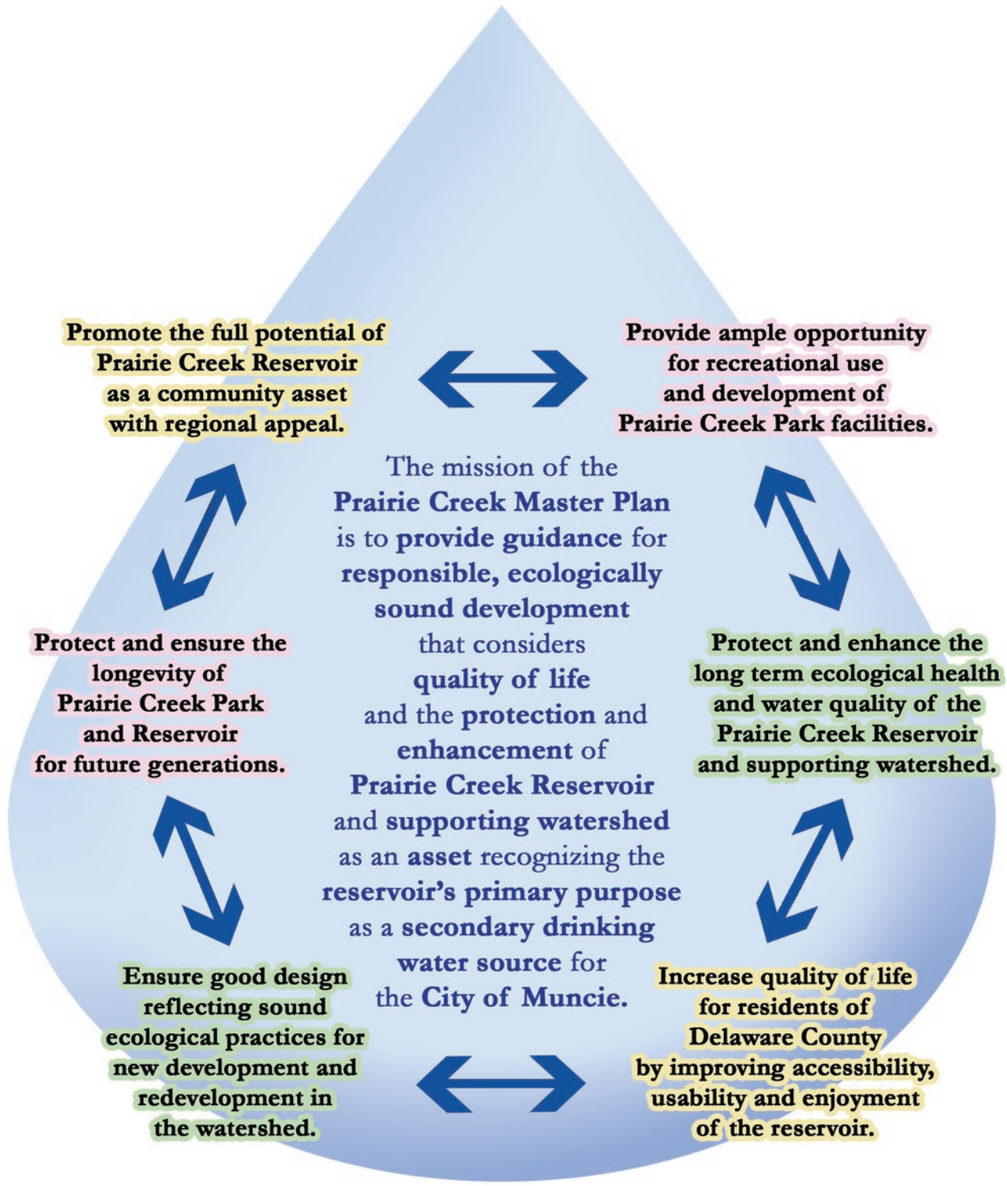
- Protecting the future of the park and reservoir as community assets entails extending the city's lease with IAWC beyond the 2021 termination of the current lease and purchasing the land if it becomes available for sale. These measures are essential to ensure that both public access to the area and its ecological health continues.

- Water quality in the watershed is a fundamental concern. Conservation measures must be extended to limit pollution. The impact of development must be mitigated through regulations and creative design. On-site wastewater disposal systems are one source of pollution that needs to be addressed immediately. Measures to reduce sedimentation and accompanying nutrient and pesticide loading in the reservoir should continue and expand.

- Enhance the value of the park and reservoir as an economic, aesthetic (quality of life) and recreational asset for our community. The reservoir and park have regional appeal that should be capitalized on through planning and marketing of special events. The park facilities are in need of an upgrade and should receive priority funding.

- Implementation of this plan should involve public education, amending ordinances, the forming of public and private partnerships and the cooperation of all involved entities.

The time for action is now. The reservoir already shows signs of deteriorating water quality and habitats. At a minimum, officials and property owners need to take measures that will ensure that the existing water quality is maintained.



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Publication Notice

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Introduction

Rationale

Successful sustainable communities meet present human needs while not compromising the resources for future generations to meet their needs. Sustainable plans and communities focus on four key principles: education, equity, environment, and economy. Every year, more and more cities and communities throughout the world are putting these sustainability principles into practice. Residents of Muncie and Delaware County are becoming more conscious of how local natural resources, open spaces, parks and greenways can contribute to improving the quality of life and transforming Muncie and Delaware County into a healthy and sustainable community.

During the public input process of the 2000 Muncie-Delaware County Comprehensive Plan, participants generally saw natural resources and recreational opportunities as strengths of the community. They noted that there was an increase in demand for open-space recreational opportunities. Furthermore, the Prairie Creek Reservoir was seen as a unique community resource that the City and County should capitalize on for recreational opportunities. However, capitalizing on the recreational opportunities of the Prairie Creek Reservoir and using it as a tool to stir economic development could create some water quality concerns if not handled properly.

In 2001, the White River Watershed Project (WRWP) was initiated to study water quality and land use conditions in three subwatersheds within the Upper White River Watershed in Delaware County. The Prairie Creek subwatershed was chosen as one of the subwatersheds for the WRWP. The results of the WRWP Management Plan's baseline study indicated that some pollutant levels were problematic to the water quality in the Prairie Creek subwatershed. A positive finding from the baseline study was the existence of an extensive wooded and grassed buffer acreage surrounding the Prairie Creek Reservoir. Indiana-American Water Company leases this buffer acreage to the Muncie Parks Department, and the 60 year lease is due to expire in 2021. Therefore, the future of the Prairie Creek Reservoir is uncertain. For all these listed reasons, it was recommended in the 2000 Muncie-Delaware County Comprehensive Plan and phase one of the White River Management Plan that a strategic master plan for development and preservation in and around the Prairie Creek Reservoir be created.

The 1998 Muncie Park and Recreation Master Plan called for several improvements across the spectrum of city parks. Among those were several that remain pertinent to date. These include a "Lack of conceptual development plans for individual parks and facilities."[1] The 1998 Master Plan called for such conceptual development plans to be prepared for each park and facility including Prairie Creek Reservoir. A lack of public awareness and participation in park activities was cited as another cause for concern. Many citizens are unaware of park facilities and activities and therefore the parks including Prairie Creek are underutilized. It was recommended more use be made of local media, mailings and civic organization contacts. A lack of adequate funding was also cited as a problem that needed to be addressed. Without adequate funding, facilities cannot be maintained or improved. It was suggested that funding sources be explored outside the traditional appropriation from property taxes including grants, bonds, foundations and cooperative projects. Specific improvements called for at Prairie Creek Park included the installation of a shock-absorbent/resilient surface to play areas and the renovation of picnic areas, including upgrading the tables to permanent heavy-duty fixtures. Renovation of the beach bath house and shelter and of the restrooms was also suggested. All those improvements were called for by the year 2000.

1 Rundell Ernstberger Associates, Muncie Park & Recreation Master Plan, December 1998, p. 84

The Muncie-Delaware County Comprehensive Plan, completed in 2000, noted that Prairie Creek Reservoir Park meets the National Recreation and Park Association's definition of a regional park. The Comprehensive Plan stated the Prairie Creek area is a very special regional amenity and that a subarea study should be conducted to help plan its long-term future. The Plan suggested the following issues should be examined:

- Environmental amenity preservation areas
- Utility extension alternatives
- Other infrastructure requirements
- Alternative development patterns including the provision of upscale housing sites

The Comprehensive Plan listed six goals as statements of policy describing the community's desired future conditions. Goal 4 is to "preserve, protect and maximize benefits from the natural environment". Objective C under that goal is to "capitalize on recreational opportunities provided by Prairie Creek Reservoir as a unique community resource". The specific policies listed for that objective are to "encourage passive recreational sites and activities at Prairie Creek such as scenic overlooks and habitats", and "develop a strategic master plan for development and preservation in and around the Prairie Creek Reservoir"[2].

The White River Watershed Management Plan referred to the Prairie Creek Subwatershed as a unique Delaware County watershed possessing a man-made drinking water reservoir as its major water body. The major positive finding of the study for this watershed was the extensive wooded and grass buffer acreage that surrounds the reservoir. The status of this buffer was noted as in jeopardy due to the acreage being held by a private water company and leased to the local park department through 2021 after which its future is uncertain. The Plan also noted the problem is compounded by there being no master plan for the reservoir or the surrounding subwatershed. Specifically mentioned among the recommendations is to develop a Master Plan for the Prairie Creek Watershed.

Drinking water quality, wildlife diversity, aesthetics, fishing, boating and swimming were all community identified concerns that served as impetuses for the initial White River Watershed Project and are applicable to Prairie Creek Reservoir. The Management Plan that came out of that project calls for the development of a plan that will achieve a balance between development and resource protection needed for a subwatershed that provides drinking water. For the Prairie Creek Subwatershed specific water quality concerns included the threat of potential development on the banks of the reservoir, the impact of conservation practices on agricultural lands that might positively affect water quality, the affects recreational activities on the reservoir, geese, broken drainage tiles and the impact of woodland loss. The Management Plan states that Prairie Creek Subwatershed has most of its reservoir surrounded by trees or grass which is appealing on many different fronts, most importantly as a zone of protection against non-point source pollution runoff.[3] Part of the implementation phase of the White River Watershed Management Plan included partnership with the Delaware-Muncie Metropolitan Plan Commission to develop a Master Plan for the Prairie Creek Reservoir area. Specifically the Watershed Management Plan calls for this Master Plan to address urban sprawl, recreation on the reservoir and the loss of woodlands.

2 HNTB, Muncie-Delaware County Comprehensive Plan. 27 August 1999. p. 7-9. 27 February 2006. <http://www.co.delaware.in.us/departments/plancommission2/>

3 White River Watershed Management Plan, 2004, p. 45

Justification

The positive effects of parks and accessible natural areas make them important contributors to a community's health and economic vitality. People and businesses choose to locate near parks and trails and cite the importance of those quality of life amenities as variables that affect their decisions. Studies have shown that natural open space, parks and trails are one of the deciding factors in retirees choosing a community. Properties with a view to a river, stream, lake or woodlot are often more desirable. Access to the outdoor recreational opportunities afforded by proximity to parks and trails are also seen as positives. Owners of small companies cited recreation and parks as the highest priority in choosing where to locate their businesses.[4] Increased marketability of properties near such amenities can result in higher accessed values and increased tax revenues for local governments. Parks and trails can help define a community and give it a sense of place adding to local pride.

People are increasingly becoming aware of the health benefits of hiking, walking and biking. There are health care cost benefits for those who exercise regularly and they carry over to a community's economic prosperity. A National Park Service study indicates that regular exercise can lead to 14% fewer healthcare claims, 30% fewer days in the hospital and 41% fewer claims of more than $5,000.[5]

Haphazard development has led to numerous problems in many communities. Developing in important watersheds can reduce the abilities of the natural waterways to control flooding, filter out toxins and nutrient pollutants, trap sediments and support wildlife and plant species. Flooding, water pollution and habitat problems have been linked to the existence of impervious surfaces in a watershed that causes runoff when it rains.[6] Rainwater flows across the impervious surface collecting pollutants and during warmer months heat. The amount of impervious surface in a watershed significantly impacts the quality of the water and the health of the stream ecosystem. As little as eleven percent of the ground covered by impervious surfaces such as roads and buildings can adversely impact this condition. Above 25% impervious surface the run off radically alters the streams and they become non-supporting environments. Currently the watershed is at 1.5 percent impervious surface runoff into the streams that feed Prairie Creek Reservoir. However, a significant increase in the built environment of the watershed would push the level to impacted leading to degradation. Once a watershed becomes impacted the increased water flow changes the geometry of the streambeds. The banks become unstable meaning the physical habitat of the stream declines noticeably. Stream water quality shifts from good to fair and stream biodiversity declines. The most sensitive species begin to disappear.

Providing infrastructure and other public services to outlying development may cost more than the development produces in tax revenues. This is particularly true when homes are spaced out on larger lots. Farmland generally produces more tax revenue than it costs government to supply services, but residential properties usually consume more service dollars than they generate. Green infrastructure is necessary to manage stormwater and reduce pollution even along farmland.

4 Crompton, John L., Lisa L. Love, and Thomas A. More. 1997. An empirical study of the role of recreation, parks and open space in companies' (Re) location decisions. Journal of Park and Recreation Administration pages 37-58.
5 Greenways Incorporated, p. 14.
6 Benedict, Mark A. and Edward T. McMahon. 2001. Green infrastructure: smart conservation for the 21st century. Sprawl Watch Clearinghouse Monograph Series. 20 September 2006.

A recent study conducted by Ball State University demonstrates that a concentration of phosphorus from fertilizers used in agriculture and lawn treatments together with wastewater seepage from surrounding septic systems and soil erosion has contributed to algal growth, aquatic weeds and a lack of dissolved oxygen which can negatively impact fishing, recreational use and drinking water quality.[7] The process of eutrophication, having already began, should be addressed. Measures should be taken to halt the progression of this process and return the reservoir to a healthy state.

It is hoped that the City of Muncie, Delaware County, landowners and interested groups will see the need to protect and enhance the special gifts this community has in Prairie Creek Reservoir and Park. Clean water, animal and plant habitat and natural landscapes, especially water bodies, are increasingly rare in our environment. It is a basic belief that this community has an obligation to ensure that these gifts are well cared for so they may be passed on to future generations.

Study Area

The area covered by this study is multi-boundary reflecting a number of different levels of interest. The physical watershed based on topography and draining into Prairie Creek Reservoir is one way to define the area. On another level the viewshed, that land which can be seen from the reservoir and land from which one can observe the water, is an area of study. The park and reservoir is the subject of some aspects of this study. At times this plan will refer to the "ring roads", those roads that adjoin the park, as an area of interest. A larger area contributes to the study regarding transportation and marketing issues. See Figure 1, on page 14, for a graphic representing the primary study area.

7 Popovicova, Jarka, Ph.D. 2006. Water Quality Assessment of the Prairie Creek Reservoir.

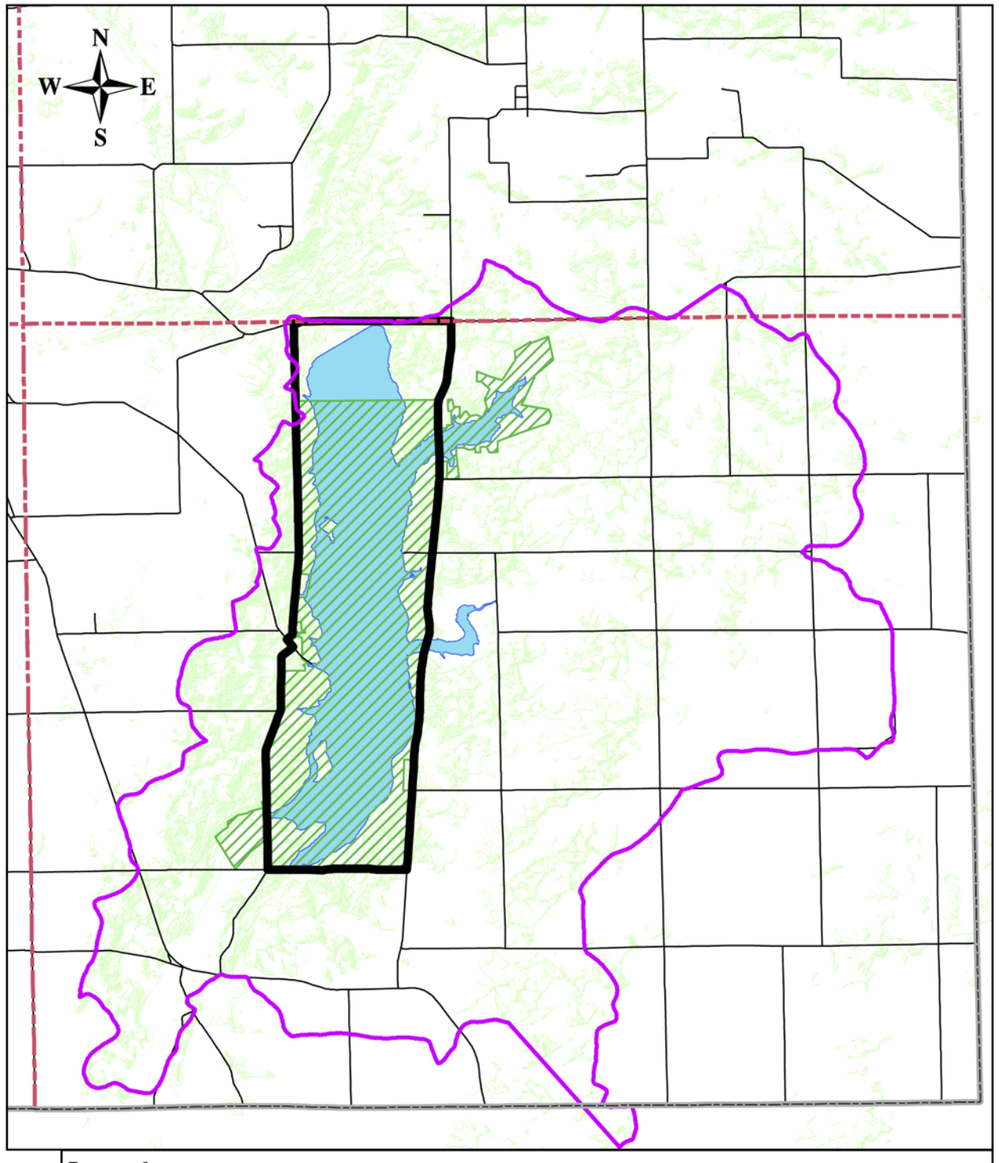


Figure 1: Study Area.

Process

This document is a plan for the efficient and intelligent development and management of the resources of the Prairie Creek Reservoir. The goal is to develop a master plan that enhances the long-term ecological health of the reservoir and supporting watershed while at the same time providing ample opportunity for human use and appreciation of this unique resource, finding the right balance between ecology and the built environment. It is hoped that this document can be a catalyst for connecting the entire community to the reservoir. The creation of a sense of place that gains public respect will greatly aid in this process. Community education about caring for the water, water quality, habitat and natural vegetation is key. The desire for new recreational opportunities and protecting the local ecology while increasing the value of personal property are important considerations. Fostering economic growth and vitality is also a consideration.

The plan is a joint effort between the Delaware-Muncie Metropolitan Plan Commission and the White River Watershed Project. It is an outgrowth of both the Muncie-Delaware County Comprehensive Plan and The White River Watershed Management Plan. The Prairie Creek Master Plan was written by Delaware-Muncie Metropolitan Plan Commission Staff Fred Daniel and Lorey Stinton with assistance from two Ball State planning interns and Delaware County Soil & Water Conservation District's Watershed Coordinator Angela Brown. A Steering Committee was formed from members of the community with various backgrounds and expertise to help guide development of the plan.

The process for developing the plan began in August 2005 when the DMMPC hired two Ball State University graduate assistants. The graduate assistants and the planning team held initial meetings and began preliminary background research about the area. The second major phase of the plan entailed a site inventory and analysis of the natural resource and ecological features, current land uses and development, relationship of the site to adjacent land uses, and compatibility. Two site visits were conducted in September and October to survey the area, take photographs, and speak with the park staff. Written text and maps using Geographic Information System technology were created to articulate findings for presentation. After the site inventory and analysis phase was complete, a needs assessment was conducted. A 3-D graphic video produced by intern Hemanth Tallam takes the viewer through the reservoir valley from an aerial perspective using ArcGIS technology.

A webpage was created for the Prairie Creek Master Plan, as an extension to the White River Watershed Project's website. The web address is http://www.co.delaware.in.us/watershed/PC_master_plan.htm. The Prairie Creek Master Plan webpage contains links to relevant documents including a copy of the lease agreement for Prairie Creek Reservoir between the Indiana American Water Company and the City of Muncie, and graphics showing the land owned by the Water Company and the watersheds that contribute directly to Muncie's drinking water. The Muncie-Delaware County Comprehensive Plan can also be viewed from the Prairie Creek Master Plan site and there is a link to the Delaware-Muncie Metropolitan Plan Commission website. This webpage was also used to host a link to an online survey. Other materials were posted as they became available including the focus group recommendations.

A Steering Committee was formed from sixteen members of the community with various backgrounds and expertise to help guide development of the plan. The Prairie Creek Master Plan Steering Committee met for the first time in November. At that meeting interns Molly Molter and Hemanth

Tallam shared the results of their preliminary studies. An informational notebook prepared by staff was passed out at the meeting.

The Prairie Creek Master Plan Steering Committee met for the second time on January 6th. Bob McCormick of Planning With Power talked to the Committee about services his program offers as well as general water quality and planning issues. At this meeting the need for a public input survey was discussed. The survey was mailed in February to 1,500 Delaware County residents chosen randomly. We received two hundred and nine returned survey forms, fourteen percent of those mailed out. The results were compiled and are included in the appendix. The survey was also available online. An article appeared in the Star Press February 26th that mentioned the online survey.

An Executive Committee was formed as a guiding body from members of the Steering Committee. Jarka Popovicova, Jon Creek and Dave Ferguson met with staff on February 16th to discus the future organization of the Steering Committee and issues regarding the Master Plan document. An adjusted timeline and strategies for plan development were discussed at this meeting. Other public outreach projects discussed included a public informational meeting and a water quality educational module for elementary school presentation. The Steering Committee again met in February and performed a S.W.O.T. exercise identifying the Strengths, Weaknesses, Opportunities and Threats they saw at Prairie Creek Reservoir. The outcome of this exercise helped to refine the issues.

A meeting on Feb. 24th with Plan Commission staff and Prairie Creek Park Superintendent Ron Bonham was held in his office. Ron shared his perspective on the challenges facing the reservoir and answered several background questions. Ron Bonham's unique knowledge of the reservoir and surrounding area added greatly to our ability to define the important considerations in planning for Prairie Creek's future. Foremost among his concerns is the ability to protect the resources at Prairie Creek beyond the terms of the current lease so that they will be available for future generations.

Members of the Steering Committee met with Ron Bonham at Prairie Creek Park on March 11. Mr. Bonham answered member's questions and gave the members some good information on park operations, issues and concerns. He also outlined for them some suggestions for park improvements.

The Steering Committee met on March 13 and reviewed the survey data. Based on the survey results and Committee discussion, the next steps were the creation of three focus groups, one each to address Economic Development, Recreation, and Conservation & Environmental issues. A breakfast workshop was authorized and held March 30. Presentations were given by Mike Lunsford (Economic Development focus), Barry Banks (Conservation & Environment focus), David LeBlanc (Conservation & Environment focus), and Rick Conrad (Conservation & Environment focus). The focus groups then each met separately to devise an ideal land use map and strategies to implement their vision of development in the Prairie Creek Watershed. Two such meetings were held with each group. Lorey Stinton and Jon Creek met with Ron Bonham April 21 to discuss the outcome of the focus group work.

The team met with members of the Steering Committee May 4 and presented the results of the focus group work. This meeting marked the end of involvement by interns Molly Molter and Hemanth Tallam. Lorey Stinton and Fred Daniel completed the Plan with assistance from Watershed Coordinator Angie Brown.

Synthesis and policy development was the next phase following the focus groups. Goals and objectives such as ecological, recreational, education potentials, development concerns, natural resource management issues, and scientific perspectives taken from the focus groups were synthesized to create preliminary master plan recommendations.

A public meeting was held July 25th. This meeting presented background information and land-use scenarios and recommendations developed by the focus groups. Individual invitations were sent to property owners in the Prairie Creek Watershed. The Star Press printed an article June 15th that informed the public that a public meeting would be held in late July, and then printed a follow-up article July 24th announcing the time and place for public meeting on July 25th. Nearly 150 people attended this meeting. Attendees were asked to complete a comment sheet giving their opinion on the recommendations from the focus groups and to provide any additional thoughts and/or suggestions. Feedback from the public meeting was analyzed and used to determine the amount of public support for each recommendation. Articles also appeared in the Star Press July 27th and August 8th following up on this meeting.

The Executive Committee met with DMMPC staff and the SWCD Watershed Coordinator in September through December to finalize Goals and Objectives and Implementation. Land use zone maps and supportive text were created, examples of suitable development and alternative concepts were defined, and project phasing and implementation steps were developed.

The final phase was to write the plan document herein presented.

ENVIRONMENTAL CHARACTERISTICS

GEOLOGY

Indiana is located within the Interior Plains Region which spreads across the stable center of North America. This area formed when several small continents collided and fused together more than a billion years ago. Precambrian, metamorphic, and igneous rocks now form the subterranean of the Interior Plains and make up the stable core of North America.[1]

The geology of Delaware County is further classified into the Lower Paleozoic Era and Middle Paleozoic Era. The Paleozoic Era is a period of geologic time spanning between 544 and 248 million year ago, from the end of the Precambrian Era to the beginning of the Mesozoic Era. The word Paleozoic is a Greek word meaning "old life." The Paleozoic Era is divided into seven Periods: Cambrian Period, Ordovician Period, Silurian Period, Devonian Period, Carboniferous Period, and Permian Period.[2]

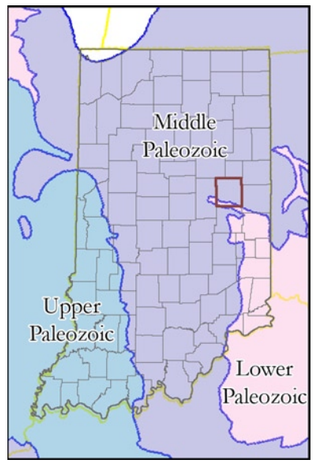


Figure 2: Delaware County's Geologic Eras.
Source: "National Geospatial Programs Office." U.S. Geological Survey. 27 February 2006.

Delaware County's Lower Paleozoic Era geology includes sedimentary rocks from the Cambrian and Ordovician Periods. The Cambrian Period is the earliest period of the Paleozoic era spanning between 544 and 505 million years ago, and the Ordovician Period is the second earliest period of the Paleozoic era, spanning between 505 and 440 million years ago. The Lower Paleozoic Era is denoted as a light peach color on the geological map. Geological formations from this era comprise the very southern edge of Delaware County.[3]

Delaware County's Middle Paleozoic Era geology includes sedimentary rocks from the Silurian, Devonian, and Mississippian Periods. The Silurian Period spanned the time between 440 and 410 million years ago, and the Devonian Period spanned the time between 410 and 360 millions years ago. Sediments laid down during the Middle Paleozoic Era are denoted as the periwinkle color on the geological map and represent the majority of Delaware County, including the Prairie Creek Subwatershed.[4]

The Prairie Creek Subwatershed is located within the New Castle Till Plains and Drainageways section of the Central Till Plain. The Till Plains lie to the south of the Great Lakes Plains and run through

1 USGS/NPS Geology in the Parks Website, 2001, and Indiana Geological Survey Website, 2002. 27 February 2006. <http://vulcan.wr.usgs.gov/LivingWith/VolcanicPast/Notes/interior_plains_region.html>
2 USGS/NPS Geology in the Parks Website, 2001, and Indiana Geological Survey Website, 2002. 27 February 2006. <http://vulcan.wr.usgs.gov/LivingWith/VolcanicPast/Notes/interior_plains_region.html>
3 USGS Easter Region Website, Paleontology at the U.S. Geological Survey, 2003, and Newman, W.L., Geologic Time: USGS General Information Publication, online version, 1997. 27 February 2006.
4 USGS Easter Region Website, Paleontology at the U.S. Geological Survey, 2003, and Newman, W.L., Geologic Time: USGS General Information Publication, online version, 1997. 27 February 2006.

the central part of Indiana. The broad and fertile Till Plains in Indiana are a part of the Midwestern Corn Belt.[5] The landscape of the Till Plains is characterized by low hills and valleys, and the shrink-swell characteristics are modest throughout the Prairie Creek Subwatershed. The subwatershed has no active industrial mineral mining sites. There are three abandoned sand and gravel pits located close to the southern tip of the Prairie Creek reservoir. There are also four gas wells and six petroleum test wells located throughout the subwatershed.[6]

SOILS

Miami soils are the state soil of Indiana. The less sloping Miami soils are used mainly for corn, soybeans, or winter wheat throughout the state. The steeper areas are used as hayland, pasture, or woodland. Miami soils are fertile and have a moderate available water capacity. Because of the highly productive Miami soils, as well as other prime farmland soils in the State, Indiana is nationally ranked for agricultural production.[7]

Only the most productive soils are considered prime farmland. "Soil, and its productive capacities, is a critical natural resource that can not be replaced, and therefore must be protected."[8] "Loss of agricultural land to urban development, by and large, is irreversible. The inflexibility of much urban land use makes it impractical, if not impossible, to bring such land back into production again. This is not the case when cropland is diverted to forestry, forage production or recreation uses."[9]

Some soils are considered prime farmland if they are protected from flooding and/or drained. However, soils that are prime farmland if they are drained are more valuable and important if they are maintained as wetlands. Delaware County along with 39 other counties in Indiana have 0%-2.9% of their lands as wetland and deepwater habitat.[10] Considering that 24% of Indiana was once covered by wetlands, the present coverage is a staggeringly small amount. Figure 3 represents soils classified according to their productivity capacities.

The dominant soil types in the Prairie Creek Subwatershed are Crosby and Miamian. The Miamian soils comprise approximately 27% of the total area, and the Crosby soils comprise approximately 23% of the total area.[11] Crosby soils are somewhat poorly drained and respond well to tile drainage. Other soil types are less abundant and make up less than 10% of the total area of the subwatershed.[12] Figure 4 shows the soils' drainage capability in the Prairie Creek Subwatershed.

In most areas of Delaware County, septic systems should be discouraged due to the low carrying

5 The Geography of Indiana." 15 January 2006. Netstate.com. 27 February 2006. <http://www.netstate.com/states/geography/in_geography.htm>
6 Chapter 2: Describing the Subwatersheds. White River Watershed Management Plan. 2004. p. 40. 27 February 2006. <chapter%202%20ebook[1].pdf>
7 "Miami-Indiana State Soil." Natural Resources Conservation Service. 27 February 2006. <http://soils.usda.gov/gallery/state_ soils/>
8 http://www.in.gov/dnr/reclamation/protect_resources/farmland/
9 http://www.ces.purdue.edu/extmedia/AY/AY-245.html
10 Jackson, Marion T. The Natural Heritage of Indiana. Indianapolis: Indiana University Press, 1997. 73
11 "Miami-Indiana State Soil." Natural Resources Conservation Service. 27 February 2006.
12 "Miami-Indiana State Soil." Natural Resources Conservation Service. 27 February 2006.

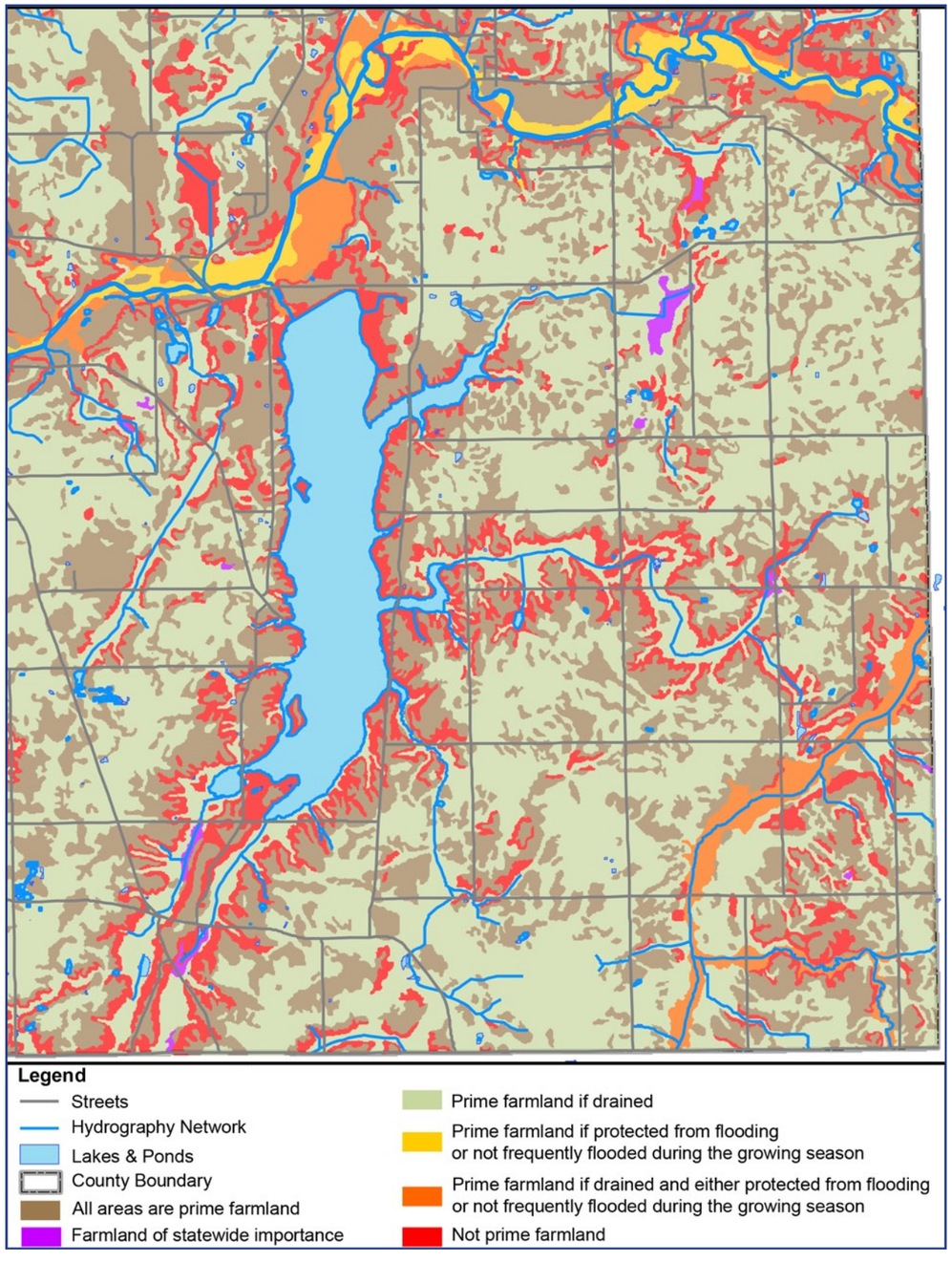


Figure 3: Soil Productivity Capacity Classification.

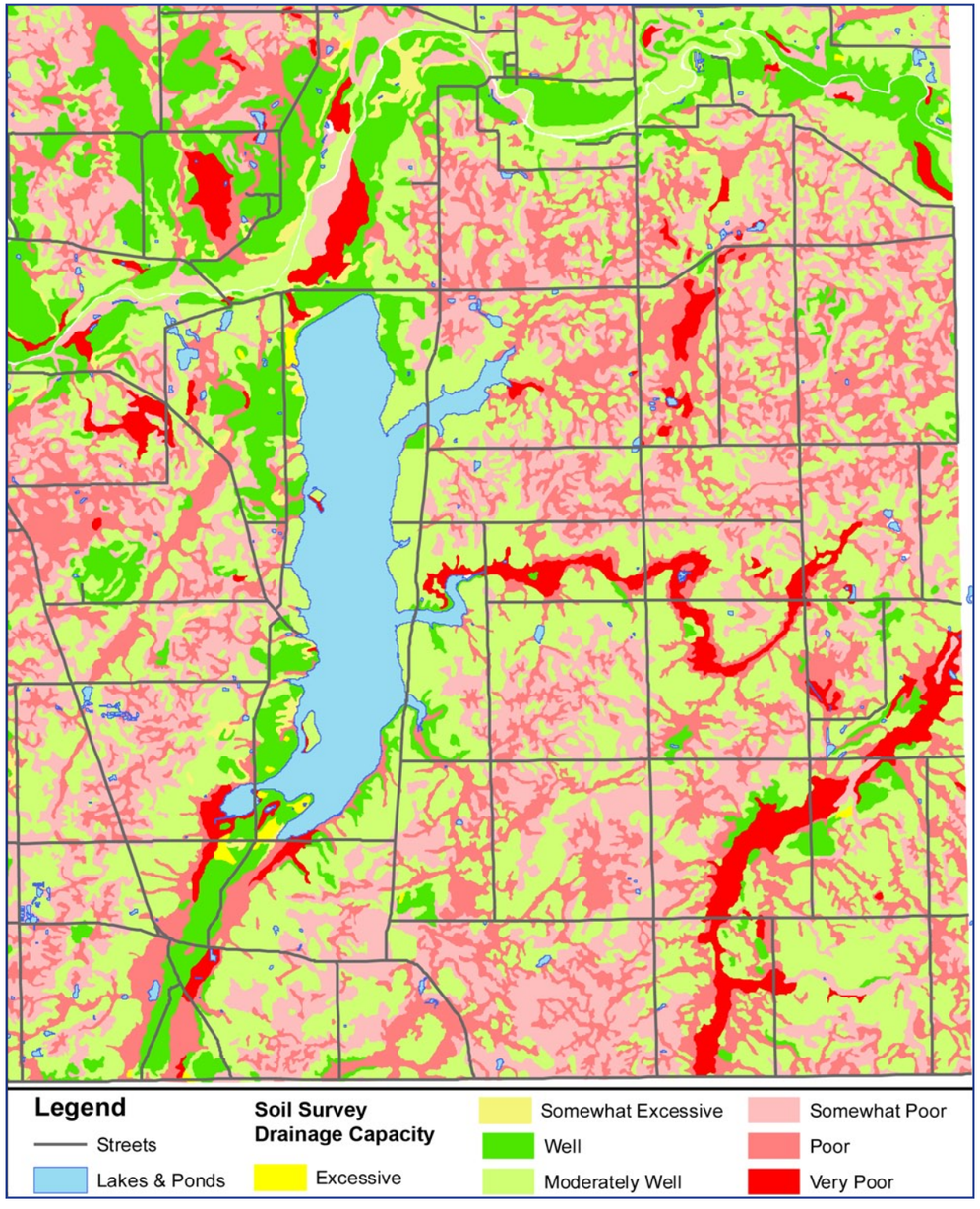


Figure 4: Soil Drainage Capacity Classification.

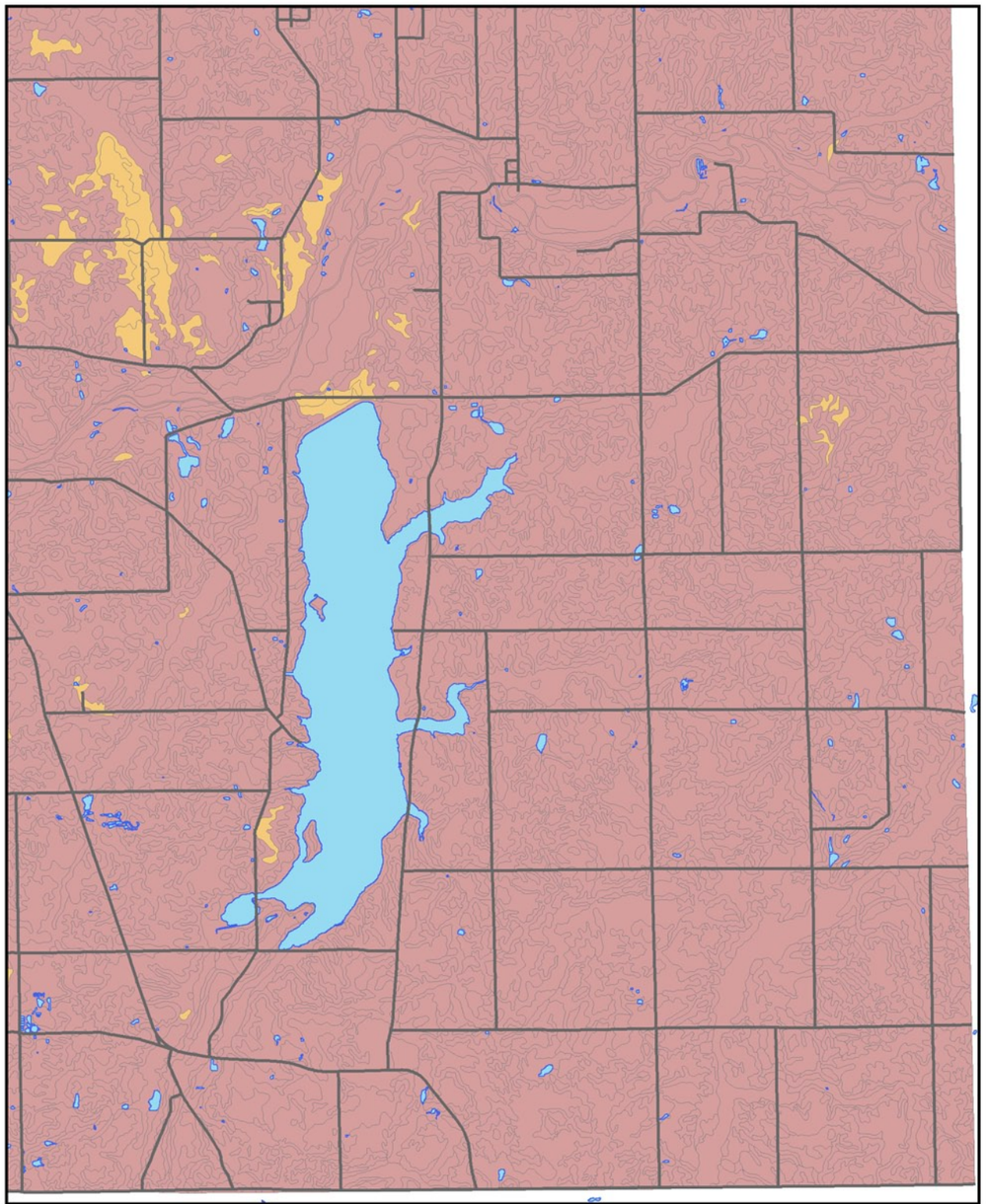


Figure 5: Soils Rated for Septic Tank Absorption Fields.

capacity of the soils. Throughout Delaware County there are no soils ranked as "not limited" for septic tank absorption fields. In fact, there are only four soils (Martinsville loam, 0-2% slopes; Martinsville loam 2-6% slopes; Mountpleasant silt loam, 2-6% slopes, eroded; and urban land Wawaka-Miami complex, 1-6% slopes, eroded) that are rated "somewhat limited" for septic tank absorption fields. All other soils are rated "very limited" for septic tank absorption fields. Figure 5 represents soils ranked for septic tank absorption fields. Appendix B- Sewage Disposal and Soil Characteristics, gives an in depth explanation of the NRCS rankings ("very limited", "somewhat limited", and "not limited"), and provides information for the soils found throughout Perry Township.

HYDROLOGY

WATERSHEDS

> **watershed-** the land area that drains water to a particular stream, river, or lake. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. Large watersheds, like the Mississippi River basin contain thousands of smaller watersheds.[13]

Each watershed is identified by the designated proper name and Hydrologic Unit Code (HUC). The HUC is a set of numbers ranging from 2 to 16 digits long. The smaller the number, the larger the area that is being identified; the larger the number, the smaller the area that is being identified. For example HUC 05 identifies the Ohio Region, a drainage region that includes parts of Illinois, Indiana, Kentucky, Maryland, Ohio, Tennessee, Virginia, and West Virginia. HUC 0512 identifies the Wabash River Basin within the Ohio Region, including area within Illinois, Indiana, and Ohio. HUC 051202 identifies the Patoka and White River Basins in Indiana, which are within the Wabash River Basin. HUC 05120201 identifies the Upper White River Watershed, which is within the Patoka and White River Basins.

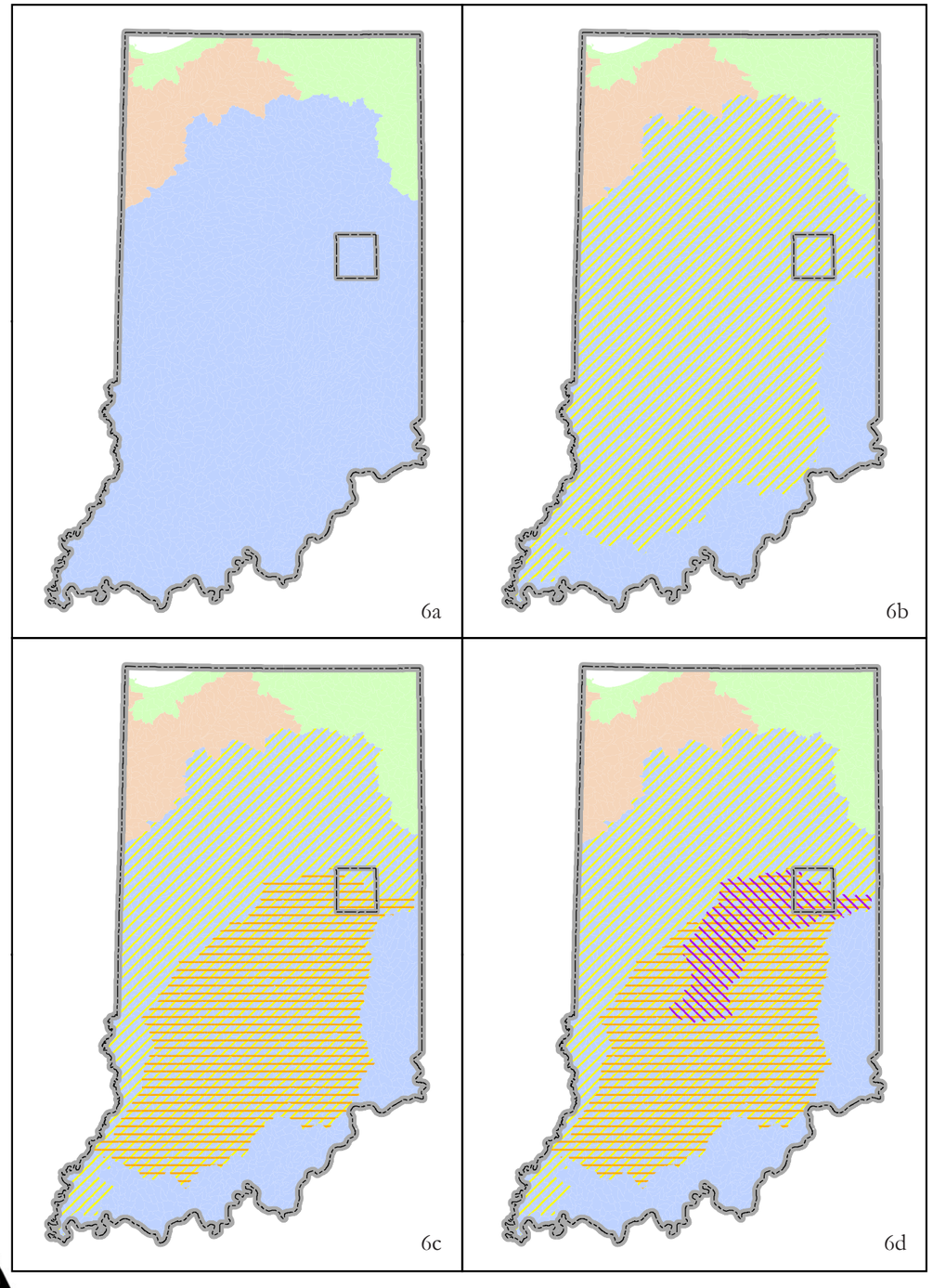
Prairie Creek Reservoir is located in the Prairie Creek Watershed, within the Upper White River Watershed, within the White River Basin. Figure 6 represents the various scales of watershed boundaries for the Prairie Creek Watershed.

HYDROGRAPHY

Prairie Creek was originally the main water body in the Prairie Creek subwatershed with several other tributaries, such as Huffman and Cunningham, flowing into it. In 1960, the United States Army Corps of Engineers constructed an earthen dam just above Prairie Creek's convergence with the White River to create the Prairie Creek Reservoir. The reservoir, 1250 acres, is now the major water body in the subwatershed. It serves as a backup drinking water source to the White River for the City of Muncie and is fed by 5 main streams: Carmichael Ditch, Shave Tail Creek, James Huffman Ditch, Cemetary Run, and Cecil Ditch.

The Silurian-Devonian Aquifer is the principle aquifer located within the northern part of the Prairie

13 (http://ga.water.usgs.gov/edu/dictionary.html#W)



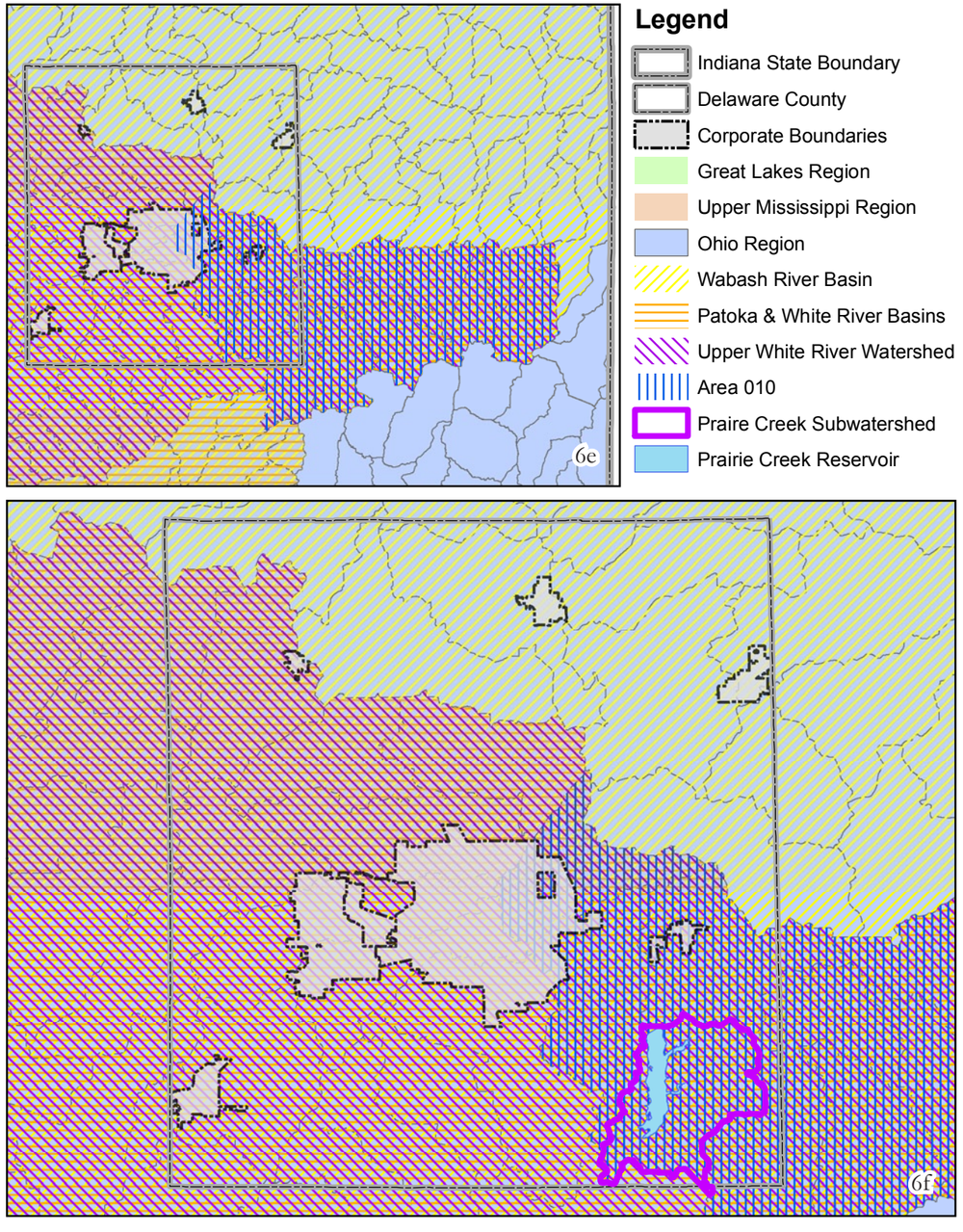


Figure 6: Watershed Boundaries in Indiana. 6a) the Ohio Region (Region 05); 6b) the Wabash River Basin; 6c) the Patoka & White River Basins; 6d) the Upper White River Watershed; 6e) Area 010; 6f) the Prairie Creek Watershed

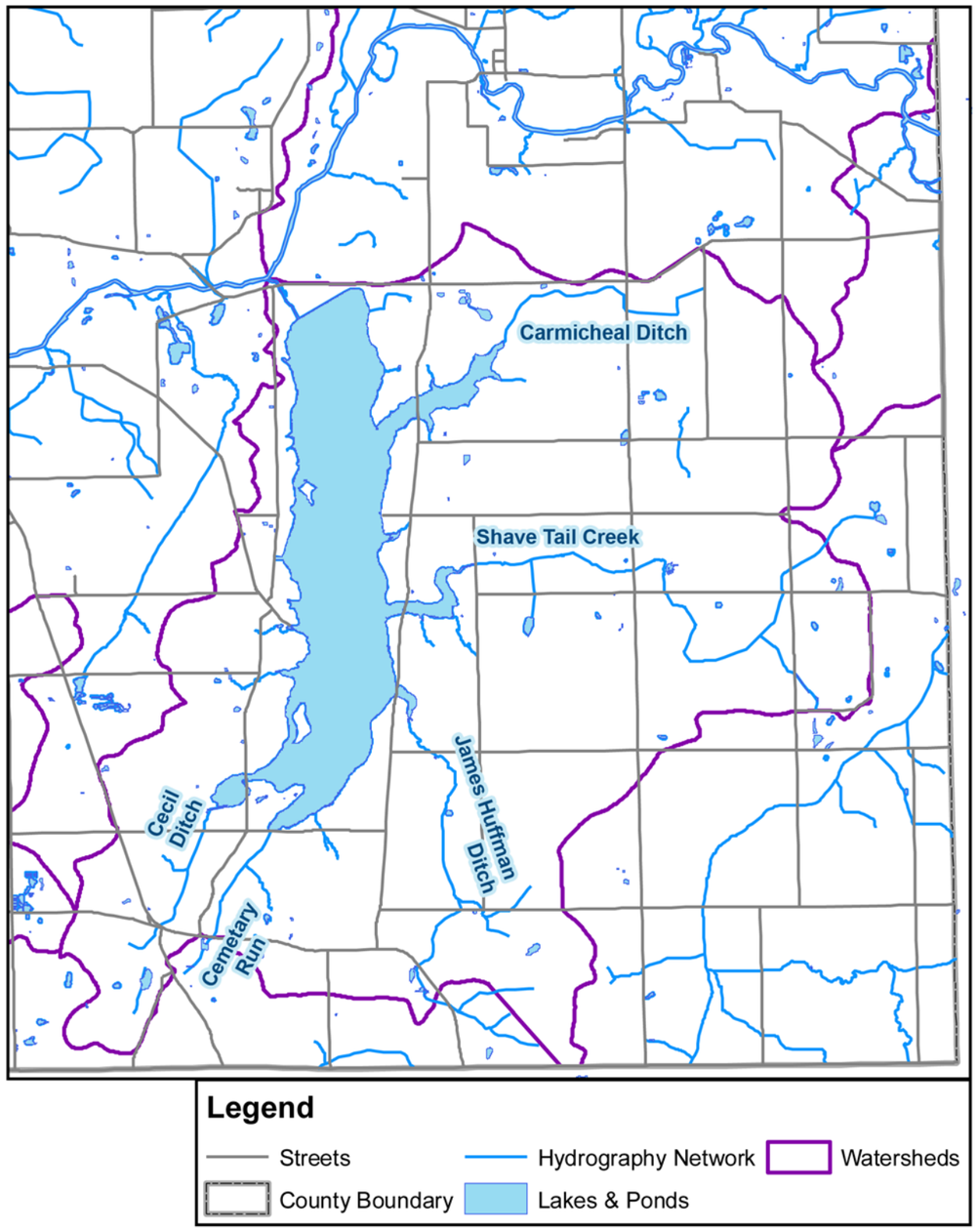


Figure 7: Hydrography of the Prairie Creek Watershed.
Note: The watershed boundaries are based upon information created for the State of Indiana. This information is not accurate at this magnification, streams should not cross a watershed boundary.

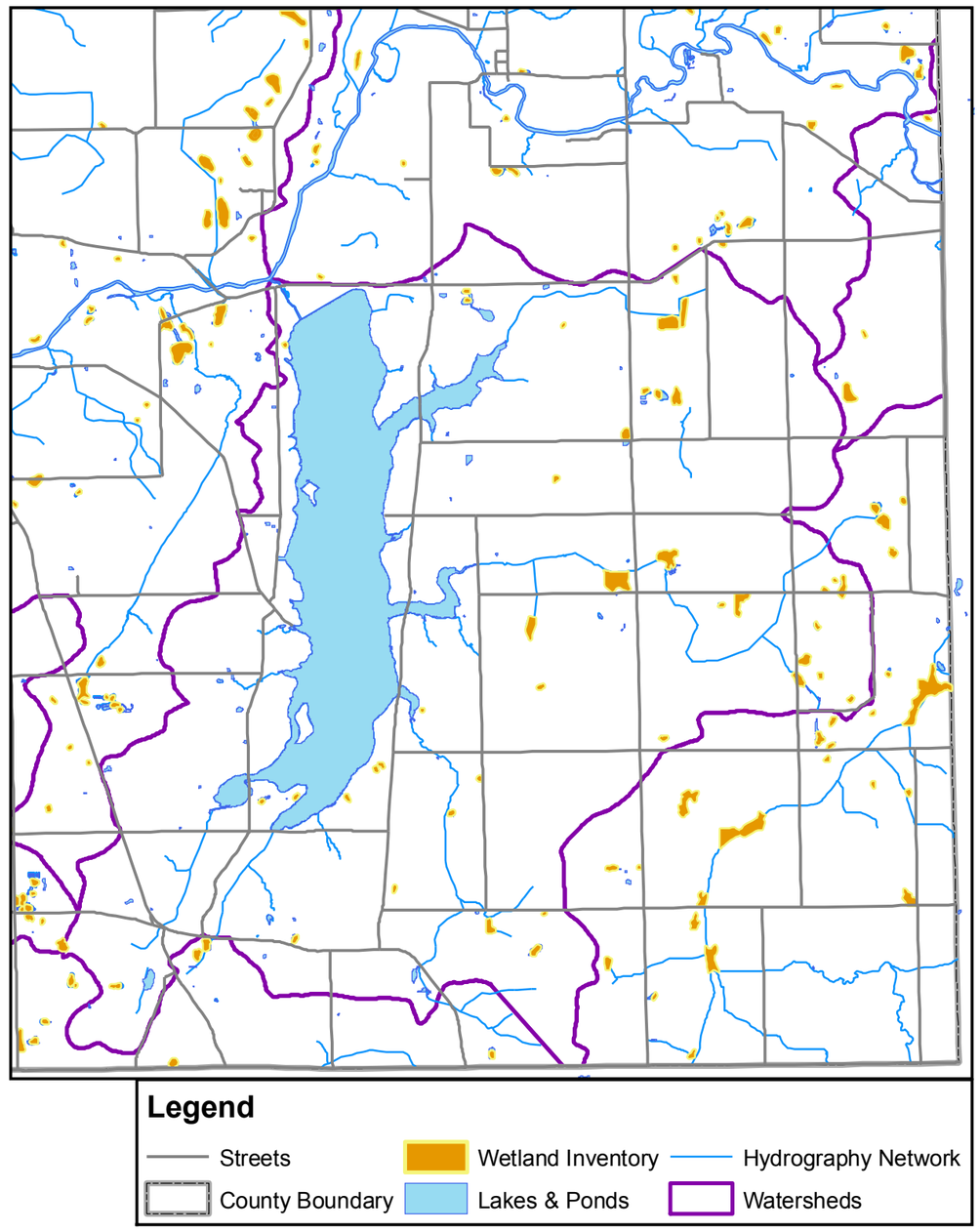


Figure 8: Wetlands in the Prairie Creek Watershed area.

Creek Subwatershed boundaries. The southern portion of the subwatershed gets groundwater through unconsolidated glacial till.[14] There are approximately fifty five acres of wetlands in the Prairie Creek Subwatershed.[15] Figure 7 shows the hydrology in the area.

WETLANDS

Wetlands clean our water, recharge groundwater aquifers, provide protection from flooding, control erosion, provide wildlife habitat, and educational and recreational opportunities. As previously mentioned, 24% of Indiana was once covered by wetlands. Wetlands not only provide environmental benefits, they are also a part of our natural heritage.

Currently less than 1.5% of Delaware County is covered by wetlands. The area surrounding Prairie Creek Reservoir reveals that only 0.5% of Prairie Creek Subwatershed is covered by wetlands. This small percentage of land cover is made up of 43 wetlands of the following types: 7- PEMA, 2- PEMAD, 1- PEMAH, 9- PEMC, 2- PEMF, 2- PFO1A, 1- PFO1AX, 2- PFO1C, 2- PSS1A, 1- PSS1AH, 1- PSS1C, 2- PUBG, 3- PUBGH, 8- PUBGX. All of these acronyms refer to wetland types that are palustrine; some of the variations refer to vegetative types, whether or not the land is always wet, temporarily wet, or seasonally wet, or if it contains open water.

"Over 70% of Indiana residents rely on ground water for part or all of their drinking water needs."[16] However, 100% of the residents in the Prairie Creek Reservoir area depend on groundwater for all or part of their drinking water needs for there are no water utilities in the watershed area. This factor makes wetlands an even more valuable resource for filtering surface water before it seeps into the groundwater.

Wetlands are also a valuable resource for recreation. "A 1996 survey by the U.S. Fish and Wildlife Service suggests that Indiana wetland habitats generate more than a million user days of nonconsumptive recreation each year," with activities including bird watching, photographing wildlife, and hiking.[17] Figure 8 shows wetlands within the Prairie Creek Reservoir Watershed area.

WATER QUALITY

Compared with the other waters of the county, the streams leading into Prairie Creek Reservoir have good water quality. Compared with other waters of the state, water quality is fair.[18] There are no water bodies in this watershed listed on the impaired waters of the state list (303(d) list).

Water quality monitoring of the Prairie Creek watershed took place during 2002-2003 during the White River Watershed Project Phase I study. Nine sampling points were monitored, seven within the watershed, and two in the White River (one before the watershed drains into the river and one after the

14 Chapter 2: Describing the Subwatersheds." 2004. White River Watershed Management Plan p. 42. 27 February 2006. <chapter%202%20ebook[1].pdf>

15 USFWS National Wetland Inventory [NWI], http://wetlands.fws.gov/

16 http://www.in.gov/wetlands/whatis/index.html

17 http://www.cees.iupui.edu/Education/Wetlands/index.htm

18 Rick Conrad, interview held during a Prairie Creek Master Plan Focus Group Presentation, Delaware County, Indiana, March 30th, 2006.

watershed drains into the river). Of the seven points within the watershed, four sampling points were from creeks and ditches that drain into the reservoir, two were in the reservoir, and the final sampling point was immediately below the reservoir's spillway. Figure 9 represents the sampling point locations.

The results from the monitoring indicated the following : 1) Temperature and pH were within state or scientific standards for those parameters; 2) Biological oxygen demand was within the standard range during some sampling events, but high during others; 3) Dissolved oxygen was low; 4) Total suspended solids and ammonia were higher than state standards; 5) Nitrates and orthophosphate at certain sampling points were higher than state standards; 6) E. Coli were higher than state standards; 7) Atrazine and diazinon were within detectable limits at one point or another in this watershed during the sampling season; 8) Biological habitat and aquatic life scores varied due to low flow in the creeks leading into the reservoir. Parameters of concern (in order of priority) included ammonia, dissolved oxygen, nitrate, orthophosphate, and E. coli.

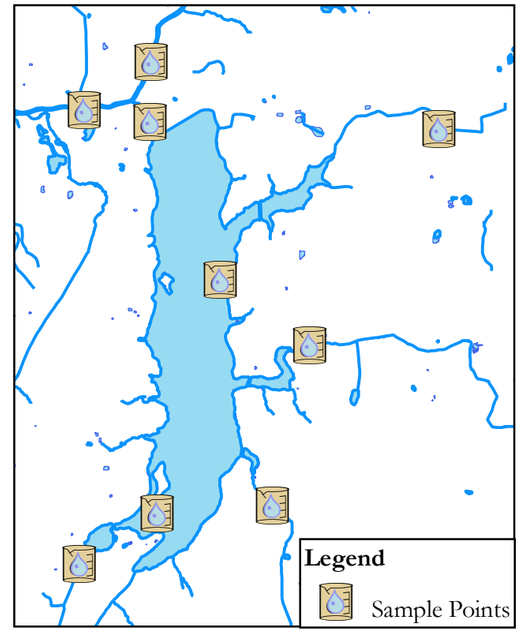


Figure 9: Sampling Points for the WRWP Phase 1.

Prairie Creek Reservoir continued to be a subject of study during 2005 and 2006. For this study, seven sampling points within the reservoir were monitored.

> The goal of this study was to assess the current water quality status of the Prairie Creek Reservoir in Delaware County, Indiana, and to initiate a long-term monitoring effort that will hopefully continue into the future. The results of this two-year study provide only a glimpse into the reservoir's water quality issues. Trends in a reservoir's water quality develop over a long period of time (e.g. 8 to 10 years) and thus it is essential that this monitoring effort continues in order to support future management decisions in this watershed.[19]

This study revealed that Prairie Creek Reservoir is a warm water body with extremely low amounts of dissolved oxygen. Nitrate concentrations were acceptable for drinking water standards, however nitrates can encourage eutrophication. Ammonia concentrations were only measured in 2006 and only exceeded permissible levels in September. Average orthophosphate concentrations were well above the level recommended by the EPA. Secchi disk readings indicated that the reservoir is in a eutrophic state. E. coli levels were above recommended amounts only 3 times, however since the monitoring is conducted in open water the monitoring of E. coli was not as informative as it could be if testing were

19 Popovicova, Jarka. "Water Quailty Assessment of the Prairie Creek Reservoir." December 2006.

conducted in the streams and ditches that drain into the reservoir. In conclusion:

> The reservoir is a warm eutrophic water body, meaning that the nutrient input has been the cause of algal growth and resulted in the current state of water quality: dissolved oxygen depletion within 40-60% of the reservoir depth from June through September, low water clarity, and concentrations of orthophosphates that exceed levels required to prevent eutrophication (increased biological production). Eutrophication at this reservoir has been an ongoing process and will continue into the future unless some measures are taken to manage input of nutrients from its watershed.
>
> Lack of dissolved oxygen throughout 40-60% of water depth measured in 2006 can negatively affect fishing, recreation, and water supply. As uncontrolled input of nutrients to the reservoir continues, algal growth is expected to persist and even worsen, and thus affect the value and benefits of this water resource in the future. Therefore, improved management of current land use practices, wastewater disposal, and properly planned future development is absolutely necessary if the community wants to maintain the benefits of this reservoir. It is important to keep in mind that all pollutants from surrounding land are continuously drained to the reservoir either by stormwater runoff or through streams and ditches and therefore affect its water quality, and current and future uses and enjoyment.

While the reservoir itself can be managed for oxygen depletion and algal growth by various chemical methods, this strategy should be used as a last resort and watershed management upstream from the reservoir should be considered in order to deal with the consequences of eutrophication. These in-reservoir management practices only "medicate and reduce the symptoms" rather than solve the real problems, which lie within the watershed. For example, it is necessary that future development and watershed activities include management strategies that (1) reduce production of pollutants from various sources within the Prairie Creek watershed through mitigation and improvement of current onsite wastewater treatment and reduction of pollutants input from tile drains; and that (2) retain pollutants upstream from the reservoir to prevent their accumulation in the reservoir.[20]

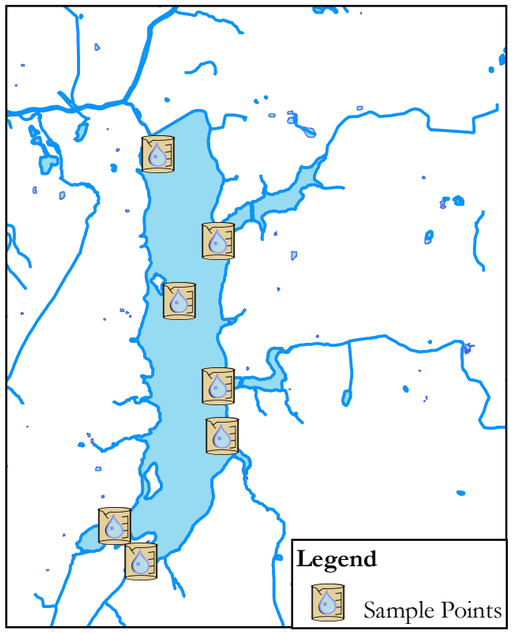


Figure 10: Sampling Points for the 2005-2006 study conducted by Dr. Jarka Popovicova.

Dr. Jarka Popovicova prepared an in-depth summary of this study (*Water Quality Assessment of the Prairie Creek Reservoir*) which is included in its entirety in Appendix A.

CLIMATE

Indiana has an energizing climate with strongly marked seasons. The transition from cold to hot weather sometimes produces an active spring with thunderstorms and tornadoes. Harsh humidity and high temperatures arrive in summer. Autumn has lower humidity than the other seasons, and mostly sunny skies. Indiana's location within the continent determines its climatic cycle. The Gulf of Mexico is a major player in Indiana's climate. Southerly winds from the Gulf region bring warm, moisture-laden air into the state. The warm moist air collides with continental polar air brought southward by central and western Canada's jet stream. A third air mass found in Indiana begins in the Pacific Ocean. However, this third air source arrives less frequently in the state than the other two due to the obstructions posed by the Rocky Mountains.[21]

Air temperatures in Indiana have a wide annual range due to the state's location and natural characteristics. January is usually the coldest month of the year with normal daily maximum temperatures ranging from 31-38°F north to south across Indiana. Normal January minimum temperatures range between 15-21°F north to south. July is the warmest month with daily maximums averaging 80-83°F and minimums 63-65°F. Table 1 summarizes the monthly mean temperature for Muncie, IN.[22]

Table 1: Monthly 1971-2000 Mean Temperature Normals for Muncie, IN

Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
24.5	28.5	38.8	50	61.5	70.6	75.5	72.3	65	53.1	41.3	30	50.8

Average annual precipitation in Indiana ranges from 37- 47 inches. May is the wettest month of the year with average rainfall between 4 and 5 inches across the state. Average rainfall decreases as the summer progresses. Autumn months are drier with 3 inches of rainfall typical in each month. Winters are the driest time of year in Indiana with less than 3 inches of precipitation commonly received each month. Precipitation increases in March and April as the spring soil moisture recharge season begins. Annual precipitation in Indiana is adequate, but an uneven distribution in the summer occasionally may limit crops. Floods occur in some part of the state almost every year and have occurred in every month of the year. The months of December through April have the greatest flood frequency. The primary cause of floods is prolonged periods of heavy rains, although rain falling on snow and frozen ground are sometimes contributing factors.[23]

Snowfall amounts vary greatly from year to year depending on both temperature and the frequency

20 Popovicova, Jarka. "Water Quailty Assessment of the Prairie Creek Reservoir." December 2006.
21 Scheeringa, Ken. "Climate of Indiana." December 2002. Indiana State Climate Office: Purdue University. 27 February 2006. <http://shadow.agry.purdue.edu/toolbox/narrative.html>
22 Scheeringa, Ken. "Climate of Indiana." December 2002.
23 Scheeringa, Ken. "Climate of Indiana." December 2002. Indiana State Climate Office: Purdue University. 27 February 2006. <http://shadow.agry.purdue.edu/toolbox/narrative.html>

of winter storms. Measurable snow typically begins in late November and ends by early April. Table 2 shows the monthly mean precipitation for Muncie, IN.[24]

Table 2: Monthly 1971-2000 Precipitation for Muncie, IN

Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
2.13	2.22	3.02	3.49	4.05	4.26	4.01	3.44	2.96	2.52	3.34	2.83	38.27

NATURAL REGIONS

> Natural regions are large delineations of the landscape where a distinctive and somewhat cohesive combination of natural features occurs. Such features include physiography (landforms) and types of soil, exposed bedrock, climate, vegetation, flora, and fauna. Subsets of these regions are called "sections." Sections of a natural region have enough differences between them that recognition is warranted, but the differences are not as great as between regions.[25]

Delaware County is in Indiana's Central Till Plain Natural Region. This is the largest natural region in Indiana. "The Central Till Plain is largely a level to gently undulating, somewhat monotonous landscape that was formerly heavily forested. Its deep, fertile glacial soils supported great forests of beech and maple, oak and ash and elm."[26]

Delaware County contains 2 of the 3 sections of this natural region including Bluffton Till Plain and Tipton Till Plain. Both of these sections contain the best representations of flatwood communities. Central Till Plain Flatwoods are particularly significant due to their status on the list of endangered, threatened and rare species that are documented in Delaware County, Indiana. This high quality natural community is rated as significant, imperiled in the state of Indiana, and as globally rare or uncommon.

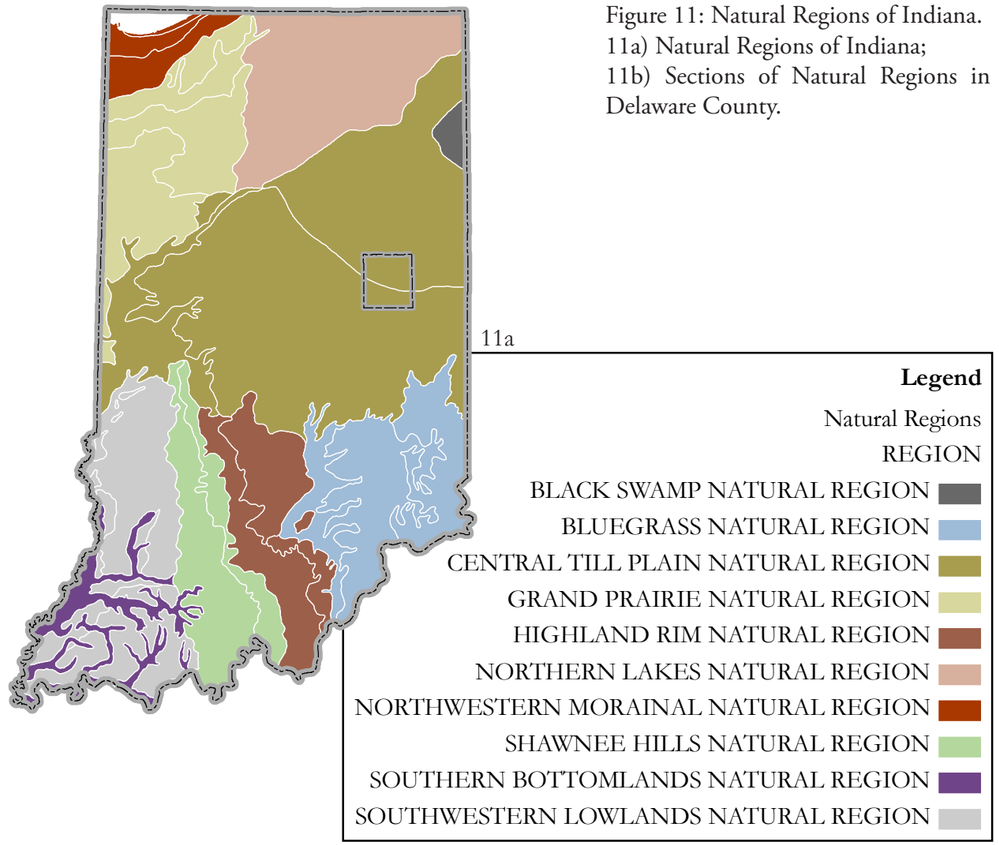
The Tipton Till Plain makes up the southern third of the county, including the area surrounding Prairie Creek Reservoir (see figure 11). This section is noted for flatwoods and mesic upland forests. Historically the flatwoods, which are often on poorly drained soils, were the most common type of forest in the region with mesic upland forests, with their particularly varied communities, well represented.

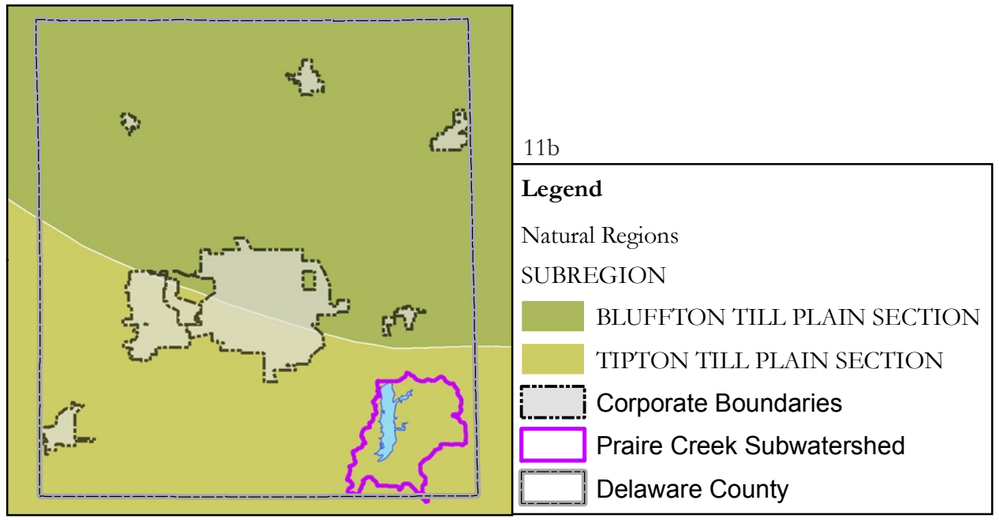
ECOREGIONS

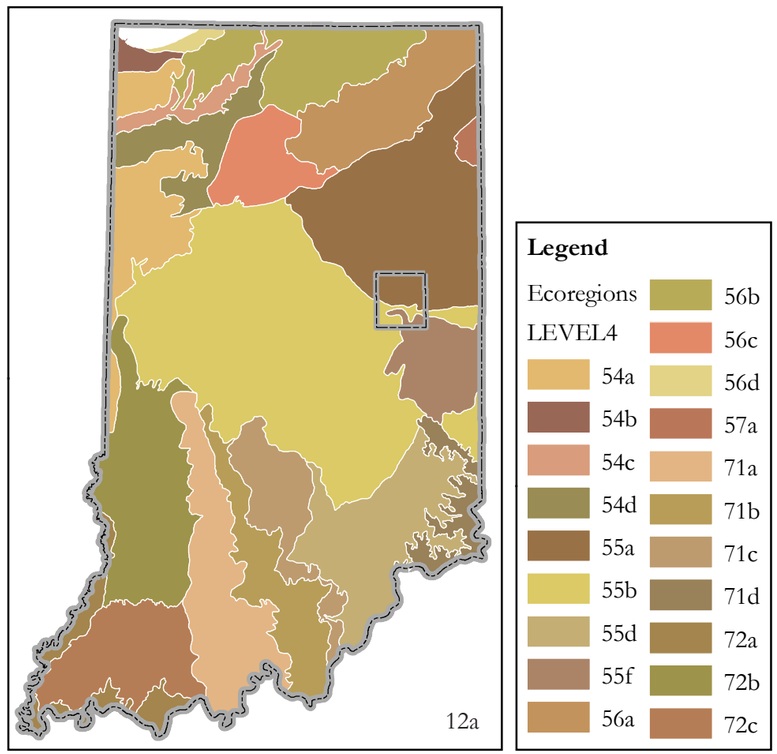
> Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components.

24 Scheeringa, Ken. "Climate of Indiana." December 2002.
25 Jackson, Marion T. The Natural Heritage of Indiana. Indianapolis: Indiana University Press, 1997. 159.
26 Jackson, Marion T. The Natural Heritage of Indiana. Indianapolis: Indiana University Press, 1997. 195.

Figure 11: Natural Regions of Indiana.
11a) Natural Regions of Indiana;
11b) Sections of Natural Regions in Delaware County.







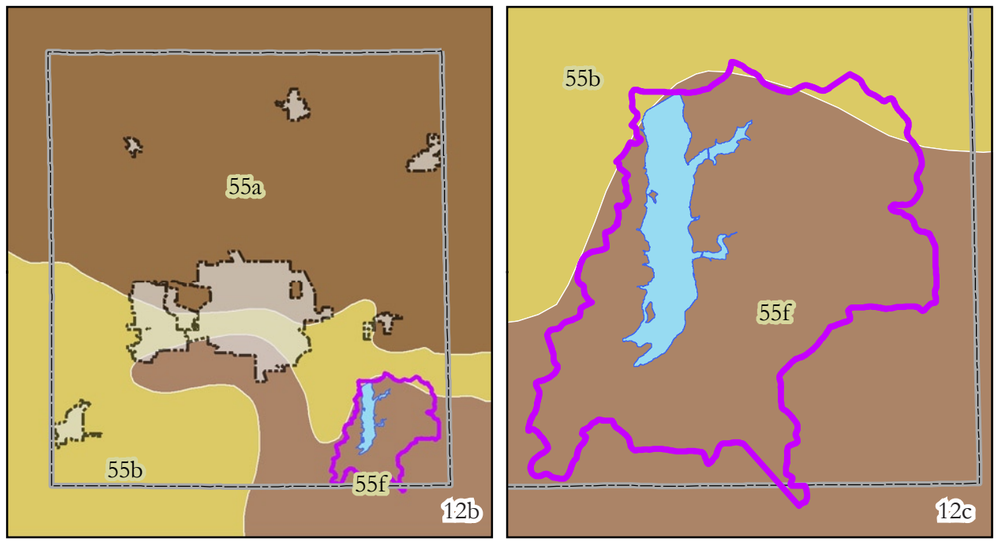


Figure 12: Ecoregions of Indiana. 12a) Ecoregions of Indiana; 12b) Ecoregions of Delaware County; 12c) Ecoregions of Prairie Creek Watershed.

The Loamy, High Lime Till Plains ecoregion, or 55b, contains soils that developed from loamy, limy, glacial deposits of Wisconsinan age; these soils typically have better natural drainage than those of Ecoregion 55a and have more natural fertility than those of Ecoregion 55d. Beech forests, oak-sugar maple forests, and elm-ash swamp forests grew on the nearly level terrain; today, corn, soybean, and livestock production is widespread.

The Whitewater Interlobate Area ecoregion, or 55f, has distinctive cool water, coarse-bottomed streams that are perennial and fed by abundant ground water. The redside dace, northern stud fish, and banded sculpin occur; they are absent or uncommon in Ecoregion 55b. Unique Ozarkian invertebrates also occur in Ecoregion 55f. Dolomitic drift and meltwater deposits are characteristic and overlie limestone, calcareous shale, and dolomitic mudstone.[27]

FLORA & FAUNA

Indiana has been the home of many species that are now extinct within its boundary. In the last 200 years Indiana has lost black bears, spotted skunks, porcupines, fishers, big-eared bats, elk, mountain lions, plains bison, Canada lynxes, red wolves, timber wolves, wolverines, and black rats. And that list only includes mammals. Most of these species' populations disappeared from Indiana shortly after European settlement between 1830 and 1860 while just a few of those species were able to maintain their populations in the state into the early and middle parts of the 20th century. Since European settlement, the majority of the forested areas have been cleared for agriculture, leaving behind fragmented woodlots.

Indiana also lost its populations of beavers and river otters. Beaver populations were able to make a come back within Indiana in the early 1900's. During the 1990's efforts began to reestablish populations of river otters.

Delaware County is home to 33 species of endangered, threatened or rare species including nine vascular plant species, nine species of mollusca, five species of reptiles, six species of birds, three species of mammals, and one high quality natural community (as previously mentioned). See Appendix C for the endangered, threatened and rare species list for Delaware County.

Dominate wildlife of the area include white-tailed deer, red and gray fox, raccoon, opossum, fox squirrel, and American robin. The reservoir area also provides habitat for waterfowl including belted kingfisher, double-crested cormorant, Canada goose, loon, gulls, and great blue herons. There are plans to erect 3 osprey nesting platforms by the end of 2006 in this area. Woodcock have been observed near the reservoir. Fish species are stocked yearly in the Prairie Creek Reservoir. The Indiana Department of Natural Resources inventories the fish in the lake; their latest inventory showed that the reservoir contains Channel Catfish, Northern Pike, Largemouth Bass, Smallmouth Bass, Bluegill, Blue Catfish, Crappie, Perch, and Walleye[28]; common carp are a nuisance species of concern in the reservoir and its tributaries.

27 ftp://ftp.epa.gov/wed/ecoregions/oh_in/ohin_front.pdf
28 http://www.in.gov/dnr/fishwild/publications/notes/prairie.pdf

Figure 13: Fish found in Prairie Creek Reservoir.
1) Gizzard Shad, 2) Longear Sunfish, 3) Bluegill, 4) Quillback, 5) White Sucker, 6) Green Sunfish, 7) White Bass, 8) Orangespotted Sunfish, 9) Yellow Perch, 10) Golden Shiner, 11) White Crappie, 12) Common Carp, 13) Walleye, 14) Black Crappie, 15) Channel Catfish

Fish illustrations: Iowa Department of Natural Resources, Maynard Reese: 1,3, 4, 6, 8, & 10; USFWS, Duane Raver: 2; Ohio Division of Wildlife: 5, 7, 9, 11-15

History

Delaware County is located in the east central part of Indiana. The County contains one centrally located second-class city, the City of Muncie and six incorporated towns; Eaton, Albany and Gaston located in the northern third of the County; Yorktown to the west of Muncie and Selma to the east of Muncie; and Daleville (the County's newest incorporated town) located in the southwest corner of the county. The Madison County town of Chesterfield has annexed territory in southwest Delaware County next to Daleville. There are also several small, unincorporated communities, some of which date back to the earliest settlements in Delaware County.

The early history of Muncie and Delaware County is mostly unknown until the Munsee Clan of the Delaware Indian Tribe moved into the area around 1790. After being driven from Eastern Pennsylvania by the Iroquois, the Munsee Clan was given permission by the dominant Miami Tribe to settle along the Wapahani, now White River. While here the Clan established 14 towns extending along the river from a point southeast of the present site of Muncie to an area near what is now Noblesville. One of these towns was located a short distance from what would later be the intersection of Walnut Street and Minnetrista Boulevard and is the source for the name Munsee town, now Muncie. The Munsee Indians remained in the area until late 1820 when they moved to land west of the Mississippi, as they agreed to do in a treaty signed with the federal government in 1818.

Following the departure of the Indians, federal surveyors arrived in the area and began work on setting up the township system. When this was completed in 1822, the land was officially opened for settlement. The abundance of fertile soil drew settlers into the area from the east as they migrated westward across northern Ohio. Others came up from the south after passing through the Cumberland Gap. By 1827 these settlers had decided to ask the Indiana General Assembly to organize and recognize the area as Delaware County, Indiana. Delaware County was organized January 18, 1827, and became effective April 1, 1827. It is 339 square miles and bounded on the north by Grant and Blackford Counties, on the east by Randolph County, on the south by Henry County, and the west by Madison County. Munseetown was founded and selected as the county seat in the same year, but the name was changed to Muncie by a state act in 1844. In 1849 it had a population of 800.[1] Other area communities settled at that time including Smithfield and Granville, both before 1830.

Muncie first had an opportunity for town status in 1847, but the community did not take action on incorporation until 1854. The reasons for the delay are not known, but it is thought that the impetus to finally incorporate was the arrival of Muncie's first railroad in1852. The town grew at a modest rate and in the 1860's there was a movement for incorporation as a city. This resulted in an election in February 1865 with 293 votes for and one vote against incorporation. Later that month the first mayor, John Brady, and other city officials were elected into office. The city experienced normal growth and served as an agricultural-serving trade center for the next twenty-five years. Then, in 1886 a natural gas field was tapped near Eaton. This gas was piped to Muncie where it served as a major attraction for glass, rubber, metal and other industries. The economic expansion caused by the gas fields not only changed the city from an agricultural center to an industrial center, but also caused Muncie's population to double in the following ten years. This "boom" had turned into a "bust" by

1 Delaware County." Copyright 2000-2006. Indiana County History Preservation Society. 13 Jan 2006. <http://www.countyhistory.com/delaware/start.html>)

the turn of the century when the natural gas supply ran out. Many industries closed, others moved, but some remained. The employment slack picked up slightly after World War I with the introduction of automotive industry, but glass, stone and clay industries remained dominant until after World War II necessitated the expansion of the automotive industry.

Delaware County once contained eastern deciduous forests that were broken up by wet prairies that were excellent for meadows and pastures. The principle growth was timber: oak (Quercus spp), hickory (Carya spp.), beech (Fagus grandifolia), poplar (Liriodenderon tulipifera), and walnut (Juglans nigra). There were few acres in the County that could not be adapted for agricultural purposes. Following settlement most of the land was cleared of trees, drained and converted to farmland.

The White River has been the main water source for the City of Muncie since it's founding. During the 1950's it was decided that the projected growth of Muncie's industry and population warranted a back-up water source to supplement the White River. The site of the current reservoir was chosen because of topography, proximity to the river and the rural nature of the ground cover at the time. In 1960, the United States Army Corps of Engineers constructed an earthen dam just above Prairie Creek's convergence with the White River to create the Prairie Creek Reservoir. In the building process of the reservoir, land around the dam and beach was graded, but everything else was left "as is" – tree stumps, fence posts, roads, etc. The dam is earthen lakeside stabilized by riprap. The reservoir is fed water by Prairie Creek and other smaller tributaries. The outlet goes under the dam and the gates are manual. A spillway is located to the west of the dam.

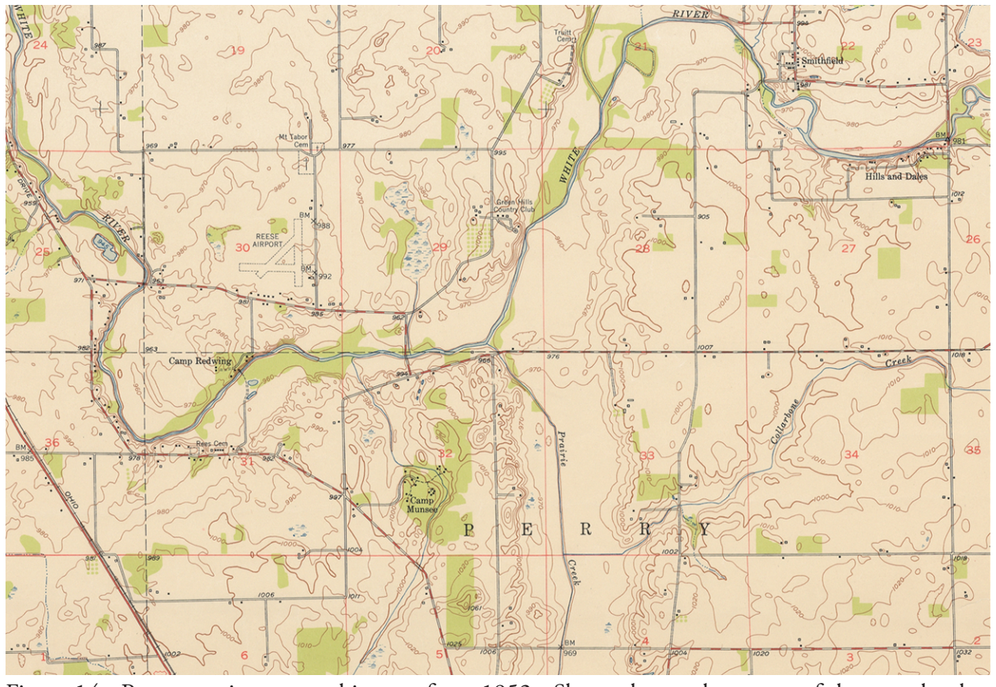


Figure 14: Pre-reservoir topographic map from 1952. Shows the northern part of the area that has since been converted into Prairie Creek Reservoir. Source: MUNCIE EAST, IND 1952; USGS & Indiana Department of Conservation

Land Use

The predominant land use in the Prairie Creek Subwatershed is agriculture followed by green space and water bodies. Currently, residential land use only comprises approximately 6% of the area but this could change as development pressures increase.

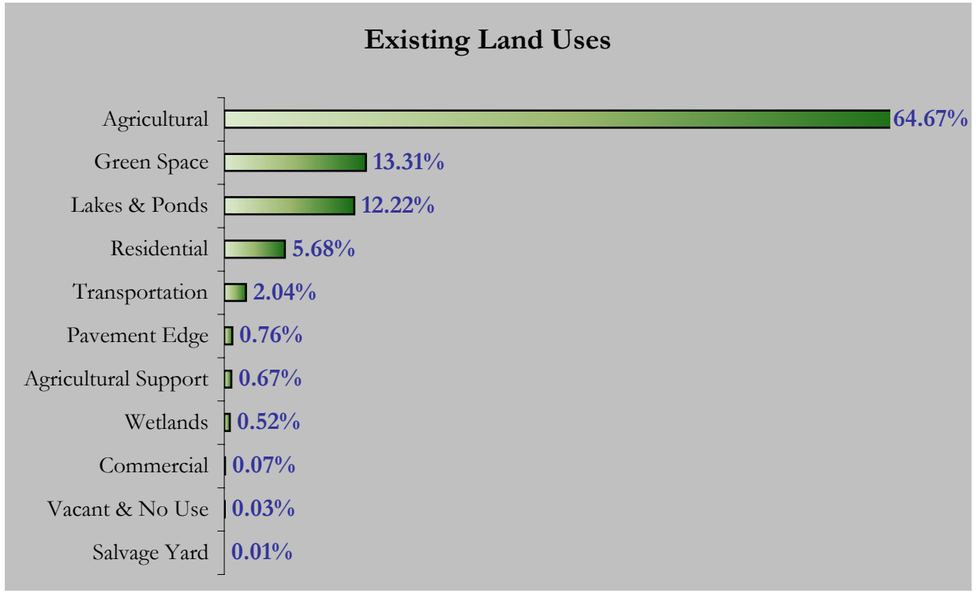
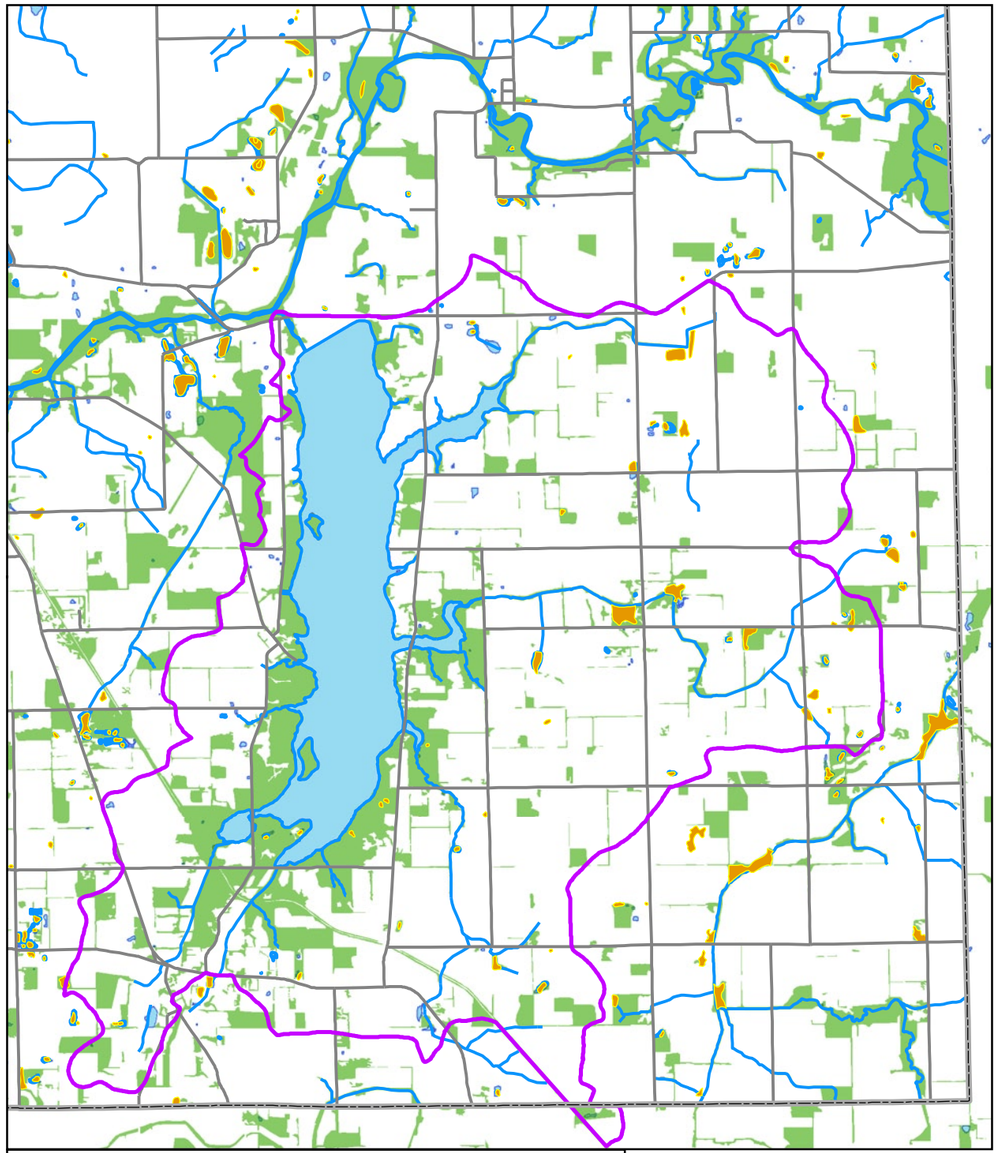


Figure 15: Land use breakdown in the Prairie Creek Watershed.

The existing development pattern is of a rural nature. There are several farms in the watershed and a number of homes on smallish one to five-acre parcels that line the county roads. The area around the reservoir is substantially wooded and open space grass. The banks of the White River and the streams feeding it are frequently wooded. Other land in the reservoir area is mostly covered by farm fields and with the yards of homes. There are a number of scattered woodlots separated by fields. Figure 16 shows the land cover in the Prairie Creek Reservoir watershed area.

New Burlington, a small, unincorporated community of about two-dozen homes abuts the reservoir. Mount Pleasant, another small unincorporated community lies about a mile southwest of the reservoir and has approximately three-dozen homes and a couple businesses. The area surrounding the reservoir and between the water and the county roads is mostly park administered by the City of Muncie Parks Department. To the east of the reservoir there are a number of businesses including a bar/restaurant, bait shop and a marina.

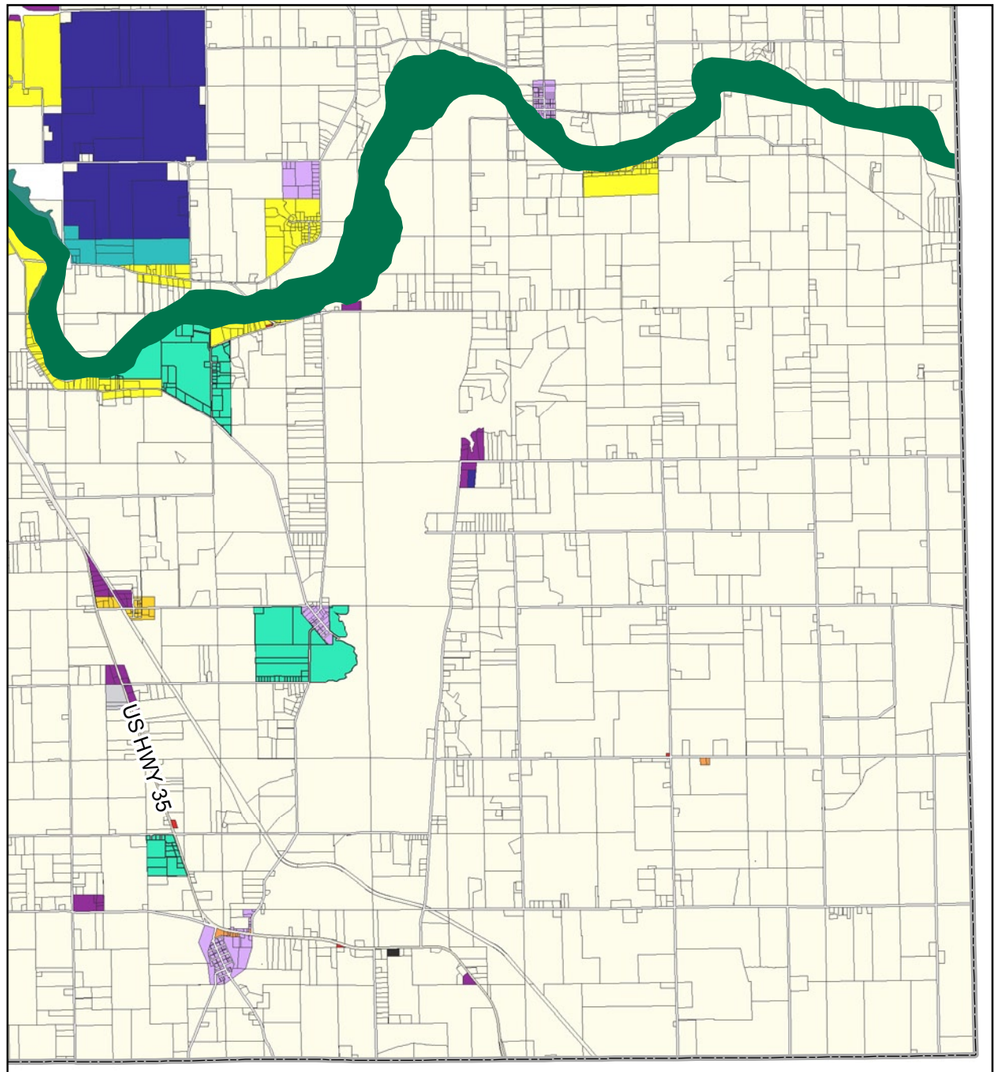
This section describes the current development located within a three mile buffer surrounding the Prairie Creek Reservoir. For general housing statistics for Delaware County and Perry Township see the Demographics section. The data was taken from the Delaware County Geographic Information



Legend

- Delaware County
- Praire Creek Subwatershed
- Streets
- Hydrography Network
- Wetland Inventory
- Wooded Areas
- Lakes & Ponds

Figure 16 (above): Land Cover in the Prairie Creek Watershed area.



Legend

- Delaware County

Zoning

ZONE

- AGRICULTURAL BIOENTERPRISE
- CENTRAL BUSINESS ZONE
- AIRPORT DEVELOPMENT ZONE
- BUSINESS PROFESSIONAL
- COMMUNITY BUSINESS ZONE
- FARMING ZONE
- FLOOD AREA ZONE
- INDUSTRIAL PARK ZONE
- INTENSE INDUSTRIAL ZONE
- LIMITED BUSINESS ZONE
- LIMITED INDUSTRIAL ZONE
- MAJOR TRADING ZONE
- MOBILE HOME RESIDENCE ZONE
- RECREATION AND CONSERVATION ZONE
- RESIDENCE ZONE 1
- RESIDENCE ZONE 2
- RESIDENCE ZONE 3
- RESIDENCE ZONE 4
- RESIDENCE ZONE 4a
- RESIDENCE ZONE 5
- RESIDENCE ZONE 6
- STUDENT SOCIAL SERVICE ZONE
- VARIETY BUSINESS ZONE

Figure 17 (p. 43): Zoning in the Prairie Creek Watershed area.

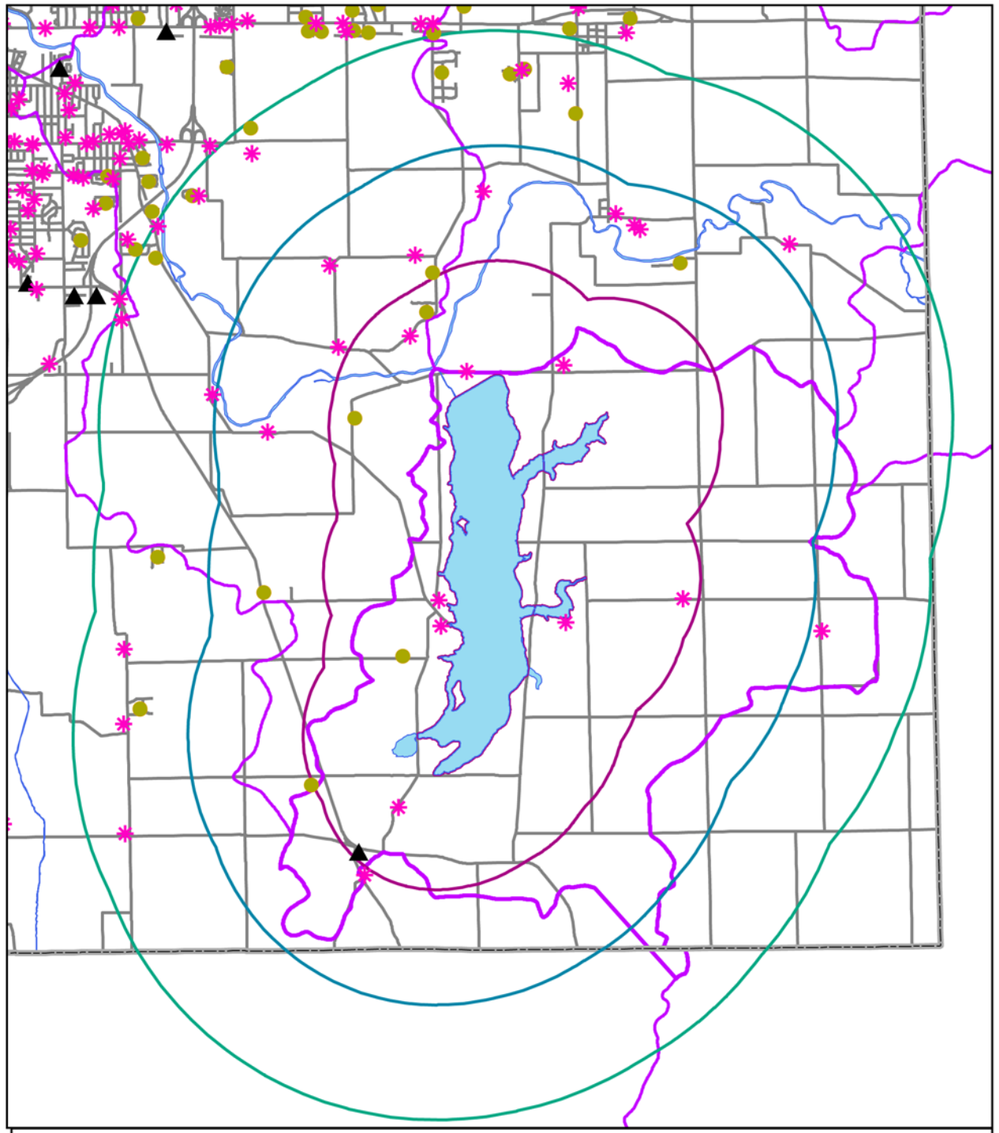


Figure 18: Development in the Prairie Creek area.

System's (G.I.S.) county subdivision, mobile home park, and points of interest layers. Information may be incomplete and is not exclusive. Most of the current development located within three miles around the reservoir tends to be on the southwest, west, and northwest sides. Figure 18 shows some of the current development in the area.

Within one mile of the reservoir there are two unincorporated communities: 1) New Burlington located 0.27 miles WSW of the reservoir; and 2) Mount Pleasant on U.S. 35 South about one mile southwest of the reservoir; and two subdivisions; 1) Lakeview situated approximately 0.78 miles WNW of the reservoir; and 2) Glenn Hills situated approximately 0.80 miles north of the reservoir. There is also one mobile home park named Quiet Acres Mobile Home park located approximately one mile southwest of the reservoir.

Located within the two mile buffer surrounding the Prairie Creek Reservoir are the unincorporated community of Medford on County Road 500South and four residential subdivisions: 1) Rolling Hills Est. located just over a mile southwest of the reservoir and 0.75 miles northwest of the mobile home park; 2) Perry Heights positioned approximately 1.68 miles west of the reservoir; 3) Olde Wellington situated about 1.17 miles north of the reservoir; and 4) Hills and Dales located approximately 1.45 miles northeast of the reservoir. The South Muncie Kiwanis Club is located on Inlow Springs Road just over a mile northwest of the reservoir.

The limits of the City of Muncie and Town of Selma are just within three miles of the reservoir. There are also nine residential subdivisions located within the three mile buffer surrounding the reservoir: 1) Country Walk positioned about 2.6 miles WSW of the reservoir; 2) Fox Glenn located approximately 2.5 miles west of the reservoir; 3) Suburban Court A situated about 2.8 miles WNW of the reservoir; 4) Maple Manor located approximately 2.8 miles northwest of the reservoir; 5) Ironwood Estates positioned just under three miles north of the reservoir; 6) Meredith II situated about 2.9 miles north of the reservoir; 7) Liberty Village is located about 2.6 miles north of the reservoir; 8) Edgewood Addition is just east of Liberty Village about 2.6 miles from the reservoir; and 9) Huntington Village is situated approximately 2.5 miles north of the reservoir. Other points of interested located within the three mile boundary include: 1) Christian Chapel located on CR 200 E about 2.7 miles west of the reservoir; 2) Rosewood Manor on Burlington Drive just over 2 miles WNW of the reservoir; and 3) Academy of Model Aeronautics situated on Memorial Drive about 2.7 miles northwest of the reservoir.

Recreational Opportunities

There are many recreational opportunities available at the Prairie Creek Reservoir Park and surrounding area. The Prairie Creek Reservoir Park is a 2,300 acre facility which holds a 1,242 acre stream-fed lake. The City of Muncie holds a long-term lease on approximately 740 acres of the land surrounding the water that comprises the park. Most of that land is devoted to passive recreation and is undeveloped. The park serves all of Muncie and Delaware County as well as surrounding counties. The Prairie Creek Reservoir Park begins full operation on April 15th each year and remains open until October 15th. During the off-season the park is open, but is staffed during limited hours.

On site recreational opportunities include fishing, boating, picnicking, playing at playgrounds, swimming (at the beach area only), basketball, volleyball, horseshoe pitching, barbecuing, camping, off-road vehicle trails, and horseback riding trails. Off site recreational opportunities include access to the Cardinal Greenway and the Red-Tail Nature Preserve. Various clubs and service groups use Prairie Creek Reservoir including the Muncie Sailing Club, Bass-fishing Club, The Munsee Sky Chiefs (a model aeronautics club), a windsurfers group, and the Muncie Model Boat Club.

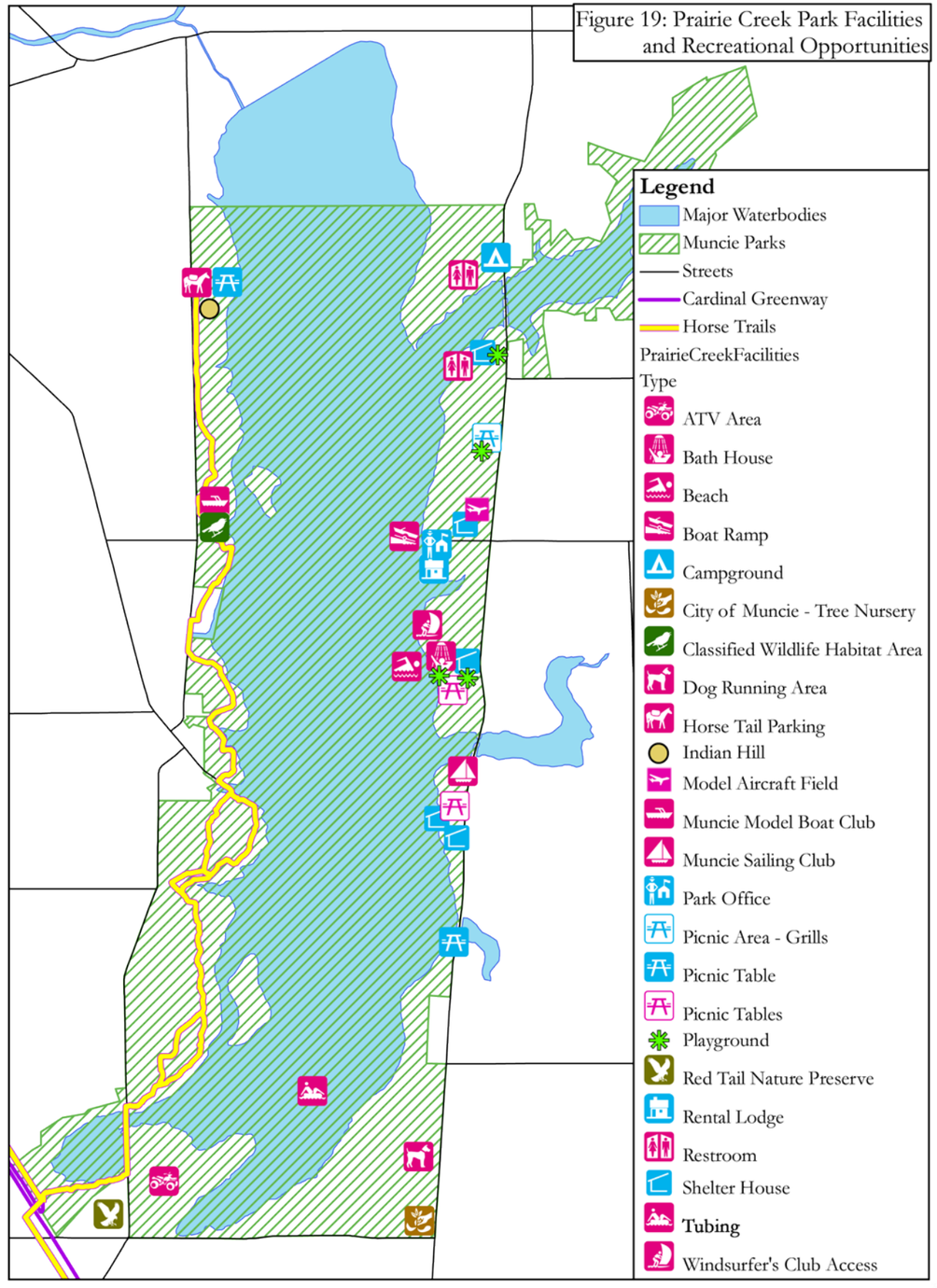
Park facilities include handicapped fishing pier, row boat rentals, approximately 363 boating docks (permitting two boats at each dock) and one launch, moorings, open-air shelters, one rentable lodge, a beach area, concession stand, a basketball court, three main playgrounds with swing sets, slides, Teeter Totters, Whirls and other playground equipment, a volleyball court, a horseshoe pitch, three main picnic areas, barbeque grills, vending machines, restrooms, campground with 140 camp sites and bath house, off-road vehicle trails, and horseback riding trails. The Muncie Sailing Club offers dock facilities for sailboats that are privately operated.

Docks are taken out of water every winter. Dock fees are $250 for city residents, $300 for county residents and $350 for out of county residents (includes private landowners). Docks are in high demand and there is a waiting list. The Parks Dept. puts piers on the "arms" of the reservoir for people who own private property along the tributaries. On a good summer day 100-200 people will put additional boats on the reservoir ($5/day public access). There are 140 campsites. On holidays the campgrounds are usually full. There is a primitive camping area that usually has open spaces. The seasonal campsites are often fully occupied and there is a waiting list. There are three main picnic areas located by the beach. Playgrounds are near Dry Dock Marina, on the south shore, and in the campground. South of the beach there are two more shelter houses. A number of picnic tables are scattered about the park. The speed limit for boats is 20 mph. Figure 19 illustrate the facilities and recreational opportunities within and neighboring Prairie Creek Park.

Figure 20 represents trails and routes in the southeastern portion of Delaware County including the existing horse trail (yellow trail on map), existing Cardinal Greenway route (purple on map), existing open spaces (green), and proposed bike route suggestions taken from the 2005-2030 Delaware County Transportation Plan. A multi-modal approach to transportation planning in the Delaware-Muncie community was used to include the bicycle and the pedestrian component. The vision of the plan is that everyone within Delaware County is within ten minutes of connecting to "the system".

Background & Inventory

Figure 19: Prairie Creek Park Facilities and Recreational Opportunities



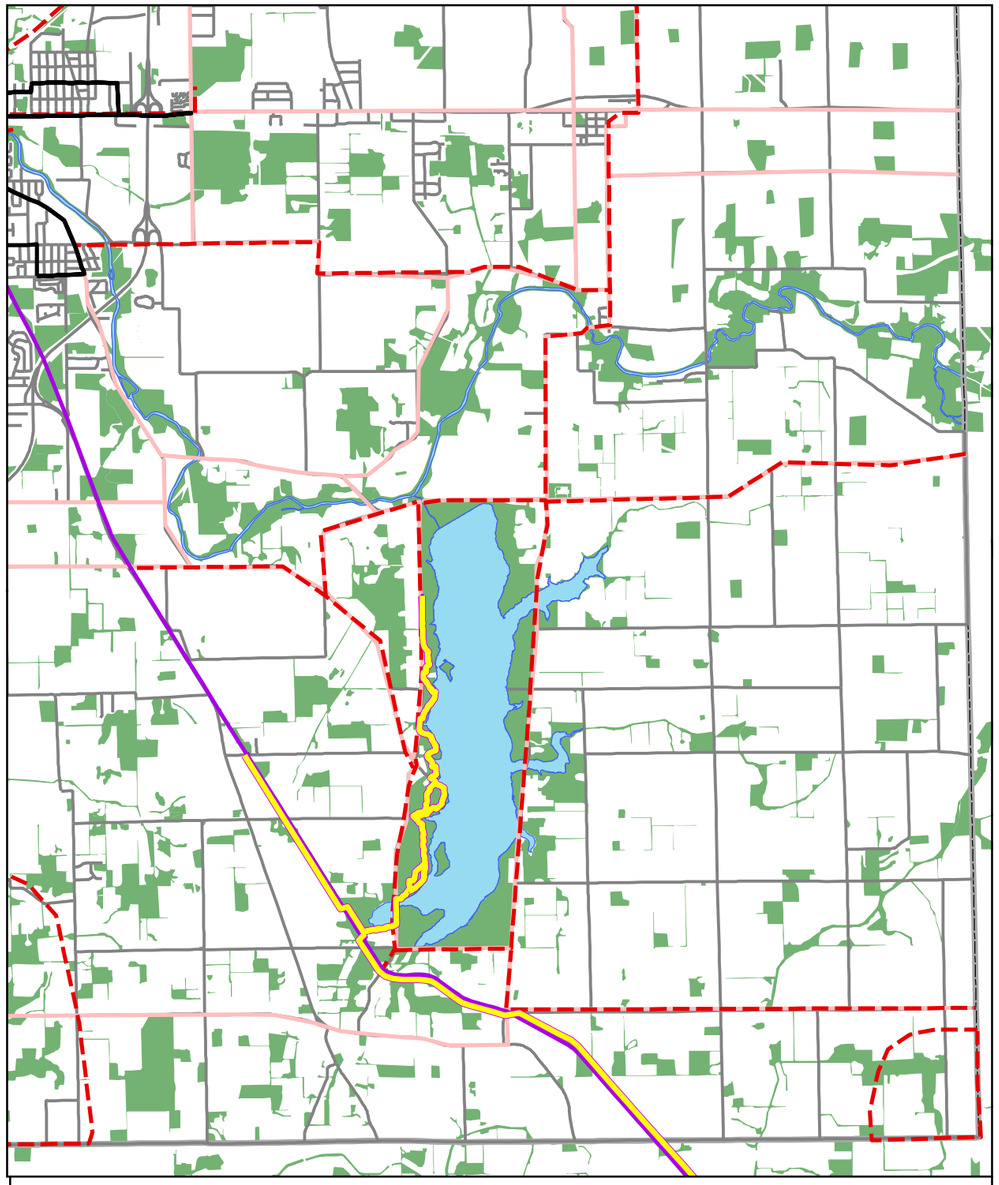


Figure 20: Recreational Trails and Routes in the Prairie Creek area.

Transportation Inventory

Delaware County's most direct surface transportation connection to nearby metropolitan areas is I-69, located along the western edge of the county. I-69 runs north and south until it nears the southern end of the county where it turns southwest towards Anderson and Indianapolis. Interchanges occur at State Road 28, State Road 332 and State Road 67/32. State Road 28 runs east-west between I-69 and State Road 67. State Road 332 runs east-west from I-69 to the City of Muncie where it becomes McGalliard Road. State Road 67/32 extends northeast to the City of Muncie where it intersects State Road 3 and U.S. 35 and turns into the Muncie Bypass. State Road 3 runs north-south through the county intersecting both Muncie and Eaton and connecting New Castle in Henry County and Hartford City in Blackford County to Delaware County. U.S. 35 breaks off from the bypass and follows a southeastern course through Delaware County to Richmond in Wayne County, coming to within about a mile of the southwest corner of Prairie Creek Reservoir. State Road 32 splits from the bypass and goes east from Muncie through Selma to the county line and beyond connecting Winchester in Randolph County to Delaware County. State Road 67 runs northeast through Albany and connects Portland, in Jay County, and Muncie. See Figure 20 for the locations of the major roads in Delaware County.

Access to Prairie Creek Reservoir is through a combination of state and county roads. There is no direct route to the reservoir from either SR 35 or SR 32. Both routes involve taking county roads that are often winding and narrow. Many of the county roads in the area are less than twenty feet wide. Access from the City of Muncie is also indirect via winding and often narrow county roads (see Figure 21). The reservoir is accessible by bike from the Cardinal Greenway only by biking on those same narrow winding county roads. The rural nature of the roads in this area may be partially responsible for slowing residential growth and indirectly protecting the rural character of the watershed.

The roads adjoining Prairie Creek Park are County Road 575East on the east, County Road 475East on the west, County Road 650South to the south and Windsor Road on the north. County Road 575East approximately twenty feet wide, but sections are rated as only in 'Fair' condition in the County's pavement inventory. County Road 475East is only about eighteen feet wide and narrows to as little as sixteen feet near County Road 700South. Together these four roads make up what is referred to as the "ring roads" surrounding the reservoir (see Figure 21). The County's road inventory sites several problems along the ring roads that need attention. Potholes, missing or damaged signs and guardrail issues are noted.

Burlington Drive is the most direct route when coming from Muncie and is listed as in 'Fair' condition in the County's inventory. Its width is generally about twenty feet. Access from U.S. 35 makes use of County Road 534East, one of the 'Poor" condition roads in the area according to the County's inventory. Inlow Springs Road, another road on the route between Muncie and the reservoir, is also in "Poor" condition according to the County's inventory. Figure 22 illustrates the road inventory for the area surrounding Prairie Creek Reservoir.

There is no public transit that currently has service to Prairie Creek Park, although the Muncie Indiana Transit System (MITS) has serviced the park in the past. MITS has no plans at this time to resume public transit service to the reservoir on a regular basis, however temporary service might be extended

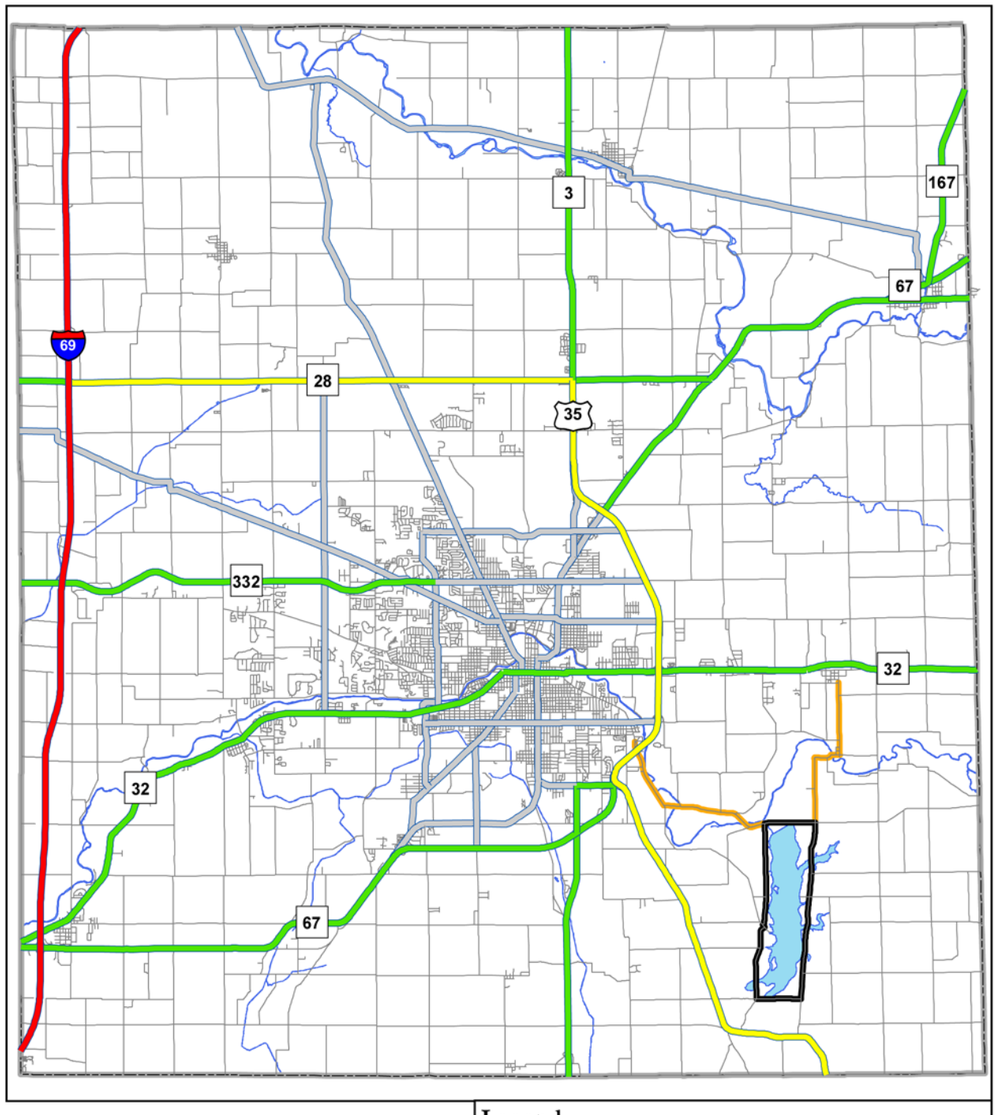


Figure 21: Roads in Delaware County.

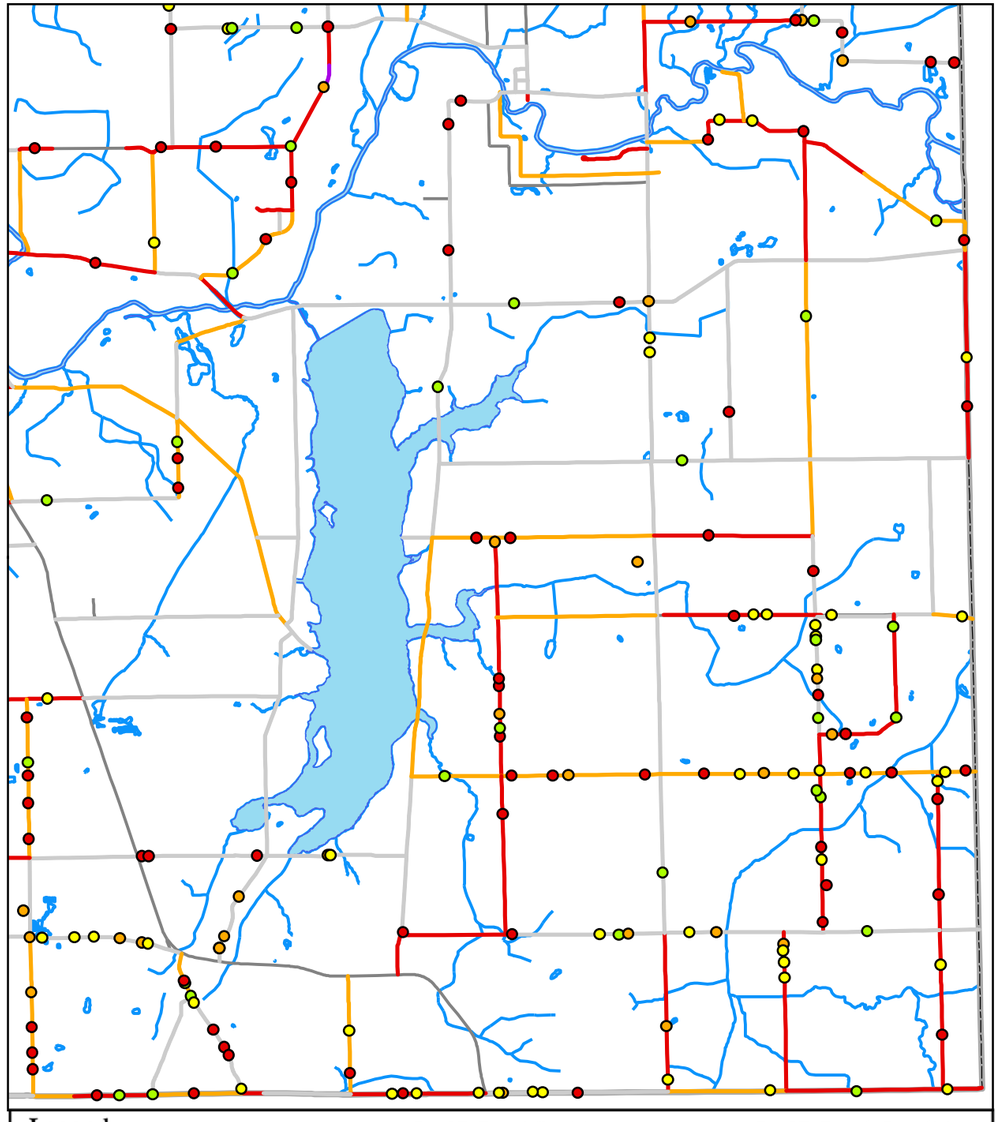


Figure22: Road Inventory.

for special events.

Scheduled transportation improvement projects for the Prairie Creek area include replacement of the Smithfield Bridge and improvements to County Road 700East from SR 32 south to the county line. The Smithfield Bridge is scheduled for replacement in 2009. At that time the road will probably be realigned and the new bridge placed so as to leave the historic truss bridge in place. The Transportation Improvement Plan for Delaware County has the section of County Road 700East north of Windsor Road and south of SR 32 scheduled for improvements in 2013. The road will remain two lanes, but most likely be widened and shoulder and ditch work done. The section of County Road 700East south of Windsor Road will most likely be improved soon after that work is completed.

Other possible future improvements not currently scheduled in the Delaware County Transportation Improvement Plan could include widening County Road 575East along the east side of the reservoir, widening, adding turn lanes and a bike lane and improving County Road 450 South from County Road 700East to County Road 575East. This could furnish improved access routes to Prairie Creek Reservoir from both SR 32 and US 35. Such improvements are not currently part of the Delaware County long-range transportation plans.

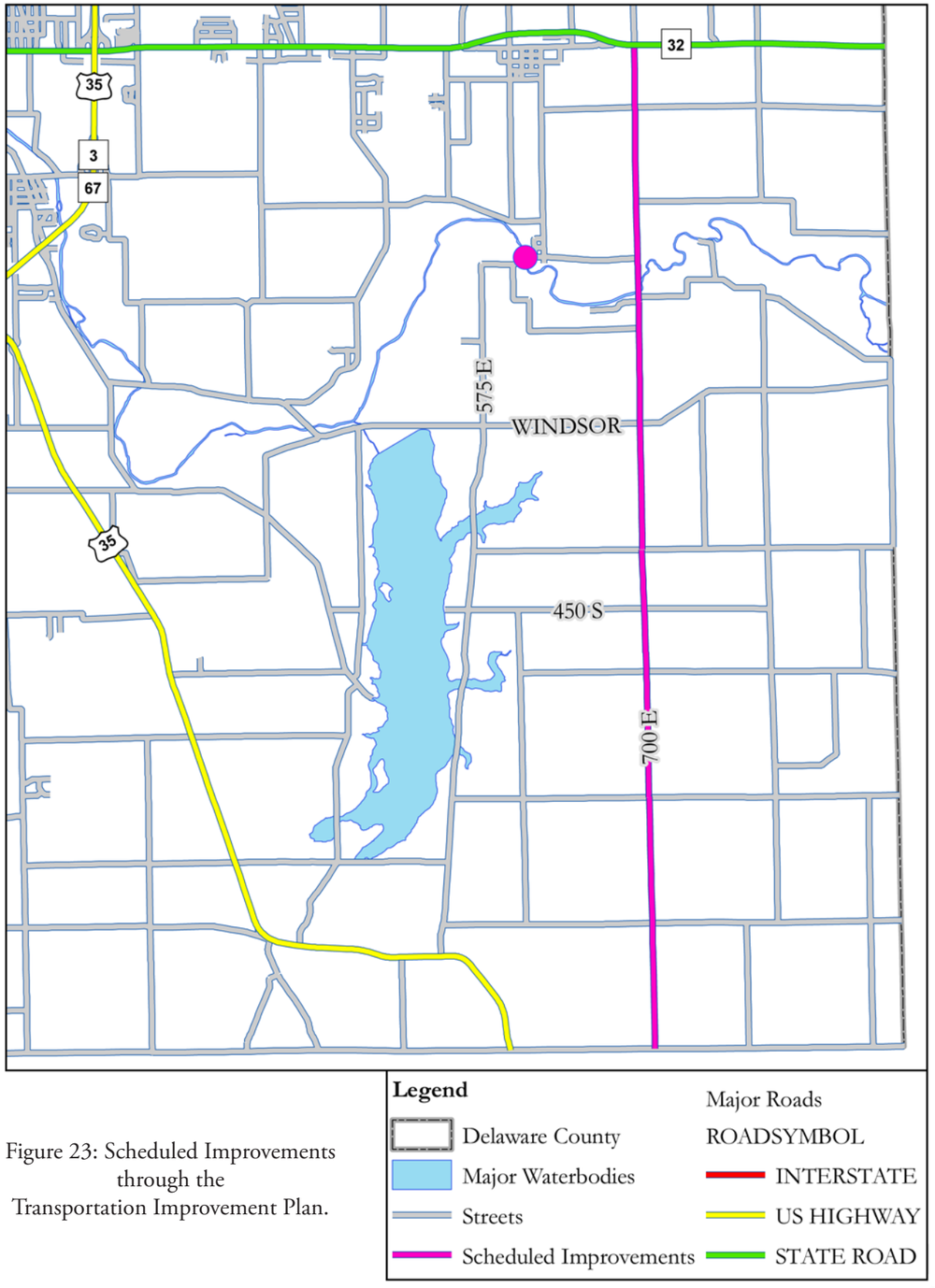


Figure 23: Scheduled Improvements through the Transportation Improvement Plan.

Existing Utilities

Prairie Creek Reservoir is owned and operated as a supplemental drinking water source for the City of Muncie by the Indiana-American Water Company. Public utilities at Prairie Creek and in the area surrounding it are limited to electric power and telephone service. Local water is supplied by private wells. There are no public or private wastewater treatment systems. Area homes and businesses are serviced by individual septic systems. It is believed that many of those are in need of maintenance or replacement. Storm water runoff is handled by county ditch and tile systems. The closest public wastewater treatment facility is Liberty Regional Wastewater located in Selma.

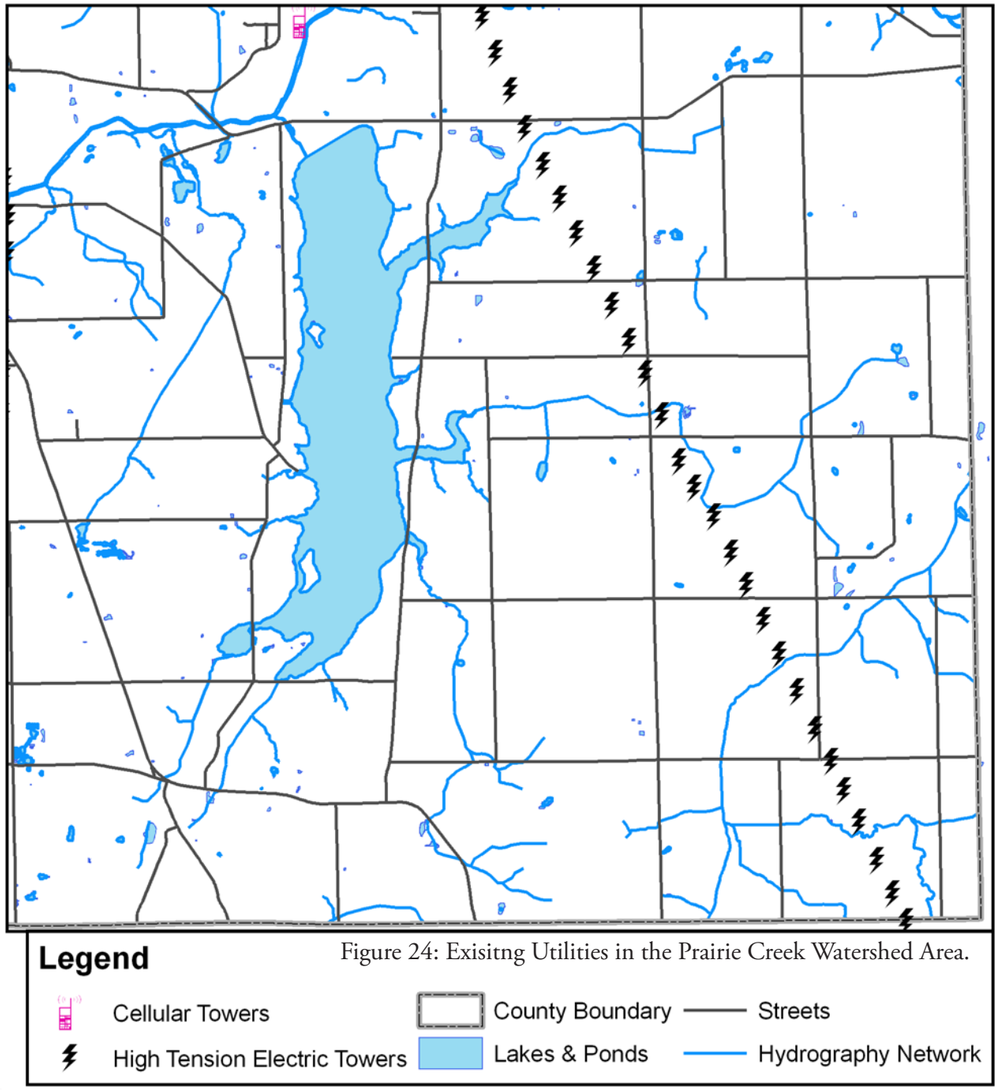


Figure 24: Exisitng Utilities in the Prairie Creek Watershed Area.

Figure 25: Aerial of Perry Twp. and part of Liberty Twp. (2005).

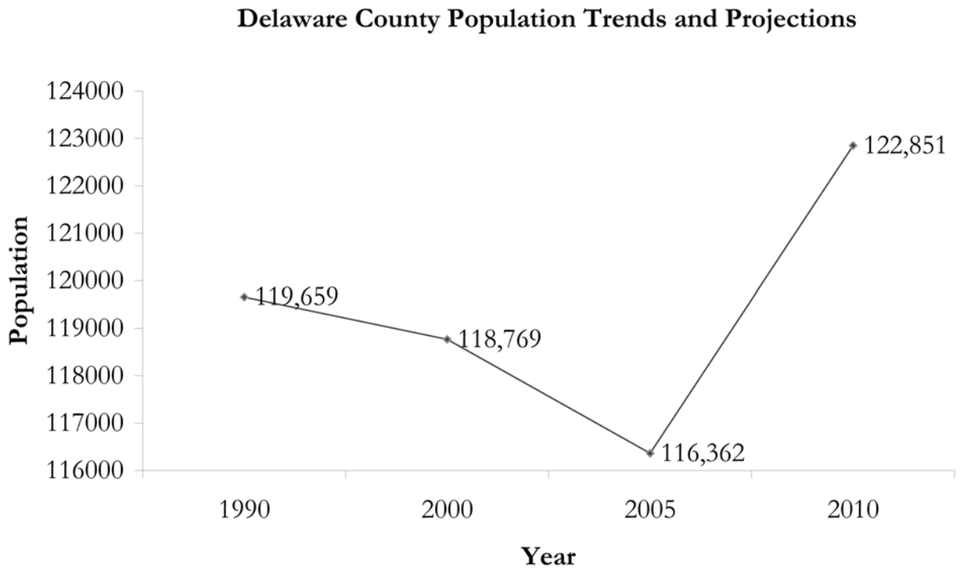
Demographics

INTRODUCTION

This chapter summarizes the findings of demographics for Delaware County and Perry Township where data was available. Demographics present in this section include population trends, age distribution, education statistics, labor force statistics, poverty and income statistics, employment statistics, housing statistics, and agricultural statistics.

DELAWARE COUNTY POPULATION TRENDS

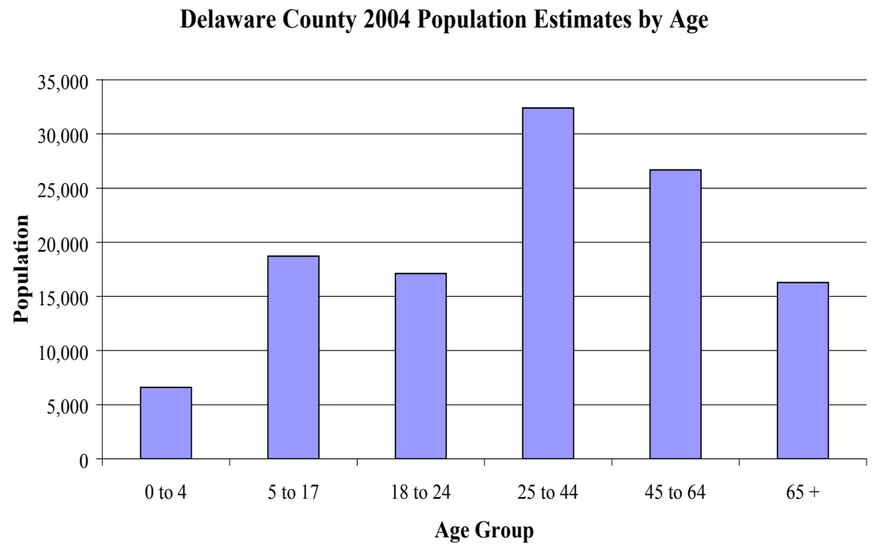
Figure 26 (below) shows how the population in Delaware County has changed and is expected to change over time. The U.S. Census Bureau's estimated population for Delaware County in 1990 was 119,659. Ten years later in 2000, the population declined by approximately 1,000 people to 118,769. In 2005, Delaware County's population again declined by approximately 2,000 people to a total population of 116,362. However, in 2010 the U.S. Census Bureau projects a population increase of approximately 6,000 people to a total population of 122,851. This could be due to the age distribution of the County. In 2004 the 25-44 age group had the largest population. The offspring of this age group could contribute to the increase in Delaware County's 2010 population. Of the 92 Indiana Counties, Delaware County ranks 14th for overall population based on 2005 population estimates.



Source: U.S. Census Bureau, 2005 Population estimates, Census 2000, 1990 Census <http://www.factfinder.census.gov>

DELAWARE COUNTY AGE DISTRIBUTION

Figure 27 (below) shows the age distribution of Delaware County from the U.S. Census Bureau's 2004 estimates. The 25-44 age group had a population of 32,389 representing the largest portion of the County's total population. The 45-64 age group represented the second largest portion of the total population with a 2004 population of 26,672.



Source: US Census Bureau; Indiana Business Research Center <http://www.stats.indiana.edu/profiles/pr18035.html>

DELAWARE COUNTY EDUCATION STATISTICS

The table below summarizes the educational attainment level for the Delaware County population compared to the Indiana population from the U.S. Census Bureau. Delaware County is ranked 13th in the state for number of high school graduates; there were 1,083 high school graduates in Delaware County from the 2003-2004 school year. Of those high school graduates, 990 or 91% were reported going on to higher education.

Table 3: Delaware County Education Statistics

Education	Number	Rank in State	Percent of State	Indiana
School Enrollment (2004/2005 Total Reported)	18,781	14	1.6%	1,154,681
Public	17,225	14	1.7%	1,021,244
Private	1,556	9	1.2%	133,437
High School Graduates (2003/2004)	1,083	13	1.8%	59,655
Going on to Higher Education	990	10	2.0%	48,296
4-year	748	10	2.1%	36,056
2-year	188	12	2.4%	7,711
Vocational/technical	54	30	1.2%	4,529
Adults (25+ in 2000 Census)	72,444	13	1.9%	3,893,278
with High School dipolma or higher	81.6%	36		82.1%
with B.A. or higher degree	20.4%	15		19.4%

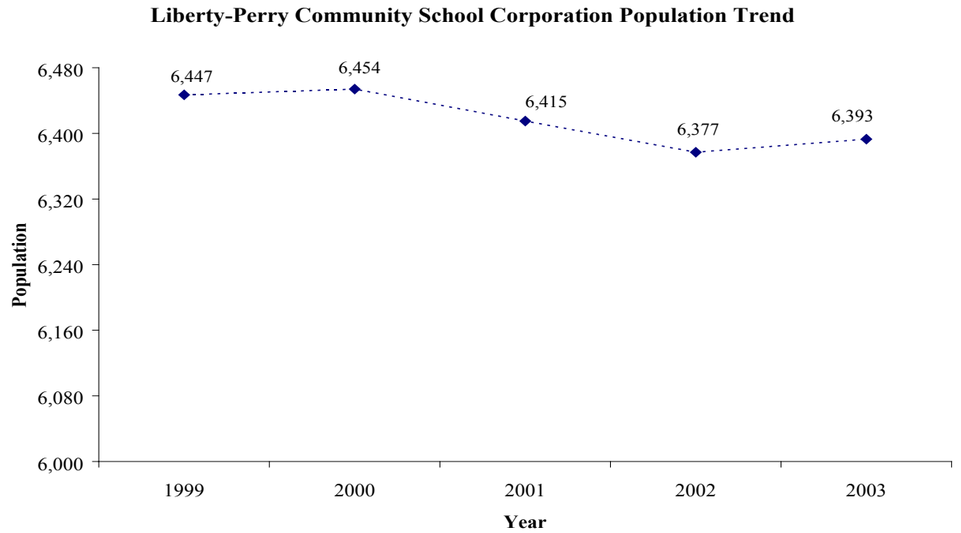
Source: Indiana Department of Education; U.S. Census Bureau
<http://www.stats.indiana.edu/profiles/pr18035.html>

Table 4 shows 2003 education statistics for the Liberty-Perry Community School Corporation serving Liberty and Perry Townships and including Prairie Creek Reservoir. The total 2003 population in the Liberty-Perry school district (6,393) comprises approximately 6% of the total Delaware County population.

Table 4: Estimates for Indiana School Districts, 2003

District Name	Grade Range of Responsibility	Total Population	"Relevant" age 5 to 17	"Relevant" age 5 to 17 in families in poverty
Liberty-Perry Community School Corporation	K - 12	6,393	1,180	73

Source: U.S. Census Bureau, Housing and Household Economic Statistics Division, Small Area Estimates Branch
<http://www.census.gov/cgi-bin/saipe/saipe.cgi>



Source: U.S. Census Bureau. SAIPE. 17 April 2006. <http://www.census.gov/cgi-bin/saipe/saipe.cgi>

Figure 28 (above) shows the Liberty-Perry school district population trend over a five year period. The population declined slightly between the years of 1999 to 2003.

DELAWARE COUNTY LABOR FORCE STATISTICS

Table 5 summarizes the labor forces statistics for Delaware County in 2004. The unemployment rate in Delaware County (6) was higher than the state's rate (5.2) in 2004. The gap widened (6.4; 5.0) in 2005.

Table 5: Delaware County Labor Force Statistics

Labor Force in 2004	Number	Rank in State	Percent of State	Indiana
Total Resident Labor Force	57,036	14	1.8%	3,170,404
Employed	53,639	14	1.8%	3,005,247
Unemployed	3,397	12	2.1%	165,157
Unemployment Rate	6	23	115.4%	5.2
December 2005 Unemployment Rate	6.4	19	120.8%	5

Source: Bureau of Labor Statistics; Indiana Department of Workforce Development <http://www.stats.indiana.edu/profiles/pr18035.html>

DELAWARE COUNTY INCOME AND POVERTY STATISTICS

Table 6 shows the annual per capita income in Delaware County in 2003 was approximately $26,000; this ranks 40th in the state and is lower than the state's annual per capita income. The median household income ranked even lower at 87th. Like the unemployment rate, the 2003 poverty rate (13.4%) in Delaware County was higher than the state's poverty rate (10%).

Table 6: Delaware County Income and Poverty Statistics

Income and Poverty	Number	Rank in State	Percent of State	Indiana
Per Capita Personal Income (annual) in 2003	$25,905	40	89.8%	$28,838
Median Household Income	$35,212	87	81.3%	$43,323
Poverty Rate in 2003	13.4%	3	134.0%	10.0%
Poverty Rate among Children under 18 in 2003	17.2%	10	125.5%	13.7%
Welfare (TANF) Monthly Average Families in 2004	1,138	8	2.1%	54,330
Foodstamp Recipients in 2004	12,108	8	2.3%	516,360
Free and Reduced Fee Lunch Recipients in 2004	6,708	9	1.9%	356,702

Source: U.S. Bureau of Economic Analysis; US Census Bureau; Indiana Family Social Services Administration; Indiana Department of Education <http://www.stats.indiana.edu/profiles/pr18035.html>

DELAWARE COUNTY EMPLOYMENT STATISTICS

Table 7 shows Delaware County employment for 2003 was 66,437 persons. Health care, social services (11,032) and government (11,273) make up almost 34% of that total. The highest average wage ($68,385) was found in the manufacturing industry.

Table 7: Delaware County Employment and Earnings Statistics

Employment and Earnings by Industry in 2003 (NAICS)	Employment	Pct Dist. In County	Earnings	PCT Dist. In County	Ave. Earnings Per Job
Total by place of work	66,437	100.0%	$2,242,893	100.0%	$33,760
Wage and Salary	56,560	85.1%	$1,625,724	72.5%	$28,743
Farm Proprietors	663	1.0%	$5,858	0.3%	$8,836
Nonfarm Proprietors	9,214	13.9%	$142,640	6.4%	$15,481
Farm	808	1.2%	$7,882	0.4%	$9,755
Nonfarm	65,629	98.8%	$2,235,011	99.6%	$34,055
Private	54,356	81.8%	$1,797,630	80.1%	$33,071
Accomodation, Food Service	4,673	7.0%	$59,276	2.6%	$12,685
Arts, entertainment, Recreation	956	1.4%	$8,917	0.4%	$9,327
Construction	3,343	5.0%	$122,474	5.5%	$36,636
Health Care, Social Service	11,032	16.6%	$398,071	17.7%	$36,083
Information	564	0.8%	$18,041	0.8%	$31,988
Manufacturing	7,803	11.7%	$537,116	23.9%	$68,835
nbsp; Professional, Tech. Serv.	Data not available due to BEA non-disclosure requirements.				
Retail Trade	8,563	12.9%	$161,999	7.2%	$18,918
Trans., Warehousing	1,309	2.0%	$47,106	2.1%	$35,986
Wholesale Trade	1,495	2.3%	$62,107	2.8%	$41,543
Other Private (not above)	11,270*	17.0%*	$267,211*	11.9%*	$23,710*
Government	11,273	17.0%	$437,381	19.5%	$38,799

Source: US Bureau of Economic Analysis <http://www.stats.indiana.edu/profile/pr18035.html>

* These totals do not include county data that are not available due to BEA non-disclosure requirements

DELAWARE COUNTY HOUSING STATISTICS

The 51,032 housing units available in Delaware County represent 2% of the state's total housing units. Housing characteristics in Delaware County generally reflect state trends.

Table 8: Delaware County 2000 General Housing Characteristics

			Vacant Housing Units				Vacancy Rate	
Geographic Area	Total Housing Units	Occupied Housing Units	Total	For Sale Only	For Rent	Seas., Rec., or occ.	Homeowner	Rental
Indiana	2,532,319	2,336,306	196,013	15.2%	32.8%	17.2%	1.8	8.8
County								
Delaware	51,032	47,131	3,901	13.9%	39.3%	5.1%	1.7	9

Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrices H1, H3, H4, and H5. 17 April 2006 <http://factfinder.census.gov/servlet/GCTTable?_bm=y&-geo_id=04000US18&-_box_head_nbr=GCT-H5&-ds_name=DEC_2000_SF1_U&-format=ST-2>

Delaware County covers 395.92 square miles or just over 1% of the state's total area. The county is more densely populated (302 people per square mile) than the state in general (169.5 people per square mile).

Table 9: Delaware County 2000 Population, Area, Housing Units, and Density Characteristics

			Area in Square Miles			Density Per Square Mile of Land Area	
Geographic Area	Total Population	Total Housing Units	Total Area	Water Area	Land Area	Population	Housing Units
Indiana	6,080,485	2,532,319	36,417.73	550.83	35,866.9	169.5	70.6
County							
Delaware	118,769	51,032	395.92	2.63	393.29	302.0	129.8

Source: U.S. Census Bureau, Census 2000 Summary File 1 <http://factfinder.census.gov/servlet/GCTTable?_bm=y&-geo_id=04000US18&-ds_name=DEC_2000_SF1_U&-_lang=en&-redoLog=false&-mt_name=DEC_2000_SF1_U_GCTPH1_ST2&-format=ST-2>

Table 10 shows Delaware County householders are slightly older (22% 65 and older) than the state average (20.8% 65 or older). The average household size in Delaware County is smaller (2.37) than the state (2.53) and there are a higher percentage of renters (33%; 29%) compared to home ownership (67.2%; 71.4%). Home ownership is higher in Perry Township (89.4%) where Prairie Creek Reservoir is located.

Table 10: Delaware County 2000 Occupied Housing Characteristics

			Occupied Housing Units					
Geographic Area	Total Population	Total	Owner	Renter	Average Household Size	1-person Household	With Householder 65 Yrs & Over
Indiana	6,080,485	2,336,306	1,669,162	667,144	2.35	25.9%	20.8%
Delaware County	118,769	47,131	31,687	15,444	2.37	28.2%	22.0%
Center Twp	71,120	28,756	16,344	12,412	2.25	33.4%	22.3%
Delaware Twp	3,797	1,539	1,203	336	2.42	25.7%	25.6%
Hamilton Twp	7,163	2,735	2,429	306	2.62	19.0%	21.5%
Harrison Twp	3,425	1,220	1,049	171	2.62	17.5%	20.3%
Liberty Twp	4,919	1,915	1,584	331	2.55	18.5%	23.2%
Monroe Twp	3,636	1,366	1,250	116	2.63	15.4%	23.8%
Mount Pleasant Twp	12,591	4,927	3,833	1,094	2.52	21.3%	19.6%
Niles Twp	1,321	499	455	44	2.65	17.2%	22.8%
Perry Twp	1,528	595	532	63	2.57	18.2%	20.0%
Salem Twp	4,099	1,606	1,357	249	2.55	21.7%	22.4%
Union Twp	3,004	1,174	985	189	2.56	21.3%	21.3%

Source: U.S. Census Bureau, Census 2000 Summary File 2, Matrices PCT1, HCT2, HCT5, HCT6, and HCT8. http://factfinder.census.gov/servlet/GCTTable?_bm=y&-content=gct&-reg=DEC_2000_SF2_U_GCTH6_CO2:001&-ds_name=DEC_2000_SF2_U&-CONTENT=gct&-mt_name=DEC_2000_SF2_U_GCTH6_CO2&-tree_id=402&-redoLog=true&-geo_id=05000US18035&-format=CO-2&-_lang=en

DELAWARE COUNTY AGRICULTURE STATISTICS

There are approximately 189,600 acres of farmland in Delaware County. In 2004, corn was planted on 63,200 acres yielding 10,315,600 bushels. Soybeans covered 90,200 acres and yielded 4,564,700 bushels.

Table 11: Delaware County Agriculture Statistics

Agriculture Statistics	Delaware County
Number of Farms (2002)	687
Land In Farms (thousand acres) (2002)	189.6
Avg. Value Per Acre (dollars) (2002)	2,540
Planted Acres of Corn (thousands) (2004)	63.2
Harvested Acres of Corn (thousands) (2004)	62.7
Corn Yield (Bu/Ac) (2004)	165
Corn Production (thousand Bu) (2004)	10,315.6
Planted Acres of Soybeans (thousands) (2004)	90.2
Harvested Acres of Soybeans (thousands) (2004)	90.0
Soybean Yield (Bu/Ac) (2004)	51
Soybean Production (thousand Bu) (2004)	4,564.7

Sources: Delaware County Data 2002 USDA, NASS, Indiana Field Office; Delaware County Data Corn, Indiana 2004 Revised USDA, NASS, Indiana Field Office; Delaware County Data, Soybeans, Indiana 2004 USDA, NASS, Indiana Field Office

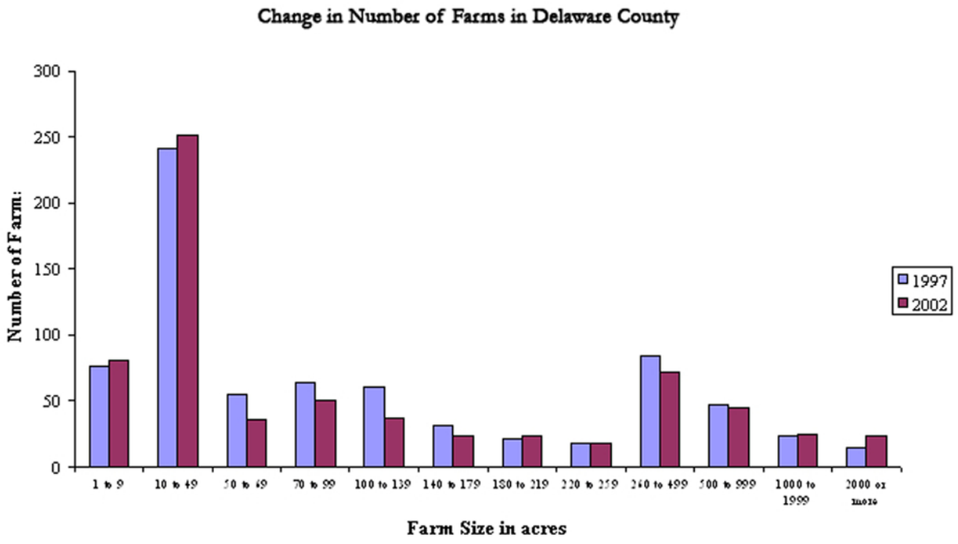
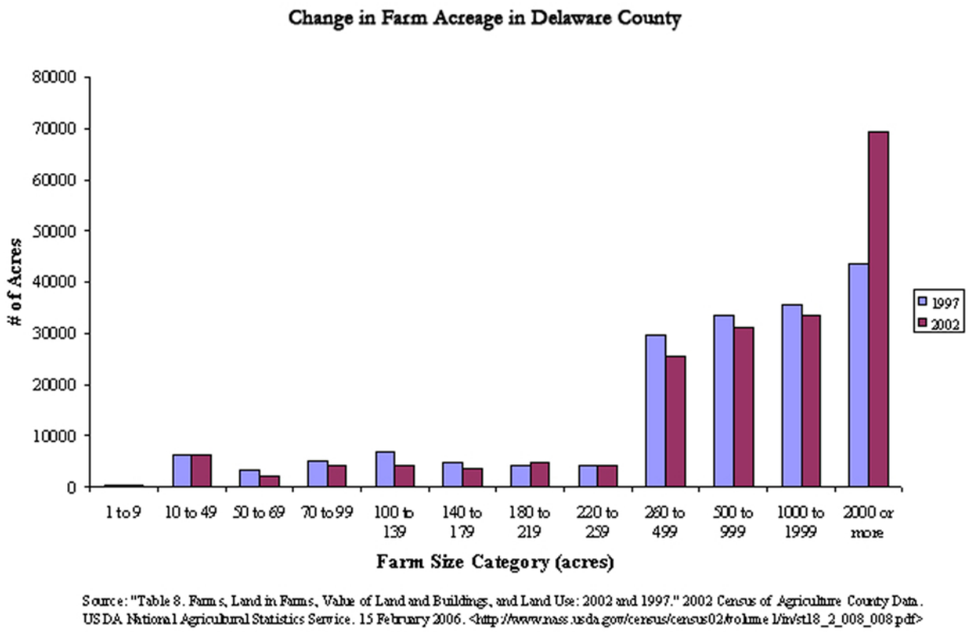


Figure 29: Change in Number of Farms in Delaware County.

Figure 29 shows the change in the number of farms in Delaware County between 1997 and 2002. The results vary with the size of the farm. The number of farms with 50 acres or less increased while the number of farms with 50 to 179 acres decreased.



Source: "Table 8. Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2002 and 1997." 2002 Census of Agriculture County Data. USDA National Agricultural Statistics Service. 15 February 2006. <http://www.nass.usda.gov/census/census02/volume1/in/st18_2_008_008.pdf>

Figure 30 (above) shows the change in acreage of farms between 1997 and 2002. Farms with large acreage (2000 acres or more) had a large increase. It appears as though larger, more commercial farms are becoming more frequent in Delaware County compared to small farms (179 acres or less) have decreased.

Perceptions

Surveying the Public

In the beginning of 2006, a mail-in survey was sent out to 1,500 randomly selected residents throughout Delaware County. Concurrently, the survey was placed on the Prairie Creek Master Plan website so that anyone that wanted to participate in the survey could. The surveys concentrated on exploring the importance of Prairie Creek Reservoir in the community and to discover pertinent values of the community. Questions allowed participants to convey perceived positive and negative aspects of Prairie Creek Reservoir, what types of activities they participated in at the reservoir, and whether the property should be pursued by the city.

To discover the values of the community, participants were asked about the importance of water quality, and multiple questions concerning the character of the area. For example, participants were asked if they would like to see the area's character change and how. This type of question reveals the importance of naturalized environments or built environments to the community.

From the mail-in survey there were 208 responses (nearly 14%). The online survey had 92 participants. A copy of the surveys and their results are contained in Appendices G, H & I. The following outlines the mail-in survey responses followed by the responses from the online participants in italics:

- 96.1% of responders of the mail-in survey had visited Prairie Creek Reservoir and 69% lived in the watershed.
- *97.8% of the online participants had visited Prairie Creek Reservoir while 77.2% were current residents of Delaware County. 15% lived in Prairie Creek Reservoir's watershed.*

- 92.1% felt that Prairie Creek Reservoir was a positive asset to the community. Only 1.5% disagreed and 6.4% didn't know if it was a positive asset to the community or not.
- *95.7% felt that Prairie Creek Reservoir was a positive asset to the community.*

- 85.1% knew that Prairie Creek Reservoir is a backup drinking water source for Muncie, and 97.5% agreed that water quality in Prairie Creek Reservoir is important.
- *91.4% knew that Prairie Creek Reservoir is a backup drinking water supply for Muncie, and 100% agreed that the water quality in Prairie Creek Reservoir is important.*

- 59.3% found out about the reservoir from friends. The rest of the respondents had heard about the reservoir from the newspaper, coworkers, church and TV. 45% felt that the reservoir should be made more visible through the community while 33.7% disagreed and 20.8% didn't know.
- *44.1% found out about the reservoir from friends and nearly 40% found out about the reservoir from other sources. Nearly 45% felt that the reservoir should be made more visible through the community while 31.5% disagreed and nearly 24% didn't know.*

- 52.5% agreed that the City of Muncie should consider expanding park services at PCR, while 16.2% disagreed, and 31.3% didn't know. However 61.6% agreed that Muncie should buy the area surrounding PCR currently owned by the Indiana American Water Company to provide more public open space and/or park space for the community. 22.7% disagreed and 15.7% didn't know.

- *71% agreed that the City of Muncie should consider expanding park services at PCR and nearly 70% agreed that Muncie should buy the area surrounding PCR currently owned by the Indiana American Water Company to provide more public open space and/or park space for the community.*

- Respondents were asked which activities or amenities they have used at PCR. Picnicking was the most common activity followed by boating and fishing. Swimming at the beach and playing at playgrounds were also relatively common activities. The campground, horse trails, and ATV site were used by the least amount of the responders.
- *Participants were asked which activities or amenities they have used at PCR. Most participants noted boating and picnicking followed by fishing. Swimming at the beach and playing at playgrounds were somewhat common activities. The campground, horse trails, and ATV site were used by the least amount of the participants.*

- When asked what type of recreation should be allowed at PCR, most people agreed with swimming, fishing, boating, sailing, camping, and horseback riding. Only a few respondents agreed that off-road vehicles should be allowed.
- *When asked what type of recreation should be allowed at PCR, most people agreed with swimming, fishing, sailing, camping, horseback riding, and boating. Only a few participants agreed that off-road vehicles should be allowed.*

- Just over half of the respondent would like to see the character surrounding the reservoir become more naturalized. Over 25% preferred no change to the character surrounding the reservoir. Only a few respondents would like to see more agriculture, commercial, or residential. Even less wanted to the area's character less naturalized.
- *Nearly 60% of the participants would like to see the character surrounding the reservoir become more naturalized. Over 25% preferred no change to the character surrounding the reservoir. Only a few participants would like to see more commercial, residential, or agriculture areas. None of the online participants would like to see the character become less naturalized.*

- 79.9% do not want to see waterfront lots for sale to home builders along PCR.
- *Over 90% do not want to see waterfront lots for sale to home builders along PCR.*

Furthermore both surveys had open-ended questions allowing respondents and participants to express what they felt were strengths and weaknesses of Prairie Creek Reservoir. The feed-back from these open-ended questions showed that there are some polar views concerning the reservoir. Some responses indicated that a strength of PCR was that it is not too crowded, while other responses indicated that a weakness of PCR was that it was overcrowded in some areas. Similarly, the Muncie Sailing Club, fishing, water quality, waterfowl, and the facilities were seen as both strengths and weaknesses. See Appendices H & I for a summary of all of the submitted comments from the surveys.

Perceptions

Focus Groups

After analyzing the public survey, three areas of public interest and concern that stood out. Nearly all comments could be categorized as Conservation/Environmental, Economic Development, and/or Recreational issues. In order to focus on the spectrum of factors, focus groups were created for each issue. Each member of the steering committee was asked to volunteer to sit on a focus group. To complete the groups, members from the community with special expertise were asked to join the appropriate focus group.

Each focus group met with the charge of creating the ideal land-use plan for the Prairie Creek Reservoir watershed and surrounding area within a focus on the topic of their group. For example, the Recreation Focus Group was charged with creating the ideal land-use plan for recreation. While each group deliberated on their focus they also looked at the region as a whole, thus considering all types of developmental scenarios.

Beyond creating their ideal land-use plan for the area, each group was also asked to recommend how to implement their ideas. The following pages contain the recommendations suggested by each of the focus groups.

Recommendations by the Conservation/Environment Focus Group

1) Delaware County should set up a regional on-site wastewater district to regulate wastewater treatment in the Prairie Creek watershed and collect taxes for improved wastewater treatment technologies if soil is not suitable for individual leach fields.

2) Install 50-foot buffer strips around the shoreline of the existing ATV course to mitigate sediment loading and erosion impacts caused by the extensive use of the course.

3) Look for alternative areas within the watershed to eventually replace the ATV course currently adjacent to the Prairie Creek Reservoir.

4) No individual leach fields for new concentrated developments located within the ring road boundary.

5) If development pressures continue to increase, the Muncie Sanitary District should extend sanitary sewer lines out to the Prairie Creek Reservoir loop road for new developments.

6) Encourage best management practices for sediment-reduction in the watershed.

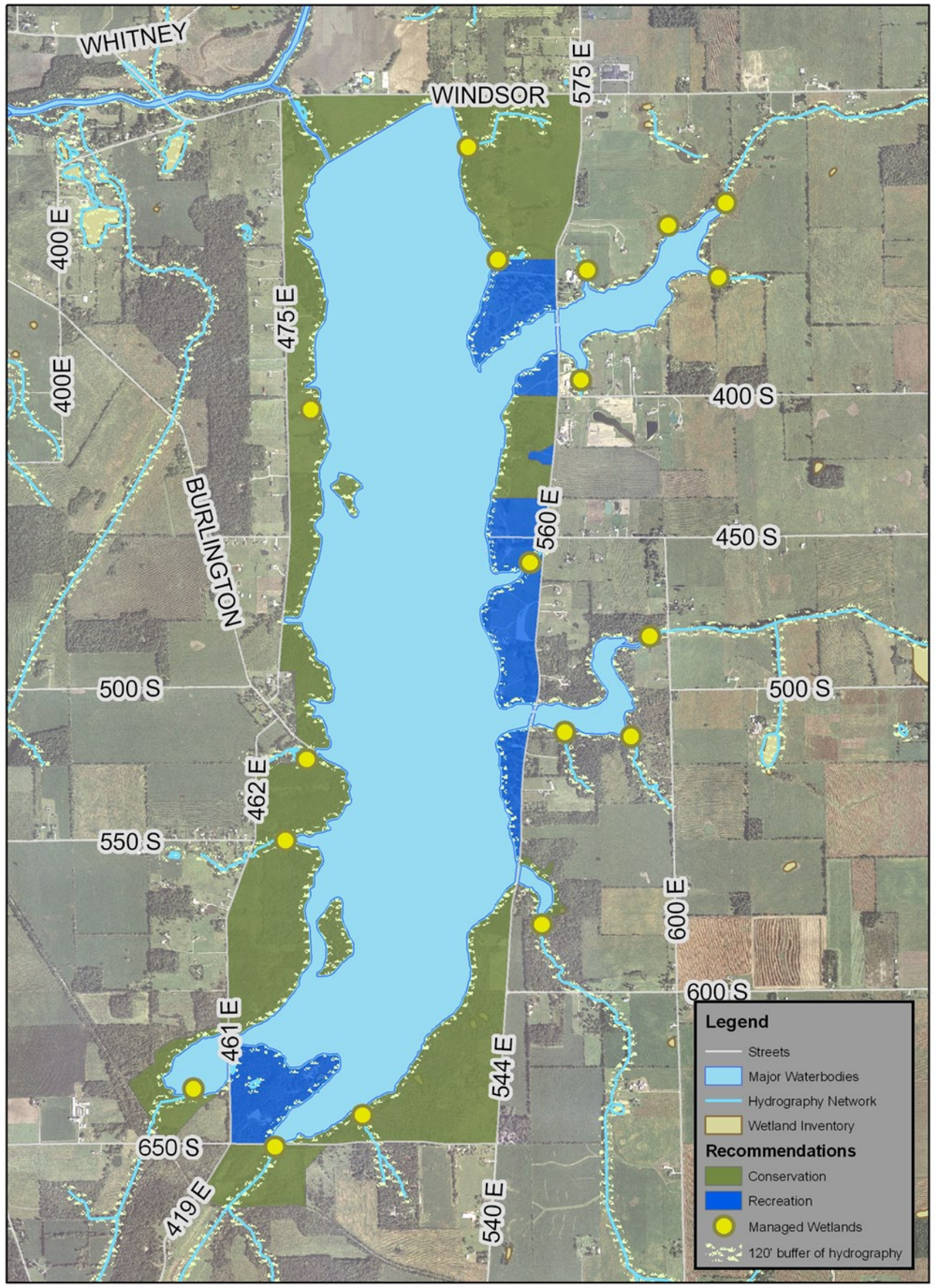
7) Constructed wetlands should be built along the bays and inlets of the Prairie Creek Reservoir and managed by the Muncie Parks Department to mitigate septic and agricultural runoff and enhance habitat for waterfowl and fish reproduction.

8) Every drainage ditch in the watershed should have a buffer strip with natural vegetation to reduce sediment and nutrient loading from agricultural runoff, to stabilize the ditch bank, and to reduce the need for dredging: 120 feet wide on each side for ditches with permanent flows of water and 30 feet wide on each side for intermittent ditches.

9) Conservation districts are zoned for the intent of humans to enjoy wildlife and greenspace, not solely to protect wildlife; No structural buildings such as playgrounds or shelters should be built in the conservation zones.

10) Land within the "ring roads" on the West side of the reservoir should be rezoned to conservation instead of residential because it provides a buffer from the development outside the "ring roads" on the west side.

Figure 31 (pg. 75): Recommendations by the Conservation / Environment Focus Group.



Recommendations by the Economic Development Focus Group

1) It is the opinion of the group that the reservoir and park represent a regional destination attraction and that is the principle economic reality.

2) The area inside the ring road should remain mostly as is. Rezoning as recreational and conservation may be appropriate.

3) There should be more marketing of the park and existing facilities and opportunities available in the area. A park brochure and event attractions that would appeal to visitors and residents were suggested. Improvements in the park facilities and the addition of trails on the west side that connect to the greenway could make the park more appealing.

4) Improved informational signage to help locate the reservoir is needed.

5) It was felt that the east bank is pretty well used currently and that the only opportunity for further development inside the ring road would involve the west bank. Such use of the west bank would be inconsistent with the desire to keep that area in an undeveloped and "natural" state and would impair the overall appeal of the reservoir.

6) It was recommended that the city either extend their lease beyond the expected expiration date or purchase the reservoir grounds so the community might continue to enjoy the benefits of this unique area.

7) If the school becomes available it could be an opportunity for development. An educational or interpretive center focusing on water was suggested.

8) Road access could be improved to allow for easier travel to and from the reservoir. This would be especially important if the reservoir is to host many events of any size.

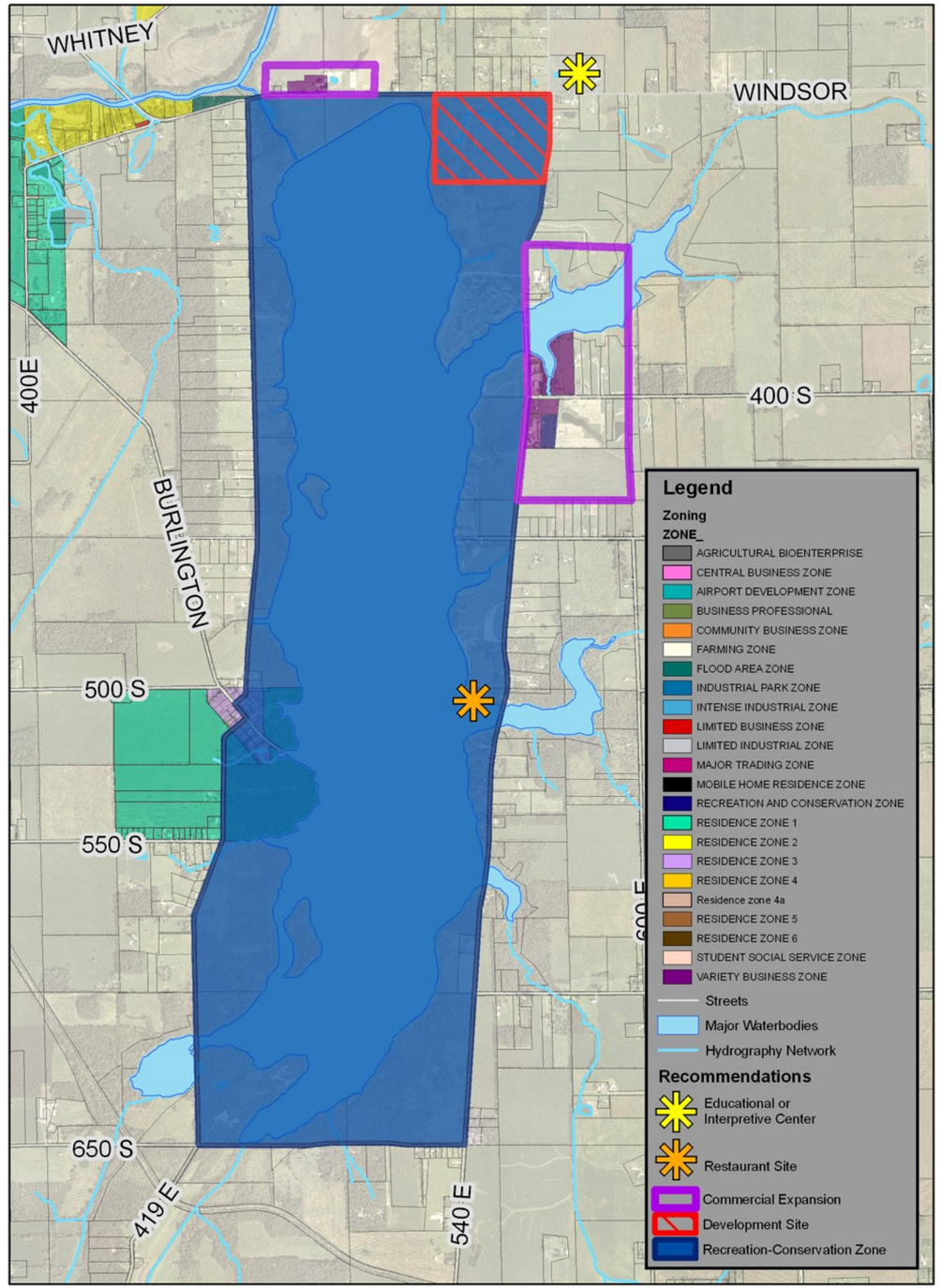
9) The construction of additional resources could benefit the area. Such construction might include an educational area or facility, cabins or a facility for overnight stay.

10) Limited development may be appropriate in the future if demand increases, but currently there seems to be commercial and residential resources available to meet the demand.

11) If the demand for commercial resources increases it is recommended that it be met by clustering any new use near or adjacent to the exiting areas. A possible exception to this general rule could be a specialty restaurant sited to overlook the reservoir just north of the sailing club.

12) It is recommended and seems practical that no residential development occur on a large scale in the area without the existence of sewer and water utilities. The absence of large tracts near the water and the desire to maintain water quality seem to preclude residential development on any large scale.

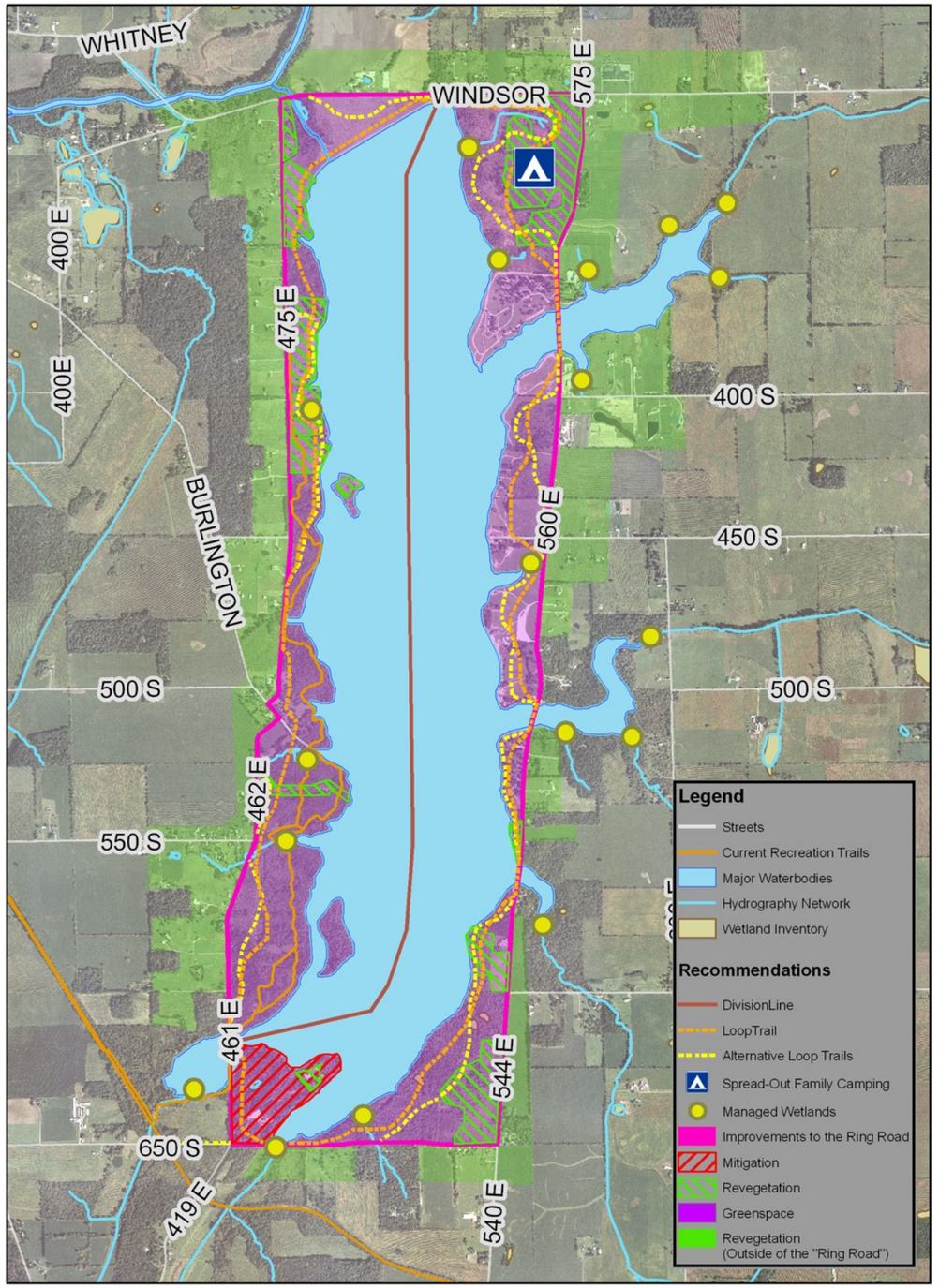
Figure 32 (pg. 77): Recommendations by the Economic Development Focus Group.



Recommendations by the Recreation Focus Group

1) Attach a recreation/conservation land use and future zone to the area within the "ring road" and other areas as appropriate.
2) The City and/or County should buy the land inside the "ring roads."
3) Establish an agreement for "flipping" ownership of the reservoir that is embraced by both the city of Muncie and Delaware County that:
   - Establishes that the Water Company wants to retain control of the reservoir as long as they are using it as water supply.
   - The City (or county) shall obtain 1st right of refusal for purchasing any of the land for public use/ public protection in or out of the "ring roads."
4) Establish a Land Restoration-Revegetation Management Plan:
   - Identify 3 native revegetation scenarios that would enhance the natural character of the reservoir.
   - Involve 501(c)3s in the planting of areas within the ring road.
   - Create a provision for tree replacement. Currently when developers remove large trees they have to replant multiple trees in their place. If there isn't enough space onsite to plant all the trees necessary, then there could be a designated replacement area at Prairie Creek for the additional trees.
   - Create a Cost-Share program to reforest corridors along and outside the ring road.
5) Establish wetlands on inlets to the reservoir.
6) Improvement of the road structure is needed as well as routing through New Burlington. When these improvements are prepared/constructed, it is recommended that:
   - New road construction around the reservoir shall include a road side trail or bike lanes.
   - This main "loop trail" must connect to the Cardinal Greenway (most sensibly on the southwest side of the reservoir).
     *This would establish the desired main route around the reservoir ("loop trail"), and then additional trials leading into natural areas would create destinations. Multi-use trails shall maintain visual separation from the horse trails.
7) The area inside the "ring road" shall be dedicated to public use, whether recreation or conservation.
   - The west side shall be dedicated to passive recreation.
   - The east side shall be dedicated to active recreation.
8) The area inside the "ring road" shall be returned to green space.
9) The City and/or County Park should increase pier fees for out-of-county residents. If the park is run by the City of Muncie, pier fees should increase for county residents.
10) The City and/or County Park needs to update the bathrooms/showers.
11) A management plan shall be imposed on the ATV site. The city/county should also look into alternative areas for an ATV site.
12) The City and/or County Park should extend services to include:
   - An access area for non-motorized boats (canoes, rowboats...).
   - Additional camping, including
     - Spread out family camping in the north-eastern section of the park.
     - Primitive camping- requires a short walk to the campsite from parking area.
       - Use of alternative waste disposal is recommended (composting toilet systems).
   - Additional Cabins
13) Establish plat restrictions to any land in the area that gets platted.
14) Encourage private landowners to use covenants/deed restrictions.
15) It is recommended that a 501(c)3 is set up to help gather resources to defend the reservoir and the long-term transition envisioned in this plan.
16) Encourage conservation farming practices.

Figure 33 (pg. 79): Recommendations by the Recreation Focus Group.



The Public Meeting

During the summer of 2006 the Delaware-Muncie Metropolitan Plan Commission, in a joint effort with the Soil and Water Conservation District, conducted a public meeting to obtain feedback from the public. The public was invited to review the process undertaken for the Prairie Creek Master Plan and to evaluate the progress made. Staff priority for the public meeting was to obtain feedback concerning the recommendations made by the focus groups.

Informational boards were used to communicate pertinent background information including an inventory of the area, the results from the public survey, and the recommendations prepared by the focus groups. Participants were also encouraged to utilize "work maps" to make comments. The project team was on hand to encourage participation, answer any questions, and to absorb any concerns or recommendations posed. Participants were asked to fill out comment sheets that asked how much they agreed or disagreed with each recommendation as well as to make any additional comments.

With 123 people that signed in at the meeting and over a dozen more than didn't sign in, the meeting had an attendance of nearly 150 people. 82 participants filled out and returned the comment sheets. Overall most recommendations had the support of the majority of the participants. See Appendix K for the feedback in its entirety. The following summarizes the feedback from the public meeting:

Conservation/Environment Recommendations

- Out of 10 recommendations, 2 recommendations were supported by less than 55% of the participants. Recommendation #1 advised that Delaware County set up a regional on-site wastewater district. While 32% supported this recommendation, 56% rejected the measure. Similarly, recommendation #5 advised that if development pressures increase, then the Muncie Sanitary District should extend sanitary sewers to the area. This advice was supported by 34%, however 64% rejected the recommendation.
- 4 recommendations had the support of more than 75% of the participants. Recommendation #4, supported by 76%, stated that no individual leach fields for new development should be created within the "ring roads." Supported by 88%, recommendation #6 encourages BMP for sediment reduction in the watershed. Similarly 80% supported recommendation #7 which advised using constructed wetlands along the bays and inlets of the reservoir. 78% supported recommendation #10, rezoning the west side of the ring road to conservation.
- Recommendation #2 to mitigate impacts from the ATV course was supported by 73% of the participants and the recommendation to look for alternative sites for the AVT course (#3) was supported by 58%.

Economic Development Recommendations

- Out of 12 recommendations, 2 recommendations were supported by less than 55% of the participants. Recommendation #7 suggested that if the local elementary school becomes available it could be an opportunity for development as an educational or interpretational center. This recommendation was supported by only 38%, however 37% had no opinion regarding this issue. Recommendation #9 advised that developing additional resources such as cabins or an educational facility would benefit the area. This recommendation was both supported and rejected by 41% of the participants.
- 3 recommendations that were supported by more than 80% dealt with measures that would keep the area in its current condition. Supported by 89%, recommendation #2 suggested rezoning the area within the "ring road" to recreation and conservation. Supported by 83%, recommendation #6 endorsed that the City of Muncie extends their lease or purchases the area in order to sustain the park. Recommendation #12, supported by 86%, maintains that there should be no large scale residential development in the area without the existence of sewer and water utilities.

Recreation Recommendations

- Out of 16 recommendations, 2 recommendations were supported by less than 55% of the participants. Recommendation #8, recommending that the area inside the "ring road" be returned to green space, was supported by 49% and rejected by 37%. Recommendation #9, advising that pier fees be increased for out-of-county residents and increased for county residents as long as the park is run by the City of Muncie, was only supported by 26% of the participants and rejected by 48%.
- 4 recommendations were supported by 75% or more of the participants. Those recommendations included: establishing wetlands on inlets to the reservoir (75% approval), road improvements including widening to allow a bike lane on the "ring road" (78% approval), dedicating the area inside the "rig roads" to public use whether recreation or conservation (83% approval), and encouragement of conservation farming practices (86% approval).
- 7 recommendations were supported by 60-74% of the participants. Those recommendations included: rezoning the area inside the "ring roads" to recreation/conservation (74%), the city and/or county buying the area inside the "ring roads" (61%), establishing an agreement with the Indiana American Water Company for obtaining ownership of the property (71%), establishing a land restoration-revegetation management plan (70%), imposing a management plan for the ATV site and looking for alternative sites to relocate the ATV course (61%), using plat restrictions to control future development (66%), and using a 501(c)3 to help defend the reservoir and the long term transition envisioned in the plan (61%).

Overall the feedback from the public meeting suggested that participants were supportive of measures that would preserve the current land-use of the area while protecting and enhancing the natural environment. One of the most controversial issues concerned wastewater treatment. While a majority of participants agreed that there should be no large scale developments without sewer and water utilities, a majority of participants also rejected recommendations to extend sanitary sewer lines or to set up a regional on-site treatment facility. The conflicting feedback could suggest that participants are supportive of measures that will make development difficult if not impossible or it could have been due to the wording of the recommendations or the fact that a neighboring township has a wastewater treatment facility that could expand. Regardless, while the recommendation to set up an on-site wastewater district was rejected by 56% and the recommendation to extend Muncie Sanitary District's sewer lines was rejected by 64%, the recommendation that large scale residential development should not occur without sewer and water utilities was supported by 86% of the participants.

This section describes the Prairie Creek Master Plan and recommendations. The recommended Master Plan elements are firmly based on the guiding principle, and input from the steering committee, focus groups, and the public.

Elements of the Prairie Creek Master Plan are presented in the following manner:

- Mission Statement
- Goals & Objectives
- In-depth explanation of the Objectives

Mission Statement

The mission of the Prairie Creek Master Plan is to provide guidance for responsible, ecologically sound development that considers quality of life and the protection and enhancement of Prairie Creek Reservoir and supporting watershed as an asset recognizing the reservoir's primary purpose as a secondary drinking water source for the City of Muncie.

Goals & Objectives

General statement: These are the Goals and Objectives of our Master Plan. Goals are statements of desired future conditions. Objectives describe measurable methods of accomplishing the goals. Some Objectives support more than one Goal and are therefore listed more than once. All of the Goals are of equal importance and are not listed in order of priority.

Goal A: Protect and ensure the longevity of Prairie Creek Park and Reservoir for future generations.

Objectives:

1. Encourage the City of Muncie to pursue extending the lease for Prairie Creek Park with the Indiana-American Water Company.
2. Before the land inside the "ring roads" becomes available, establish an agreement for first right of refusal that is embraced by both the City of Muncie and Delaware County.
3. If the land inside the "ring roads" and/or other adjacent IAWC properties goes up for sale, purchase them.
4. Encourage 501(c)3's, nonprofit organizations, to help gather resources to protect and promote Prairie Creek Reservoir and the long term transition envisioned in this plan.
5. Work with relevant existing community entities for the implementation of the objectives in this master plan.

Goal B: Protect and enhance the long term ecological health and water quality of the Prairie Creek Reservoir and supporting watershed.

Objectives:

1. Control developmental impacts in immediate vicinity of the reservoir.
    a. Rezone the area within the "ring road" to the conservation/recreation zone.
    b. Encourage owners of properties outside the "ring roads" that are used, could be used, and/or land banked for purposes such as habitat preserves, conservation areas, greenspace, and farmland conservation to rezone those properties to the conservation/ recreation zone. (See expanded Objectives, whereby the Plan Commission could offer to do the rezoning for these properties as an incentive.)
    c. Amend local ordinances to ensure that no large scale developments can occur without the existence of sewer and water utilities, or equivalent alternatives.
    d. Initiate policies and/or amend ordinances as applicable for new development to ensure that no individual on-site sewage disposal systems (OSDS) may be located within the "ring road" boundary.
    e. Develop and implement a program that is a joint effort between the Bureau of Water Quality and Delaware County Health Department to investigate and improve, as needed, water quality in the greater New Burlington area.
2. Reduce sedimentation and accompanying nutrient and pesticide loading in the reservoir.
    a. Establish and manage constructed wetlands before the bays and inlets of Prairie Creek Reservoir.
    b. Create and maintain 50-foot vegetated buffers around the shoreline of the existing ATV course to mitigate sediment loading and erosion impacts.
    c. Promote conservation farming practices in the Prairie Creek watershed, including best management practices for drainage, nutrient management, pesticide management, soil conservation, surface water protection, tillage/residue management, and waste management.
    d. Restore areas where erosion has occurred.
    e. Support and augment where possible the establishment of 120' wide vegetated buffers on each side of streams and ditches with permanent flows, and 20'-30' wide on each side of intermittent streams and ditches in order to reduce sediment and nutrient loading to stay the progress of eutrophication of the reservoir.
3. Develop and promote a program to educate people about: 1) proper on-site wastewater treatment system maintenance, 2) the health ramifications from failed/failing individual on-site wastewater treatment systems and 3) alternative sewage/wastewater treatment systems.
4. Support/enhance enforcement of existing laws (410 IAC 6-8.1) governing residential on-site sewage disposal systems, including options for funding relief.
5. Increase biodiversity in and around the reservoir.
    a. Establish a Land Restoration-Revegetation Management Plan.
        i. Establish a Flora Assessment Study for the area within the "ring roads".
        ii. Restore, enhance, and reestablish the historical native plant communities of the Tipton Till Plain in the area surrounding Prairie Creek Reservoir.
    b. Create wetland and improve aquatic habitats in Prairie Creek Reservoir to increase biodiversity.

Goal C: Ensure good design reflecting sound ecological practices for new development and redevelopment in the watershed.

Objectives:

1. Amend local ordinances to ensure that no large scale developments can occur without the existence of sewer and water utilities or equivalent alternatives.
2. Develop an ordinance amendment requiring all new housing developments in the Prairie Creek Watershed to meet conservation design standards.
3. Establish model plat restrictions that ensure use of sound ecological practices, and require

their use on any land in the area that gets platted.

4. Encourage private landowners to use the model plat restrictions as deed restrictions to ensure sound ecological practices on individual properties.
5. Encourage and enforce best management practices for sediment reduction during construction in the watershed.
6. Amend or adopt local ordinances to require that lots are of sufficient size to accommodate both the initial OSDS and repair/replacement space; both spaces must remain uncompromised and viable.
7. Protect existing on-site wastewater treatment systems that are not in failure.
    a. Require all on-site wastewater treatment system repairs to meet new construction standards for on-site wastewater treatment systems.
    b. Adopt an ordinance that requires all building permits to include an on-site wastewater treatment system review by the Health Department.[1]
8. Amend local ordinances to coordinate the requirements/permitting processes for stormwater control when soil types require perimeter drains for an OSDS.

Goal D: Promote the full potential of Prairie Creek Reservoir as a community asset with regional appeal.

Objectives:

1. Expand promotion of Prairie Creek Park as a visitor destination.
2. Develop and enhance wayfinding and marketing devices, including signage, maps, brochures, and websites, to assist people in locating Prairie Creek Reservoir and educating the public about available recreational opportunities.
3. Promote the development of special events that enhance the community service/amenity value and the attraction destination/economic development potential at Prairie Creek Reservoir.
4. Establish fair regulations for campers that encourage attractive short-term use of campsites at Prairie Creek Park.
5. Capitalize on and promote an opportunity for unique overnight accommodations.
6. Encourage the development of a specialty restaurant located on the east side of the reservoir with view of the Sailing Club.
7. Investigate the feasibility of design standards, overlay districts, planned unit developments, etc. that provide a mechanism to maintain and to capitalize on (from an economic development standpoint) the rural, naturalized character of the Prairie Creek area.
8. Investigate the feasibility of a conference center/hotel that capitalizes on the natural character of the Prairie Creek area.

Goal E: Provide ample opportunity for recreational use and development of Prairie Creek Park facilities.

Objectives:

1. Balance the recreation needs for active and passive activities at Prairie Creek Park.
2. Develop walking/bicycle trails that encircle Prairie Creek Reservoir.
3. Retain and enhance the separate trail system for horseback riders.

1 While this objective focuses on on-site wastewater treatment systems, the Health Department should be included in the permit process for all new construction for additional potential environmental hazards including but not limited to lead paint.

4. Design children's play areas that emphasize learning and connections to the natural environment.
5. Provide an access area for non-motorized boats.
6. Comply with ADA (Americans with Disabilities Act) standards for a "natural park".
7. Promote the establishment of 120' wide vegetated buffers on each side of streams and ditches with permanent flows, and 20'-30' wide on each side of intermittent streams and ditches in order to reduce sediment and nutrient loading to maintain acceptable levels in the reservoir for human recreational use.

Goal F: Increase quality of life for residents of Delaware County and enhance visitor experience by improving accessibility, usability and enjoyment of the reservoir.

Objectives:

1. Improve visitor access to Prairie Creek Reservoir.
    a. Designate a point of entry and gateways for Prairie Creek Park.
    b. Designate route(s) for best access.
    c. Make needed road improvements.
2. Promote bike and pedestrian use of Prairie Creek Reservoir.
    a. Develop bike and pedestrian trails that encircle the reservoir.
    b. Include bike lanes in the needed improvements to the road structure of the "ring roads".
    c. Install pervious surface parking facilities adjoining bike trails for park and peddle opportunities in the park.
    d. Connect trail system to Cardinal Greenway.
3. Use Prairie Creek Reservoir as a focus to educate the public about environmental issues including water quality, compatible development, and wildlife habitat needs.
4. Encourage the development of educational programs and workshops that would take place at Prairie Creek Park.
5. Promote the use of Prairie Creek Park as an outdoor laboratory for educational purposes.

In-depth Explanation of the Objectives

Goal A: Protect and ensure the longevity and availability of Prairie Creek Park and the reservoir for future generations.

Objective 1: Encourage the City of Muncie to pursue extending the lease for Prairie Creek Park with the Indiana-American Water Company.

The members of all three Focus Groups believe that to control the land inside the "ring roads" is the best way to preserve the park, limit development, and maintain reservoir water quality. The current situation whereby the Indiana-American Water Company leases most of the waterfront land to the City of Muncie for use as a park seems to be working well towards that end. The two entities have a good working relationship and similar goals. It seems ideal that this arrangement be extended for the foreseeable future.

Objective 2: Before the land inside the "ring roads" becomes available, establish an agreement for first right of refusal that is embraced by both the City of Muncie and Delaware County.

The current ownership situation at the reservoir with the Indiana-American Water Company owning the land and the City of Muncie leasing it for park use seems optimal. However, should the Indiana-American Water Company wish at some point to sell the land it is strongly suggested that the City of Muncie in partnership with Delaware County work with Indiana-American Water Company to set up an agreement whereby ownership could pass to the city and county while the water company continues to oversee the reservoir and its water. We are recommending that even if ownership changes at some time in the future, that local government and the Indiana-American Water Company both continue to play major roles in the operation of the reservoir.

Objective 3: If the land inside the "ring roads" and/or adjacent IAWC properties goes up for sale, purchase them.

Should the current owner of the land, Indiana-American Water Company, decide to put the land up for sale rather than renew the city's lease, it is recommended that the City of Muncie, perhaps together with Delaware County, whose residents greatly benefit from the recreational value of the reservoir and park, should purchase the land for the purpose of maintaining Prairie Creek Park and the good quality of the drinking water of the reservoir.

Objective 4: Encourage 501(c)3s, non-profit organizations, to help gather resources to defend Prairie Creek Reservoir and the long term transition envisioned in this plan.

It is the premise of this plan that the protection of water quality, ecological health, and recreational opportunities at Prairie Creek Reservoir and Park will be the culmination of decisions made by the entire community. However, non-profit organizations could serve a special role in helping to secure funding, for providing manpower for implementation and championing specific projects outlined in this plan. Non-profit (501(c) 3) groups often have greater opportunity than political subdivisions to obtain grants from the private sector and could assist in fundraising efforts for projects. Also, many

local non-profits are capable of mobilizing volunteers to assist in the physical aspects of project development.

Finally, if a nonprofit "Friends of Prairie Creek" group were to be re-organized, they could serve as local champions of the reservoir, promoting accountability among other groups and agencies that are responsible for carrying out this plan. This plan envisions the realizations of goals that may take many years to fully accomplish and oversight by a non-profit organization interested in the reservoir could help ensure that those goals are achieved. Implementation is the key to making any plan work and non-profit organizations are often key players in making things happen. It is therefore seen as highly desirable that contact with various nonprofit organizations be made and their help elicited in working to achieve the goals set forth in this plan.

Objective 5: Work with relevant existing community entities for the implementation of the objectives in this master plan.

Implementation of the objectives called for in this plan can only be achieved through partnerships between local government, service institutions, private clubs and groups, institutions of learning, public utilities, area land owners, including Indiana-American Water Company, and individuals. The general concern for drinking water quality, recreation and lifestyle amenities make the reservoir's health a goal for everyone. It would be optimal to establish a committee (the Prairie Creek Park Committee) that would act as an oversight/development/program/advisory group to coordinate efforts and explore future possibilities in the area.

The Prairie Creek Park Committee should be formed by the Park Board to help develop future park plans, improve facilities, plan special events and programs, identify future needs and determine solutions. The PC Park Committee could act as an advisory body to the Park Board. Membership could include Park Board members and other interested persons who bring expertise not found on the Board- examples include Muncie Civic Theatre, educators, BSU faculty, Visitor's Bureau staff, nonprofits, etc.

This committee's mission would be to serve as an implementation and oversight body, and as the creative lead to develop programs such as the outdoor laboratory, educational programs and workshops, special events, etc. It should have a marketing function promoting Prairie Creek Park. Also this Committee should push for community involvement and buy-in regarding safe-guarding the Park's future and take a leading position in implementing the Goals and Objectives outlined in this Plan.

Goal B: Protect and enhance the long term ecological health and water quality of the Prairie Creek Reservoir and supporting watershed.

Objective 1: Control developmental impacts in immediate vicinity of the reservoir.

Objective 1a: Rezone the area within the "ring road" to the conservation/recreation zone.

Members of all three focus groups suggested that the area inside the county roads be rezoned to RC, Recreation and Conservation to protect it from future development. The RC Zone as described in the Comprehensive Zoning Ordinance in effect for Delaware County was established "…primarily as a conservation measure to preserve for existing and future generations a part of the ecological balance between man and his natural environment." The Ordinance goes on to say;

> Through the maintenance of certain areas of land devoted to woodlands and best practical conservation uses, much benefit can be derived by many people in the form of diminished air and water pollution and soil erosion, cover for wildlife and flora, and the preservation of natural resources located therein. These designated areas may be located along rivers and streams, the hills, or level areas within the jurisdiction of this Ordinance. Once a Recreation and Conservation Zone is established, the Plan Commission shall take extreme care in making any deviation.

The uses permitted in the Recreation and Conservation Zone principally are forests, woodlands, and best practical agricultural land uses. Other accessory uses and structures that may be in the Recreation and Conservation Zone include recreational lakes, wildlife preserves, public parks, playgrounds, boat landings and docks, and fishing. Residential, industrial and commercial uses would be prohibited under the Recreation and Conservation Zone. The minimum lot size is four acres except for playgrounds which can be one acre.

Objective 1b: Encourage owners of properties outside the "ring roads" that are used, could be used, and/or are land banked for purposes such as habitat preserves, conservation areas, greenspace, and farmland conservation to rezone those properties to the conservation/ recreation zone.

By rezoning properties to the conservation/recreation zone property owners can utilize a local mechanism "established primarily as a conservation measure to preserve for existing and future generations a part of the ecological balance between man and his natural environment."[1] Because this mechanism could play an important part in preserving the natural character in the area, the Plan Commission could offer to do the rezoning for area properties as an incentive.

1 "Delaware County Comprehensive Zoning Ordinance" Delaware-Muncie Metropolitan Plan Commission. p.65.

Objective 1c: Amend local ordinances to ensure that no large scale developments can occur without the existence of sewer and water utilities, or equivalent alternatives.

Proper wastewater treatment and disposal is necessary to maintain good water quality. However, throughout Delaware County there are no soils that are ranked as "not limited" for septic tank absorption fields. In fact, there are only four soils (Martinsville loam, 0-2% slopes; Martinsville loam, 2-6% slopes; Mountpleasant silt loam, 2-6% slopes, eroded; and urban land Wawaka-Miami complex, 106% slopes, eroded) that are rated "somewhat limited" for septic tank absorption fields. All other soils in Delaware County are rated "very limited". This means that anywhere that a septic system is installed in Delaware County there will be increased need for maintenance and poor performance from the system should be expected. (See Appendix B for more information on soils and their properties for sewage disposal).

Therefore members of the DMMPC staff and the Prairie Creek Steering Committee recommend that minimal use be made of septic systems as a means of wastewater treatment in the Prairie Creek Reservoir watershed. Any development on a large scale, such as a platted subdivision, planned unit development, condominiums or cluster development should not occur with the use of individual septic systems. Instead such developments need to utilize alternative on-site wastewater treatment systems (such as cluster treatment systems) or connect to a regional wastewater treatment facility.

Water utilities or alternate drinking water supply should also be explored due to suspected high levels of arsenic found in the ground water.

Objective 1d: Initiate policies and/or amend ordinances as applicable for new development to ensure that no individual on-site sewage disposal sytems (OSDS) may be located within the "ring road" boundary.

Ample evidence exists to the effect that leach fields emit effluent or runoff that is inconsistent with maintaining good drinking water quality (see Appendix A). To ensure that the quality of the water in Prairie Creek Reservoir stays as high as it is today, a moratorium should be placed on construction of septic systems and leach fields near the water body or its direct tributaries.

Objective 1e: Develop and implement a program that is a joint effort between the Bureau of Water Quality and the Delaware County Health Department to investigate and improve, as needed, water quality in the greater New Burlington area.

During the planning process it was discovered that significant wastewater issues exist in the New Burlington area and nearby homes. Clusters of homes on septic can pose a threat to the water quality of the reservoir and therefore warrant special attention. It is essential for residents to be able to learn about proper septic system maintenance, the health ramifications of living with and around failing/ failed septic systems, and alternative sewage/wastewater treatment systems. The Watershed Project's Outreach and Eduction efoorts could serve this function.

It is recommended that the Bureau of Water Quality and the Delaware County Health Department work together to investigate and resolve this water quality issue. The Bureau of Water Quality would

begin the process by testing for E. coli in the greater New Burlington area. If high counts of E. coli are found, Delaware County Health Department would then "dye test" residences to discover where the failing septic systems are. If a large amount of houses are found to have failing systems, it is recommended that residents look into a cluster system or other alternative systems to process their waste. The unincorporated village of New Burlington and homes along County Road 550South, County Road 475East, County Road 450South and County Road 461East should all be included in the plan. Funding sources should continue to be sought to absorb costly solutions.

Objective 2: Reduce sedimentation and accompanying nutrient and pesticide loading in the reservoir.

Objective 2a: Establish and manage constructed wetlands before the bays and inlets of Prairie Creek Reservoir.

The value of wetlands as natural filters has been well-documented. Prairie Creek Reservoir receives waters from five streams on the south and east sides, and an intermittent flow from the west side. Land uses surrounding these flows include agriculture and residential uses. Potential surface-water contaminants in the watershed include nutrients from agricultural field runoff and failed and failing septic systems; pesticides from agricultural runoff; pathogenic bacteria from failed and failing septic systems, livestock, and wildlife; and sediment from row-cropped fields and streambank erosion. Wetlands that receive incoming waters from the feeder streams of the reservoir would serve as a settling basin for sediment and its associated nutrients, pesticides, and bacteria. Further, specific wetland plants could be planted for the uptake of nutrients to prevent further nutrient-loading of reservoir waters. In addition to being surface-water filters, wetlands are also valued as wildlife refuges, groundwater recharge sites, and water storage areas.

Proximity to the Reservoir is an important consideration for these wetlands. The closer the wetlands are to the inlet of the stream, the less potential there is for contamination downstream of the wetland to bypass the wetland and enter directly into the reservoir. However, wetlands higher up the watershed could decrease velocity of waters coming into the reservoir after a rain by storing some floodwaters, decreasing streambank erosion associated with those fast-moving waters, and thereby, decreasing sedimentation entering the reservoir with each storm event. Therefore, the recommendation of this plan is to place wetlands along each of the feeder streams within the watershed, both in the upper-watershed and near the inlets of the reservoir.

A pilot wetland is currently being constructed at the southwest corner of the reservoir by the White River Watershed Project, in partnership with the Indiana American Water Company, the US Fish and Wildlife Service, Ducks Unlimited, and the Robert Cooper Audubon Society.

Objective 2b: Create and maintain 50-foot vegetated buffers around the shoreline of the existing ATV course to mitigate sediment loading and erosion impacts.

Prairie Creek Park maintains a 50-acre all-terrain vehicle course, for use by vehicles such as 4-wheelers and motorbikes, on the south shore of the main body of the reservoir. The course primarily consists of mud paths crisscrossing through hardwood forested lands. Vehicular traffic on the ATV course

paths prevents annual and perennial plants from rooting into the soil over much of the course, hinders the development of leaf-cover that would shelter the soil from rainfall, and deepens gully erosion on the paths, leading to sediment in stormwater runoff from the course.

In order to protect the reservoir from further sedimentation from the ATV course, this plan recommends that 50-foot vegetated buffers be created on the shoreline adjacent to the ATV course. Woody vegetation already extends from the course down to the shoreline. However, at least one path leads down to the water, creating a direct link for sediment to enter the water. This path, and all other paths that are within 50 feet of the shoreline, should be taken out of service and the gully(ies) should be reconstructed. It is further recommended that the Parks Department consult with a soil resource specialist to identify additional measures to mitigate sedimentation resulting from ATV course use.

Objective 2c: Promote conservation farming practices in the Prairie Creek watershed, including best management practices for drainage, nutrient management, pesticide management, soil conservation, surface water protection, tillage/residue management, and waste management.

Approximately 11,000 acres, or 64%, of the Prairie Creek Watershed is in agricultural land use. The potential exists for agriculture to impact water quality in the reservoir if best management practices and conservation farming are not followed. Conservation farming practices protect soil, water, air, and wildlife resources. The United States Department of Agriculture's Natural Resources Conservation Service recommends conservation farming practices for sustainable farming in a variety of circumstances.

Farming practices that could have the most positive impact upon water quality are

- Buffer practices for surface water protection (e.g., filter strips and riparian forest buffers),
- Drainage/run-off management (e.g., grade stabilization),
- Livestock management (e.g., exclusion fencing and stream crossings),
- Nutrient management (e.g., grid sampling, variable rate technology, cover crops),
- Pesticide management (e.g., pesticide management planning, agrichemical handling facility),
- Soil erosion management (especially tillage practices and waterways), and
- Waste management (e.g., comprehensive nutrient management planning and waste storage facilities).

The White River Watershed Project's Watershed Management Plan for Prairie Creek subwatershed calls for an increase in manure and nutrient management, and an increase in conservation tillage. Increased adoption of these practices will decrease sediment, nutrients, and bacteria in the waterways leading to the reservoir.

A list of conservation practices that have a bearing on water quality is included in Appendix D.

Objective 2d: Restore areas where erosion has occurred.

Erosion within the watershed results in sedimentation in the waterways leading to Prairie Creek Reservoir and within the reservoir itself. Sediment has been ranked as the number one pollutant

in Indiana's waterways. When it settles out, sediment covers up fish and macroinvertebrate habitat, smothers macroinvertebrates, and hinders hunting in sight-predators. In addition, sediment can carry other contaminants, such as nutrients, pesticides, and E. coli with it, causing further pollution. Because of the importance of Prairie Creek Reservoir as a supplemental drinking water and recreation source, it is important that water flowing into the reservoir is of as high quality as possible. Therefore, this plan recommends that an erosion assessment be carried out on the watershed and that eroded areas be restored.

Major sources of erosion that would likely contribute to sedimentation in Prairie Creek Reservoir include:

- Stream/ditch banks, due to increased flow velocity, stream crossings, gullies from fields, removal of woody vegetation from banks;
- Agricultural fields, especially those that are conventionally tilled;
- Developments where stormwater runoff best management practices are not in place or are not effective;
- Prairie Creek Reservoir shorelines, due to wave action and non-motorized boat access as well as wildlife access points; and
- Dirt trails, including the horse trail and any dirt access roads in the watershed.

Potential strategies for restoring these areas include:

- Working with the Delaware County Surveyor's office to stabilize ditchbanks of legal drains;
- Restoring tree cover or grass filter strips to riparian areas;
- Working with local landowners to construct localized stream crossings for livestock and motorized vehicles;
- Install grassed waterways and other solutions to gully erosion in agricultural fields;
- Promote reduced tillage to producers who conventionally till their fields;
- Work with landowners to construct best management practices for stormwater runoff in residential and commercial areas;
- Install bulkheads and/or seawalls on the most vulnerable shorelines of Prairie Creek Reservoir;
- Install non-motorized boat access points to the reservoir; and
- Stabilize dirt trails with permeable substrate such as wood chips, crushed limestone, or gravel.

Objective 2e: Promote the establishment of 120-foot wide vegetated buffers on each side of streams and ditches with permanent flows, and 20 to 30-foot wide buffers on each side of intermittent streams and ditches in order to reduce sediment and nutrient loading to maintain acceptable levels in the reservoir for human recreational use.

Prairie Creek Reservoir receives water from several streams and ditches in the watershed, as well as run-off from its shoreline. As a reserve drinking water reservoir, it is important that water flowing into the reservoir is of as high quality as possible, while still allowing for the recreational use of the Park. Water flowing from upland areas into the tributaries could be slowed and filtered by vegetated buffers lining the banks. Roots, leaves, and stems of woody and herbaceous vegetation impede water flowing through them, allowing infiltration, settling of sediments, and plant uptake of nutrients. Wider

buffers have more time to filter water and slow its progress to the stream. Over the width of the buffer, water will infiltrate the soil to contribute to groundwater recharge; and vegetation will remove nutrients that have percolated into the soil. Plant roots also hold streambank soils and protect against bank erosion.

In addition, riparian forest buffers shade the water below, decreasing stream temperatures and increasing dissolved oxygen. The amount and types of aquatic species in a stream are directly related to the amount of dissolved oxygen available. Shaded streams are also less susceptible to algal blooms due to the low penetration of sunlight. The importance of minimizing algal blooms is related to the algae's ability to consume all available dissolved oxygen and kill other aquatic life during blooms.

Suitable vegetation for buffer strips includes primarily trees, shrubs, and grasses. Several species of legumes may also be added to the mix. Trees included in riparian forest buffer are typically flood-tolerant species and should include some species with high shade value. Warm and cool season grasses with deep root systems could be utilized as filter strips in areas with less than 10% slopes.

This plan recommends that all permanently-flowing streams and ditches be lined with a 120-foot woody or herbaceous buffer. This recommendation is based upon 1) the maximum filter strip width for which the United States Department of Agriculture's (USDA) Farm Services Agency will pay landowners; and 2) the recommendation of Young, Huntrod and Anderson, whose research published in 1980 estimated that 118-foot riparian buffers would be required to reduce pathogens, including coliform bacteria, for waters that will be utilized for human recreation. In addition, this plan recommends a 20-30 foot buffer for streams of intermittent flow. The USDA Natural Resources Conservation Service (Indiana) recommends that buffer strips be no less than 20 feet wide to be effective in filtering nitrates and slowing the progression of runoff water.

Traditionally, cost-share programs for the installation of filter strips and riparian forest buffers have been available through the USDA, Indiana State Department of Agriculture, and local Soil and Water Conservation Districts.

See Appendix E for recommended species for filter strips and NRCS design specifications.

Objective 3: Develop and promote a program to educate people about: 1) proper on-site wastewater treatment system maintenance, 2) the health ramifications from failed/failing individual on-site wastewater treatment systems and 3) alternative sewage/wastewater treatment systems.

Septic systems require proper design, construction and maintenance in order to operate properly. A septic system that is not functioning properly pollutes water and can be a health hazard. Many people are unaware of septic system maintenance needs and therefore many systems are poorly maintained. A program is recommended to inform the public to septic system issues and to educate people regarding the use, care and maintenance of their septic systems. People should also be informed about alternative sewage/wastewater treatment systems that may be more cost-effective and offer better longevity. Other programs need to be developed to address the needs that result from increased septic health awareness.

Objective 4: Support/enhance enforcement of existing laws (410 IAC 6-8.1) governing residential on-site sewage disposal systems, including options for funding relief.

Homes and businesses that are not on public sewers can be major contributors to water pollution if they do not have properly functioning sewage disposal systems. Laws currently govern the discharge of wastewater and solid wastes into streams, ditches and onto the ground. For a variety of reasons those laws are sometimes not enforced allowing contamination of surface water that ends up in the reservoir. Since enforcement is often complaint driven, a concerned citizen group may need to make those complaints.

Bringing a failed system into compliance can also result in a variety of issues including but not limited to 1) having enough uncompromised and viable land to support a replacement on-site sewage disposal system (OSDS) and 2) the cost of bringing a failed system into compliance can be more than some residents can afford. Thus it is recommended that an OSDS Committee is formed by the County Commissioners in order to strategize solutions for assisting property owners with failed OSDSs.

Objective 5: Increase biodiversity in and around the reservoir.

Objective 5a: Establish a Land Restoration-Revegetation Management Plan.

The Land Restoration-Revegetation Management Plan should be established in order to:

- Restore and enhance the natural character of the land within the viewshed of the "ring roads" and designated routes for accessing Prairie Creek Reservoir.
- Mitigate and restore areas with erosion.
- Restore and enhance the character of Prairie Creek Park.

Figure 34 represents the viewshed from the "ring roads" around Prairie Creek Reservoir. The viewshed illustrates primary areas to naturalize. To implement the land restoration-revegetation management plan, a cost-share program should be initiated that will assist property owners that would like to contribute to the overall natural character of the area around the reservoir. Property owners would be assisted with the cost of revegetating areas within their properties that affect the viewshed from the "ring roads" as long as they plant species recommended through the cost-share program.

Many areas throughout Prairie Creek Park are affected with erosion. In order to protect the buffer surrounding Prairie Creek Reservoir, eroded areas must be mitigated and restored.

This management plan will:

- Identify native plant communities for a Cost-Share Program that would assist landowners with returning the roadside portion of their properties to a natural state.
- Identify revegetation scenarios that will address erosion issues affecting the buffer around Prairie Creek Reservoir.
- Identify invasive/undesirable (target) species for removal.
- Recommend maintenance measures.

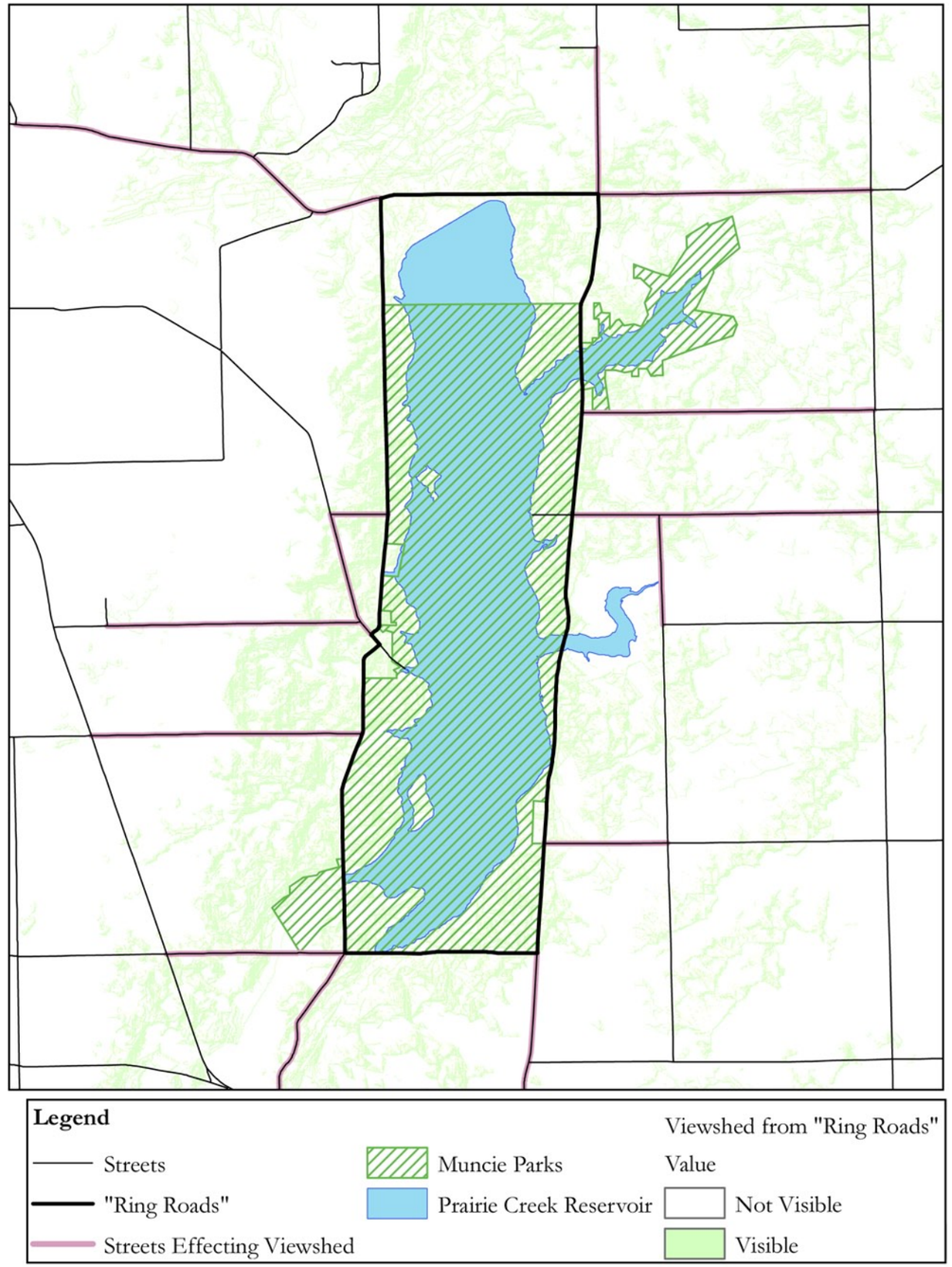


Figure 34: Viewshed from the "ring roads."

Objective 5a-i: Establish a Flora Assessment Study.

This study should be established in order to assess the flora within the "ring roads" at Prairie Creek Reservoir. This study is necessary in order to determine:

- What species are there?
- Are there significant specimens worth protecting?
- Are there significant plant communities that should be protected?
- Do significant specimens occur in a pattern that should be protected and/or even highlighted through design?
- Are there areas, beyond those already identified, which should be designated as "to be enhanced, restored or revegetated"?
- What types of plant communities (scenarios) should be used to enhance, restore or revegetate designated areas?
- Are there plant communities that could be used to enhance scenic views?

Establishing a partnership with Ball State University to conduct this study would be logical and beneficial. This type of study would be logical since BSU employs professional botanists and ecologists; and mutually beneficial in that it could provide graduate projects for several departments while minimizing costs for the party responsible for implementing the study. From brief discussions it seems that this study would be attractive to the Landscape Architecture Department, the Biology Department, and the Natural Resources Department. By necessity, the project would be long term with the first phases concentrating on areas that need to undergo remediation (i.e. the ATV site) or for areas that could be attractive for development. In addition it is the recommendation of this Master Plan that this study be completed before any development could occur.

Objective 5a-ii: Restore, enhance, and reestablish the historical native plant communities of the Tipton Till Plain in the area surrounding Prairie Creek Reservoir.

The Prairie Creek Watershed is found within the Tipton Till Plain section of the Central Till Plain Natural Region. This section is home to the Central Till Plain Flatwoods, a natural community found on the list of endangered, threatened, and rare species documented in Delaware County, Indiana (see Appendix C). Due to the status of this natural community, it is recommended that efforts be taken to restore, enhance, and reestablish this historical native plant community. Species belonging to the Till Plain Flatwoods community should be primary species recommended in the Land Restoration-Revegetation Management Plan, where appropriate.

Objective 5b: Create wetland and improve aquatic habitats in Prairie Creek Reservoir to increase biodiversity.

Prairie Creek Reservoir and the area within the "ring roads" are used by many different species of fish and wildlife. Because fishing and ecotourism (e.g. bird watching) are so important to the support of the reservoir, this plan recommends that wetlands are created and aquatic habitats improved in Prairie Creek Reservoir to increase biodiversity, and thereby, increase opportunities for recreation, education, and environmental stewardship.

The majority of fish species within the reservoir are game fish, as fishing is an important recreational activity at the Reservoir. Currently, the Reservoir contains gizzard shad, walleye, largemouth bass, white crappie, smallmouth bass, channel catfish, flathead catfish, perch, bluegill, red-ear sunfish, carp, and possibly a few surviving sturgeon from stocking years ago. It is anticipated that game fish will continue to be stocked. These types of fish need shallow water to spawn and prefer some type of structure, such as submerged stumps, rock piles, or weed beds, as hang outs. Many of these fish are sight-predators and require relatively clear water to hunt.

The aquatic habitat available in the reservoir currently includes shallows, open water, and structures, including fallen logs, weed beds (summer), and rock piles. The lake bottom is dotted with submerged islands from former building foundations. Much of the lake substrate is muck, due to sediment migration from the feeder streams. Improvement measures could include the addition of lilly-pad beds, and supplementary fallen logs and rock piles to provide cover for game fish. Continued sedimentation of the lake bottom could be managed by installing additional filter strips upstream of the reservoir and/or installing a sediment trap at the mouth of feeder streams. Excessive "weediness" could also be controlled by filter strips upstream and mechanical harvesteing

Other wildlife, such as spring peepers, chorus frogs, blue herons, double-crested cormorants, belted kingfishers, Canada goose, gulls, white cranes, and loons, are known to inhabit and utilize the lake area. Waterfowl and amphibians would benefit from the creation of wetlands for habitat in the lake. Shallow areas in the south end of the lake would be a good location for these wetlands.

Goal C: Ensure good design reflecting sound ecological practices for new development and redevelopment in the watershed.

Objective 1: Amend local ordinances to ensure that no large scale developments can occur without the existence of sewer and water utilities, or equivalent alternatives.

Proper wastewater treatment and disposal is necessary to maintain good water quality. However, throughout Delaware County there are no soils that are ranked as "not limited" for septic tank absorption fields. In fact, there are only four soils (Martinsville loam, 0-2% slopes; Martinsville loam, 2-6% slopes; Mountpleasant silt loam, 2-6% slopes, eroded; and urban land Wawaka-Miami complex, 1-6% slopes, eroded) that are rated "somewhat limited" for septic tank absorption fields. All other soils are rated "very limited". This means that anywhere that a septic system is installed in Delaware County, there will be increased need for maintenance and poor performance from the system should be expected. (See Appendix B for more information on soils and their properties for sewage disposal).

Therefore members of our staff and Steering Committee recommend that minimal use be made of septic systems as a means of wastewater treatment in the Prairie Creek Reservoir watershed. Any development on a large scale, such as a platted subdivision, planned unit development, condominiums or cluster development should not occur with the use of individual septic systems.

Water utilities or alternate drinking water supply should also be explored due to suspected high levels of arsenic in the ground water.

Objective 2: Develop an ordinance amendment requiring all new housing developments in the Prairie Creek Reservoir area to meet conservation design standards.

An ordinance amendment making the use of conservation design standards mandatory inside the watershed should be made to ensure the future drinking water quality of Prairie Creek Reservoir, to protect groundwater in general, and to protect the natural character of the area.

Objective 3: Establish model plat restrictions that ensure sound ecological practices, and require their use on any land in the area that gets platted.

Sound ecological practices are essential to maintaining future drinking water quality. Landscaping, drainage, impervious surfaces and wastewater treatment and disposal are areas that impact water quality and merit the establishment of guidelines that follow best practices. Guidelines for platted areas should be established and their inclusion made a mandatory part of the platting process, much the same as the "right to farm" restrictions have been used.

Objective 4: Encourage private landowners to use model plat restrictions as deed restrictions to ensure sound ecological practices on individual properties.

Water quality in the Prairie Creek watershed depends on the cooperation of individual landowners as well as developers, government and utility companies. It is therefore advised that best practice guidelines be made widely known and the general public educated regarding their use. Landowners

in the watershed should be encouraged to place covenants on their land to ensure that future land owners follow the same sound ecological practices.

Objective 5: Encourage and enforce best management practices for sediment reduction during construction in the watershed.

Stormwater runoff from construction sites during new development and redevelopment can deposit significant amounts of sediment into adjacent and downstream watercourses if best management practices (BMPs) for soil erosion during and after construction are not implemented. Sediment has been ranked as the number one pollutant in Indiana's waterways. When it settles out, sediment covers fish and macroinvertebrate habitat, smothers macroinvertebrates, and hinders hunting in sight-predators. In addition, sediment can carry other contaminants, such as nutrients, pesticides, and E. coli with it, causing further pollution.

Indiana's Rule 5 requires that any developer planning construction (new development or redevelopment) that will disturb more than one acre of land must file an erosion control plan with appropriate BMPs with the local regulating authority and Notice of Intent (NOI) with the Indiana Department of Environmental Management before land disturbing activities can occur. Plans must meet sufficiency standards as outlined by 327 IAC 15-5-6.5. Contractors must comply with the provisions of the plan during construction activities. Inspection of construction sites is typically carried out at the local level, with violations of the plan enforceable by the Indiana Department of Environmental Management.

In addition, local regulations apply, Delaware County Ordinance 2006-35 and Muncie Sanitary District Resolution 2006-12. Delaware County and the Muncie Sanitary District are permitted separate storm sewer system (MS4) operators under the National Pollution Discharge Elimination System (NPDES) and control stormwater discharges within unincorporated Delaware County and the Muncie Sanitary District. Any new development or redevelopment within these areas will fall under the jurisdiction of the Muncie Delaware County Department of Stormwater Management and must file a storm water pollution prevention plan (SWPPP) for review in the Delaware County Building Commissioners Office. Once local plan approval has been received, an NOI must be filed with IDEM by the developer. Within 48 hours of land disturbing activities, the local department must also receive a copy of the NOI and a notice that construction will begin. The MS4s have developed a stormwater quality management plan (SWQMP). Minimum Control Measure #4 in the SWQMP describes suggested construction site runoff BMP's. These BMPs include:

- Construction Site Planning Practices (e.g., plan development to fit the topography, soils and other conditions of the site)
- Soil Cover (e.g., use of soil stabilizers, installation of vegetative debris over exposed soil)
- Tracking Control (e.g., mandatory construction entrance, constructed tire wash areas)
- Structures to Control and Convey Runoff (e.g. earth dikes, swales)
- BMPs to Capture Sediment (e.g. filter strips, sediment basins)
- Good Housekeeping (e.g., spill control, protected refueling stations)

Post-construction erosion control is also regulated by the Muncie-Delaware County Department of Stormwater Management under the above mentioned Ordinance and Resolution. Post-construction

runoff BMPs also include planning, structural, vegetative, and good housekeeping practices.

Monitoring carried out by the White River Watershed Project indicates that sedimentation (as measured by total suspended solids) in the watershed is within acceptable ranges. In order to maintain these low levels of sedimentation, this plan recommends that the use of BMPs for sediment reduction in new development and redevelopment under one acre is encouraged. This plan also recommends that the use of BMPs for sediment reduction in new development and redevelopment over one acre in the subwatershed is enforced. In addition, this plan suggests accurate review of BMPs outlined in erosion control plans and education for those expected to use them.

Objective 6: Amend or adopt local ordinances to require that lots are of sufficient size to accommodate both the initial OSDS and repair/replacement space; both spaces must remain uncompromised and viable.

There are local and state ordinances administered by the Health Department that govern requirements for on-site sewage disposal systems. In order to meet some of those requirements, the area intended for installation of the system must remain undisturbed. The local zoning and subdivision control ordinances contain lot size requirements to accommodate an initial on-site sewage disposal system but the requirements do not address allowing enough area for the repair/replacement. The requirements also do not contain provisions that would support keeping the area undisturbed. Ordinance amendments should be adopted to require lot areas sufficient for both the initial system and a replacement. Provisions could also be added requiring the use of OSDS easements, similar to drainage easements where standard restrictions prevent disturbance, alteration, and/or structures to be placed in the easement area.

Objective 7: Protect existing on-site sewage disposal systems that are not in failure.

Objective 7a: Require all on-site sewage disposal system repairs to meet new construction standards for on-sitesewage disposal systems.

On-sitre sewage disposal systems (OSDS) can be a major source of water pollution if not designed, installed and maintained properly. Although there is some variability in the life-span of an OSDS, most systems do not last as long as the homes they are servicing. Repairs are therefore to be expected and should be planned for. Older system designs often emit effluent that doesn't meet current standards for wastewater quality, even when working properly. Therefore repairs to existing systems should be done using the best up-to-date technology and bring older systems up to current standards. It is recommended that OSDS installation and repair should be governed by a permitting process and done only by licensed contractors using modern technologies.

Objective 7b: Adopt an ordinance that requires all building permits to include an on-site sewage disposal system review by the Health Department.

In order to improve septic health in existing scattered sites as well as new development, the building permit process should be amended to include review by the Health Department of any permit application

for additions or non-residential structures. Septic system capacity is an important consideration when adding bedrooms and making other improvements that may impact total maximum dynamic load. Conservation measures can often be taken to reduce the load on the system. In severe cases where systems are inadequate, the on-site sewage disposal system may need to be upgraded before the building improvements can be permitted.

Protection of the septic system itself is also vital. The owner(s) and contractor should be aware of the location of the septic system to avoid causing damage such as from heavy equipment.

In order to review both a building project and on-site sewage disposal system, scaled site plans should include: the building's floor plan, contours, lot line dimensions, additional structures (driveways, parking areas, or other improvements), trees to remain in the absorption area; location of underground services, easements, wells (existing and proposed), soil test sites, septic tank, absorption fields, perimeter drains, distances between trenches, and distances from the septic tank to foundations, lot lines, wells, water lines, lakes, ponds, streams, wetlands, floodplains, drainage ditches and other surface water.

Objective 8: Amend local ordinances to coordinate the requirements/permitting processes for stormwater control when soil types require perimeter drains for an OSDS.

More often than not, onsite sewage disposal systems require perimeter drains in order to function properly. In addition to high water table issues, stormwater must also be considered. The outlet for a perimeter drain system is as important to its function as it is to any storm drain system. Perimeter drain outlets should be treated similarly to outlets for storm drains – there should be easements, capacity reviews, and approvals for connections. In addition to function, it is important that those drains be of sufficient depth and correct design to maintain water quality. There should be coordination between standard drainage permits, perimeter drain installations, and erosion control/stormwater quality requirements by reviewing and amending local ordinances under the health department, the engineering department and the MS4 program.

Goal D: Promote the full potential of Prairie Creek Reservoir as a community asset with regional appeal.

Objective 1: Expand promotion of Prairie Creek Park as a visitor destination.

Marketing strategies should be developed that advertise and promote the facilities available at the Prairie Creek Park. The survey results indicate that many people are unfamiliar with what is currently available at the park and most people first learn about the park through word-of-mouth. Marketing to target groups such as bikers, hikers, horseback riders and fishermen could bring new visitors to the park. Highlighting the seasonal changes at the park would help people appreciate the reservoir year-round and increase the return on the community's investment.

Objective 2: Develop and enhance wayfinding and marketing devices, including signage, maps, brochures, and websites, to assist people in locating Prairie Creek Reservoir and educating the public about available recreational opportunities.

There should be more marketing of the park and existing facilities and the opportunities currently available in the area. A park brochure would assist in making people aware of what Prairie Creek Park has to offer and help orient first time visitors. Event attractions require publicity to make them a success and by holding such events at Prairie Creek, people would become more aware of the facilities and be more likely to visit the Park for the first time. Targeting groups with an interest in outdoor activities, camping, fishing, boating and horseback riding could bring visitors from a wider regional area. Improved directional signage to help locate the reservoir is in the works and is essential for the success of any event which brings numbers of people from outside the Muncie community. A separate web address for the Park should be considered. Links to this website should be made from both the City & County government's websites as well as from the websites for the Chamber of Commerce and the Visitor's Bureau.

Objective 3: Promote the development of special events that enhance the community service/ amenity value and the attraction destination/economic development potential at Prairie Creek Reservoir.

The biggest annual event at Prairie Creek Park is the 4th of July fireworks. Special events like the Endurathon bring hundreds of visitors to Prairie Creek Park and the Muncie community. The Greenway Giddy-Up is a weekend of horseback riding and camping. The facilities that exist at Prairie Creek could support even more special events. Suggested additions include concerts, fishing and boating competitions, and various workshops.

The Endurathon and the Giddy-up reflect public/private partnerships. That model could be expanded by existing non-profits into other programs such as children's theater productions or talent shows. Furthermore a Frisbee golf course could be laid out as a permanent attraction and be used for competition.

Objective 4: Establish fair regulations for campers that encourage attractive short-term use of campsites at Prairie Creek Park.

The Prairie Creek Park campground together with the boat docks constitute major financial assets for the park and offer visitors an opportunity to maximize their enjoyment of the reservoir. The use of these facilities should be viewed as a privilege. Fair regulations that meet the needs of all should govern their use. It is important that the individual sites and the campground in general be maintained in an attractive, orderly condition so that the park's good image is upheld. The availability of short-term camping (1-14 days) allows for the promotion of the park as a visitor destination and for a wider range of use by local residents.

Objective 5: Capitalize on and promote an opportunity for unique overnight accommodations.

The reservoir and area attractions are a significant destination for many visitors. By providing overnight accommodations in the immediate area, the unique experience of the reservoir would be enhanced. The exact nature of the overnight facilities could take the form of individual cabins or a lodge (preferably at the north end of the park for closer proximity to public sewers). Development of scattered site Bed & Breakfast operations should be encouraged. The added choices available to visitors and opportunity to host events involving these accommodations would further diversify the amenities and charm of the reservoir as a unique area destination.

Objective 6: Encourage the development of a specialty restaurant located on the east side of the reservoir with views of the Sailing Club.

Members of the Economic Development Focus Group believe that a potential exists for a waterfront restaurant placed so that it would take advantage of one of the nicer views at the reservoir. The high ground on the north bank of the inlet that the sailing club uses affords one of the nicer views on the reservoir. It was felt that a potential exists here to develop a restaurant that could serve as a regional draw to the reservoir. Members recognized that there was a local place to eat already at the reservoir and emphasized that the waterfront restaurant would need to have a good menu and nice decor, something that would draw people from outside the local area. In general it is recommended that when demand for commercial resources increases that need be met by clustering any new use near or adjacent to existing commercial areas. This is consistent with the Comprehensive Zoning Ordinance in effect for Delaware County and with good zoning practice.

Objective 7: Investigate the feasibility of design standards, overlay districts, planned unit developments, etc. that provide a mechanism to maintain and to capitalize on (from an economic development standpoint) the rural, naturalized character of the Prairie Creek area.

The possibility of implementing additional measures dealing with conservation of the rural and natural character of the Prairie Creek Reservoir area should be explored. Support may exist for design guidelines to be developed and encouraged for use with any new conventional development or for more visionary development projects. This could take the form of establishing standards that are

consistent with the existing character of the built environment and compatible with the natural setting of the reservoir area. A variety of creative measures could be taken to help realize a vision that may take the shape of a specialized community, large residential estates, a theme development or other innovative design that, in an appropriate low density manner with planned conservation/preservation areas, could become part of the attraction and draw of the Prairie Creek area.

Objective 8: Investigate the feasibility of a conference center/hotel that capitalizes on the natural character of the Prairie Creek area.

The Prairie Creek area offers a natural atmosphere that could be very conducive for a distinctive conference center/hotel/lodge. It is recommended that the PC Park Committee look into the feasibility of locating a conference center near Prairie Creek Park so that conference attendees could utilize the park's amenities. The north area offers proximity to sewers, a commercial node and access to park facilities and other naturalized areas.

Goal E: Provide ample opportunity for recreational use and development of Prairie Creek Park facilities.

Objective 1: Balance the recreation needs for active and passive activities at Prairie Creek Park.

Prairie Creek Park has a plethora of opportunities for a range of activities, both active and passive. Passive activities are those that impose little or no impact on the landscape and frequently involve a very small number of people. Activities such as hiking, horseback riding, bird watching and fishing are considered passive. Active recreation activities are those that have some significant impact on the landscape, either through the need for facilities and equipment or involve significant numbers of people at a time. They would include sporting and entertainment special events, playground activities, swimming, basketball, volleyball, horseshoes and boating. Currently visitors to Prairie Creek Park can choose from a variety of active recreation to engage in, however there are only a few opportunities to engage in passive recreation.

The Recreation Focus Group recommended that, in terms of recreation, the reservoir be viewed as an east bank devoted to active recreation and a west bank reserved for passive activities. Passive activities would not be limited to the west bank and could also occur on the east bank. By creating this juxtaposition of use, the western bank would gain use while maintaining its natural character and the eastern bank would absorb any additional need for development. Thus it is recommended that the Prairie Creek part of the Muncie Park Plan address a site development strategy that maintains a balance whereby the west shore, excepting the ATV course, be devoted to passive recreation in order to preserve the undeveloped character that currently exists there. Should the need to expand the ATV course arise, the ATV course should be relocated outside of Prairie Creek Park.

Objective 2: Develop walking/bicycle trails that encircle Prairie Creek Reservoir.

Creating walking/bicycle trails that encircle Prairie Creek Reservoir is an important opportunity to allow park visitors to appreciate this resource's natural features. A trail system would provide great recreational opportunities in conjunction with the opportunities it would offer for enjoying nature. This trail system should be kept separate from the horse trails and from the "ring roads." The only areas that the trail system should meet the "ring roads" would be to utilize shared bridges where waterways must be crossed. The trail system should maintain connectivity by providing access to the Cardinal Greenway. It should have an unpaved surface such as crushed limestone with strategically placed bike racks and signage.

Objective 3: Retain and enhance the separate trail system for horseback riders.

West bank trail users including the Muncie Light Horse Club have a long history of helping maintain the integrity of the west bank and the horse trails that are it's principal recreational use. Currently the west bank uses are devoted to passive recreation that has very minimal impact on the "natural" state of that area. Any significant development on the west bank would be inconsistent with the desire to keep that area in an undeveloped and "natural" state and would impair the overall appeal of the reservoir. Officers of the Muncie Light Horse Club have indicated that there is a danger in mixing

horses and bikers and pedestrians. It is therefore recommended that any trails that are built for bikers and pedestrians on the west side be separated from those devoted to horseback riding.

Objective 4: Design children's play areas that emphasize learning and connections to the natural environment.

The reservoir offers a unique area in our community to explore the relationship between water and nature. It is recommended that playground facilities be designed that take advantage of this relationship. This could take the form of a ride designed like a fish or aquatic insect such as a dragonfly, for smaller children, and for older children animal footprints or fossils in pavement. Upgrades are needed to existing playground facilities and replacement equipment could follow the nature theme.

Objective 5: Provide an access area for non-motorized boats.

A need for parking and launching non-motorized boats was identified. Non-motorized boats such as canoes and kayaks do not require the facilities at the boat launch and may experience significant wait and some danger when attempting to use that facility. A small pervious surface parking area and path to the water could be of more use to users of such small craft providing a safe, easy access to the water and relieving some of the traffic at the boat launch on busy days.

Objective 6: Comply with ADA (Americans with Disabilities Act) standards for a "natural park."

Prairie Creek Park should be in compliance with ADA Standards. The Standards should be consulted and measures taken to correct any oversights. The Standards differ with regard to "improved" areas including buildings and "natural" areas. Trails may be "improved" or "natural," depending on their surface and construction. The ADA standards indicate that paved trails need to be accessible, but that "natural" trails do not if doing so would destroy part of the natural ruggedness or experience of the trail.

Objective 7: Promote the establishment of 120-foot wide vegetated buffers on each side of streams and ditches with permanent flows, and 20 to 30-foot wide buffers on each side of intermittent streams and ditches in order to reduce sediment and nutrient loading to maintain acceptable levels in the reservoir for human recreational use.

Prairie Creek Reservoir receives water from several streams and ditches in the watershed, as well as run-off from its shoreline. In order for the reservoir to continue to support recreation such as swimming, boating, and game fishing, sedimentation, nutrification, and excessive weediness must be controlled in the main body of the reservoir. These conditions would be most effectively remedied in the upper watershed by placing vegetated buffers alongside feeder streams and ditches.

Water flowing from upland areas into the tributaries could be slowed and filtered by vegetated buffers lining the banks. Roots, leaves, and stems of woody and herbaceous vegetation impede water flowing through them, allowing infiltration, settling of sediments, and plant uptake of nutrients. Wider buffers have more time to filter water and slow its progress to the stream. Over the width of the buffer,

water will infiltrate the soil to contribute to groundwater recharge, and vegetation will remove excess nutrients that have percolated into the soil. Plant roots hold streambank soils and protect against bank erosion.

Suitable vegetation for buffer strips includes primarily trees, shrubs, and grasses. Several species of legumes may also be added to the mix. Trees included in riparian forest buffer are typically flood-tolerant species and should include some species with high shade value. Warm and cool season grasses with deep root systems could be utilized as filter strips in areas with less than 10% slopes.

This plan recommends that all permanently-flowing streams and ditches be lined with a 120-foot woody or herbaceous buffer. This recommendation is based upon 1) the maximum filter strip width for which the United States Department of Agriculture's (USDA) Farm Services Agency will pay landowners; and 2) the recommendation of Young, Huntrod and Anderson, whose research published in 1980 estimated that 118-foot riparian buffers would be required to reduce pathogens including coliform bacteria for waters that will be utilized for human recreation. In addition, this plan recommends a 20-30 foot buffer for streams of intermittent flow. The USDA Natural Resources Conservation Service (Indiana) recommends that buffer strips be no less than 20 feet wide to be effective in filtering nitrates and slowing the progression of runoff water.

Traditionally, cost-share programs for the installation of filter strips and riparian forest buffers have been available through the USDA, Indiana State Department of Agriculture, and local Soil and Water Conservation Districts.

See Appendix E for recommended species for filter strips and NRCS design specifications.

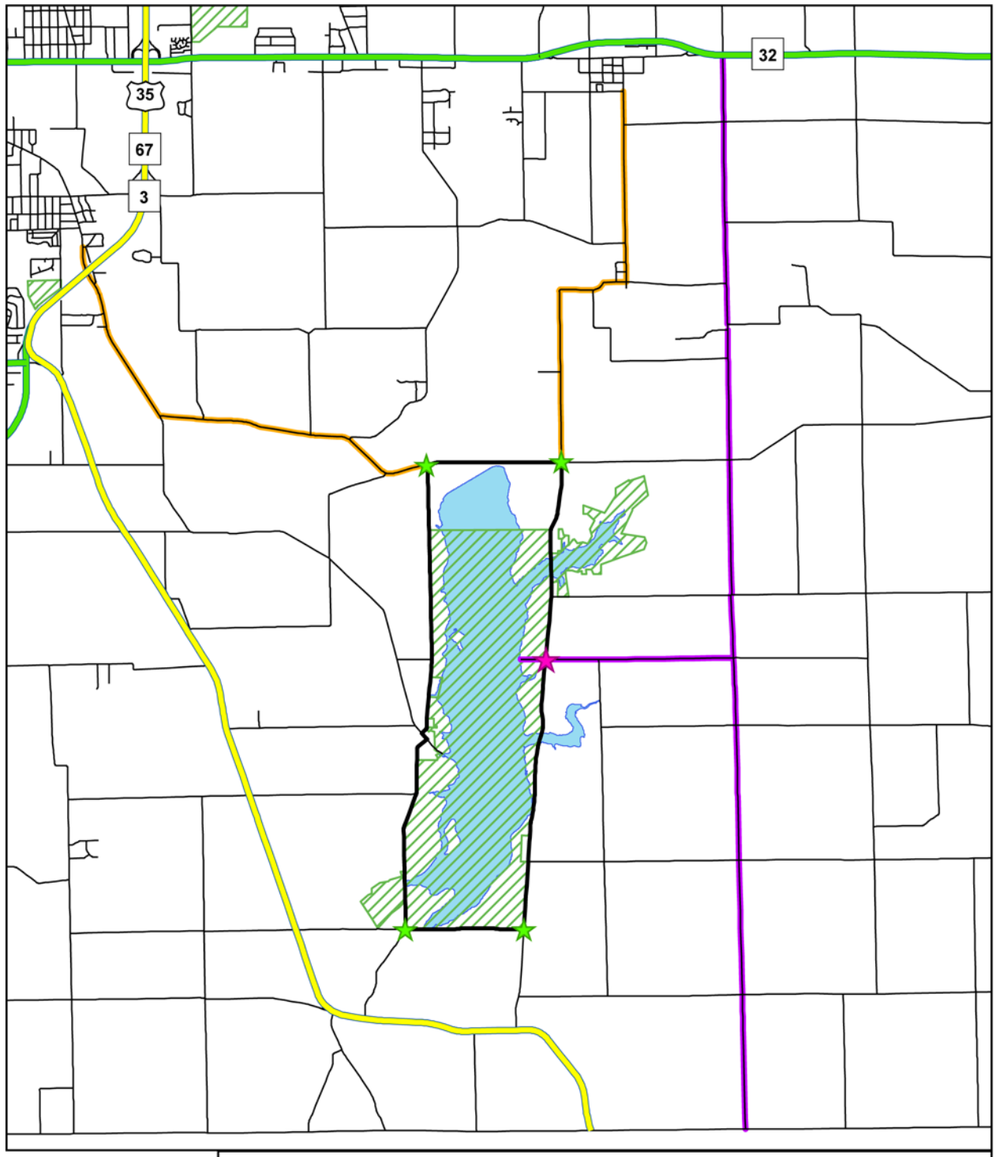


Figure 35: Access and Gateways to Prairie Creek Park.

Goal F: Increase quality of life for residents of Delaware County and enhance visitor experience by improving accessibility, usability and enjoyment of the reservoir.

Objective 1: Improve visitor access to Prairie Creek Reservoir.

Objective 1a: Designate a point of entry and gateways for Prairie Creek Park.

A point of entry or gateway into the reservoir area would help define the reservoir as a destination. Having a primary point of entry would also be helpful to tourists to the area. However, access points surround the reservoir & Prairie Creek Park and roads approach the reservoir & Prairie Creek Park from all directions. Therefore multiple secondary gateways should also be designed with a common theme to let the visitor know that they have arrived. Signage is an important part of the secondary gateways to direct visitors to their intended destinations within Prairie Creek Park. It is noted that the south visitor entry off of US 35 will require coordination with Henry County as well as INDOT.
See Figure 35 on page 110.

Objective 1b: Designate route(s) for best access.

To improve visitor access to Prairie Creek Reservoir, routes for best access need to be designated. Since the reservoir & Prairie Creek Park attract visitors from a range of locations, various access routes need to be designated. Routes from the City of Muncie, Selma & SR 32, and from US 35 should be explored since these represent principle locations that visitors travel from and primary roads that visitors would travel on for access to Prairie Creek Park.
See Figure 35 on page 110.

Objective 1c: Make needed road improvements.

Once routes that provide the best access to the reservoir & Prairie Creek Park have been identified, those roads should be enhanced with 3R improvements (Resurface, Rehabilitate, Restore). It may be necessary and appropriate for local government to fund these road improvements as they stand to directly benefit the community and economic development in the area by improving access to a major water attraction with regional appeal..

Objective 2: Promote bike and pedestrian use of Prairie Creek Reservoir.

Objective 2a: Develop bike and pedestrian trails that encircle the reservoir.

Creating walking/bicycle trails that encircle Prairie Creek Reservoir is an important opportunity to allow park visitors to appreciate this resource's natural features. A trail system would provide great recreational opportunities in conjunction with the opportunities it would offer for enjoying nature. This trail system should be kept separate from the horse trails and from the "ring roads." The only areas that the trail system should meet the "ring roads" would be to utilize shared bridges where waterways must be crossed. The trail system should maintain connectivity by providing access to the Cardinal Greenway.

Objective 2b: Include bike lanes in the needed improvements to the road structure of the "ring roads."

It is recommended that new road construction around the reservoir shall include bike lanes. While bike lanes are typically urban features, providing bike lanes on the "ring roads" would provide a unique recreational opportunity. This would also enhance the "ring roads" for events such as the Annual Muncie Endurathon.

Objective 2c: Install pervious surface parking facilities adjoining bike trails for park and pedal opportunities in the park.

In order to maximize access to the bike and pedestrian trails it is recommended that various small scale parking areas be designed and placed at strategic locations to better accommodate use. The parking areas should be attractive and constructed of pervious materials so they will not add to storm water runoff.

Objective 2d: Connect trail system to Cardinal Greenway.

Capitalizing on the success of the Cardinal Greenway, trails and bike lanes, both existing and planned, should make logical and useful connections. A comprehensive system of walking trails and bike paths should be completed that would make accessible the variety of natural and manmade landscapes that make up the park. Connections should be made between the existing infrastructure as well as any future improvements.

Objective 3: Use Prairie Creek Reservoir as a focus to educate the public about environmental issues including water quality, compatible development, and wildlife habitat needs.

Prairie Creek Park and the reservoir area are unique resources to our area and offer special opportunity to study and interact with water and nature. The nearest similar facility is Summit Lake State Park in Henry County. In order to provide local education on environmental issues in a rural setting, it is recommended that programs of an educational nature be developed and promoted that would capitalize on the resources at Prairie Creek. The park seems an ideal place to host such programs in conjunction with education personnel from the community, schools or university. Water quality, animal and plant habitats, and recreation seem natural subjects for programs and workshops that could target age groups from the very young to the elderly. Partnerships between the park and community institutions will be key in developing this objective. In addition, it would be useful for the Parks Department to employ an educator that would be available to develop and deliver programming and provide outreach to community groups, potentially providing additional revenue to the Park.

As elements of this Master Plan are implemented, increased opportunities to discuss compatible development will arise. At a minimum, as environmental measures are developed, interpretative/ educational signage could be used at locations such as the buffer strips, the wetlands, erosion control sites, and revegetation areas. By using the Prairie Creek Reservoir as a focus for environmental issues, the area can serve as an example to the larger east-central Indiana region for how to involve the local community when working toward resource protection.

Objective 4: Encourage the development of educational programs and workshops that would take place at Prairie Creek Park.

Prairie Creek Reservoir offers a unique setting in Delaware County to provide a variety of educational programs and workshops on many different topics. By conducting workshops and educational programs on a variety of topics at the reservoir, non-traditional visitors will be able to utilize the Prairie Creek Park and reservoir area. Therefore, it is recommended that the Parks Department encourage and work in conjunction with local and regional community agencies, institutions, and organizations to develop educational programs and workshops that would take place at Prairie Creek Park. In addition, this plan recommends that the Parks Department work towards developing an educational program that would utilize the Prairie Creek Reservoir and Park area. Existing structures could be utilized for this purpose. Shelters are available for programs held in moderate temperatures, while the Lodge can provide space for workshops, classes, and programs in any weather.

Objective 5: Promote the use of Prairie Creek Reservoir as an outdoor laboratory for educational purposes.

Delaware County school districts do not currently own or lease land to utilize as an outdoor laboratory facility. However, members of the Prairie Creek steering committee believe it is in the community's best interest to educate young people about the nature of water quality, ecosystems, and other natural resources and means to sustain them while enjoying the activities that natural resources can afford. The reservoir and surrounding area is a venue for natural resources education that is unique to our area. It is recommended that the Delaware County schools partner with the Parks Department to make more use of the reservoir as an outdoor laboratory. These partnerships could lead to curriculum development funded through local foundations.

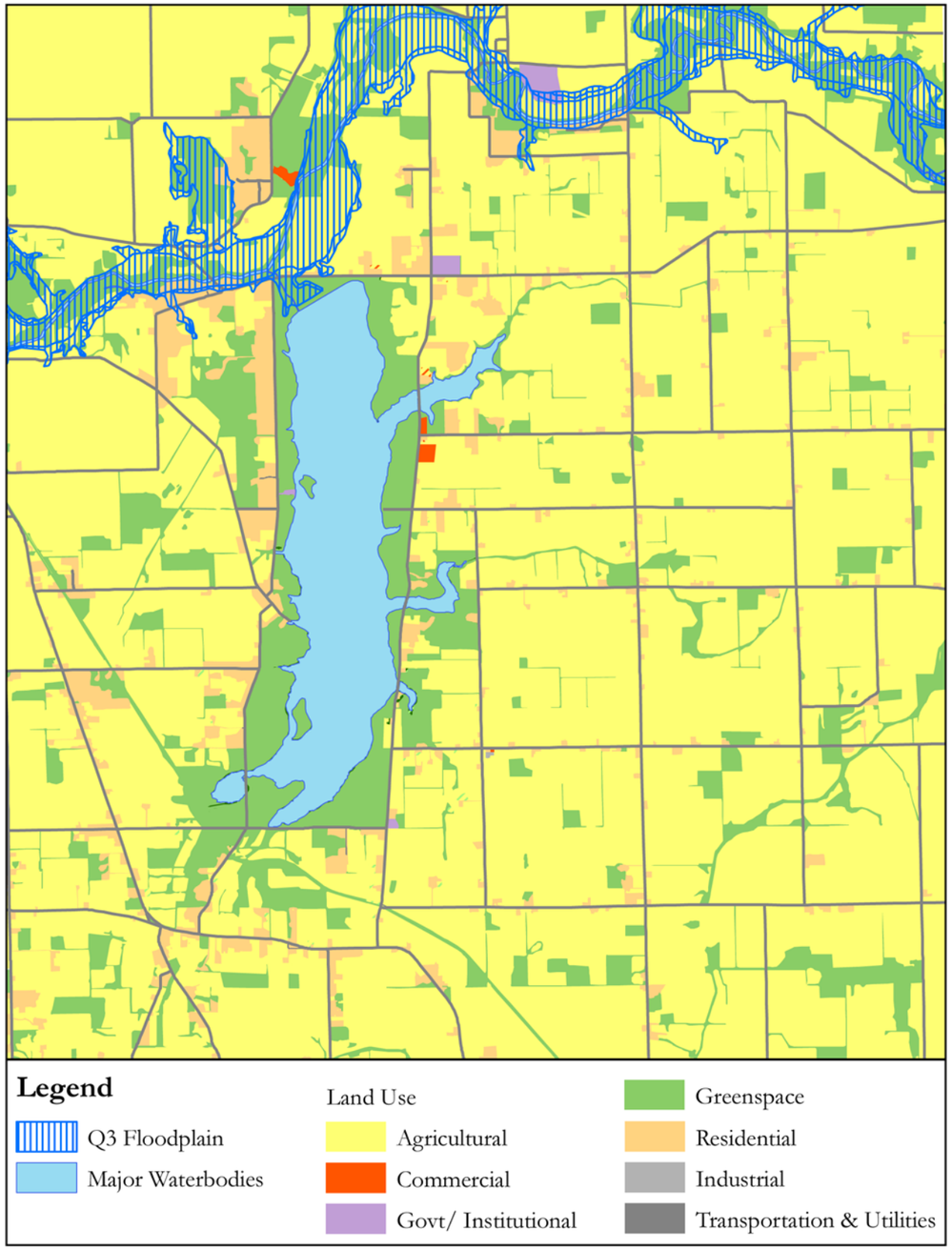


Figure 36: Existing Land Use. Source: Delaware County Cama Information & 2003 Aerial of Delaware County.

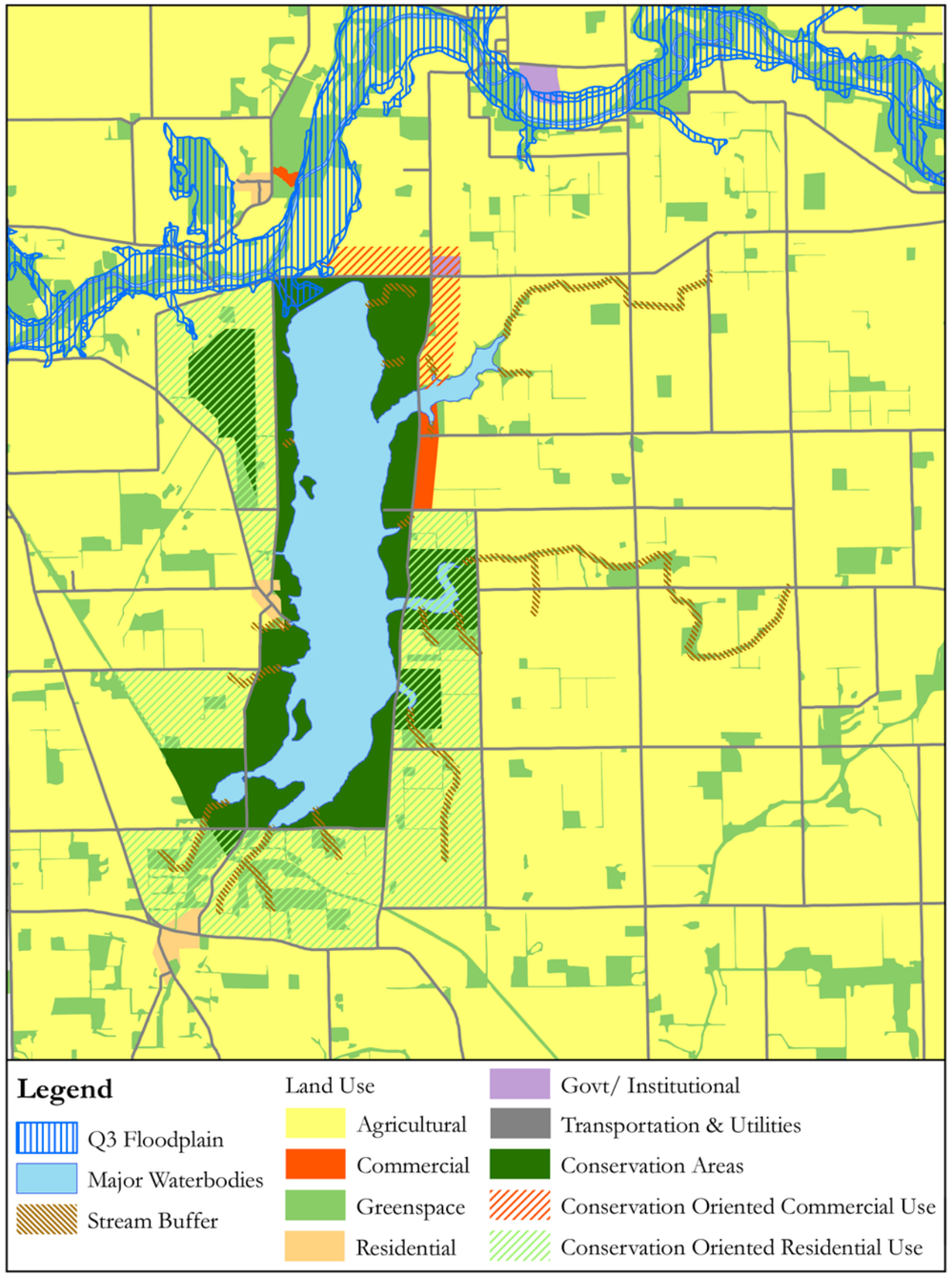


Figure 37: Prairie Creek Master Plan Land Use.

Implementation

This section is intended to address implementation for each of the Plan's objectives, identify leaders and participants, and recommend possible funding sources. The critical players/participants indicate groups and entities that have been identified as important to the implementation process, but should not be taken as all inclusive. Many objectives require community wide support and participation. Targeted time frames are expressed in years and indicate the ideal completion time of the objective. Some objectives should be started in the suggested span of years and are ongoing from that point.

Goal A: Protect and ensure the longevity of Prairie Creek Park & Reservoir for future generations.

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
1. Encourage the City of Muncie to pursue extending the lease for Prairie Creek Park with the Indiana-American Water Company.	City of Muncie	IAWC Park Board County Comm. Friends of PCR	N/A	0-2
2. Before the land inside the "ring roads" becomes available, establish an agreement for first right of refusal that is embraced by both the City of Muncie and Delaware County.	City of Muncie	IAWC County Comm.	N/A	0-2
3. If the land inside the "ring roads" and/or other adjacent IAWC properties go up for sale purchase them.	City of Muncie	IAWC County Comm.	EDIT EDI	ongoing
4. Encourage 501(c)3's, nonprofit organizations, to help gather resources to protect and promote Prairie Creek Reservoir and the long term transition envisioned in this plan.	RTC Director PCP Supt.	RTC Friends of PCR CGI WRWP	N/A	0-2 and ongoing
5. Work with relevant existing community entities for the implementation of the objectives in this master plan.	Park Committee	all	N/A	ongoing

Goal B: Protect and enhance the long term ecological health and water quality of the Prairie Creek Reservoir and supporting watershed.

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
1. Control developmental impacts in immediate vicinity of the reservoir.				
a. Rezone the area within the "ring road" to the conservation/recreation zone.	DMMPC County Comm.	Property owners (including IAWC)	N/A	0-2
b. Encourage owners of properties outside the "ring roads" that are used, could be used and/or land banked for purposes such as habitat preserves, conservation areas, greenspace, and farmland conservation to rezone those properties to the conservation/recreation zone.	DMMPC County Comm.	SWCD RTC Property owners Auditor	N/A	0-2
c. Amend local ordinances to ensure that no large scale developments can occur without the existence of sewer and water utilities, or equivalent alternatives.	DMMPC County Comm.	Health Dept. Sanitary districts	N/A	0-2
d. Initiate policies and/or amend ordinances as applicable to ensure that no individual OSDS for new development may be located within the "ring road" boundary.	County Comm. Health Dept.	DMMPC Park Board IAWC	N/A	0-2
e. Develop and implement a program that is a joint effort between the Bureau of Water Quality and the Delaware County Health Department to investigate and improve as needed water quality in the greater New Burlington area.	BWQ Health Dept.	WRWP SWCD Property owners	special assessments IDEM/EPA	develop in 0-2 and implement program in 2-5
2. Reduce sedimentation and accompanying nutrient and pesticide loading in the reservoir.				
a. Establish and manage constructed wetlands before the bays and inlets of Prairie Creek Reservoir.	SWCD	Nonprofits WRWP IAWC Park Board	319 funds	0-5

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
b. Create and maintain 50' vegetated buffers around the shoreline of the existing ATV course to mitigate sediment loading and erosion impacts.	Park Board	IAWC WRWP course users	user fee 319 funds	0-2
c. Promote and enforce conservation farming practices in the Prairie Creek watershed, including best management practices for drainage, nutrient management, pesticide management, soil conservation, surface water protection, tillage/residue management, and waste management.	SWCD NRCS	WRWP RTC Extension Office Property owners Farm Bureau	NRCS programs 319 cost share	ongoing
d. Restore areas where erosion has occurred.	SWCD	WRWP IAWC Park Board nonprofits property owners	319 cost share IDEM NRCS	ongoing
e. Support and augment where possible the establishment of 120' wide vegetated buffers on each side of streams and ditches with permanent flows, and 20'-30' wide on each side of intermittent streams and ditches in order to reduce sediment and nutrient loading to stay the progress of eutrophication of the reservoir.	SWCD	Surveyor property owners Drainage Board WRWP NRCS	ditch assessments 319 cost share NRCS	0-5
3. Develop and promote a program to educate people about: 1) proper OSDS maintenance, 2) the health ramifications from failed/failing systems and 3) alternative sewage/wastewater treatment systems.	Health Dept. SWCD	WRWP MSD/BWQ County Comm. Nonprofits	319 funds	Develop in 0-2 and promote ongoing
4. Support/enhance enforcement of existing laws (410 IAC 6-8.1) governing residential on-site sewage disposal systems including options for funding compliance relief.	OSDS Committee (to be established by County Comm.)	Health Dept. DMMPC SWCD/WRWP MSD concerned citizens	IDEM EPA private funds	Develop in 0-2 and ongoing

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
5. Increase biodiversity in and around the reservoir.				
a. Establish a Land Restoration-Revegetation Management Plan.	WRWP	BSU Park Board IAWC property owners nonprofits	EPA 319 funds	0-5
b. Create wetland and improve aquatic habitats in Prairie Creek Reservoir to increase biodiversity.	SWCD	WRWP Park Board IAWC nonprofits	319 funds DNR	0-5

Goal C: Ensure good design reflecting sound ecological practices for new development and redevelopment in the watershed.

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
1. Amend local ordinances to ensure that no large scale developments can occur without the existence of sewer and water utilities or equivalent alternatives.	DMMPC County Comm.	Health Dept. sanitary districts	N/A	0-2
2. Develop an Ordinance amendment requiring all new housing developments in the Prairie Creek Watershed to meet conservation design standards.	DMMPC County Comm.	Health Dept. property owners developers local surveyors	N/A	0-2
3. Establish model plat restrictions that ensure use of sound ecological practices, and require their use on any land in the area that gets platted.	DMMPC	County Comm. Health Dept. BSU	N/A	0-2
4. Encourage private landowners to use the model plat restrictions as deed restrictions to ensure sound ecological practices on individual properties.	DMMPC SWCD	WRWP property owners RTC local surveyors title companies	N/A	ongoing

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
5. Encourage and enforce best management practices for sediment reduction during construction in the watershed.	County Comm. SWCD	WRWP DMMPC Surveyor County Engineer Building Comm.	319 grant stormwater assessment	ongoing
6. Amend or adopt local ordinances to ensure lots of sufficient size to accommodate both the initial OSDS and repair/replacement space and ensure that the OSDS and replacement fields remain uncompromised and usable.	DMMPC	Health Dept. County Comm.	N/A	0-2
7. Protect existing OSDS that are not in failure.				
a. Require all on-site wastewater treatment system repairs to meet new construction standards for on-site wastewater treatment systems.	Health Dept.	OSDS installers	N/A	ongoing
b. Adopt an ordinance that requires all building permits to include an OSDS review by the Health Department.	Health Dept.	County Comm. Building Comm.	N/A	0-2
8. Amend local ordinances to coordinate the requirements/permitting processes for stormwater control when soil types and terrain require perimeter drains for an OSDS.	County Engineer Health Dept.	County Comm. DMMPC Building Comm.	N/A	0-2

Goal D: Promote the full potential of Prairie Creek Reservoir as a community asset with regional appeal.

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
1. Expand promotion of Prairie Creek Park as a visitor destination.	Visitor's Bureau	Park Board City of Muncie Chamber County Comm.	hotel/motel tax EDIT	ongoing

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
2. Develop and enhance wayfinding and marketing devices, including signage, maps, brochures, and websites, to assist people in locating Prairie Creek Reservoir and educating the public about available recreational opportunities.	Visitor's Bureau Park Board	DMMPC City of Muncie County Comm. Chamber	hotel/motel tax EDIT	0-2 and ongoing
3. Promote the development of special events that enhance the community service/amenity value and the attraction destination/economic development potential at Prairie Creek Reservoir.	Park Board Visitor's Bureau	Muncie Civic PC Park Supt. CGI, RTC Minnetrista City of Muncie County Comm. Chamber	User fees Private funds EDIT	0-5 and ongoing
4. Establish fair regulations for campers that encourage attractive short-term use of campsites at Prairie Creek Park.	PC Park Supt. Park Board	Visitor's Bureau City of Muncie	N/A	0-5 and ongoing
5. Capitalize on and promote opportunities for unique overnight accommodations.	Park Board inside park and private outside park	Chamber Visitor's Bureau DMMPC County Comm.	EDIT Grants private funds	5-10
6. Encourage the development of a specialty restaurant located on the east side of the reservoir with view of the Sailing Club.	Private	Park Board IAWC Chamber City of Muncie County Comm.	Private funds	5-10
7. Investigate the feasibility of design standards, overlay districts, planned unit developments, etc. that provide a mechanism to maintain and to capitalize on (from and economic development standpoint) the rural, naturalized character of the Prairie Creek area.	DMMPC BSU	Property owners City of Muncie County Comm. Chamber	N/A	5-10
8. Investigate the feasibility of a conference center/hotel that capitalizes on the natural character of the Prairie Creek area.	private	City of Muncie County Comm. Chamber	private	>10 yrs

Goal E: Provide ample opportunity for recreational use and development of Prairie Creek Park facilities.

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
1. It is recommended that the Prairie Creek part of the Muncie Park Plan should address a site development strategy that maintains a balance whereby the west shore, excepting the ATV course, be devoted to passive recreation in order to preserve the undeveloped character that currently exists there.	Park Board	PC Park Supt. IAWC	N/A	ongoing
2. Develop walking/bicycle trails that encircle Prairie Creek Reservoir.	Park Board	County Engineer CGI IAWC	DNR RTP	0-5
3. Retain and enhance the separate trail system for horseback riders.	Park Board	horse riders club IAWC	private	ongoing
4. Design children's play areas that emphasize learning and connections to the natural environment.	Park Board	Park Committee Schools Minnetrista BSU nonprofits	public and private grants	2-5
5. Provide an access area for non-motorized boats.	Park Board	IAWC PC Park Supt.	N/A	2-5
6. Comply with ADA (Americans with Disabilities Act) standards for a "natural park".	Park Board	PC Park Supt.	N/A	ongoing
7. Promote the establishment of 120' wide vegetated buffers on each side of streams and ditches with permanent flows, and 20'-30' wide on each side of intermittent streams and ditches in order to reduce sediment and nutrient loading to maintain acceptable levels in the reservoir for human recreational use.	WRWP	Surveyor Drainage Board Owners SWCD NRCS	NRCS 319 cost share Ditch Assessment	0-5

Goal F: Increase quality of life for residents of Delaware County and enhance visitor experience by improving accessibility, usability and enjoyment of the reservoir.

Objectives	Recommended "Leaders"	Critical Players/ Participants	Potential Funding Sources	Targeted Time Frame
1. Improve visitor access to Prairie Creek Reservoir.	County Engineer PC Park Supt.	DMMPC Visitor's Bureau Park Board County Comm.	LRS STP	designate in 0-2 and phased improvement over next 10 yrs.
a. Designate a point of entry and gateways for Prairie Creek Park.				
b. Designate route(s) for best access.				
c. Make needed road improvements.				
2. Promote bike and pedestrian use of Prairie Creek Reservoir.				
a. Develop bike and pedestrian trails that encircle the reservoir.	Park Board County Engineer	County Engineer CGI IAWC	DNR RTP	0-5
b. Include bike lanes in the needed improvements to the road structure of the "ring roads".	County Engineer	DMMPC County Comm.	CMAQ RTP STP LRS private funds	phased with trail improvement over next 10 yrs.
c. Install pervious surface parking facilities adjoining bike trails for park and peddle opportunities in the park.	PC Park Supt.	RTC Park Board		
d. Connect trail system to Cardinal Greenway.	PC Park Spt. CGI	Park Board		
3. Use Prairie Creek Reservoir as a focus to educate the public about environmental issues including water quality, compatible development, and wildlife habitat needs.	SWCD Park Committee	Park Board BWQ IAWC environmental groups Minnetrista	319 funds other public and private grants	2-5 and ongoing
4. Encourage the development of educational programs and workshops that would take place at Prairie Creek Park.	Park Committee	Park Board IAWC Muncie Civic Schools Minnetrista	grants and user fees	2-5 and ongoing
5. Promote the use of Prairie Creek Park as an outdoor laboratory for educational purposes.	Park Committee	Schools Park Board IAWC, BSU	grants	2-5 and ongoing

Acronyms:

BSU denotes Ball State University

Building Comm. refers to the Delaware County Building Commissioner

BWQ denotes the Bureau of Water Quality

CGI denotes Cardinal Greenways Incorporated

Chamber refers to the Delaware County Chamber of Commerce

CMAQ denotes Congestion Mitigation and Air Quality

County Comm. refers to the Delaware County Board of Commissioners

DMMPC denotes the Delaware-Muncie Metropolitan Plan Commission

DNR denotes the Indiana Department of Natural Resources

EDI denotes the Economic Development Initiative of the Federal HUD program

EDIT denotes Economic Development Income Tax

EPA denotes the Environmental Protection Agency

Health Dept. refers to the Delaware County Health Department

IAWC denotes the Indiana-American Water Company

IDEM denotes the Indiana Department of Environmental Management

LRS denotes Local Road and Street

MSD denotes the Muncie Sanitary District

Muncie Civic refers to Muncie Civic Theater

N/A denotes activity requires no money or is to be funded through the normal work activities of the participants

NRCS denotes the Natural Resources Conservation Service

OSDS denotes onsite sewage disposal system

PC Park Supt. Denotes the Prairie Creek Park Superintendent

RTC denotes the Red Tail Conservancy

RTP denotes the Recreational Trail Program

STP denotes Surface Transportation Program

Surveyor refers to the Delaware County Surveyor

SWCD denotes the Soil and Water Conservation District

WRWP denotes the White River Watershed Project

Conclusion

The citizens of Muncie and Delaware County enjoy the benefits of Prairie Creek Reservoir and have acknowledged it as one of the important factors contributing to the quality of life in our community. Government plays a vital role in establishing and maintaining good water quality, public parks and protected natural environments. Governments can enact regulations and fund public efforts towards those goals, but cannot achieve them without assistance from nonprofit groups, citizens and business leaders. The success of this plan will depend on the support it receives from a coordinated effort between all stakeholders.

Like any plan this document should be periodically revised. It is intended to be dynamic and changing as future situations and needs may develop. The goals and objectives outlined in this plan aim to protect and enhance the quality of water, park facilities and the natural landscape in the Prairie Creek Reservoir, Park and watershed while providing for human use and enjoyment of those resources. Water quality plays a central role throughout the plan. Good water quality is essential not only for human consumption, but also for the health of the plants and wildlife that make this area their home and for the continued recreational use of the reservoir. At a minimum the current good water quality of the reservoir and watershed should be maintained. Implementing the recommendations made here will accomplish that. Many of those recommendations would also improve water quality conditions throughout Delaware County if the objectives were adopted countywide.

This plan is an outgrowth of the partnership between the Delaware-Muncie Metropolitan Plan Commission and the White River Watershed Project. The White River Watershed Project is funded through a grant and therefore may have an uncertain future. It is important that the initiative began with the Watershed Project be continued in some form. It is therefore recommended that in some future venue a committee of interested and informed persons such as that formed for the guidance of this plan should take advisory and advocacy roles similar to those demonstrated by the White River Watershed Project if that project expires.

Appendices

Water Quality Assessment of the Prairie Creek Reservoir

Prepared and submitted by Jarka Popovicova, Ph.D.

December 2006

Significance of reservoir monitoring

"Every lake is a mirror of its environment" (Stumm, 2004). Lakes and reservoirs provide many valuable services that can be negatively affected by environmental changes (in the atmosphere, watershed, and groundwater) as well as human activities. While change in reservoirs and lakes through time is a natural occurrence, human activities can further accelerate it. If the causes of the changes are known, human-implemented management practices can control, or even reverse, detrimental changes in these water bodies. Consequently, field monitoring has been widely utilized to assess the status of water quality, identify emerging water quality problems, evaluate existing management practices, and to determine the effects of land use on lake and reservoir water quality (EPA, 2006). Monitoring usually results in a modification of land and water management practices within a watershed to improve or maintain quality of water and its intended uses.

In the United States, limited water quality monitoring is performed by the US Environmental Protection Agency (EPA) and the US Geological Survey, while major monitoring efforts are undertaken by states, local agencies, researchers, and volunteers. In the State of Indiana, monitoring of publicly owned lakes and reservoirs is performed and assessed by the Indiana Department of Environmental Management (IDEM) on a five-year rotating basin approach with about 1-2 basins monitored each year (IDEM, 2006). The goal of this state-wide monitoring is to evaluate the suitability of water resources to support its beneficial uses such as aquatic life, water supply, recreation and fishing, and subsequently submit this evaluation in a report to the U.S. EPA (IDEM, 2004). The results of such monitoring showed that nutrients have been the major cause of the pollution of Indiana reservoirs (EPA, 2002). Although nutrients, such as nitrogen and phosphorous, occur naturally in the environment, human activities (e.g., fertilizer use, wastewater discharge) add excessive nutrients into water sources. Persistent nutrient load to a lake or reservoir can result in unwanted growth of algae, algal blooms, overabundance of macrophytes, increased sediment accumulation rates, and eventually to depletion of dissolved oxygen from the water and fish kills (EPA, 2000). Algal growth can lead to reduced water transparency (clarity), increased turbidity, decreased concentration of dissolved oxygen required by aquatic organisms, development of undesirable taste and odor of water when the supply is used for drinking water purposes, and

increased cost of drinking water treatment (Jørgensen et. al 2005). These conditions may result in unsuitability of a lake or reservoir to support its beneficial and intended uses. Therefore, monitoring of a reservoir is essential if a community wants to maintain or improve its water quality and follow up with appropriate management activities to sustain its beneficial uses into the future.

Prairie Creek Reservoir Status

In Delaware County, Indiana, privately-owned Prairie Creek Reservoir serves as a secondary water supply for the City of Muncie by means of water releases into the White River during dry seasons. The reservoir also offers recreational opportunities, such as fishing, camping, swimming, and boating and for these purposes it is leased to the City of Muncie's Department of Parks and Recreation until 2021 to maintain and operate the grounds (Cescon, 1997). The future of development and land management within the reservoir's watershed beyond the year 2021 is unclear.

Several stream tributaries to the reservoir drain adjoining and predominantly agricultural land. The watershed is located in a rural area where agriculture utilizes 73% of its surrounding land while 12% of the land is occupied by green space (WRWP, 2004). The reservoir is situated at the lowest point of the watershed, collecting water from its agricultural drainage ditches and small streams. The reservoir outfall is located on the north side of the reservoir and drains to the White River (Figure 1).

The condition of any reservoir at a particular time is related to the land use within its watershed, climate, geology, human influence, and characteristics of the reservoir itself (Garn, 2003). Because of a predominantly agricultural land use in this watershed, a concern is to prevent negative effects of watershed activities through implementation of appropriate land and water management practices within the watershed and therefore to protect water quality of the reservoir. It is well known that fertilizers (used for agriculture as well as for domestic applications) designed to increase the biological productivity of agricultural soils also increase the biological productivity of waters draining these soils and contribute to lake and reservoir eutrophication (Jørgensen et. al 2005). Eutrophication, defined as increased biological production due to excessive load of nutrients, supports growth of algae and aquatic weeds in the reservoir which causes problems with water use for fisheries, recreation, industry, and drinking (Sharpley et al, 1995).

To maintain this reservoir as a valued feature in this county it is, among other things, necessary to maintain its good water quality. A limited number of studies have addressed biological water quality issues of this reservoir (Haman, 1964, Gathman, 1968, Cescon, 1997) and water quality

of its watershed (Goward, 2004, and WRWP, 2004). However, direct reservoir monitoring to assess its chemical water quality status was not performed. The final White River Watershed Project (WRWP) project report (WRWP, 2004) called for development of land management practices to reduce non-point source pollution within the watershed as well as continuous monitoring of the Prairie Creek Reservoir. In summary, up to 2003, historical information about the reservoir's water quality had been limited which justified the development of a more comprehensive reservoir monitoring study to gain knowledge of its water quality and thus support future land management decisions and uses of the reservoir.

The goal of this study was to assess the current water quality status of the Prairie Creek Reservoir in Delaware County, Indiana, and to initiate a long-term monitoring effort that will hopefully continue into the future. The results of this two-year study provide only a glimpse into the reservoir's water quality issues. Trends in a reservoir's water quality develop over a long period of time (e.g. 8 to 10 years) and thus it is essential that this monitoring effort continues in order to support future management decisions in this watershed.

Methods employed in the Prairie Creek Reservoir field monitoring

Seven reservoir monitoring sites, located in open waters (Figure 1.), were monitored weekly (in 2005) and bi-weekly (in 2006) for the following water quality parameters:

- **pH** – determines acid or basic character of the water. Very low pH, usually below 5, will harm fish and other aquatic organisms. Normal lakes have a pH of 6.5 to 9. Algal growth tends to increase pH, especially during the daytime hours.
- **Dissolved oxygen** in water is necessary to maintain good water quality, support aquatic life (fish, insects, plants) and to maintain good aesthetic quality. Water bodies containing low levels of dissolved oxygen can be fatal to fish and other aquatic species. Additionally, water with depleted oxygen (anoxic conditions) is characteristized by its black color and unpleasant smell. Oxygen concentration in water can be reduced by decomposition of organic matter such as algae, grass clippings, dead plants or animals, animal droppings, and sewage. This organic matter is decomposed by bacteria that use dissolved oxygen to perform this natural process. The more

organic matter available to bacteria, the more dissolved oxygen will be used, leading to its depletion.

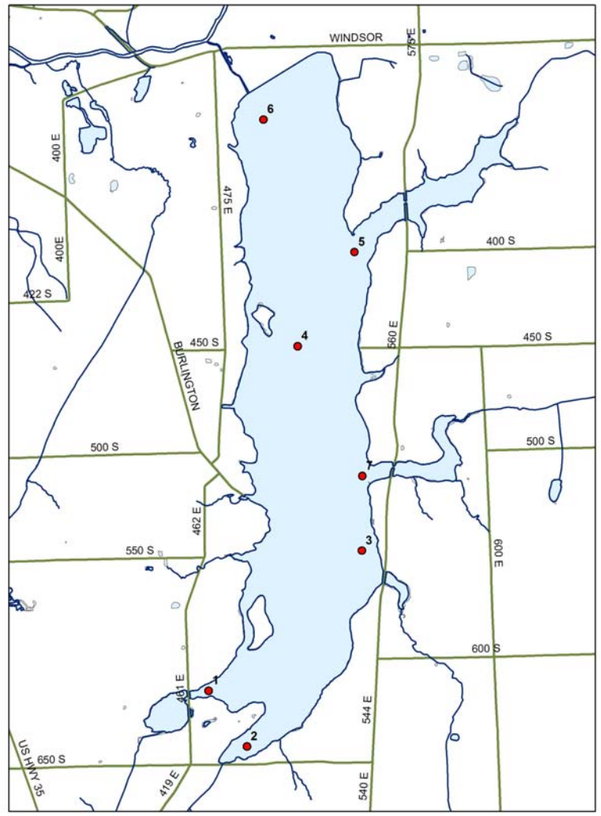


Figure 1. Prairie Creek Reservoir – location of monitoring sites.

- **Water temperature** determines survival of species by affecting concentration of dissolved oxygen in water. Warm water contains less dissolved oxygen. Therefore, warm water

temperatures will support only those fish species that can withstand lower oxygen levels (warm water fish) and eliminate those that cannot (cold water species).

- **Transparency** (clarity) of water is measured by lowering a Secchi disk (a black and white disk) into the water and reading the depth at which this disk is disappears. Visibility or transparency of water can be negatively affected by its color, and/or the presence of algae or suspended solids. In lakes and reservoirs, the measurement of Secchi Disk transparency has been used to determine their biological quality (trophic status) and correlated with the concentration of nutrients and algae. It has been shown that with increased input of nutrients to a lake or a reservoir, Secchi disk transparency decreases as a result of increased algal growth.
- **Nitrates and orthophosphates** are nutrients readily available for algal growth and their excessive input to a lake/reservoir can spurt the growth of algae and eventually lead to the development of green algal mats. When these algae die, bacteria at the bottom of the lake decompose them and use up dissolved oxygen in water. This can cause depletion of dissolved oxygen, development of anoxic conditions, and even fish kills. Therefore, increased input of nutrients from the watershed can negatively affect oxygen concentrations in a reservoir and can also lead to growth of toxic algal species in a water body, negatively impacting human health.
- **Ammonia**, also a nutrient available for assimilation by algae, is produced by decomposition of organic matter, such as decomposition of algae at the bottom of a reservoir. Ammonium hydroxide is toxic to fish and its concentration increases with rising water temperature and pH, which are the conditions of the Prairie Creek reservoir in summer.
- **Chlorophyll *a*** is a measure of algal growth. Any organism that undergoes photosynthesis requires chlorophyll. Increased concentration of Chlorophyll *a* indicates increased algal growth.
- ***E.coli*** is measured to indicate and assess the presence of fecal contamination in water. Fecal waste from animal or human sources carries pathogens that are responsible for gastrointestinal and other waterborne disease. Recreational waters must comply with the state standard of 235 coliform-forming units (CFU)/100 ml to be able to sustain its recreational use and thus protect public health from waterborne diseases.
- **Vertical depth profile** analysis (water quality measurements from the water surface to the bottom of the reservoir) at all seven reservoir locations was performed in 2006. The profile measurements included dissolved oxygen, pH, temperature, and chlorophyll *a* within the entire water column. This measurement is useful in determining thermal regime of the reservoir, changes in pH, and chlorophyll as a function of depth as well as the extent of any anoxic zone

(layer with depleted concentration of dissolved oxygen) throughout the summer season that is a result of nutrient load and algal growth.

Results of the monitoring study

The results of this two-year study provide only a glimpse into Prairie Creek Reservoir's water quality issues. Trends in reservoir water quality develop over a long period of time (e.g. 8 to 10 years) and thus it is essential that this monitoring effort continues in order to support future management decisions at this watershed. Water quality at the Prairie Creek reservoir did not differ significantly between the 2005 and 2006 monitoring period. In addition, the results from seven monitored locations were not significantly different from each other for any measured water quality parameter except transparency. Results are compiled in Table 1.

- ***Water Temperature:*** Average annual temperature of the surface water was 74.1°F (23.4°C) in both 2005 and 2006. Summer (June 15 through September 1) average surface water temperature was 80.7 °F (27.0 °C) in 2005 and 80.0 °F (26.6 °C) in 2006. The maximum temperatures of surface water at all locations were achieved on August 9 in 2005 and on July 17 in 2006. The average bottom water temperature in 2006 (May through November) was also 74.1 °F, with a minimum measured temperature of 49.1°F. In summary, the reservoir is a warm water body – a characteristic which will be reflected in dissolved oxygen concentration and aquatic species selection as well.

In general, reservoirs in temperate regions typically stratify during the summer, meaning that the upper warmer layer with uniform temperature (epilimnion) is separated from the bottom cooler layer (hypolimnion) by a layer where temperature changes significantly (thermocline). This stratification can limit mixing of a reservoir's water and create a hypolimnion with depleted or very low oxygen concentration, especially in the case of a reservoir with high input of nutrients and algal growth (eutrophic reservoirs). This can affect fisheries as some fish species will not be able to survive at low oxygen concentrations.

In the case of Prairie Creek Reservoir, the measurement of temperature profiles at its deepest location (near the release tower, measured at PCR 6) revealed that the reservoir was not completely stratified and it lacked the bottom, cooler layer. Thermal stratification began to establish itself in early June; however, it never reached three distinctive, thermally-stratified layers, as would be expected. On September 21, 2006 the reservoir temperature at its deepest point

Table 1. Statistics: Average, Minimum and Maximum values measured at PCR during 2005 – 2006 monitoring period.

	Study Average†	Summer* 2005 average	Summer* 2006 average	Study Minimum†	Study Maximum†	Number of analyzed samples
Surface Water Temperature (°F)	*74.1*	*80.7*	*80.0*	*52.0*	*86.9*	*247*
Bottom Water Temperature (°F)	*70.2*	*NA*	*74.1*	*49.1*	*80.1*	*115*
Secchi Disk transparency (cm)	*80*	*85*	*77*	*40*	*130*	*240*
Dissolved Oxygen in surface water (mg/L)	*8.8*	*8.0*	*9.3*	*3.1*	*15.2*	*246*
pH (s.u.)	*8.4*	*8.4*	*8.5*	*6.1*	*11.5*	*232*
Chlorophyll a (µg/L)	*8.1*	*11.5*	*4.9*	*2.0*	*26.2*	*141*
Conductivity (µS/cm)	*347*	*339*	*339*	*302*	*563*	*247*
Nitrates-N (mg/L)	*.38*	*0.24*	*0.26*	*ND*	*2.3*	*248*
OrthoPhosphates-P (mg/L)	*.17*	*0.19*	*0.12*	*ND*	*1.48*	*249*
E. Coli (CFU/100 mL)	*18*	*19*	*4*	*0*	*450*	*160*

† *Average is calculated from all data acquired from April 2005 through November 2006; winter data from November through April were not collected*
* *Summer is defined as the period from June 15 through September 1*

was uniform, suggesting a complete mixing of water at that time. This temperature regime also has an effect on concentration of dissolved oxygen within the reservoir profile.

- ***Dissolved oxygen***: Average concentration of dissolved oxygen in surface water was 8.3 mg/L in 2005 and 9.6 mg/L in 2006. This indicates a very good quality of the surface water that is easily achieved by wind mixing, a predominant characteristic of this reservoir. However, monitoring of

the reservoir profile for dissolved oxygen revealed a more serious situation: a significant portion of the depth profile was anoxic (less than 1 mg/L of dissolved oxygen) between June and September 2006 (Figure 2). During the period of anoxic conditions nutrients bound to sediment, such as phosphorous and ammonia, may be released into bottom water and encourage additional algal blooms. In other words, depletion of oxygen, that is a result of increased input of nutrients from external sources and subsequent algal growth in the reservoir, can create a situation within the reservoir where more nutrients are released from the bottom sediment to further exacerbate this situation. These low concentrations of dissolved oxygen and warm temperatures will affect fish communities in this reservoir. In addition to nutrients (such as ammonia and phosphorous), metals (such as iron, managenese) and hydrogen sulfide can also be released from the sediment during anoxic conditions which may cause taste and odor problems and negatively affect fish communities that are repelled by higher concentrations of ammonia. The condition of oxygen levels in the reservoir is a result of watershed activities (input of pollutants from agricultural, rural sources, and wastewater seepage from septic systems) that most likely have been occurring throughout the entire lifetime of this reservoir.

- **Nitrates** are nutrients readily available for consumption by algae. Nitrate concentration was 0.45 mg/L in 2005 and 0.28 mg/L in 2006, respectively. This concentration is well below the current drinking water standard of 10 mg/L and therefore it does not pose any problem to public health or aquatic life. However, nitrate is an algal nutrient and can exacerbate eutrophication that leads to consequences mentioned previously, such as depleted oxygen, fish kills, taste and odor.
- **Ammonia** concentration was measured only in the 2006 monitoring season. The maximum permissible ammonia level allowed in water bodies is provided by the Indiana Administrative Code (IAC, 2000) and is dependent upon pH and temperature. For example, a sample with a pH of 8.5 and temperature of 25 °C should not exceed a concentration level of 0.2137 mg/L. Only the concentrations measured in September 2006 exceeded these allowable limits when the ammonia concentration at the surface was 0.34 mg/L at location 4 (in the center of the reservoir), and 0.24 mg/L near the release tower. This higher concentration was most likely caused by release of ammonia from the sediment during anoxia and then mixing of the entire water volume that began in September. Concentrations of ammonia in the bottom water are expected to be higher due to its production during decomposition of organic matter and depletion of dissolved oxygen.

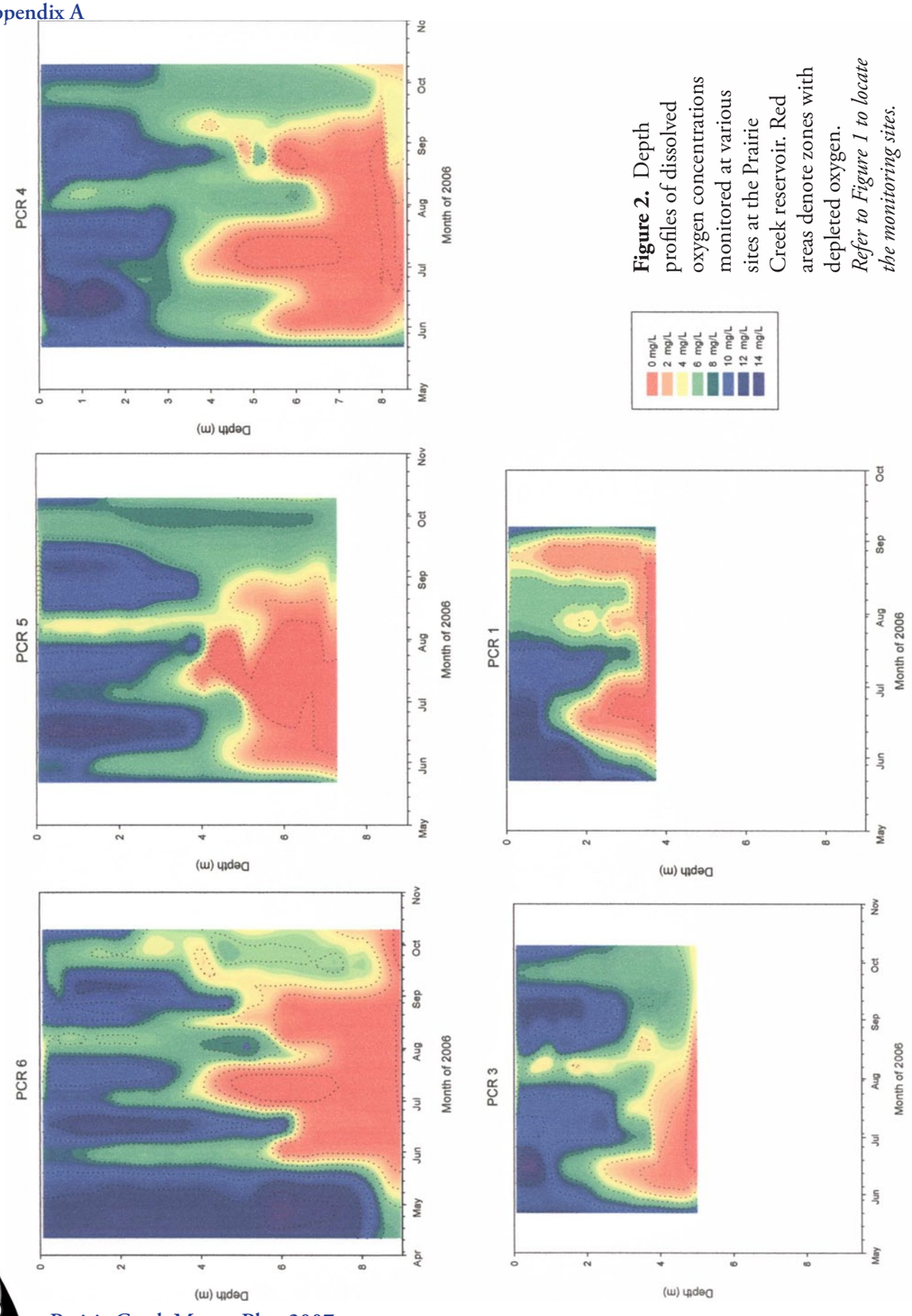


Figure 2. Depth profiles of dissolved oxygen concentrations monitored at various sites at the Prairie Creek reservoir. Red areas denote zones with depleted oxygen. *Refer to Figure 1 to locate the monitoring sites.*

- **Orthophosphates**, a form of phosphorous, are readily available to algae for their growth and high levels of this nutrient can contribute to excessive nutrient loading and eutrophication. There is neither a drinking water nor surface water standard for phosphorus; however, levels as low as 0.005 mg/L have been found to cause eutrophication (Correll, 1998) and EPA recommends the concentration of orthophosphates not to exceed the level of 0.025 mg/L in lakes and reservoirs to prevent eutrophication. At Prairie Creek reservoir the average concentration of orthophosphate was 0.17 mg/L for 2005 and 0.18 mg/L for 2006, significantly higher than the recommended concentration to prevent eutrophication, which is a cause for concern. The recommended level was exceeded in 92.4% of samples. There was no statistical difference found either among the seven study sites or between the two monitoring years.

  Orthophosphate concentration from the bottom waters was analyzed only in 2006. The average concentration of orthophosphates in bottom water was 0.33 mg/L, well above the recommended level. The concentration of orthophosphate is expected to be higher in the bottom waters because it is released from the sediment during anoxic conditions such as those that occurred from June through September (Figure 2) when dissolved oxygen concentration was less than 1 mg/L. Thus, concentration of phosphorous in this reservoir is of concern. Sources of orthophosphate and any other species of phosphorous are fertilizers used in agriculture as well as in urban and rural areas, wastewater seepage from surrounding septic systems, and soil erosion. Since the exact source cannot be identified, it is important to design proper management strategies within the watershed to control input of nutrients into the reservoir.

- **Secchi disk transparency (SD):** Average SD transparency was 0.8 m (2.6 feet) with an average of 0.85 m in summer 2005 and 0.77 m in summer 2006. According to the EPA guidelines for Ecoregion VI that includes Midwestern areas, **the** SD reading should be a minimum 1.36 m (4.46 feet) (EPA 2003). Low transparency at the local reservoir in comparison to the guidelines suggests the eutrophic state of the reservoir meaning that transparency is reduced due to the presence of algae as well as sediment. According to the IDEM, a SD transparency of less than 5 feet is an indicator of eutrophic state (IDEM, 2006).

- The ***E. coli*** standard of 235 colony forming units per 100 mL for a single sample (IAC, 2000) was exceeded only in 3 samples during the two-year monitoring period; a total of 160 samples were analyzed. Because of a large dilution factor that occurs in the reservoir, the monitoring of the levels in open water, however, is not informative. The input of fecal contamination to the reservoir should be monitored at the beach area (currently performed by the Department of

Parks and Recreation) as well as in streams and ditches that drain the watershed and contribute water to the reservoir.

Conclusions

It is said that "Every lake is a mirror of its environment" (Stumm, 2004). This expression is appropriate in the case of Prairie Creek reservoir water quality, which is a mirror of its watershed activities. The reservoir is a warm eutrophic water body, meaning that the nutrient input has been the cause of algal growth and resulted in the current state of water quality: dissolved oxygen depletion within 40-60% of the reservoir depth from June through September, low water clarity, and concentrations of orthophosphates that exceed levels required to prevent eutrophication (increased biological production). Eutrophication at this reservoir has been an ongoing process and will continue into the future unless some measures are taken to manage input of nutrients from its watershed.

While this was the first study of the reservoir's water quality, the results and consequences are not to be taken lightly since it is impossible to predict the future conditions and changes in water quality. Lack of dissolved oxygen throughout 40-60% of water depth measured in 2006 can negatively affect fishing, recreation, and water supply. As uncontrolled input of nutrients to the reservoir continues, algal growth is expected to persist and even worsen, and thus affect the value and benefits of this water resource in the future. Therefore, improved management of current land use practices, wastewater disposal, and properly planned future development is absolutely necessary if the community wants to maintain the benefits of this reservoir. It is important to keep in mind that all pollutants from surrounding land are continuously drained to the reservoir either by stormwater runoff or through stream and ditches and therefore affect its water quality, and current and future uses and enjoyment.

While the reservoir itself can be managed for oxygen depletion and algal growth by various chemical methods, this strategy should be used as a last resort and watershed management upstream from the reservoir should be considered in order to deal with the consequences of eutrophication. These in-reservoir management practices only "medicate and reduce the symptoms" rather than solve the real problems, which lie within the watershed. For example, it is necessary that future development and watershed activities include management strategies that (1) reduce production of pollutants from various sources within the Prairie Creek watershed through mitigation and

improvement of current onsite wastewater treatment and reduction of pollutants input from tile drains; and that (2) retain pollutants upstream from the reservoir to prevent their accumulation in the reservoir.

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You may receive more information about the results of this study by contacting Dr. Jarka Popovicova, Assistant Professor, Ball State University; Phone: 765-741-8757; Email: jpopovicova@bsu.edu.

Sewage Disposal

This table shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

"Septic tank absorption fields" are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

"Sewage lagoons" are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity (Ksat) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a Ksat rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough

to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

USDA Natural Resources Conservation Service

Sewage Disposal

Delaware County, Indiana

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The large the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations.]

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BdlC2:					
Belmore	75	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	0.04	Slope	1.00
BdmA:					
Belmore	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
BdmB2:					
Belmore	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.08
BdsAN:					
Benadum, drained	80	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Organic matter content	1.00
BdsAU:					
Benadum, undrained	85	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Organic matter content	1.00
BltA:					
Blount	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
CdgC3:					
Casca	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	0.37	Slope	1.00
CudA:					
Crosby	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.53
DdxA:					
Digby	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46		
Haney	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46		
EdxA:					
Eldean	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.72		
EdxB2:					
Eldean	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46	Slope	0.32
EdxC2:					
Eldean	75	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46	Slope	1.00
		Slope	0.04		
EdxD2:					
Eldean	75	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Slow water movement	0.46		
EdxE2:					
Eldean	75	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46		

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
FexB2:					
Fox	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46	Slope	1.00
FexC2:					
Fox	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46	Slope	1.00
		Slope	0.04		
GinAH:					
Gessie	50	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46		
Eel	35	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46		
HtbAU:					
Houghton, undrained	75	Very limited		Very limited	
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Subsidence	1.00	Seepage	1.00
		Seepage, bottom layer	1.00		
LneAW:					
Lickcreek	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
LshC3:					
Losantville	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Flooding	1.00
		Slope	0.00	Seepage	1.00
LshD3:					
Losantville	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slope	0.84	Depth to saturated zone	1.00

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MecA:					
Martinsville	80	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
MecB:					
Martinsville	80	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32
MoeB2:					
Miamiam	80	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Slow water movement	1.00	Slope	0.08
MoeC2:					
Miamian	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	0.19
		Slope	0.00		
MorA:					
Milford	75	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
MphA:					
Milford	80	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
MryA:					
Millgrove	80	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46		
MvxA:					
Mountpleasant	80	Very limited		Not limited	
		Seepage, bottom layer	1.00		
		Slow water movement	1.00		

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MvxB2:					
Mountpleasant	80	Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Slope	0.32
		Slow water movement	1.00		
MvxC2:					
Mountpleasant	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
		Slow water movement	1.00		
		Slope	0.04		
MwzAU:					
Muskego, undrained	75	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Subsidence	1.00	Organic matter content	1.00
ObxA:					
Ockley	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46		
PgaA:					
Pella	75	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
ReyA:					
Rensselaer	85	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
RroAH:					
Ross	50	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46		
		Depth to saturated zone	0.43		
Lash	35	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SgmAH:					
Shoals	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.46		
SmsAH:					
Sloan	80	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.72	Seepage	0.53
SnlA:					
Southwest	80	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
SvsE2:					
Strawn	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
Belmore	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
SvsG:					
Strawn	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
Belmore	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
ThrA:					
Treaty	80	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Uam:					
Udorthents	80	Very limited		Not limited	
		Slow water movement	1.00		
		Depth to saturated zone	0.94		
Ucu:					
Udorthents	80	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	0.08
W:					
Water	100	Not rated		Not rated	

This report shows only the major soils in each map unit. Others may exist.

USDA Natural Resources Conservation Service

Tabular Data Version: 4

Tabular Data Version Date: 07/16/2006

Indiana County Endangered, Threatened And Rare Species List

County: Delaware

November 22, 2005

SPECIES NAME	COMMON NAME	STATE	FED	SRANK	GRANK
MOLLUSCA: BIVALVIA (MUSSELS)					
ALASMIDONTA VIRIDIS	SLIPPERSHELL MUSSEL	* *	* *	S2	G4G5
EPIOBLASMA TORULOSA RANGIANA	NORTHERN RIFFLESHELL	SE	LE	S1	G2T2
LAMPSILIS FASCIOLA	WAVY-RAYED LAMPMUSSEL	SSC	* *	S2	G4G5
PLEUROBEMA CLAVA	CLUB SHELL	SE	LE	S1	G2T2
PLEUROBEMA CORDATUM	OHIO PIGTOE	SSC	* *	S2	G3
PTCHOBRANCHUS FASCIOLARIS	KIDNEYSHELL	SSC	* *	S2	G4G5
TOXOLASMA LIVIDUS	PURPLE LILLIPUT	SSC	* *	S2	G2
TOXOLASMA PARVUM	LILLIPUT	* *	* *	S2	G5
VILLOSA FABALIS	RAYED BEAN	SSC	C	S1	G1G2
REPTILES					
CLEMMYS GUTTATA	SPOTTED TURTLE	SE	* *	S2	G5
CLONOPHIS KIRTLANDII	KIRTLAND'S SNAKE	SE	* *	S2	G2
EMYDOIDEA BLANDINGII	BLANDING'S TURTLE	SE	* *	S2	G4
SISTRURUS CATENATUS CATENATUS	EASTERN MASSASAUGA	SE	C	S2	G3G4T3T4
THAMNOPHIS BUTLERI	BUTLER'S GARTER SNAKE	SE	* *	S1	G4
BIRDS					
ARDEA HERODIAS	GREAT BLUE HERON	* *	* *	S4B	G5
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	SE	* *	S2B	G4
LANIUS LUDOVICIANUS	LOGGERHEAD SHRIKE	SE	* *	S3B	G4
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON	SE	* *	S2B	G5
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	SE	* *	S1B	G5
RALLUS ELEGANS	KING RAIL	SE	* *	S1B	G4
MAMMALS					
LYNX RUFUS	BOBCAT	* *	* *	S1	G5
MYOTIS SODALIS	INDIANA BAT OR SOCIAL MYOTIS	LE	LE	S1	G2
TAXIDEA TAXUS	AMERICAN BADGER	* *	* *	S2	G5

VASCULAR PLANT				
CAREX ALOPECOIDEA	FOXTAIL SEDGE	SE	* * S1	G5
GLYCERIA BOREALIS	SMALL FLOATING MANNA-GRASS	SE	* * S1	G5
MATTEUCCIA STRUTHIOPTERIS	OSTRICH FERN	SR	* * S2	G5
SILENE REGIA	ROYAL CATCHFLY	ST	* * S2	G3
TRICHOSTEMA DICHOTOMUM	FORKED BLUECURL	SR	* * S2	G5
TRIFOLIUM STOLONIFERUM	RUNNING BUFFALO CLOVER	SE	LE S1	G3
VALERIANELLA CHENOPODIIFOLIA	GOOSE-FOOT CORN-SALAD	SE	* * S1	G5
WISTERIA MACROSTACHYA	KENTUCKY WISTERIA	SR	* * S2	G5
HIGH QUALITY NATURAL COMMUNITY				
FOREST - FLATWOODS CENTRAL TILL PLAIN	CENTRAL TILL PLAIN FLATWOODS	SG	* * S2	G3

STATE:
SE=state endangered; ST=state threatened; SR=state rare; SSC=state species of special concern; SX=state extirpated; SG=state significant;
WL=watch list; * * no status but rarity warrants concern

FEDERAL:
LE=Endangered; LT=Threatened; C= canidate; PDL= proposed for delisting; * *=not listed

SRANK: State Heritage Rank:
S1= critically imperiled in state; S2= imperiled in state; S3= rare or uncommon in state; G4= widespread and abundant in state but with long term concern; SG= state significant; SH= historical in state; SX= state extirpated; B= breeding status; S?= unranked; SNR= unranked; SNA= nonbreeding status unranked

GRANK: Glogal Heritage Rank:
G1= critically imperiled globally; G2= imperiled globally; G3= rare or uncommon globally; G4= widespread and abundant globally but with long term concern; G5= widespread and adundant globally; G?= unranked; GX= extinct; Q= uncertain rank; T= taxonomic subunit rank

Indiana Natural Heritage Data Center
Division of Nature Preserves
Indiana Department of Natural resources
This data is not the result of comprehensive county survey.

Conservation Practices from NRCS FOTG

Practice	Standard	Notes
Drainage/Water Quantity Mgmt		
Clearing and Snagging	326	
Dike	356	
Diversion	362	
Drainage Water Mgmt	554	
Grade Stabilization Structure	410	
Irrigation Regulating Reservoir	552	
Irrigation Storage Reservoir	436	
Irrigation System Sprinkler	442	
Irrigation System - Micro-irrigation	441	
Irrigation System - Suface and Subsurface	443	
Irrigation Water Conveyance - Pipeline, Aluminum Tubing	430AA	
Irrigation Water Conveyance - Pipeline, High-Pressure, Underground, Plastic	430DD	
Irrigation Water Conveyance - Pipeline, Low-Pressure, Underground, Plastic	430EE	
Irrigation Water Management	449	
Open Channel	582	
Pumping Plant	533	
Spoil Spreading	572	
Spring Development	574	
Structure for Water Control	587	
Subsurface Drain	606	
Subsurface Drainage - Field Ditch	607	
Surface Drainage - Main or Lateral	608	
Underground Outlet	620	
Land Reclamation		
Landslide Treatment	453	
Toxic Discharge Control	455	
Abandoned Mined Land	543	
Currently Mined Land	544	
Land Smoothing	466	
Mine Shaft and Adit Closing	457	
Livestock		
Animal Mortality Facility	316	
Aquaculture Fishponds	397	
Fence	382	

Conservation Practices from NRCS FOTG

Practice	Standard	Notes
Livestock, continued		
Forage Harvest Mgmt	511	
Pasture and Hay Planting	512	
Pipeline	516	
Stream Crossing	578	
Use Exclusion	472	
Nutrient/Pest Mgmt		
Agrichemcial Handling Facility	702	
Nutrient Management	590	
Pesticide Management	595	
Salinity and Sodic Soil Mgmt	610	
Plant Community Management		
Forest Stand Improvement	666	
Forest Trails and Landings	655	
Prescribed Burning	338	
Prescribed Grazing	528	
Tree/shrub Establishment	612	
Tree/shrub Pruning	660	
Recreation		
Recreation Area Improvement	562	
Recreation Land Grading and Shaping	566	
Recreation Trail and Walkway	568	
Soil Conservation (Erosion)		
Conservation Crop Rotation	328	
Contour Buffer Strips	332	
Contour Farming	330	
Cover Crop	340	
Critical Area Planting	342	Set-aside
Cross-wind Trap Strips	589C	
Diversion	362	
Field Border	386	
Grassed Waterway	412	
Heavy Use Area Protection	561	
Mulching	484	
Stripcropping	585	

Conservation Practices from NRCS FOTG

Practice	Standard	Notes
Soil Conservation (Erosion)		
Terrace	600	
Use Exclusion	472	
Surface Water Protection/Mgmt		
Access Road	560	
Constructed wetland	656	
Filter Strip	393	
Fish Pond Management	399	
Grade Stabilization Structure	410	
Lined Waterway or Outlet	468	
Pond	378	
Pond Sealing/Lining, Bentonite Sealant	521C	
Pond Sealing/Lining, Flexible Membrane	521A	
Pond Sealing/Lining, Soil Dispersant	521B	
Riparian Forest Buffer	391	
Riparian Herbaceous Cover	390	
Roof Runoff Structure	558	
Runoff Mgmt System	570	
Sediment Basin	350	
Stream Channel Stabilization	584	
Stream Crossing	578	
Stream Habitat Improvement/Mgmt	395	
Streambank and Shoreline Protection	580	
Use Exclusion	472	
Wastewater Treatment Strip	635	
Water and Sediment Control Basin	638	
Watering Facility	614	
Well Decommissioning	351	
Wetland Creation	658	
Wetland Enhancement	659	
Wetland Restoration	657	
Tillage		
Mulch Till	645	
No Till/Strip Till/Direct Seed	329	
Ridge Till	329C	
Seasonal Residue Mgmt	344	

Conservation Practices from NRCS FOTG

Practice	Standard	Notes
Waste Management		
Closure of Waste Impoundments	360	
Composting Facility	317	
Comprehensive Nutrient Management Planning		
Manure Transfer	634	
Waste Storage Facility	313	
Waste Treatment Lagoon	359	
Waste Utilization	633	
Wastewater Treatment Strip	635	
Wildlife		
Conservation Cover	327	
Conservation Crop Rotation	328	
Cover Crop	340	
Early Successional Habitat Development	647	
Field Border	386	
Forest Stand Improvement	666	
Hedgerow Planting	422	
Restoration and Mgmt of Declining Habitats	643	
Shallow Water Mgmt for Wildlife	646	
Stream Habitat Improvement/Mgmt	395	
Upland Wildlife Habitat Mgmt	645	
Wetland Wildlife Habaitat Mgmt	644	
Wildlife Watering Facility	648	

Note: the following practices were excluded from this list

Cultural Resources Archival Research
Cultural Resources Evaluations
Cultural Resources Identification Surveys
Dry Hydrant
Firebreak
Seed Calculator
Water Well
Windbreak

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

Filter Strip

(Acre)

Code 393

DEFINITION

A strip or area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forest land) and environmentally sensitive areas.

PURPOSES

1. To reduce sediment, particulate organic matter, and sediment adsorbed contaminant loading in runoff.

2. To reduce dissolved contaminant loading in runoff.

3. To reduce sediment, particulate organic matter, and sediment adsorbed contaminant loading in surface irrigation tailwater.

4. To serve as Zone 3 of a Riparian Forest Buffer, Practice Standard 391.

5. To restore, create or enhance herbaceous habitat for wildlife and beneficial insects.

6. To maintain or enhance watershed functions and values.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies (1) in areas situated below cropland, grazing land, or disturbed land (including forest land) (2) where sediment, particulate organic matter and/or dissolved contaminants may leave these areas and are entering environmentally sensitive areas; (3) in areas where permanent vegetative establishment is needed to enhance wildlife and beneficial insects, or maintain or enhance watershed function. This practice applies when planned as part of a conservation management system.

This practice does not apply to areas subject to long duration flooding, typically greater than 45 days during spring or summer. Sites where it is historically difficult to maintain a stand of perennial grasses or legumes due to frequency or timing of flooding should be planned for a riparian buffer.

CRITERIA

<u>General criteria applicable to all purposes</u>

Filter strips shall be designated as vegetated areas to treat runoff and are not part of the adjacent cropland rotation.

Overland flow entering the filter strip shall be primarily sheet flow. Concentrated flow shall be dispersed by grading or shaping to assure sheet flow.

Prevent erosion where filter strips outlet into streams or channels

Do not use the filter strip as a roadway.

Filter strip establishment shall comply with local, state and federal regulations.

<u>Additional criteria to reduce sediment, particulate organic matter, and sediment adsorbed contaminant loading in runoff</u>

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

The minimum flow length for this purpose shall be 20 feet. Flow length may be increased to meet other resource needs.

Filter strip location requirements:

The filter strip shall be located along the downslope edge of a field or disturbed area. The average watershed slope above the filter strip shall be greater than 0.5% but less than 10%.

The average annual sheet and rill erosion rate above the filter strip shall be less than 10 tons per acre per year.

The filter strip shall be established to permanent herbaceous vegetation consisting of a single species or a mixture of grasses, legumes and/or other forbs adapted to the soil, climate, and nutrients, chemicals, and practices used in the current management system.

For herbaceous cover establishment, refer to Table 1 for Purposes 1, 2, and 3 and Table 2 for Purposes 4, 5, and 6.

Additional criteria to reduce dissolved contaminants in runoff

This criteria supplements "Additional criteria to reduce sediment, particulate organic matter, and sediment adsorbed contaminant loading in runoff".

Filter strip flow length required to reduce dissolved contaminants in runoff shall be based on management objectives, contaminants of concern, and the volume of runoff from the filter strip's drainage area compared with the filter strip's area and infiltration capacity.

The flow length determined for this purpose shall be in addition to the flow length determined for reducing sediment, particulate organic matter, and sediment adsorbed contaminant loading in runoff. The minimum flow length for this purpose shall be 30 feet. Flow length may be increased to meet other resource needs.

Additional criteria to serve as Zone 3 of a Riparian Forest Buffer, Practice Standard 391

Except for the location requirements, the criteria given in "Additional criteria to reduce sediment, particulate organic matter, and sediment adsorbed contaminant loading in runoff" also apply to this purpose.

If concentrated flows entering Zone 3 are greater than the filter strip's ability to disperse them, other means of dispersal, such as spreading devices, must be incorporated.

Additional criteria to reduce sediment, particulate organic matter, and sediment adsorbed contaminant loading in surface irrigation tailwater

Filter strip vegetation may be a small grain or other suitable annual with a plant spacing that does not exceed 4 inches.

Filter strips shall be established early enough prior to the irrigation season so that the vegetation can withstand sediment deposition from the first irrigation.

The flow length shall be based on management objectives.

Additional criteria to restore, create, or enhance herbaceous habitat for wildlife and beneficial insects

If this purpose is intended in combination with one or more of the previous purposes, then the minimum criteria for the previous purpose(s) must be met. Additional filter strip flow length devoted to this purpose must be added to the length required for the other purpose(s).

Any addition to the flow length for wildlife or beneficial insects shall be added to the downhill slope of the filter strip. Vegetation to enhance wildlife may be added to that portion of the filter strip devoted to other purposes to the extent they do not detract from its primary functions.

Plant species selected for this purpose should be selected from Table 2 for permanent vegetation adapted to the wildlife or beneficial insect population(s) targeted.

If this is the only purpose, filter strip width and length shall be based on requirements of the targeted wildlife or insects. Density of the vegetative stand established for this purpose shall consider targeted wildlife habitat requirements and encourage plant diversity. Dispersed woody vegetation shall be used to the extent it does not interfere with herbaceous vegetative growth, or operation and maintenance of the filter strip.

The filter strip shall not be mowed during the nesting season of the target wildlife.

Livestock and vehicular traffic in the filter strip shall be excluded during the nesting season of the target species.

Additional criteria to maintain or enhance watershed functions and values

Filter strips shall be strategically located to enhance connectivity of corridors and non-cultivated patches of vegetation within the watershed.

Filter strips shall be strategically located to enhance aesthetics of the watershed.

Plant species selected for this purpose shall be for establishment of permanent vegetation.

SEEDING MIXTURES FOR FILTER STRIPS

Instructions: Select one grass mix according to the purpose and add one legume at the rate indicated or two legumes at half the rate. Forbs can be added if desired for extra wildlife benefits.

Table 1. Seeding Mixtures for Purposes 1 to 3.

Grass Mix	Rate (lbs/PLS*/Ac)	Seeding Dates
Switchgrass [1/] Redtop	8 0.5	Frost Seed [2/] April 15 to June 1
Orchardgrass Low Endophyte Tall Fescue	5 10	March 1 to May 1 August 1 to September 15
Orchardgrass Timothy	8 1	March 1 to May 1 August 1 to September 15
Orchardgrass Redtop	6 2	March 1 to May 1
Tall Fescue	25	March 1 to May 1 August 1 to September 15
Smooth Brome	40	February 1 to May 1 August 1 to September 15

[1/] Use 20 foot cool season grass (CSG) strip on the side with highest contaminant load except where filter strip will be shaded.
[2/] Frost seed by broadcasting switchgrass into thin wheat nurse crop, bean stubble, or disturbed corn stalks. Frost seeding should be completed by February 20th south of US 40 and by March 15th north of US 40 to assure adequate soil heaving for good seed to soil contact.

Legumes	Rate (lbs/PLS*/Ac)	Seeding Dates
Annual Lespedeza[1/]	4	Frost Seed [2/] March 15 to May 1
Red Clover	4	Frost Seed [2/] March 15 to May 1 August 1 to September 1
Alsike Clover	1.5	Frost Seed [2/] March 15 to May 1 August 1 to September 1
Ladino Clover	1	Frost Seed [2/] March 15 to May 1 August 1 to September 1

[1/] South of US 40, can be used with either warm season grasses (WSG's) or CSG's.
[2/] Frost seed by broadcasting legumes into thin wheat nurse crop, bean stubble, or disturbed corn stalks. Frost seeding should be completed by February 20th south of US 40 and by March 15th north of US 40 to assure adequate soil heaving for good seed to soil contact.

Table 2. Seeding Mixtures for Purposes 4 to 6.

Grass Mix	Rate (lbs/PLS*/Ac)	Seeding Dates
Switchgrass	5	Frost Seed [2/] April 15 to June 1
Smooth Brome Timothy	10 1	February 1 to May 1 August 1 to September 15
Switchgrass Redtop	3 0.5	Frost Seed [2/] April 15 to June 1
Orchardgrass Timothy	4 0.5	March 1 to May 1 August 1 to September 15
Orchardgrass Redtop	4 0.5	March 1 to May 1
Orchardgrass Kentucky Bluegrass	4 1	March 1 to May 1 August 1 to September 15
Orchardgrass Virginia Wildrye	4 4	March 1 to May 1 August 1 to September 15
Orchardgrass Timothy Redtop	3 0.5 0.5	March 1 to May 1 August 1 to September 15
Little Bluestem [1/]	6	April 15 to June 1
Little Bluestem [1/] Sideoats Grama	4 1.5	April 15 to June 1

[1/] These seeding mixtures have a flooding tolerance of three days or less.
[2/] Frost seed by broadcasting switchgrass into thin wheat nurse crop, bean stubble, or disturbed corn stalks. Frost seeding should be completed by February 20th south of US 40 and by March 15th north of US 40 to assure adequate soil heaving for good seed to soil contact.

Legumes	Rate (lbs/PLS*/Ac)	Seeding Dates
Annual Lespedeza[1/]	4	Frost Seed [2/] March 15 to May 1
Red Clover	4	Frost Seed [2/] March 15 to May 1 August 1 to September 1
Alsike Clover	1.5	Frost Seed [2/] March 15 to May 1 August 1 to September 1
Ladino Clover	1	Frost Seed [2/] March 15 to May 1 August 1 to September 1
Sweet Clover	4	Frost Seed [2/] March 15 to May 1
Alfalfa	5	March 1 to May 1 August 1 to September 1

[1/] South of US 40, can be used with either WSG's or CSG's.
[2/] Frost seed by broadcasting legumes into thin wheat nurse crop, bean stubble, or disturbed corn stalks. Frost seeding should be completed by February 20th south of US 40 and by March 15th north of US 40 to assure adequate soil heaving for good seed to soil contact.

*To figure percent Pure Live Seed (PLS) rates, multiply the percent purity by the percent germination. Divide the seeding rate by the %PLS to find the bulk seed needed per acre. Example: 98% Purity X 60% Germination = .588 PLS, 10 pounds seed per acre/.588 PLS = 17 pounds of bulk seed per acre.

CONSIDERATIONS

Determine landowner's objectives.

Establish filter strips as a component of an overall conservation management system.

Evaluate the type and quantity of pollutant(s).

Determine soil types and slopes.

Estimate average ground water depth.

Determine noxious weed pressure.

Determine fire hazard and other special needs.

Filtering benefits are generally maximized within a 100-foot flow length.

Filter strips established on slopes less than 5 percent are most effective. Steeper slopes require a greater area and width. Filter strips may lose significant effectiveness on slopes greater than 10 percent.

Filter strips should be strategically located to reduce runoff, and increase infiltration and ground water recharge throughout the watershed.

Filter strips for the single purposes of wildlife/beneficial insect habitat or to enhance watershed function should be strategically located to intercept contaminants thereby enhancing the water quality of the watershed.

To avoid damage to the filter strip consider using vegetation that is somewhat tolerant to herbicides used in the watershed. Check recent herbicide use for possible carryover.

Consider using this practice to enhance the conservation of declining species of wildlife,

including those that are threatened or endangered.

Consider using this practice to protect National Register listed or eligible (significant) archaeological and traditional cultural properties from potential damaging contaminants.

Filter strip size should be adjusted to a greater flow length to accommodate harvest and maintenance equipment.

Preferred seeding method for Purposes 1 - 3: Broadcast the seed after tilling and culti-packing twice. The seed should be packed in with another pass of the culti-packer. A brillion seeder or similar implement would also be acceptable. A drill, no-till or conventional, is acceptable but not preferred. Drills have 5" to 10" of space between the rows. Grass stands thus established may not be as effective in filtering as those established by broadcast methods or with a brillion type seeder.

A warm season grass drill is the preferred method for establishing warm season grasses for any of the purposes. It is designed to seed the light, fluffy warm season grass seed. Broadcasting warm season grasses often results in failure as the seeds may be planted too deep. (Switchgrass is an exception. It may be seeded with conventional equipment or may be broadcast.)

A no-till or conventional drill is an acceptable method of seeding for Purposes 4 - 6.

PLANS AND SPECIFICATIONS

Based on this standard, plans and specifications shall be prepared for each specific field site where a filter strip will be installed. A plan includes information about the location, construction sequence, vegetation establishment, and management and maintenance requirements.

Specifications will include:

1. Length, width, and slope of the filter strip to accomplish the planned purpose (length refers to flow length across the filter strip).
2. Species selection and seeding or sprigging rates to accomplish the planned purpose.
3. Planting dates, care, and handling of the seed to ensure that planted materials have an acceptable rate of survival.
4. A statement that only viable, high quality, and regionally adapted seed will be used.
5. Site preparation sufficient to establish and grow selected species.

OPERATION AND MAINTENANCE

For the purposes of filtering contaminants, permanent filter strip vegetative plantings should be harvested as appropriate to encourage dense growth, maintain an upright growth habit, and remove nutrients and other contaminants that are contained in the plant tissue. Warm season grasses should not be mowed closer than 10 inches and cool season grasses should not be mowed closer than 6 inches.

Control undesired weed species, especially state-listed noxious weeds.

Prescribed burning may be used to manage and maintain the filter strip when an approved burn plan has been developed.

Inspect the filter strip after storm events and repair any gullies that have formed, remove unevenly deposited sediment accumulation that will disrupt sheet flow, re-seed disturbed areas, and take other measures to prevent concentrated flow through the filter strip.

Apply supplemental nutrients only as needed to maintain the desired species composition and stand density of the filter strip.

To maintain or restore the filter strip's function, periodically re-grade the filter strip area when sediment deposition at the filter strip-field interface jeopardizes its function, and then reestablish the filter strip vegetation, if needed. If wildlife habitat is a purpose, destruction of vegetation within the portion of the strip devoted to that purpose should be minimized by re-grading only to the extent needed to remove

sediment and fill concentrated flow areas.

Grazing shall not be permitted in the filter strip unless a controlled grazing system is being implemented. Grazing will be permitted under a controlled grazing system only when soil moisture conditions support livestock traffic without excessive compaction. Warm season grasses should not be grazed closer than 10 inches and cool season grasses should not be grazed closer than 6 inches.

Redistribute organic wastes that accumulate in the filter strip to minimize damage to the vegetation.

S.W.O.T. ANALYSIS OF PRAIRIE CREEK RESERVOIR FROM THE STEERING COMMITTEE MEETING ON 1-30-06

STRENGTHS

1. Greenspace
2. Recreation
3. Public accessibility
4. Good water quality/clean water
5. Park area well maintained
6. Aesthetics
7. Undeveloped areas i.e. still large amounts of wide open spaces
8. Unpolluted by industry and noise
9. Free access (as in no cost)
10. Location/Close proximity to large population i.e. Muncie short travel time
11. Unique community amenity/facility
12. Large water body
13. Good public management/maintenance
14. Family oriented destination
15. Economical recreation
16. Buffered area around the water
17. Wildlife habitats; particularly for endangered wildlife
18. Close to greenway
19. Diverse activities in a small geographic area
20. Agricultural area
21. Lack of commercialization/ overdevelopment
22. Naturalized setting

WEAKNESSES

1. Traffic
2. Potential crime area/illegal dumping
3. Infrastructure
4. Handicap accessibility
5. Canada geese
6. Erosion
7. Pollution/trash
8. Dead fish
9. Campground's appearance
10. Failing Septic on-site disposal systems
11. Not enough amenities i.e. crowded on nice days
12. Uncertain future ownership
13. Off-road area i.e. erosion and noise
14. Motorized (gas) boats
15. Amount/types of recreation i.e. could degrade drinking water quality
16. Under utilized i.e. for education purposes
17. Not well advertised; not enough visibility or marketing
18. Minimal setbacks on some residential development
19. No recreational access on west side
20. Indirect routing to access facility
21. Lack of facility signage and direction signage
22. Inadequate pedestrian facilities
23. Agricultural encroachment
24. Only 1 boat rental place
25. Swimming limitations
26. Trash disposal
27. Run off; pesticides and fertilizers
28. Lack of organization; groups or lake associations

OPPORTUNITIES

1. Educational/Outdoor lab
2. First class natural recreational complex
3. Expand park area/more recreational services
4. BMP laboratory sites
5. Waterfront restoration
6. Residential
7. Commercial
8. Infrastructure
9. Increase Tax Base
10. Tourism/Eco-tourism to improve economic development
11. More developed/better kept trail system; potential for loop hiking trail
12. Enhance natural areas; take weeds out of lake
13. Fish stocking
14. More conservation easements
15. Nature Preserve State Park
16. Non-traditional/innovative residential development
17. Public/Private partnerships in development i.e. PUD's
18. Organic farming and family farming—less corporate farming

THREATS

1. Water pollution/Increased contamination
2. Uncontrolled/unstemmed encroachment from development
3. Dam failure
4. Drought/heat waves
5. Non-renewal of park lease
6. Nuisance/Invasive species
7. Development pressure
8. Potentials for rezones
9. Shore bank erosion
10. Recreation "pressure"
11. Water quality
12. Limited public access/potential loss of access
13. Loss of greenspace/parks
14. Loss of wildlife habitat
15. Increased usage of on-site wastewater disposal
16. Unregulated/unrestricted residential development
17. Neglected property if not publicly maintained/loss of management
18. Commercialization
19. Illegal dumping
20. Uncertain future ownership
21. Lack of regulations and enforcement

PRAIRIE CREEK MASTER PLAN QUESTIONNAIRE

The Delaware-Muncie Metropolitan Plan Commission is working jointly with the Delaware County Soil and Water Conservation District through the White River Watershed Project to create a Master Plan for Preservation and Development for the Prairie Creek Reservoir area. In order to write an effective plan for the area with logical recommendations, we need your help. With the survey responses, we hope to gain a better understanding of how the community feels about the recreational services, water quality, current character and values, and potential for future development in the Prairie Creek Reservoir area. We assure you that your responses to this survey will remain anonymous and will only be used in the planning process for the Prairie Creek Master Plan. Please do not provide any personal information such as your name or address on this form. Postage has been provided so there is no monetary cost to you for completing this survey. Your responses to the survey are greatly valued and appreciated, and we ask that you thoughtfully answer each question to the best of your knowledge. Since your responses are an important part of the planning process, we ask that you please respond to the survey in a timely fashion. We can then begin to compile the results and write the plan.

1. Have you ever visited the Prairie Creek Reservoir?
□ Yes □ No

2. Approximately how many times did you visit the Prairie Creek Reservoir in 2005?
□ 0 □ 6-10 □ 16-20
□ 1-5 □ 11-15 □ More than 20

3. What activities or amenities have you done or used at the Prairie Creek Reservoir? Check all that apply.
□ Fishing □ ATV course □ Playgrounds
□ Picnicking □ Swimming/beach □ Horse trails
□ Campground □ Boating

□ Other (please explain)_____

4. How did you hear about the Prairie Creek Reservoir? Check all that apply.
□ Friends □ Newspaper
□ TV □ Coworkers
□ Online □ Church members

□ Other (please explain) _____

5. What are the strengths of the Prairie Creek Reservoir? Please write answer below.

_____

6. What are the weaknesses of the Prairie Creek Reservoir? Please write answer below.

_____

_____

7. Should the Prairie Creek Reservoir be made more visible throughout the community by advertisements and promotions? Check only one.
□ Yes □ No □ I don't know

8. Do you know what a Watershed is? Check only one.
□ Yes □ No

9. Do you live in the Prairie Creek Watershed? Check only one.
□ Yes □ No □ I don't know

10. The City of Muncie should consider expanding the park services at the Prairie Creek Reservoir. Check only one.
□ I agree □ I disagree □ I don't know

11. What changes would you like to see at the Prairie Creek Reservoir? Please write answer below.

_____

_____

12. What is most worth protecting at the Prairie Creek Reservoir? Please write answer below.

_____

_____

13. The Prairie Creek Reservoir is a positive asset to our community. Check only one.
□ I agree □ I disagree □ I don't know

14. Did you know that the Prairie Creek Reservoir is a backup drinking water source for Muncie? Check only one.
□ Yes □ No

15. What types of recreation do you think should be allowed at the Prairie Creek Reservoir? Check all that apply.

□ Camping □ Sailing □ Fishing
□ Swimming □ Horseback riding □ Off-road vehicles
□ Motor and pontoon boating

□ Other (please explain)_____

16. Water quality in the Prairie Creek Reservoir is important. Check only one.

□ I agree □ I disagree □ I don't know

17. What character or image do you associate with the Prairie Creek Reservoir? Write answer below.

_____

_____

18. Would you like to see the area surrounding the Prairie Creek Reservoir change its character to become any of the following? Check all that apply.

□ More naturalized □ More commercialized
□ Less naturalized □ I don't know
□ More residential □ No change, I like the current character of the area.
□ More agricultural

19. What types of development would you like to see in the Prairie Creek area? Check all that apply.

□ Single family homes □ Housing subdivisions □ Retail stores
□ Apartments □ Industrial □ Other commercial
□ Condominiums □ No development □ I don't know

20. The Prairie Creek Reservoir and surrounding areas should be kept just the way it is now. Check only one.

□ I agree □ I disagree □ I don't know

21. What opportunities would you like to see pursued at the Prairie Creek Reservoir? Write answer below.

_____

_____

22. What threats do you see at the Prairie Creek Reservoir? Write answer below.

_____

_____

23. I would like to see waterfront lots available for sale to home builders along the Prairie Creek Reservoir. Check only one.

□ I agree □ I disagree □ I don't know

24. The City of Muncie should buy the area surrounding the Prairie Creek Reservoir that is currently owned by the Indiana-American Water Company to provide more public open space and/or parks for the community. Check only one.

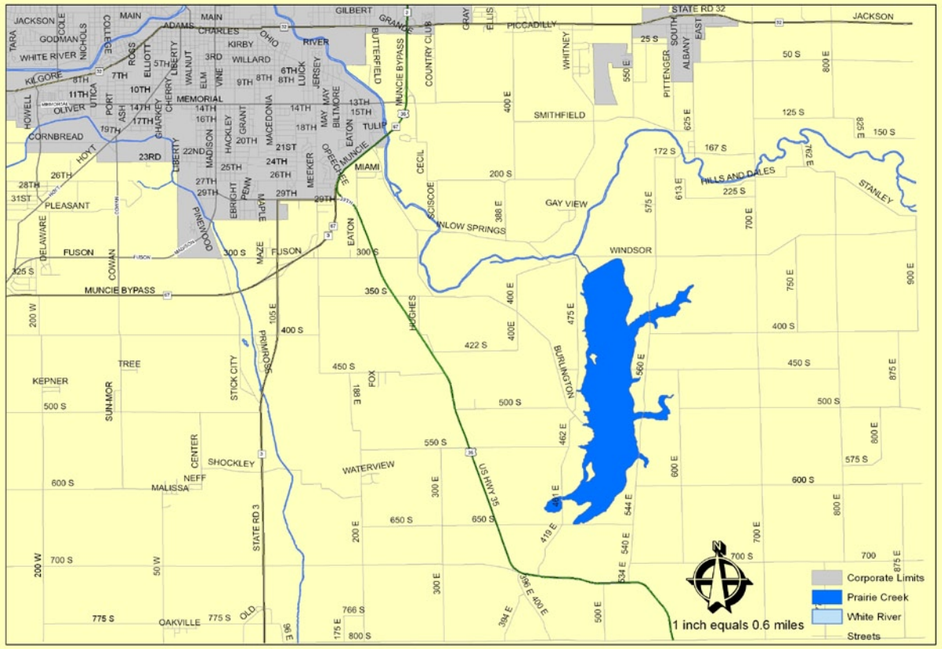
□ I agree □ I disagree □ I don't know

25. Would you attend a public meeting to gain more information, discuss, and provide feedback on the Prairie Creek Master Plan? Check only one.

□ Yes □ No □ I don't know

26. What boundaries would you use to define the Prairie Creek area? Draw on map below.

Propose a Boundary for Prairie Creek Master Plan



Prairie Creek Master Plan Mail-In Survey Results

209 **Total Surveys**

1. Have you ever visited the Prairie Creek Reservoir?

199 □ Yes
8 □ No

2. Approximately how many times did you visit the Prairie Creek Reservoir in 2005?

51 □ 0
88 □ 1-5
25 □ 6-10
14 □ 11-15
8 □ 16-20
22 □ More than 20

3. What activities or amenities have you done or used at the Prairie Creek Reservoir?

118 □ Fishing
126 □ Picnicking
31 □ Campground
6 □ ATV course
85 □ Swimming/beach
118 □ Boating
73 □ Playgrounds
8 □ Horse trails

4. How did you hear about the Prairie Creek Reservoir?

110 □ Friends
5 □ TV
0 □ Online
37 □ Newspaper
23 □ Coworkers
9 □ Church members

7. Should the Prairie Creek Reservoir be made more visible throughout the community by advertisements and promotions?

92 □ Yes
69 □ No
43 □ I don't know

8. Do you know what a Watershed is?

141 □ Yes
63 □ No

9. Do you live in the Prairie Creek Watershed?

19 □ Yes
141 □ No
43 □ I don't know

10. The City of Muncie should consider expanding the park services at the Prairie Creek Reservoir.

105 □ I agree
33 □ I disagree
62 □ I don't know

13. The Prairie Creek Reservoir is a positive asset to our community.

190 □ I agree
3 □ I disagree
13 □ I don't know

14. Did you know that the Prairie Creek Reservoir is a backup drinking water source for Muncie?

175 □ Yes
30 □ No

15. What types of recreation do you think should be allowed at the Prairie Creek Reservoir?

174 □ Camping
192 □ Swimming
177 □ Motor and pontoon boating
175 □ Sailing
158 □ Horseback riding
187 □ Fishing
61 □ Off-road vehicles

16. Water quality in the Prairie Creek Reservoir is important.

197 □ I agree
1 □ I disagree
4 □ I don't know

18. Would you like to see the area surrounding the Prairie Creek Reservoir change its character to become any of the following?

106 □ More naturalized
3 □ Less naturalized
14 □ More residential
25 □ More agricultural
19 □ More commercialized
20 □ I don't know
59 □ No change, I like the current character of the area.

19. What types of development would you like to see in the Prairie Creek area?

25 □ Single family homes
3 □ Apartments
10 □ Condominiums
9 □ Housing subdivisions
3 □ Industrial
131 □ No development
21 □ Retail stores
19 □ Other commercial
22 □ I don't know

20. The Prairie Creek Reservoir and surrounding areas should be kept just the way it is now.

113 □ I agree
50 □ I disagree
29 □ I don't know

23. I would like to see waterfront lots available for sale to home builders along the Prairie Creek Reservoir.

18 □ I agree
165 □ I disagree
24 □ I don't know

24. The City of Muncie should buy the area surrounding the Prairie Creek Reservoir that is currently owned by the Indiana-American Water Company to provide more public open space and/or parks for the community.

122 □ I agree
46 □ I disagree
33 □ I don't know

25. Would you attend a public meeting to gain more information, discuss, and provide feedback on the Prairie Creek Master Plan?

98 □ Yes
37 □ No
69 □ I don't know

OPEN ENDED QUESTION RESULTS FROM THE MAIL-IN PUBLIC SURVEY

Question #5: What are the strengths of PCR?

- Proximity to Muncie
- Green space
- Water quality
- Decent fishing
- Public access/open to public
- Sailboat club
- Wildlife area/habitat
- Water supply
- Camping
- Boating
- Clean facilities
- Variety of recreational activities
- Size
- New rules limiting long-term camping
- Beach area
- Beautiful surroundings
- Waterfowl
- Family atmosphere
- Boat launch
- Yacht club
- Well maintained
- Peacefulness
- Flood control
- Community gathering area
- Not too crowded
- Picnic areas
- Lifeguards
- Only water body in area for family recreation
- Minimal housing on the property
- Friendly Staff
- Place outside of City to get back to nature
- Family friendly music selection
- Cost effective
- Docks well maintained
- No wave runners/ jet skis allowed

Question #6: What are the weaknesses of PCR?

- Accessibility
- Weedy
- Poor foot access
- Lease is about to expire
- Trailer campers
- Invasive species
- Too many carp
- Overcrowded in some areas
- Needs better advertisement/PR
- Launching & boat ramps inadequate
- Too much shoreline tied up in pier rentals
- Septic system issues
- Nutrient loading
- Bacteria in water
- Too many people go to party/drunk people/drugs
- Beach is dirty
- Campground looks trashy
- More enforcement/better patrols/better security
- Bathroom/showers need updated
- Not enough commercial development to encourage tourism
- Year round campers
- Trash
- Limited electric camping sites
- Not enough mowed areas on west side
- Too many pontoons take away shoreline
- Fights in campground
- Outdated equipment
- Tax drain
- Too small for many boats
- No water skiing allowed
- Geese/ducks
- Poor fishing/poorly stocked
- Water unclean
- Bank fishing areas limited
- Yacht club
- Horse club
- Model boat club
- Not deep enough
- Speed limit too low
- Signage
- Too many houses/businesses
- Hard for out of town people to find
- Dock rental/campground rental procedure (political)
- Not enough restaurants or bait houses
- No temporary docking
- Poor lighting at boat ramp
- Too much control by government

- Waterfowl hunting not allowed
- No walking/biking trails
- No paddle boat/canoe rentals
- No sewage disposal for camping
- Underdeveloped
- Not enough camping sites
- Not enough piers
- Have to pay at beach
- Parking
- Not enough watercraft speed enforcement
- Not enough room for tent campers
- Run down facilities
- Red neck people
- Traffic around reservoir makes it dangerous for biking/running
- Bad roads (potholes)

Question #11: What changes would you like to see at PCR?

- Time limit on camping
- Foot access all around the lake
- Muncie purchase lake from IAW
- Keep West side more natural
- Keep development on East side
- Less trash
- Less nutrient loading
- Increase game fish population
- Improve water clarity
- Better boat ramps
- Habitat enhancement
- Easier access for dog running area
- Larger boat launching area
- More primitive camping areas
- More law enforcement
- Newer/bigger playground
- Stop speed boats
- Encourage private investors
- New bathrooms
- Roller or ice rink
- Community planned activities i.e. fairs, craft shows, etc.
- More electric camp sites
- Make it for profit- stop using tax money
- Expand it
- More water sports allowed i.e. skiing
- More areas for speed boats
- Expand beach area
- One dock per person
- Add more boat docks
- More camping sites on both sides
- More picnic shelters
- More areas open to bank fishing
- Turn it into state park
- Keep drugs/alcohol out of area
- More picnic tables
- Better signage
- Lake view restaurant
- Bike trails
- Fish cleaning station
- Rental cabins
- More tourism businesses close to PCR
- Clean lake out; get rid of growths
- More bait houses
- Extension of City sanitary sewer lines
- Affordable boat/paddle boat rental
- Press for better upkeep of personal docked vessels
- Allowed to fly American flag
- More ATV courses
- More horse trails
- Water park
- Waterfowl hunting allowed
- Paved roads on West side
- Gift shop
- No more piers installed
- Mountain bike trails
- Sports facilities i.e. baseball diamond, soccer fields
- Frequent visitor program
- Smoke free store
- Publicize proximity of PCR to Greenway
- Allow free days at beach for low income residents
- More park workers
- More watercraft speed limit enforcement
- Roadways leading to shoreline/banks for fishing
- Attractions for motorcycle enthusiasts

Question #12: What is most worth protecting at PCR?

- Open space/ green space
- Recreational opportunities
- Safety of users
- Family atmosphere
- Keep area surrounding PCR the same as it is now
- Water quality

- Wildlife
- Undeveloped riparian
- City park
- Red tail nature preserve
- Public access
- Lack of excess housing around PCR
- Wooded areas
- Natural beauty
- Rural atmosphere
- Campground
- Playground
- Swim area
- ATV courses
- Horseback riding trails
- The American flag
- Wildlife habitat
- Fishing
- Water supply
- Watershed
- Wetlands
- The land- no development

Question #17: What character or image do you associate with PCR?

- Relaxed atmosphere
- Boating
- Fishing
- Ron Bonham
- Sailboat
- A heron
- Teeter Totter
- Water
- White trash
- Family fun
- Ducks
- Community recreation area
- State attraction
- Laying in the sun
- Beach
- Serene & quiet
- Drain on tax payers
- Middle-upper class recreation
- Tourist environment
- Children
- Fun in the sun
- Water sports
- Focuses on those with money i.e. dock rental
- Run down/ poor maintenance
- Nature
- Unattractive
- Party central
- Too small to support large crowds
- A former boondoggle
- Getaway place
- Smokey bear
- Muncie endurathon
- Hillbilly
- Trashy campground
- Low income campers
- Anti-hunter
- Campfires
- Fireworks
- Carp
- Hangout for rough people
- Deer drinking from the Reservoir
- Hawk flying in the distance
- Low life people

Question #21: What opportunities would you like to see pursued at PCR?

- Improve quality of fishing
- More recreational activities
- Hiking trails
- Pedestrian access
- Bird watching areas
- Surrounding areas returned to a naturalized state
- Fishing tournaments
- Reduction in pier rentals
- Increase in boating activities
- Educational/nature programs
- Biking trails
- Sailing regattas
- More little shops/retail
- Petting zoo
- More picnic areas
- No motorized off-road vehicles
- Marina on water with gas pumps
- Better swimming facility
- Baseball diamond
- A pay as you go system that ensures a fair return to the city coffers
- Make the lake larger
- Naturalize the banks
- Tourist retail stores
- Day camps for kids
- More boat docks

- Less fishing restrictions
- Lower camping rates
- Supply store/general store
- More activities for elderly population/handicapped
- More jobs
- Rental cabins
- Affordable horse back riding
- Game room
- Water skiing
- More family facilities
- Environmental protection
- State park
- No commercial development
- Summer work for high school or college kids
- More public camping sites
- Water park
- Bike rentals
- Mow more places to bank fish
- Waterfowl hunting area
- More public piers
- Wildlife preserve
- Stock with game fish
- More up keep/maintenance
- Dog running or hunting tournaments
- Hotel
- Newer playground equipment
- Ice skating
- Concert pavilion
- Lottery for dock rentals
- Houseboat rentals
- Measures put in place to protect PCR's environment
- A building for community groups to gather at
- Only low-impact recreation

Question #22: What threats do you see at PCR?

- Residential development
- Trailer campers
- Commercial development
- Introduction of invasive species
- Pollution
- Lack of suitable funds for maintenance
- Increasing real estate values
- Agricultural runoff
- Limited public access
- Congestion
- Drunks
- Firearms
- Fights
- Off-road vehicles
- Unappealing campground
- Littering
- More taxes for good old boys
- Golf carts
- Lack of informed community members
- Lack of quality fish
- Poor water quality
- Sewage
- Decline in family atmosphere/family use
- Overuse by campers
- Drug use
- Poor safety
- Losing land to private landowners
- Overuse by boats
- Redneckification
- Politics of PCR
- Vandalism
- Not enough advertisement
- Septic systems
- Lakeside homes
- The mayor
- High speed boating
- Anti-hunter/PETA
- Too many geese/droppings
- Crime
- Trash dumping
- Becoming overpopulated
- Too many boating accidents
- Lack of a development plan

Prairie Creek Master Plan Online Survey Results

92 **Total Surveys**

1. Are you a current resident of Delaware County, Indiana?

76 □ Yes	16 □ No

2. Have you ever visited the Prairie Creek Reservoir?

91 □ Yes	1 □ No

3. Approximately how many times did you visit the Prairie Creek Reservoir in 2005?

23 □ 0	6 □ 6-10	11 □ 16-20
17 □ 1-5	7 □ 11-15	28 □ More than 20

4. What activities or amenities have you done or used at the Prairie Creek Reservoir?

13 □ Fishing	3 □ ATV course	9 □ Playgrounds
17 □ Picnicking	11 □ Swimming/beach	4 □ Horse trails
5 □ Campground	23 □ Boating	7 □ Other

5. How did you hear about the Prairie Creek Reservoir? Check all that apply.

52 □ Friends	3 □ Online	9 □ Coworkers
1 □ TV	10 □ Newspaper	3 □ Church members
		40 □ Other

6. What are the strengths of the Prairie Creek Reservoir?

(Last five responses)

* Limited motor boat speeds. Close to the Greenway trail. Natural shoreline except for the numerous pontoons on east side.
* Nice quiet sailing and fishing lake that is very pretty. The grounds are beautifully maintained
* Sailboat club.
* Natural shore line. Clean water. Well maintained park. Sailing club.
* Close place to go fishing.

7. What are the weaknesses of the Prairie Creek Reservoir?

(Last five responses)

* No facilities on the West side.
* Camp ground is an eye sore.
* Campground, the way piers for pontoons are transferred.

* Over crowded campground. Too many pontoon boats. Pontoon boat docks. 10 mph speed limit no longer enforced.
* No skiing.

8. Should the Prairie Creek Reservoir be made more visible throughout the community by advertisements and promotions?

41 □ Yes	29 □ No	22 □ I don't know

9. Do you know what a Watershed is?

80 □ Yes	12 □ No

10. Do you live in the Prairie Creek Watershed?

13 □ Yes	62 □ No	17 □ I don't know

11. The City of Muncie should consider expanding the park services at the Prairie Creek Reservoir.

66 □ I agree	16 □ I disagree	10 □ I don't know

12. What changes would you like to see at the Prairie Creek Reservoir?

(Last five responses)

* Need more restrroms away from beach and campground. Continue to review and enforce
* Add some picnic areas on the west side with facilities. Continue to limit motor boat speeds.
* Don't allow big boats.
* Cycling trails
* Reduce number of pontoon boat docks, either by creating a pontoon marina or by offering to rent pontoon boats. Eliminate high speed boats, no skiing or tubing. Eliminate off road tracks. That can be anywhere. Turn off road area into a quailty camping area with good security.

13. What is most worth protecting at the Prairie Creek Reservoir?

(Last five responses)

* Shore line water Quailty. Don't permit Buildings any closer that now is permitted.
* The natural look of the shoreline.
* Don't allow houses to be built around lake.
* Water
* Natural shore line. Separate long term camping from short term. Offer a higher quailty short term camping area (more space per camp site, better security.)

14. The Prairie Creek Reservoir is a positive asset to our community.

88 □ I agree 3 □ I disagree 1 □ I don't know

15. Did you know that the Prairie Creek Reservoir is a backup drinking water source for Muncie?

86 □ Yes 6 □ No

16. What types of recreation do you think should be allowed at the Prairie Creek Reservoir?

(Last five responses)

14 □ Camping
16 □ Swimming
15 □ Fishing
12 □ Motor and pontoon boating
15 □ Sailing
13 □ Horseback riding
5 □ Off-road vehicles
2 □ Other

17. Water quality in the Prairie Creek Reservoir is important.

92 □ I agree 0 □ I disagree 0 □ I don't know

18. What character or image do you associate with the Prairie Creek Reservoir?

(Last five responses)

* Water, Wind, Relaxation, Sunshine, Fellowship, Fun, Activity.
* A place to get away from the stress of everyday life.
* Quiet lake that is affordable to everyone.
* Redneck
* A place of natural beauty, with camping, sailing, fishing and swimming.

19. Would you like to see the area surrounding the Prairie Creek Reservoir change its character to become any of the following?

65 □ More naturalized
0 □ Less naturalized
4 □ More residential
3 □ More agricultural
6 □ More commercialized
2 □ I don't know
29 □ No change, I like the current character of the area.

20. What types of development would you like to see in the Prairie Creek area?

9 □ Single family homes
3 □ Apartments
6 □ Condominiums
3 □ Housing subdivisions
0 □ Industrial
71 □ No development
9 □ Retail stores
5 □ Other commercial
9 □ I don't know

21. The Prairie Creek Reservoir and surrounding areas should be kept just the way it is now.

51 □ I agree 29 □ I disagree 12 □ I don't know

22. What opportunities would you like to see pursued at the Prairie Creek Reservoir?

(Last five responses)

* Bicycle friendly roads or trails around the reservoir
* Hiking Trails
* Redneck dunk tank
* Recreational Trails
* Trail Connection.

23. What threats do you see at the Prairie Creek Reservoir?

(Last five responses)

* Development
* Development
* Developers
* Rednecks
* Nearby Residential development without proper septic system.

24. I would like to see waterfront lots available for sale to home builders along the Prairie Creek Reservoir.

7 □ I agree 83 □ I disagree 2 □ I don't know

25. The City of Muncie should buy the area surrounding the Prairie Creek Reservoir that is currently owned by the Indiana-American Water Company to provide more public open space and/or parks for the community.

64 □ I agree 9 □ I disagree 19 □ I don't know

26. Would you attend a public meeting to gain more information, discuss, and provide feedback on the Prairie Creek Master Plan?

79 □ Yes 4 □ No 9 □ I don't know

Public Meeting

Sign In

July 25th, 2006

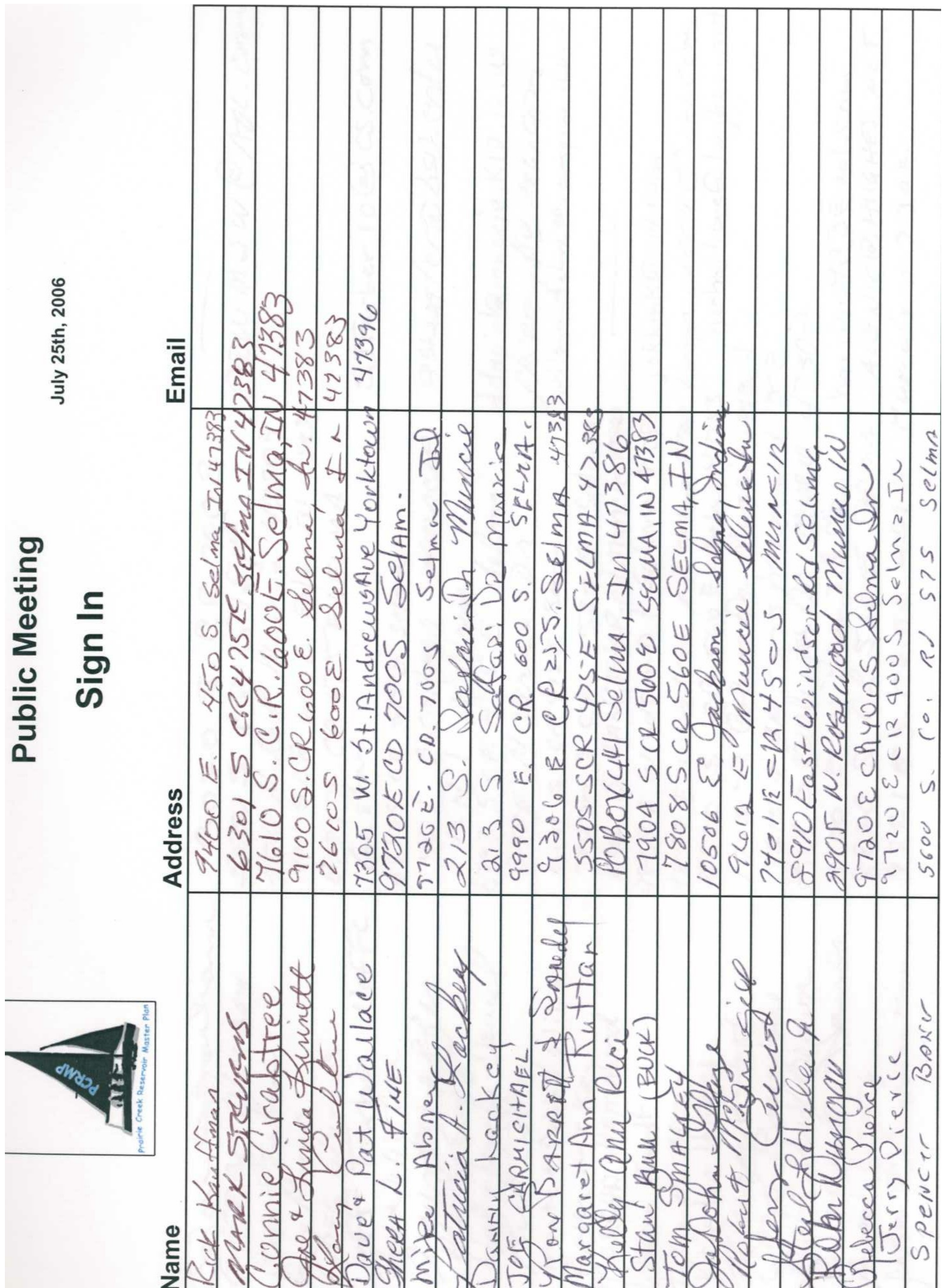
Name	Address	Email
G.R. JOE PROKOS	8111 S. BURLINGTON DR	—
Walker Jarman	3501 S Bell CR 5 Yorktown	
Steve Good	3119 Challenger Muncie	
MARK Hoyt	1712 N. COLSON DR. MUNCIE	
John Logan		Locologan1870@yahoo.com
Susan Malone		
Mr & Mrs Robert Robertson	6553 E Nichols Rd	Muncie
John Logan	PO Box 3274 Muncie 47307	John logan 03@ Yahoo.
Dave Adams	Same " " "	
JEROME B MARLATT	401 N. SYCAMORE, HAGERSTOWN	47346
JANE E MARLATT	401 N. SYCAMORE-HAGERSTOWN, IN	47346
Kent W Bullis	8420 S Co Rd 560 East Selma	kent.bullis@prodigy.net
BOB TAYLOR	12441 W CR 300 S PARKER	
Eileen Oren-Taylor	12441 W CR 300 S PARKER	
STONEY & CASEY BURKE	10901 E CR 700 S SELMA	SDODGERMAN3600@AOL.com
Jim BURGESS	6616 W. Alma Ct Yorktown	
JENNY BURGESS	" "	
Mike Elmy	5110 S CR. 575 EAST	
Connie Ammett	7305 E. C.R. 550 So.	cammett@msn.com
CHARLES McPHERSON	7001 S CR 475 E	
Jim LAMBERT	3915 N. CR 650 E.	
Phill Wills	4404 S. C.R. 575 E Selma	INDIANA_TRUE_BLUE@YAHOO.C
Robert D. White	16144 Grade Dr.	Indpls, IN 46060
James Burn	5501 S CR 475 E Selma	

Public Meeting

Sign In

July 25th, 2006

Name	Address	Email
BILL+LINDA MICHEL	8000 CR 560 E Selma	Bmic370995 AT MW.NET
Jim Reagan	4605 S CR 575 E Selma, IN	—
Anne Reagan	4605 S CR 575 E Selma, IN	reaganstabl@aol.com
Rick Compton Sr	6004 E Rick Rd Muncie	
David Brannon	11900 E. CR 500S.	David@PennvilleCabinetry.com
Carolyn & Darrel Hughes	4515 S. C.R. 700 E Selma, 47383	
Barry Burton	959 W CR 500S Muncie 47302	redtail@tmcsmail.co
Mr. & Mrs. Jack Poor	8300 S. Burlington	A1961BEARCAT@aol.com
Jim & Karen Vincent	6909 S CR 475 E Selma 47383	kmvincent715@cove.com
Doug McKeighen	8101 Scr 475 East Muncie 47302	
DARRIN MURRELL	3300 N CR 800 E, PARKER CITY 47368	MUNCIECIVIC@AOL.COM
Nancy Wilkins	6505 S CR 475 E Selma 47383	nwilkins@muncie.k12.in.us
Patricia Cooper	9225 E CR 600S Selma 47383	
REX COOPER	9225 E. CR. 600S Selma 47383	SCORPION1@ATT.NET
DAVE SIMMONS	6504 S CR 560 E. Selma	SIMRE1515@ICOUST.NET
Mark Harper	3501 S CR 575 E Selma	oakwoodretreatcenter@webstop.co
Ted Blodgett	3501 S CR 575 E. Selma	tcblod@pngusa.net
MARGARET CANTRELL	3810 S BURLINGTON MUNCIE	—
CHARLES CANTRELL	" " " "	—
LARRY BLENSOE	11201 S. CR. 700E Selma 47383	
RANDY NUCKOLS	9435 E 400 S Selma 47383	NUCKIE@ATT.NET
Tim & Cindy OSBORN	5021 S 475 E Selma 47382	TOSBORN7@HOTMAIL.COM
Rick Miller	7112 Waldemar Dr. Indianapolis, IN 46268	rmiller@grwinc.com
Doug Spence	2220 S Fuson Rd Muncie IN	

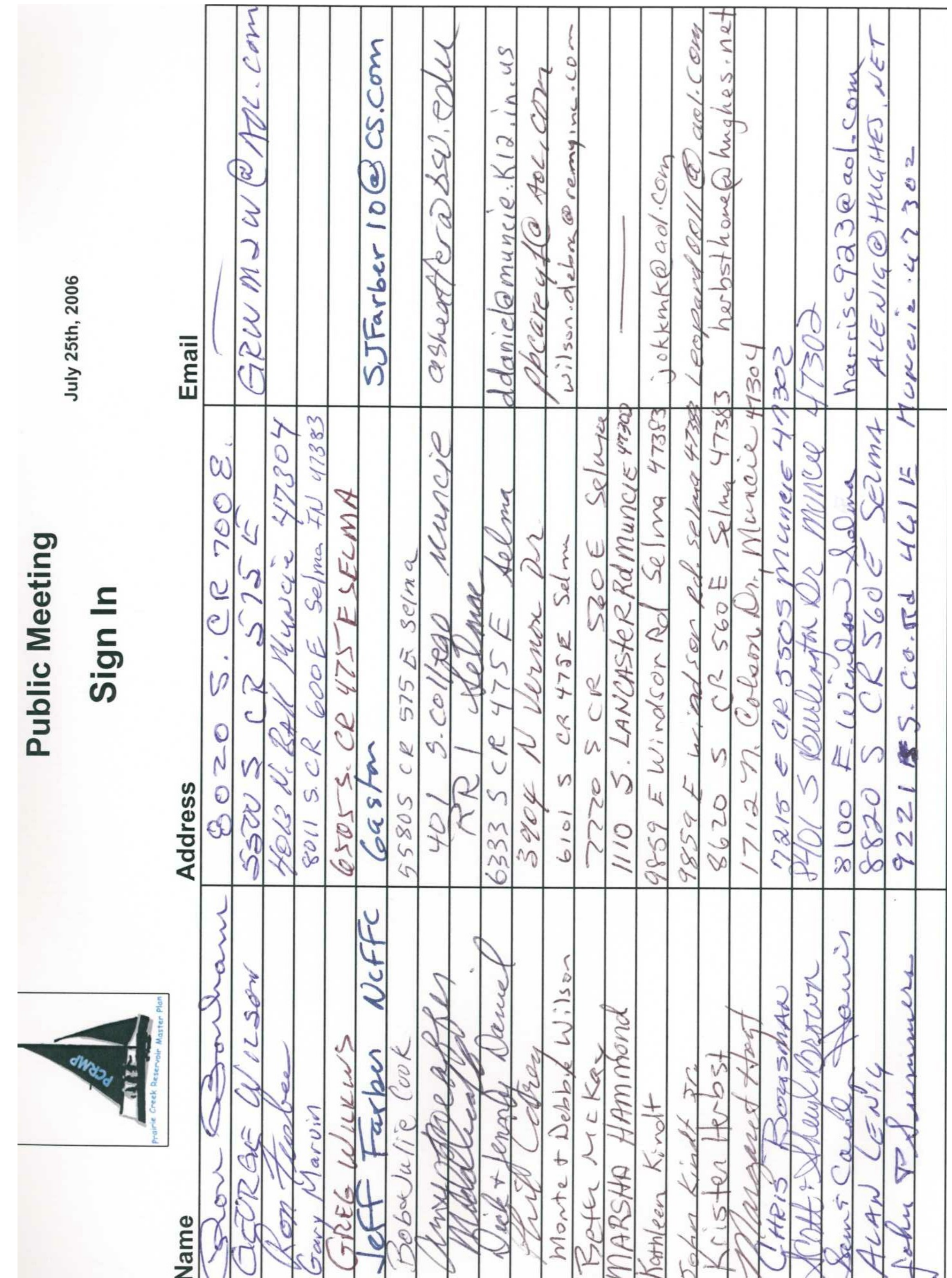


Public Meeting

Sign In

July 25th, 2006

Name	Address	Email
Rick Kauffman	9400 E. 450 S. Selma IN 47383	
Mark Stevens	6301 S CR 775E Selma IN 47383	
Connie Crabtree	7610 S. C.R. 600 E. Selma, IN 47383	
Joe & Linda Emmott	9100 S. CR 600 E Selma, In. 47383	
[illegible]	7610 S 600 E Selma IN 47383	
Dave & Pat Wallace	7305 W. St. Andrews Ave Yorktown 47396	
Sheila L. Fine	9790 E CD 700 S Selma	
Mike Abner	5926 E. CD. 700 S Selma IN	
Patricia A. Rockey	213 S. Sagamore Dr. Muncie	
Donald Rockey	213 S. Sagamore Dr. Muncie	
Joe Carmichael	9990 E. CR. 600 S. Selma	
Ron Barrett & Sandy	9306 E CR 25 S. Selma 47383	
Margaret Ann Rutter	5505 S CR 475E Selma 47383	
[illegible] Rice	PO Box 44 Selma, IN 47383	
Stan Burk (Buck)	7904 S CR 560E Selma, IN 47383	
Tom Smalley	7808 S CR 560E Selma, IN	
[illegible]	10506 E Jackson Selma Indiana	
[illegible]	9619 E Muncie [illegible]	
[illegible]	7401 E CR 450 S Muncie	
[illegible]	5910 East Windsor Rd Selma	
[illegible]	2905 N. Rosewood Muncie IN	
Rebecca Pierce	9720 E CR 900 S Selma IN	
Jerry Pierce	9720 E CR 900 S Selma IN	
Spencer Baker	5600 S. Co. Rd 575 Selma	



Public Meeting

Sign In

July 25th, 2006

Name	Address	Email
Don Gorham	8020 S. CR 700 E.	
George Wilson	5500 S CR 575 E	GRWMJW@AOL.com
[illegible]	4613 N. [illegible] Muncie 47304	
Gary Marvin	8011 S CR 600 E Selma IN 47383	
Greg Wilkins	6505 S. CR 475 E Selma	
Jeff Farber NCFFC	Gaston	SJFarber10@CS.com
Bob & Julie Cook	5580 S CR 575 E Selma	
[illegible]	401 S. College Muncie	asheaffer@bsu.edu
[illegible]	RR1 Selma	
Dick & Jenny Daniel	6333 S CR 475 E Selma	ddaniel@muncie.k12.in.us
[illegible]	3904 N Vernon Dr	pbcarey4@aol.com
Monte & Debbie Wilson	6101 S CR 475E Selma	wilson.debra@remyinc.com
Beth McKay	7720 S CR 520 E Selma	
Marsha Hammond	1110 S. Lancaster Rd Muncie 47302	
Kathleen Kindt	9859 E Windsor Rd Selma 47383	jokkmk@aol.com
John Kindt Jr.	9859 E Windsor Rd Selma 47383	leopard6011@aol.com
Kristen Herbst	8620 S CR 560 E Selma 47383	herbsthome@hughes.net
[illegible]	1712 N. Colson Dr. Muncie 47304	
Chris Bowsman	7215 E CR 550S Muncie 47302	
[illegible]	3401 S Burlington Dr Muncie 47302	
[illegible]	8100 E. Windsor Selma	harrisc923@aol.com
Alan Lenig	8820 S CR 560 E Selma	ALENIG@HUGHES.NET
[illegible]	9221 S. Co. Rd. 461 E Muncie 47302	

Public Meeting

Sign In

July 25th, 2006

Name	Address	Email
Bill & Penny Cahoe	6091 S. C.R 475 47383	pcahoe@bsu.edu
Paula McKinney	7770 S CR 560E "	PJMCKINW@AOL.com
Tom + Anne Priestly	8080 S. Burlington 47302	
The Knight of WANDS	Del Co.	
Thomas & Wendy Tully	8080 S. County Road 475 E	
Joshua S. Williams	311 S Hacker St. Muncie 47305	dcenviron@localhealth.in.gov
Sharon & Rudy Rivera	8851 E CR 650S Selma	Skyy1806@netzero.net
Richard Chamness Jr	11910 S. US Highway 35 Losantville 47354	srrichards@aol.com

PUBLIC COMMENT FORM
RESULTS FROM THE PUBLIC MEETING JULY 25TH, 2006

Blue numbers are the raw data of respondents.
Orange numbers are the response percentages.

Recommendations of the Economic Development Focus Group

1) The reservoir and park represent a regional destination attraction and that is the principle economic reality.

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Respondents	17	43	9	11	2
Percentage	21%	52%	11%	13%	2%

2) The area inside the ring road should remain mostly as is. Rezoning as recreational and conservation may be appropriate.

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Respondents	45	29	0	6	3
Percentage	54%	35%	0%	7%	4%

3) There should be more marketing of the park and existing facilities and opportunities available in the area. A park brochure and event attractions that would appeal to visitors and residents were suggested. Improvements in the park facilities and the addition of trails on the west side that connect to the greenway could make the park more appealing.

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Respondents	22	34	6	13	5
Percentage	27%	42%	7%	16%	6%

4) Improved informational signage to help locate the reservoir is needed.

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Respondents	10	39	18	11	4
Percentage	12%	48%	22%	13%	5%

5) It was felt that the east bank is pretty well used currently and that the only opportunity for further development inside the ring road would involve the west bank. Such use of the west bank would be inconsistent with the desire to keep that area in an undeveloped and "natural" state and would impair the overall appeal of the reservoir.

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Respondents	28	27	6	15	6
Percentage	34%	33%	7%	18%	7%

6) It was recommended that the city either extend their lease beyond the expected expiration date or purchase the reservoir grounds so the community might continue to enjoy the benefits of this unique area.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
36	32	4	6	3
44%	39%	5%	7%	4%

7) If the school becomes available it could be and opportunity for development. An educational or interpretive center focusing on water was suggested.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
5	25	29	9	10
6%	32%	37%	11%	13%

8) Road access could be improved to allow for easier travel to and from the reservoir. This would be especially important if the reservoir is to host many events of any size.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
17	41	3	17	5
20%	49%	4%	20%	6%

9) The construction of additional resources could benefit the area. Such construction might include an educational area or facility, cabins or a facility for overnight stay.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
2	31	14	23	10
2%	39%	17%	29%	12%

10) Limited development may be appropriate in the future if demand increases, but currently there seems to be commercial and residential resources available to meet the current demand.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
8	44	9	13	4
10%	55%	11%	17%	5%

11) If the demand for commercial resources increases it is recommended that it be met by clustering any new use near or adjacent to the exiting areas. A possible exception to this general rule could be a specialty restaurant sited to overlook the reservoir just north of the sailing club.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
6	40	11	11	12
7%	50%	14%	14%	15%

12) It is recommended and seems practical that no residential development occur on a large scale in the area without the existence of sewer and water utilities. The absence of large tracts near the water and the desire to maintain water quality seem to preclude residential development on any large scale.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
38	32	3	6	2
47%	39%	4%	7%	2%

Recommendations of the Conservation/Environment Focus Group

1) Delaware County should set up a regional on-site wastewater district to regulate wastewater treatment in the Prairie Creek subwatershed and collect taxes for improved wastewater treatment technologies if soil is not suitable for individual leach fields.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
9	17	9	26	18
11%	21%	11%	33%	23%

2) Install 50 foot buffer strips around the shoreline of the existing ATV course to mitigate sediment loading and erosion impacts caused by the extensive use of the course.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
26	33	13	3	6
32%	41%	16%	4%	7%

3) Look for alternative areas within the subwatershed to eventually replace the ATV course currently adjacent to the Prairie Creek Reservoir.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
20	27	17	5	12
25%	33%	21%	6%	15%

4) No individual leach fields for new concentrated developments located within the ring road boundary

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
28	29	12	3	3
37%	39%	16%	4%	4%

5) If development pressures continue to increase, the Muncie Sanitary District should extend sanitary sewer lines out to the Prairie Creek Reservoir loop road for new developments.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
11	17	1	20	33
13%	21%	1%	24%	40%

6) Encourage best management practices for sediment-reduction practices in the subwatershed.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
21	48	8	0	2
27%	61%	10%	0%	2%

7) Constructed wetlands should be built along the bays and inlets of the Prairie Creek Reservoir and managed by the Muncie Parks Department to mitigate septic and agricultural runoff and enhance habitat for waterfowl and fish reproduction.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
23	43	4	10	3
28%	52%	5%	12%	4%

8) Every drainage ditch in the subwatershed should have a buffer strip with natural vegetation to reduce sediment and nutrient loading from agricultural runoff, to stabilize the ditch bank, and to reduce the need for dredging: 120 feet wide on each side for ditches with permanent flows of water and 30 feet wide on each side for intermittent ditches

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
16	38	13	7	7
20%	47%	16%	9%	9%

9) Conservation districts are zoned for the intent of humans to enjoy wildlife and greenspace, not solely to protect wildlife; No structural buildings such as playgrounds or shelters should be built in the conservation zones.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
25	30	9	11	4
32%	38%	11%	14%	5%

10) The West side in the ring road should be rezoned to conservation instead of residential because it provides a buffer from the development outside the ring road on the West side

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
31	31	8	5	5
39%	39%	10%	6%	6%

Recommendations of the Recreation Focus Group

1) Attach a recreation/conservation land use and future zone to the area within the "ring road" and other areas as appropriate.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
12	42	16	6	4
15%	59%	20%	7%	5%

2) The City and/or County should buy the land inside the "ring road".

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
19	26	11	10	8
26%	35%	15%	13%	11%

3) Establish an agreement for "flipping" ownership of the reservoir that is embraced by both the city of Muncie and Delaware County that:
- Establishes that the Water Company wants to retain control of the reservoir as long as they are using it as water supply.
- The City (or county) shall obtain 1st right of refusal for purchasing any of the land for public use/ public protection in or out of the "ring road".

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
15	38	9	11	2
20%	51%	12%	15%	3%

4) Establish a Land Restoration-Revegetation Management Plan:
- Identify 3 native revegetation scenarios that would enhance the natural character of the reservoir.
- Involve 501(c)3s in the planting of areas within the ring road.
- Create a provision for tree replacement. Currently when developers remove large trees they have to replant multiple trees in their place. If there isn't enough space onsite to plant all the trees necessary, then there could be a designated replacement area at Prairie Creek for the additional trees.
- Create a Cost-Share program to reforest corridors along and outside the ring road.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
18	34	10	8	4
24%	46%	13%	11%	5%

5) Establish wetlands on inlets to the reservoir.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
17	40	4	12	3
22%	53%	5%	16%	4%

6) Improvement of the road structure is needed as well as routing through New Burlington. When these improvements are prepared/constructed, it is recommended that:
- New road construction around the reservoir shall include a road side trail or bike lanes.
- This main "loop trail" must connect to the Cardinal Greenway (most sensibly on the southwest side of the reservoir).

*This would establish the desired main route around the reservoir ("loop trail"), and then additional trials leading into natural areas would create destinations. Multi-use trails shall maintain visual separation from the horse trails.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
30	31	2	9	6
38%	40%	3%	11%	8%

7) The area inside the "ring road" shall be dedicated to public use, whether recreation or conservation.
- The west side shall be dedicated to passive recreation.
- The east side shall be dedicated to active recreation.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
24	40	2	10	1
31%	52%	3%	13%	1%

8) The area inside the "ring road" shall be returned to green space.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
12	24	10	21	7
17%	32%	13%	28%	9%

9) The City and/or County Park should increase pier fees for out of county residents. If the park is run by the city of Muncie, pier fees should increase for county residents.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
7	12	19	18	17
10%	16%	26%	25%	23%

10) The City and/or County Park needs to update the bathrooms/showers.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
13	30	29	4	1
17%	39%	38%	5%	1%

11) A management plan shall be imposed on the ATV site. The city/county should also look into alternative areas for an ATV site.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
21	25	13	9	8
28%	33%	17%	12%	11%

12) The City and/or County Park should extend services to include:

- An access area for non-motorized boats (canoes, rowboats...).
- Additional camping, including
  - Spread out family camping in the north-eastern section of the park.
  - Primitive camping- requires a short walk to the campsite from parking area.
    - Use of alternative waste disposal is recommended (composting toilet systems).
- Additional Cabins

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
7	36	10	15	9
9%	47%	13%	19%	12%

13) Establish plat restrictions to any land in the area that gets platted.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
18	35	19	3	5
22%	44%	24%	4%	6%

14) Encourage private landowners to use covenants/plat restrictions.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
16	29	23	6	6
20%	36%	29%	7%	7%

15) It is recommended that a 501(c)3 is set up to help gather resources to defend the reservoir and the long term transition envisioned in this plan.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
12	36	18	5	8
15%	46%	23%	6%	10%

16) Encourage conservation farming practices.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
28	43	5	4	3
34%	52%	6%	5%	4%

Please write any additional comments in the space below. You may use additional paper if needed.
-Responses recorded separately.

OPEN ENDED COMMENTS FROM THE PUBLIC MEETING JULY 25th 2006

Access to the water and piers on west side for homeowners only.

When planning horse trail for area riders it has been suggested that the trail also be used for walking and hiking. This is not a good idea because of a very good chance of injury to riders or walkers/ hikers and the trash that is sometimes discarded by people. People and horses on the same trails will not mix.

Keep Ron Bonham- He's a good guy.

Have a goose fest!

Let's not dilute the progress of the Red Tail Conservancy with other 501(c)3's.

Keep the reservoir as natural a possible, keep building limited. Improve water quality. Have law enforcement monitor the roads for speeding traffic as this is a problem on the east side.

We already have a 501(c) 3 for land conservation in ECI! Red Tail Conservancy

Access to the water (piers) for homeowners on 475E. Allow jet skiing- not to increase speed limit currently in place.

Home owners on ring road be allowed one pier near their property.

Piers on west side for homeowners on the west side.

The geese are overpopulated and create a health risk with the recreation facilities.

It was a good turnout.

You just want all this and the people living in the area to pay for it!!! I'm tired of my taxes going up every year! You want to talk we'll talk don't hide behind paper!

Let's pass this area on to future generations in a pristine as possible state.

There are no park areas on the west side. Add a park area at Indian Hill and maintain it.

Pier on west side for homeowners. Bike trail around.

The trailer park is an eyesore… has really taken over what could be beautiful grounds! People pay minimal fees for an almost year-round lake view and are not assessed stiff property taxes like the rest of us! The geese are a problem because people ignore the "no feeding" signs… that is not patrolled strictly enough.

Geese control please! Camp ground to be regulated permitting only overnight camping not motor home or trailer for extended periods.

Recreational classes for kids. Concerts, plays and musicals and family events.

Form a county parks and recreation commission to administer the park.

Needs to be developed for waterfront homes.

Everyone here has their opinion, however you should look strongly at the economic opportunities. Conservation and habitat restoration costs $$, economic development brings in $$ so that all the other programs/ wish list items can be funded.

Get rid of the geese!

Fire trucks from Selma (Liberty Township) must use CR 700E (big water trucks) increasing their response time. What happened to the proposed new road from Selma? Smithfield Bridge can't handle the heavy trucks.

The park should open west side drives to waters edge for fishing. Step up patrols (security) in the park (real police officers) Piers should be handled and sold in a different manner- not by the buddy system. Stop the golf carts and scooters in the park. Repave drives on east side and re-open for autos. Need more spots to go fishing.

Preserve the horse trails.

Please preserve the horse trails on the west side!

Horseback riders have worked very hard to establish and maintain trails. We would like them to remain. The Muncie Light Horse Club and the Indiana Trails Riders would be happy to meet with any committee about the existing trails and what we could do to improve them.

Don't organize this to death. Don't develop it to death. It is a small lake. What each of the groups proposes will change the essential use of the park. We don't want another Geist and we don't want "Agenda 21" (sustainable development) either.

A soft trail should be constructed around the perimeter just inside of the ring road. This would protect people's knees and joints when they jog or walk around the lake. It would extend people's walking and jogging life considerably. It would be considered an outstanding resource for the area. Events could be held on it.

Include in the plan a strong fish base for improved fish populations. It is important to include fishing as a continuing popular recreation. I am concerned that the increase in water sports will harm the fish and the opportunity to fish. Prohibit the use of personal watercraft such as seadoos or skijets. These would be dangerous to the many boats and people tubing or other water sports.

As for purchasing the land inside the loop, I think it would be great however the price might be too much on already overtaxed landowners. Bike trails around the reservoir are not necessary. The roads around the reservoir can be utilized for this purpose, but more patrolling for vehicle speeders would be nice. The reservoir should remain low speed for the boats that use it and enforcement of the speed. The park personnel do a great job at keeping the grounds maintained.

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Delta grad Adam Shunk wins U.S. indoor high jump title, qualifies for World Championships
Full story in Sports, 1C

Bombs and bullets kill more than 50 in Iraq

Diplomatic efforts show no results as violence continues in wake of shrine's destruction.

THE ASSOCIATED PRESS

BAGHDAD, Iraq — Bombs and gunfire killed about 60 people as another daytime curfew Saturday failed to halt violence that has claimed nearly 200 lives since the destruction of a Shiite shrine set off a wave of retribution against Sunnis and pushed Iraq toward civil war.

In an unusual round of telephone diplomacy, President Bush spoke with seven leaders of Shiite, Sunni Arab and Kurdish political parties in a bid to defuse the sectarian crisis unleashed by the bombing of the Shiites' Askariya shrine in Samarra.

Bush "encouraged them to continue to work together to thwart the efforts of the perpetrators of the violence to sow discord among Iraq's communities," said Frederick Jones, a spokesman for the White House's National Security Council.

Reprisal attacks that followed the Wednesday blast in Samarra have derailed talks on a forming new Iraqi government and threaten Washington's goal of building up a self-sufficient Iraqi force of U.S. military involvement.

But Bush's personal intervention appeared to ease Sunni fears. Tariq al-Hashimi, leader of the Sunni Iraqi Accordance Front, said after speaking with Bush that a new government was the best way to ease the sectarian crisis.

➤ See CURFEW, 4A

DEATHS

Actor Don Knotts dies at 81; made being a nerd OK

Knotts

Don Knotts, the skinny, lovable nerd who kept generations of television audiences laughing as bumbling Deputy Barney Fife on *The Andy Griffith Show*, has died. He was 81.

Knotts died Friday night at Cedars-Sinai Medical Center in Beverly Hills, said Paul Ward, a spokesman for the cable network TV Land.

The West Virginia-born actor's half-century career included seven TV series and more than 25 films, but it was the Griffith show that brought him TV immortality and five Emmies.

Complete story | 6A

MUNCIE MARDI GRAS 2006

Revelers chill out

PHOTOS BY TONI FURUKAWA / THE STAR PRESS
BELLY DANCERS perform Saturday night during Mardi Gras in downtown Muncie. The dancers were just one facet of entertainment available to revelers.

Partiers not deterred by dropping temperatures

By OSEYE T. BOYD
oboyd@muncie.gannett.com

MUNCIE — Deb Swift and her friends planned to party all night long — or at least until they became too cold to keep it up.

Swift, Gary Crabtree, Lyle Long and Tina Prescott attended Muncie's annual Mardi Gras celebration for the first time on Saturday. The group stood front and center of the main stage, dancing to the music of Jennie DeVoe.

Entertainer DeVoe, formerly of Muncie, was one of the main reasons the friends decided to attend "Muncie Gras" for the first time.

"We love Jennie DeVoe, Walking Catfish, too," said Swift, a Winchester resident and teacher at Willard Elementary School. "The music is good."

Both women were in the Mardi Gras spirit as they carried purple masks in their hands. Prescott, also of Winchester, had about a dozen strands of beads around her neck while Swift wore a blue boa.

Muncie's annual Mardi Gras celebration began at 7 p.m. — an hour earlier than last year's event — and wasn't set to end until 2 a.m. today.

Walnut Street between Main and Charles streets was packed with men and women wearing colorful Mardi Gras beads on top of winter coats as temperatures were expected to drop to 18 degrees. Vendors selling food, peanuts, beads and T-shirts were set up near the sidewalk, leaving plenty of room for revelers to walk.

This year's celebration has been surrounded by controversy as a group of local pastors called for its cancellation, citing displeasure with drunkenness and "flashing" sometimes associated with the event.

Anti-Mardi Gras posters were placed throughout the city and along Ind. 67 heading into Muncie to protest the event.

➤ See PROTESTERS, 4A

He's a freak, and he loves it

Loren "Freakshow" Foley, 21, performed Saturday during Muncie's annual Mardi Gras event. Foley began juggling and performing magic tricks at 8 years old.

As a teenager, he became interested in sideshows. He performs at private events and has taken his show on the road with the World of Wonder sideshow.

Foley can stick a nail, screws, scissors and knitting needles up his nose, and dangle 5-pound objects from his earlobes. During an interview with The Star Press, Foley whipped out a screwdriver and stuck it in his nose.

➤ See PERFORMER, 4A

LOREN "FREAKSHOW" FOLEY breathes fire Saturday night during Muncie Mardi Gras.

TODAY AT www.thestarpress.com

SATURDAY'S POLL RESULTS
Q: Do you plan on attending Mari Gras tonight?
YES 17.4%
NO 82.6%
Results as of 10:15 p.m. Total votes: 685

TODAY'S POLL QUESTION
Q: How many times to you usually eat out in a week?
a) Never
b) One to two
c) Three to five
d) More than five

On the Web

Navigate to The Star Press Web site at www.thestarpress.com for these features on Saturday's Mardi Gras:
➤ A gallery of photos from the event.
➤ An audio slide show of the evening's festivities (should be up by 11 a.m.)
➤ To submit your own photos from Mardi Gras, use the following link http://blog.thestarpress.com/formmail/photosubmit.html

More Mardi coming Monday

➤ A recap of the downtown event, from the first band to the last string of beads.
➤ Also, what happens after the party is over? We look at the clean-up and more.

Master plan to guide Prairie Creek Reservoir finally under way

The plan to guide future development of the state's 20th-largest lake was supposed to have been done in 2002.

By SETH SLABAUGH
sethslabaugh@muncie.gannett.com

MUNCIE — A master plan is finally being prepared to guide the long-term development and preservation of Prairie Creek Reservoir — six years after such a plan was recommended.

Delaware County residents consider the reservoir — Indiana's 20th-largest lake — one of the community's greatest assets, along with Ball State University, Ball Memorial Hospital, Cardinal Greenway and the Minnetrista cultural center.

The comprehensive plan adopted by city and county officials in 2000 called for a special study or master plan of the reservoir in 2002.

Work on the plan finally has started, including the mailing of a questionnaire to 1,500 randomly selected households in the county.

Dozens of questionnaires already have been returned. They indicate that many people believe the continued construction of housing around the 1,230-acre reservoir could threaten swimming, boating, fishing, water quality and wildlife at the recreational area.

During his 16 years as superintendent of the reservoir — owned by Indiana-American Water Co. and leased by the city of Muncie as a park — Ron Bonham has witnessed the construction of more and more housing, and an increase in traffic.

"It's just natural," Bonham said. "People are drawn to water. They want to build close enough to the water to be able to see it. There have been a lot of big houses going up in the surrounding area."

So far, no waterfront development has been allowed.

Whether that prohibition should continue is one of the 26 questions on the questionnaire.

➤ See CITY'S, 4A

How to comment
To complete the Prairie Creek Reservoir master plan questionnaire, visit www.co.delaware.in.us/Watershed/PC_master_plan.htm, or the Delaware-Muncie Metropolitan Planning Commission office in the county building to obtain a form.

Inside, 4A
➤ Comments from questionnaires.
➤ A list of steering committee members.

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TONI FURUKAWA / THE STAR PRESS
JENNIE DeVOE performs at Muncie Mardi Gras on Saturday night.

Protesters stay away from event

Continued from 1A

On Friday, local church members held a prayer meeting, in anticipation of Saturday night's activities, at Christ Temple Church.

No protesters were at Saturday's event, although one woman passed out Christian leaflets — titled "Girls, Dress Modestly" and "America Has Broken the Heart of God — at the entrance gate on Charle's Street.

The controversy helped inspire Muncie resident Sharon Mosher to don a nun's veil — plastic breasts on top of her clothes — during Mardi Gras. Mosher is a regular at Mardi Gras and her costume generated "a lot of laughs. Nothing negative, very positive. It's a lot of fun."

"If it wasn't for this event, we might not have our Friday movie night," Mosher said of another reason she attended Mardi Gras because "it's a party."

"It's entertainment in Muncie, and they need entertainment no matter who it appeals to," she added.

Contact news reporter Oseye T. Boyd at 213-5830.

The controversy surrounding the event wasn't enough to keep Sara Jarvis away.

Jarvis, a teacher at Washington-Carver Elementary School, stopped in front of Wishbone Gifts to watch belly dancers from Carenza's Caravan perform. She said she attended Mardi Gras because "it's a party."

"It's entertainment in Muncie, and they need entertainment no matter who it appeals to," she added.

Contact news reporter Oseye T. Boyd at 213-5830.

Performer likes unique appeal

Continued from 1A

When the reporter questioned the authenticity of the stunt, he did it again — with a bigger screwdriver. Visit www.freakshowbrielygym for more information on this Muncie resident.

What made you want to become a sideshow act?

"The fact that it was unique. The reactions to sideshows are a little more extreme than regular magic shows. I like to shock people."

When did you start performing sideshow stunts?

"About four or five years ago when I learned I could lift stuff with my ear lobes. I did the (Humani) Block Head when I was about 13."

How did you learn how to safely stick stuff up your nose?

"Anatomy books. Trial and error."

Any injuries?

"Cuts, scrapes, bruises and burns."

Is it painful?

"Yes, it can be a lot of times. When I'm shoving needles through my arms and chest, I'm really shoving a needle through my arm and chest. A lot of what I feel I register as just a sensation, I guess! You learn your limits as well, and you don't really push yourself."

How do your parents feel about your career?

"They're actually supportive of it. They know I'm not just doing it just for fun. I can actually make a living at it."

Oseye Boyd

Curfew in place for second day

Continued from 1A

A second straight day of curfew in Baghdad and three surrounding provinces kept the city relatively calm, raising hopes the worst of the crisis was past. Authorities lifted the curfew in the areas outside Baghdad but decreed an all-day vehicle ban Sunday for the capital and its suburbs.

"I think the danger of civil war as a result of this attack has diminished, although I do not believe we are completely out of danger yet," U.S. Ambassador Zalmay Khalilzad told reporters Saturday night.

Nevertheless, bloodshed continued.

A car bomb exploded in the Shiite holy city of Karbala, killing at least six people, hospital officials said. Gunmen broke into a Shiite home northeast of Baghdad and massacred 13 male members, police said.

Bodies of 14 Iraqi police commandos were found near their three burned vehicles near a Sunni mosque in southwestern Baghdad, police Maj. Falah al-Mohammedawi said. Two rockets slammed into Baghdad's Shiite slum, Sadr City, killing three people, including a child, and wounding seven, police said.

Two Iraqi security officers guarding the funeral of an Al-Arabiya television correspondent Atwar Bahjat were killed and four other people were wounded when a car bomb exploded as mourners left a cemetery in western Baghdad. Bahjat was slain Wednesday along with two colleagues after covering the Samarra shrine bombing.

Earlier, shooting broke out as the funeral procession was carrying her coffin near the home of Harith al-Dhari, head of the Association of Muslim Scholars, a prominent Sunni clerical group. One policeman was killed and two people were wounded in the shooting, police said.

At least 21 other people died in small-scale shootings and bombings in Baghdad and western areas of the city, according to police and hospital reports.

Gunmen also shot at two Sunday in Tuz Khormato, 130 miles north of Baghdad, police and witnesses said.

The crisis has distracted attention from the approaching deadline set by the kidnappers of American journalist Jill Carroll, abducted Jan. 7 in Baghdad. Carroll, a freelancer for the Christian Science Monitor, was last seen on a videotape broadcast Feb. 10 by a Kuwaiti television station. It said the kidnappers threatened to kill her unless the U.S. met unspecified demands by Sunday.

"There are no new developments on her case so far because we are busy with a lot of things right now," Deputy Interior Minister Hussein Kamal said Saturday. "We know about the deadline and we hope that we can reach her before they manage to kill her."

Faced with one of the gravest threats of the turbulent U.S. presence in Iraq, American officials mounted a furious effort to get the political process back on track while Iraqi authorities defended their handling of the crisis.

Defense Minister Saadoun al-Dulaimi, a Sunni Arab, told reporters the government had one army division and one Interior Ministry armored brigade ready to move in case of a new outbreak of violence around the capital.

"All honorable Iraqis are asked today to do all they can to preserve Iraqi blood and avoid strife, which in case it breaks out will burn everyone," al-Dulaimi said. "We do not want to burden the public with our security measures but the more we take, the more we can control acts of violence. If we have to, we are ready to fill the streets with (armored) vehicles."

Following Bush's phone call, the main Sunni political group said in a statement that it would return to talks on joining a new government if Prime Minister Ibrahim al-Jaafari followed through on promises to rebuild damaged religious sites and determine who was behind the Samarra bombing and the reprisals attacks on Sunnis that followed.

The Sunnis, who pulled out of government talks Thursday, sent representatives to a meeting with other factions late Saturday at al-Jaafari's home. Khalilzad, the U.S. ambassador, also attended.

City's lease expires in 2021

Continued from 1A

Others include whether people want the reservoir to become more residential, natural, agricultural, commercial or to stay the same; what type of development should be allowed, if any; what threatens the future of the reservoir; and whether the city should buy it from the water company. The city's lease expires in 2021.

"The big thing is to protect it after the lease expires," Bonham said, "and not let it become another Geist Reservoir with multi-million-dollar waterfront homes. People I talk to don't want that. They want nature trails and wildlife habitat."

Planners say the master plan will enhance the long-term ecological health of the reservoir and at the same time provide ample opportunity for human use of the man-made lake.

The plan is being written by Fred Daniel and Lorey Stinton, both GIS (geographic information system) planners with the city-county planning commission. Stinton began as an intern in the office in 2003 and started working full time last fall. She is completing a master's degree in landscape architecture. Daniel is a more experienced urban planning graduate.

They are being assisted by two urban planning graduate students from Ball State, a steering committee, and the White River Watershed Project, which is contributing $6,500.

In the summer of 2003, Marta Moody, director of the planning commission, said the master plan for the reservoir hadn't started because of other projects, such as studies of a county-wide network of walking and biking paths, The Village commercial and residential district near Ball State, and the feasibility of completing the Muncie Bypass around the western side of the city.

"The Prairie Creek study is one that we're going to try to do in 2004, though I'd like to start it yet this year," Moody said in 2003.

Asked last week why the reservoir plan hadn't been started sooner, Moody answered, "I'd say part of it is work load."

She also noted that in recent years the watershed project had conducted a study of water quality in the watershed containing the reservoir.

"The watershed project seemed to be the ideal partner to get the master plan done," Moody said.

The plan could be adopted by officials in May, June or July, after the questionnaires are returned and after public meetings.

Contact news reporter Seth Slabaugh at 213-5834.

Steering committee

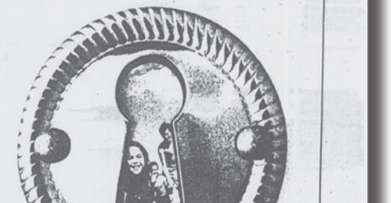
Members of the Prairie Creek Reservoir master plan steering committee:
- Don Black, Delaware County Soil and Water Conservation District.
- Ron Bonham, Prairie Creek Park superintendent.
- Alvie Brown, coordinator, White River Watershed Project.
- Dave Clemme, Delaware County extension educator.
- Charles Colwell, property owner, farmer.
- Jim Craig, Liberty-Perry School Corp.
- Jon Creek, Sierra Club.
- Michael Denton, county highway engineer.
- Dave Ferguson, Cardinal Greenway, Ball State University.
- Chanelle Harris, Dry Dock Marina.
- Rich Huyck, Muncie Sanitary District, Bureau of Water Quality.
- Marta Moody, city-county planning commission.
- Jarka Popovicova, natural resources department, Ball State.
- Jan Van Meter-Reed, board of realtors.
- Dave Wallace, property owner.
- Josh Williams, county health department.

Questionnaires provide plenty of comments on reservoir

Examples of comments from dozens of respondents who have answered the Prairie Creek Reservoir master plan questionnaire. All responses are anonymous.

Positive remarks about reservoir
- Beautiful, quiet, clean, peaceful, family friendly.
- Well-maintained.
- Great place for camping, pontoon boating, swimming and fishing.
- Scenic.
- Safe.
- Fun in the sun.
- Close to Muncie.

Negative remarks about reservoir
- If they keep building houses, there will be no reservoir left.
- The lake is crowded, over-used and too small.
- Too much drinking, rowdiness, fighting, partying, teen sex, drug use.
- Not family friendly.
- Lacks hiking trails.
- Beer shouldn't be allowed.
- No skiing allowed.
- No personal watercraft allowed.
- No speed boats allowed.
- Undesirables taking over campground.
- Too shallow.
- Waiting list for boat docks.
- Need more game fish; too many carp.
- Campground resembles trailer park.
- Worst fishing lake in Indiana.
- Needs a petting zoo, small shopping mall, restaurant overlooking lake, shooting range, gas pumps, roller-skating rink, basketball courts, baseball diamond.
- Geese overpopulated, goose droppings.
- Golf carts taking over.
- Invasive weeds in water.
- Too much shoreline occupied by pontoon boat docks.
- Too many pontoon boats.
- Too many camp sites.
- Lack of law enforcement.
- White-trash image.
- More duck-feeding areas needed.
- Year-round campers think they own the reservoir.
- Need more electric camp sites.
- Needs to be privatized to end taxpayer subsidy.



Master plan to guide Prairie Creek Reservoir finally under way

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By SETH SLABAUGH
seths@muncie.gannett.com

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The comprehensive plan adopted by city and county officials in 2000 called for a special study or master plan of the reservoir in 2002.

Work on the plan finally has started, including the mailing of a questionnaire to 1,500 randomly selected households in the county.

Dozens of questionnaires already have been returned. They indicate that many people believe the continued construction of housing around the 1,252-acre reservoir could threaten swimming, boating, fishing, water quality and wildlife at the recreational area.

How to comment
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Inside, 4A
➤ Comments from questionnaires.
➤ A list of steering committee members.

During his 36 years as superintendent of the reservoir — owned by Indiana-American Water Co. and leased by the city of Muncie as a park — Ron Bonham has witnessed the construction of more and more housing, and an increase in traffic.

"It's just natural," Bonham said. "People are drawn to water. They want to build close enough to the water to be able to see it. There have been a lot of big houses going up in the surrounding area."

So far, no waterfront development has been allowed.

Whether that prohibition should continue is one of the 26 questions on the questionnaire.

➤ See CITY'S, 4A

Page designer: Phil Miller, 213-5841

City's lease expires in 2021

Continued from 1A

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They are being assisted by two urban planning graduate students from Ball State, a steering committee, and the White River Watershed Project, which is contributing $6,500.

In the summer of 2003, Marta Moody, director of the planning commission, said the master plan for the reservoir hadn't started because of other projects, such as studies of a county-wide network of walking and biking paths, The Village commercial and residential district near Ball State, and the feasibility of completing the Muncie Bypass around the western side of the city.

"The Prairie Creek study is one that we're going to try to do in 2004, though I'd like to start it yet this year," Moody said in 2003.

Asked last week why the reservoir plan hadn't been started sooner, Moody answered, "I'd say part of it is work load."

She also noted that in recent years the watershed project had conducted a study of water quality in the watershed containing the reservoir.

"The watershed project seemed to be the ideal partner to get the master plan done," Moody said.

The plan could be adopted by officials in May, June or July, after the questionnaires are returned and after public meetings.

Contact news reporter Seth Slabaugh at 213-5834.

Steering committee

Members of the Prairie Creek Reservoir master plan steering committee:

- Don Black, Delaware County Soil and Water Conservation District.
- Ron Bonham, Prairie Creek Park superintendent.
- Angie Brown, coordinator, White River Watershed Project.
- Dave Clamme, Delaware County extension educator.
- Charles Conwell, property owner, farmer.
- Jim Craig, Liberty-Perry School Corp.
- Jon Creek, Sierra Club.
- Michael Denton, county highway engineer.
- Dave Ferguson, Cardinal Greenway, Ball State University.
- Chanette Harris, Dry Dock Marina.
- Rich Huyck, Muncie Sanitary Disrict, Bureau of Water Quality.
- Marta Moody, city-county planning commission.
- Jarka Popovicova, natural resources department, Ball State.
- Jan Van Meter-Reed, board of realtors.
- Dave Wallace, property owner.
- Josh Williams, county health department.

Questionnaires provide plenty of comments on reservoir

Examples of comments from dozens of respondents who have answered the Prairie Creek Reservoir master plan questionnaire. All responses are anonymous.

Positive remarks about reservoir
- Beautiful, quiet, clean, peaceful, family friendly.
- Well-maintained.
- Great place for camping, pontoon boating, swimming and fishing.
- Scenic.
- Safe.
- Fun in the sun.
- Close to Muncie.

Negative remarks about reservoir
- If they keep building houses, there will be no reservoir left.
- The lake is crowded, over-used and too small.
- Too much drinking, rowdiness, fighting, partying, teen sex, drug use.
- Not family friendly.
- Lacks hiking trails.
- Beer shouldn't be allowed.
- No skiiing allowed.
- No personal watercraft allowed.
- No speed boats allowed.
- Undesirables taking over campground.
- Too shallow.
- Waiting list for boat docks.
- Need more game fish; too many carp.
- Campground resembles trailer park.
- Worst fishing lake in Indiana.
- Needs a petting zoo, small shopping mall, restaurant overlooking lake, shooting range, gas pumps, roller-skating rink, basketball courts, baseball diamond.
- Geese overpopulated, goose droppings.
- Golf carts taking over.
- Invasive weeds in water.
- Too much shoreline occupied by pontoon boat docks.
- Too many pontoon boats.
- Too many camp sites.
- Lack of law enforcement.
- White-trash image.
- More duck-feeding areas needed.
- Year-round campers think they own the reservoir.
- Need more electric camp sites.
- Needs to be privatized to end taxpayer subsidy.

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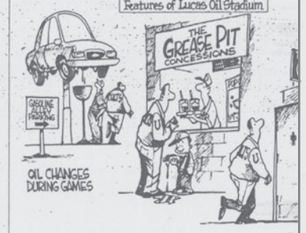
KATHLEEN SCOTT • Wire Editor
TRICIA STANLEY and J. PAUL MITCHELL • Community Representatives
Where the spirit of the Lord is, there is liberty.
II Corinthians 3:17

Features of Lucas Oil Stadium



EDITORIALS

Reservoir plan needs plenty of public input

OUR VIEW
Citizens who care about Prairie Creek Reservoir should provide their views and suggestions to survey-takers.

YOUR VIEW
Reader submissions may be published or distributed in print, electronic or other forms. Send to P.O. Box 2408, Muncie 47307-0408; fax to 213-5858, or e-mail to letters@muncie.gannett.com.

QUESTIONS
Direct them to Larry Shores, editorial page editor, at 213-5854.

ON THE WEB
Click the Opinion button on The Star Press home page, www.thestarpress.com

How you can participate
There are two ways to complete the Prairie Creek master plan questionnaire:
- Obtain a survey form at the planning commission office in the Delaware County Building.
- Do the survey online by going to www.co.delaware.in.us/Watershed/PC_master_plan.htm

DELAWARE COUNTY RESIDENTS have received an offer they shouldn't refuse — that is, to participate in a survey about Prairie Creek Reservoir. And the more surveys that are completed, the more the public's views can be represented in a new comprehensive plan for the reservoir area.

The long-delayed master plan should depend heavily on public input. And on the need to preserve and protect Prairie Creek's environment and ecology.

As Indiana's 20th largest lake, Prairie Creek is generally ranked as one of the community's greatest assets. Its recreational opportunities are considerable, yet its potential might far exceed its current status and use. But only if its ecology is preserved.

This is where the public comes in. By telling officials what they think of reservoir policy, facilities, upkeep and security, citizens can help guarantee a more broad-based plan that responds to needs and provides solutions.

SURVEY ANSWERS are already arriving, and they are interesting. Early returns spotlight the park's obvious positives, but also suggest some weaknesses.

Respondents have criticized the "lack of law enforcement," claiming that Prairie Creek is "not family friendly," that too much "drinking, rowdiness, partying and drug use" are present and that the campground "resembles a trailer park."

Concerns have also been expressed about the lake's lack of game fish and the park's lack of hiking trails. One respondent provided a litany of Prairie Creek needs, including a petting zoo and a restaurant and shops overlooking the lake.

Several users believe the continued construction of housing around the 1,252-acre lake could threaten swimming, boating, fishing, water quality and wildlife.

So far, no significant waterfront development has been allowed, but one survey question asks if that policy should continue.

ANOTHER QUESTION ASKS whether the city should buy the reservoir from Indiana-American Water Co., which uses Prairie Creek as a backup water supply for the Muncie area. The company leases the reservoir to the city, an agreement that expires in 2021.

Now is an opportune time to prepare a master plan for Prairie Creek's future. Good planning anticipates change, and should not be done in a crisis situation (which is hardly the case now).

The project is being directed by the city-county planning commission and a 16-member steering committee. Besides its stated goals, the panel should conduct extensive interviews with city and water company officials concerning their plans and expectations. The fee structure for reservoir uses should be studied, along with the always-present policing and campgrounds issues.

The steering committee contains an impressive mix of professionals and officials — many with wide knowledge of Prairie Creek and its history. As a group, they should be able to plan effectively to protect the reservoir's ecological health and sustain and improve user opportunities.

Their work will be expedited if a large number of knowledgeable citizens who care about Prairie Creek take part in the survey.

PUBLIC LETTER BOX

Avoid the problem
ROBERT ROSE
Muncie

A writer argued recently on this page that we might as well smoke, since degenerative disease will get us anyway. My father, who smoked for 60 years, reached 83 and still had plenty of time for bronchitis and cancer. For six months, he lay paralyzed by a stroke in a "democratic" nursing home, where he inhaled secondhand smoke while suffocating from emphysema.

Many of us learned in school that a nourished body protects itself from illness. Whole foods supply the necessary fuel and generate healthy tissue. A person who puts non-food into the body year after year need not be surprised to sacrifice energy reserves and regenerative capacity.

No matter how much we meddle chemically with our central nervous systems, the body does it best to keep internal conditions constant. Why waste immunological resources being terrified by predictable illnesses, when we could focus our attention on avoiding them?

Defending your home
CRAIG ROBBINS
Virginia Avenue

Thank you, Mr. Stevenson, for defending your property against the burglar. As a victim of a recent burglary, I knew what I had to do as a homeowner — arm myself and my house. The loser was a repeat offender who walked into my house, too, and I was there.

The police department cannot protect us from the people they've already arrested. The courts can't keep them behind bars where they belong. So it's up to the homeowner to make sure they get the point.

Every household should have something to protect them, and it doesn't have to be a firearm. Taser guns are relatively expensive, but much safer to have in the house. Pepper spray in a can is often overlooked and may be the best deterrent. Stun guns are inexpensive and effective as well.

If every home was armed, burglars and robbers would think twice before they crawl through our windows, change our lives, steal our belongings, get caught by the police, get their hand slapped, and are back on the streets. No one wants to hurt anyone else, but once you put a man and his family in danger, we will do whatever it takes to make sure you do not come back.

How to contact your legislators
The Indiana Legislature is now meeting. Here is how to contact legislators:
Call (800) 382-9842 to reach members of the Indiana House:
- Bill Davis, R-Portland
- Tim Harris, Marion
- Jack Lutz, R-Anderson
- Tom Saunders, R-New Castle
- Dennis Tyler, D-Muncie

Call (800) 382-9467 to reach members of the Senate:
- Allie Craycraft, D-Selma
- David Ford, R-Hartford City
- Beverly Gard, R-Greenfield
- Tim Lanane, D-Anderson
- Allen Paul, R-Richmond

For online information about the Legislature, visit http://www.IN.gov/ai/gov/leg.html

What a plane!
JAMES D. FULKS III
Jay County

Recently, the U.S. Navy announced the final mission for the once ubiquitous F-14 "Tomcat." The final mission was launched from the aircraft carrier USS Theodore Roosevelt, and as was fitting for this great old bird, it was indeed an actual combat mission. The F-14 was sent to do close air support in a remote area of Iraq.

As a young man, I departed from here in Jay County and went overseas aboard an aircraft carrier to serve as an air traffic controller. I was always awed by the performance characteristics of the Tomcat, and it was pretty heady stuff for a rural Indiana boy to get to know this bird up close and personal.

The Tomcat was one of the best fighter aircraft ever implemented by the U.S. Navy. Her articulated swept-wing design, which was precedent-setting in her time, allowed her to be both lightning fast but slow and stable during recovery. I have personally controlled this aircraft in good and bad weather, and could always count on the Tomcat to bring her crew back safely.

During the 1980s the Hollywood summer blockbuster movie Top Gun touted stars Cruise, McGillis, Kilmer and Skerritt, among others. The real star of this movie was the F-14 Tomcat, and even the actors and technical advisors concurred with this. Many of the at-sea sequences and other scenes were shot aboard our ship.

At a time when it was not considered "cool" to be in the military, those of us associated with naval aviation were elevated to a different level in the eyes of the general public once t
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Edwards hasn't caught up with paradigm

GEORGE WILL
Washington Post Writers Group

CHAPEL HILL, N.C. — "Sometimes," says John Edwards, "people need a breather." He is not talking about himself, although surely he needed one after his brief rocket ride through the upper atmosphere of national politics. That ride ended — or perhaps paused — when the Kerry-Edwards ticket lost. The people whom Edwards thinks really need a breather from presidential candidates are the voters.

But Edwards is roaming around, with 2008 in mind. His travels to more than 30 states have been organized around his interest in poverty. His Senate term ended nine weeks after the election and he went to earth here. While his wife, Elizabeth, continues to recover well from breast cancer, he is director of the new Center on Poverty, Work and Opportunity at the University of North Carolina.

MOST AMERICANS seem to regard as the only glaring economic injustice the violation of their constitutional right to cheap gasoline. But Edwards believes attacking poverty can be a politically energizing issue if, by stressing "work, responsibility, family," the attack "is built around a value-system, the nation embraces."

In a speech shortly after Katrina, he rightly stressed the correlation of family disintegration — especially out-of-wedlock births — with many social pathologies associated with poverty. He said, "It is wrong when all Americans see this happening and do nothing to stop it."

But no one knows how to stop it. Anyway, spending at least $16 trillion on poverty-related programs in the four decades since President Johnson declared the "war on poverty" is not "nothing." In fact, it has purchased a new paradigm of poverty.

Edwards has a 1930s paradigm of poverty: Poor people are like everyone else, they just lack certain goods and services (housing, transportation, training, etc.) that government knows how to deliver. Hence he calls for a higher minimum wage and job-creation programs.

The 1930s paradigm has been refuted by four decades of experience. The new paradigm is of behavior-driven poverty that results from individuals' nonmaterial deficits. It results from a scarcity of certain habits and mores — punctuality, hygiene, industriousness, deferral of gratification, etc. — that are not developed in disorganized homes.

Edwards, who does not recognize the name James Q. Wilson, may have missed this paradigm shift. Many people in public life, and almost all those with presidential ambitions, are too busy for the study and reflection necessary for mastering any subject.

WHEN DEMOCRATS wonder what red states Hillary Clinton could turn blue in 2008, the wondering does not help Edwards, whose presence on the 2004 ticket did not sway his own state. In 2000, Bush beat Gore-Li-
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The Star Press

THURSDAY June 15, 2006

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50¢ Muncie, Indiana

82 61 Weather, 10C

ALL ACCESS, INSIDE
AIR TIME
Summer Heat Fest takes to the skies Saturday

SPORTS, 1B
State golf tournament
Delta's Chase Wright (left) finishes second.

LOCAL: Six injured in Tuesday-night accident. 3A

Officer taken home after alleged DUI

Sheriff George Sheridan acknowledged the suspect's status as a police officer helped keep him out of the county jail.

PARKS & RECREATION | Reservoir master plan emerging

The future of Prairie Creek

There is support from the public and a steering committee for preservation and enhancement

NO TALKING TO LIFEGUARD WHILE ON DUTY

LIFEGUARD BRANDON HENRY keeps watch over a small group of swimmers as boaters float by Tuesday afternoon at Prairie Creek Reservoir.

"The public is interested in seeing it continue as a park, maintaining water quality, and maintaining it in a natural state. There is not a great deal of support for developing it or abandoning it as a public resource."

Fred Daniel, a geographic information systems planner for the city-county planning commission

What's next

Inside

On the Web

Abduction, death highlight challenges of Amber Alert

The alert was not filed by police until seven hours after the mother of two young boys reported their abduction by their father.

Woman finds herself caught in vise of pain

She can't find a surgeon in Indiana to perform an operation.

INSIDE

WHAT DO YOU THINK?

ALSO ONLINE

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THURSDAY
June 15, 2006

Water company owns reservoir

Reservoir opinion poll

Walker faces murder charges

"I just bought a kayak a week ago and have been on the reservoir with it twice already. The water is pretty high in algae content, which gives the reservoir that soupy green color."

Dave LeBlanc, a Ball State University biology professor

Prairie Creek master plan steering committee

Recommendations for Prairie Creek Reservoir

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PARKS & RECREATION | *Reservoir master plan emerging*

The future of Prairie Creek

There is support from the public and a steering committee for preservation and enhancement

MELANIE MAXWELL / THE STAR PRESS

LIFEGUARD BRANDON HENRY keeps watch over a small group of swimmers as boaters float by Tuesday afternoon at Prairie Creek Reservoir.

By SETH SLABAUGH
seths@muncie.gannett.com

The future of Prairie Creek Reservoir as envisioned by a master plan steering committee includes forested perimeter roads, hiking trails along the wild west bank, and wetlands by the bays and inlets to protect water quality and enhance habitat for waterfowl and fish reproduction.

The committee also recommends the creation of a non-profit organization to defend the reservoir.

"The public is interested in seeing it continue as a park, maintaining water quality, and maintaining it in a natural state," said Fred Daniel, a geographic information systems planner for the city-county planning commission. "There is not a great deal of support for developing it or abandoning it as a public resource."

The planning commission conducted a public opinion poll in February to help the steering committee. Virtually all of the 209 randomly selected respondents said water quality was important. (One said it wasn't important, and four said they didn't know if it was important). The vast majority do not want to see the development of waterfront housing. And the majority want the reservoir to either remain like it is or to become more naturalized.

One reason for the shortage of support for more housing and commercial development near the reservoir is the lack of sanitary sewers, Daniel said.

➤ See WATER, 6A

What's next

A public hearing on the draft recommendations will be conducted in late July, tentatively at Wapahani High School. The exact date and time will be announced. After comments from the public hearing are incorporated, the draft plan will be presented to the city-county planning commission, county commissioners, city council, the city park board, and the county soil and water conservation district for adoption.

Inside

➤ The list of recommendations and the results of the pubic opionion poll | 6A

On the Web

➤ Learn more at **www.co.delaware.in.us/watershed/pc_masterplan**

"The public is interested in seeing it continue as a park, maintaining water quality, and maintaining it in a natural state. There is not a great deal of support for developing it or abandoning it as a public resource."

Fred Daniel, a geographic information systems planner for the city-county planning commission

Water company owns reservoir

Continued from 1A

"What we need to do as much as anything market what's there inside the ring (perimeter roads)," said Realtor Jan Van Matre-Reed, a member of the steering committee. "The general public has no idea what goes on out there."

Much of the area outside the perimeter roads was sold off years ago by Indiana-American Water Co., and it has been developed into large-lot exurban housing, she noted.

The water company owns the 3.3-mile-long, 1,252-acre reservoir, which it leases, along with 1,100 acres of natural and park area surrounding it, to the city of Muncie. The reservoir is used for sailboating, pontoon boating, fishing, swimming, camping, off-road motorcycle riding, horseback riding, wind surfing, model boating, dog running and wildlife habitat.

One idea that could boost the local economy is to improve motor-vehicle access to the reservoir and stage more events like the Fourth of July celebration, Daniel said.

"There has been discussion about having a more direct route to the reservoir off of (U.S.) 35 and selling it as a regional asset," he said. "But you would need a more handy way of getting people there than a meandering country-road route."

The steering committee is still in the middle of the planning process.

"These are just ideas, scenarios," Daniel said. "We expect some of the ideas to meet with opposition. We are kind of anticipating that there will be conflicts."

Daniel said there was support among committee members for the city and/or county to buy the leased area if the lease is not extended by the water company. The lease expires in 2021, he said.

Dave LeBlanc, a Ball State University biology professor, was one of those invited by the steering committee to participate in a focus group discussion.

"I was able to have my input, and others were as well, including farmers," he said.

LeBlanc suggests constructing wetlands on the reservoir's bays and inlets to treat water draining into the reservoir and to provide habitat for fish and waterfowl.

"I just bought a kayak a week ago and have been on the reservoir with it twice already," LeBlanc said. "The water is pretty high in algae content, which gives the reservoir that soupy green color."

Wetlands, which are known as "nature's kidneys" and "nature's nursery," would trap and treat nutrients flowing into the reservoir such as agricultural fertilizer, human waste from failing and illegal septic systems, and livestock waste. Wildlife waste also enters the reservoir.

Nutrients contribute to algae growth, which can lead to a reduction in the water's oxygen content.

Because of all the nutrient pollution, "I'm not ever going to take my kids to swim in the beach," LeBlanc said.

"All of this agricultural land around the reservoir is crisscrossed with drainage tile, and it's very hard to find a house not within a short distance of a drainage tile. Virtually every house surrounding the reservoir is probably straight-piping (wastewater) into the reservoir because the leach fields are in close proximity to the drain tiles."

Water samples are collected at the beach every week during swimming season. Those samples have never failed to meet state standards for recreational waters.

"In general, water quality at the reservoir is pretty high," said Hugh Brown, chairman of the natural resources and environmental management department at Ball State. "But it won't stay high if it's not protected."

▌Contact news reporter Seth Slabaugh at 213-5834.

Reservoir opinion poll

The Muncie-Delaware Metropolitan Planning Commission in February interviewed 209 randomly selected Delaware County residents regarding the future of Prairie Creek Reservoir. The poll was conducted by mail. Twenty-five questions were asked, including the following:

Would you like to see the area surrounding the reservoir change its character to become any of the following?

(Responses)
- More naturalized, 106.
- No change, 59.
- More agricultural, 25.
- More commercialized, 19.
- Don't know, 20.
- More residential, 14.
- Less naturalized, 3.

The reservoir and surrounding area should be kept just the way it is now.

(Responses)
- Agree, 113.
- Disagree, 50.
- Don't know, 29.

The city of Muncie should buy the area surrounding the reservoir that is currently owned by Indiana-American Water Co. to provide more public open space and/or parks for the community.

(Responses)
- Agree, 122.
- Disagree, 46.
- Don't' know, 33.

I would like to see waterfront lots available for sale to homebuilders along the reservoir.

(Responses)
- Agree, 18.
- Disagree, 165.
- Don't know, 24.

Prairie Creek master plan steering committee

- Don Black, county soil and water conservation district.
- Ron Bonham, reservoir superintendent.
- Angie Brown, White River Watershed Project.
- Dave Clamme, county extension educator.
- Charles Conwell, property owner, farmer.
- Jim Craig, Liberty-Perry school corporation.
- Jon Creek, environmental activist.
- Michael Denton, county engineer.
- Dave Ferguson, Center for Media Design, landscape architectural professor, Ball State.
- Channette Harris, Dry Dock Marina.
- Rich Huyck, Bureau of Water Quality, Muncie Sanitary District.
- Marta Moody, city-county planning commission.
- Jarka Popovicova, natural resources professor, Ball State.
- Jan Van Matre-Reed, Realtor.
- Dave Wallace, property owner, attorney.
- Josh Williams, county health department.

"I just bought a kayak a week ago and have been on the reservoir with it twice already. The water is pretty high in algae content, which gives the reservoir that soupy green color."

Dave LeBlanc, a Ball State University biology professor

THURSDAY
June 15, 2006

"I just bought a kayak a week ago and have been on the reservoir with it twice already. The water is pretty high in algae content, which gives the reservoir that soupy green color."

Dave LeBlanc, a Ball State University biology professor

Recommendations for Praire Creek Reservoir

The Prairie Creek master plan steering committee is considering various recommendations – made by members of the committee and focus groups – including the following:

- The land surrounding the reservoir inside the perimeter roads should be rezoned from farming to recreation and conservation.
- There should be more marketing of the reservoir to make it a regional destination, including a park brochure and more event attractions.
- Adding hiking trails on the west side as well as other improvements, such as cabins, a facility for overnight stay, or educational center, could make the park more appealing. The west side should be devoted to passive recreation, the east side to active recreation.
- Given the campgrounds, pontoon piers, playgrounds and swimming area on the east side, the only opportunity for further development inside the perimeter roads would involve the west bank. However, development of the west bank would be inconsistent with the desire to keep that area "natural" and would impair the appeal of the reservoir.
- The city should either extend its lease of the reservoir (it expires in 2021) from Indiana-American Water Co., or the city and/or county should purchase the property.
- Access to the reservoir from U.S. 35 should be improved if the reservoir will host many large events.
- Restore native vegetation to enhance the natural character of the reservoir. Re-forest corridors along perimeter roads.
- A management plan should be imposed on the all-terrain-vehicle course, including installation of vegetative buffer strips on the shoreline to mitigate sediment loading and erosion caused by the extensive use of the course. The city and county also should consider alternative areas for an ATV site.
- A non-profit organization should be created to gather resources to help defend the reservoir and the long-term transition envisioned by the master plan.
- A regional wastewater district should be established to regulate wastewater treatment in the reservoir's watershed and to collect taxes to improve treatment technologies.
- If development pressure continues to increase, the Muncie Sanitary District should extend sewer lines to the reservoir.
- Construct wetlands along the bays and inlets of the reservoir to mitigate septic and agricultural runoff and enhance habitat for waterfowl and fish reproduction.
- Install natural, vegetated buffer strips along every drainage ditch near the reservoir to reduce sediment and nutrient loading from agricultural runoff.

THURSDAY
June 15, 2006

48 SUNDAY June 18, 2006
OPINION
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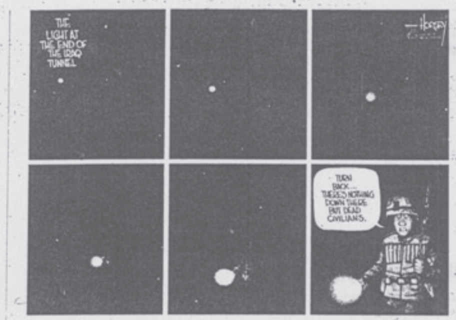

PUBLIC LETTER BOX

Immigration issue helps the GOP – for now

GEORGE WILL

EDITORIALS

Plan for Prairie Creek needs proper execution

OUR VIEW
Now that a master-plan committee has done its work, local officials need to sustain the effort.

YOUR VIEW
Reader submissions may be published or distributed in print, electronic or other forms. Send to P.O. Box 2408, Muncie 47307-0408; fax to 213-5858, or e-mail to letters@muncie.gannett.com.

QUESTIONS
Direct them to Larry Shores, editorial page editor, at 213-5854.

ON THE WEB
Click on Opinion on The Star Press home page, www.thestarpress.com. Also, click on Forums to discuss issues of the day with editorial board member Kathleen Scott.

Most people want the reservoir kept the way it is now — as opposed to making waterfront lots available for homes.

ALTHOUGH Delaware County is years late in developing a master plan for Prairie Creek Reservoir, recent work toward that objective is encouraging and exciting. It also demands continued attention — and leadership — from local officials and citizens.

The recent change-agent has been a master plan steering committee that carefully researched its subject, gathered much input from the community and mapped out a proposal for Prairie Creek that is easily capable of sustaining and improving that valuable property.

The committee's membership is heavy on professionals, many with above-average interest in seeing the reservoir properly upgraded and protected. Their plan for the future reflects a panel that has been serious in its approach and conscientious in its recommendations.

Its plan is carefully balanced between protecting the reservoir environment and helping Prairie Creek better realize its potential for serving area residents.

HIGHLIGHTS of the report are many, but these recommendations seem particularly noteworthy:

- Better marketing of and access to the reservoir would increase its use and value to the community. Staging more events like the Fourth of July celebration is suggested, along with making it easier for users to get there. Better access from U.S. 35 was highly recommended.
- Adding hiking trails on the west side, as well as cabins, a facility for overnight stay, or educational center could make the park more appealing. The west side should be devoted to passive recreation, the eastside (swimming and pontoon areas) to active recreation.
- The city should either extend its lease of the reservoir (it expires in 2021) from Indiana-American Water Co., or the city and or county should purchase the property.
- A regional wastewater district should be established to regulate wastewater treatment in the reservoir's watershed and to collect taxes to improve treatment technologies.
- If private developments (and septic systems) continue to put the lake's water quality at risk, the Muncie Sanitary District should extend sewer lines to the reservoir.
- Wetlands should be constructed along bays and inlets to mitigate septic and agricultural runoff and enhance habitat for waterfowl and fish reproduction. Wetlands, commonly called nature's "kidneys," would trap and treat nutrients such as fertilizer and human waste, helping prevent water pollution and algae growth.
- A non-profit organization should be created to help protect the reservoir and implement the master plan.

The latter recommendations — environmental integrity and continuing committee — are crucial to the reservoir's future. The first could guard its environmental health, and the second could produce orderly, regulated development and increased public use.

THE STEERING COMMITTEE made excellent use of citizen input in helping it form recommendations. It is noteworthy that large majorities of the randomly selected group that was polled want the reservoir and surrounding area kept the way it is now, as opposed to making waterfront lots available to homebuilders.

Water quality is important to those polled, as is continuity: respondents were strong (122 to 46) that the city should buy the area surrounding the reservoir to provide more public open space and/or parks.

The public has spoken, and so has the steering committee. Now it is up to local officials — including Muncie Mayor Dan Canan, his park board and the city-county planning commission — to lead the way in implementing the report.

Their job can be made easier — and the community's stake protected — if the working committee suggested in the report becomes a reality soon. As local officials seek panel members, they should encourage the same sort of professional diversity and expertise that marked the steering committee's membership.

There is no reason why that kind of excellence can't be sustained.

SUNDAY
June 18, 2006

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Sniper hits semi, car in Delaware County

Police unsure if local shootings related to two incidents - one fatal - in southern Indiana

By GAIL KOCH
gkoch@muncie.gannett.com

MUNCIE — A semi-tractor trailer traveling on Interstate 69 near the Ind. 332 interchange and an abandoned car at a nearby convenience store were the apparent targets of a sniper in shootings that occurred early Sunday in western Delaware County.

About two hours before those incidents, two pickup trucks traveling on Interstate 65 in southern Indiana were hit by what was believed to be sniper fire, killing a man in one vehicle and injuring a man in the other.

Victims in the first shootings, which occurred about 12:20 a.m., were traveling in southbound pickup trucks on I-65 near Seymour.

Jerry L. Ross, 40, New Albany, was fatally shot as he rode in the passenger seat of a pickup truck. Two other occupants of that vehicle were not injured.

In the second southern Indiana shooting, a passenger in pickup truck that came under fire, Robert I. Hart, 55, of Audubon, Iowa, suffered non-life-threatening injuries and was treated at a Seymour hospital.

As of Sunday evening, state police had not linked the Delaware County shootings to the Seymour shootings but were examining the possibility the incidents were related.

While Seymour police investigated the I-65 shootings, Indiana State Police from the Redkey post were called about two hours later, around 2:30 a.m., to investigate shots fired at a semi-truck driven by Richard G. Greek, 57, of Kunkle, Ohio.

Greek was driving his 2006 vehicle northbound on I-69 when his rig was hit by multiple gunshots near the 42-mile marker, about a mile north of Ind. 332. Greek drove to the next exit and called police from a Gaston-area truck stop off the interstate, authorities said. He was not injured in the shooting.

As state police examined Greek's vehicle, the Delaware County sheriff's department received a call around 3:30 a.m. about another shooting nearby. An unoccupied 1996 Chevrolet Suburban had been shot multiple times while parked at the Ricker's convenience store off I-69, at the 41-mile marker near the Ind. 332 interchange.

As of Sunday evening, authorities were not releasing the name of that vehicle's owner.

➤ See SHOOTINGS, 5A


CHRIS BERGIN / THE STAR PRESS
DELAWARE COUNTY SHERIFF George Sheridan talks with Indiana State Police Sgt. Rod Russell while ISP trooper Adam Fisher looks on during a police investigation into a shooting early Sunday. Shots were fired at a semi that was driving on I-69 near Ind. 332.

Motorists to stay alert

State police from Redkey were examining the local shootings in partnership with the county sheriff's department. For hours on Sunday, an ISP helicopter flew over the area where the two Delaware County shootings occurred.


MATTHEW BERRY / THE STAR PRESS
A THRONG OF SPECTATORS crowd around a court at the Gus Macker 3-on-3 basketball tournament Sunday to watch the Kelhn and the Fab Five play.

Changes go smoothly for Gus Macker

By TROY MEZERA
tmezera@muncie.gannett.com

MUNCIE — The 17th Annual Muncie Gus Macker 3-on-3 basketball tournament saw its numbers dwindle this year, but in turn saw plenty of positives to build on for the future.

Maybe the most positive sign of all was the number of arrests — zero, according to tournament director Cindy Foster.

Seemingly always a problem at sites across the state and around the country, this year's Muncie Macker at Delta High School had no one taken away and booked.

While there were a few altercations across the 26 divisions and a few detainments during the weekend, the event ran smoothly.

"I think with less people playing and more room at this site (than Southside High School), it made for a more comfortable couple of days," said Foster, who noted there were four arrests made at last year's tournament. "Security did a great job and overall and it all went very well."

Echoing Foster's sentiments were some of the vendors who said business was good.

Larry Barth, owner of Barth Concessions, said his Giant Testerlonis stand did much better at this year's Macker.

"It's about the location and when you are out here, the people don't really have a choice to go anywhere else — unless they want to leave and drive," Barth said.

➤ See WEATHER, 5A


More inside
➤ Being a spectator is a sport all its own | 3A
➤ More about the tournament | Sports, Section B

Comments sought on future of reservoir

■ A meeting this week seeks public reaction to a draft plan for Prairie Creek Reservoir.

By SETH SLABAUGH
seths@muncie.gannett.com

SELMA — The public is invited to comment on the draft master plan for Prairie Creek Reservoir during a meeting on Tuesday at Wapahani High School. The doors will open at 6 p.m.

The plan is a document that would be approved by the city-county planning commission, city council, county commissioners, the city park board, and the county soil and water conservation district to provide policy direction on the physical development of the reservoir.

"If you are interested in what's going on with the master plan, if you have some comments you'd like to make, you should go to the meeting," said Fred Daniel, a geographic information systems planner for the planning commission. "If you want to participate in the local government planning process, you should go. It's kind of like voting. If you are concerned about water quality or recreational facilities or you live in the watershed, you should attend."

The 1,252-acre reservoir is the state's 20th largest lake. It is used for sailboating, picnicking, pontoon boating, fishing, swimming, camping, off-road motorcycle riding, horseback riding, wind surfing, dog running, wildlife habitat and other activities. It is also a backup water supply for the city of Muncie.

Planners will set up information stations at the high school to help explain the project. Planners also will be on hand to answer questions and to hand out comment cards.

"It's more of an informal, open-house format," Daniels said. "It's not a speaker-audience format."

The future of the reservoir as envisioned by the master plan steering committee includes hiking trails, more trees, and new wetlands by the bays and inlets to protect water quality and enhance habitat for waterfowl and fish reproduction.

The planning commission conducted a public opinion poll in February to help the steering committee. Virtually all of the 209 randomly selected respondents said water quality was important. The vast majority did not want to see the development of waterfront housing. And the majority wanted to see the reservoir remain like it is or to become more naturalized.

■ Contact news reporter Seth Slabaugh at 213-5834.

Fair Photo


CHRIS BERGIN / THE STAR PRESS
A GOAT stares out of a pen at the Delaware County Fair on Sunday.

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➤ Delaware, Jay fair schedules | 5A
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WHAT DO YOU THINK?
TODAY'S QUESTION: Has daylight saving time affected how late you go out to eat?
Voice your opinion with the online poll at www.thestarpress.com. To find the poll, scroll down the home page.

RESULTS FROM PREVIOUS QUESTION: Should bingo halls be able to allow smoking as "private clubs"?
Yes 54.4%
No 45.6%
Results as of 9 p.m. Total votes: 722

ALSO ONLINE
Ask the expert
Get healthy living tips from Cardinal Health System experts at thestarpress.com

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WHAT DO YOU THINK?

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East Central Indiana News

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Coming Friday: Band family tunes up for Delaware County Fair contest

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New Castle man faces charges in stabbing

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Local unemployment rates are up slightly

Yorktown merchants planning block party

Jay

Volunteers named to league's hall of fame

Randolph

Free immunizations offered to students

BSU students study online, off campus

While on-campus enrollment continues to drop, the number of students taking online summer courses from Ball State has increased.

By GAIL KOCH

A Fairly Hair-Pulling Experience

TWO-YEAR-OLD MARCI BUNCH, of Gaston, reacts as Bobby the sheep tugs on her hair as she and her family walk around the Delaware County Fair Wednesday afternoon.

Builder says 'no question' about Cardinal Ethanol plant

By SETH SLABAUGH

BSU stadium expansion up for final state approval

By RICK YENCER

THURSDAY
July 27, 2006

Future of Prairie Creek Reservoir's west bank at issue

Should it remain wild and natural or become a beach, campground or park?

By SETH SLABAUGH
seths@muncie.gannett.com

SELMA — A public meeting on the proposed master plan for Prairie Creek Reservoir on Tuesday night seemed to confirm the findings of a public opinion poll conducted in February.

"My first impression is, people don't want anything done at all," said Fred Daniel, a geographic information systems planner for the Delaware-Muncie Metropolitan Planning Commission. "Which is OK. Preserving what's there is one option."

The vast majority of those polled in February did not want to see the development of waterfront housing, and the majority wanted to see the reservoir remain as is or become more naturalized.

About 130 people attended the meeting — 30 more than Daniel's office anticipated. Only 100 public-comment forms were available. Officials said they would mail forms to those in attendance who didn't get one.

Daniel received many comments Tuesday night about the future of the reservoir's west bank, which remains mostly undeveloped and in a natural state.

"What to do or not to do with the west bank seemed to be controversial," he said.

Suggestions on the future of that area included making it more like the east bank: creating a beach, adding a primitive camping ground, and developing a park. Others want hiking trails in that area, and some want it to become more accessible to fishing.

"Some want it left the way it is, and some want more stuff over there," Daniel said.

"I'm all for keeping it the way it is, and don't much care for more development," Larry Bledsoe Jr., the Democratic nominee for third-district county commissioner, said of the reservoir in general. He attended the meeting.

Incumbent third-district Commissioner Larry Crouch, a Republican who was not at the meeting, also said he would like to see the reservoir remain "more or less the way it is," with the possible addition of trails and "more wilderness."

"We'd like to see more recreational activity as opposed to more homes," Carolyn Hughes, who lives near the reservoir, told The Star Press.

"It's nice like it is," said Kelly Rice, who lives near the reservoir.

"I hope it stays more natural," said Marsha Hammond, co-owner of R&M Bait and Tackle. "I'd like to see it stay as something all our kids and grandkids can enjoy."

"We don't want another Royerton, that's for sure," said reservoir resident Sam Poor, referring to the sanitary sewer fiasco that stemmed from the failure of septic systems in Hamilton Township.

"Nature sells," said Doug Spence of Spence Restoration Nursery, who believes the reservoir could become a Midwestern model for watershed protection.

THURSDAY
July 27, 2006

OPINION
The Star Press | Founded 1899
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Where the spirit of the Lord is, there is liberty.
II Corinthians 3:17

EDITORIALS

No-growth policy will protect Prairie Creek

OUR VIEW
Preservation, not expansion, looks to best fit Prairie Creek's future.

YOUR VIEW
Reader submissions may be published or distributed in print, electronic or other forms. Send to PO Box 2408, Muncie 47307-0408; fax to 213-5858, or e-mail to letters@muncie.gannett.com.

QUESTIONS
Direct them to Larry Shores, editorial page editor, at 213-5854.

ON THE WEB
Click on Opinion on The Star Press home page, www.thestarpress.com. Also click on Forums to discuss issues of the day with editorial board member Kathleen Scott.

FACED WITH A DECISION on growth or no-growth policies, government — in its leadership capacity — often chooses the former (aggressive) path. In the case of more development for Prairie Creek Reservoir, this appears to be ill-advised.

Another indication that Prairie Creek needs preservation, not expansion, came last week when an overflow crowd attended a public hearing on the proposed master plan for the reservoir. The strong consensus was that "people don't want anything done at all," said Fred Daniel, who is helping the city-county planning office construct the plan.

This consensus mirrored opinions gathered in an earlier poll about the reservoir. That verdict was that Prairie Creek should remain as is, or become more naturalized.

The poll rejected development of waterfront housing and other improvements for Prairie Creek's west bank, which is largely undeveloped and in a natural state.

SUGGESTIONS FOR THE WEST BANK had included creating a beach and/or camping ground and developing a park and hiking trails.

Several who are interested in the reservoir have expressed opposition to more homes in the area. They probably realize how homes would encroach on the area's environment/ecology, and how development normally encourages government to extend expensive infrastructure (roads, bridges and sewers) to the Prairie Creek area.

There is another huge reason why a stand-pat policy fits Prairie Creek.

Local government, with its declining or stagnant population/tax base, is hardly in a financial position to develop the reservoir or extend improvements. The expense is far too great.

"It's nice like it is," said Kelly Rice, who lives near the reservoir and attended last week's planning session.

"Nature sells," said Doug Spence, who owns a local restoration nursery and who believes Prairie Creek could become a Midwestern model for watershed protection.

Those like Spence understand that protecting and preserving this unique resource will maximize benefits for the entire community.

Protecting Prairie Creek looks to be the will of the public — and the policy that best predicts a healthy future for the reservoir.

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Jischke hard to replace

When Martin Jischke came to Indiana six years ago, strong leadership — not only in education but political and business circles as well — was scarce. The new president of Purdue University quickly began changing that.

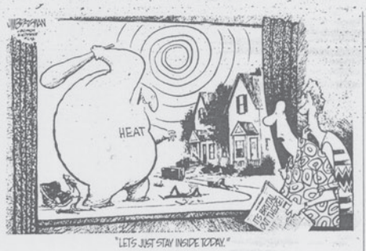
Jischke's accomplishments at Purdue, including construction of a first-class research complex known as Discovery Park and the launch of a $1.5 billion fundraising campaign, have been outstanding. Even more remarkable, however, has been Jischke's influence outside the university's campus.

He's been an energetic, highly visible advocate for rebuilding Indiana's outdated economy and improving its underperforming schools. Jischke, who on Friday announced that he will retire next year, forged strong ties with the state's business leaders, a key in developing and raising money for cutting-edge programs in the life sciences and high-tech sectors. He has been nearly as visible in Indianapolis as he has in West Lafayette.

Jischke's departure, set for June, means that both of the state's flagship universities, IU and Purdue, will undertake the search for new presidents at the same time. IU already is moving forward with replacing Adam Herbert, whose contract will expire in 2008.

Search committees at both universities would do well to study what made Jischke so successful: A clear vision of the university's mission. Strong personal leadership skills. A seemingly limitless well of energy. Boundless enthusiasm. Jischke brought all of those qualities to Purdue and in turn the entire state.

The Indianapolis Star



Public Letter Box

Report was incorrect
SUSAN CARNES
3600 W Brook Drive

Morris Windhorst, a former Muncie man accused of soliciting young children for sex, does NOT live at 1428 W. Washington St., as reported on Saturday by The Star Press. That was his former address before he was arrested. There is currently another young man living at this address who is in his early 20's, has graduated from Ball State and is currently employed in Muncie. This young man has no connection at all with Mr. Windhorst. But because of the original report, this young man has had his reputation questioned. In the future, the newspaper should try and get its facts straight before issuing such reports.

Editor's note: The address information was provided by law enforcement officials and later proved erroneous.

Why stop at cigarettes?
AARON ROSS
1705 S. Mulberry St.

In response to the editorial concerning raising cigarette taxes: By all means, raise these taxes, and while we're at it, let's raise taxes on license plates. After all, the fumes our cars contribute to air pollution put everyone at risk. Let's not stop there. How about alcohol; that puts many people at risk. What about raising property taxes because of the extra cost of recycling, and the untold millions of pounds of pollutants that put Indiana citizens at great risk? This is no more then a thinly shielded fleecing of Indiana citizens again by "My man Mitch."

Not surprised
ROBERT WEAVER
405 N. Taft Road

I'm not surprised to learn that congressman Mike Pence cannot vote for a minimum wage increase. That would do away with part-time work and some people would not be able to have enough time to work two jobs to pay their bills. Let's just keep minimum wage as it is so that more part-time jobs are available and continue to hand out abatements to the employers so that they can afford their Jaguars.

Shameful habit
CONNIE STILLWELL
3409 W. Wheatfield Lane

Twice in the last six days I've witnessed people tossing trash out of their vehicles. Where do they think this trash is going? Do they think the trash fairies will come along and make it disappear?

I'm ashamed of the way our city looks. There's garbage on the sides of the roads caught in fences, diapers and drink containers in parking lots, etc. I could go on, but I think you get the message.

People, we need to keep our city clean. This includes not tossing cigarette butts out of vehicle windows. Can't you clean your vehicle out when you get home? People who do this should be ashamed of themselves.

Why is it a plus?
BRAD PEDIGO
6612 E. Jackson St.

Sunday's front-page article on East Central Indiana's population loss quoted Mayor Dan Canan and chamber of commerce president Dan Allen as saying the region's low cost of living is a positive in our economic development efforts.

However, aside from the local real estate market, which is depressed because supply exceeds demand, exactly what areas are less expensive here than at Indianapolis or in other states — utilities, gasoline, groceries, etc.)

It's impossible for readers to make up their own minds on the effectiveness of local economic development initiatives unless the facts are presented to back up (or refute) what our officials are telling us.

Huge mistake
DONNA WEAVER
Hartford City

Every year my friends and I (there's at least 6-8 of 'us') look forward to the End of Summer Jam in downtown Muncie. It's an annual "girls night out" for us, a tradition we started and planned to continue. But, not this year.

Who is the bright one to decide to schedule the concert for 3 p.m. instead of the usual time? A lot of people have to work on Saturdays, but hope to have an evening free to enjoy the concert. If you think having the concert that early is going to generate more people going to the Ball State football game that night, think again. And think very hard.

Why not have the concert after the game? I feel like a huge mistake was made in the new time for this concert, and that devoted fans will disappear.

Doonesbury

GARRISON KEILLOR
Tribune Media Services

Stuck in a dang-nab heat wave

IT IS STIFLING HOT in Minnesota, more like Savannah than St. Paul, and if the heat wave goes on much longer, I am bound to start writing a play in which folks sit around in their underwear beneath a ceiling fan and drink sloe gin and curse the degeneracy of their ancestors that cost them the old plantation.

Up here, we associate heat with degeneracy. Once the temperature gets above a hundred for several days in a row, you expect to see the minister canoodling with the church secretary and getting jazzed on joy juice, and the deputy shooting the sheriff over a hand of euchre. And you expect to come to church and see some make-handling.

Episcopalians have pretty much ignored snake-handling, but a few more weeks of this heat could change things. Attendance was good at our church last Sunday morning, considering the heat, and the sermon was okay (about having faith that the Lord will provide), but something in me wanted Father Frank to come right down into the congregation and pull out a gun and yell, "You peckerwoods have been ignoring me for too long now and I'm sick of it!"

Guns aren't allowed in churches up here in Minnesota, but in Texas and all through the South, I'm sure that the deacons are packing heat and anybody in a long white robe has got at least a .38 special under his belt.

I never touched a banjo before in my life, but I got one down from the wall this morning and was frailing it and singing about Dixie, and the demons of liberalism left my body and I saw the light and also my dropsy cleared up. Wham. Just like that.

IT'S HOT HERE. And so the governor of Minnesota is campaigning for re-election on a platform of No New Taxes and Less Gummint, and I for one say Hallelujah. Taxes is way too high as it is. There is no point in pouring money into these danged schools and filling they heads with notions, let 'em learn to read the Holy Word, that is enough for any normal person. And quit telling us what we can and cannot do with our property. I intend to raise chickens in my garage and paint Scripture verses on my house and sell melons off the front porch and a medicinal formula called Rise & Shine which cures gout, dyspepsia, timidity, and female problems. It is none of the gummint's bidness what I do here. According to Mr. Samuel Colt, this is still a free country.

The governor also wants to bring back capital punishment. Hail, yes! It's been more than a century since we had public hangings here in St. Paul and about time we get back to it. With this heat, we're going to have sex criminals galore, serial killers, traitors, blasphemers, hermaphrodites wanting to marry flag burners, you name it, and I say hanging's too good for that scum. Let's learn them at the stake, and let's stone the adulterers and cut the hands off the thieves. Vengeance is mine, sayeth the Lord. Hand me down another pint of bushead, honeypie, and fry us up some possum, and you children hush or I will clobber you so hard you'll be seeing stars for a week.

Hot enough for me? I thrive on heat, Precious. Heat is my natural element. And seeing you walk around barefoot in that little ole dress is getting me hot and bothered. Never mind the possum. Come here and sweeten up to your papa and then let's go out and shoot some beer cans.

Garrison Keillor is substituting for Mitch Albom.

Welfare kings on tractors sap our country

JONAH GOLDBERG
Tribune Media Services

FOR THE FIFTH SUMMER in six years, I'm driving across the country. Aside from the country's immense beauty, the decency of its people and the impossibility of finding a good cup of coffee near the interstate, one of the things you start to appreciate when you've seen a lot of America is how sparsely populated it is in the middle. It seems the welfare recipients need a lot of room.

I'm referring, of course, to American farmers. Or, more precisely, American farm owners, a.k.a. Welfare Kings.

There are few issues for which the political consensus is so distant from both common sense and expert opinion. Right-wing economists, left-wing environmentalists and almost anybody in between who doesn't receive a check from the Department of Agriculture or depend on a position from said recipients understand that Americans are filling billions to prop up the last of the horse-and-buggy industries.

At this nation's founding, nearly nine out of 10 workers were employed in agriculture. By 1900 it was fewer than four in 10. Today, fewer than one in every 100 workers is in agriculture, and less than 1 percent of gross domestic product is attributable to agriculture. Yet America spends billions of dollars subsidizing the system.

IT'S ALMOST IMPOSSIBLE to know how much agricultural subsidies cost U.S. taxpayers. But we know from the Washington Post's recent reporting that since 2000, the U.S. government paid out $23 billion to "farmers" who don't farm. They were simply compensated for owning land previously used for farming. A Houston surgeon received nearly $500,000 for, literally, nothing. Cash payments have cost $172 billion over the last decade, and $25 billion in 2005 alone, nearly 50 percent more than what was paid to families receiving welfare.

But those sorts of numbers barely tell the story. Subsidies combined with trade barriers (another term for subsidy) prop up the price of agricultural commodities for consumers at home while hurting farmers abroad. This is repugnant because agriculture is a keystone industry for developing nations and a luxury for developed ones. Hence we keep Third World nations impoverished, economically dependent and politically unstable. Our farm subsidies alone — forget trade barriers — cost developing countries $24 billion every year, according to the National Center for Policy Analysis. Letting poor nations prosper would be worth a lot more than the equivalent amount in foreign aid. But Big Agriculture likes foreign aid because it allows for the dumping of wheat and other crops on the world market, perpetuating the cycle of dependency.

THEN, OF COURSE, there's the environment. Subsidies sap the ecosystem, but the full environmental costs are incalculable. If global warming concerns you, consider that American farming is hugely energy intensive. Swaths of forests and wetlands have been cleared or drained to make room for farmland that would never earn a buck if not for welfare support. Who knows how much cleaner the air and water would be with those resources intact? And who knows how many more dubious "wetlands" would be free for productive economic development?

There's a lot of romance about the family farm in this country. But that's what it is: romance. Most of the Welfare Kings are rich men — buffalo farmer and CNN founder Ted Turner is one of the biggest. Of course, there are small farmers out there, but they have no more right to live off the government teat than the corner bakery I so loved as a child but that couldn't keep up with the times. We don't have a political system addicted to keeping bakers rich.

Meanwhile, our system — chiefly the U.S. Senate, which gives rural states outsized power, and the Iowa presidential caucus, which forces politicians to whore themselves to agricultural welfare — is rigged to prevent real free-market reform.

I'm all in favor of farming when it's economically feasible. And while many of these folks I meet on my adventures are the salt of the earth, I don't see why they shouldn't pull their own weight.

The Prairie Creek Master Plan has been a joint effort between

Delaware-Muncie Metropolitan Plan Commission

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Delaware County Soil and Water Conservation District