Division of Nature Preserves

Indiana Nature Preserves

2010 Annual Report:

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Executive Summary

The Division of Nature Preserves is charged with finding, protecting, and managing examples of Indiana's natural communities, coastal resources, and rarest species for the benefit of present and future generations. It is comprised of four primary components: Nature Preserve Protection, Nature Preserve Management, the Natural Heritage Data Center, and the Lake Michigan Coastal Program. The Division is funded by a variety of funding sources, including trust funds, grants, and general funds. Approximately half of the staff are paid by non-general fund sources, and all of the remaining staff receive a portion of their funding from non-general fund sources (See Figures 1 and 2). Division staff work in nine locations scattered around the State, including the Central Office in Indianapolis.

During 2010, some of the field inventory work resulted in the discovery of two plants thought to have been extirpated from Indiana: river broomrape and Southern wood violet. DNP Ecologists also completed a multi-year ecological and botanical assessment of designated Special Areas found on the Hoosier National Forest, and a two year project to help develop wetland assessment methodology as part of USEPA's upcoming national wetland sampling. Staff also monitored 50 occurrences of endangered plants.

The Natural Heritage Database now contains 16,466 element occurrences (rare plants, animals, natural community locations), and during 2010, 811 new records were entered and 4,011 records were updated. Staff answered 712 information requests and conducted 990 environmental reviews, 117 flood permit application reviews, 121 public lake permit application reviews, and 50 coal permit application reviews. Forty-three collecting and research permits were issued. The certified ginseng harvest was 3,940 pounds; and twenty-nine ginseng dealers were licensed.

There is at least one nature preserve in every natural region in Indiana except the "Black Swamp" Region, located in eastern Allen County. Nature preserves contain at least one example of all but two of the 58 natural community types known to occur in the State. Of the 213 state-endangered plants, there is at least 1 protected example of 179 of them. All but 3 of the 88 threatened species have at least 1 population protected, and only 2 of the 115 rare plant species have no protected populations.

To date, 235 nature preserves have been dedicated. They are owned by 45 different owners, which include 5 different DNR landholding divisions, 8 land trusts, 18 city/county governments, and 3 colleges/universities. Nature preserves protect some of Indiana's most diverse landscapes, including dunes, sand prairies and savannas, wetland complexes, lakes, rivers, forested ecosystems, glades, karst features, prairies, fens, bogs, swamps, and geologic features. In 2010 six new preserves were dedicated, including the largest, Ten O'Clock Line at Brown County State Park. The others were Sherman Minton Nature Preserve, which contains a landscape sized portion of "the Knobs" in Floyd County, the Tom and Jane Dustin Nature Preserve along Cedar Creek in Allen County, Low Gap Nature Preserve in Morgan-Monroe State Forest, Miller Ridge in Yellowwood State Forest, and Mossy Point, along Sugar Creek in Parke County.

Regional ecologists managed over 2000 acres in 2010, removing invasive species, installing and repairing trails, restoring wetlands, and planting prairie and wetland species. Large restoration projects funded through the Great lakes Restoration Initiative are underway at several areas in Lake County. Regional ecologists were involved with prescribed burns at 17 different properties encompassing over 1000 acres. A water control structure was installed at Round Lake, Starke County, restoring the lake to its normal level. Technical assistance was provided to a number of agencies, and conservation planning efforts helped with the decision making for the future use of the now closed Newport Chemical Depot in Vermillion County. Conservation planning was also provided for Governor Daniel's Healthy Rivers Initiative projects along the Sugar Creek, the Muscatatuck, and the Wabash Rivers.

Public dedication ceremonies were held honoring Fr. Damian Schmelz, dedicating an addition to Donaldson Woods Nature Preserve in his honor, and to dedicate the Tom and Jane Dustin Nature Preserve in honor of the Dustin's, two of Indiana's eminent conservationists. DNP staff participated in many outreach activities to over 6,000 people, leading hikes, giving talks, writing articles for Outdoor Indiana magazine, leading volunteer work days, and at the State Fair.

The Lake Michigan Coastal Program hosted the 2010 Great Lakes Regional Meeting in Chesterton on Sept. 22-24. The "Ecosystems of the Indiana Coastal Region – The Dunes" poster was unveiled in conjunction with the official dedication of the Indiana Dunes State Park Nature Center on October 28. LMCP funded 19 projects in 2010 through its matching grant program, passing through funds from NOAA totaling $676,000. While in 2010, we had 35 projects open (across all grant years) totaling $968,777.

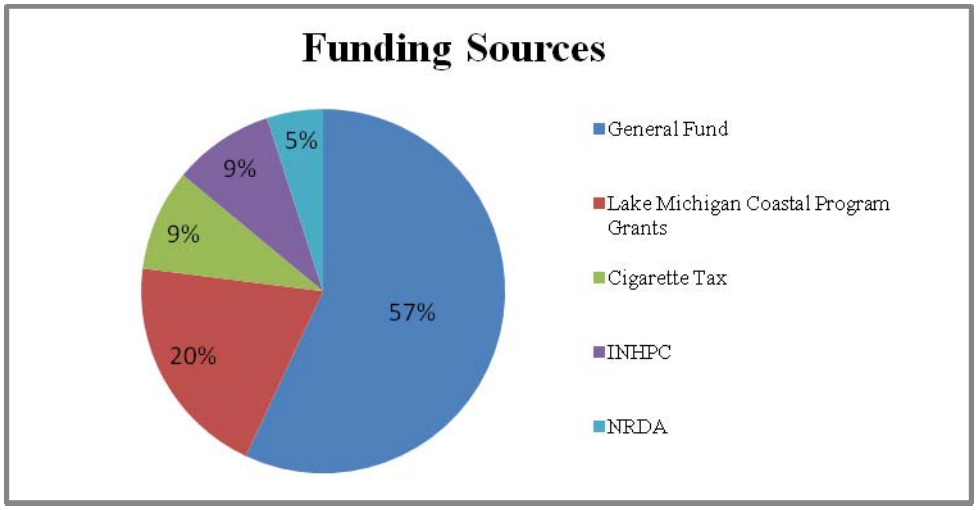

Figure 1. Funding sources for the Division of Nature Preserves.

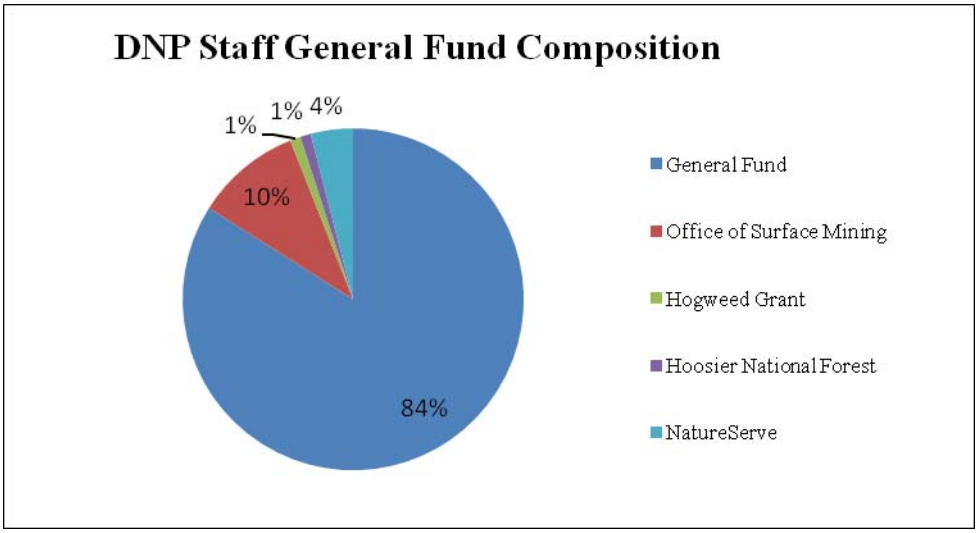

Figure 2. Composition of funding sources.

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I. Introduction

The Division of Nature Preserves is made up of four components: the Nature Preserve Program, Preserve Management Program, Natural Heritage Data Center, and the Coastal Program. The Nature Preserve Program works with numerous partners to protect natural areas through acquisition and other protection actions and dedication into the State Nature Preserve System. The Preserve Management Program takes care of Nature Preserves using many restoration and management activities, including prescribed burning and control of invasive species; the program also provides access to Nature Preserves by providing parking and trails where appropriate. The Heritage Data Center collects data on rare species and high quality natural communities which are used in two primary ways. The Department's environmental review process uses the data to avoid impacts to important natural features. The data are also used to guide conservation efforts of agencies and organizations across Indiana. The Coastal Program is responsible for coastal activities including natural, cultural, and historic resource activities in the Indiana Lake Michigan Coastal Zone, providing grant funding for a variety of projects, as well as being a central clearinghouse for natural resource conservation and planning.

MISSION

The Indiana Legislature passed the Nature Preserves Act in 1967, creating the Division of Nature Preserves, charging it to work with partners to set aside and preserve areas of unusual natural significance for the benefit of present and future generations. Since that time, Division staff has worked with colleagues in the Department of Natural Resources, and with partners throughout Indiana, to catalogue Indiana's flora, fauna, and natural areas, striving to set up a system of nature preserves that includes examples of all the natural areas and rare species habitat that occur in Indiana. While not totally complete, much progress has been made. At least one example of 56 out of 58 types of natural communities found in Indiana at the time of settlement is included in Indiana's nature preserve system. Ninety percent of the 416 plants considered endangered, threatened, or rare have viable populations in Indiana nature preserves.

> *The mission of the Division of Nature Preserves is to identify, protect, and manage an array of nature preserves and natural areas in sufficient numbers and sufficient sizes to maintain viable examples of all of Indiana's natural communities. Nature Preserves will also manage and maintain viable populations of endangered, threatened and rare species. These activities will be conducted for the benefit of the natural communities, and their representative species, as well as for the benefit of future generations of mankind.*
>
> *The purpose of the Indiana Lake Michigan Coastal Program is to enhance the State's role in planning for and managing natural and cultural resources in the coastal region and to support partnerships between federal, state and local agencies and organizations. The Indiana Lake Michigan Coastal Program relies upon existing laws and programs as the basis for achieving its purposes.*

Funding

For a number of years, the Division's Operating Budget was funded through the Indiana General Fund, and its Capital Funds alternately were either Cigarette Tax or General Fund. Starting in the 1980's, as new staff positions were added to the Division to meet increasing demands, they were paid for with alternate funding sources. Currently, 43% of Division staff is paid through a variety of non-general fund sources: INHPC Endowment, Coastal Program, Natural Resources Damages Account, and Cigarette Tax.; 57% are paid with General Fund monies (Figure 1). For General Fund paid staff, all have a portion of their salaries paid by non-state funds. These funds include grants from Office of Surface Mining, US

Fish and Wildlife Service (USFWS), and other grants. A portion of the time of most of these employees also serves as match for employees paid for with NOAA Coastal Program funds. Additionally, all seasonal division employees have at least a portion of their salary paid for by federal grants, which further enhances taxpayer funds, enabling more natural resource work to be accomplished with less state funding (Figure 2). See Appendix A for a listing of Nature Preserve staff.

II. INDIANA NATURAL HERITAGE DATA CENTER

The Indiana Natural Heritage Data Center collects and manages natural resource data, including rare plants, rare animals, and natural community information; it is used to conserve the State's biological diversity. Division ecologists conduct field surveys to find and monitor endangered plants and high quality natural communities. Information on Indiana's plants, animals, and insects is also gathered from biologists statewide; then managed using the program's Biotics software. The data are used by public and private conservationists to help guide protection efforts. The data are also used in the Department of Natural Resources environmental regulatory process to help avoid or minimize impacts to significant natural communities, endangered species, and nature preserves.

Field Notes **New Botanical Discoveries**

River Broomrape (*Orobanche riparia*). State Endangered. This plant, an attractive flowering plant parasitic on the roots of giant ragweed (*Ambrosia trifida*), is known in Indiana only from counties bordering the Ohio River and lower Wabash River. It was considered extirpated in Indiana until its rediscovery by DNP botanists at a site near Mauckport in Harrison County.

Southern Wood Violet (*Viola hirsutula*). State Endangered. Until 2010 the one and only known occurrence of Southern wood violet in Indiana was in Clark County. Plants of that population, found by Charles Deam in 1916, were never relocated and thus the violet was considered extirpated in the state. In 2010 a new population was found by DNP botanists while conducting survey work on the Hoosier National Forest in Perry County. Several dozen plants were observed.

Southern Blue Monkshood (*Aconitum uncinatum*). State Endangered. DNP botanists discovered a new population of blue monkshood while conducting survey work on the Hoosier National Forest in Perry County. Blue monkshood is principally a species of Appalachian and Piedmont forests; the populations in Indiana represent the northwestern-most occurrences in the species' range.

DNP botanists completed a multi-year ecological and botanical assessment of designated **Special Areas** on the **Hoosier National Forest**. The survey provided up-to-date information on the significant natural features present in the Special Areas, including identifying management needs and population trends and locations of state-listed and Regional Forest Sensitive species. The Southern wood violet and Southern monkshood referenced above, as well as other rare species found in previous years, were discovered during this project.

Nature Serve

NatureServe is an international organization which serves as the umbrella structure for the network of natural heritage programs and conservation data centers in the United States, Canada, Central and South America. The organization helps to insure data consistency across the network, and also serves to provide natural heritage data to clients who need it across state and country boundaries. NatureServe's

website is broadly recognized as the best source of summary data on plant associations, plant, animal and insect species and their global significance.

DNP ECOLOGISTS HELP DEVELOP WETLAND ASSESSMENT METHODOLOGY

Division of Nature Preserves ecologists completed a two year project to help develop wetland assessment methodology as part of USEPA's upcoming national wetland sampling. DNP ecologists cooperated with the Michigan Natural Features Inventory, under the leadership of NatureServe.

Using wetland occurrence data from the Natural Heritage Program's database, wetland sites were selected across a series of wetland types and conditions. Biologists conducted field sampling of more than 100 wetland sites during a two year period. With the experience gained through the field sampling, DNP ecologists provided suggestions for improving sampling methods as well as time saving measures. The project was extremely beneficial to DNP, providing significant funding as well as updated wetland occurrence data for the Natural Heritage database.

Monitoring

Occurrences of 50 state-listed species were monitored by DNP botanists during 2010, including the federally endangered Short's goldenrod (*Solidago shortii*). This plant occurs at one site in the state, and it is one of only two places in the world where the species currently occurs naturally. Growing with Short's goldenrod is the state endangered prairie redroot (*Ceanothus herbaceus*); it is known in the state only from this site.

Collecting Permits

A total of 43 Research and Collecting Permits were issued to researchers to permit work on dedicated nature preserves in 2010.

43 permits

86 Nature Preserves
72% issued to University / Non-Profit
16% issued to State and Federal Agencies
12% issued to Individuals or For-Profit organizations
42% Herptile study
32% Vegetation study

Highlights: **Year of the Turtles**!

Eastern Box Turtles, Blandings and Ornate box turtles were all subjects of research permits issued in 2010. A large catch and release program was conducted for the box turtles to collect tissue samples to study the population genetic structure. This will quantify genetic variation, identify traces of population bottlenecks, and inform management policies. Another unique ongoing study concerns the earthworms here in Indiana, they are all non-native invasives. This study is trying to determine the extent of earthworm invasion in Indiana old-growth forests and secondary growth forests and to determine the relationship between earthworms and the herbaceous understory. They have been implicated in substantial changes to forest plant communities and to forest soil structure and function. Other studies focused on copperheads using transmitters, locating wood frogs using a song meter, tracking salamander movements, collecting seeds of ETR plants, and several surveys of birds.

Environmental Review

Lands Unsuitable Database
Element Occurrences (EOs)

Statistics

EOs in the INHDC database:	16,466
New records entered:	811
EO records updated:	4,011

The Natural Heritage Program Database also serves as DNR's Land Unsuitable Database, for the Division of Reclamation. We continuously update and quality control the database.

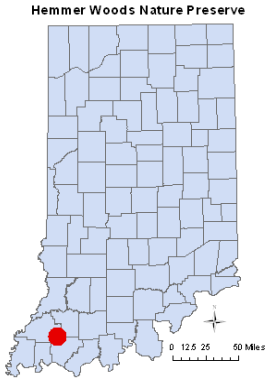
Database Usage

Information requests:	712
Early Coordination:	990
Flood Permit Applications:	117
Public Lake Permit Applications:	121

The database is used for permit reviews in several DNR Programs and aids in planning and site development, while minimizing impact to sensitive natural resource features.

Coal Permit Application Reviews

New Permit Applications	4
Permit Amendments	9
Underground Applications	1
Permit Renewals	22
Permit Transfers	11
AML Construction Grants	3



Hemmer Woods to Benefit from Additional Buffer

Active surface mining is presently occurring on three sides of Hemmer Woods Nature Preserve in southwest Indiana's Gibson County. This preserve is an old growth forest and a designated National Natural Landmark. In cooperation with the coal company and the Department of Natural Resources' Division of Reclamation, the Division of Nature Preserves received a conservation easement for native tree plantings in a 100 foot wide strip around the perimeter of the nature preserve as mitigation; it has been planted and is currently being monitored. This will eventually become an important buffer to the nature preserve helping protect the large old trees from high wind. Access to the nature preserve for public visitation has been maintained during the active mining.

Ginseng Conservation

The 2010 harvest season for ginseng was an eventful year; 3,940 pounds (an average year) were reported as being harvested. Pricing of the root started the trade season as high as $650/lb but dropped to as little as $250 by end of season. Following a two year investigation, a major enforcement action was coordinated by USFWS Agents and conducted by Indiana Conservation Officers with assistance from their counterparts from surrounding states on the morning of Aug. 31, 2010 (the day before season opened). Subsequently, the Division of Nature Preserves has and continues to work diligently with the Division of Law Enforcement to update the Indiana Code, the Administrative Code, and the entire ginseng regulatory process. Changes to the process have been implemented and changes to the Code passed the Senate but were not included on the shortened House agenda. The Department will again attempt these changes this coming legislative session, as well as present changes to the IAC which will enhance the overall program.

Gap Analysis ~ Protecting Natural Communities

The Division of Nature Preserves and Indiana Natural Heritage Data Center (INHDC) are responsible for tracking, monitoring, and recording Indiana's Endangered, Threatened, and Rare (ETR) plants. The number of native populations of a plant is used to assign the ranking of ETR; Endangered has 1 – 5 populations, Threatened has 6 – 10 populations, and Rare has 11 – 20 populations. Botanists and ecologists scour the state every year, searching for new and previously known populations of ETR plants. When field scientists from around the state return from their searches, they bring with them "records" of their findings which are added to the Indiana Natural Heritage Database's 16,000+ existing records.

The DNP seeks to protect and/or purchase lands supporting natural communities with populations of ETR plants. This weighs prominently in our land acquisition decision making process. This year we took a serious look at our program and undertook an in depth gap analysis to determine just how we have been performing as a program. With less funding available currently for land acquisition, we wanted to focus our efforts and dollars where they were truly needed to meet our mission. As a guide, we used the GIS-supported Natural Heritage Database to perform gap analyses, or simply analyzing the gap between which communities or plants are protected and which are not.

There are nature preserves in every Natural Region in Indiana except the Black Swamp Natural Region, (Figure 3 and Appendix B-Map 2). This region was nearly completely converted to agriculture, primarily due to the high quality, deep soils with little slope and high productivity found in the area.

There are only two high quality natural communities out of the 58 found in Indiana that do not have a protected example within a managed area, the Sinkhole Swamp and the Wet Prairie, (Appendix C- Table 1). The Sinkhole Swamp occurs in the Karst region in the southern part of our state with seven known examples, all unprotected; while the Wet Prairie is in the northern part with four known examples, also unprotected.

Examination of the status of ETR vascular plants shows that only 34 out of the 213 *Endangered* species, 2 out of the 88 *Threatened* species, and 2 out of the 115 *Rare* species do not have any level of protection, Figure 4. The *Endangered* species that do not have any protected occurrences are too numerous to list here but can be found in Appendix D. The two unprotected *Threatened* species are *Carex gigantea* and *Crataegus pedicellata*. The two *Rare* species are *Ceratophyllum echinatum* and *Senna obtusifolia* with no protected occurrences.

In addition to State listed ETR species, nature preserves also protects Federally listed species. An examination of the status of those Federal ETR species shows that three out of six federally listed plants are protected, along with the two mammals and the two herptiles that are found here in Indiana. In addition, 1 out of three federally listed birds can be found in an Indiana nature preserve, along with 4 of the 22 invertebrates, Table 1.

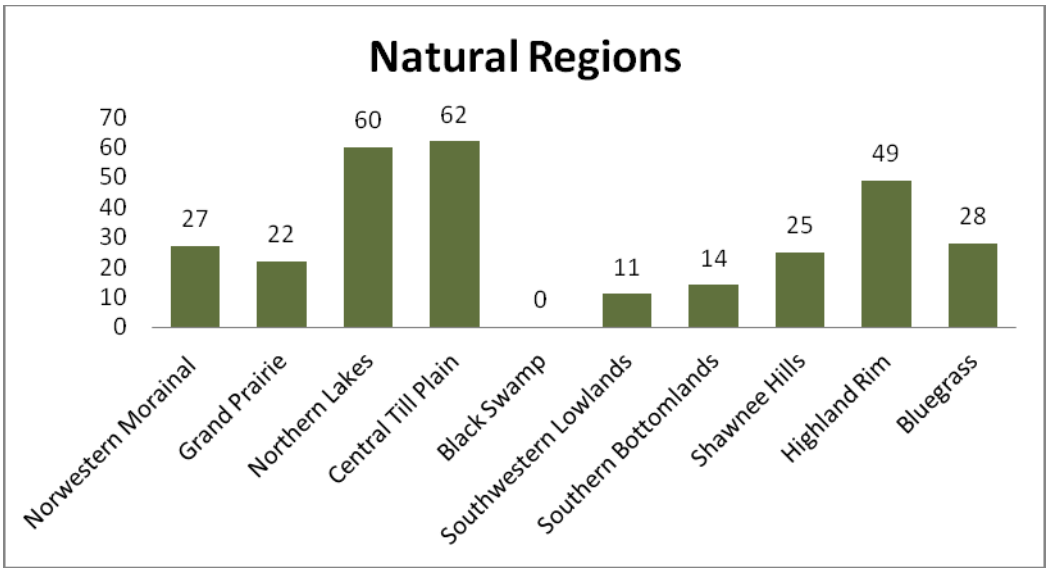


Figure 3. Number of Nature Preserves in each of the Natural Regions of Indiana, 2010.

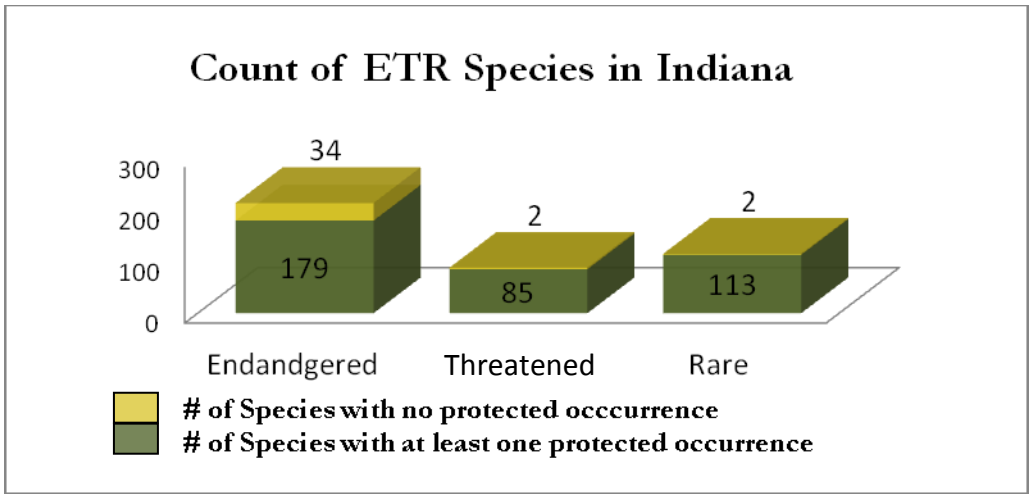


Figure 4. The number of imperiled species in Indiana that have at least one population protected.

Table 1. Number of State and Federally listed Rare, Threatened, or Endangered species within State Nature Preserves.

Group	State Listed	# w/in Preserve	Federally Listed	# w/in Preserve
Invertebrates	531	294	22	4
Fish	32	3	0	0
Herptile	34	20	2	2
Birds	64	35	3	1
Mammals	22	15	2	2
Plants	509	338	6	3

III. Nature Preserve Program

There are 235 Nature Preserves dedicated under state law, Indiana Code 14-31-1. This represents more than 39,139.441 acres spread throughout Indiana. We work closely with many others in dedicating significant natural areas, including DNR Divisions of State Parks and Reservoirs, Forestry, Historic Sites, and Fish and Wildlife, as well as the Nature Conservancy and local land trusts, local county park systems, colleges and universities.

The first dedicated nature preserve was Pine Hills Nature Preserve in Shades State Park dedicated in 1969. Since then, the nature preserve system has grown to be the most widely distributed system of protected lands in the state. More than any other reason, nature preserves are set aside to protect the plants, animals, and natural communities which are found on them, providing in perpetuity protection for the benefit of future generations. Visitation is allowed to the extent that the features can tolerate it without deterioration.

Overview of Indiana's Nature Preserve System as of 2010

Number of nature preserves: 235
Number of acres: 39,139.441
Average size: 166.55

Number of owners

46 different owners: 3 colleges and universities; 12 Land Trusts; 18 City/County/Local governments; 1 federal agency; 2 private conservation groups/organizations; 2 state agencies. Within the Department of Natural Resources, nature preserves are owned by 6 divisions.

Ownership information

123 nature preserves are owned by DNR (63 by Division of Nature Preserves; 25 by State Parks and Reservoirs; 18 by Forestry; 8 by Fish and Wildlife; 7 jointly owned by Fish and Wildlife and Nature Preserves; 2 by Historic Sites. Of Land Trusts, 28 are owned by The Nature Conservancy; 26 by ACRES; 5 by Heinze; 5 by CILTI; 4 by Whitewater Valley; 3 by NICHES; 2 each by Oak Heritage and Indiana Karst Conservancy. See Appendix E for complete listing of owners.

Interesting Statistics

Smallest nature preserves:	German Methodist Cemetery Prairie	1.01 acres
	Smith Cemetery Prairie	1.1 acres
	Orangeville Rise	3.02 acres
Largest nature preserves:	Ten O'clock Line	3,339 acres
	Rocky Hollow-Falls Canyon	1,608 acres
	Dunes	1,530 acres
	Minton	1,301 acres
	Whippoorwill Woods	908.3 acres
	Thousand Acre Woods	933 acres
	Thomastown Bottoms	888 acres

Natural Community Types found in the Nature Preserve System

Dunes Ecosystem

Lake front, beach, foredune, high dunes, prairies, swamp forest, savanna and marsh natural communities are protected in *Dunes Nature Preserve;*

Interdunal ponds and dune and swale complexes are protected at *Pine Station and Clark and Pine Nature Preserves.*

Sand Prairies and Sand Savanna complexes: *Bill Barnes, Tefft Savanna, Hoosier Prairie, Beaver Lake, and Conrad Savanna. Kankakee Sands Wetland and Prairie Restoration* connects these complexes.

Dune and swale complexes are represented at *Gibson Woods and Ivanhoe***.**

Coastal Plain Ponds: a very rare natural community throughout the entire Midwest, *Coastal Plain Ponds Nature Preserve*

Burr Oak Savanna: a rare community in Indiana, is found at *McCloskey Savanna*

Glacial Morainal Complex

Moraine Nature Preserve includes ponds, fens, upland forests, and seeps;

Spicer Lake protects an excellent kettle lake;

Lakes and Wetlands

Chain of Lakes: Potawatomi; Trine; Wing Haven/Seven Sisters/Marsh Lake

Undeveloped natural lake: *Olin Lake*

Marl Beach: *Loon Lake*

Bog: *Elkhart Bog*

Fens: *Mongoquinong; Prophetstown*

Floating mat: *Pipewort Pond; Boot Lake*

Northern Forested Swamp: *Marsh Lake; Ropchan*

Sedge Meadow: *Hoosier Prairie; Bill Barnes*

Marsh: *Manitou; Big Chapman Lake*

Seeps: *Jordan Seeps; Wening-Sherrit;*

Springs: *Big Spring; Charles Spring*

Wetland Complexes: *Manitou/Bob Kern/Judy Burton; Ball Wetlands; Swamp Angel*

Glacial Landscape

Potawatomi Marsh contain examples of ponds, swamp forests, fens, sedge meadows, marshes, and upland forests

Forested Ecosystems

Large complexes of upland forest types are included in *Ten O'Clock Line; Low Gap; Rocky Hollow-Falls Canyon; Brock-Sampson Nature Preserves*

Old Growth Forests: *Donaldson Woods; Kramer Woods; Wesselman Woods; Shrader-Weaver Woods*

Southern Swamp Forest/Cypress Swamp: *Twin Swamps; Wabash Lowlands; Buffalo Pond*

Flatwoods: a forest type in which a shallow hardpan restricts root growth and results in a unique forest type

Flatwoods Types:

Bluegrass Till Plain: *Guthrie Woods, Versailles Flatwoods, Chelsea Flatwoods*

Boreal: *Ambler Flatwoods*

Central Till Plain: *Bryan Woods, Bell-Croft Woods, Stout Woods*

Dry Flatwoods: *Bloomfield Barrens*
Sand Flatwoods: *Bill Barnes*
Southwestern Lowland: *Section Six Flatwoods*

River Landscapes

Tippecanoe River; Fawn River; 14 Mile Creek; Pigeon River (Mongoquinong Fen); Blue River Gravel Wash
Sugar Creek Corridor: *Mossy Point; Rocky Hollow-Falls Canyon; Pedestal Rock; Pine Hills*
(protects floodplain and upland forests, seeps, fens, canyons, waterfalls)
Cedar Creek: *Dustin; Rodenbeck; Barrett*
River Bluffs: *Deam's Bluffs*

Karst Landscape

These areas are underlain by limestone, characterized by sinkholes and caves: *Mitchell Sinkhole Plain; Donaldson Woods and Donaldson's cave.*
Caves: *Buddha; Donaldson's; Scout Mountain*
Sinkhole Ponds – Indiana's rarest natural community – *only 1 known example*: The Nature Conservancy owns 1/3 of this community, Three-Way Sedge Swamp. *Not dedicated*
Sinkhole Swamps: one of Indiana's rarest natural communities.
No examples have been protected (7 known examples).

Glades and Barrens

Limestone Glade: *Mosquito Creek; Teeple Glade; Leavenworth Barrens*
Sandstone Glade: *Armstrong Glade*
Chert Barrens: *Flint Barrens*
Clay Barrens: *Bloomfield Barrens*
Gravel Slope Barrens: *Wea Creek; Lookout Point*
Sand Barrens: *Granville Sand Barrens*
Siltstone Glade and Knobstone glades: *Minton*

Prairies

Black Soil/Loam Prairies are one of Indiana's rarest natural communities; gravel prairies were one of the rarest types of prairies in Indiana even during pre-settlement times.
Mesic Prairie: *German Methodist Cemetery Prairie; Cressmoor Prairie; Smith Cemetery Prairie; Biesecker Prairie*
Gravel Prairie: *Wabash Breaks*
Black Soil Prairie: *German Methodist Cemetery Prairie; Cressmoor Prairie; Biesecker Prairie Gravel Prairie: Wabash Breaks*
Wet Prairies: *No examples of wet prairie have been protected- 4 known examples*

Geologic Features

Natural Bridges/Arches: *Portland Arch; Yellow Birch Ravine*
Waterfalls: *Clifty Canyon; Hathaway Ross Run; Anderson Falls*
Karst: *Orangeville Rise of the Lost River*
Rock Columns: *Jug Rock*
Backbones: *Pine Hills*

DEDICATION

New Preserves 2010. The 5,243.60 acres dedicated were our most *ever* in one year.

Ten O'Clock Line Nature Preserve

This 3,339 acre preserve is located in the southwest corner of Brown County State Park. It protects a large eastern deciduous forest ecosystem that holds the high-quality core within the largest contiguous forest block remaining in Indiana. Critical habitat for forest-interior plants and animals which are dependent upon unfragmented ecosystems includes multiple Yellowwood stands and documented high quality woodlands that are found nowhere else in our State. Perhaps most significantly, it also represents a large block of migrant songbird nesting habitat. It is expected to provide habitat for viable populations of some of our woodland species of highest conservation concern. We have worked closely with the Trail Riders Association to ensure existing trails can still be used. We have also worked closely with Hoosier Mountain Bike Association to ensure flexibility is there to enable connections on these trails to Yellowwoods and Hoosier National Forest in the future.

Tom and Jane Dustin Nature Preserve

This 69.16 acre nature preserve is dedicated in honor of Tom and Jane Dustin, eminent conservationists who were members of the inaugural class of the Indiana Conservation Hall of Fame. They were leaders who helped with the creation of the Indiana Dunes National Lakeshore and a number of important pieces of Indiana conservation legislation. They were also founding members of the ACRES Land Trust, Indiana's first land trust. The preserve consists primarily of high quality forest land (upland, ravine and floodplain) on the steep bluffs along the north bank of Cedar Creek. Cedar Creek is a State Natural Scenic and Recreational River, one of only three such designated rivers in Indiana. This preserve is part of a 1,000 acre conservation area along Cedar Creek and is owned by ACRES Land Trust.

Low Gap Nature Preserve

This nature preserve is a 320 acre property that contains one of the largest uninterrupted tracts of high-quality forest in Indiana's Brown County Hills Section of the Highland Rim Natural Region. Plant species of special interest include the sedge (*Carex woodii)* and wintergreen (*Gaultheria procumbens)*. A number of state special-status birds summer and presumably nest in the Low Gap area as well. The state-listed Worm-eating Warbler, Cerulean Warbler, Black and White Warbler, and Hooded Warbler may be found in this area of the Brown County Hills. Raptors such as the state-listed Red-shouldered and Broad-winged Hawks may also be found at Low Gap as well. It is also important habitat for other state-rare animals including the bobcat *Lynx rufus.* This tract is owned and managed by the Department of Natural Resources and under the administration of the Division of Forestry.

Mossy Point Nature Preserve

This preserve is 183.61 acres located 2 miles west of Annapolis, Parke County, along Sugar Creek. It is characterized by high, dramatic ridges intersected by deep ravines carved out by water rushing down to the creek. The high, dry ridges support high quality stands of white oak and shagbark hickory, while the rocky points extending down to Sugar Creek feature a riparian microclimate wet and cool enough to support a population of relict Eastern hemlock. Beneath the hemlocks are such uncommon plants as witch hazel and partridgeberry. The Sugar Creek Valley is a breeding ground for critical populations of Wood Thrush, Cerulean Warbler, Worm-eating Warbler, Louisiana Waterthrush, and Kentucky Warbler. During the winter months, massive Bald Eagle roosts can be seen in this stretch of Sugar Creek. This preserve is located within the major land conservation initiative for the Wabash River and Sugar Creek

announced by Governor Daniel's, and is adjacent to conservation lands owned by Wabash College and DNR Division of Forestry. It is owned and managed by the Central Indiana Land Trust (CILTI).

Miller Ridge Nature Preserve

This nature preserve is a 30.6 acre property and is located 5 miles southwest of Nashville in Yellowwood State Forest, Brown County. The preserve generally lies between Miller Ridge to the south and Taylor Ridge to the north; the north and east boundaries share a common border with Brown County State Park. It contains high-quality examples of mesic, dry-mesic, and dry-upland forest communities. The state-endangered Yellowwood (*Cladrastis kentukea)* is the most notable species in the preserve. Yellowwoods are known only from a few isolated populations in the state of Indiana, all located in Brown County. At least three state-listed species utilize the Miller Ridge Nature Preserve: Worm-eating Warbler, large whorled pogonia (*Isotria verticillata)*, and the Yellowwood tree. Together with the existing Crooked Creek Nature Preserve, the proposed Miller Ridge Nature Preserve supports the highest-quality Yellowwood populations in the Yellowwood State Forest. This tract is owned and managed by the Department of Natural Resources and under the administration of the Division of Forestry.

Sherman Minton Nature Preserve

This nature preserve is a 1,301.23 acre property located 4 miles southwest of downtown New Albany, Floyd County. This preserve protects a significant portion of the Knobstone Hills landscape, which is a dramatically dissected complex of steep forested hills and mesic ravines. It consists of dry, dry-mesic, and mesic upland forest, and several siltstone glades, which are small, relatively barren openings occurring on and around exposed siltstone. Noteworthy animal species found in this preserve include: bobcat, gray bat, Worm-eating Warbler, Cerulean Warbler, and Hooded Warbler (all state listed). Several state-threatened plants also are found here: Deam's beardtongue and Harvey's buttercup. The preserve is named in honor of Dr. Sherman A. Minton, Jr., noted authority and expert who authored The Reptiles and Amphibians of Indiana. Dr. Minton was a medical doctor, who grew up in New Albany. This preserve is co-owned and managed by the Department of Natural Resources Division of Nature Preserves and Division of Fish and Wildlife.

Indiana Heritage Trust Program

The Indiana Heritage Trust Program is the primary program that funds land acquisition for the Division of Nature Preserves and our partners. This unique program is funded through the purchase of Indiana's environmental license plate: the bald eagle and sun on the blue background. This program funds much of the land acquisition for DNR's Divisions of State Parks and Reservoirs, Forestry, Fish and Wildlife, Outdoor Recreation, Historic Sites, and Nature Preserves.

Land Acquisition

In 2010, the Division of Nature Preserves forged partnerships with a number of partners to help acquire seven parcels of ground with significant features. Those sites, the ecologic types of features they contain, their location and size, and the partners involved, are shown in the following table.

Site	Partners	Ecological Type	County	Acreage
Oak Ridge Prairie Savanna	Lake Co Parks, TNC, LMCP	Savanna, Wetlands	Lake	62.3
Blossom Hollow	CILTI	Upland Forest	Johnson	110
Blue Clay Falls / Lick Creek Hollow	Whitewater Valley Land Trust	Upland Forest	Wayne	120
Oak Ridge Prairie	Lake Co Parks, TNC, North American Wetlands Conservation Act	Marsh, Shrub Swamp	Lake	27
Lick Creek Macro Site	Whitewater Valley Land Trust	Floodplain and Upland Forest	Wayne	55.4
Camp Munsee	Redtail Conservancy Land Trust	Upland Forest, Wetlands	Delaware	47
Harrison Spring	DFW; TNC; USFWS	Spring; Rare Animals	Harrison	41

TNC: The Nature Conservancy; LMCP: Lake Michigan Coastal Program; CILTI: Central Indiana Land Trust Incorporated; DFW: Division of Fish and Wildlife; USFWS: United States Fish and Wildlife Service.

IV. NATURE PRESERVE MANAGEMENT

Managing and caring for nature preserves are one of the most important functions of the Division of Nature Preserves. The eight Regional Ecologists are kept busy with this work all across Indiana (Appendix A, Map 1). They care for numerous preserves found within large geographic areas covering many counties, working with many partners. This report deals primarily with what they have accomplished on nature preserves they are directly responsible for, and including preserves where they have worked with partners.

Regional Ecologists are trained in many areas, including prescribed burning, chains saw use and safety, herbicide application, and use of heavy equipment. Stewardship activities include eradicating invasive species, woody species control, and restoration of native ecosystems. Collectively, the Regionals have conducted stewardship activities on over 2,000 acres in 2010. They also supervised seasonal work crews, and installed trails, parking lots, signs and fences. Restoration includes streambank stabilization, reconstructing presettlement natural communities, and long-term planning incorporating the native planting of wetlands, trees, prairie, and riparian systems. Monitoring of these systems and the invasive pressures are key to long-term success of rare species. They are also heavily involved with conservation planning and public outreach. Conservation planning has contributed to multiple partner projects and provided technical assistance to partner DNR divisions and agencies. Public outreach efforts included leading hikes, writing articles, giving interpretive talks, and leading work days. They have hosted Eagle Scout projects, worked with volunteers, and coordinated with partners on management and wetland mitigation projects.

Invasive Species Control

Numerous invasive species continue to invade natural areas. The list of species of concern seems to grow every year. This year, Regional Ecologists aimed eradication and control efforts at the following species, at numerous nature preserves: Garlic mustard, Canada thistle, Glossy buckthorn, Bush honeysuckle, Japanese honeysuckle, Teasel, Phragmites, White sweet clover, Yellow sweet clover, Autumn olive, Knapweed, Crown vetch, Serecia lespedeza, Japanese stiltgrass, Reed canary grass,

Moneywort, Bouncing bet, Ailanthus, Brome grass, Ground ivy, Privet, Purple loosestrife, Oriental bittersweet, Multiflora rose, Amur cork tree, Tall fescue, Johnson grass, Burning bush, and Hybrid cattail.

Woody Species Control

Woody succession of and invasion into prairies, glades, wetlands, and other types of natural communities continually needs to be addressed. Typically, this is done by prescribed fire, mowing, and applying herbicide to cut stems. The Regional Ecologists did woody control work on many nature preserves. The typical species of concern vary from region to region but primarily include Sassafras, Black cherry, Aspen, Cottonwood, and in certain areas Redbud, River birch and Shagbark hickory.

In Northwest Indiana a total of 50 acres on 4 preserves were restored using private contractors for heavy tree and brush cutting work followed by herbicide application to increase mortality of aggressive invasive woody plants. Each site was being shaded by heavy woody plant growth, diminishing the native herbaceous layer and reducing diversity. Each of these 4 projects was associated with the NOAA Lake Michigan Coastal Program, a source for 50% of the funding, and the Natural Resources Damage Account also contributed the balance for two of the projects. In sum, $155,654 in major restoration was completed with the General Fund share being only $31,145 (20%). The long term savings in returning these acres to an annual maintenance condition will far outweigh that cost and comply with the Nature Preserve Act's mandate for maintenance of our preserves in their historically recorded natural state.

Prescribed Burns

Historically, Indiana's natural areas burned frequently due in part to natural causes such as lightning strikes, especially savannas and grasslands. Soil samples and tree-ring analysis reveal that Indiana's grasslands burned, on average, every two years, while savannas appear to have burned at least once every three to five years. There is strong evidence that Native Americans encouraged habitat productivity by deliberately setting fire to their hunting and gathering grounds.

European settlement altered the natural fire cycle by replacing native plants with cultivated crops as well as suppressing wildfires. Because fire is a critical component to healthy Indiana ecosystems maintaining an early successional state and what is known as "nutrient cycling", the face of natural areas has changed in its absence.

The Division of Nature Preserves, charged with maintaining the ecological integrity of some of Indiana's most valuable natural areas, employs a system of prescribed burning mimicking regenerative, pre-settlement fires. To ensure the utmost safety, Division of Nature Preserves staff undergoes extensive controlled-burn training through the US Forest Service, National Park Service, and the Indiana Division of Forestry. Our people have a collective prescribed burn experience of over two hundred years. To maximize the benefits and range of our prescribed burns, we worked closely with our partners in 2010. Help from DNR Fire Headquarters (within the Division of Forestry), the Division of State Parks and Reservoirs, The Nature Conservancy, Lake County Parks, and the Division of Fish and Wildlife allowed us to successfully and safely burn 1,081 acres throughout the state. As usual, we also received crucial support from numerous local police and fire departments.

The 2010 burn season was one of the most challenging and least successful in years due to poor weather conditions. Plans called for burning approximately 2100 acres including 45 separate burn blocks at 32 different properties. We only got one burn on 27 acres done in the fall of 2010. And, after having three disappointing years in a row with no burning in February, we managed to get two done in February this year. Spring burns included large burns at Tefft Savanna (160 acres), Conrad Savanna (220 acres), and a first-time burn at Coastal Plain Ponds (230 acres).

BURN SUMMARY:

Burns done with DNP in charge, or DNP oversight: 22 blocks, 17 properties, 990 acres
Burns done by others, through contract: 7 properties, 91 acres

TOTAL ACRES BURNED: 1081

Restoration Projects

Prophetstown State Park

The Prophetstown Fen Restoration and Wabash Streambank stabilization project was jointly developed by the Indiana Department of Natural Resources (IDNR) and the Indiana Department of Transportation (INDOT) as off-site compensatory mitigation for impacts that occurred along the SR225 Heartland Highway improvement project in Tippecanoe County. On-site mitigation of the impacted wetlands was not possible.

This project upon completion will restore 120 acres of woodland, wetland, stream, and prairie habitats in an area associated with the confluence of the Wabash and Tippecanoe Rivers and centered on Harrison Creek, a permanent stream and tributary of the Wabash River. This restoration will reconstruct the presettlement natural communities important to the site's significant cultural and historical integrity.

To develop the restoration plan, DNR Ecologists reviewed onsite hydrologic conditions, topographic and soil surveys of the site, assessed existing flora, and compared known flora of nearby wetland sites. The design involved dismantling existing drainage tile system, herbicide control of existing invasive vegetation, and planting of native herbaceous wetland plants.

Zeigler Woods

Zeigler Woods Nature Preserve is contained within Summit Lake State Park, near New Castle. SLSP comprises 2,680 acres including a large lake. Zeigler Woods NP is 129 acres of which 79 acres are high quality upland forest with ephemeral wetlands. It occupies a high bluff over the Big Blue River valley-formerly an expansive wetland. It is one of the largest high quality blocks of forest in Henry County.

A restoration plan implemented in the western 50 acres of Zeigler Woods NP was locked in a monoclonal stand of smooth brome (*Bromus inermis)* a difficult to control Eurasian pasture grass. The restoration plan targeted replacing the smooth brome and establishing a native cover of perennial bunchgrasses and forbs onsite in preparation for eventual reforestation project where trees would be planted into the native grass planting. A cost effective native seedmix was selected for hardiness and benefits to wildlife. It included important nectar sources, sunflower seeds, and two nutrient-rich legumes.

Funding was provided through the Wildlife Habitat Incentive Program (WHIP), Robert Cooper Audubon, and a generous contribution by the Zeigler family.

Adam's Mill Oxbow Nature Park

Adams Mill is a National Register Historic Site noted for its amazingly intact working gristmill and covered bridge all cradled within a large oxbow of the scenic North Fork of the Wildcat Creek. Historically, it is a high-quality example of 19th Century industry, technology, and commerce in Indiana.

Adams Mill has long been known as a destination point and staging ground for many organizations and private individuals. It is ideally located midway between Lafayette and Kokomo providing close access for area canoeists, bicyclists, runners and other tourists. IDNR Nature Preserves acted to secure a strategically located adjacent agricultural field that greatly enhances the existing destination by securing the remainder of the oxbow as a multi-use nature park and wildlife area.

Partnering with the Wildcat Creek Foundation, the DNP Regional Ecologist designed a comprehensive development and restoration plan, and then brokered three separate wetland and streambank mitigations to realize the vision. What began as a frequently flooded agricultural field has now become a fully restored and functioning nature sanctuary in a huge oxbow of this scenic creek.

Restoration Highlights

1. Loblolly / Limberlost wetland restoration:
    a. Restored 40 acres of emergent wetlands in Limberlost area.
    b. Completed restoration on 200 acres of shorebird habitat.
    c. Planted 24 acres of rare and declining habitat.
    d. Assisted six landowners with Wetland Reserve Program (WRP) signups on 380 acres of land on private holdings.
2. A Great Lakes Restoration Initiative (GLRI) grant of $500,000 from the US EPA is funding the restoration of large portions of Hoosier Prairie and Pine Station Nature Preserves. No state funds were utilized in this project.
3. The Army Corps of Engineers, through, GLRI grants, is in the process of restoring more than 100 acres of wet prairie sedge meadow at Calumet Prairie Nature Preserve in Lake County. No state funds are being utilized by this project valued at over $500,000.
4. A water control structure was installed at Round Lake Nature Preserve in Starke County restoring Round Lake and its wetland complexes. The structure was necessitated by a drawdown of the lake level caused by ditching properties on adjacent neighboring lands.

DNP SECURES PITTMAN-ROBERTSON WILDLIFE RESTORATION GRANT

Thanks to the Division of Fish & Wildlife, the Division of Nature Preserves received a Pittman-Robertson grant which started in April, 2010 and will run through June, 2012. The grant, entitled "**Wildlife Restoration Activities on Natural Areas**", will focus on wildlife habitat restoration activities, including prescribed burning as well as invasive species and woody plant succession control methods on several nature preserves where hunting is permitted as part of the preserves' management plans.

With roughly one half of the grant completed, there have been more than 2,000 acres of wildlife habitat that have benefitted from prescribed fire and invasive species/woody plant succession control activities; these activities having been completed on 26 nature preserves. Grant funds have helped DNP significantly offset budget shortfalls, helped DFW meet grant match goals, and helped restore some very important natural areas throughout the state.

Monitoring and Management

Deer Monitoring

Deer exclosures have been installed in a number of nature preserves and state parks. Ecologists monitor them annually, comparing deer browse on vegetation inside and outside the exclosure to determine whether deer browse on vegetation is excessive. Many nature preserves are open to deer hunting, which has resulted in recovery of vegetation that has been over-browsed by deer. Monitoring helps document these changes.

Hogweed Monitoring and Eradication

Giant hogweed (*Heracleum mantegazzianum),* a member of the carrot family, is an invasive species introduced to North America from the Caucasus region of Eurasia in the early 1900's. It escaped from cultivation and invades rich moist soils along roadside ditches, stream banks, and open woodlands. It is a public health hazard, as it can cause severe skin irritation. It has been declared a federal noxious weed, unlawful to propagate, transport or sell, but it is spreading on its own. With the assistance of a grant from USDA, DNP staff is monitoring the state, looking for populations, and when discovered, we are striving to eradicate it. In 2010, staff worked on its removal from several populations in northern Indiana.

Eastern Hemlock Monitoring

Eastern hemlock is a rare coniferous species known from only a few populations in Indiana. White-tailed deer favor this species, and deer browsing has caused its decline in certain areas. Additionally, the Woolly adelgid, an invasive insect pest, has decimated hemlock populations in the southeastern United States. DNP ecologists, and many of our partners, annually monitor hemlock populations, to ascertain whether the Woolly adelgid has arrived in Indiana. So far, it has not been detected, and hopefully it will never arrive. If it does, early detection will enable us to eradicate it before it is able to destroy our hemlock populations.

Technical Assistance

1. Division of Forestry regarding timber management to avoid negative impact on ETR species and natural communities.
2. Provided input to CNN Railroad as they relocate lines in Lake County, Indiana, to avoid impact to wetlands and dune and swale habitat.
3. Trained ACRES Land Trust volunteers regarding invasive species identification and eradication.
4. Assisted the Division of Fish and Wildlife with the development of a GLRI grant to control invasive aquatic species.

Trails and Public Access

Many nature preserves, in a variety of ownership types, are open and have trails that provide an excellent opportunity for nature study and outdoor recreation. See our website for information and maps www.in.gov/dnr/naturepreserve.

Conservation Planning

DNP Ecologists were involved with a number of partnerships and projects in 2010; some of these included:

1. Re-use of the decommissioned Newport Chemical Depot in Vermillion County, where a portion of the property is being recommended for conservation use.
2. The Sugar Creek Corridor, in Parke County, which is included in Governor Daniel's Healthy River Initiative.
3. The Muscatatuck River Corridor, in Scott, Washington, and Jackson Counties, which is included in Governor Daniel's Healthy River Initiative.
4. NiSource Habitat Conservation Plans, helping to conserve and mitigate for impacts to endangered species.

Partner Outreach

Outreach highlights for 2010 included:

1. The Division's Web Site was updated: www.in.gov/dnr/naturepreserve. The updates included the addition of numerous maps and descriptions of nature preserves and links to the partners who own them.
2. A youth hunt for white-tailed deer was held at Big Walnut Nature Preserve.
3. A public dedication of the addition to Donaldson Woods Nature Preserve in Spring Mill State Park was held in honor of Father Damian Schmelz.
4. A public dedication of the Tom and Jane Dustin Nature Preserve, Allen County, was held to honor Tom and Jane Dustin, notable Indiana conservationists.
5. Over 6,000 people attended the numerous hikes and talks to groups of conservation students and agencies that were led by Nature Preserves Staff.
6. Several scientific articles were published by DNP staff.
7. The State Fair Nature Preserves display was well attended.
8. Several volunteer work days were held at nature preserves around the state.

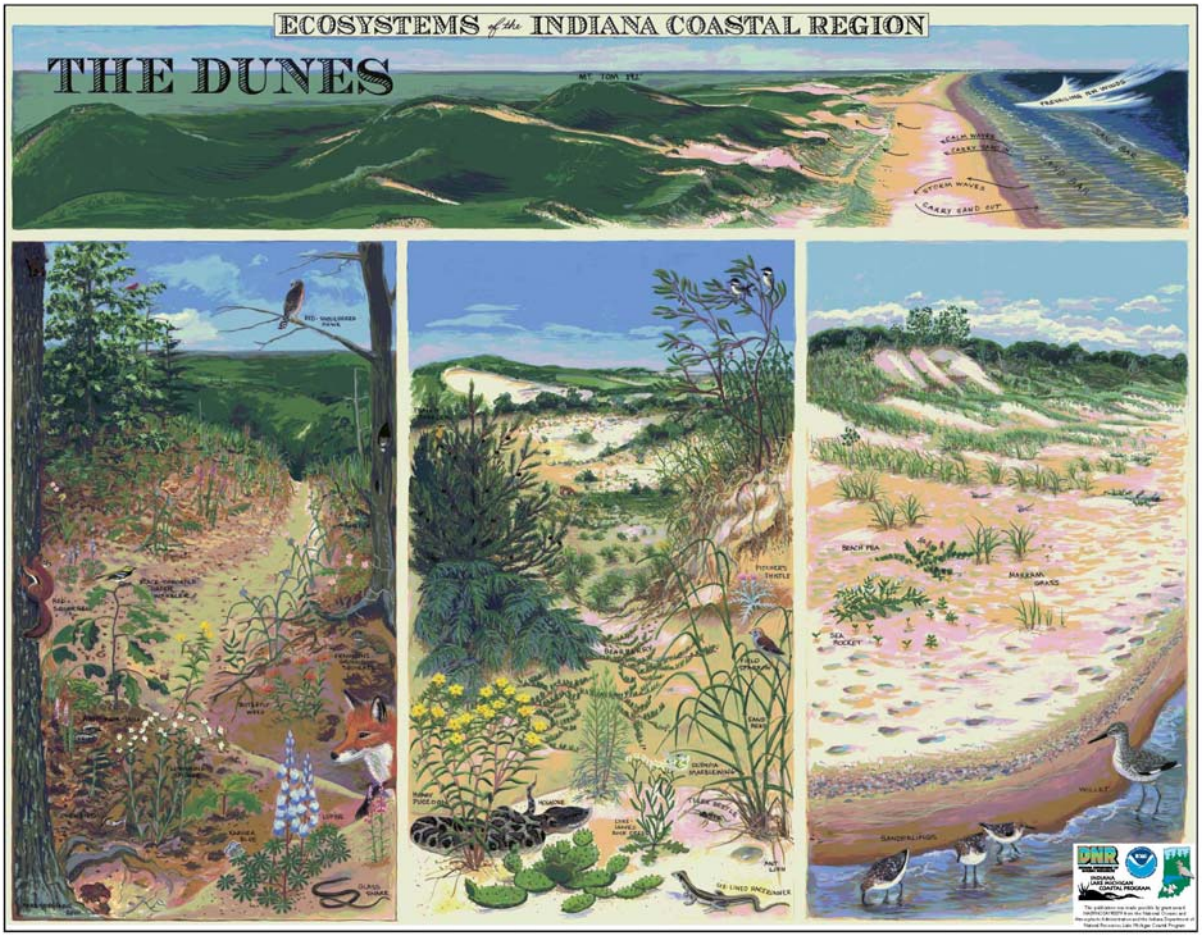
COASTAL PROGRAM

Lake Michigan Coastal Program (LMCP) Hosts 2010 Great Lakes Regional Meeting

The LMCP hosted the 2010 Great Lakes Regional Meeting in Chesterton, Indiana September 22-24. All Great Lakes Coastal Programs participated – either in person or via the web connect webinar function. In addition, staff from NOAA Ocean and Coastal Resource Management, Coastal Services Center, and National Oceanic Service attended and participated. The two and a half day meeting agenda allowed ample time to discuss current issues and upcoming initiatives. In addition, the attendees got a first look at the redesigned Indiana Dunes State Park Nature Center. The LMCP provided funding for a major portion of the new nature center displays from the 2007 Cooperative Agreement. Field excursions included project site reviews as well as a closer look at the Trail Creek corridor.

Ecosystems of the Indiana Coastal Region *The Dunes*

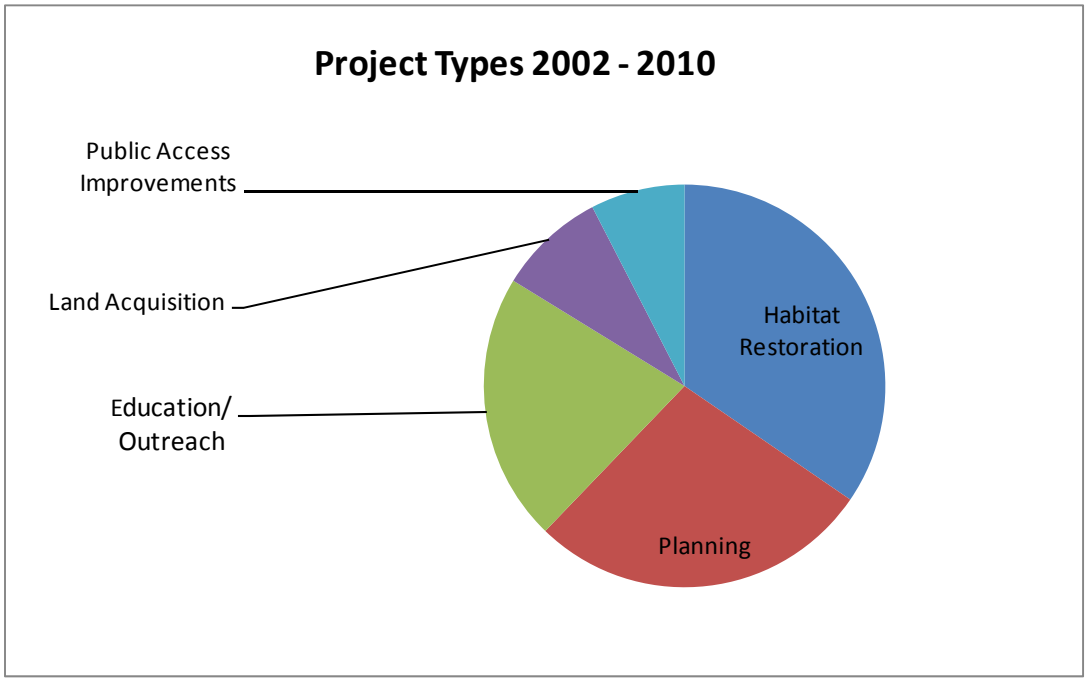
The LMCP commissioned the third interpretive poster in the Ecosystems of the Indiana Coastal Region series. The LMCP hired local artist Barb Labus to do the artwork once again. The poster unveiling, done in conjunction with the official dedication of the Indiana Dunes State Park Nature Center, on October 28th drew an estimated 150 attendees. Barb Labus was on hand to sign posters and the poster was very well received. To date there have been 2, 500 of these posters distributed. During the State Fair, school teachers, the most vocal of the poster recipients, planned to include them in various curriculums for their students.



The U.S. Congress has made available to states and territories with approved coastal zone management programs, funds for competitive grants for community-based coastal activities. Funding and oversight are provided by the National Oceanic and Atmospheric Administration (NOAA), Office of Ocean and Coastal Resource Management (OCRM). Projects must be consistent with the goals and objectives of the Coastal Zone Management (CZM) Act of 1972 (CZMA, 16 U.S.C. §1451 et seq.) and meet the requirements of the CZM Program administered by OCRM.

Indiana's Lake Michigan Coastal Program instituted an annual competitive Grants Program in 2002. The purpose of the Grants Program is to support projects that preserve, protect, restore and where possible develop the resources of the coast for this and succeeding generations and to achieve wise use of the land and water resources of the coastal region. Grants must give full consideration to ecological, cultural, historic and esthetic values as well as to needs for economic development. Since inception the program funded almost $10 M in projects.

Each year a substantial portion of our total Federal award is set aside for the Grants Program. The LMCP Coastal Advisory Board hosts a Public Input session each year to set priorities for grant projects. The program funds a variety of project types with the major balance between Education/Outreach, Habitat Restoration, and Planning (see below figure).



Time Period: 7/1/09-6/30/10

	Number of Activities	Number	Modifier
Government Coordination: Educational Activities	242	4709	Participants
Government Coordination: Training and Coordination Events	52	1424	Participants
Number of Public Access Sites Enhanced	3		
Coastal Habitat: Protection and Restoration	121.11		acres restored
Number of Clean Marinas Dedicated	3		

Financial Measures: Funds Spent and Leveraged	Total Projects	Number of CZM Federal and Matching Dollars Spent	Number of Dollars Leveraged by CZM Funds	Total Investment
Government Coordination	2	$259,536.11		$259,536.11
Public Access	5	$385,402.34	$84,000.00	$469,402.34
Coastal Habitat	15	$674,696.09	$335,000.00	$1,009,696.09
Coastal Water Quality	7	$247,734.79		$247,734.79
Coastal Hazards	1	$98,915.36		$98,915.36
Coastal Dependent Uses and Community Development	5	$271,270.11	$82,640.00	$353,910.11
Total	35	$1,937,554.80	$501,640.00	$2,439,194.80

Appendix A: Division Staff

Nature Preserves Management

John Bacone	Division Director
Lee Casebere	Preserve Management
Cary Floyd	Operations Director
Leah Kopp	Office Manager

Natural Heritage Program

Cloyce Hedge	Natural Heritage Coordinator
Ron Hellmich	Heritage Data Manager
Roger Hedge	Heritage Ecologist
Mike Homoya	Heritage Botanist
Ben Eddy	Protection Director

Natural Heritage Seasonal Staff

Katie Bacone

Breana Sowers

Robin Hedge

Regional Ecologists *

Tom Swinford	**Central Ecologist**
Brian Abrell	**SW Ecologist**
Rich Dunbar	**NE Ecologist**
Tom Post	**NW Ecologist**
Ken Brunswick	**Limberlost Ecologist**
Derek Nimetz	**Coastal Ecologist**
Jason Larson	**SE Ecologist**
John Ervin	**Coastal Region**

*****See Appendix B, Map 1: Regionals Service Area

Regional Ecologist Seasonal Staff

Phillip Bieberich	Tina McClure
Michael Everidge	Paul Osborn
Curtis Greer	John Petzl
Sandra Greer	Joshua Purvis
Brian Grieger	Nathan Simons
Joshua Grubaugh	Dallas Trump
David Holliday	Thomas Walstra
Timothy Keller	Matthew Wise

Lake Michigan Coastal Program

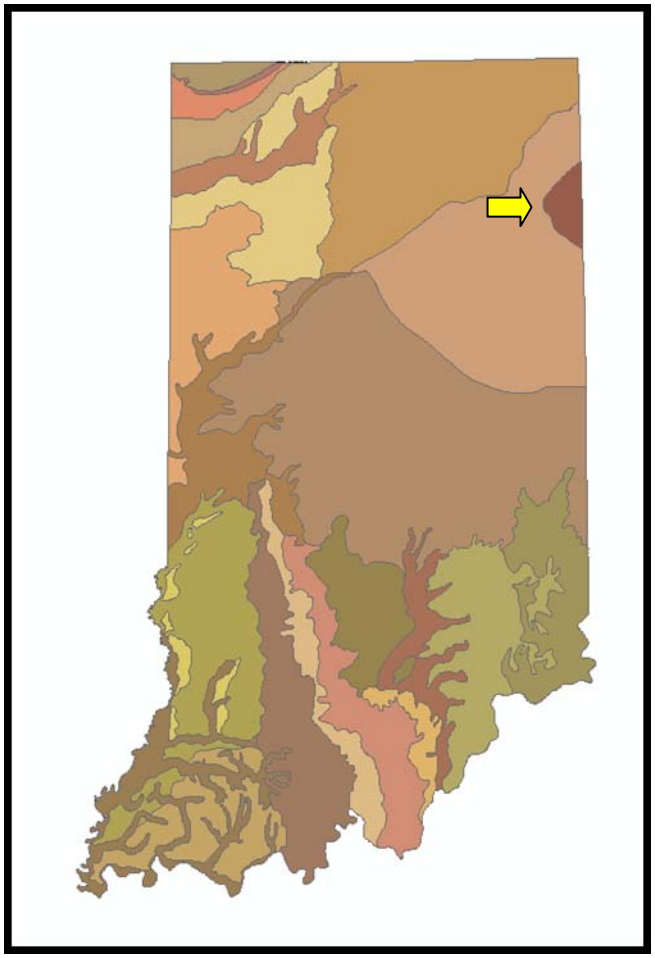
Mike Molnar	Coastal Program Director
Jenny Swinney	Operations Manager
Jenny Orsburn	Coastal Programs Specialist
Sergio Mendoza	Coastal Resources Planner
Colin Highlands	Coastal Grant Program Assistant

LMCP Seasonal Staff

Chloe Lawson

Appendix B:

Map 1. Geographic area of the Eight Regional Ecologist for the Division of Nature Preserves.



Map 2. Natural Regions of Indiana – Black Swamp Region.

Appendix C: Natural Community Gap Analysis

Table 1. State Overview of Community Gap Analysis 2010.

COMMON NAME	Count	State Rank	Global Rank	Total Acres	Protected	% Protected
Acid Bog	14	S2	G3	513.27	167.75	32.68
Acid Seep	7	S1	GU	595.73	79.66	13.37
Aquatic Cave	4	SNR	GNR	30.88	17.68	57.25
Bluegrass Till Plain Flatwoods	17	S2	G3	2,363.92	725.14	30.68
Boreal Flatwoods	4	S2	G2?	608.27	153.69	25.27
Central Till Plain Flatwoods	31	S2	G3	1,931.27	728.59	37.73
Chert Barrens	6	S1	G2	79.38	32.77	41.28
Circumneutral Bog	15	S3	G3	334.43	77.05	23.04
Circumneutral Seep	20	S1	GU	133.12	16.91	12.70
Clay Barrens	1	S1	GNR	4.68	4.68	100.00
Dry Flatwoods	4	S2	G2?	524.00	372.48	71.08
Dry Sand Prairie	12	S2	G3	1,333.37	928.47	69.63
Dry Sand Savanna	23	S2	G2?	3,450.89	1,289.46	37.37
Dry Upland Forest	58	S4	G4	6,946.55	4,905.11	70.61
Dry-mesic Prairie	17	S2	G3	597.26	37.00	6.19
Dry-mesic Sand Prairie	34	S3	G3	2,088.71	835.96	40.02
Dry-mesic Sand Savanna	33	S2S3	G2?	2,366.04	1,631.43	68.95
Dry-mesic Upland Forest	120	S4	G4	15,913.00	11,034.60	69.34
Eroding Cliff	6	S1	G4	2,007.03	853.33	42.52
Fen	66	S3	G3	1,469.50	562.67	38.29
Foredune	2	S1	G3	501.17	356.61	71.16
Forested Fen	16	S1	G3	1,291.76	266.56	20.64
Forested Swamp	25	S2	G2?	1,796.61	566.30	31.52
Gravel Slope Barrens	3	S1	G3	4.01	2.31	57.61
Gravel Wash	2	S1	GU	12.64	8.10	64.08
Inland Coastal Plain Marsh	10	SNR	G2?	110.21	108.78	98.70
Lake	14	S2	GNR	1,557.43	219.06	14.07
Limestone Cliff	20	S1	GU	1,235.18	601.60	48.71
Limestone Glade	45	S2S3	G4	1,211.74	738.66	60.96
Marl Beach	13	S2	G3	481.98	120.06	24.91
Marsh	67	S4	GU	6,120.09	2,984.29	48.76
Mesic Floodplain Forest	27	S1	G3?	3,515.78	1,914.39	54.45
Mesic Prairie	39	S2	G2	2,102.11	137.64	6.55
Mesic Sand Prairie	8	SNR	GNR	777.89	229.77	29.54
Mesic Sand Savanna	4	SNR	GNR	100.84	87.75	87.02
Mesic Savanna	1	SNR	GNR	38.59	36.02	93.34
Mesic Southwestern Lowland Flatwoods	6	S1	G2?	455.61	329.48	72.32
Mesic Upland Forest	188	S3	G3?	19,504.19	12,254.22	62.83
Muck Flat	14	S2	G2	334.81	113.07	33.77

Panne	6	S1	G2	161.24	46.05	28.56
Pond	8	SNR	GNR	637.41	332.37	52.14
COMMON NAME	**Count**	**State Rank**	**Global Rank**	**Total Acres**	**Protected**	**% Protected**
Sand Barrens	4	S2	G3	70.74	10.57	14.94
Sand Flat	4	S1	G2	171.29	169.45	98.93
Sand Flatwoods	6	S1	G2?	151.44	110.72	73.11
Sandstone Cliff	36	S3	GU	2,304.85	1,431.39	62.10
Sandstone Glade	6	S1	G2	20.32	15.96	78.54
Sandstone Overhang	11	S2	G4	137.33	75.61	55.06
Sedge Meadow	21	S1	G3?	1,334.11	903.91	67.75
Shrub Swamp	38	S2	GU	3,248.24	1,700.56	52.35
Siltstone Glade	22	S2	G2	39.42	23.27	59.03
Sinkhole Pond	1	S1	GU	22.35	5.85	26.17
Sinkhole Swamp	7	S1	G2?	44.25	0.00	0.00
Terrestrial Cave	4	SNR	GNR	578.84	412.01	71.18
Wet Floodplain Forest	21	S3	G3?	3,298.90	1,792.09	54.32
Wet Prairie	4	S1	G3	16.40	0.00	0.00
Wet Sand Prairie	13	S3	G3	885.68	303.61	34.28
Wet-mesic Floodplain Forest	50	S3	G3?	6,007.34	3,662.05	60.96
Wet-mesic Sand Prairie	25	S2	G1	980.19	721.30	73.59

Appendix D: State Endangered Vascular Plants with No Protected Occurrences

American Barberry	*Berberis canadensis*
Buckthorn	*Bumelia lycioides*
Clustered Poppy-mallow	*Callirhoe triangulata*
Black Hickory	*Carya texana*
Biltmore Hawthorn	*Crataegus biltmoreana*
Fineberry Hawthorn	*Crataegus chrysocarpa*
Kellogg Hawthorn	*Crataegus kelloggii*
Pretty Dodder	*Cuscuta indecora*
Wild Mudwort	*Dicliptera brachiata*
Matted Broomspurge	*Euphorbia serpens*
Sharp-scaled Manna-grass	*Glyceria acutiflora*
Hairy-fruited Hibiscus	*Hibiscus moscheutos ssp. Lasiocarpos*
American Water-penny	*Hydrocotyle americana*
Kankakee Globe-mallow	*Iliamna remota*
Bayonet Rush	*Juncus militaris*
Amazon Sprangle-top	*Leptochloa panicoides*
Mountain Phlox	*Phlox ovata*
Deam's Pholox	*Phlox pilosa ssp. Deamii*
Heart-leaved Plantain	*Plantago cordata*
Pink Milkwort	*Polygala incarnata*
Fringed Black Bindweed	*Polygonum cilinode*

Swamp Smartweed	*Polygonum hydropiperoides var. setaceum*
Oakes Pondweed	*Potamogeton oakesianus*
Dwarf Chinquapin Oak	*Quercus prinoides*
Virgin Mallow	*Sida hermaphrodita*
Large-leaf Snowbell	*Styrax grandifolius*
Eggleston's Violet	*Viola egglestonii*

Appendix E: Owners of Nature Preserves

County and City Partners
Allen County Parks and Recreation
Bartholomew County Parks and Recreation
Bloomington Parks Board
City of Elkhart
Evansville Park Board
Ft. Wayne Park Board
Town of Fishers
Harrison County Parks and Recreation
Indy Parks
Jennings County Community Foundation
LaGrange County Parks Board
LaGrange County Parks and Recreation
Lake County Parks and Recreation
LaPorte County Parks and Recreation Department
LaPorte County Conservation Trust
City of Marion Schools
Muncie YMCA
St. Joseph County Parks and Recreation
Steuben County Parks and Recreation Department
Terre Haute Park Board
Town of DeMotte
Vigo County Parks and Recreation

Federal Partners
U.S. Fish and Wildlife Service

For Profit Partners
Chicago South Shore Railroad

University Partners
Goshen College
Indiana State University
Purdue University

State Partners
DNR Forestry
DNR Fish and Wildlife
DNR State Museum and Historic Sites
DNR State Parks and Reservoirs
State Board of Health

Land Trust and Non-Profit Partners
ACRES Land Trust, Inc.
Central Indiana Land Trust (CILTI)
Indiana Karst Conservancy
Izaak Walton League
Niches Land Trust
Shirley Heinze Land Trust
Sycamore Land Trust
The Nature Conservancy (TNC)
Whitewater Valley Land Trust
Oak Heritage Conservancy
Sycamore Trails RC&D
Ouabache Land Trust