Nature will not be admired by proxy. ~Winston Churchill
NATURAL RESOURCES & LAND STEWARDSHIP

In 1993, Indy Parks ushered in many positive changes, which will continue to evolve and influence the Indianapolis park system into the 21st Century. As a result of creating the ten-year strategic plan, Pathways to Success, changes were implemented that embodied the newest and best approaches to the field of park and recreation management. One of the pathways called for Stewardship of community spaces. The Land Stewardship Section of Indy Parks manages natural resource areas within parks.

Indy Parks recognizes the need to manage natural areas, a change from the old philosophy of no management at all. Today’s natural plant communities are isolated fragments, lacking the stability of larger ecosystems. These small fragments are very susceptible to degradation. One negative impact is caused by biological pollutants. An example of a biological pollutant was introduced in the form of nonnative plant species, some of which invade and displace native plant communities. Careful management of remnant natural spaces will help protect these dynamic and unique natural systems for which people and wildlife depend.

The land is subject to continuous change. The last glacier retreated from the central region of the state over 18,000 years ago. This glacier overrode and cleared the previous vegetation, leaving a bare surface for the next wave of plants to succeed. European settlement was the next major disturbance on the landscape. The original flora was cleared in less than 200 years and often replaced with plants native to Europe and Asia.

Parks preserve open spaces that contain some natural areas. Nonnative plants dominate many of the abandoned agricultural fields and other open spaces in parks. Depending on proposed land use, some of the large fields located in parks can be managed to reclaim the naturalness of the site. In an effort to restore the native landscape, land stewards reintroduce indigenous species. Native vegetation is generally less expensive to maintain and is ideal for recreation such as hiking, nature exploring and wildlife viewing. Native plant introduction and management of degraded sites will increase biotic diversity while improving the land’s ability to cycle air, water and nutrients.

Indy Parks manages over 11,140 acres of parkland and greenways. Protection of natural areas and restorative management of open spaces are keys to sustaining a healthy living environment and vibrant economy. People need natural, quiet areas to recreate, enjoy nature and balance an often fast-paced lifestyle. Other benefits that natural spaces provide include their ability to reduce the effects of heat islands, filter air and water contaminants and decrease storm water runoff.

Indy Parks shares a social responsibility to manage natural resources for future generations. Indy Parks coordinates land stewardship programs in cooperation with, and assistance from, other City departments, state and federal agencies, corporations, volunteers, conservation groups, businesses, and universities.

Land Stewardship programs at Indy Parks include:
Invasive species control
Wetland restoration and enhancement
Reforestation of floodplain and upland areas
Native plant landscaping
Parkland stewardship plans
Educational booklets and brochures
Informational signage
County wide inventories
Specifications for best management practices

Natural Areas

Exploration, nature observation, hiking, running and picnicking are popular activities in both natural areas and those areas perceived as being natural. A natural setting in park and greenways could be considered the most appropriate environment for most of these popular passive recreation activities.

A small percentage of the remaining woodlots contain natural forest plant communities. Natural areas are represented by plant assemblages and topography that reflect natural changes since the last ice age.

Significant natural areas found are recorded on a database maintained by the Indiana Department of Natural Resources, Division of Nature Preserves.
The natural area types represented in Marion County are: Mesic Floodplain Forest; Mesic Upland Forest; Dry-Mesic Upland Forest; Wet-Mesic Floodplain; Wetland Fen; and Central Till Plains Flatwoods.

Indy Parks cooperatively manages four State Dedicated Nature Preserves in public trust that comprises 460 acres. Of these preserve acres, — 310 acres contain areas that have intact natural plant communities. The nature preserves within Indy Parks are Woollen’s Garden, Marott Park Woods, Eagle’s Crest Woods, and Spring Pond.

Other natural areas are present in small portions throughout various park properties including Holliday, Eagle Creek, Southwestway, Southeastway and Raymond Park. These non-preserve sites comprise 575 acres of Indy Parks. The former Fort Benjamin Harrison contains the largest area of forested natural area at 800 acres, which is now protected within the State Park. In total, there are 1,685 acres of natural plant communities at park designations in Marion County.

Some of the state’s rarest plants are found in Marion County. These are listed at the Indiana Natural Heritage Data Center.

New land acquisitions will help preserve some of the remaining woodlots that contain natural plant communities. It is important to catalog remaining plant communities. Unique sites need to be monitored for qualitative changes and appropriate protection measures should be taken to help ensure their survival.

**Invasive Species Plant Control**

A small percentage of the remaining woodlots are natural. The naturalness of a site is compromised when invasive plants choke native flowers, grasses, sedges, shrubs and trees. When this happens, the natural diversity (or biodiversity) of an ecosystem is compromised. Common yard plants are some of the biggest problem species in natural areas. Wintercreeper vine, burning bush, and privet are a few of the problem plants. Efforts are ongoing to control the worst invasive plants before they destroy natural areas. Indy Parks is able to complete an average of 45 acres of invasive plant control each year.
Many of the woodlands in the county have been overtaken by bush honeysuckle. As the honeysuckle reaches maturity, the native wildflowers, grasses, seedling trees and shrubs die off leaving bare soil in a forest that can no longer regenerate. The honeysuckle bushes are being controlled and native plants are being reintroduced.

Butler University, Dr. Dolan conducts floral inventories so changes in the plant community can be monitored.

Wetland Restoration

Indiana has lost 85% of its original wetlands due to farming and development pressure. Wetlands are being reestablished in Indy Parks each year. Part of the work includes restoring the hydrology by removing field tiles and reintroducing sedges, rushes, grasses, shrubs and wildflowers. Over 50,000 wetland plants have been installed over the last seven years.

Raymond Park
Science classes helped restore this wetland sedge meadow.
Reintroduction of Native Plant Communities

Much of the land was cleared of vegetation by the mid-1800s. Open spaces that were previously in another land use are being reclaimed and managed as wildlife habitats. Large agricultural fields and turf areas are planted to mitigate the effects of pollution and to provide the opportunity for nature observation. Indy Parks (with the help of many partners) has installed 45,000 native plants in landscaping projects, planted 30,000 native trees and shrubs, and converted over 85 acres of turf and former agricultural fields into native plant communities.

Holliday Park: Conversion from turf grass into native under story plants.

The Land Stewardship Office coordinates restoration programs at Indy Parks in cooperation with park staff and other Indianapolis City departments. State and federal agencies, corporations, volunteers, conservation groups, businesses and universities are also involved. Friends and neighbors are encouraged to contact Indy Parks to learn more about volunteering for restoration programs.

Eagle Creek Park
Former farm field planted with prairie seed.
Geographic Setting & Geologic Framework

Marion County is approximately 402 square miles and is located near the geographic center of Indiana. It is situated in the lower third of a large natural region called the Tipton Till Plain. The till plain is a product of several periods of glaciation. Glacial deposits cover the surface of Marion County. These deposits include clay-rich material (till), and alluvial deposits (sand and gravel). At least three glacial advances infilled an early dissected landscape of sedimentary rock. The overlying glacial deposits range from approximately 15 to 300 feet in thickness according to Geology for Environmental Planning in Marion County, Indiana.

Major outwash deposits of sand and gravel are largely concentrated in the White River Valley, but also occur in smaller Buck, Eagle, and Fall Creek stream valleys. The bedrock is naturally exposed in just one place in Marion County. This exposure is just south of Holliday Park in the White River channel and can be observed during dry summer periods.

Indy Parks recognizes its responsibility to help acquire unique natural features such as oxbows, steep ravines and escarpments in stream valleys. These features, preserved within parkland, are important for recreation and education. Nature enthusiasts enjoy scenic natural features. University instructors take students out in the field to educate them in natural history, ecology, geography and geology.

Topography of Marion County

Landscapes are very dynamic and evolve over time through continuous processes of erosion and deposition. The last glacier that retreated from the Marion County area left a gently rolling surface. Meltwater flowing under the ice is thought to have formed part of the White River valley; however, most of the major features were formed by very large rivers and streams from the melting and retreating ice lying farther to the north. The relatively deep valleys of the White River and Fall Creek are prominent topographical features that now serve as floodplains for modern streams.

While the local relief is rarely more than 100 feet, the elevation difference within the county is roughly 267 feet. With so little variation in topography, almost any overlook becomes a unique feature. Glenn’s Valley and Southwestway Parks contain overlooks situated on what was a large glacial river delta. Mann Hill in Southwestway Park is a delta feature of glacial origin that stands 170 feet over the White River floodplain. Eagle Crest Nature Preserve houses a bluff, which drops 60 feet to the valley floor. Such parks containing hilly areas serve many purposes such as habitat for rare plant communities, recreational opportunities, and scenic views.

Marion County: Vegetation at Settlement

Historical written information gives a better understanding of the plant communities before European settlement. The landscape held at least three peat bog remnants and roughly 3,000 acres of open swamp and marsh. Over 99 percent of the land area was closed canopy forest. This information is available now in digital formats and it will be used to interpret our natural heritage, aid in restoration activities, and to locate unique geological and natural features.

Witness tree data and 1911 soil maps were reproduced in a digital format using GIS technology. The IUPUI Center for Earth and Environmental Science (CEES) was provided a grant by Indy Parks that helped fund a project to provide tools to interpret pre-settlement vegetation information for Marion County. This project was done in cooperation with the Indiana Department of Natural Resources. The report is available as hard copy and digital format for GIS applications.
Open Space Characteristics

Rural open space (vacant land) is defined for this document as tracts of land with relatively few artificial structures. These open green spaces are often vegetated with seasonal row crops, grass, wooded tracts, old field and riparian wetland vegetation. The gently rolling to nearly flat topography in the Southeast and Southwest corners of the county contain large areas of open space now being used for agriculture. The remaining contiguous wooded open space is primarily concentrated in steep ravine topography around Eagle Creek and Geist Reservoirs. Scattered woodlands in other parts of the county are typically found in floodplains or wet depression areas that could not be easily drained. In urban areas, potential land use is limited by impervious surfaces and surrounding land use. By contrast, open space can be managed in a wider variety of ways.

Wetlands

Wetlands in Marion County range from the open man-made detention basins and reservoirs to the more natural springs, seeps, seasonal ponds and marshes.

According to Cowardin et al., in 1979, “Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.”

Artwork by Dawn Kroh

Many of the springs, seeps and seasonal ponds are not on wetland maps and escape attention. Most of the man-made wetlands are more obvious to the casual observer because of the typical open characteristic of detention basins, ponds or reservoirs.

The reservoir at Eagle Creek Park serves recreational needs by providing a water body for fishing, swimming, canoeing, rowing, sailing and nature observation.

During the summer and fall, lowered water levels expose mud flats that provide habitat for shore birds and waterfowl. This naturalized wetland environment is large enough to attract a diverse population of birds, often rare species. The engineered habitat has provided a resource that has gained national attention for its excellent bird watching opportunities.

Over 75 percent of the Marion County landscape at the turn of the 19th century contained poorly drained upland flatwoods with depressions that ponded in the Spring and Fall.

Vernal pools were the most common wetlands in the Marion County area. The vegetation communities included Beech, Oak, Maple, Elm, Ash and Walnut trees. Today, in the remaining seasonal pools, the songs of the Spring Peeper frogs can be heard in March and April during breeding.

Often smaller and less recognizable wetlands and communities are the seeps that trickle out of exposed hills and stream banks. Seeps and springs often flow year round. Under the right conditions, seeps and springs may form fens, which are water saturated deep muck soils formed by the decay of vegetation. Fen plant communities are rare in Marion County.

Holliday Park has a high quality fen near the river, and several hill slopes where seeps are very visible from the trail. Lesser known are the small seeps in Eagle Creek Park and at Southwestway Park.

These fen and other wetland areas have unique plant communities. All known remaining wetland areas in Marion County have moderate to severe cultural impacts, such as, damage from invading, non-native vegetation and chemical runoff. These small wetlands also provide some of the habitat requirements for birds, bats, dragonflies and butterflies.

Cold Springs Road is true to its name. Along the roadside ditch are seeps that were tiled into concrete...
collection tanks. One example is the small spring wetland at the entrance to Lake Sullivan and the Major Taylor Velodrome. Although the site has undergone many cultural impacts, it attracts wildlife such as redwing blackbirds, frogs, and dragonflies.

**Detention Basins**

There are no natural lakes or ponds in Marion County, however, engineered lakes and ponds are a common sight in Indianapolis. These basins act as small reservoirs that temporarily hold storm water runoff and release it at a controlled rate into the drainage systems. Storm water basins in parks are usually not constructed to serve a natural function such as filtering water or providing wildlife habitat.

Most existing basins have limestone rip rap to line the steep shorelines. However, there is a updated storm water ordinance that mandates naturalized basins or engineered wetlands. These provide benefits of improved aesthetics, increased water filtration and wildlife habitat.

**Mitigated Wetlands**

Indy Parks is often contacted by design engineers about potential mitigation sites. Wetland mitigation is a regulated wetland replacement program. Building a wetland is usually a condition before a permit is issued to drain or fill an existing wetland. Indy Parks evaluates whether to provide places for wetland mitigation on a per case basis.

**Rivers and Streams**

Numerous creeks, brooks, runs and ditches drain Marion County. They all eventually flow into the White River (although Buck Creek in the southeast corner of the county takes a roundabout route via the Big Blue River). In 1983, the Federal Emergency Management Agency identified 34 Marion County streams. These streams, plus 4 others identified by park staff, represent the bulk of Marion County waterways with a collective length of 233.5 miles.

Natural characteristics of major waterways include relatively stable flow rates, low sediment and nitrogen loads, sustained and adequate dissolved oxygen levels, meandering channels, natural plant communities and corresponding native plant and animal diversity.

From an ecological standpoint, the highest and best use for riparian corridors is as managed natural space. The National Park Service published a booklet called, *How Greenways Work: A Handbook on Ecology* that...
explains the ecological functions of riparian corridors. The handbook lists six ecological functions of riparian corridors. These functions are: 1) as habitat for plant and animal communities 2) as a conduit for plants, animals, water, sediment, and chemicals 3) as a barrier preventing movement 4) as a filter allowing some things to pass while inhibiting others 5) as a source for animals or seeds which move to other parts of the landscape and 6) as a sink for trapping sediment, toxins, or nutrients.

In its natural form, the riparian corridor fully functions to absorb water, reduce flooding, and recharge ground and aquifer water resources. The water stored within the land is then slowly released back into rivers and streams, sustaining summer water flows in periods of no precipitation. Land use in the floodplain directly affects the natural function of the corridor.

The public benefits of riparian corridors have been acknowledged since the early parkway systems. Indy Parks Greenways is building more access to meet the demand for self-directed passive recreation. The 2004 Indianapolis Greenways Plan further explains the quality-of-life benefits and the challenges facing the city as it continues to work towards improving water quality.

No Mow or Reduced Mow Areas.

In 2005, our land stewardship, planning, and maintenance divisions intentionally focused on areas of non active recreational use in our system which could be converted to more natural/native palette or put on a no mow/reduced mow schedule. This strategy proved to be successful along more natural sections of our greenway corridors and in our parks. This strategy is just the first step in returning more areas to a more natural habitat. As mentioned before subsequent stages could include: natural/native plantings, wetland restoration/mitigation, open woods or reforestation. The benefits to Marion County residents is positive both economically and environmentally. Reduction of these areas from mowing would:

1. lower cost to tax payers (reduction of maintenance dollars needed to provide service over time would be greater)
2. lower carbon emissions (reduction of gas power mowing equipment and non-turf plant palette sequesters more carbon gases, non-turf plant palette releases more clean oxygen than turf alone)
3. cleaner rivers and streams (non-turf palette lowers contaminant run off into natural streams and rivers)
Marion County and its Cities exist under the canopy of our urban forest. The urban forest is a term used for the total of all vegetation growing within an urban area. Trees are the dominant features of the urban forest. The amount of trees within an urban forest is often expressed as a percentage of land area covered by trees as seen from above. Marion County’s canopy cover varies by township and is shown below.

Indy Parks is responsible for flora issues on all City and County owned property. This includes parks, street right of ways and other properties owned by local governments. Indy Parks is therefore responsible for over 1 million trees. Due to city and community efforts, Indianapolis has been awarded the distinction of being a Tree City USA for the past 16 years.

Indy Parks Forestry section ensures public safety by maintaining street and park trees and by responding to tree related emergencies such as storm events.

Over the next five-year period, urban forestry efforts will be concentrated on the following priorities:

- Continuing to provide essential tree maintenance services within Marion County.
- Expand the care provided to young trees within the park system.
- Implementation of suggestions provided by the Mayor’s Task Force on Tree Issues.
- Creation of an urban forestry advisory board for Marion County.
- Increasing overall canopy coverage within Marion County.

Marion County: Wildlife at Settlement

From 1820 to 1822, Government Land Office Surveyors superimposed a grid that framed and set order to the wilderness area that became Marion County.

Early settlers encountered a wild landscape described in A Home in the Woods. This account describes a land of endless trees. The animals were reported to include walleyed pike (fish), ruffed grouse (bird), turkey, squirrel, bobcat, deer, and an occasional bear. The story told about the challenges of pioneer life and joys of having a land with abundant natural resources.

The wilderness of Marion County was mostly forested swampland. It was quickly converted to support a European style of agriculture. By 1876, 60 percent of the original forested sites were cleared primarily for agricultural purposes. By the early 1900s, most of the original vegetation was heavily disturbed or completely removed.

Cleared forest area for agriculture purposes
Bass Collection, Indiana Historical Society

Habitat and wildlife are codependent. Habitat is the total minimum environment needed by animals for shelter, cover, water, and food to ensure survival and reproduction.

Animals perform ecological functions that regenerate habitat including pollination, seed dispersal, and decomposition. Wildlife and habitat together provide a food chain for herbivores and carnivores that support the predator-prey relationships that form a balanced ecosystem.

The type and quantity of resident and migratory
natural resources
wildlife depends on the availability of habitat. In large natural areas, the food chain and original habitat structure may support forest dwelling wildlife like the Prothonotary Warbler, a forest dwelling neotropical migrant.

Some predatory animals, such as the great horned owl, fox, and weasel require a relatively large range with several types of habitats for shelter and cover. Some species of wildlife, such as the opossum, can survive in an urban habitat.

The habitat requirements needed to attract and sustain certain kinds of wildlife are available. However, the habitat and wildlife in Marion County has not been inventoried in a comprehensive way. More information is needed to begin management and protection strategies for wildlife and habitat.

Wildlife provides many people with enjoyable opportunities for education and recreation. The nature centers at Indy Parks are filled to capacity each year due to the demand for environmental education and wildlife programs.

The public, as well as private groups like the Amos Butler Audubon Chapter, Sierra Club Heartlands Group, and The Indiana Native Plant and Wildflower Society share their joy and appreciation of wildlife and flora with children and adults.

Popular wildlife species in Marion County include birds, chipmunks, butterflies, lightning bugs, dragonflies, geese, ducks, turtles, fish, raccoons, snakes, bats, and deer.

The Indiana Department of Natural Resources, Division of Fish and Wildlife regulates game and non-game wildlife in Indiana. The Division of Fish and Wildlife and Indy Parks manages public access sites in Marion County to help meet the demand for fishing.

The Indiana Natural Heritage Data Center is maintained by the Indiana Department of Natural Resources, Division of Nature Preserves. This database is updated with information on animals that have special status at a federal and/or state level. The sites for rare habitats and animals are monitored so protection strategies may prevent further loss or extinction. Some of the species listed are not confirmed and may no longer be present.

The majority of wildlife in Marion County relies on open fallow fields, woodlots, and riparian corridors for habitat. As fallow farm fields make way for an expanding population, the parks and greenways may be some of the last areas that could offer habitat for some species of wildlife in Marion County.

In an effort to protect habitat for wildlife, The Central Indiana Land Trust Inc., INDNR, citizens groups, Indy Parks, and conservation groups are acquiring lands for wildlife and recreational use. Acquisition and funding issues are among topics of serious discussion as efforts are made to prioritize lands for public use that provides environmental quality, habitat, wildlife and recreation opportunities.

Soils in Marion County

The soil types are organized and named according to their characteristics. The Soil Survey of Marion County, Indiana (1978) provides an explanation of the soil classification system and the mapping of soil types.

The survey is designed to assist in land use planning.
and soil management. Qualitative categories were created that rate soil characteristics and limitations for various land uses. These categories are: building site development, sanitary facilities, water management, construction materials, recreational development, crop management, and woodland management.

The Natural Resource Conservation Service and the Marion County Soil and Water Conservation District provide technical assistance in determining soil limitations and recommending best management practices.

Determining the general soil associations at the watershed level is one tool used for locating potential parkland and planning recreation areas. Soil behavior is a term used to describe soil limitations based on how different types of soil react to specified land uses. The soil wetness, percolation, or shrink and swell behavior can be termed good or poor depending on the proposed use. Wet or poorly drained soil may not be considered a proper building foundation for load-bearing structures, whereas, wet or poorly drained soils are integral to wetland and forest natural systems.

Relatively undisturbed soils in a forest or wetland may be better used for passive recreation and protected and managed as a conservation or natural area. Recreational lands may also require space for parking and buildings to support outdoor and indoor activities. Soil limitations can play a key role in determining the sustainable use of the structure and the cost of maintenance.

The soil, for all practical purposes, is a non-renewable resource. Approximately seven inches of the estimated fourteen inches of pre-settlement topsoil is no longer present in Marion County. Unprotected soil in dry or wet conditions is eroded by blowing or washing away.

The soils that are present are deficient in valuable nutrients such as carbon. These nutrients are being removed faster than they are replaced. It is important to always follow best management practices and regulations to protect soil and water bodies from further degradation.

Silt Deposit
Photo by INDNR, Division of Soil Conservation