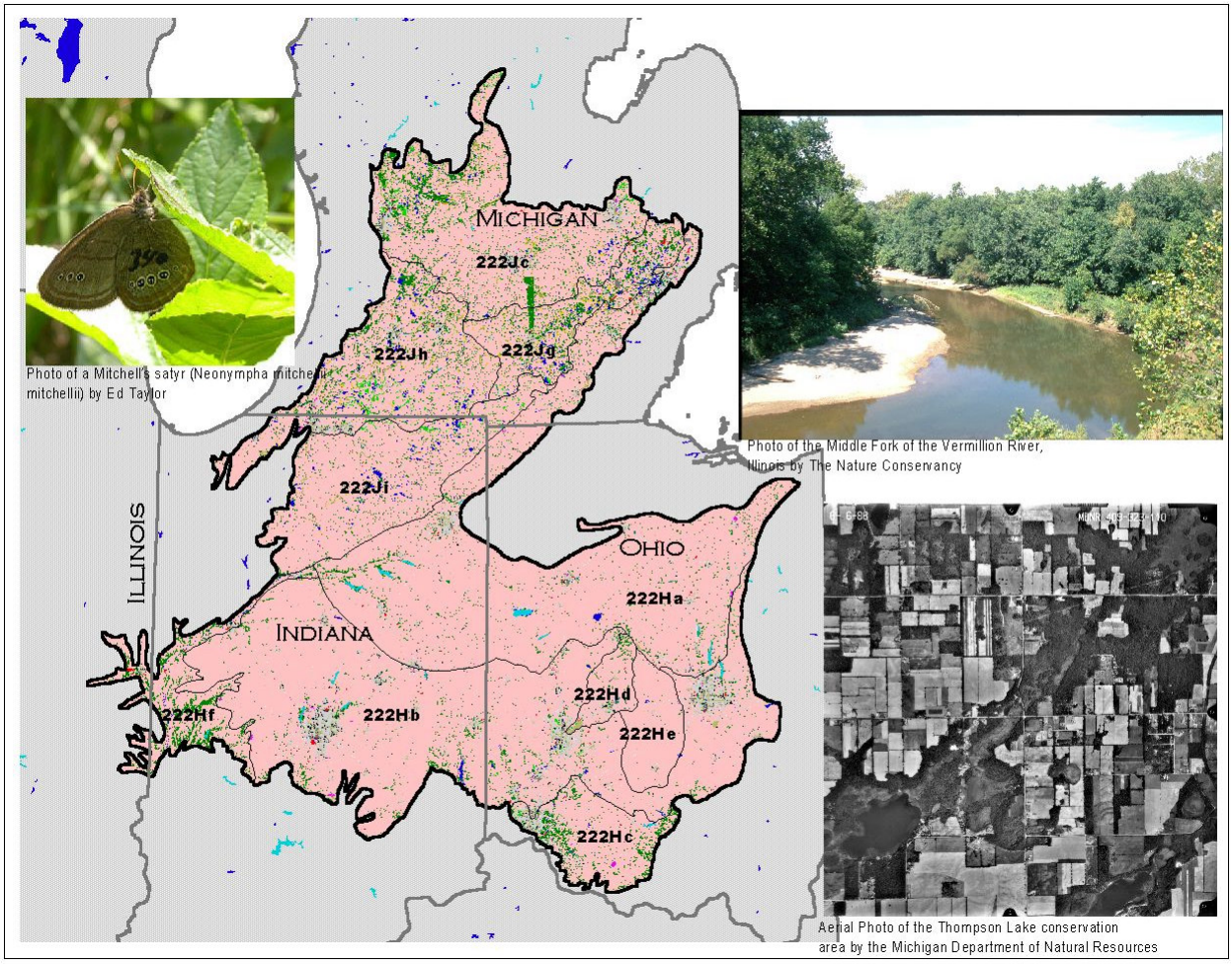
The North Central Tillplain Ecoregion: A Conservation Plan



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North Central Tillplain
Ecoregional Planning Team

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

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Chapter 1: Ecoregional Planning in the North Central Tillplain

1.1. Introduction

The conservation goal of The Nature Conservancy, as stated in Conservation by Design: A Framework for Mission Success (The Nature Conservancy 1996a), is *"the long-term survival of all viable native species and community types through the design and conservation of portfolios of sites within ecoregions."* This statement represents the first time the Conservancy made explicit the geographic framework—ecoregions—that would enable the overall mission of the organization to be implemented in ecologically meaningful units of the earth's surface. Within each ecoregion, the specific species and natural communities that would become the focus of conservation planning and implementation—the conservation targets—could be considered in the context of the ecological patterns and processes that helped to shape their distribution, abundance, composition, structure, and life history.

To support this approach to conservation, the Conservancy developed guidelines that established the initial framework of ecoregions, adopted from the work of Robert G. Bailey of the U.S. Forest Service for the continental US (Bailey 1994), and the process to be followed in planning ecoregional conservation (Designing a Geography of Hope, The Nature Conservancy 1996b). In the Continental US, 64 ecoregions have been identified, most of which occur as unique entities; a few, such as the Wyoming Basins, repeat in two or more distinct units. In general, areas of the US that are diverse in geology or topography and have steep climatic gradients (such as the Pacific and Rocky Mountain states or the Appalachian states) have a complex arrangement of many relatively small ecoregions. Other areas, such as the Great Plains, in which ecological patterns and processes vary along much broader gradients tend to have larger, less complex ecoregions.

The Conservancy has made the advancement of plans for all ecoregions its highest priority, and expects to finish assessments for the continental US ecoregions by the end of 2004. In keeping with this mandate, assessment for the North Central Tillplain was initiated in mid-1998 and was completed over a period of roughly two years, simultaneously with several other ecoregional plans in the midwest region. Many of the partners involved in this process were also involved in assessments for other ecoregions, especially the Great Lakes, the Central Tallgrass Prairie, and the Interior Low Plateau. Involvement in several ecoregional plans enhanced the familiarity of participants with the concepts and approaches being used, and in all probability increased the efficiency of the process.

The Core Team established the following goal for this ecoregion:

"The goal of the North Central Tillplain Ecoregion is to conserve all native, viable species. We assume that protecting adequate examples of community types will protect common species. Therefore, species targets include G1-G3, vulnerable and declining and federally listed species."

1.2. Description of the North Central Tillplain

1.2.1. Ecological Overview

The North Central Tillplain ecoregion occupies major portions of three states in the Midwest and Great Lakes regions of the United States, Indiana, Michigan, and Ohio, and a small portion of Illinois (Figure 1). Compared with other ecoregions, it is of average size, covering 30,467,178 acres; (12,329,898 hectares; 47,605 square miles). Surficial geology is virtually entirely of glacial origin, being mostly till and outwash from the Wisconsinan and Illinoian glacial events (Appendix B). An exception is the Entrenched Valleys subsection (222Hf), which is characterized by alluvium and loess (wind blown silt from glacial meltwaters) of Holocene origin. Elevation ranges from a high in central Ohio of roughly 1,500 ft. (457 m) in the Miami-Scioto Plain-Tipton Till Plain, to a low of 450 ft. above sea level at the point where the Wabash River drains from the ecoregion in the Entrenched Valleys. Most (94%) of the ecoregion lies between 640 ft. (195 m)and 1100 ft. (335 m) in elevation.

The coldest and driest subsection is the Iona Moraines (MI), which experiences an average annual temperature of 46° F (8 C), and precipitation of about 34 inches (86 cm). The warmest and wettest portion of the ecoregion is in the southernmost subsections, where up to 42 inches (107 cm) of precipitation falls annually, and average annual temperatures reach 54° F (12 C). Originally a mostly forested ecoregion with increasing predominance of prairie and savanna in the western portion, it is now primarily an agricultural region, with less than eight percent of its area in some sort of natural land cover (Figure 2).

The relatively small elevational range, low climatic variability, similarity of landform and substrate, and the effects of recent glaciation (surficial geology varies from approximately 14,000 to 40,000 years in age), result in low species diversity and endemism in the North Central Tillplain. Species have had relatively few ecological niches and little time to evolve and specialize.

1.2.2. Ecological Systems

The ecological systems of the North Central Tillplain have developed, for the most part, on landforms and substrates of glacial origin. Virtually the entire ecoregion is covered in glacial drift, i.e., material deposited by glaciers. The generic term for this drift is *till*, and it can occur in a variety of forms and substrates depending on the direction and speed of the glacial movement (or lack thereof) and the waters flowing from and around the glacier. Over time, patterns of these landforms have influenced the development of ecological systems, including natural communities and the ecological processes and patterns of natural disturbance that have shaped them. Many of the natural communities and species that we seek to protect in this ecoregion exhibit patterns of distribution reflective of the climate and glacial geomorphology. Even more relevant to the challenge of conserving the biodiversity of the ecoregion, the history of human activity and use in the ecoregion has been strongly influenced by the landforms, soils, topography, and water bodies over several millenia.

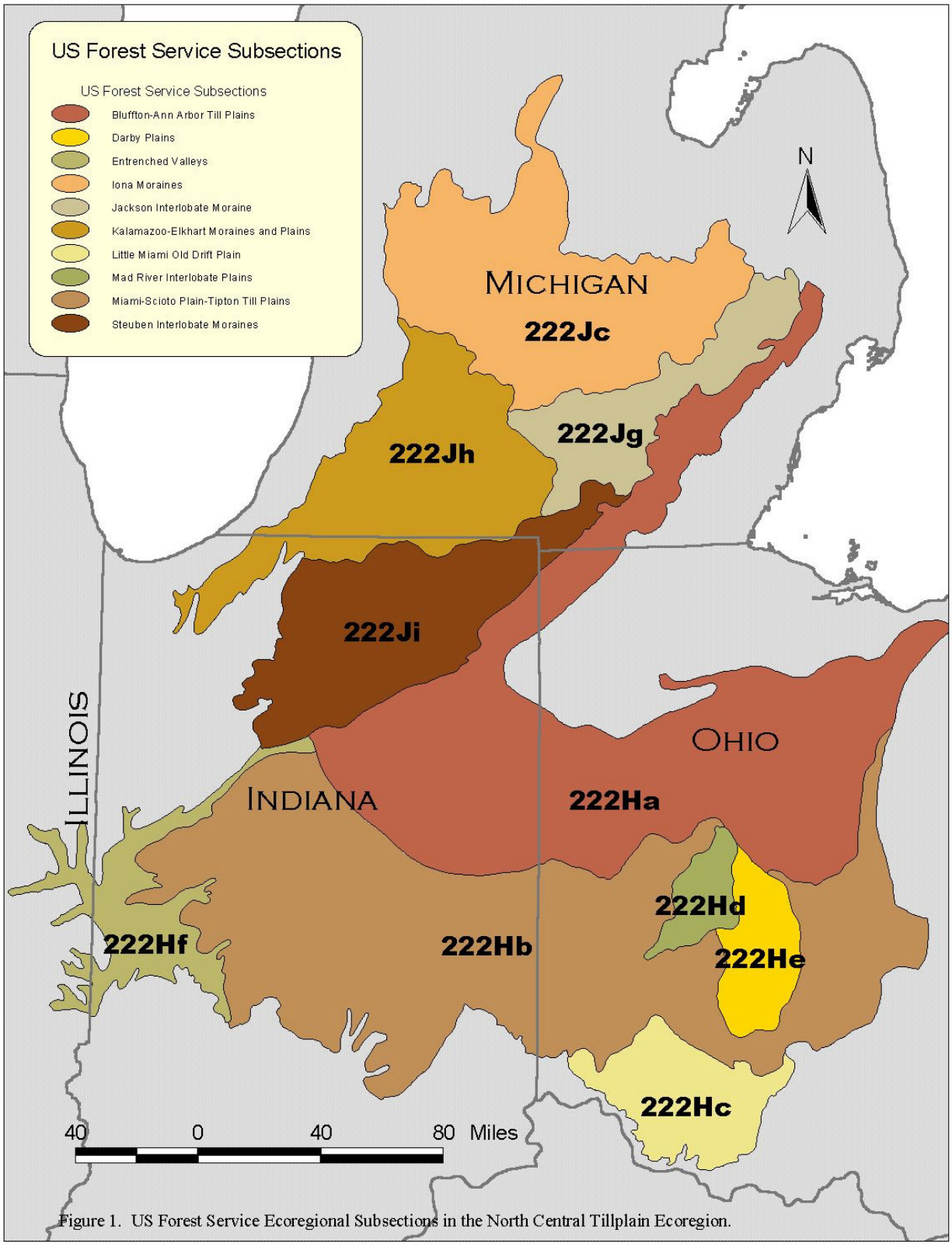

Figure 1. US Forest Service Ecoregional Subsections in the North Central Tillplain Ecoregion.

Ecological subsection names, as given in the US Forest Service classification, indicate the nature of the predominant landforms, which, in combination with local climate, determine patterns of

vegetation and disturbance processes (Appendix B). Within this ecoregion, glacial landforms fall into two major classes, those that are formed directly by glacial ice, such as ground moraines, till plains and terminal moraines, and those that were formed by water melting from the glaciers, either in contact with the ice (i.e., ice-contact landforms) or having flowed away from the ice (i.e., outwash channels and plains). Moraines are formed of materials that were deposited by the ice as it flowed from north to south, either on the underside of the ice as it advanced or receded steadily across an area (as in a ground moraine or till plain), or at the edge, or terminus, of the moraine as the glacier remained stationary, balanced between advancing and melting (as in a terminal moraine). Ice-contact landforms include kames (hills of sands, gravels, and clays deposited in holes on the glacier or adjacent to a glacier) and eskers (long, narrow ridges of sand and gravel deposited by rivers flowing under a glacier). Kettle lakes, formed in holes created by blocks of ice that were left behind as the glacier receded, often occur in an area of kames and eskers, collectively known as ice-stagnation areas. Outwash, another water-laid material, consists of mostly sands and gravells deposited in broad or narrow, level plains. Outwash channels often snake around kames and moraines, tracing the route of glacially-borne rivers. Present-day rivers often occupy central, more deeply incised portions of former outwash channels that are much broader than the current rivers could have created in their short lives.

Till plains, such as those in the Bluffton-Ann Arbor Till Plains (Subsection 222Ha), the Miami-Scioto Plain-Tipton Till Plain (222Hb), and Little Miami Old Drift Plain (222Hc), are characterized by gently rolling to level terrain, clay or loam soils, and broad forests—either pin oak-swamp white oak swamps on the poorly drained soils or beech-maple forests on the well-drained soils. These subsections can be generally considered the most productive and least variable, in terms of the diversity of ecosystem types that might have occurred in them prior to conversion to agriculture. Indeed, the productive and highly accessible (due to low topographic relief) nature of these till plains made them especially suited to agricultural use, and these subsections are the least natural, in terms of current vegetation type, of any in the ecoregion. The Darby Plains (Subsection 222 He) are similar to these other subsections in the terms of characteristic landforms, but the glacial till there has less clay and is of a lighter, loamy texture. The white oak-red oak forests there are probably a reflection of these comparably lighter and perhaps less fertile soils.

Subsections that are characterized by mostly water-laid deposits, particularly those of ice-contact landforms, exhibit the greatest topographic diversity and most complex configurations of ecosystems. Due to their characteristically drier soils and steeper slopes, subsections such as the Jackson Interlobate Moraine (222Jg) and the Kalamazoo-Elkhart Moraines and Plains (222Jh) retained more of their natural land cover. They are also among the most attractive places to live in the ecoregion and are experiencing the most rapid development. Ecosystems of the drier hills range from oak-hickory forests to black oak barrens and prairies. These open systems historically exhibited greater fire frequency than those more densely forested systems of the tillplains, and fires born in the uplands often carried into the wetlands, creating characteristically open, herbaceous, wetlands such as prairie fens, sedge meadows, and wet prairies.

Wetlands in the North Central Tillplain often are a mosaic of these herbaceous types with forested conifer and broadleaf swamps and shrub fens. They are quite dynamic, responding to

periodic fires, fire suppression, and changes in the water table by shifting the relative proportion of wooded versus herbaceous wetlands.

Aquatic systems in the North Central Tillplain range from tiny, cold, groundwater-fed, headwater streams to large, warm-water rivers such as the Wabash. Lakes of glacial origin occur throughout the ecoregion, but are clustered heavily in the areas of diverse, ice-contact landforms. Like the terrestrial systems, their physical and ecological characteristics are reflective of their geologic setting. Yet unlike the terrestrial systems, the rivers also integrate effects from upstream, from perhaps very different landforms, substrates, and land uses.

1.2.3. Present Land Use

Agriculture is the overwhelmingly dominant land use in the ecoregion today (Table 1; Figure 2). The fertile, easily tillable soils present in most of the ecoregion led to early clearing and cultivation of most of the land surface. Deciduous forest land occupies only 6% of the ecoregion, and all natural land use classes combined add up to only 8 %. Other than the top three natural land use classes (including lakes), no other class exceeds 1% of the ecoregion in area. This pattern of land use presents a challenge to conservation, assuming that meeting conservation goals will occur primarily within the areas that have natural land cover. In such an ecoregion, restoration becomes an even more important tool to consider, as is discussed later in the plan.

Table 1. Land use in the North Central Tillplain ecoregion. Land use categories follow the Anderson Level 2 classification. Data were obtained from the Multi-Resolution Land Characteristics Consortium Group (MRLC 1992).

LEVEL2 LAND USE CATEGORY	ACRES	HECTARES	PERCENT OF TOTAL
CROPLAND AND PASTURE	25,695,590	10,398,649	84%
DECIDUOUS FOREST LAND	1,867,623	755,801	6%
RESIDENTIAL	1,173,574	474,929	4%
COMMERCIAL AND SERVICES	321,786	130,222	1%
FORESTED WETLAND	212,947	86,177	1%
LAKES	187,709	75,963	1%
TRANS, COMM, UTIL	178,244	72,133	1%
OTHER URBAN OR BUILT-UP	151,429	61,281	0%
MIXED FOREST LAND	149,852	60,643	0%
INDUSTRIAL	102,530	41,492	0%
NONFORESTED WETLAND	91,488	37,024	0%
RESERVOIRS	86,756	35,109	0%
STRIP MINES	75,714	30,640	0%
TRANSITIONAL AREAS	50,476	20,427	0%
ORCH,GROV,VNYRD,NURS,ORN	39,435	15,959	0%
EVERGREEN FOREST LAND	28,393	11,490	0%
MXD URBAN OR BUILT-UP	15,774	6,384	0%
STREAMS AND CANALS	15,774	6,384	0%
INDUST & COMMERC CMPLXS	9,464	3,830	0%
OTHER AGRICULTURAL LAND	6,310	2,554	0%
CONFINED FEEDING OPS	4,732	1,915	0%
SHRUB & BRUSH RANGELAND	1,577	638	0%
TOTALS	**30,467,178**	**12,329,645**	**100%**
COMBINED NATURAL LAND USES	2,555,363	1,034,120	8%
ANTHROPOGENIC LAND USES	27,905,506	11,292,972	92%

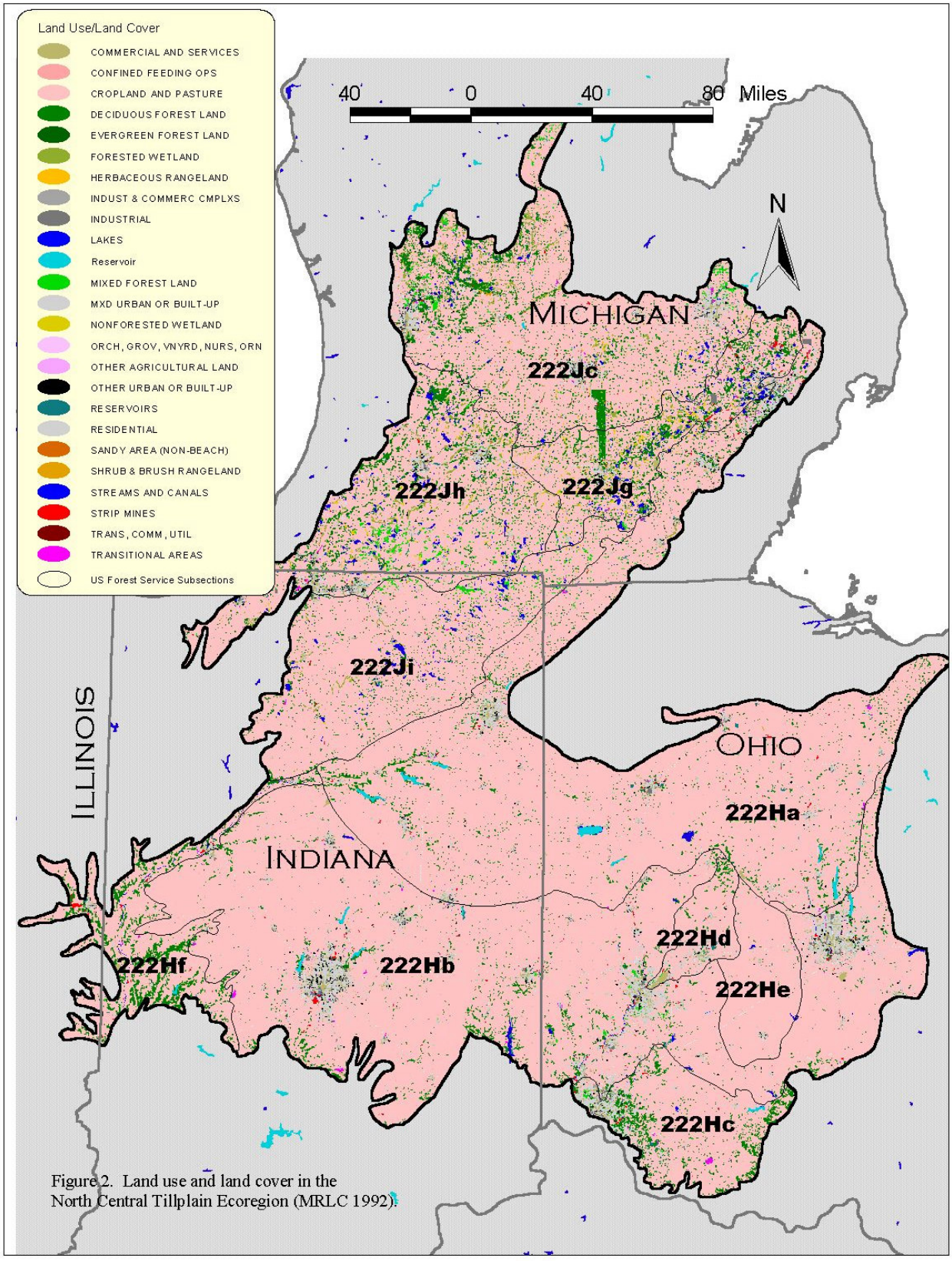

Figure 2. Land use and land cover in the North Central Tillplain Ecoregion (MRLC 1992).

Chapter 2: Planning Teams

2.1. Introduction

In mid-1998, a Core Team was set up as the central organizing and management unit. Authorization, administrative support, and final approval was assigned to a Steering Committee. Technical Teams, one for each of six groups of conservation targets, were initiated to be responsible for gathering and analyzing data, identifing and selecting viable target element occurrences, and identifing data gaps. A complete list of planning participants appears in Appendix A.

2.2. The Core Team

The role of the Core Team was to implement and complete the planning process. Specifically, the Core Team was charged with synthesizing data and presenting data to the design team, selecting conservation targets, providing guidelines to the technical teams for identifying conservation targets and setting conservation goals, and developing the timeline and budget.

Members of the Core Team included representatives from each of the four Conservancy Field Offices and Heritage Programs, State Departments of Natural Resources or Natural Areas and Preserves, and the Director of Science from the Midwest Resource Office (Appendix A). Many of the Core Team members were leaders of technical teams, and after setting up the timeline and budget at the kickoff meeting, their main functions were to guide and ensure completion of target assessments and then to review the preliminary portfolio.

The planning leader coordinated the Core Team in completion of its tasks. The team met twice: once at the Kickoff meeting and once to design the portfolio. Communication among team members was accomplished mostly by e-mail and phone, and one conference call was held as the portfolio was being refined.

Other roles of the Core Team were to synthesize the information from the Technical Teams and select portfolio sites, to identify multi-site and ecoregion-wide threats and strategies, and to select Priority Action Sites.

2.3. The Steering Committee

The Steering Committee was formed early in the process and includes the state directors from the four offices of the Conservancy, the directors of the State Heritage programs, and the planning leader. The roles of the Steering Committee during planning were to review and authorize the timeline and budget for the process, to ensure implementation of the plan, to help develop partner involvement strategies, and to review and accept the final plan document. Once the plan was in its final form, the steering committee took responsibility for implementing the plan.

Initially, support and authorization for the budget and timeline were obtained through individual contact of each steering committee member by the planning leader, both by phone and e-mail. Without exception, members authorized staff and funds as requested and gave approval of the

proposed process. Committee members agreed that the Core Team should carry out most of the planning process without their direct participation, and that a separate meeting of the Steering Committee was unnecessary.

The Steering Committee also gave final approval of the plan, including the portfolio of sites and strategies recommended by the planning team.

2.4. Technical Teams

Recognizing the variation among different groups of conservation targets with regard to historic and current status, breadth of expertise of appropriate experts, and the amount of information available, six technical teams were established: plants, natural communities, birds, terrestrial vertebrates (other than birds), terrestrial invertebrates, and aquatic species. The role of these teams was to finalize the list of conservation targets, determine conservation goals and viability criteria, evaluate all element occurrences (EOs) for viability, and recommend a set of element occurrences for inclusion in the portfolio.

Chapter 3: Gathering The Pieces

3.1. Introduction

The North Central Tillplain, due to past and present land use and also to the long history of scientific exploration, is relatively well known. The planning team benefited from comprehensive knowledge and tracking of most rare species and natural communities. This availability of fairly reliable data and the familiarity of TNC, Heritage, and other experts with many of the remaining natural areas enabled the team to focus on fine-scale conservation targets and not to require extensive use of coarse-scale data, such as remote imagery. In determining conservation targets, setting conservation goals, and gathering, analyzing, and evaluating information about those targets (i.e., "gathering the pieces"), the planning team was working within a fairly well-defined universe of possibilities. The technical teams did not have to spend a lot of time choosing conservation targets, and in many cases did not have abundant EO's from which to choose to meet conservation goals. A greater challenge was whether or not to recommend EO's of unknown viability to try to meet these goals.

The May, 2003 version of this plan utilizes species, terrestrial natural communities, and aquatic ecological systems as conservation targets. Current ecoregional planning standards call for the use of terrestrial ecological systems as targets. At present, terrestrial ecological systems have not been defined for this ecoregion. The next iteration of the plan should incorporate terrestrial ecological systems as targets.

Gathering the pieces was an iterative and continuous phase. Data compiled early in the process were later augmented by information that was incorporated through expert workshops and conference calls. The first draft of this plan was printed in May, 2000, and was used by Conservancy chapters in Indiana, Illinois, Michigan, and Ohio as the blueprint for conservation. Subsequent analyses, incorporating new data and more rigorous evaluations of target viability, were performed in Michigan and Ohio in 2002 and in 2003. The May, 2003 version of the plan thus contains recent information and thinking, though planning for landscape-scale restoration

areas and incorporation of ecological systems as conservation targets remain as opportunities to improve. The plan is meant to be an evolving, dynamic process, and will be revised with new information in the coming years. In this chapter, we describe how we identified those pieces of the North Central Tillplain that might be assembled into a portfolio, and how the information on those pieces was managed and communicated. Whereas general guidelines for these steps were established by the Core Team, technical teams were at liberty to improve and modify the process as required to improve efficiency. This flexibility was most evident in the processes used for declining and vulnerable birds and herptiles, and for aquatic species and communities.

3.2. Identification of Conservation Targets, Setting Conservation Goals, and Selecting Target Element Occurrences

3.2.1. General Guidelines

At the Kickoff Meeting in June, 1998, the Core Team and others established guidelines for identification of conservation targets. As a general rule, the team chose a minimum of ten viable occurrences as a goal for conserving each conservation target, following on the guidance provided by the Conservancy publication "Geography of Hope". This minimum standard is based upon the work of Cox et al. (1994) who conducted population viability analyses for 11 vertebrate species ranging from gopher tortoises and snowy plovers to Florida panthers and bald eagles. This standard refers to populations, not necessarily to occurrences in the Heritage program sense. The analyses of Cox et al. took into account demographic, environmental, and genetic stochastic factors facing most populations. Establishment of 10 relatively secure populations should provide a > 90% chance of at least one population persisting for > 100 years.

To capture variability in structure, composition, and genetic character of the conservation targets, the team also recommended that each Technical Team select occurrences to best represent the geographic distribution of the targets, and that the US Forest Service subsections be used as the framework for achieving this geographic distribution.

The team took the "coarse filter-fine filter" approach to setting guidelines for target selection and goal setting. This approach is based on the assumption that if viable examples of all representative ecological systems or natural communities (the coarse filter) are conserved, species targets, at least the common ones, would also be protected. Some species (e.g., globally imperiled, endemic and limited, or declining and vulnerable species) may not be adequately captured in the coarse filter and should be independently targeted for conservation; these species targets form the fine filter of the approach.

For some of the same reasons described in Section 3.3 "*Data Sources and Data Management*," the team chose to use natural communities as the coarse filter and not broader ecological systems. The natural communities that formerly occurred across broad expanses of the North Central Tillplain ecoregion (i.e., "matrix communities"), with only a few exceptions, do not occur in a matrix condition any more. Whereas mosaics of mesic to wet mesic tillplain forests virtually covered some subsections, and complexes of dry-mesic forests, barrens, prairies, and prairie fens covered millions of acres in other subsections two centuries ago, natural vegetation communities of all types (including aquatic systems) occupy roughly eight percent of the ecoregion now, and that percentage is distributed among thousands of mostly small patches (e.g.,

the 40-acre woodlot). Thus, broad ecological systems do not provide a useful coarse filter for conservation planning in the North Central Tillplain, and natural communities were used. That stated, the Core Team did suggest that the community Technical Team strive to identify at least ten (one in each ecological subsection) "matrix mosaics" (mosaics of matrix and large patch communities) of at least 1,000 acres, and at least 30 matrix mosaics of 300-1,000 acres. These matrix mosaics should capture as broad a set of the ecological systems in a subsection as possible, and be of a size and contiguity that allows natural processes to occur to the greatest possible extent.

For natural communities, the Core Team recommended that all viable natural communities be conservation targets, and that each community should be represented in at least ten viable occurrences distributed maximally among the ten ecological subsections. For species, the team recommended that all viable G1-G3 or declining and vulnerable (as determined by the technical teams and experts) species comprise the list of conservation targets. This recommendation left considerable leeway to the technical teams with respect to declining and vulnerable species, which was particularly important for reptiles and birds. The team recommended not including as conservation targets disjunct plants that were not globally imperiled, agreeing that the natural communities in which these species occur would be captured in the coarse filter.

Forty four species and three natural communities for which there are EO reports from within the ecoregion, and that otherwise meet the above criteria, were not considered conservation targets (see Appendix C). For the three communities, the reason for exclusion was that the occurrences in question had been wrongly classified, and the type in question did not occur elsewhere in the ecoregion. Species were dropped from consideration as conservation targets for various reasons, first among them being that there were no more viable occurrences in the ecoregion (e.g., the regal fritillary). Some of these targets should become restoration targets, and the next iteration of the ecoregional plan should establish restoration goals as appropriate.

3.2.2. Terrestrial Natural Communities

In identifying conservation targets, the technical team for natural communities followed the recommendations of the Core Team and chose all viable natural communities at the plant association level of the National Vegetation Classification (Grossman et al. 1998) as targets. The list of natural communities that occur in the North Central Tillplain (see Appendix C) was developed entirely from Heritage EORs. For these communities, the technical team set a generic conservation goal of ten viable occurrences distributed evenly among the ten subsections, or proportionally among the subsections if the geographic distribution of the community type was not even.

For one natural community type, Cinquefoil – Sedge Prairie Fen (CEGL005139; Anderson et al. 1998), the team departed from the generic goal and set the goal of conserving 20% of the known occurrences (currently 33 of 168), proportionally distributed among the subsections. This type of prairie fen has the center of its distribution in the North Central Tillplain, and occurs more frequently in this ecoregion than any other. In addition, it was recognized by the technical team and the Core Team that many other target species and communities occur in or around prairie fens, and that by conserving a higher number of prairie fens in functional sites than the generic

goal, we would be creating a second coarse filter that would, in part, make up for the lack of an adequate coarse filter of matrix communities.

Given this list of conservation targets and goals, the natural community technical team then evaluated all known EORs for the targets for viability and selected a set of EOs to best meet the conservation goal. To evaluate viability, EORs for target communities were reviewed by team members from all four states considering three criteria: size, condition, and landscape context. No strict specifications for these criteria were developed, so the evaluations were undeniably subjective. This approach was a conscious decision on the part of the technical team recognizing that even if someone were hired to develop criteria for all the community types, the level of knowledge about EOs was, in most cases, not detailed enough to permit evaluation with respect to specific criteria. Each EO was then assigned one of three possible viability ranks: "Y" for yes, it is viable; "P" for provisional, or, it could be viable but we are not certain of its size, condition, or landscape context; or "N" for not viable.

The technical team met to review the complete set of EOs, and their viability rankings, and to select occurrences to meet conservation goals. In most cases, there were not enough viable EOs to meet conservation goals, so all viable occurrences were selected and, in some cases, some that were thought possibly viable but for which current information was lacking. These latter EOs were recommended "provisionally" for inclusion in the portfolio, while the best viable occurrences were recommended with "no regrets."

The technical team meeting was held jointly with the plant species technical team, which, due to common membership between the two teams, resulted in economy of time and travel and allowed the two selection processes to inform each other. At this meeting, an ArcView GIS system was used to facilitate evaluation of overall geographic distribution and inform selection of EOs. The selection process was truly interactive, and data were entered during the process, saving a great deal of time and improving accuracy in the data management process.

For Ohio, terrestrial portfolio sites from the May, 2000 draft of the North Central Tillplain Plan were reassessed slightly differently for viability in January 2003. Viability was assessed in a stepwise heirarchical fashion. First, the natural vegetation surrounding each EO was digitized using GIS and digital aerial photos and the size of each natural vegetation patch was calculated. Target EOs were then categorized into matrix, small patch or large patch classes based on information provided by the North Central Tillplain draft plan. Then, based on the distribution of patch sizes and natural data breaks of all the suggested portfolio sites, thresholds for viability were determined for each patch type (Table 2). Each potential portfolio site then was assigned to a category of viability based on these size thresholds. Sites categorized as not viable or provisional were assessed using a landscape context filter.

Landscape context was assessed by determining the landuse in a one-mile buffer around each natural patch. Sites surrounded by a large amount of non-natural landuse were considered non-viable or provisional based on the thresholds presented in Table 3. Only sites that were considered provisional for the size filter were assessed with the landscape context filter, as it was assumed that a large enough patch, even if surrounded by non-natural landuse in the landscape, could remain viable. Most sites that were ranked provisional on size, but not viable on landscape

context, were removed from the portfolio. An exception is Hazel Daughmer Savanna, which ranked provisional for size and not viable due to landscape context. Since this site is so important to the portfolio, it was decided to retain this site as provisionally viable. Sites that were ranked both provisional on size and provisional on landscape context were considered provisionally viable. A condition filter for the remaining sites still ranked as viable or provisional was then applied using EO ranks and professional opinion, which moved some sites that were considered viable with the size filter into provisional status. These sites were Springville Marsh, Richardson Forest, Brown County Flatwoods, Clermont County Flatwoods and Stonelick Lake.

Table 2. Size viability thresholds used in analysis of potential portfolio sites in Ohio, January 2003.

EO Scale/Patch Type	Not Viable	Provisional	Viable
Matrix	<100 acres	100-250 acres	>300 acres
Large Patch	<50 acres	50-75 acres	>75 acres
Small Patch	<10 acres	10-50 acres	>50 acres

Table 3. Landscape context viability thresholds used in analysis of potential portfolio sites in Ohio, January 2003.

% Type of Land Use	Not Viable	Provisional	Viable
% Agriculture	> 90%	82-90%	<82%
% Urban/Developed	>30%	20-30%	<20%
% Natural	<10%	10-16%	>16%

In Michigan, many sites that were considered provisional in the May, 2000 draft of this plan were evaluated through field visits or further expert interviews. Several of these sites were then determined to be of degraded condition (typically due to invasive species, e.g., Monette Street Fen, or to very recent habitat destruction, e.g., Thornapple River Corridor) or in inhospitable landscapes (e.g., Smith's Woods) and were dropped from the portfolio entirely.

3.2.3. Plant Species

The process for selecting targets, setting conservation goals, and evaluating element occurrences for plant species was very similar to that for natural communities. The plant technical team followed the guidelines established by the Core Team, and made and initial selection of all G1-G3 species. From this list, a few species were removed as it became clear that there were no viable occurrences in the ecoregion and they were much better represented in other ecoregions (see Appendix C). Two other species were dropped when the Global Ranks for each species were changed to G4.

The team established a conservation goal of ten viable occurrences, distributed maximally, for all target plant species. If fewer than ten viable occurrences were known, then all viable occurrences were recommended for the portfolio.

Preparation of distribution maps and assessment of target viability was performed in much the same manner as for terrestrial communities (see above). In some cases, the team recommended more than ten occurrences of a target species to achieve better geographic representation among

the recommended EOs. For Ohio, a similar viability assessment was performed for terrestrial species targets as described above.

3.2.4. Terrestrial Invertebrates

The technical team for terrestrial invertebrates followed the Core Team recommendations in selecting conservation targets, but departed somewhat in setting conservation goals. All G1-G3 species initially selected as targets were exclusively insects (see Appendix C). For some species, there were no known viable occurrences, and these ended up being dropped as conservation targets. Preliminary conservation goals were set based on the overall distribution of the targets. For endemic and limited species, a goal was set for ten viable occurrences stratfied maximally among subsections, or, for Federally Listed as endangered or threatened species, following the Recovery Plan (if one existed; e.g., for Mitchell's satyr *Neonympha mitchellii mitchellii*). For widespread and peripheral species, a goal of five viable occurrences was set.

Information on the target species came from Heritage programs in the form of EORs, and distribution maps were compiled and distributed to technical team members. Team members evaluated the information and assessed viability as described for communities, and the team leader then conferred with each member regarding the viability of EOs in their portion of the ecoregion. For some targets, EORs from the 1999 field season, though incorporated late in the process, were considered and provided valuable information. Preliminary recommendations were then submitted to the portfolio design team for consideration in the context of all conservation target EOs.

3.2.5. Terrestrial Vertebrates (other than birds)

This small group of targets included five reptiles, one mammal, and one amphibian (see Appendix C). In addition to the four species in this group that had Global Ranks of G1-G3, the technical team evaluated several other species that were recognized to be declining over some portion, or all of their range. From this list, they selected three that have a significant portion of their range in the North Central Tillplain. The technical team had little real data to rely on in evaluating the declining and vulnerable species, but had to rely on their own expertise. They selected those species that were clearly in decline and rejected others for which the decline seemed to be less significant. It was hoped that selection and ultimate conservation of these declining and vulnerable species will capture other species not selected as conservation targets.

The technical team set an initial conservation goal of ten viable occurrences for each target, but did not maintain this goal for all species. For example, if two EOs in different parts of the ecoregion seemed roughly equal in quality and viability, the team chose to include both of them and perhaps exceed the conservation goal in preference to making a recommendation to conform to an arbitrary goal. The goal of ten was used as a guideline, not as a strict constraint.

In the case of the Indiana Bat (*Myotis sodalis*), the state of knowledge of the species' maternity colonies required a more customized approach. There are millions of individuals of this species known from hibernacula (a relatively few caves, mostly out of this ecoregion, where the bats spend the winter), but only a fraction of this number is ever accounted for during the summer breeding season. Studies have given a fairly good characterization of maternity habitat, but only a few maternity colonies, supporting relatively few individuals, are known. The technical team

made the assumption that there are many more undetected maternity colonies in the ecoregion and, in addition to recommending known maternity colonies as portfolio sites, selected several other floodplain forest areas that fit the description of maternity habitat. The team recommended that surveys in the potential maternity sites be a high priority.

3.2.6. Birds

The technical team identified as conservation targets breeding species with a Partners In Flight (PIF) global score of 20 or more, or a G1-G4 rank, plus a group of three species (Red-headed Woodpecker, Blue-winged Warbler and Grasshopper Sparrow) with globally important populations in the North Central Tillplain ecoregion (see Appendix C). For these target species, the technical team identified up to ten sites, and for most species the team only selected sites with 25 or more breeding pairs. Because current knowledge on critical parameters of landscape context leaves considerable uncertainty when considering specific sites, population size was used as an indicator of the viability of the populations for these birds. The assumption was made that if the site is sustaining 25 breeding pairs, landscape context and condition of the population must also be acceptable. It is possible that some of these populations are being sustained by birds originating from other sites, and that reproduction and recruitment are not sufficient to maintain numbers over the long term. Sites that had at least 25 breeding pairs of one of the target species were recommended for the portfolio.

In addition to identifying sites for target species, the team also identified important stopover sites for migratory landbirds, shorebirds, raptors, and waterfowl, modifying criteria being used by Important Bird Area programs of the American Bird Conservancy and National Audubon Society. For a site to be considered a viable stopover site, the team required that 20,000 landbirds or shorebirds, or 10,000 raptors or waterfowl, use the site per season.

Data on declining and vulnerable bird species came from a variety of sources: Heritage programs; breeding bird atlases and other publications; information provided by the American Bird Conservancy and National Audubon Society from their Important Bird Area projects; experts on specific species; and from one-day expert workshops held in Indiana, Michigan, and Ohio. Typically 15-20 people attended the workshops except in Indiana where participation was approximately 50. Important ecoregion sites for birds were mapped on DeLorme atlases; this information was then digitized in ArcView allowing the data to be displayed with other species and community data.

3.2.7. Aquatic Species

The aquatic species Technical Team followed the guidelines of the Core Team and selected all G1-G3 species as targets. These species were primarily mussels, but also included some fish and one cave isopod (see Appendix C). The data available on these species were primarily Heritage EORs, as with most other conservation targets. However, the extremely imprecise nature of EORs for the target species led the Technical Team to a different approach to establishing conservation goals and prioritizing target occurrences. For example, a typical EOR for a target species of mussel might read "one live and one freshly dead specimen," and that might be all the information available for a significant stretch of a major river system in the past twenty years. A definition of a viable element occurrence for the target aquatic species was thus unattainable,

prompting the Technical Team to abandon numeric goals for target EOs, and to instead use the available information to prioritize watersheds for conservation of aquatic species.

The conservation goal for aquatic species was to select a set of priority watersheds of varying sizes that were judged to be of sufficient quality to support viable populations of the target species, and that there be credible evidence for a viable population of each target species in at least one of the watersheds selected. Due to the paucity of definitive, recent data for most of the species, the expert judgment of the members of the Technical Team was critical to the selection of the priority watersheds. The Technical Team also recognized the huge areas that would be selected via this approach and the huge investment that would be implied by the map of priority watersheds and declined to set any goals for geographic representation of species. Indeed, the number of watersheds recommended to capture the aquatic species targets was fewer than the number of ecological subsections in the ecoregion, but the watersheds span subsections in many cases, reducing the need to stratify by subsections.

To prioritize watersheds, the Technical Team reviewed all Heritage EORs for the target species and selected those that indicated the presence of live individuals within the last twenty years. They used GIS maps of the EOs overlain on a watershed map (HUC 8 units see map of recommended watersheds) to then identify where there were clusters of target species within a given watershed. The watersheds that included selected EOs were then evaluated for viability by the Technical Team based on available data and their knowledge of water quality and landscape context, and those that were judged viable were recommended by the team as conservation priorities (Figure 3).

3.2.8. Aquatic Systems

The process to identify sites to represent aquatic systems occurred in three phases, one phase covered the Great Lakes Basin portion of the ecoregion, a second for the remainder of the ecoregion, and a third that entailed a review of the initial aquatic sites in Ohio. About 41% of the ecoregion is within the Great Lakes Basin, the rest being in the Ohio River basin. For the Great Lakes basin, aquatic system targets were identified and ecoregionally significant occurrences were selected via a five step process (The Nature Conservancy 2001):

Step One: Identify general patterns by developing Ecological Drainage Units
Develop an understanding of the variety and distribution of aquatic ecosystems and aquatic species patterns present in the ecoregion.

Step Two: Identify representative targets
Identify and map the distribution of aquatic targets (species, communities, macrohabitats, and/or aquatic ecological systems).

Step Three: Select the best examples of targets
Select the best examples of aquatic targets that together represent the full aquatic diversity in the ecoregion.

Step Four: Creating a portfolio that meets conservation goals
Incorporate aquatic targets with terrestrial species and community targets to design the ecoregional portfolio.

Step Five: Identifying information gaps and strategies
Identify information gaps and strategies to address them.

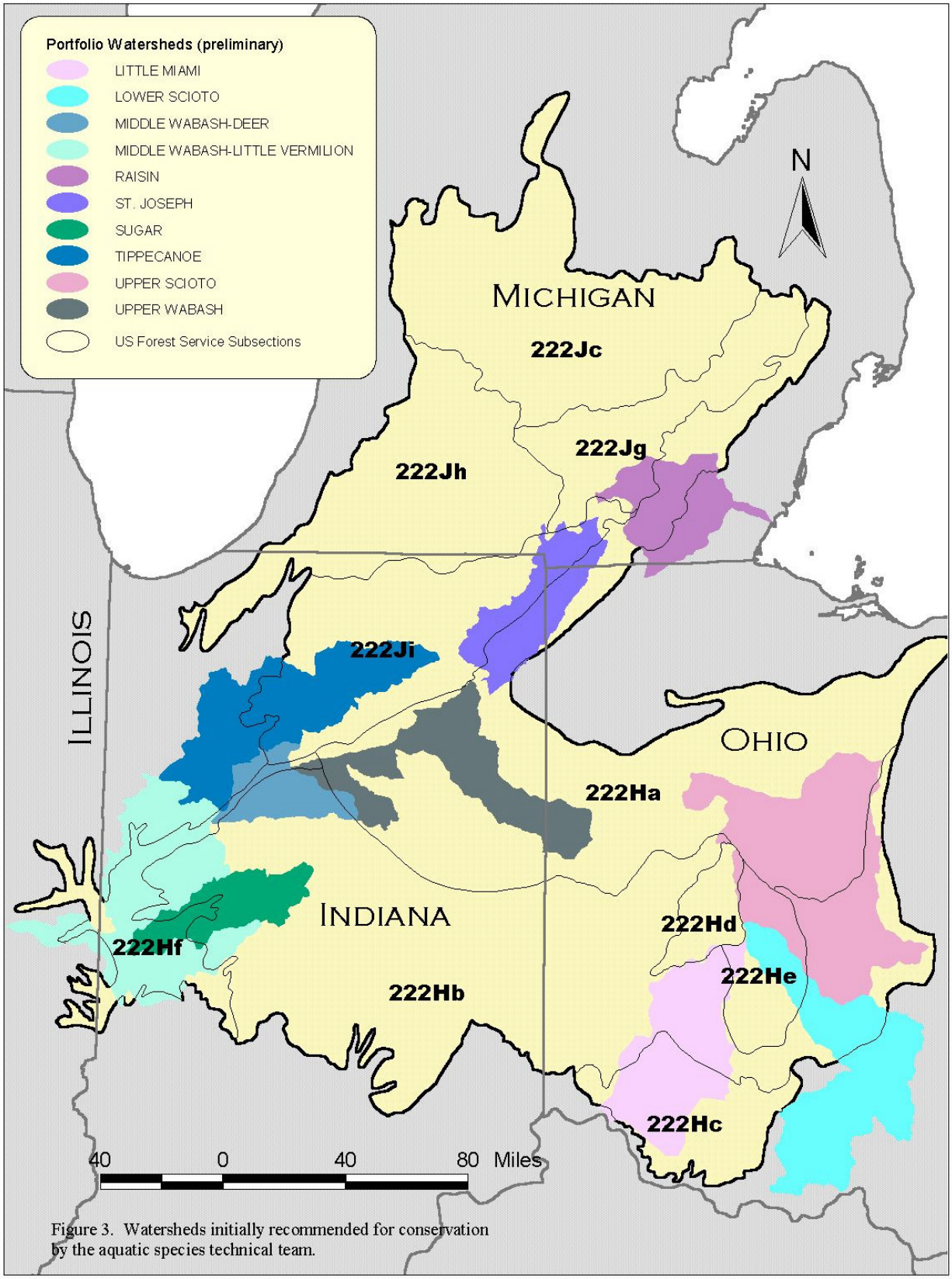

Figure 3. Watersheds initially recommended for conservation by the aquatic species technical team.

Ecological Drainage Units (EDUs) are shown in Figure 4. The process for the area of the ecoregion outside the Great Lakes Basin also involved two steps. First, ecologists from the

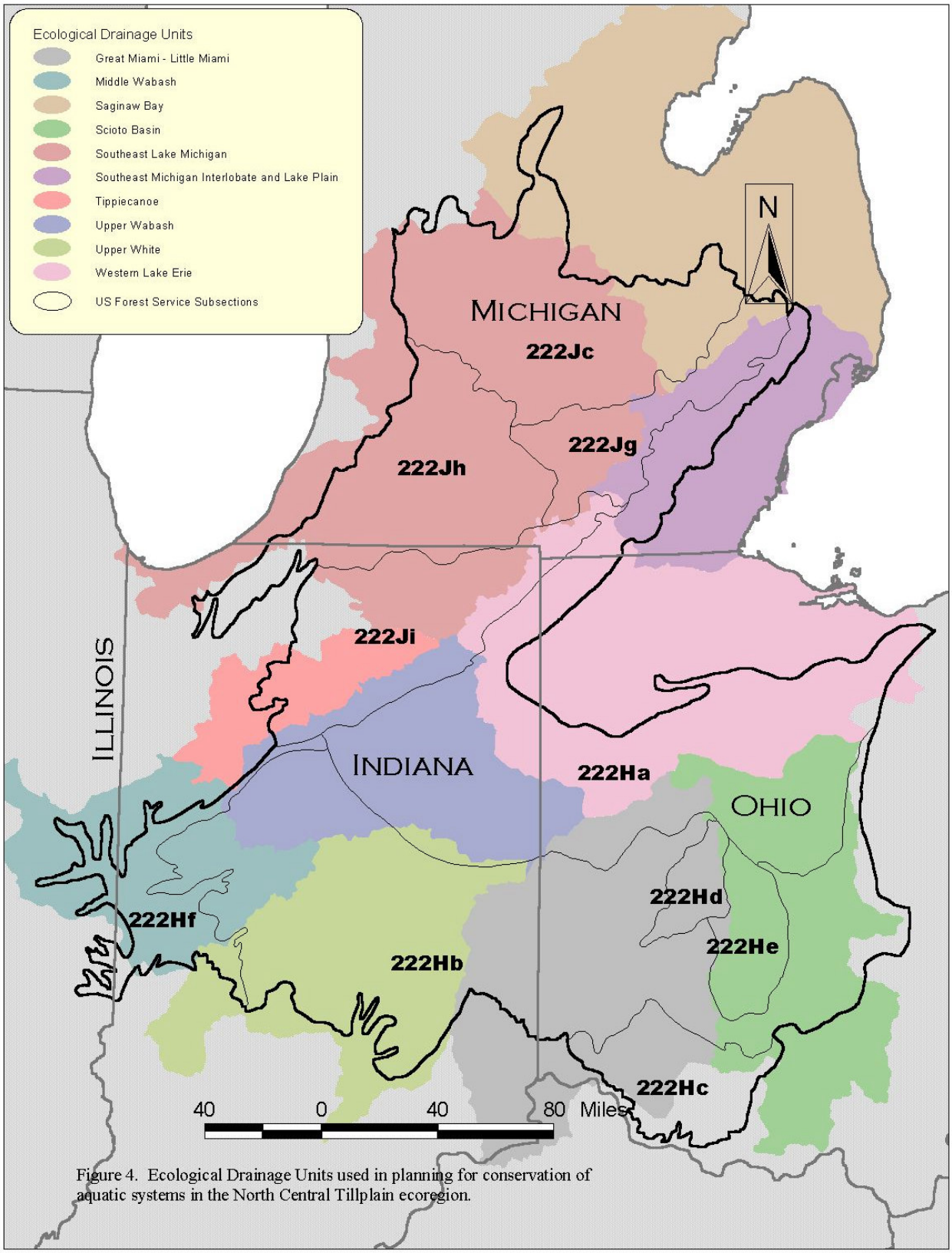

Figure 4. Ecological Drainage Units used in planning for conservation of aquatic systems in the North Central Tillplain ecoregion.

Freshwater Initiative of The Nature Conservancy completed a gap analysis, wherein they classified all the aquatic systems, determined which of those aquatic systems were under-represented in sites selected for other targets, and recommended additional aquatic sites to ensure representation of all aquatic communities (for details of this process see Designing a Geography of Hope, Second Edition, Appendix 7 [The Nature Conservancy, 2000]). This process resulted in a set of 72 aquatic system targets (Appendix C). The second step was to present the results of this analysis to a team of experts from Ohio and Indiana (the two states primarily involved in the area in question). These experts reviewed the classification and gap analysis, and reviewed the recommended sites in light of their own knowledge of water quality and the quality of the biotic communities. The expert team pointed out recommended sites that were not of good quality and recommended alternatives of better quality to fill gaps in representation. Through this process, many gaps were revealed. The current land use and quality of aquatic systems in the North Central Tillplain made it very difficult to identify adequate representatives of all types of systems (see results in section 5.3.3).

As a review of the aquatic systems in Ohio, a process similar to that used in the Great Lakes was done in 2002 as an "add-on" to the planning for the Western Allegheny Plateau ecoregion. Freshwater Initiative and Eastern Resource Office ecologists, while classifying data for the EDUs found in the Western Allegheny Plateau, also included information from the EDUs within the Great Lakes and North Central Tillplain ecoregions due to some overlap of ecoregional boundaries, and as an opportunity to refine aquatic planning in Ohio. During an expert meeting in September 2002, best examples of targets were chosen for all the EDUs, including those found primarily in the North Central Tillplain and Great Lakes Ecoregion. The sites selected during this process overlapped to a large extent with sites chosen in the May, 2000 draft of the North Central Tillplain Plan and the Great Lakes Ecoregional Plan and served to further refine the stream segments and viability assessment of aquatic sites chosen in the earlier plans.

3.2.9. The Conservation Targets

Roughly sixty percent of the conservation targets chosen by the technical teams are either terrestrial natural communities or aquatic systems (Table 4). They include all viable natural communities that have been defined and that are tracked within the ecoregion, and various imperiled or declining species (See Appendix C). Somewhat unconventionally, three types of bird stopover sites (landbird, raptor, and waterfowl) are included as targets. The conservation targets have been characterized in terms of their taxonomic groupings, Federal listing status, global imperilment status, geographic distribution, pattern of occurrence (for natural communities), and scale of occurrence.

Globally imperiled targets (G1-G2) make up 30% of the list (Table 5). Of these 56 targets, 26 are communities, 13 are mollusks, 6 are vascular plants, 2 are crustaceans, 5 are insects, and there are one each of non-vascular plants, fish, reptiles and mammals .

Table 4. Number of conservation targets in the North Central Tillplain, by taxonomic group.

Taxonomic Group	Number of Targets
Amphibians	1
Bird Stopover Sites	3
Birds	13
Crustaceans	2
Fish	9
Insects	20
Mammals	1
Mollusks	24
Non-vascular Plants	2
Reptiles	6
Aquatic Systems	72
Terrestrial Communities	82
Vascular Plants	24
Total	259

Table 5. Conservation targets in the North Central Tillplain, grouped by Grank. (two versions, ungrouped rankings and grouped rankings)

GRANK	NUMBER OF TARGETS
G1	16
G2	40
G3	63
G4	45
G5	19
GH	1
GU	75
TOTAL	259

*Unranked targets include three types of bird stopover sites and the aquatic systems targets.

There are 17 target species that are listed under the Federal Endangered Species Act (Table 6). Of these, there are nine listed mollusks, two insects, two birds, one mammal, two vascular plants, and one reptile for which the northern (Tillplain) population is listed as threatened.

There are very few endemic and limited targets in the North Central Tillplain (Table 7). The seven endemic targets are the Central Indiana Tillplain Flatwoods community, Frost Cave Isopod, White Catspaw (a mollusk), the Laricis Tree Cricket, Kramer's Cave beetle, Murray birch, and a spittlebug (*Flexamia huroni*), the latter three each being known from only one site in the world. See Appendix C for a complete listing. There is one insect, the Mitchell's satyr (*Neonympha mitchellii mitchellii*) that was formerly widespread, but due to extirpation from former sites outside the ecoregion, over 90% of the currently known sites for the species are within the ecoregion; it is, for practical purposes, limited in distribution.

Table 6. Number of species in each status category of the Federal Endangered Species Act in the North Central Tillplain.

Federal Listing Status*	Number of Targets
PS:LE	1
LE	13
LT	1
PS:LT	1
PS:LT,PDL	1
Total	17

*PS = Partial Status; LE = Listed as Endangered; LT = Listed as Threatened; PDL = Partially De-listed

Table 7. Conservation targets in the North Central Tillplain, grouped by distribution (not including aquatic systems and bird stopover sites).

DISTRIBUTION	NUMBER OF TARGETS
Endemic	7
Limited	27
Widespread	90
Peripheral	60
Total	187

The pattern of occurrence of terrestrial communities and aquatic systems relates to the general size of a characteristic occurrence. A matrix community or system occurs over large areas and includes occurrences of large patch and small patch communities nested within. Aquatic systems mainly fall into large patch patterns but with a good number of larger rivers forming a matrix pattern. Terrestrial communities are reasonably evenly distributed between large patch and small patch patterns with a smaller number forming a matrix.

Table 8. Pattern of occurrence of terrestrial natural communities and aquatic systems in the North Central Tillplain ecoregion.

	PATTERN		
TAXONOMIC GROUP	Matrix	Large Patch	Small Patch
Terrestrial Communities	14	37	31
Aquatic Systems	19	52	1

Another way of understanding the nature of conservation targets is by classifying them according to their scale, which refers to the area over which they occur or carry out most of their life history. There are four classes of scale, and they relate to the pattern of occurrence described above. Most of the terrestrial communities and nearly all the species, apart from birds, mammals and five of the nine the fish species, occur at either the local or intermediate scale (Table 9).

Table 9. Number of conservation targets in the North Central Tillplain that occur at various scales.

SCALE	NUMBER OF TARGETS
Local	72
Intermediate	80
Coarse	89
Regional	18
Total	259

Relatively few of the targets occur at a regional scale, these including migratory birds and fish species, as well as the Indiana Bat. All but one of the aquatic systems are coarse in scale, whereas most of the local scale targets are insects, herptiles, and plants.

3.3. Data Sources and Data Management

3.3.1. Conservation Target Data

Most of the data used in selecting portfolio sites were obtained from Heritage programs in the form of Element Occurrences (EO's) that had been gathered from all states in the Midwest Division by the Midwest Resource Office, separated by ecoregion, and distributed to ecoregional planning teams. The first edition of EO data were provided to the NCT team in early 1998 in a Microsoft Access database. This database included around 9,000 EO's for species, natural communities, and other features such as heron rookeries. Species included were any being tracked by the Heritage programs, including many records that were not of importance to ecoregional planning.

Along with EO records, the database included pre-developed tables for planning teams, sites, and conservation targets, and several tools for managing the data including lookup tables for sorting by global rank, pre-built queries and reports (such as reports on species and community target occurrences). These ready-made tools enhanced communication early in the planning process by enabling quick reporting of data to technical teams as they were commencing their work. An updated version of the database was provided in mid-1998.

Other sources of data included the Breeding Bird Atlas for each of the four states. These data were used in conjunction with expert knowledge of bird populations in the selection of sites for declining and vulnerable birds (see section 3.3.6). As sites were selected for declining birds, "dummy" EO records were created for each species at each site selected for that species. This enabled comprehensive reporting and analysis of conservation targets in portfolio sites during the planning process.

Experts were another source of data on conservation targets. For species that were not well known (e.g., the Indiana bat *Myotis sodalis*) or not well tracked (e.g., declining herptiles), dummy EO records were created based on reliable reports from experts within and outside the technical teams. All of these dummy EOs will be reported to the respective Heritage programs following completion of the ecoregional plan.

For aquatic communities, original data for ecoregional planning were created by the Freshwater Initiative (FI). Since the nature and availability of biotic data for streams and lakes varies so greatly within and across ecoregions, there is no biotic classification, let alone map, of aquatic communities. Aquatic ecologists at the FI used a combination of physical parameters, including stream size, gradient, and surficial geology to classify aquatic macrohabitat types. These macrohabitat types were then used as aquatic conservation targets in surrogate for aquatic communities, based on the assumption that the aquatic communities would correspond in their distribution to the aquatic macrohabitat types..

The identification of aquatic conservation sites, and hence the data on aquatic macrohabitat types, did not follow ecoregional lines. The first ecoregion for which a comprehensive classification and map were completed was the Great Lakes, but instead of confining the analysis to the Great Lakes Ecoregion, the analysis included the entire Great Lakes Basin, which is larger than the ecoregion. The aquatic site selection for the Great Lakes Basin covered roughly the northern third of the North Central Tillplain ecoregion. Hence, a subsequent classification, mapping, and analysis process was completed by FI for the remainder of the North Central Tillplain. This mapping and analysis was managed entirely by FI.

3.3.1. Geographic Information Systems

A baseline set of geographic data, in digital form, was provided to the ecoregional team by the Midwest Resource Office in 1998. This data set included land use and land cover, hydrologic data, geopolitical boundaries, ecoregional boundaries, transportation systems, and water quality data (see Appendix D).

Chapter 4: Assembling the Portfolio

4.1. Introduction

The set of sites[1] that, if conserved, would best meet conservation goals for the ecoregion (i.e., the "portfolio"), was assembled by compiling all the EOs recommended for conservation by the technical teams, using a GIS to map preexisting site boundaries or generate polygons around those EOs. Those areas contained within the polygons were then assessed to determine whether they should be included in the portfolio or not and whether they should be priorities for conservation action by The Nature Conservancy. The portfolio design team, comprising members of the Core Team and a few others, carried out this process through engaging knowledgeable experts in their respective states to compile information about each site and then convening to select the portfolio from the complete set of sites. The team then developed a process for determining "Action Sites", those sites for which The Nature Conservancy would play a lead or other significant role in conservation over the next five to ten years. In this chapter, the assembly process and results are described.

[1] "Site," as used here, is a general term and refers to an area of significant biodiversity value. It does not imply an area precisely or specifically defined, as through a site conservation planning process.

4.2. Developing a Preliminary Portfolio

Two sets of preliminary sites were initially developed, one for terrestrial conservation targets and one for aquatic targets. This distinction was made for two reasons. First, the selection of sites for aquatic species and communities entailed three processes (one for species and two for communities; see Chapter 3) and was completed well after the terrestrial process. Second, it was agreed that while there is significant overlap among conservation strategies used for terrestrial and aquatic targets, the geographic and economic scale of action is typically much greater for aquatic conservation projects than terrestrial, especially in a predominantly agricultural ecoregion such as the North Central Tillplain. The processes used for both terrestrial and aquatic site selection are described below, followed by a brief synopsis of how the two sets of sites were combined to form the first iteration portfolio.

For terrestrial conservation targets, each technical team recommended a set of EOs to be protected to meet conservation goals for their set of targets. Most teams assigned recommended EOs to two categories, based primarily on certainty of the viability of EO. If an EO was of high quality and was considered viable, it was recommended for the portfolio with "no regrets." If there was some question as to the condition or viability of an EO, but the team thought the EO was necessary for meeting conservation goals, it may have been recommended "provisionally." The provisional EOs that were included in the final portfolio of sites will become priorities for field survey to determine their viability.

All EOs that were recommended for the portfolio were compiled into a GIS coverage. Since site boundaries did not exist for most of the recommended EOs, ArcView software was then used to generate polygons around each EO by buffering each EO with a circle of one-mile radius. In Ohio, sites for each EO were digitized using GIS and digital aerial photos to delineate the natural vegetation patch of each EO. Natural vegetation is easily distinguished in this highly altered landscape using digital aerial photos. In Ohio, these natural vegetation patches were used to define the sites and these boundaries were buffered with a 1-mile buffer to allow each shape to been seen at a larger scale. Any EOs (or EO sites in Ohio) that were within two miles of each other were thus incorporated into the same polygon as the buffers around them merged into a larger polygon. These "sites" formed the first draft of the portfolio for terrestrial conservation targets. This draft portfolio, including maps and reports of EOs within sites, was distributed to the Design Team which then met in December, 1999, to review the contribution of sites to the portfolio and the viability of the site to decide which sites should remain (for details on this process, see Appendix E). Sites that made a significant contribution to the portfolio and were judged viable were recommended with "no regrets" for inclusion in the portfolio; sites for which long-term viability was not knowable given current information but that contributed to meeting conservation goals were recommended "provisionally". As with provisional EOs, provisional sites will be priorities for critical assessment in the next one to five years to enable refinement of the ecoregional plan.

For aquatic species targets, the technical team recommended a set of seven watersheds, including the Tippecanoe River, Upper St. Joseph of the Maumee River, Wabash River, Scioto River, Sugar Creek, Upper River Raisin, and the Little Miami River. These watershed units (at the HUC 8 level of the USGS classification) became the first draft of sites for conservation of aquatic species. The watersheds proposed to capture aquatic species targets were judged by the

Core Team to be too large for practical application. The team felt that presenting such huge sites on a map would seem overwhelming both for the Conservancy offices that would be ultimately responsible for their conservation and for partners who might be involved in conservation. Instead, the seven watersheds were incorporated as one piece of information in the process of representing aquatic communities (see section 3.2.8). The sites resulting from the aquatic selection processes were ultimately represented by buffered stream reaches and selected lakes. In the Great Lakes basin outside of Ohio, polygons were digitized roughly by hand to include the selected stream reaches and lakes. For sites selected outside the Great Lakes basin, selected stream reaches were buffered with ArcView, using a buffer distance of two miles, to create polygons for the set of preliminary sites. In Ohio, both within and outside the Great Lakes Ecoregion, expert-selected stream reaches were buffered with ArcView, using a buffer distance of two miles.

Combining the terrestrial and aquatic sites was accomplished with a GIS. There was considerable overlap between the initial portfolios, with the aquatic sites being, in general, larger than the terrestrial sites. In some instances, sites that had been selected and digitized for conservation of migratory birds, e.g., riparian forests along major rivers, mirrored aquatic sites. In these cases, the two sites became one. In cases where a large aquatic site engulfed many terrestrial sites, the two sets of sites were maintained as nested sites in the combined portfolio. This step helped to avoid losing the information that went into site selection and reflected the difference in scale of conservation and management required for isolated, terrestrial targets (quite common in the North Central Tillplain) and for large, continuous aquatic systems. In a few cases, large terrestrial sites were linked by large aquatic sites, and the polygons were joined to become one site. In others, there was some overlap between terrestrial and aquatic sites of similar size, but the conservation targets and ultimate strategies were distinct enough that the sites were maintained as separate sites. Ultimately, site conservation planning will result in more meaningful site boundaries. Throughout the process of merging sites, EOs were tracked and linked to the sites through use of the GIS and MS Access databases. Information management through this phase of the process was both critical, for ensuring continuity of logic and earlier results, and challenging.

4.3. Designing and Refining the Portfolio

4.3.1. Assessing Preliminary Sites

Throughout the portfolio design process, members of the Core Team, Design Team, and Technical Teams were called upon to complete an assessment of all sites that were being considered for inclusion in the portfolio. Most sites that had been generated from the process for terrestrial conservation targets (described in the previous section) were assessed for several parameters, and these results informed the design process. Sites that were unfamiliar to members of these teams may not have been assessed until later in the process of portfolio refinement, and aquatic sites were assessed during the aquatic site selection process, well after the terrestrial portfolio had been largely assembled. In all cases, there were two direct purposes to the assessment: to discuss and record the conservation value, threats, feasibility, probability of success, partners, and strategies pertaining to each site; and to inform site selection (i.e., decide whether a site was "in" or "out"). A third, indirect outcome of the assessments was that the information gathered was then used to help in selecting Action Sites. (see section 5.5.3).

Site assessments were completed using two different worksheets, one for terrestrial and one for aquatic sites (see Appendix E). The parameters assessed were developed based on earlier, similar processes used in the Great Lakes ecoregion. For the North Central Tillplain, the process was streamlined considerably given limitations on staff available to process information and the availability of partners. As it was, assessing over 200 sites took considerable time on the part of the knowledgeable team members, and assessments were still being completed well into the portfolio refinement process, even up to within one week of completion of the First Draft of the ecoregional plan. There were several "drafts" of the portfolio that were developed in the process over the period from December, 1999 to April, 2000, and managing the updated information, often received in spurts, was again facilitated through coordinated use of the ArcView and Access databases.

As mentioned above, there were sites that were recommended for the portfolio but that were unfamiliar to the planning teams and partners. These were usually sites that had been visited by previous Heritage staff ten or more years in the past. Ideally, there would be time enough to revisit these sites to determine the viability of the EOs and the sites, but there were too many such sites to make this a practical alternative. Sites that were not assessed were given a "Provisional" portfolio status at most and will become priorities for field assessment in the years following the first iteration. As such, they were not considered in the Action Site selection process, as that requires more information than was available for these sites.

4.3.2. Representing Matrix Communities

Recognizing that over 90% of the North Central Tillplain is in "non-natural" land cover, the Design Team recognized that the ecoregion lacks an adequate coarse filter and considered targeting sites for restoration of matrix communities. There were two motivating factors for this discussion. First, we discussed the overall viability of the ecoregion in the context of surrounding ecoregions and potential scenarios of global warming or future ice-ages. We agreed that the North Central Tillplain in its present condition would be a difficult place for species to either migrate through or to disperse to new sites in response to dramatic climatic changes, and that many existing natural areas do not include enough ecological variability (or ecosystem diversity) and are generally too small to support targets in a scenario of global change. Though we did agree on this, we also concurred that addressing the functional viability of the entire ecoregion in a broader context given the uncertainties about future climatic conditions was beyond the scope of this iteration of the ecoregional plan, and moved on to the second perspective.

The almost complete absence of matrix communities in a matrix condition was the second rationale for consideration of restoration, both for conservation of the communities themselves and to provide more suitable matrix for small patch communities and associated species. It was in this context that we then agreed on a goal for landscape-scale restoration and criteria by which to choose and evaluate potential areas for broad-scale restoration. We also discussed and recommended some approaches to landscape-scale restoration appropriate for the Tillplain that should be considered by site conservation planners for individual sites.

Goal for landscape-scale conservation: Identify at least one area in each subsection that has potential for restoring and connecting natural communities in an area large enough to support the matrix (and large or small patch) communities, natural processes, and native species characteristic of the subsection.

The main purpose for this goal is not to recreate new element occurrences for matrix communities, as that may or may not be possible, but to enhance the landscape context of existing occurrences of target communities and species. This goal is related to the goal for "matrix mosaics" (mosaics of matrix, large, and small patch communities) originally stated at the Kickoff Meeting in June, 1998: To conserve a minimum of 10 areas of greater than 1000 acres, stratified maximally, and a minimum of 30 areas of between 300-1000 acres, stratified maximally. The first draft portfolio presented below will be evaluated against both goals.

In keeping with the terminology used in the ecoregional plan for the Central Tallgrass Prairie, the areas targeted as sites for the restoration of matrix and embedded large and small patch communities will be called **Landscape Restoration Areas**. The design team developed criteria for these Landscape Restoration Areas to aid selection:

Criteria:

1. Fragmentation: minimize fragmentation relative to conservation target viability and natural processes
2. Size: 2,000-10,000+ acres (size should be appropriate for conservation targets)
3. Human/natural land uses: (agreed that there could be a component of these uses, but the appropriate proportion is yet to be determined)
4. Spatial distribution and configuration of ecosystems: represent the types and arrangement of local ecosystems, including ecotones and other natural gradients, that is characteristic of the subsection and the landforms, topography, soils, and hydrology of the area.

Using these criteria and applying them in a qualitative manner, the Design Team then made some preliminary selections of areas to consider as **Potential Restoration Areas**. By subsection, they were:

- 222He--a potential National Wildlife Refuge in the Little Darby Creek watershed; nothing else identified to date
- 222Hd--extreme northern tip of subsection in OH in a moraine area of Logan County
- 222Hc--Rocky Fork or East Fork Lake
- 222Hb--Hueston Woods; should identify one more for this large subsection
- 222Hf--Vermillion and Middle Wabash Rivers; Turkey Run and Shades State Park
- 222Ha--Ives Road Fen (may be too small); Wabash River (to be identified); Alum Creek?; Delaware Wildlife Area?
- 222Ji--Marsh Lake Complex; Lake Diane (or some larger area in the Upper St. Joe watershed)
- 222Jg--Pinckney-Waterloo; Shiawassee-Huron Headwaters; Grand River Bat site?
- 222Jh--Fort Custer; Barry SGA; SE Cass County

- 222Jc--Grand River-Thornapple?; Flat River State Game Area; Maple River State Game Area?

To the original criteria, one was added: that there be an existing commitment to restoration of matrix communities on the part of the Conservancy Chapter in the appropriate state. This criterion was recommended by the planners for the Central Tallgrass Prairie, and helped to narrow down the set of Potential Restoration Areas to identify the Landscape Restoration Areas.

Using these criteria, three Landscape Restoration Areas were selected, including Ives Road Fen, Middle Fork of the Vermilion River, and Big Walnut. Several other sites were selected as Potential Restoration Areas as well (Figure 5).

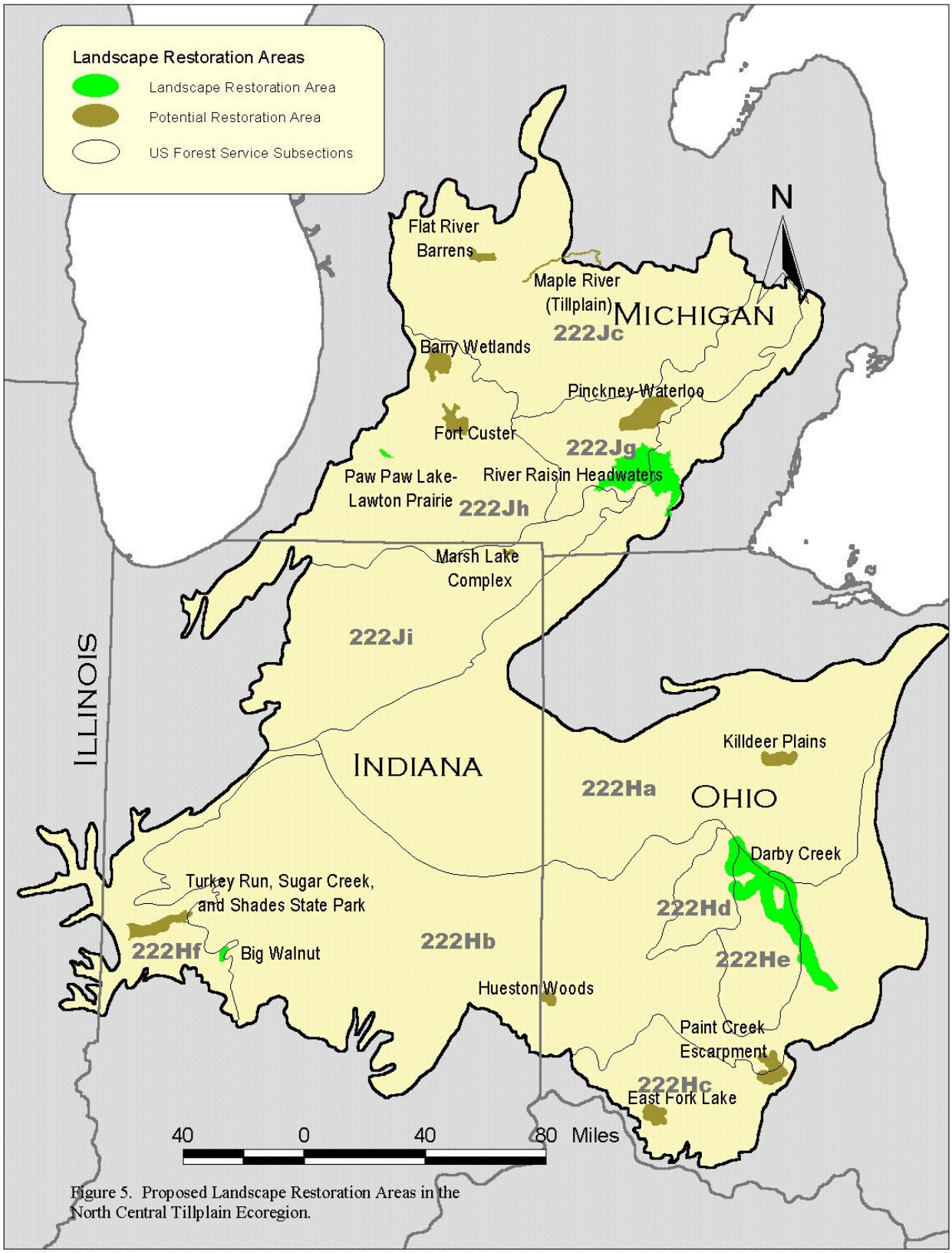

Figure 5. Proposed Landscape Restoration Areas in the North Central Tillplain Ecoregion.

The Design Team also made some recommendations for identification of future Landscape Restoration Areas in subsections where the goals are not met:

- Find large, good to marginal quality remnants and build out from them, reforesting over time;
- Restore tillplain forest around the margins of high-quality sites chosen for other targets;
- Focus on large, "conservation-friendly" areas (public or conservation ownership) as core areas;
- Focus on large privately owned parcels as potential acquisitions for core areas.

There have been few ecoregional planning teams that have considered identifying areas for restoration of matrix communities, and those that have are in ecoregions in which the natural ecosystems have been mostly displaced by other uses. The ecoregions of the Midwest and Great Plains, in particular, face this challenge. As yet, the approaches to identification and the ultimate benefits of Landscape Restoration Areas have been best described in the Central Tallgrass Prairie ecoregional plan. The approach used in the North Central Tillplain plan is admittedly rough and represents a first cut. There is considerable room for improvement and standardization of an approach to confront this challenge, and it should be a consideration, if not a priority, for ecoregions that lack a functional coarse filter to refine this approach for future iterations.

Chapter 5: Assessing The Portfolio and Setting Priorites

5.1. Description of the Portfolio

The portfolio of conservation areas in the North Central Tillplain ecoregion comprises 169 sites in four states and covers over six million acres (over 2.5 million hectares), or roughly 21 percent of the ecoregion (Table 10; Figure 6; see Appendix F for a list of conservation areas, Appendix G for detailed conservation area reports, and Appendix H for a report of conservation targets found in conservation areas).

Excluding cross-boundary sites, Ohio contains the greatest total area of portfolio sites with 2.6 million acres (1 million hectares); Michigan and Indiana each contain about 1.3 million acres (0.5 million hectares). Indiana has the greatest number of sites (68); Ohio has 47, Michigan 46, and Illinois has no sites entirely within its boundaries. The larger average size of sites in Ohio is likely due to the presence of many sites that include riverine aquatic systems as targets.

In all, eight of the portfolio sites cross state boundaries. Seven overlap two states and one, the Upper St. Joseph of the Maumee River, overlaps three states.

Table 10. Distribution of portfolio sites among states in the North Central Tillplain ecoregion.

STATE	NUMBER OF SITES			HECTARES OF SITES			ACRES OF SITES		
	PROVISIONAL SITES	NO REGRETS SITES	TOTAL PORTFOLIO	PROVISIONAL SITES	NO REGRETS SITES	TOTAL PORTFOLIO	PROVISIONAL SITES	NO REGRETS SITES	TOTAL PORTFOLIO
IL-IN	0	1	1	0	98,574	98,574	0	243,576	243,576
IN	11	57	68	137,421	378,002	515,423	339,567	934,042	1,273,609
IN-MI	0	3	3	0	30,511	30,511	0	75,393	75,393
IN-MI-OH	0	1	1	0	139,374	139,374	0	344,395	344,395
IN-OH	0	3	3	0	167,595	167,595	0	414,129	414,129
MI	8	38	46	17,154	529,665	546,819	42,388	1,308,802	1,351,190
OH	11	36	47	16,599	1,019,820	1,036,419	41,017	2,519,975	2,560,992
Grand Total	30	139	169	171,174	2,363,541	2,534,715	422,972	5,840,312	6,263,284

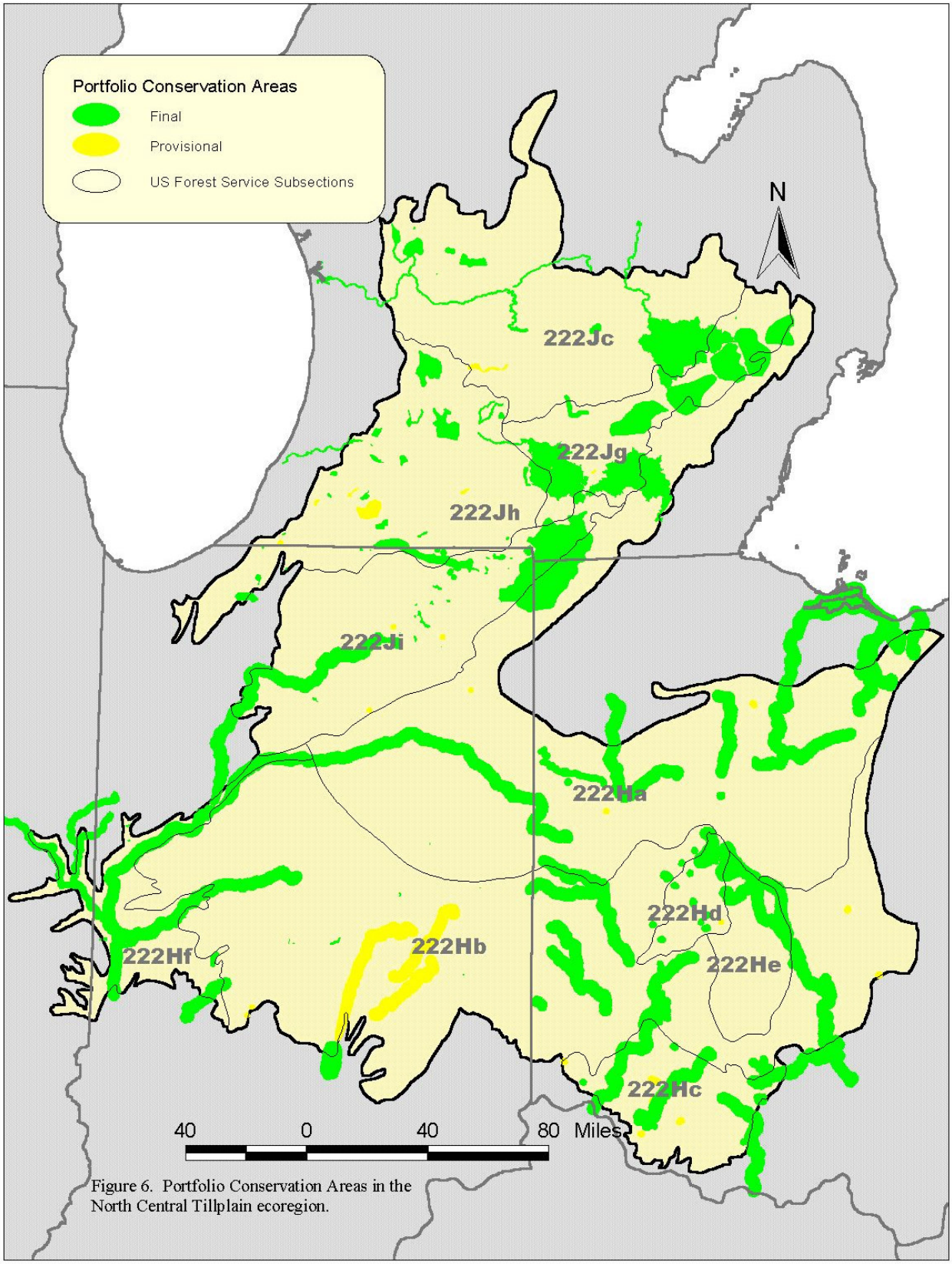

Figure 6. Portfolio Conservation Areas in the North Central Tillplain ecoregion.

5.2. Identifying Action Sites

5.2.1. Action Sites

Action Sites are the sites at which The Nature Conservancy should invest significant time and energy within the next five years to ensure achievement of conservation goals over the long term. Recognizing that the Conservancy can not work in all the portfolio sites, it is requisite of the ecoregional planning to recommend the subset of sites that should be the Action Sites. The Design Team developed an approach to select these sites, relying both on human judgement and on quantitative measures.

At the portfolio design meeting in December, 1999, it was agreed that though the set of Action Sites should reflect and capture the biodiversity of the ecoregion to the greatest degree possible, it is ultimately the responsibility of the individual state programs to choose and modify the set of Action Sites within their state. The ability of computer algorithms, based on data of somewhat questionable reliability, to select appropriate sites was also called into question. The Design Team concluded that three states, Illinois, Ohio, and Indiana, would each rely on their staff and partners to apply an agreed-upon set of criteria and use their best judgement to select Action Sites, to comprise roughly 20% of the total number of sites in their state. Team members from Michigan agreed that the number of sites that were poorly known by staff and the relatively good availability of data warranted a computer analysis and selection, based on the same set of criteria that the other states were using in an non-computerized approach. In the 2003 revision of the portfolio, the Ohio members of the team decided to use a computer selection tool as well. It was also agreed that the approach taken by Michigan (and later by Ohio) would be applied to the entire portfolio to provide feedback to the other states on their selections. Analysis of the Action Sites would enable all states to then modify the selections as necessary. The agreed-upon selection criteria included:

1. Biological Importance (number of targets and their global significance; irreplaceability)
2. Urgency (how soon action would need to be taken to avoid or abate threats)
3. Feasibility (how easy it should be to successfully implement conservation strategies)
4. Opportunity (whether there is a situation that would allow strategies to be implemented how, but that would probably change in the foreseeable future making conservation significantly more difficult)
5. Level of Protection (the proportion of the site that is currently protected)

There was significant discussion regarding how each of these criteria should be weighted, the ultimate conclusion being that there was no way to consistently weigh the criteria in a non-computerized approach.

Subsequent to the Portfolio Design meeting, the Action Sites Excel workbook became available, and it was utilized to assist in selecting the Action Sites for Michigan and the alternative set for other states. This workbook standardizes the selection criteria and employs a weighting system (that can be modified) to select the sites. The criteria in the workbook differ slightly from those selected by the Design Team:

1. Biological Value (a compound criterion incorporating Biodiversity Health and Number/Diversity of Targets)
2. Complementarity (the degree to which a site captures system targets not already captured in previously selected Action Sites)
3. Leverage (the degree to which conservation at a site will result in conservation of other portfolio sites)
4. Feasibility/Opportunity (the degree to which the Conservancy has the capacity to avoid or abate the threats at the site)
5. Urgency (how soon action would need to be taken to avoid or abate threats)

The data that were gathered in the process of assessing sites, coupled with EOR data from BCD and developed in this planning process, were modified for use in the workbook (see Appendix I for a detailed description of methods).

Given the evolution in approaches to selecting Action Sites concurrent with ecoregional planning in the North Central Tillplain, this version of the ecoregional plan proposes **two sets of action sites** (Table 11). The first set, Action Sites 1, contains the sites proposed by staff from Illinois and Indiana, coupled with the Michigan and Ohio sites selected by the Action Sites workbook (Figure 7). The second set, Action Sites 2, consists of the set selected by the Action Sites workbook for all states (Figure 8). The excel workbook produces 5 rankings: "Yes," "Maybe+," "Maybe," "Maybe-," and "No." Sites that were ranked with the excel spreadsheet tool as "Yes" or "Maybe+" were included in the set of Action Sites 2 (none were ranked "Maybe"). It is hoped that having two sets of Action Sites will enable states to review their actions in terms of how well they meet conservation goals and represent a diversity of the targets in the ecoregion, as well as how they fit the programmatic priorities of each Chapter.

Sites ranked as "Maybe-" (but not in Action Sites 1 or 2) are presented in Table 12 as "Potential Action Sites." Recognizing the limitations of available data, it is hoped that these Potential Actions Sites are kept in mind as potential conservation opportunities come available and so that further examination of these sites can be made.

Table 11. Action Sites in the North Central Tillplain ecoregion.

STATE	CONSERVATION AREA	ACTION SITES 1	ACTION SITES 2	ACTION SITE RANK
IL-IN	Vermillion River	Y	N	NO
IN	Douglas Woods	Y	N	NO
IN	Grass lake - Steuben Co. Complex	Y	N	MAYBE-
IN	Swamp Angel	Y	N	NO
IN	Binkly Bog/ Jimmerson Lake	Y	N	NO
IN	Mill Creek/Fish Creek Fens (La Porte)	Y	N	NO
IN	Marsh Lake Complex	Y	N	NO
IN	Elkhart Bog	Y	N	NO
IN	Rattle Snake Canyon Site	N	Y	YES
IN	Turkey Run, Sugar Creek, and Shades State Park	N	Y	YES
IN	Big Walnut	Y	N	MAYBE-
IN	Tippecanoe River	Y	Y	YES
IN-MI	Pigeon River and Wetlands	Y	Y	MAYBE+
IN-MI-OH	Upper St. Joseph River	Y	N	MAYBE-
IN-OH	Fish Creek	Y	Y	MAYBE+
MI	Liberty Fen	Y	Y	YES
MI	River Raisin Headwaters	Y	Y	YES
MI	Shiawassee River and Shiawassee Flats	Y	Y	MAYBE+
MI	Fort Custer	Y	Y	YES
MI	Pinckney-Waterloo	Y	Y	YES
MI	Barry Wetlands	Y	Y	YES
MI	Upper Clinton River	Y	Y	YES
MI	Upper Huron River	Y	Y	YES
MI	Paw Paw River	Y	Y	YES
MI	Zeigenfuss Lake/Greenville	Y	Y	YES
MI	Flat River Barrens	Y	Y	YES
MI	Mill Creek Wetlands (St. Joseph)	Y	Y	YES
MI	Baker Sanctuary	Y	Y	YES
OH	Killdeer Plains	Y	Y	YES
OH	Clifton Gorge	Y	Y	MAYBE+
OH	St. Mary' s River Wetlands	Y	Y	YES
OH	Little Miami River Mainstem	Y	Y	YES
OH	Hueston Woods	Y	Y	MAYBE+
OH	Middle Scioto River	Y	Y	MAYBE+
OH	Sandusky River	Y	Y	MAYBE+
OH	Mad River Plains	Y	Y	YES
OH	Twin Creek	Y	Y	MAYBE+
OH	Stillwater River	Y	Y	MAYBE+
OH	Macochee Creek/Mad River Headwaters	Y	Y	YES
OH	Darby Creek	Y	Y	YES

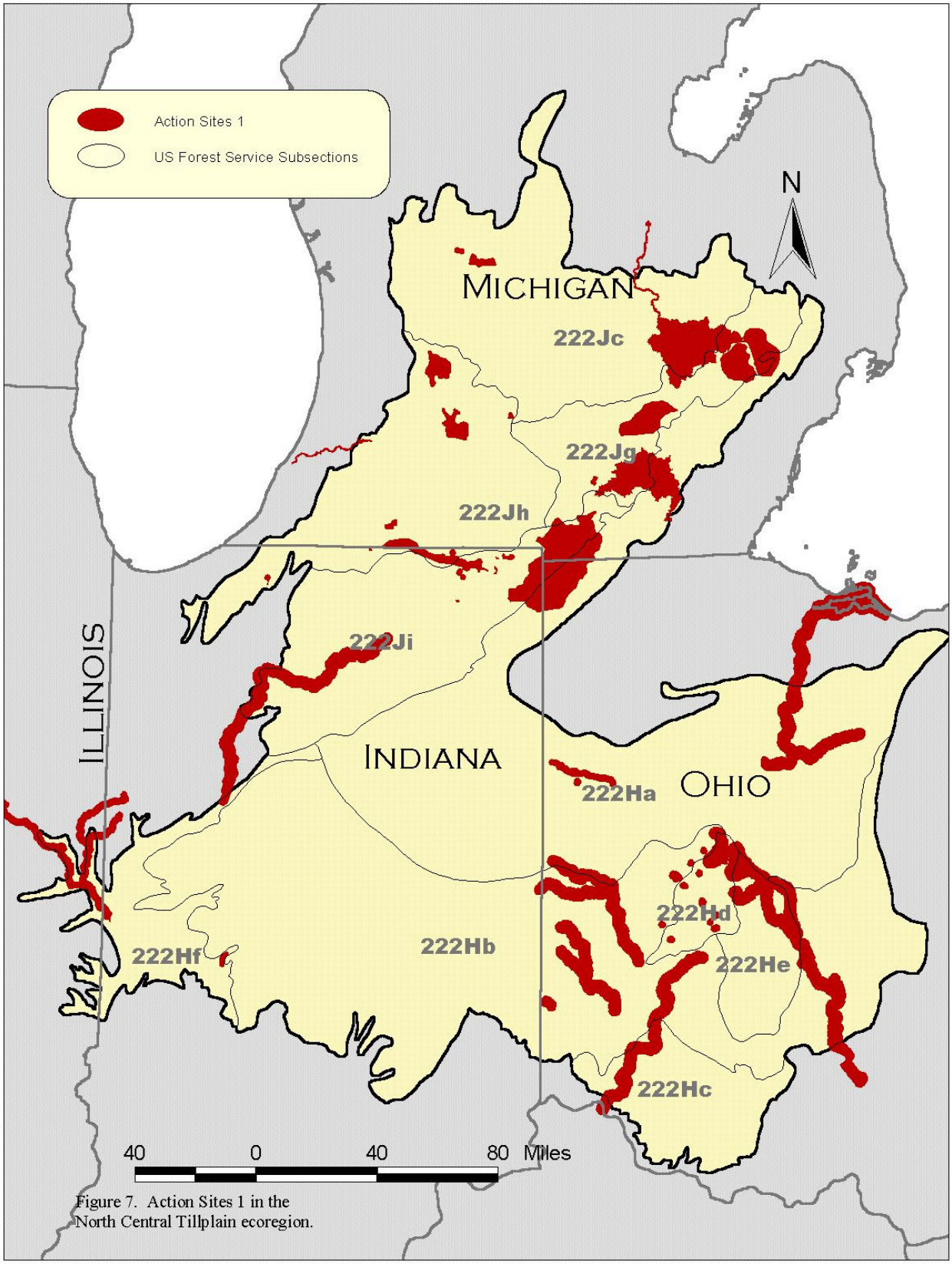

Figure 7. Action Sites 1 in the North Central Tillplain ecoregion.

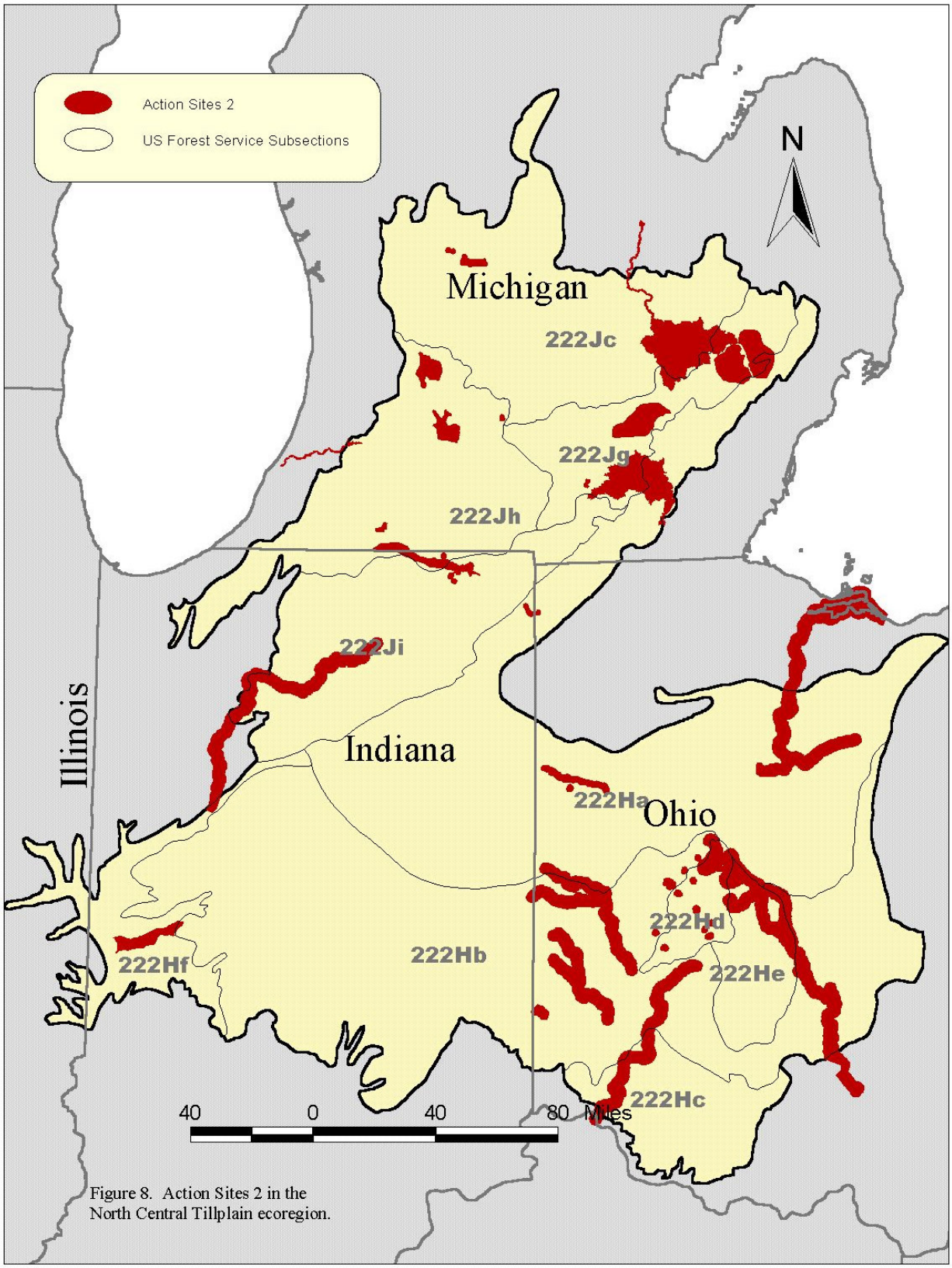

Figure 8. Action Sites 2 in the North Central Tillplain ecoregion.

Table 12. Potential Action Sites (sites that ranked "Maybe-" in the Action Site Excel workbook) in the North Central Tillplain ecoregion.

STATE	CONSERVATION AREA
IN	Fall Creek Gorge
IN	Spicer Lake Nature Preserve
IN	Christlieb Bog
IN	Spurgeon Nature Preserve
IN	Spring Creek Seeps Nature Preserve (Montgomery)
IN	Sugar River
IN-OH	State Line Woods/Mud Lake Bog
MI	Huron River Headwater Lakes
MI	Kalamazoo River Headwaters
MI	Knickerbocker Lake
MI	Stony Creek
MI	Lake Diane
MI	Upper Kalamazoo Tributaries
MI	Spring Brook-Kalamazoo Nature Center
MI	Holly Fen
OH	Dietrich Woods
OH	Beavercreek Wetlands
OH	Blakeslee Virginia Mallow
OH	Dean Culbertson Woods
OH	Fort Hill Woods
OH	East Fork Lake
OH	Paint Creek Escarpment
OH	Sears-Carmean Woods
OH	Spring Valley Fens/Caesar Creek
OH	Germantown Woods

The Action Sites 1 set contains eight more sites than Action Sites 2, and covers about 500,000 more acres (200,000 more hectares Table 13). These differences reflect the more stringent criteria employed in the Action Sites tool than in the subjective approach. Six of the eight differing sites are in Indiana, and two others are cross-boundary sites partly in Indiana. Overall, there are many sites shared between the two sets. Action Sites 1 represents about 22 percent of the total portfolio, while Action Sites 2 is roughly 18 percent. These percentages are close to the 20 percent guideline recommended by the Design Team.

Table 13. Number and acreage of Action Sites 1 and Action Sites 2, by state.

STATE	ACTION SITES 1			ACTION SITES 2		
	Count	Acres	Hectares	Count	Acres	Hectares
IL-IN	1	243,575.71	98,573.74	0	0	0
IN	9	296,991.54	120,190.83	3	333,316.41	134,891.30
IN-MI	1	70,530.59	28,543.34	1	70,530.59	28,543.34
IN-MI-OH	1	344,395.39	139,374.90	0	0	0
IN-OH	1	8,048.15	3,257.04	1	8,048.15	3,257.04
MI	13	788,949.41	319,283.45	13	788,949.41	319,283.45
OH	12	1,530,586.28	619,419.78	12	1,530,586.28	619,419.78
Total	38	3,283,077.07	1,328,643.08	30	2,731,430.84	1,105,394.91

5.2.2. Landscape-Scale Action Sites

Somewhat contrary to the approach recommended in Designing a Geography of Hope (The Nature Conservancy, 2000), Landscape-Scale Action Sites were selected from the complete set of Action Sites as opposed to being selected first. The primary reasons for reversing this order were concern over the use of an arbitrary threshold in size to preselect the Landscape-Scale Action Sites and the implication that designating a site as a Landscape-Scale Action Site requires a full-time staff to be dedicated to the site. The Design Team felt that including all portfolio sites in the selection process would allow the significance of size to be borne out in more meaningful ways, such as number of targets (big sites typically contain more, and potentially more of coarse-scale), complementarity (potentially more acres in natural land cover in a big site), and landscape context, rather than making it arbitrary. Secondly, the approach taken recognizes that conservation strategies (staffing a site is a strategy) should be determined through site conservation planning, not ecoregional planning. There is value, however, to determining that a certain set of sites meets criteria that would suggest that they might demand a staff person. Thus, the set of Landscape-Scale Action Sites should be viewed as a proposal, and a more definitive set of sites be established in a later version of the plan.

To develop the proposed set of Landscape-Scale Action Sites, the following selection filter was used: select all sites greater than 10,000 acres that captured coarse or regional scale targets AND were part of Action Sites1 AND where TNC should play a lead role AND where urgency of action to abate threats is high or very high (1-5 years). This approach considers that there is some level of commitment on the part of the lead state (Action Site 1 designation), size, need for TNC action, and urgency. It is a finer filter on the set of Action Sites.

The seven proposed Landscape-Scale Action Sites (Figure 9; Table 14) cover roughly 1.5 million acres, or 24% of the portfolio. Obviously, many of the largest sites were included by the selection process. Three of the sites are entirely in Michigan, and two others are shared among Michigan, Indiana and Ohio. Indiana and Ohio each have one Landscape-Scale Action Site entirely within state boundaries. Of the seven proposed sites, all but one (Pinckney-Waterloo) have either a dedicated project leader or significant stewardship staff already committed to their conservation. It is perhaps telling that six of the seven include river systems as targets and agriculture as a primary source of stress. Clearly, rivers and riparian areas in the agriculture-

dominated North Central Tillplain capture significant biological diversity and their conservation demands a large investment of resources.

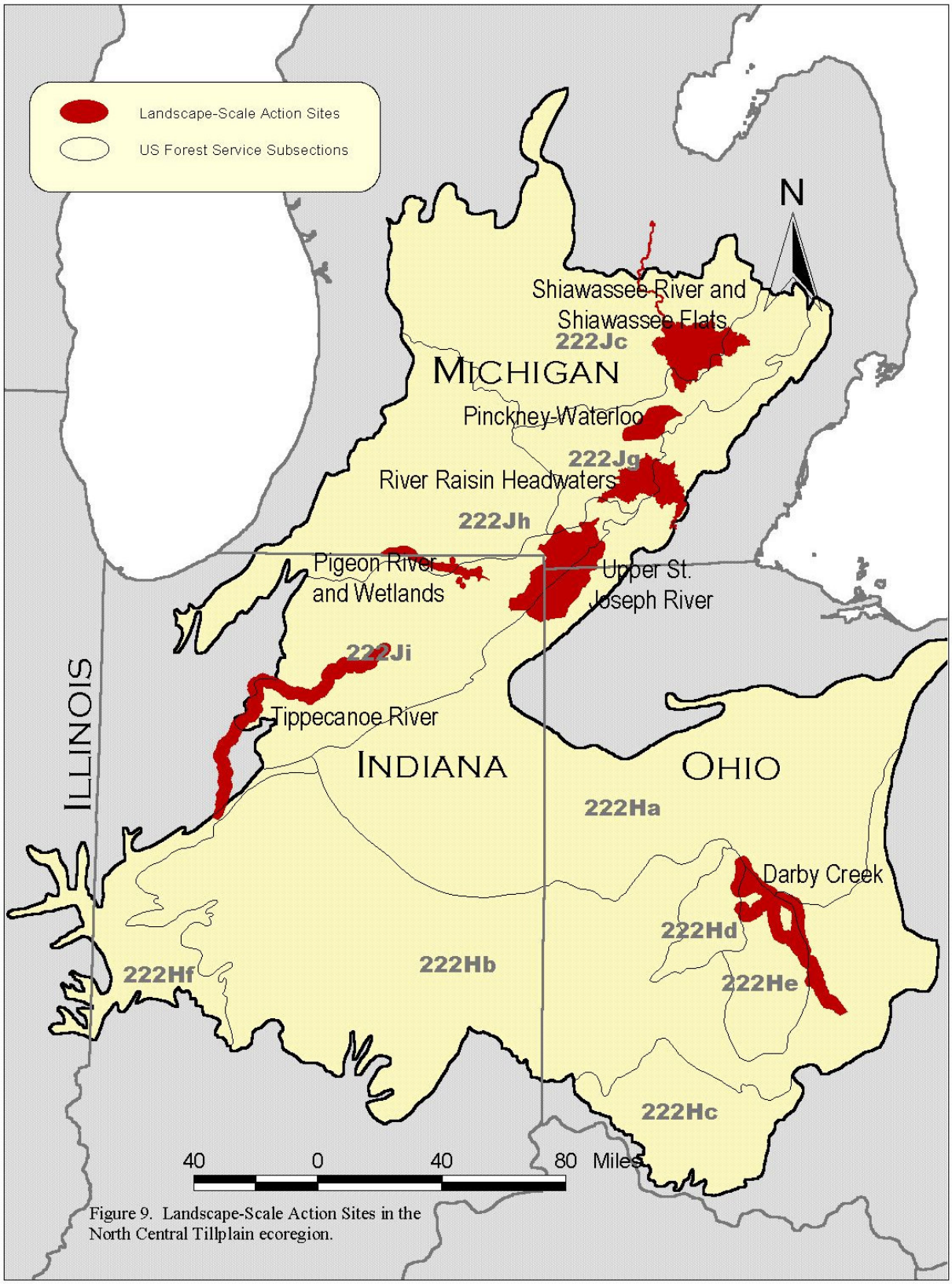

Figure 9. Landscape-Scale Action Sites in the North Central Tillplain ecoregion.

Table 14. Proposed Landscape-Scale Action Sites in the North Central Tillplain ecoregion.

STATE	CONSERVATION AREA	ACRES	HECTARES
IN	Tippecanoe River	280,521	113,525
IN-MI	Pigeon River and Wetlands	70,531	28,543
IN-MI-OH	Upper St. Joseph River	344,395	139,375
MI	Shiawassee River and Shiawassee Flats	268,611	108,705
MI	River Raisin Headwaters	177,618	71,881
MI	Pinckney-Waterloo	78,379	31,720
OH	Darby Creek	290,527	117,575
TOTAL		1,510,582	611,324

5.3. Meeting Conservation Goals

The Nature Conservancy is working with many partner organizations to develop measures of success for ecoregions (Sanjayan and Northrup 2002). These measures fall into four categories:

- *Process Measures* – which assure that we are using and adhering to the standards and methodology throughout the 4 Steps of the Conservation Approach (setting priorities, developing strategies, taking action, and measuring success);
- *Impact (or Outcomes) Measures* – which use monitoring programs to ask if we have improved biodiversity health and reduced threats;
- *Capacity Measures* – which measure the quantity and quality of resources, people and infrastructure of The Nature Conservancy and its partners; and
- *Independent Verification* (the Audit) – which provides internal/external validation of our process and outcomes, enhances credibility, and promotes innovation.

Future iterations of this plan should address how each of these measures can be quantified and assessed at the ecoregional level. For this iteration, the measure of the adequacy is an assessment of the degree to which the conservation targets are captured in the portfolio of conservation areas. This measure could be viewed as nearly a best case scenario as it assumes that all of the portfolio conservation areas will indeed be conserved. In reality, we know that some will not be. On the other hand, we also know that our information about conservation targets in the conservation areas and elsewhere in the ecoregion is incomplete and that there are certainly target occurrences yet to be discovered. If the loss of some conservation areas is balanced by discovery of new target occurrences, then the following analysis can be viewed as a reasonable estimate of how well the conservation targets are captured in the conservation areas.

The degree to which implementation of an ecoregional plan will result in achievement of conservation goals is a reflection of the viability of an ecoregion, the validity or practicality of the goals themselves, and the comprehensiveness of ecoregional planning. An ecoregion may be in such a degraded condition that there are not enough viable occurrences of the conservation targets to ensure their long-term conservation. The North Central Tillplain is in poor shape, relative to its condition only 200 years ago, by almost any standard. For this reason, we might expect that conservation goals can not be met in the ecoregion. Alternatively, if conservation goals are set unrealistically high (even for a pristine ecoregion), the ability to meet those goals will always appear daunting. Though the question of "how much is enough?" can always be

argued, the Core Team and technical teams did attempt to develop reasonable goals, though there are undoubtedly some that are unrealistic for the targets. The planning teams also made good use of available information and experts, short of gathering original data in the field specifically for the planning process. There are recognized gaps in the information that, if filled, could potentially improve the portfolio. All of these factors are applicable to the North Central Tillplain portfolio and should inform future strategies to improve the ecoregional plan and the ecoregion itself.

To measure the degree to which conservation goals were met, ArcView was used to identify all EOs included in each site, and Access was used to select those EOs that were judged viable or potentially viable and that would count towards meeting goals. Microsoft Excel was then used to do pivot-table reports of how many occurrences of each target had been captured in the portfolio for "No Regrets" sites alone and for the entire portfolio, as well as for both sets of action sites.

Overall, 18 percent of the conservation target goals were met by the portfolio (Table 15; see Appendix J for list of conservation targets with unmet goals). Ecoregional goals were met for three taxonomic groups (amphibians, mammals, and bird stopover sites) by the "No Regrets" sites, the Action Sites 1, and Action Sites 2. These values are somewhat misleading in that there was only one target species for each of the mammal and amphibian groups, and there were no goals set for numbers of stopover sites. The only other group for which more than 25% of the goals were met was the reptiles (4 of 6 targets in the "No Regrets" sites and 5 of 6 targets in the full portfolio).

The portfolio meets goals for 1 of the 7 endemic targets and 5 of the 27 targets with limited distribution. Similarly, we met the goals for only 1 (6%) of the 16 G1 targets, and 6 to 7 (16 to 22%) of the G2 targets. Thus, the targets that are most in need of protection in the ecoregion fared poorly compared to those that can be protected in other ecoregions.

Table 15. Number and percentage of conservation targets for which conservation goals were met by the North Central Tillplain portfolio, by the "No Regrets" sites only, for Action Sites 1 and Action Sites 2, reported for all targets by taxonomic group (excluding aquatic systems and bird stopover sites) and for endemic and limited targets, for Federally Listed species, and for globally imperiled targets.

		Total portfolio		No Regrets only		Action Sites 1		Action Sites 2	
Taxonomic Group	Number of targets	Goals met	Percentage of goals met	Goals met	Percentage of goals met	Goals met	Percentage of goals met	Goals met	Percentage of goals met
Amphibians	**1**	1	100%	1	100%	1	100%	1	100%
Birds	**13**	1	8%	1	8%	1	8%	1	8%
Fish	**9**	0	0%	0	0%	0	0%	0	0%
Mammals	**1**	1	100%	1	100%	1	100%	0	0%
Reptiles	**6**	5	83%	4	67%	4	67%	3	50%
Communities	**82**	15	18%	13	16%	3	4%	2	2%
Crustaceans	**2**	0	0%	0	0%	0	0%	0	0%
Insects	**20**	4	20%	4	20%	1	5%	1	5%
Molluscs	**24**	3	13%	2	8%	2	8%	2	8%
Non-vasc. plants	**2**	0	0%	0	0%	0	0%	0	0%
Bird stopover sites	**3**	3	100%	3	100%	3	100%	3	100%
Vascular plants	**24**	1	4%	1	4%	0	0%	0	0%
Grand Total	**187**	34	18%	30	16%	16	9%	13	7%
Distribution									
Endemic	**7**	1	14%	1	14%	0	0%	0	0%
Limited	**27**	5	19%	4	15%	2	7%	1	4%
Grand Total	**34**	6	18%	5	15%	2	6%	1	3%
USESA									
LE	**13**	3	23%	3	23%	2	15%	1	8%
LT	**1**	0	0%	0	0%	0	0%	0	0%
PS:LE	**1**	0	0%	0	0%	0	0%	0	0%
PS:LT	**1**	1	100%	1	100%	1	100%	0	0%
PS:LT,PDL	**1**	0	0%	0	0%	0	0%	0	0%
Grand Total	**17**	4	24%	4	24%	3	18%	1	6%
Rounded G rank									
G1	**16**	1	6%	1	6%	0	0%	0	0%
G2	**40**	7	18%	6	15%	4	10%	3	8%
Grand Total	**56**	8	14%	7	13%	4	7%	3	5%

Table 16. Number of viable target EOs conserved in the total portfolio, and number and percentage captured in "No Regrets" sites only, in Action Sites 1, and in Action Sites 2, sorted by taxonomic group.

		No regrets sites		Action Sites 1		Action Sites 2	
Taxonomic Group	Total Number of EOs in Portfolio	Number of EOs	Percentage of Total	Number of EOs	Percentage of Total	Number of EOs	Percentage of Total
Amphibians	28	26	93%	22	79%	21	75%
Aquatic Systems	98	77	79%	28	29%	22	22%
Bird Stopover Sites	7	7	100%	4	57%	4	57%
Birds	39	39	100%	24	62%	24	62%
Crustaceans	1	1	100%	0	0%	0	0%
Fish	22	21	95%	16	73%	13	59%
Insects	64	63	98%	45	70%	43	67%
Mammals	24	19	79%	12	50%	8	33%
Mollusks	107	93	87%	81	76%	68	64%
Reptiles	174	165	95%	122	70%	90	52%
Terrestrial Communities	460	432	94%	237	52%	190	41%
Vascular Plants	55	51	93%	23	42%	20	36%
Grand Total	1079	994	92%	614	57%	503	47%

Conservation of the entire portfolio of sites would lead to the protection of over 1000 viable target occurrences (Table 16.). Nearly half (460) of these EOs are terrestrial natural communities, and there are also over 100 EOs each for the reptiles and mollusks. The "No Regrets" sites would protect 87% of all target occurrences in the ecoregion, while the 43 Action Sites 1 and 45 Action Sites 2 would protect about 57% and 47%, respectively, of the viable occurrences in the portfolio.

For some targets, conservation of existing element occurrences is not a valid strategy. One example of such a target is the butternut (*Juglans cinerea*; G3G4). In the case of the butternut, the species usually occurs as isolated trees or in small groves in certain ecological systems. These ecological systems may be captured to a greater or lesser extent in the portfolio, yet the species could perish due to a pathogen that is becoming more widespread every year. Traditional conservation for sites that may contain one or only a few trees that could easily succumb to the pathogen is not a reasonable strategy. For the butternut, the ecoregional planning team recommends targeting funding for research directed at combating the pathogen or identifying and promoting genetic resistance in the species. When a strategy to abate the threat of disease is developed, then a decision should be made regarding existing EOs or re-establishing the species in suitable, protected habitat.

5.4. Patterns of Threats and Strategies in the Portfolio

5.4.1. Stresses and Sources of Stress

The assessment of the portfolio of sites enabled the planning team to summarize threats to targets at portfolio sites. Figures 10 through 15 present this summary for major stresses and sources (those that were listed first by people doing the assessments) in the full portfolio and in Action Sites 1 (results were similar for Action Sites 2). The major stress identified was habitat destruction and the major source of stress was land development (Figures 10 – 12). Nutrient loading from agricultural sources was the major threat identified for most aquatic systems, and agriculture and forestry (primarily agriculture in this ecoregion) was the major source of stress for nearly as many sites as land development. It is clear that conservation strategies will have to deal with land development and agriculture as sources of stress at a great number of portfolio sites, and it is also apparent that there is a geographic pattern to these threats (Figures 13 – 15). Land development is the key source of stress in the north, and the major stress is habitat destruction or conversion. In the south, agriculture and forestry are major sources of sediment and nutrient loading to the large river systems.

There are a couple of possible explanations for this pattern. It is possible that site assessors in Indiana and Ohio are simply more apt to list agriculture first (assessments were performed by different people). Alternatively, the scale of aquatic sites, being mostly larger than terrestrial sites, may give a visual impression of a pattern that, if one looked more closely at smaller sites, would not seem so striking. The most probable explanation is that the sites in the northern subsections are experiencing more rapid land development in and around the portfolio sites. This suggestion makes sense, given that the large sites in subsection 222Jg, 222Jc, and 222Jh are all near urban centers such as Detroit/Ann Arbor, Kalamazoo, and Grand Rapids in Michigan, and South Bend in Indiana. The greater proportion of forested lands within these large sites

makes them attractive for residential development, and that is indeed occurring in these areas at the expense of natural and agricultural lands.

The maps also reveal that biological sources of altered composition and structure are important at smaller sites, especially in south-central Ohio, the two sites in Illinois, and at Ives Road Fen in Michigan. These mostly small sites that will require intensive management to maintain viability will be, unfortunately, common in the North Central Tillplain ecoregion. Collectively they capture a great deal of targets, and in many cases there is not a great deal of opportunity for expansion by restoration. Future planning should consider strategies for increasing capacity for restoration in this ecoregion.

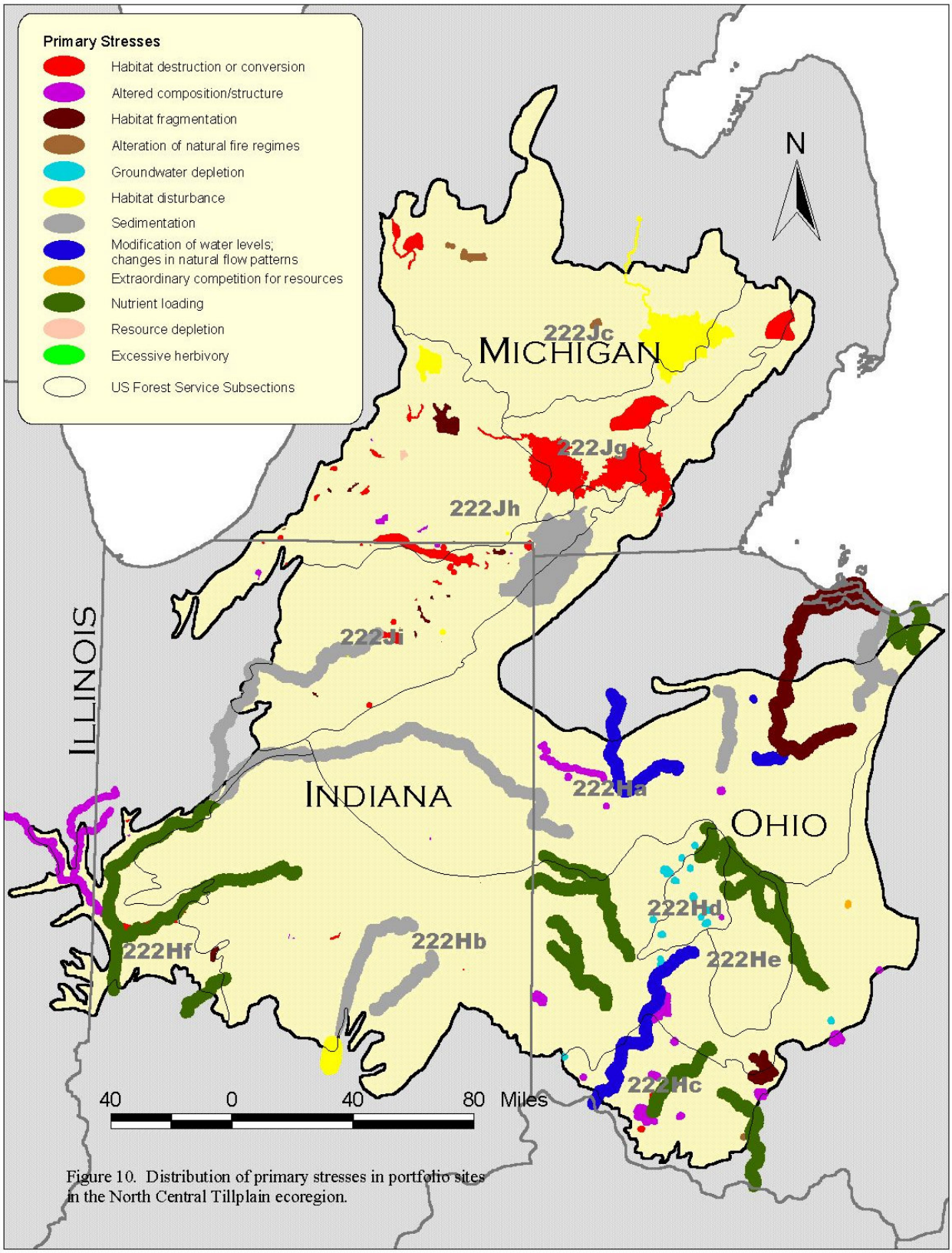

Figure 10. Distribution of primary stresses in portfolio sites in the North Central Tillplain ecoregion.

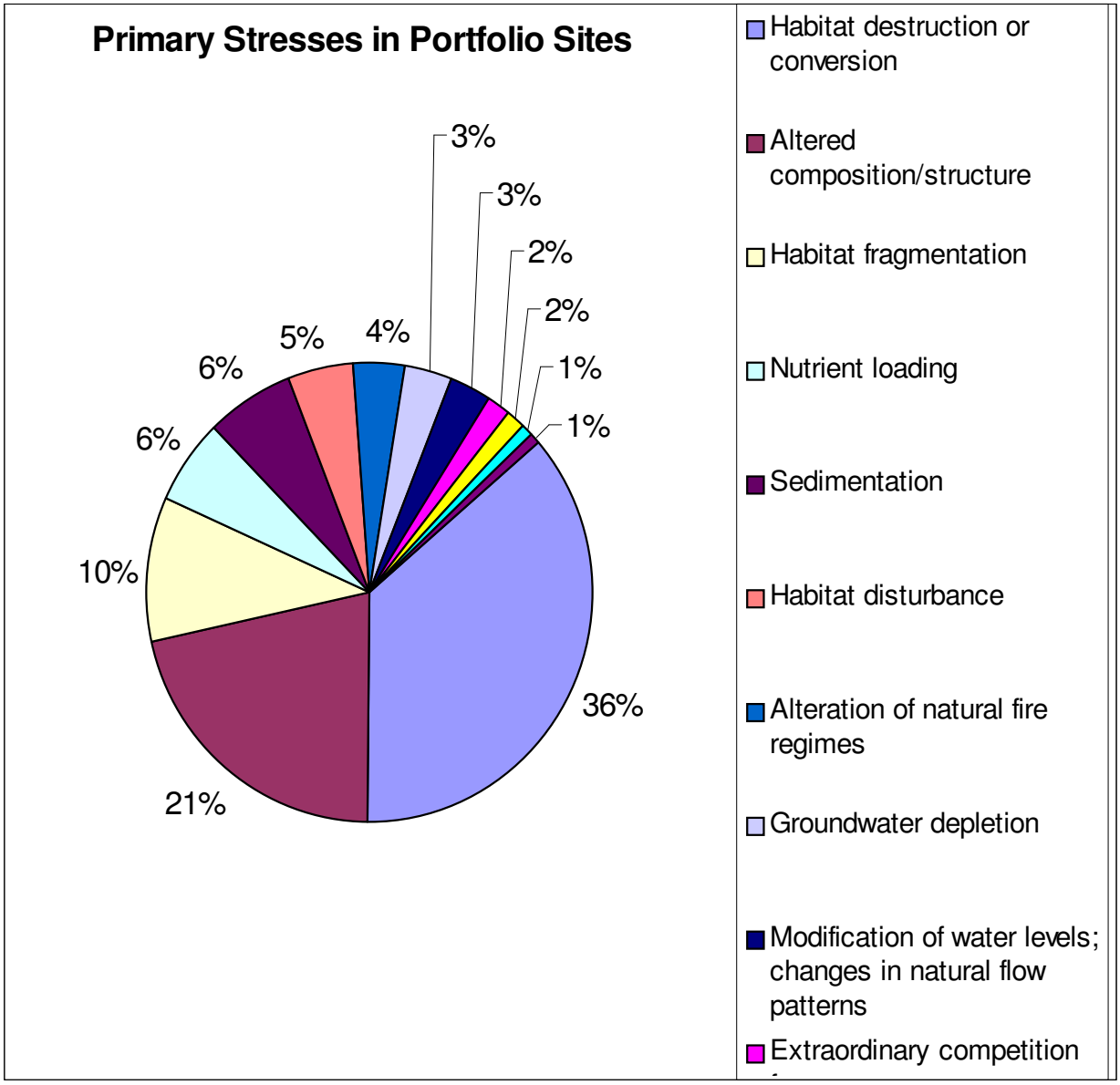

Figure 11. Primary stresses at portfolio sites in the North Central Tillplain ecoregion. Values are the percentage of sites at which the stress was chosen first by site assessors.

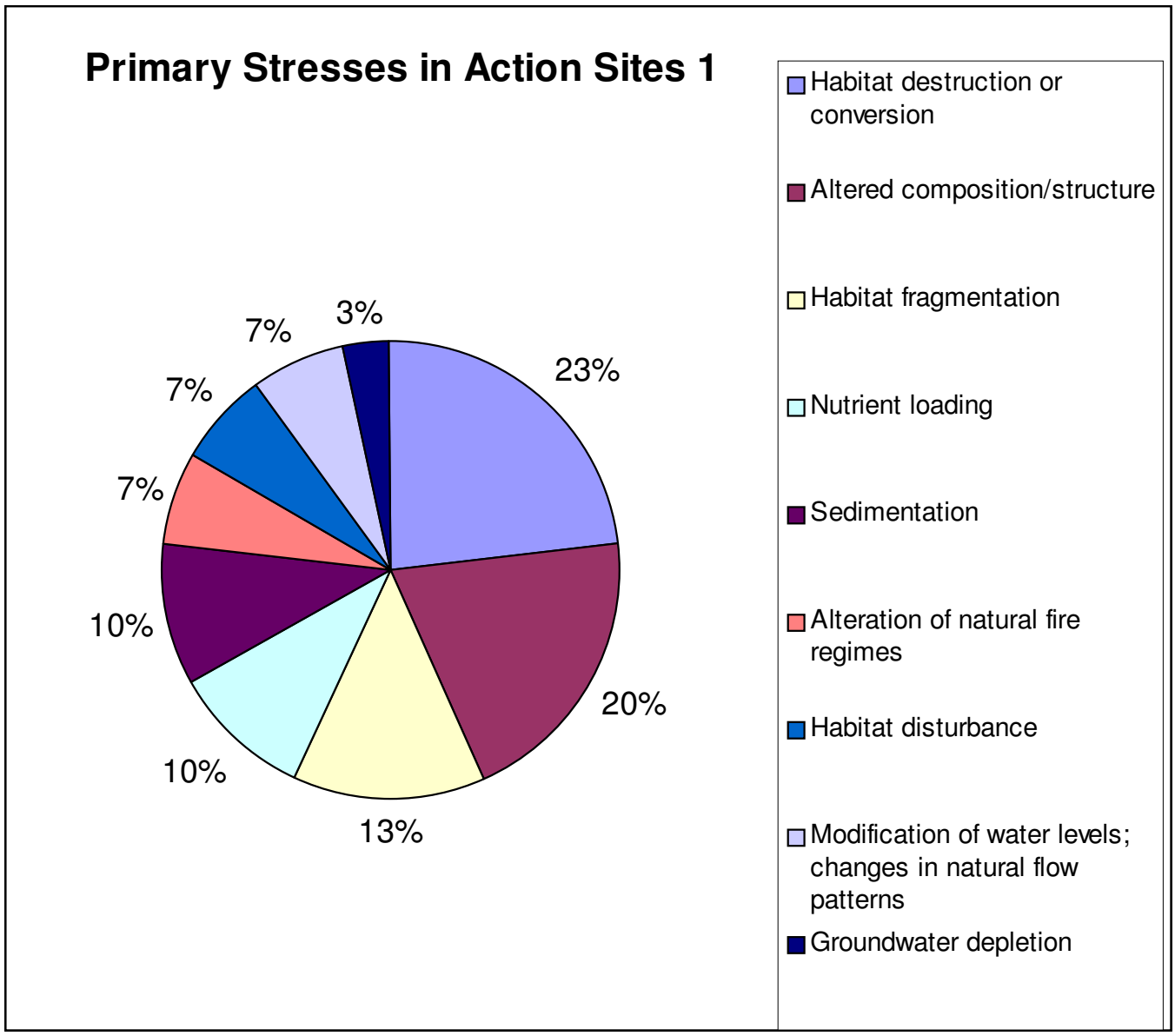

Figure 12. Primary stresses at Action Sites 1 in the North Central Tillplain ecoregion. Values are the percentage of sites at which the stress was chosen first by site assessors.

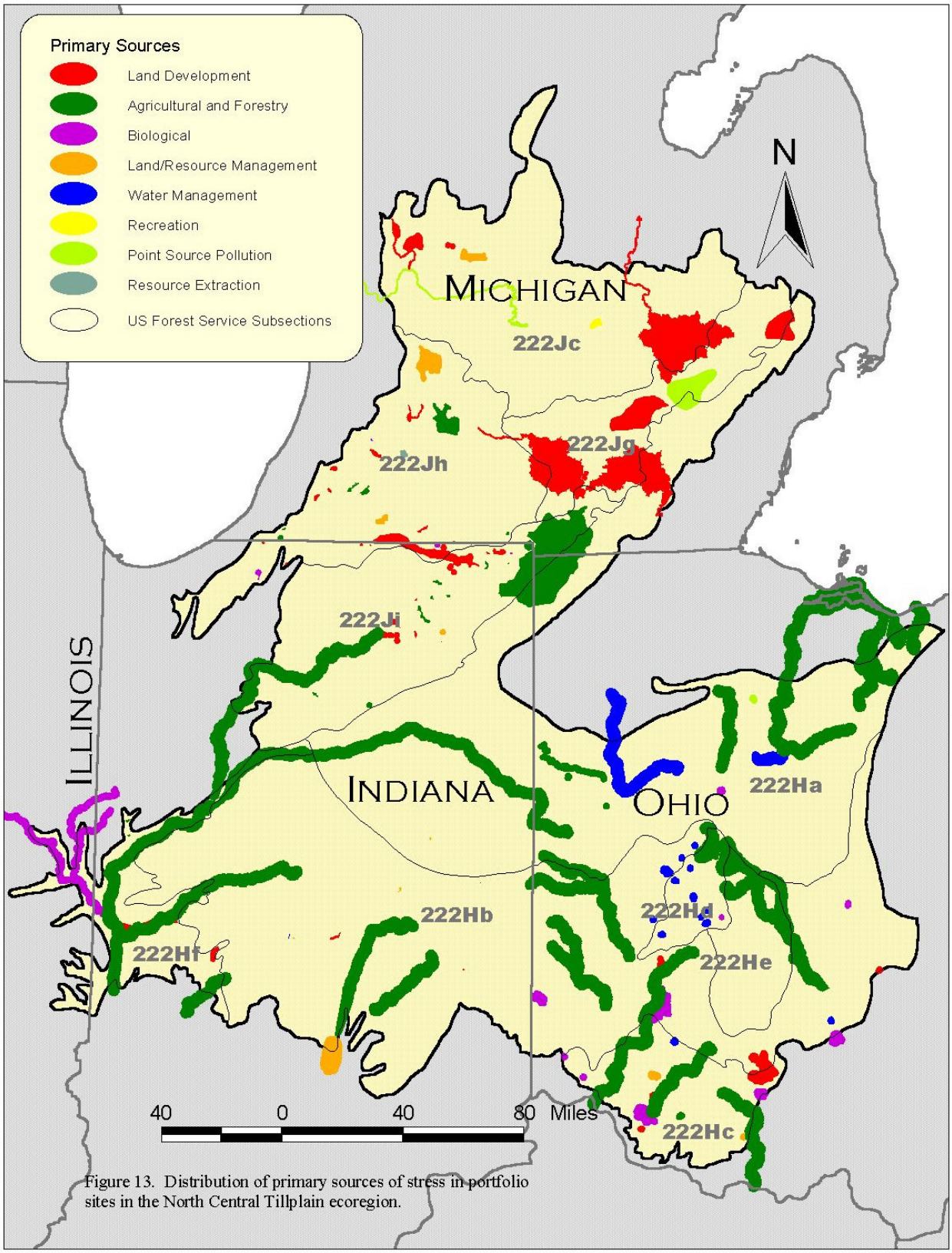

Figure 13. Distribution of primary sources of stress in portfolio sites in the North Central Tillplain ecoregion.

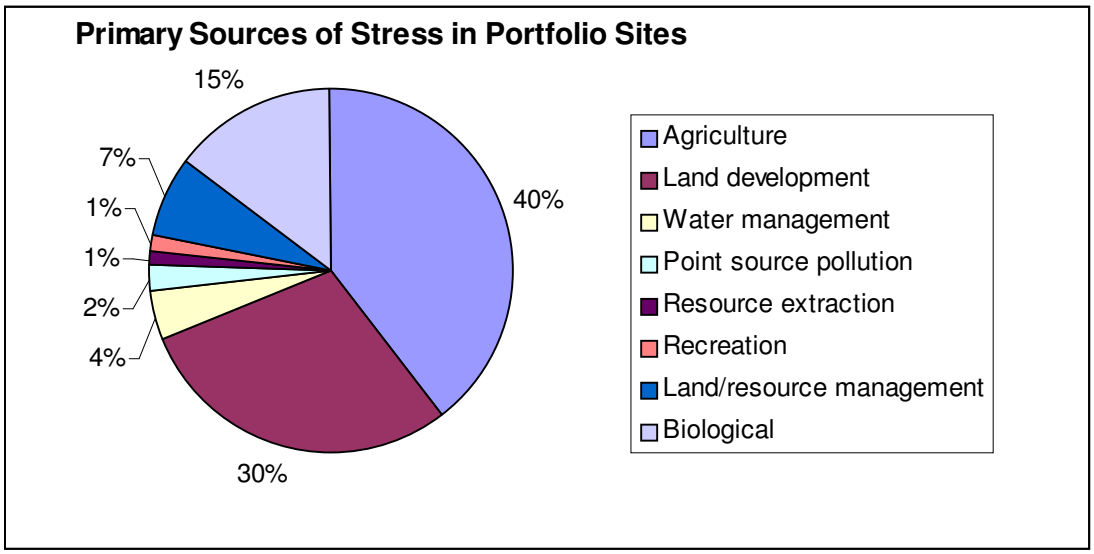

Figure 14. Primary sources of stress at portfolio sites in the North Central Tillplain ecoregion. Values are the percentage of sites at which the stress was chosen first by site assessors.

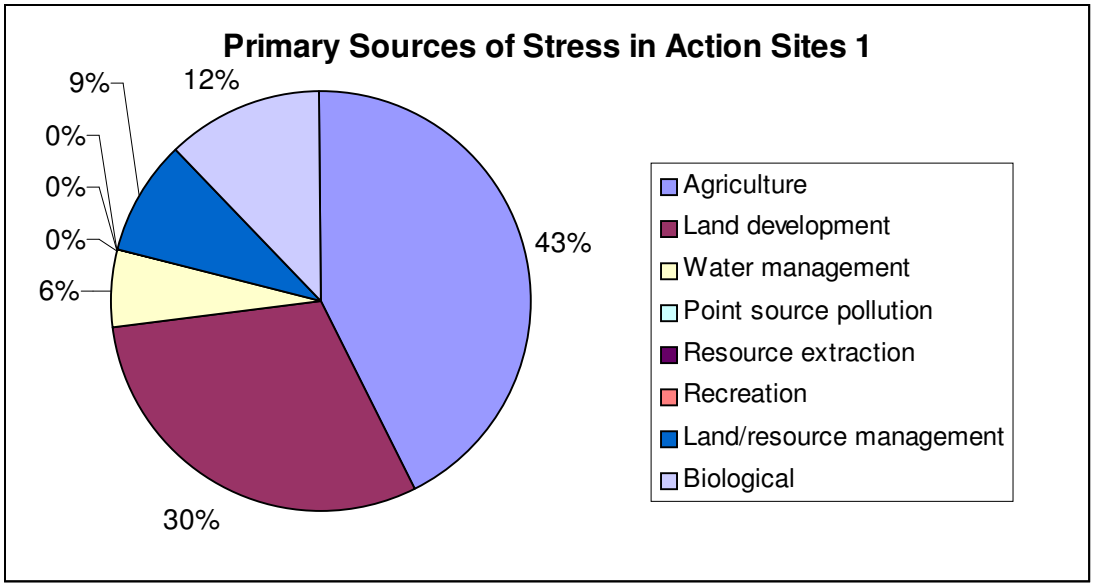

Figure 15. Primary sources of stress in Action Sites 1 in the North Central Tillplain ecoregion. Values are the percentage of sites at which the stress was chosen first by site assessors.

Important to the discussion of threats and strategies is the proportion of the portfolio that is already under some form of protection. The portfolio sites vary in the degree to which they have been protected. As part of the assessment of sites, team members evaluated level of protection, based on the percentage of the site that was either in protected ownership and management or had some legal protection other than ownership. The results show that less than 15% of most portfolio sites is protected (Table 17), though 36 sites (about 21%) have greater than 85% protection. Only one of the Landscape-Scale Action Sites and aquatic sites is protected at greater than 50%, and roughly a third of the Action Sites are protected at that level. These figures

reveal, not surprisingly, that there is a great deal of land and water in the portfolio that still needs to be protected. A very rough estimate, based on these levels of protection, indicates that 20% of the full portfolio has been protected. This is undoubtedly an overestimate, however, given that the sites in the 0-15% category that actually have 0% protection are probably the majority, and that using a median value of the category produces an overestimate. Similar estimates for the Action Sites and Landscape-Scale Action Sites produce results also around 20% protection. It is safe to assume that at least 80% of the portfolio acres currently lack protection.

Table 17. Level of protection for portfolio sites in the North Central Tillplain ecoregion. Values are number of sites that were assigned to that category of protection by the assessor.

PROTECTION LEVEL	FULL PORTFOLIO	ACTION SITES 1	ACTION SITES 2	LANDSCAPE-SCALE ACTION SITES
0-15%	71	16	12	5
15-50%	28	8	8	1
50-85%	26	9	5	1
85-100%	36	3	3	0

5.4.2. Strategies at Portfolio Sites

The site assessments provided data for summarizing major conservation strategies at sites in the portfolio. For the full portfolio, acquisition and management were the strategies most commonly cited first by site assessors (Figures 16 – 18), except for the aquatic portfolio sites, for which implementing a community program was chosen far more often than other strategies. This choice most likely stems from good results and experience at other aquatic sites, such as the Upper St. Joseph River (formerly Fish Creek) and the Mackinaw River. In the North Central Tillplain, the model used at the Upper St. Joseph would most likely apply at many other sites, given the predominance of agricultural land use and that agriculture is the major source of stress to the aquatic systems here. Working with agricultural communities and individual private land owners is a strategy the Conservancy should expand upon.

The prevalence of acquisition and management as commonly cited strategies for the full portfolio also reflects past experience and future reality. The overwhelming proportion of private versus public land owners and the many small sites in the portfolio will keep these conservation tools at the top of the list for the foreseeable future. For the Action Sites 1, the pattern is different. Landowner strategies (such as voluntary stewardship agreements, conservation tillage, and partnerships with other land trusts and public land managers) were cited most (Figure 4). Acquisition, management, and community based programs were also identified as important. The importance of conservation and management strategies on private lands was discussed at the Portfolio Design meeting in December, 1999. It was agreed that multi-site and ecoregional strategies should be developed to address this need (see section 6.1.1).

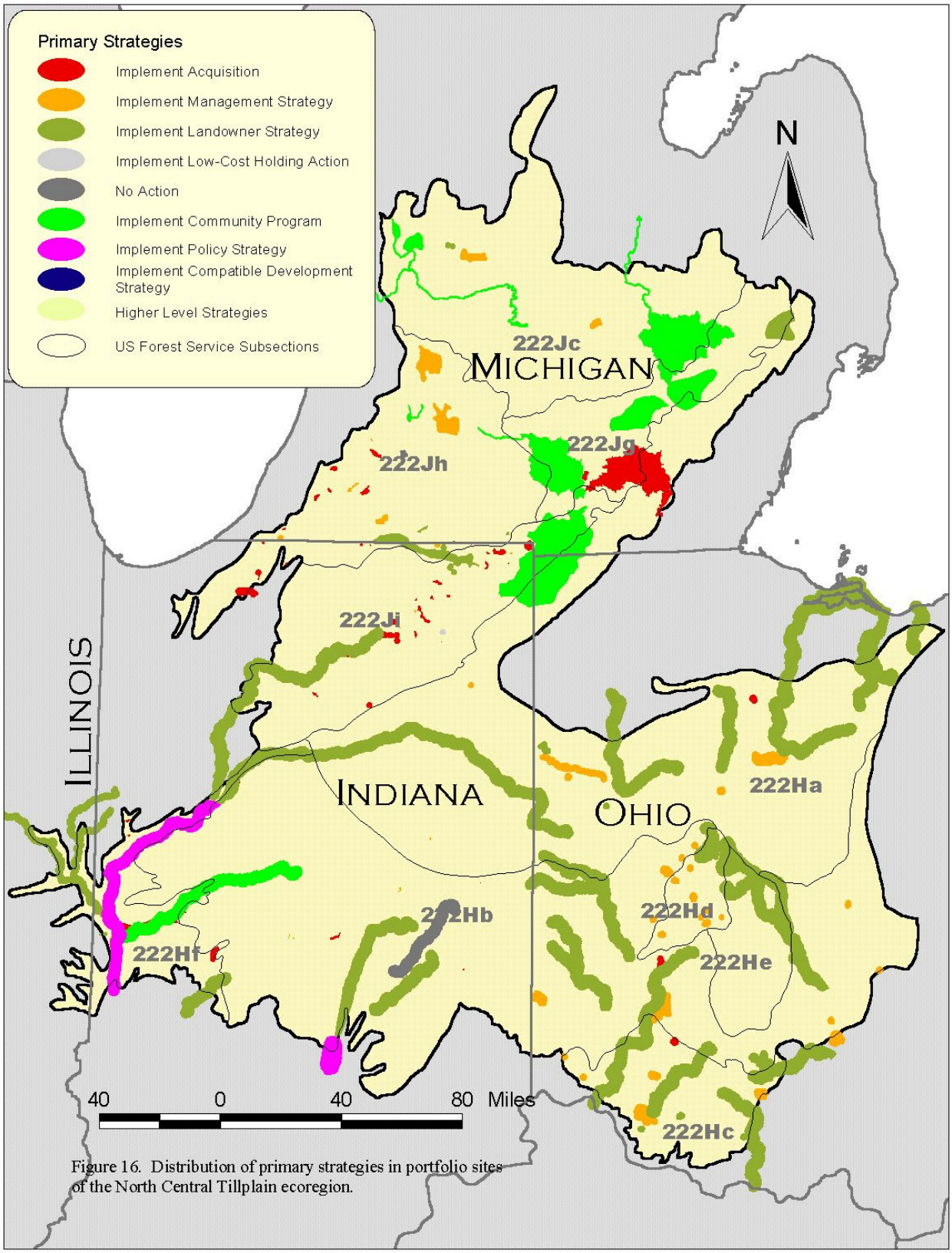

Figure 16. Distribution of primary strategies in portfolio sites of the North Central Tillplain ecoregion.

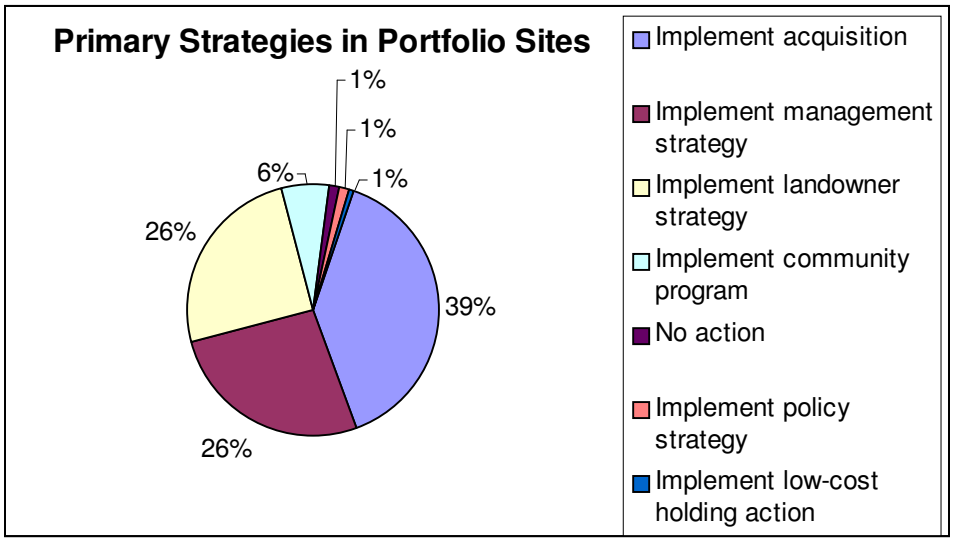

Figure 17. Primary conservation strategies in portfolio sites in the North Central Tillplain. Values indicate the percentage of sites for which that strategy was identified as of primary importance.

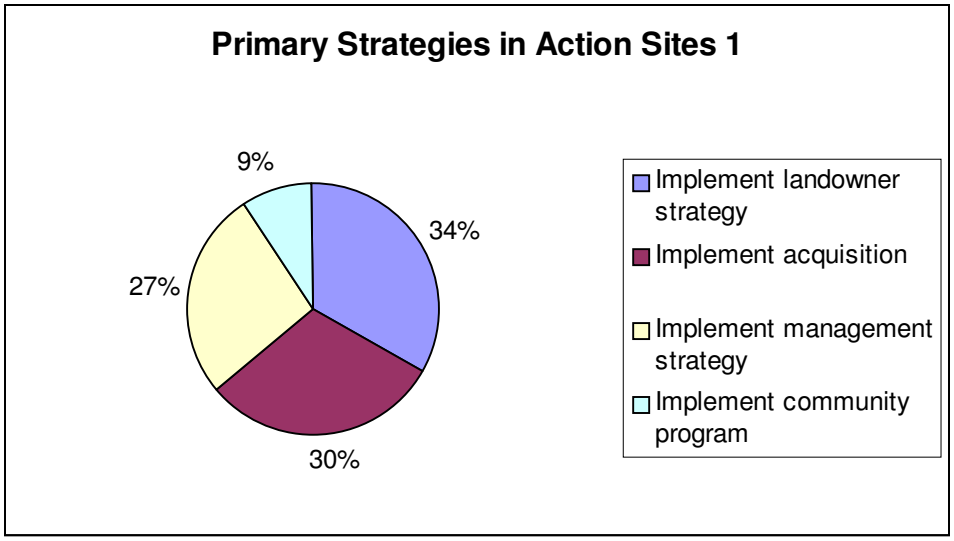

Figure 18. Primary conservation strategies in Action Sites 1 in the North Central Tillplain. Values indicate the percentage of sites for which that strategy was identified as of primary importance.

Chapter 6: Implementing the Conservation Plan

6.1. Implementing Strategies

6.1.1. Multi-Site and Ecoregional Strategies

At the Portfolio Design meeting in December, 1999, the Design Team reviewed the available information on threats to portfolio sites and discussed strategies that could be applied at multi-site or ecoregional scales to abate those threats. Our discussion commenced with a recognition that private lands make up the great majority of area in the ecoregion, so many of the strategies identified are geared towards conservation on private lands. It was agreed that state Natural Areas Programs are an important conservation strategy where they are strong, and that other states should work to strengthen such programs. It was also noted that Illinois is having good success in obtaining state-owned easements on private lands, often through donation. Strategies that were discussed and that should be viewed as suggestions to Conservancy programs in the appropriate states include:

Policy/government relations strategies:

1. Strengthen (focus) NRCS Conservation Reserve Program (CRP) on private lands in the portfolio by working with NRCS staff
2. Bring state Natural Areas Program staff from different states together to learn strategies, foster administrative support and legislative authority
3. Partner with regional/local planning commissions where development is key threat
4. Promote state-owned easements on private land as conservation strategy
5. Improve the drain code (MI) to reflect need for protecting hydrology and riparian corridors
6. Promote legislation to combat aquatic invasive species

Stewardship/management strategies:

1. IL/IN partnership on Wabash/Vermillion: mussel surveys.
2. IN/OH/MI: need to assess costs/benefits of further mussel surveys in the Upper St. Joseph of the Maumee River.
3. IN/MI: joint office or shared staff person in SW MI or NW IN to focus on restoration, fire management, non-native species
4. Share portfolio with private lands practitioners and educate, train, in natural areas management
5. Enter into carbon sequestration agreements with power companies to fund restoration of forests on ag lands; can sequester up to 2000 lb/acre/year

There has been no discussion of which strategies should be implemented first, or whether there are corollary strategies that would make these more feasible. These suggested strategies will be presented to and reviewed by the Steering Committee, whereupon priorities will be established and responsibility for coordinating the chosen strategies will be determined. At least one strategy is being implemented currently: Indiana and Michigan are partnering to share a staff person to implement stewardship strategies at portfolio sites in southwest Michigan and northwest Indiana.

6.1.2. Filling Data Gaps

Information gaps fall into at least three categories. First, provisional portfolio sites need to be visited within the next 1-2 years to determine whether they are indeed viable and should be included in the portfolio. This step is critical for refining the portfolio and helping states to review conservation priorities. Second, element occurrences that were judged of questionable viability but included as part of the portfolio should also be revisited and their viability assessed. A report on the status of element occurrences at every portfolio site is available from the Michigan Chapter office, but was too lengthy to include as part of this report. Third, there are several conservation targets for which very little information is available, perhaps because they are very difficult to survey (e.g.,the Kirtland' s snake) or because no one has made a concerted effort to do a comprehensive survey (e.g., Indiana bat). Several such targets have been noted during the planning process, and they include:

- Blanchard's cricket frog: need to count populations in IL sites
- Indiana bat needs a great deal of survey work to locate maternity colonies
- Copperbelly water snake lacks good data and is very hard to survey
- Kirtland's snake also lacks good data and is very hard to survey

In addition, non-vascular plants have not been accounted for in this plan. The two on the target list were not captured in the portfolio, and it was agreed that developing a plan for conservation of these targets is a need. Also, as mentioned earlier in this plan, conservation of the butternut (*Juglans cinerea*), a conservation target, will be challenging without a strategy to address the pathogenic threat. This species is declining significantly, and a broad strategy for its conservation is necessary, but is not part of this plan.

As information on these sites, element occurrences, and targets is gathered, the ecoregional database should be updated to gauge priority of conservation at recently reviewed sites and assess status of achieving conservation goals and to reveal and prioritize remaining data gaps.

6.2. Engaging Partners

There are three levels at which partners are part of the conservation process in the North Central Tillplain ecoregion. First, they have been aware of and, to a more limited extent than in some other ecoregions, involved in the ecoregional planning process. Partners have been engaged both in the technical teams and to complete assessments of sites with which they are familiar. With a few exceptions (Heritage programs and State Departments of Natural Resources or related agencies), they have not been part of the Core Team or Design Team. Engagement of partners in the ecoregional planning process has been strategic, based on their ability to contribute to the planning process, whereas in some cases in other ecoregions partners have been engaged for programmatic reasons.

Because there is no single partner that would be involved in implementation at a great number of sites, the Core Team decided that it would be impractical to engage the many partners in the planning process. These partners in implementation will be part of the audience for communicating the plan, the second level of partner engagement. Some engagement at this level has already begun. At least in Michigan, local land trusts and state agencies are aware of ecoregional planning and are very interested in learning what the conservation priorities are or

will be. It is one of the best potential outcomes of ecoregional planning that partners adopt, in whole or in part, the priorities of the Conservancy, and that is beginning to happen.

The third level of partner engagement comes at the implementation stage. There is a broad set of partners who will be critical to conservation of the portfolio, in many cases taking a lead role (Figures 19 and 20). Partners in state land management agencies were listed more often, by a wide margin, than any other. Only for aquatic sites, where private conservation groups and federal regulatory agency partners were listed most, does this pattern not hold. State land management agencies own and manage a respectable proportion of terrestrial sites, and will necessarily be engaged in conservation planning and implementation. Private land owners and private conservation groups also were identified as primary conservation partners at many sites. This result reflects the large proportion of private land that is in the portfolio.

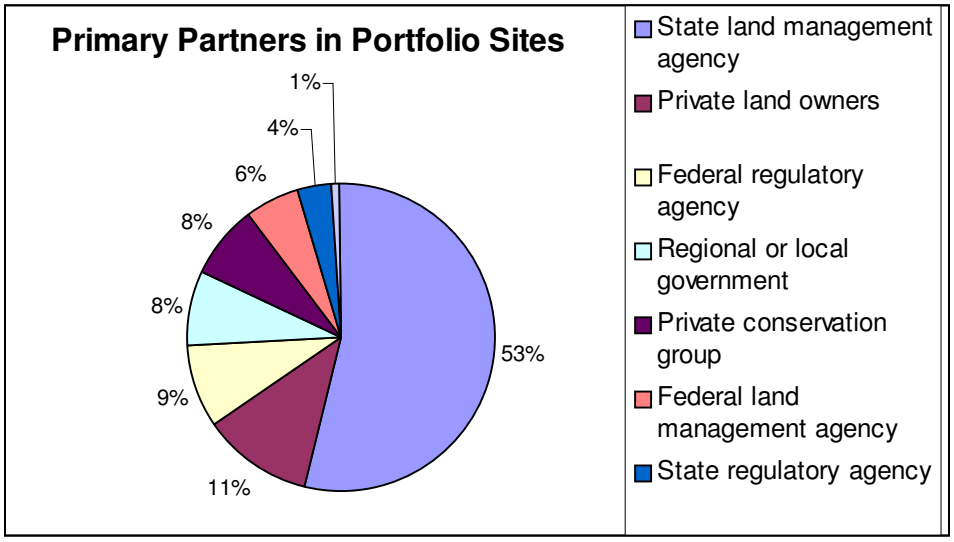

Figure 19. Primary conservation partners at portfolio sites in the North Central Tillplain ecoregion. Values are the percentage of sites at which a partner was listed first by the site assessor.

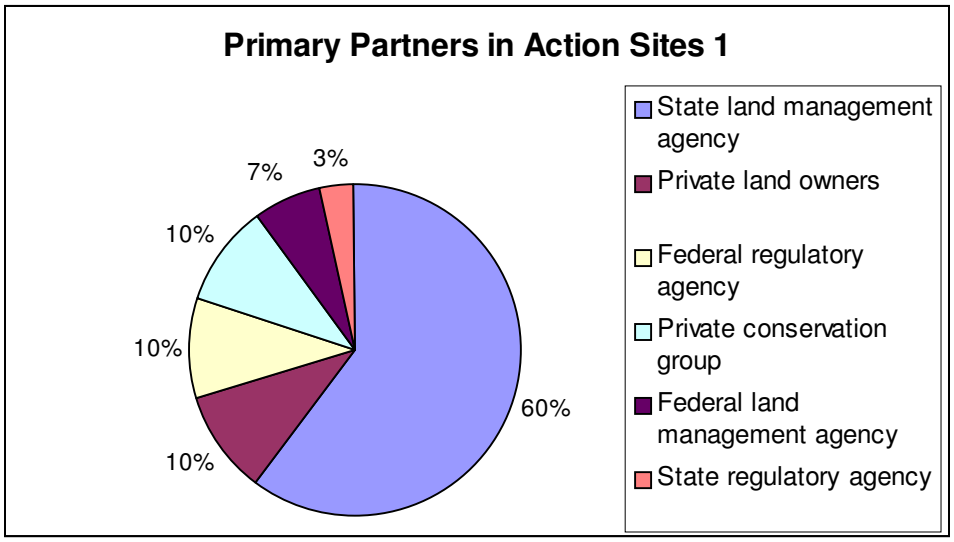

Figure 20. Primary conservation partners in Action Sites 1 in the North Central Tillplain ecoregion. Values are the percentage of sites at which a partner was listed first by the site assessor.

6.3. Communications Strategy

The May, 2000 draft of the plan, including maps, has been shared among Conservancy partners, and the map of portfolio sites has been shared in hard copy and digital form among partners outside the Conservancy. Widespread distribution of the August, 2003 version is occurring through a combination of digital and printed formats. A limited number of printed reports will be produced, mainly for Conservancy partners. The primary medium for the plan will be as a PDF document made available on CD and via the internet.

In addition, the portfolio of ecoregional sites will be available as an ArcView shapefile, with some attribute information.

6.4. Future Plan Iterations

6.4.1. Updating the Ecoregional Plan

The Director of the Midwest and Canada Division of the Conservancy will have primary responsibility for ensuring that future iterations of the plan are completed on a periodic basis. The next iteration of the portfolio should be done within 2-3 years. This proposed schedule would allow for the ecoregional planners to incorporate newly acquired data and revised priorities into their strategic planning as soon as possible. Following the next revision, future revisions may not need to be as frequent, perhaps on a five year basis. In particular, the next iteration of the plan needs to consider the gaps identified above. A more thorough examination of the role of restoration is another highly recommeded component.

6.4.2. Managing the Ecoregional Database

Currently, the ecoregional database exists in two components: a Microsoft Access database and a GIS maintained mostly as ArcView shapefiles. These components need to be maintained in a coordinated fashion to be most effectively used. They are currently maintained at the Michigan Chapter, and that is probably where they will stay. Alternatively, should it become a priority to maintain centralized resource offices (i.e., the Minneapolis Resource Office), management of ecoregional databases by such a central office would be highly effective and useful, and make it easier to adhere to data management standards.

The North Central Tillplain Access is being converted into the Conservation Planning Tool format to meet the database standards that have been recently developed.

6.5. Lessons Learned

Over the course of the planning process, the planning team (and the leader in particular) has learned a great deal. Some lessons learned had been identified by others in earlier ecoregional plans and perhaps could have been incorporated before. However, some learning from various other plans certainly did benefit this process overall. Below is a short list of lessons learned.

- Commitment of leader's time. The planning leader should have allocated a greater proportion of time to the planning process earlier in the process. Some of the delays in completion of the plan could have been avoided had the leader committed more time to coordination of team members (thus resulting in more rapid completion of tasks). Alternatively, getting assistance from trained administrative staff for such tasks as coordinating meetings and conference calls and distribution of information could have streamlined the process markedly.
- Split leadership. Coordination of the planning process was handled by the Michigan Chapter, while administrative responsibility was taken by the Indiana Chapter. This configuration might not necessarily result in problems, but having planning responsibility in one office certainly would avoid potential problems. While there was complete delegation of the planning process by the Indiana State Director to the team leader in Michigan, communication and identification of respective roles did not occur until several months into the process, resulting in a delay in starting the plan.
- Learning from other plans. It helps a great deal for planning leaders and others to be involved in other ecoregional plans, and to gather information from processes they are not involved in. Several planning team members contributed to Great Lakes ecoregional planning and other plans, and processes that worked well were incorporated while others were modified to better fit the constraints of planning in this ecoregion. Attending an Ecoregional Round Table is very helpful in this regard as well.
- Better use of core team. The Core Team was central to the planning process and handled the major tasks. Communication among members on a more frequent basis could have improved this plan.
- More timely aquatic analysis. The analysis of aquatic sites should have been done concurrently with the terrestrial sites to enable a better understanding of how sites from the two processes relate to each other.
- Data management and GIS. An advantage of having data and GIS management, as well as plan leadership, occur in the same office is that as issues arise, answers are immediately

available. Given the flexibility and variability in how GIS products, in particular, are developed and interpreted, coordinating the planning, data management, and GIS management at one location enables more precise development of desired products and analyses. A disadvantage of this approach is that it places a large burden on one office. This burden is not undue if the office plans for and is capable of handling the work. For this planning process, data management and GIS management required a great deal of time, and recruiting a data management specialist (or shifting Chapter objectives to allow existing staff to take on ecoregional data management) would have streamlined the process and perhaps resulted in closer concurrence with national data standards.

References

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Appendices

Appendix A. Members of the Planning Team

State	Name		Position title*	Organization	Core Science Team	Steering Committee	Technical team leader
IL							
	Bruce	Boyd	State Director	The Nature Conservancy, Illinois Chapter	No	Yes	No
	Randall	Collins	Database Program Manager	Illinois Department of Natural Resources Division of Natural Heritage	No	Yes	No
	Kevin	Cummings	Mollusks Collection Manager	Illinois Natural History Survey Center for Biodiversity	No	No	No
	Jim	Herkert	Project Manager	Illinois Endangered Species Protection Board	No	No	No
	Jonathan	Higgins	Aquatic Ecologist	The Nature Conservancy Great Lakes Program	No	No	No
	Vern	LaGesse	Land Steward	Nature Conservancy of Illinois Grand Prairie Area/Mackinaw River Project	No	No	No
	Chris	Phillips	Biotic Surveys Project Coordinator	Illinois Natural History Survey Center for Biodiversity	No	No	No
	Mike	Retzer	Icthyologist	Illinois Natural History Survey Office of the Chief	No	No	No

*At the time of completion of the first draft in May, 2000

State	Name		Position title	Organization	Core Science Team	Steering Committee	Technical team leader
	Michael	Reuter	Director of Conservation Programs	The Nature Conservancy Conservation Programs Office	No	No	No
	Mary Kay	Solecki	Field Representative	Illinois Nature Preserves Commission	Yes	No	No
	Bob	Szafoni	District Heritage Biologist	Illinois Department of Natural Resources	No	No	No
IN							
	Cloyce	Hedge	Director	Indiana Natural Heritage Data Center Division of Nature Reserves, Dept. of Nat. Res.	Yes	Yes	No
	Mike	Homoya		Indiana Natural Heritage Data Center Division of Nature Reserves, Dept. of Nat. Res.	No	No	No
	Bruce	Kingsbury		Department of Biology Indiana University-Purdue University-Fort Wayne	No	No	No
	Mary	McConnell	State Director	The Nature Conservancy, Indiana Chapter	No	Yes	No
	Denny	McGrath	State Director	Indiana Field Office, The Nature Conservancy	No	No	No
	Eric	Metzler		IN	No	No	No
	Scott	Pruitt		USFWS	No	No	No

State	Name		Position title	Organization	Core Science Team	Steering Committee	Tech team leader
	John	Shuey	Director of Science and Conservation Stewardship	The Nature Conservancy, Indiana Chapter	Yes	No	Yes
	Tom	Simon		USFWS	No	No	No
MI							
	Dennis	Albert	Program Ecologist	Michigan Natural Features Inventory	No	No	No
	Chris	Clampitt	Stewardship Ecologist	The Nature Conservancy, Michigan Chapter	Yes	No	Yes
	Jeff	Cooper	Assistant Zoologist	Michigan Natural Features Inventory	No	No	No
	Rich	Corner	Associate Ecologist	Michigan Natural Features Inventory	No	No	No
	Dave	Cuthrell	Assistant Zoologist	Michigan Natural Features Inventory	No	No	No
	Dave	Ewert	Director of Science and Stewardship	The Nature Conservancy, Michigan Chapter	Yes	No	Yes
	Reuben	Goforth	Aquatic Ecologist	Michigan Natural Features Inventory	Yes	No	Yes
	Lisa	Haderlein	Director of Conservation Planning	The Nature Conservancy, Illinois Chapter Conservation Programs Office	Yes	No	No

State	Name		Position title	Organization	Core Science Team	Steering Committee	Tech team leader
	Jim	Harding		Michigan State University Museum	No	No	No
	John	Legge	Landscape Conservation Planner	The Nature Conservancy, Michigan Chapter	Yes	No	Yes
	Doug	Pearsall	Conservation Planning Coordinator	The Nature Conservancy, Michigan Chapter	Lead	Yes	No
	Mike	Penskar	Program Botanist	Michigan Natural Features Inventory	Yes	No	Yes
	Mary	Rabe	Program Zoologist	Michigan Natural Features Inventory	Yes	No	No
	Judy	Soule	Director	Michigan Natural Features Inventory	No	Yes	No
	Helen	Taylor	State Director	The Nature Conservancy, Michigan Chapter	No	Lead	No
MN							
	Don	Faber-Langendoen	Regional Ecologist*	The Nature Conservancy, Midwest Regional Office	No	No	No
MRO							
	Steve	Chaplin	Director of Science*	The Nature Conservancy, Midwest Resource Office	Yes	Yes	No
OH							

State	Name		Position title	Organization	Core Science Team	Steering Committee	Technical team leader
	Kendra	Cipollini	Director of Conservation Science	The Nature Conservancy, Ohio Chapter	Yes	No	No
	Allison	Cusick	Botanist	Ohio Department of Natural Resources Division of Natural Areas and Preserves	No	No	No
	Guy	Denny	Chief	Ohio Department of Natural Resources Division of Natural Areas and Preserves	No	Yes	No
	Jim	Gammon		DePauw University	No	No	No
	Rick	Gardner	Botanist	The Nature Conservancy, Ohio Chapter	Yes	No	No
	Bob	Glotzhober		Ohio Historical Society	No	No	No
	Marleen	Kromer	Director of Science and Stewardship	The Nature Conservancy, Ohio Chapter	Yes	No	No
	Dave	Minney	Southern Ohio Land Steward	Ohio Field Office, The Nature Conservancy	No	No	No
	Dan	Rice	Zoologist	Ohio Department of Natural Resources Division of Natural Areas and Preserves	No	No	No
	Greg	Schneider	Botanist	Ohio Department of Natural Resources Division of Natural Areas and Preserves	Yes	No	No

State	Name	Position title	Organization	Core Science Team	Steering Committee	Technical team leader
Marc	Smith		Ohio EPA Division of Surface Water	No	No	No
Steve	Sutherland	Ecologist	Ohio Field Office, The Nature Conservancy	No	No	No
Tom	Waters	?	Ohio Biological Survey Ohio State University	No	No	No
David	Weekes	State Director	The Nature Conservancy, Ohio Chapter	No	Yes	No
Jennifer	Windus	Research & Monitoring Administrator	Ohio Natural Heritage Data Base Division of Natural Areas and Preserves	Yes	No	No
Chris	Yoder		Ohio EPA Division of Surface Water	No	No	No

Appendix B. Physical and Biological Characteristics of Subsections in the North Central Tillplain

SUBSECTION	SUBNAME	SECTION	SECSYM	LANDFORM	ELEVLOW	ELEVHIGH	AVERELEV
222Ha	**Bluffton-Ann Arbor Till Plains**	Central Till Plains-Beech-Maple	222H	Smooth plain-low morainal ridges-end-ground moraine	640	1032	836
222Hb	**Miami-Scioto Plain-Tipton Till Plain**	Central Till Plains-Beech-Maple	222H	Smooth plain, low hills	530	1550	1040
222Hc	**Little Miami Old Drift Plain**	Central Till Plains-Beech-Maple	222H	Smooth plain-ground moraine	600	1340	970
222Hd	**Mad River Interlobate Plains**	Central Till Plains-Beech-Maple	222H	Interlobate area-extensive outwash bordering moraines	640	1032	836
222He	**Darby Plains**	Central Till Plains-Beech-Maple	222H	Low relief-glacial drift	800	1210	1005
222Hf	**Entrenched Valleys**	Central Till Plains-Beech-Maple	222H	Dissected plain-river valley	450	930	690
222Jc	**Iona Moraines**	South Central Great Lakes	222J	Flat to rolling plains-ground and end moraine	583	1115	849
222Jg	**Jackson Interlobate Moraine**	South Central Great Lakes	222J	Irregular plains	840	1199	1020
222Jh	**Kalamazoo-Elkhart Moraines and Plains**	South Central Great Lakes	222J	Irregular plains-morainal ridges	593	1140	867
222Ji	**Steuben Interlobate Moraines**	South Central Great Lakes	222J	Irregular plain-few low hills-ice-molded	912	1200	1056

SUBSECTION	GEOLOGY1	GEOLOGY2	GEOAGE1	GEOAGE2	SGGROUP1	SGGROUP2	TEMPCLAS
222Ha	Clay-clay loam till	Shales-carbonates-sandstones	Wisconsin	Paleozoic	Hapludalfs	Epiaqualfs	Mesic
222Hb	Loamy till-thin loess-outwash	Carbonates-shale	Wisconsin	Paleozoic	Hapludalfs	Epiaqualfs	Mesic
222Hc	Clay-loam till-loess	Carbonates	Illinoian	Paleozoic	Glossaqualfs	Fragiudalfs	Mesic
222Hd	Loamy till-outwash sand-gravel	Carbonates	L. Wisconsin	Paleozoic	Hapludalfs	Argiaquolls	Mesic
222He	Loamy till	Carbonates	L. Wisconsin	Paleozoic	Argiaquolls	Epiaqualfs	Mesic
222Hf	Alluvium	Loamy till outwash	Holocene	Pleistocene	Hapludalfs	Epiaqualfs	Mesic
222Jc	Loamy till	Marine sediments	Wisconsin	Mississippian and Pennsylvanian	Hapludalfs	Argiaquolls	Mesic
222Jg	Sandy loam till	Outwash sand-gravel	Wisconsin	Wisconsin	Hapludalfs	Argiudolls	Mesic
222Jh	Loam-clay loam till-outwash sand-gravel	Eolian sand	Wisconsin	Paleozoic	Hapludalfs	Histosols	Mesic
222Ji	Loamy till-outwash sand-gravel-eolian dune sand	Shale and carbonates	Wisconsin	Paleozoic	Ochraqualfs	Hapludalfs	Mesic

SUBSECTION	MOISCLAS	AVPRECIP	AATEMP	AAPRECIP	DOMVEG1	DOMVEG2	DOMVEG3
222Ha	Udic	36	48	160	Pin Oak-Swamp	White Oak Flatwoods	Beech-Maple Forest
222Hb	Udic	42	51	168	Pin Oak-Swamp-White Oak Flatwoods	Beech-Maple Forest	
222Hc	Aquic and udic	42	54	171	Beech-Maple Forest	Pin Oak-Swamp	White Oak Flatwoods
222Hd	Udic and aquic	36	48	162	Beech-Maple Forest	White-Red Oak Forest	
222He	Aquic and udic	39	51	166	White-Red Oak Forest	Elm-Ash Swamp Forest	Cordgrass Wet Prairie
222Hf	Udic and aquic	42	52	168	Beech-Maple Forest	Silver Maple Forest	Pin Oak-Swamp/White Oak Forest/Cliff and Ravine Communities
222Jc	Udic	34	46	145	Beech-Maple Forest	White Oak-Red Oak Forest	Silver Maple Forest
222Jg	Udic	36	46	145	Bur Oak-Mixed Oak Savanna	Big Bluestem-Indiangrass Prairie	Prairie Fen
222Jh	Udic	36	48	155	Little Bluestem-Indiangrass Sand Prairie	Black Oak Barrens	Big Bluestem-Indiangrass Prairie
222Ji	Aquic and udic	38	48	158	White Oak-Red Oak Forest	Beech Maple Forest	Bulrush-Cattail and Sedge-Meadow-Sedge Fen

SUBSECTION	SURFWATER	HUMANUSE	ACRES	HECTARES	SQ_MI	SQ_KM
222Ha	Low gradient-perennial-headwater-intermittent streams common few lakes	Agriculture-Urban-Residential	7539668.201	3051261.919	11780.922	30512.619
222Hb	Low gradient streams-small rivers	Agriculture-Urban-Residential	8754603.902	3542939.661	13679.29	35429.397
222Hc	Low Stream density	Agriculture-Forestry	1200868.522	485984.833	1876.387	4859.848
222Hd	Abnormally cool main wet Prairie and Marsh	Agriculture-Forestry	401550.26	162505.164	627.432	1625.052
222He	Low stream density	Forestry-Agriculture	738683.084	298940.948	1154.211	2989.409
222Hf	Medium gradient-clear-rocky periennial-intermittent streams	Agriculture-Forestry-Recreation	1267862.061	513096.747	1981.067	5130.967
222Jc	Kettle lakes-intermittent-perennial streams-wetlands-common	Agricultural	3672909.638	1486406.167	5739.014	14864.062
222Jg	Many kettle lakes-ponds-wetland complexes-headwater streams	Agriculture-Urban	1397754.951	565663.679	2184.027	5656.637
222Jh	Small periennial streams-kettle lakes	Agriculture	2827594.764	1144311.924	4418.188	11443.119
222Ji	Numerous kettle lakes-wetlands and periennial streams	Agriculture-Recreation	2668012.129	1079729.716	4168.836	10797.297
TOTALS			30469507.51	12330840.76	47609.374	123308.407

Appendix C. Lists of Conservation Targets

Terrestrial Communities and All Species

Taxonomic Group / Distribution / Pattern / Global Scientific Name	Global Common Name	GELcode / GRANK
Amphibians		
Peripheral *Small Patch*		
Acris crepitans blanchardi	Blanchard' s Cricket Frog	AAABC01011 G5T5
Bird Stopover Sites		
Undetermined *Large Patch*		
Land Bird Stopover	Land Bird Stopover	OBIRDSTOP1 GU
Raptor Stopover	Raptor Stopover	OBIRDSTOP2 GU
Waterfowl Stopover	Waterfowl Stopover	OBIRDSTOP4 GU
Birds		
Peripheral *Large Patch*		
Empidonax traillii	Willow Flycatcher	ABPAE33040 G5
Melanerpes erythrocephalus	Red-headed Woodpecker	ABNYF04040 G5
Vermivora pinus	Blue-winged Warbler	ABPBX01020 G5
Ammodramus henslowii	Henslow' s sparrow	ABPBXA0030 G4
Ammodramus savannarum	Grasshopper Sparrow	ABPBXA0020 G5
Hylocichla mustelina	Wood Thrush	ABPBJ19010 G5
Protonotaria citrea	Prothonotary Warbler	ABPBX07010 G5
Widespread *Large Patch*		
Dendroica discolor	Prairie Warbler	ABPBX03190 G5
Haliaeetus leucocephalus	Bald Eagle	ABNKC10010 G4
Dendroica cerulea	Cerulean Warbler	ABPBX03240 G4

Taxonomic Group / Distribution / Pattern / Global Scientific Name	Global Common Name	GELcode / GRANK
Falco peregrinus	Peregrine Falcon	ABNKD06070 G4
Helmitheros vermivorus	Worm-eating Warbler	ABPBX08010 G5
Spiza americana	Dickcissel	ABPBX65010 G5
Crustaceans		
Endemic *Small Patch*		
Caecidotea rotunda	Frost Cave Isopod	ICMAL01340 G2
Peripheral *Small Patch*		
Orconectes sloanii	A Crayfish	ICMAL11150 G2
Fish		
Limited *Large Patch*		
Notropis anogenus	Pugnose shiner	AFCJB28080 G3
Etheostoma tippecanoe	Tippecanoe Darter	AFCQC02800 G3
Peripheral *Matrix*		
Acipenser fulvescens	Lake sturgeon	AFCAA01020 G3
Ichthyomyzon bdellium	Ohio Lamprey	AFBAA01010 G3G4
Etheostoma maculatum	Spotted Darter	AFCQC02420 G2
Widespread *Large Patch*		
Ammocrypta pellucida	Eastern Sand Darter	AFCQC01060 G3
Etheostoma pellucidum	Eastern Sand Darter	AFCQC02B80 G3
Moxostoma valenciennesi	Greater redhorse	AFCJC10170 G3
Noturus stigmosus	Northern Madtom	AFCKA02220 G3
Insects		
Endemic *Small Patch*		
Flexamia huroni	A Leafhopper	IIHOM03030 G?

Taxonomic Group / Distribution / Pattern / Global Scientific Name	Global Common Name	GELcode / GRANK
Oecanthus laricis	Laricis Tree Cricket	IIORT19010 G1G2
Pseudanophthalmus krameri	Kramer' s Cave Beetle	IICOL4E390 GH
Limited Small Patch		
Neonympha mitchellii mitchellii	Mitchell' s satyr	IILEPN3021 G2T2
Hemileuca sp 3	Midwestern Fen Buckmoth	IILEW0MX30 G3G4
Lepyronia angulifera	Angular Spittlebug	IIHOM09020 G3
Macromia wabashensis	Wabash River Cruiser	IIODO26110 G1G3Q
Pygarctia spraguei	Sprague' s pygarctic	IILEY39060 G3G4
Peripheral Small Patch		
Cicindela marginipennis	Cobblestone tiger beetle	IICOL02060 G2G3
Lepyronia gibbosa	Hill-prairie spittlebug	IIHOM09010 G3G4
Oarisma powesheik	Powesheik Skipperling	IILEP57010 G2G3
Widespread Large Patch		
Incisalia irus	Frosted elfin	IILEPE7040 G3G4
Lycaeides melissa samuelis	Karner Blue	IILEPG5021 G5T2
Papaipema beeriana	Blazing Star Stem Borer	IILEYC0450 G3
Stylurus amnicola	Riverine clubtail	IIODO80010 G3G4
Aeshna mutata	Spatterdock darner	IIODO14110 G3G4
Catocala dulciola	Quiet Underwing	IILEY89A40 G3
Euphyes dukesi	Duke' s skipper	IILEP77050 G3
Gomphus quadricolor	Rapids clubtail	IIODO08380 G3G4
Papaipema silphii	Silphium borer moth	IILEYC0350 G3G4

Taxonomic Group / Distribution / Pattern / Global Scientific Name	Global Common Name	GELcode / GRANK
Mammals		
Widespread *Matrix*		
Myotis sodalis	Indiana Bat	AMACC01100 G2
Mollusks		
Endemic *Small Patch*		
Epioblasma obliquata perobliqua	White Catspaw	IMBIV16112 G1T1
Limited *Small Patch*		
Epioblasma rangiana	Northern Riffleshell	IMBIV16220 G2Q
Epioblasma torulosa rangiana	Northern Riffleshell	IMBIV16184 G2T2
Pleurobema clava	Clubshell	IMBIV35060 G2
Fusconaia subrotunda	Longsolid	IMBIV17120 G3
Peripheral *Small Patch*		
Cyprogenia stegaria	Fanshell	IMBIV10020 G1
Epioblasma torulosa torulosa	Tubercled Blossom	IMBIV16183 G2TX
Obovaria retusa	Ring Pink	IMBIV31030 G1
Pleurobema plenum	Rough Pigtoe	IMBIV35240 G1
Pleurobema rubrum	Pyramid Pigtoe	IMBIV35250 G2
Quadrula fragosa	Winged Mapleleaf	IMBIV39050 G1
Plethobasus cicatricosus	White Wartyback	IMBIV34010 G1
Widespread *Large Patch*		
Pleurobema cordatum	Ohio Pigtoe	IMBIV35090 G3
Quadrula cylindrica	Rabbitsfoot	IMBIV39040 G3
Simpsonaias ambigua	Salamander mussel	IMBIV41010 G3
Epioblasma triquetra	Snuffbox	IMBIV16190 G3

Taxonomic Group / Distribution / Pattern / Global Scientific Name	Global Common Name	GELcode / GRANK
Plethobasus cyphyus	Sheepnose	IMBIV34030 G3
Toxolasma lividus	Purple lilliput	IMBIV43030 G2
Venustaconcha ellipsiformis	Ellipse	IMBIVA4010 G3G4
Villosa fabalis	Rayed Bean	IMBIV47050 G1G2
Fontigens nickliniana	Watercress Snail	IMGASG5040 G3G4
Fusconaia subrotunda subrotunda	Longsolid	IMBIV17122 G3T3
Pyganodon grandis corpulenta	Stout Floater	IMBIV54031 G5T3Q
Quadrula cylindrica cylindrica	Rabbitsfoot	IMBIV39041 G3T3
Non-vascular Plants		
Peripheral Undetermined		
Buxbaumia minakatae	Hump-backed Elves	NBMUS1B020 G2G3
Widespread Undetermined		
Plagiothecium latebricola	Lurking Leskea	NBMUS5J040 G3G4
Reptiles		
Limited Small Patch		
Clonophis kirtlandii	Kirtland' s snake	ARADB06010 G2
Nerodia erythrogaster neglecta	Copperbelly Water Snake	ARADB22023 G5T2T3
Peripheral Large Patch		
Emydoidea blandingii	Blanding' s Turtle	ARAAD04010 G4
Clemmys guttata	Spotted Turtle	ARAAD02010 G5
Widespread Large Patch		
Sistrurus catenatus	Massasauga	ARADE03010 G3G4
Sistrurus catenatus catenatus	Eastern massasauga	ARADE03011 G3G4T3T4

Taxonomic Group / Distribution / Pattern / Global Scientific Name	Global Common Name	GELcode / GRANK
Terrestrial Communities		
Endemic *Matrix*		
Fagus grandifolia - Acer saccharum - Quercus bicolor - Acer rubrum Flatwoods Forest	Central Indiana Till Plain Flatwoods	CEGL005173 G2
Limited *Large Patch*		
Pinus strobus - Quercus alba - (Quercus ellipsoidalis) / Carex pensylvanica Wooded Herbaceous Vegetation	White Pine - White Oak Barrens	CEGL005127 G2?
Andropogon gerardii - Sorghastrum nutans - Schizachyrium scoparium - Aletris farinosa Herbaceous Vegetation	Mesic Sand Tallgrass Prairie	CEGL005096 G2
Cladium mariscoides - (Carex lasiocarpa, Hypericum kalmianum, Solidago riddellii, Eleocharis elliptica) Herbaceous Vegetation	Twigrush Meadow Marsh	CEGL005104 G1Q
Larix laricina - Acer rubrum / (Rhamnus alnifolia, Vaccinium corymbosum) Forest	Central Tamarack - Red Maple Rich Swamp	CEGL005232 G?
Quercus palustris - Quercus bicolor - Acer rubrum Flatwoods Forest	Great Lakes Swamp White Oak-Pin Oak Flatwoods	CEGL005037 G2
Quercus stellata - Quercus marilandica / Schizachyrium scoparium - Silphium terebinthinaceum Wooded Herbaceous Vegetation	Post Oak Chert Barrens	CEGL005134 G1Q
Rhynchospora capitellata - Rhexia virginica - Rhynchospora scirpoides - Scirpus hallii Herbaceous Vegetation	Inland Coastal Plain Marsh	CEGL005108 G2?
Sandstone Talus Northern Sparse Vegetation	Northern Sandstone Talus	CEGL005202 G4G5
Scirpus maritimus - Atriplex patula - Eleocharis parvula Herbaceous Vegetation	Inland Saline Marsh	CEGL005111 G1
Thuja occidentalis - (Larix laricina) Seepage Forest	White Cedar Seepage Swamp	CEGL002455 G3G4
Peripheral *Large Patch*		
Acer saccharum - Carya cordiformis / Asimina triloba Floodplain Forest	Maple - Hickory Floodplain Ridge And Terrace Forest	CEGL005035 G2Q
Acer saccharum - Quercus muehlenbergii Forest [Provisional]	Sugar Maple - Chinquapin Oak Forest	CEGL005010 G?
Andropogon gerardii - Calamagrostis canadensis - Helianthus grosseserratus Herbaceous Vegetation	Central Wet-Mesic Tallgrass Prairie	CEGL002024 G2G3
Andropogon gerardii - Calamagrostis canadensis Sand Herbaceous Vegetation	Central Wet-Mesic Sand Tallgrass Prairie	CEGL005177 G2G3
Fagus grandifolia - Acer saccharum - Liriodendron tulipifera Unglaciated Forest	Beech - Maple Unglaciated Forest	CEGL002411 G4?

Taxonomic Group Distribution Pattern Global Scientific Name	Global Common Name	GELcode GRANK
Fagus grandifolia - Quercus alba - (Quercus michauxii) - Acer rubrum Flatwoods Forest	Beech - Oak - Red Maple Flatwoods	CEGL005015 G3
Fraxinus pennsylvanica - Ulmus spp. - Celtis occidentalis Forest	Central Green Ash - Elm - Hackberry Forest	CEGL002014 G?
Larix laricina / Alnus incana Forest	Tamarack Minerotrophic Swamp	CEGL002471 G4
Picea mariana / Alnus incana / Sphagnum spp. Forest	Black Spruce / Alder Rich Swamp	CEGL002452 G5
Platanus occidentalis - Acer saccharinum - Juglans nigra - Ulmus rubra Forest	Sycamore-silver Maple Floodplain Forest	CEGL007334 G3G4
Quercus macrocarpa - (Quercus alba - Quercus stellata) / Andropogon gerardii Wooded Herbaceous Vegetation	Central Bur Oak Openings	CEGL002159 G?Q
Quercus macrocarpa - Quercus bicolor - Carya laciniosa / Leersia spp. - Cinna spp. Forest	Bur Oak - Swamp White Oak Mixed Bottomland Forest	CEGL002098 G1G2Q
Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula Dry Gravel Herbaceous Vegetation	Midwest Dry Gravel Prairie	CEGL002215 G2
Scirpus tabernaemontani - Typha spp. - (Sparganium spp. - Juncus spp.) Herbaceous Vegetation [Provisional]	Bulrush - Cattail - Burreed Shallow Marsh	CEGL002026 G?
Spartina pectinata - Carex spp. - Calamagrostis canadensis - Lythrum alatum - (Oxypolis rigidior) Herbaceous Vegetation	Central Cordgrass Wet Prairie	CEGL002224 G3?
Tsuga canadensis - Fagus grandifolia - (Acer saccharum) Great Lakes Forest	Great Lakes Hemlock - Beech - Hardwood Forest	CEGL005042 G3G4
Andropogon gerardii - Sorghastrum nutans - (Sporobolus heterolepis) - Liatris spp. - Ratibida pinnata Herbaceous Vegetation	Central Mesic Tallgrass Prairie	CEGL002203 G2
Quercus alba - Quercus macrocarpa / Andropogon gerardii Wooded Herbaceous Vegetation	Bur Oak - White Oak Openings	CEGL005121 G1G3
Quercus alba - Quercus rubra - Quercus prinus - Acer saccharum / Lindera benzoin Forest	White Oak - Chestnut Oak - Maple Acid Forest	CEGL002059 G?Q
Quercus prinus - Quercus coccinea - (Castanea dentata) - Carya glabra Forest	Appalachian Oak - (chestnut) Forest	CEGL005023 G?
Tsuga canadensis - Fagus grandifolia - Acer saccharum / Kalmia latifolia - Ericaceae Forest	Eastern Hemlock - Beech Hardwood Forest	CEGL005043 G3?
Justicia americana Herbaceous Vegetation	Water-Willow Wetland	CEGL004286 G4G5
Quercus marilandica - (Juniperus virginiana) / Schizachyrium scoparium - Danthonia spicata Wooded Herbaceous Vegetation	Central Shale Glade	CEGL002428 G2

Taxonomic Group

Distribution Pattern Global Scientific Name	Global Common Name	GELcode GRANK
Schizachyrium scoparium - Carex rugosperma - Carex muhlenbergii - Lithospermum carolinense - Opuntia humifusa Herbaceous Vegetation	Midwest Sand Barrens	CEGL005099 G2G3
Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula Glacial Drift Herbaceous Vegetation	Midwest Glacial Drift Hill Prairie	CEGL005183 G2
Thuja occidentalis / Carex eburnea Woodland	Appalachian Bluff White Cedar Woodland	CEGL002596 G2Q
Widespread Large Patch		
(Chamaedaphne calyculata) - Ledum groenlandicum - Kalmia polifolia Bog Dwarf-shrubland	Leatherleaf Bog	CEGL002498 G5
Acer (rubrum, saccharinum) - Fraxinus spp. - Ulmus americana Forest	Red Maple - Ash - (elm) Swamp Forest	CEGL005038 G4?
Acer rubrum - Fraxinus spp. - Betula papyrifera / Cornus canadensis Forest	Red Maple - Ash - Birch Swamp Forest	CEGL002071 G4
Acer saccharinum - Ulmus americana - (Populus deltoides) Forest	Silver Maple - Elm - (Cottonwood) Forest	CEGL002586 G4?
Betula nigra - Platanus occidentalis Forest	River Birch - Sycamore Forest	CEGL002086 G?
Calamagrostis canadensis Eastern Herbaceous Vegetation [Provisional]	Bluejoint Eastern Marsh	CEGL005174 G?
Carex stricta - Carex spp. Herbaceous Vegetation	Tussock Sedge Wet Meadow	CEGL002258 G4?
Cornus spp. - Salix discolor - (Rosa palustris) Shrubland	Dogwood - Pussy Willow Swamp	CEGL002186 G5
Fagus grandifolia - Quercus spp. - Acer rubrum Floodplain Forest	Beech - Oak - Maple Mesic Floodplain Forest	CEGL005014 G1Q
Fraxinus pennsylvanica - Ulmus americana - (Celtis occidentalis, Tilia americana) Northern Forest	Northern Ash - Elm - Hackberry Floodplain Forest	CEGL002089 G?Q
Larix laricina / Aronia melanocarpa / Sphagnum spp. Forest	Central Tamarack Poor Fen	CEGL002472 G4?
Pinus strobus - (Pinus resinosa) - Quercus rubra Forest	White Pine - Red Oak Forest	CEGL002480 G3
Quercus palustris - Quercus bicolor - Quercus macrocarpa - Acer rubrum Sand Flatwoods Forest	Pin Oak - Swamp White Oak Sand Flatwoods	CEGL002100 G2?
Quercus velutina - (Quercus alba) - Quercus ellipsoidalis / Schizachyrium scoparium - Lupinus perennis Wooded Herbaceous Vegetation	Black Oak / Lupine Barrens	CEGL002492 G3
Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula Dry - Mesic Herbaceous Vegetation	Midwest Dry-Mesic Prairie	CEGL002214 G2G3

Taxonomic Group Distribution Pattern Global Scientific Name	Global Common Name	GELcode GRANK
Scirpus acutus - Typha spp. - Mixed Herbs Midwest Herbaceous Vegetation	Midwest Mixed Emergent Deep Marsh	CEGL002229 G5
Thuja occidentalis - (Picea mariana - Abies balsamea) / Alnus incana Forest	White Cedar - (Mixed Conifer) / Alder Swamp	CEGL002456 G4
Thuja occidentalis - Fraxinus nigra Forest	White Cedar - Black Ash Swamp	CEGL005165 G?
Typha spp. Midwest Herbaceous Vegetation	Midwest Cattail Deep Marsh	CEGL002233 G5
Vaccinium corymbosum - Gaylussacia baccata - Aronia melanocarpa / Calla palustris Shrubland	Highbush Blueberry Bog	CEGL005085 G2Q
Acer saccharum - Tilia americana / Ostrya virginiana - Carpinus caroliniana Forest	North-Central Maple - Basswood Forest	CEGL002062 G4?
Fagus grandifolia - Acer saccharum - (Liriodendron tulipifera) Glaciated Midwest Forest	Beech - Maple Glaciated Forest	CEGL005013 G3G4
Pinus strobus - Quercus alba - Mixed Hardwoods Forest	White Pine - White Oak Forest	CEGL002481 G3
Quercus alba - Quercus rubra - Carya ovata Forest	White Oak - Red Oak Dry-Mesic Forest	CEGL002068 G4?
Quercus alba - Quercus rubra - Quercus velutina / Thalictrum dioicum Forest	White Oak - Red Oak / Early Meadow-Rue Forest	CEGL005016 G?
Quercus rubra - Acer saccharum - Quercus alba - Ulmus americana / Prunus virginiana Forest	Red Oak-Sugar Maple-Elm Forest	CEGL005017 G?Q
Quercus velutina - Quercus alba - Carya (glabra, ovata) Forest	Black Oak - White Oak - Hickory Forest	CEGL002076 G4?
Quercus velutina - Quercus alba / Vaccinium (angustifolium, pallidum) / Carex pensylvanica Forest	Black Oak - White Oak / Blueberry Forest	CEGL005030 G4?
Alkaline Dry Bluff - Cliff Sparse Vegetation	Alkaline Dry Bluff - Cliff	CEGL002291 G5
Alkaline Moist Bluff - Cliff Sparse Vegetation	Alkaline Moist Bluff - Cliff	CEGL002292 G5
Carex aquatilis - Carex spp. Herbaceous Vegetation	Water Sedge Wet Meadow	CEGL002262 G4?
Carex lacustris Herbaceous Vegetation	Lake Sedge Wet Meadow	CEGL002256 G4G5
Carex spp. - Cladium mariscoides - Rhynchospora capillacea - Tofieldia glutinosa Herbaceous Vegetation	Midwest Calcareous Seep	CEGL005182 G2
Cephalanthus occidentalis / Carex spp. Northern Shrubland	Northern Buttonbush Swamp	CEGL002190 G4
Chamaedaphne calyculata Relict Bog Dwarf-shrubland	Leatherleaf Relict Bog	CEGL005092 G3G4

Taxonomic Group / Distribution / Pattern / Global Scientific Name	Global Common Name	GELcode / GRANK
Cornus amomum - Salix spp. - Rhus vernix - Rhamnus lanceolata Fen Shrubland	Dogwood - Willow - Poison Sumac Shrub Fen	CEGL005087 G2G3
Eroding Cliffs Sparse Vegetation	Small Eroding Cliffs	CEGL002315 G?
Nuphar lutea ssp. advena - Nymphaea odorata Herbaceous Vegetation	Central Water Lily Aquatic Wetland	CEGL002386 G4G5
Pentaphylloides floribunda / Carex sterilis - Andropogon gerardii - Cacalia plantaginea Shrub Herbaceous Vegetation	Cinquefoil - Sedge Prairie Fen	CEGL005139 G3G4
Polygonum spp. - Mixed Forbs Herbaceous Vegetation [Provisional]	Temporary Herbaceous Pond	CEGL002430 G?Q
Potamogeton spp. - Ceratophyllum spp. Midwest Herbaceous Vegetation	Midwest Pondweed Submerged Aquatic Wetland	CEGL002282 G5Q
Sandstone Moist Bluff - Cliff Sparse Vegetation	Sandstone Moist Bluff - Cliff	CEGL002287 G4G5
Schizachyrium scoparium - Sorghastrum nutans - Andropogon gerardii - Lespedeza capitata Sand Herbaceous Vegetation	Midwest Dry-Mesic Sand Prairie	CEGL002210 G3
Symplocarpus foetidus Herbaceous Vegetation	Skunk Cabbage Seepage Meadow	CEGL002385 G4?
Vaccinium macrocarpon / Sarracenia purpurea - Eriophorum virginicum - Dulichium arundinaceum Dwarf-shrubland	Cranberry Bog	CEGL002539 G1Q
Vascular Plants		
Endemic / Small Patch		
Betula murrayana	Murray' s Birch	PDBET020K0 G1Q
Limited / Large Patch		
Chelone obliqua var speciosa	Rose Turtlehead	PDSCR0F043 G4T3
Besseya bullii	Kitten Tails	PDSCR09030 G3
Iliamna remota	Kankakee Globe-mallow	PDMAL0K060 G1Q
Sisyrinchium strictum	Blue-eyed Grass	PMIRI0D1C0 G2Q
Peripheral / Large Patch		
Cirsium hillii	Hill' s thistle	PDAST2E1C0 G3
Delphinium exaltatum	Tall Larkspur	PDRAN0B0J0 G3

Taxonomic Group / Distribution / Pattern / Global Scientific Name	Global Common Name	GELcode / GRANK
Sida hermaphrodita	Virginia mallow	PDMAL100C0 G2
Aster furcatus	Forked aster	PDAST0T170 G3
Astragalus tennesseensis	Tennessee Milk-vetch	PDFAB0F8S0 G3
Paxistima canbyi	Canby' s Mountain-lover	PDCEL0A010 G2
Prunus alleghaniensis var davisii	Alleghany Or Sloe Plum	PDROS1C012 G4T3Q
Trifolium stoloniferum	Running Buffalo Clover	PDFAB40250 G3
Carex decomposita	Cypress-knee Sedge	PMCYP033K0 G3
Widespread Large Patch		
Prenanthes crepidinea	Nodding Rattlesnake-Root	PDAST7K080 G3G4
Juglans Cinerea	Butternut	PDJUG02030 G3G4
Silene regia	Royal Catchfly	PDCAR0U1G0 G3
Napaea dioica	Glade Mallow	PDMAL0X010 G3
Platanthera leucophaea	Eastern Prairie White-fringed Orchid	PMORC1Y0F0 G2
Poa paludigena	Bog bluegrass	PMPOA4Z1W0 G3
Arabis missouriensis var deamii	Deam' s rockcress	PDBRA06171 G4?QT3
Arabis patens	Spreading Rockcress	PDBRA061D0 G3
Poa Languida	Drooping Bluegrass	PMPOA4Z1C0 G3G4Q
Scleria reticularis	Reticulated Nutrush	PMCYP0R0K0 G3G4

Aquatic System Targets

Ecological Drainage Unit	Aquatic System Name	Notes
Great Miami - Little Miami		
	extra large headwater streams?	Low groundwater/surface; moderate/high gradient in drift plain on clay-loam till. Example Mill Creek.
	extra large headwater to mainstem streams?	High groundwater/surface; moderate gradient on dissected plateau. Examples Hogan, Tanners, Laughery Creek
	extra large mid to mainstem rivers?	Low groundwater/surface; low gradient on drift plain with many lakes, on clay-loam till-loess. Example Little Miami
	headwater streams	Low groundwater/surface; low gradient in ground moraine landform on clay loam. Examples Upper Miami and Loramie Creek
	headwater streams	Low groundwater/surface; low gradient in till plain landform
	interlobate headwater streams	Groundwater dominated; moderate/high gradient with many lakes on till and outwash. Examples Mad River
	large headwater to mainstem streams	High groundwater/surface; low/moderate gradient on dissected plateau landform on loamy till and loess. Two mainstem dams. Examples Whitewater East, West and Middle Forks (?)
	large mainstem rivers?	High groundwater/surface; low/moderate gradient on dissected plateau on alluvium. Example lower Great Miami and mainstem Whitewater
	large mainstem rivers?	Low gradient on dissected plateau. Example mainstem Ohio River
	large mainstem streams/rivers?	High groundwater/surface; low/moderate gradient on dissected plateau landform.
	large mid to mainstem streams/rivers?	Low groundwater/surface; low gradient in till plain landform on loamy till, loess, alluvium and outwash. Example Great Miami.
	medium headwater streams	Low groundwater/surface; low gradient in till plain landform
	small headwater streams	Low groundwater/surface; low gradient in till plain landform with some lakes.
	small headwater streams	Low groundwater/surface; low gradient in till plain landform on loamy till and loess. Examples Stillwater, Little Miami, Miami and Upper Little (Miami?)
Middle Wabash		
	extra large headwater to mainstem	Low groundwater/surface; moderate gradient in dissected plain – river valley. Examples Raccoon, Coal and Sugar.
	large mainstem rivers	Low groundwater/surface; low gradient. Example Wabash, below Tippecanoe.
	large mid to mainstem streams/rivers?	Low groundwater/surface; moderate gradient in dissected plain - river valley. Example mainstem Vermillion

Ecological Drainage Unit	Aquatic System Name	Notes
	medium headwater streams	Low groundwater/surface; low gradient in till plain on loamy till/loess. Examples Coal (north and east fork), Lye, Upper Raccoon, Upper Sugar, Wea and Big
	medium headwater to mainstem streams	Low groundwater/surface; low/moderate gradient. Headwaters in prairie, fine tills. Examples Little Vermillion, Vermillion River (Salt, North and Middle? Forks)
Saginaw Bay		
	bog ponds	
	interlobate headwater streams (Saginaw Bay drainage)	Moderate groundwater/moderate surface-water;low/moderate gradient;small/medium sized stream connected to
	kettle moraine lakes stream- and wetland-connected headwater and in-line lakes;	common lake type in kettle-kame topography; found in the interlobate region of southeastern Michigan
Scioto Basin		
	headwater to mainstem streams	Low groundwater/surface; low gradient on till plain. Examples Big Walnut, Scioto headwaters, Rush, Mill and Alum
	large headwater to mainstem streams	Low groundwater/surface; moderate/high gradient on dissected plateau. Examples Pigeon, Sunfish, Scioto Brush
	large mainstem rivers	Low groundwater/surface; low/moderate gradient on dissected plateau. Example Lower Scioto River, below Paint Creek
	large mid to mainstem streams/rivers?	Low groundwater/surface; low gradient on till plain. Example Middle Scioto
	large mid to mainstem streams/rivers?	Low groundwater/surface; low/moderate gradient on dissected plateau. Reservoir. Example Lower Paint Creek
	medium headwater to mainstem streams	Low groundwater/surface; low gradient on drift plain. Examples Paint, Deer, Big Darby and Rattlesnake
	medium headwater to mainstem streams	High groundwater/surface; low gradient on drift plain.
	small headwater to mainstem streams	Low groundwater/surface; low gradient on till plain. Reservoir. Examples Paint Creek, Rocky Fork
Southeast Lake Michigan		
	cisco lakes	Cisco (Coregonus artedi) require coldwater habitat and are sensitive to eutrophication; a fair number of inland Michigan lakes still contain cisco, but some populations have been lost and most are at risk; examples include Thompson and Klinger Lakes in the Fawn River drainage
	interlobate headwater streams (Lake Michigan drainage)	Moderate groundwater/moderate surface-water;low/moderate gradient;small/medium sized stream connected to
	kettle moraine lakes	stream- and wetland- connected headwater and in-line lakes; common lake type in kettle-kame topography; found in the interlobate region of southeastern Michigan

Ecological Drainage Unit	Aquatic System Name	Notes
	large rivers in southwest Michigan till plains (not coastal reach)	Large, moderate groundwater/moderate surface-water; low gradient rivers; examples include mainstems of Grand, Kalamazoo, and St. Joseph Rivers
	large, deep, stream-connected lakes	Gull Lake is example of this target; this deep (110'), clear lake is unusual for this part of the state; lake supports warm and coolwater fish species
	medium-sized, lowland rivers with extensive riparian wetlands	Very low groundwater/high surface-water; very low gradient;medium sized stream connected to a very large river
	oxbow lakes	found along mainstem of lower Grand River; Jubb, Manvill, Bass bayous; very few high quality examples
	small to medium-sized tributary streams in end moraine and outwash	Moderate groundwater/moderate surface-water; low/moderate gradient; small/medium sized stream connected to a large river; Grand River
	small to medium-sized tributary streams in outwash and ice contact	High groundwater/low surface-water;low/moderate gradient;small/medium sized stream connected to
	southern tributaries to St. Joseph River (Lake Michigan drainage)	Very low groundwater/high surface-water;low/moderate gradient;medium sized stream connected to a very large river; drain Steuben and Elkhart moraines
	tributary streams in medium textured moraines (southern Iona moraines)	Low groundwater/high surface-water; low gradient;small/medium sized stream connected to a medium/large river
Southeast Michigan Interlobate and Lake Plain		
	cisco lakes	Cisco (Coregonus artedi) require coldwater habitat and are sensitive to eutrophication; a fair number of inland Michigan lakes still contain cisco, but some populations have been lost and most are at risk; examples include Pickerel Lake, Blind Lake, perhaps Baseline Lake (ciscoes thought to be extirpated from this lake)
	inland whitefish lakes	Walnut Lake (105' deep) is the only lake in the southern part of the state that supports a native, wild population of lake whitefish; lake also supports warm and coolwater species
	interlobate headwater streams (Lake Erie	Moderate groundwater/moderate surface-water;low/moderate gradient;small/medium sized stream connected to
	kettle moraine lakes	stream- and wetland- connected headwater and in-line lakes; common lake type in kettle-kame topography; found in the interlobate region of southeastern Michigan
	lake plain tributaries connecting to a medium-sized stream	Very low groundwater/high surface-water;low gradient;small/medium sized stream connected to a medium-sized stream
	marl lakes	marl lakes occur due to inputs of groundwater that is high in lime; examples include Pickerel Lake, Blind Lake, and Baseline Lake
	medium- to large-sized lake plain coastal rivers--fed (at least in part) by interlobate	Low groundwater/high surface-water;low gradient;medium/large coastal rivers
Tippiecanoe		

Ecological Drainage Unit	Aquatic System Name	Notes
	extra large mid to mainstem streams/rivers?	Low groundwater/surface; low/moderate gradient on sand plain and irr(igation?) plains. Reservoir. Example lower mainstem Tippecanoe
	medium headwater to mainstem streams/rivers?	Low groundwater/surface; low gradient on sand plains on sand outwash with no lakes. Examples McKillup Ditch and Big Monon
	medium interlobate headwater streams	Low groundwater/surface; low gradient with no lakes. Examples Indian and Mill
	medium interlobate mid to mainstem	High groundwater/surface; low gradient with many lakes. Example upper mainstem
	small interlobate headwater streams	High groundwater/surface; low gradient with many lakes. Examples Mill, Yellow, Chippewa, Tippecanoe headwaters, Deeds
Upper Wabash		
	large headwater to mainstem streams/rivers?	Low groundwater/surface; low/moderate gradient on till plain on loamy till/loess. Examples Rock, Deer, Wildcat, Kilmore, Wildcat South fork
	large mainstem rivers	Low groundwater/surface; low gradient in dissected plain -river valley. Example Wabash below Eel
	large mid to mainstem streams/rivers?	Low groundwater/surface; low/moderate gradient on till plain
	medium interlobate headwater to mainstem	Low groundwater/surface; low gradient. Example Eel River
	medium mid to mainstem streams/rivers?	Low groundwater/surface; low/moderate gradient on till plain on clay loam with many lakes. Examples Mississinewa River, Wabash River, to Eel
	small headwater to mainstem streams	Low groundwater/surface; low gradient on till plain on clay loam with some lakes. Reservoir. Examples Salamonie, Pipe, Eight Mile, Rock, Wabash headwaters, Mississinewa headwaters, Little River.
	small headwater to mainstem streams	Low groundwater/surface; low gradient on till plain with many lakes.
Upper White		
	headwater-mainstem into large river	Low groundwater/surface dominated on loamy till on till plain with some lakes. ILP. Example Eel River
	headwater-mainstem into large river	High groundwater/surface dominated, med/high gradient on open hills/discontinuous till. Example Indian Creek
	headwaters into headwaters - mainstem	Low groundwater/surface dominated; low gradient on till plain on coarse till (loamy). Examples Duck, Upper White River, Pipe, Cicero, White Lick Creek
	headwaters into headwaters - mainstem	Low groundwater/surface dominated; low gradient with many lakes. Begins on till plain onto lowland silt area. Examples Flat Rock, Big
	headwaters into medium river	Low groundwater/surface dominated in till plain into ILP. Examples Big Walnut, Mill, *Deer.
	medium mainstem into large river	Low groundwater/surface dominated on fine textured till/loess on till plain. Example White River east fork.
	Unique to EDU	Low groundwater/surface dominated; low gradient. Example Middle White

Ecological Drainage Unit	Aquatic System Name	Notes
Western Lake Erie		
	headwater tributaries to Maumee River	Small to medium sized, very low groundwater, very low gradient streams connected to a large river;
	interlobate headwater streams (Maumee River drainage)	Moderate groundwater/moderate surface-water; low/moderate gradient; small/medium sized stream connected to a medium/large river
	medium-sized till plain mainstems-- local groundwater inputs present eastern Bluffton till plain headwater streams	Low groundwater, high surface-water; moderate gradient; medium/large sized stream connected to a large river; local groundwater inputs, mainstems fed by intermittents in headwaters
	Sandusky River headwater streams	Low groundwater, high surface-water; low/moderate gradient; small/medium sized stream connected to a medium/large river
	St. Joseph River mainstem (Maumee drainage)	Moderate groundwater/moderate surface-water; low/moderate gradient; medium/large-sized river connected to a large river

Targets Dropped From Original List

Scientific Name	Common Name	GELCode	GRank
Acer rubrum var. trilobum / Alnus serrulata / Calamagrostis coarctata Saturated Woodland		CEGL003737	G2G3
Carex lupuliformis	False Hop Sedge	PMCYP037T0	G4
Liriodendron tulipifera - Tilia americana var. heterophylla - Aesculus flava - Acer saccharum Forest [Provisional]		CEGL006309	G?
Salix myricoides	Blue-Leaved Willow	PDSAL021X0	G4

Apendix D. Geographic Data used in Ecoregional Planning

COVERAGE: Bac_stat
SOURCE: EPA
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:24,00 - 1:100,000 (depending on map availability)

EXPLANATION:
Bacteria Monitoring Stations and Data Summaries contains statistical summaries of water quality monitoring for 10 bacteria-related parameters. Parameter-specific statistics are computed by station for 5 year intervals from 1970-1994.

COVERAGE: City
TYPE: polygon
SOURCE: Digital Chart of the World
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:1,000,000

EXPLANATION:
City polygons contains depictions of the urbanized areas (built-up areas) that can be represented as polygons at 1:1,000,000 scale. The built up areas represent the shape of the urbanized area as viewed by the air observer.

COVERAGE: City_pt
TYPE: point
SOURCE: Digital Chart of the World
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:1,000,000

EXPLANATION:
City points contains depictions of point locations and names for cities.

COVERAGE: Cnty
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:
County boundaries are from the USGS Digital Line Graphs data.

COVERAGE: Contour
TYPE: line
SOURCE: USGS DEM
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:250,000 nominal data, 1:100,000 data where available

EXPLANATION:
The contours coverage was interpolated in GRID using a 90m DEM. The starting contour is 100 feet with subsequent 25 foot intervals.

COVERAGE: Nct_grid
SOURCE: USGS Digital Elevation Model
TYPE: grid
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:250,000 nominal data, 1:100,000 data where available

EXPLANATION:
The grid data is derived from a USGS Digital Elevation Model (DEM). Elevation data from cartographic sources are collected from any map series 7.5 minute through 1 degree (1:24,000 scale through 1:250,000 scale). The topographic features (contours, drain lines, ridge lines, lakes, and spot elevations) are first digitized and then processed into the required matrix form and interval spacing. In reformatting the product the USGS does not change the basic elevation .
1-degree DEM' s are also referred to as "3-arc second" or "1:250,000 scale" DEM data.

COVERAGE: Nct_hill
SOURCE: USGS 90m Digital Elevation Model
TYPE: grid
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:250,000 nominal data, 1:100,000 data where available

EXPLANATION:
The hillshade was created using Arcview's Spatial Analyst. An azimuth of 315 and an altitude of 35 were used to compute the hillshade.

COVERAGE: Dam
SOURCE: EPA
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: Not Applicable

EXPLANATION:
Dam locations contains inventory of U.S. dams with associated impoundment information based on a 1980 census.

COVERAGE: Dws
SOURCE: EPA

TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:24,000 - 1:62,500 (depending on map availability)

EXPLANATION:
Drinking Water Supply Sites contains location of public water supplies, their intakes, and sources of surface water supplies.

COVERAGE: Epa_reg
SOURCE: EPA
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:
U.S. EPA Region boundaries.

COVERAGE: Gage
SOURCE: USGS
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:24,000 - 1:100,000

EXPLANATION:
Gage Sites contains an inventory of surface water gaging station data used for water quality studies, waste load allocations, distribution studies, and advanced waste treatment assessments.

COVERAGE: Huc8
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:
This data set contains hydrologic units (drainage basins) at a scale of 1:2,000,000 for the conterminous United States and Alaska. The attributes assigned to each unit follow the 8-digit Hydrologic Unit Code (HUC) scheme, which has been approved as a Federal Information Processing Standard. The following example shows the four levels of classification, code, and description of a typical 8-digit HUC:

Classification Level	Code	Description
Region	04	Great Lakes
Subregion	0403	Northwestern Lake Michigan
Accounting Unit	04030	Fox River Basin, Wisconsin
Catalog Unit	04030203	Lake Winnebago, Wisconsin

COVERAGE: Huc8_all
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:
Same data as Huc8, includes all hucs in study area.

COVERAGE: Huc250
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:250,000

EXPLANATION:
This data was originally collected for the Geographic Information Retrieval and Analysis System (GIRAS) at a scale of 1:250K. Some areas, notably major cities in the west, were recompiled at a scale of 1:100K. The coverage was compiled to provide the National Water Quality Assessment (NAWQA) study units with an intermediate-scale river basin boundary for extracting other GIS data layers.

COVERAGE: Huc250_all
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:250,000

EXPLANATION:
Same data as Huc250, includes all hucs in study area.

COVERAGE: Ifd
SOURCE: EPA
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:24,000 - 1:100,000 (depending on map availability)

EXPLANATION:
The Industrial Facilities Discharge file is an automated database of industrial point source dischargers to surface waters in the United States. The IFD was created specifically to provide the Office of Wetlands, Oceans, and Watersheds with a comprehensive database of industrial point source dischargers.

COVERAGE: Lak1m
SOURCE: Digital Chart of the World
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:1,000,000

EXPLANATION:
The Lak1m layer contains water features with areas great enough to be depicted as polygons. This includes both lakes and rivers.

COVERAGE: Lak2m
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:
The Lak2m layer contains water body and island polygon features for the coterminous United States. These features are part of the USGS DLG data set.

COVERAGE: Lulc
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:250, 000 nominal data, 1:100,000 where available

EXPLANATION:
The landuse/landcover polygons are attributed with Anderson Level II codes and descriptions such as residential, deciduous forest land, and forested wetland.

COVERAGE: Met_stat
SOURCE: NOAA
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: Not applicable

EXPLANATION:
Weather Station Sites contains location of first order NOAA weather station areas used by the SWRRB, Basin Scale Model for Soil and Water Resource Management.

COVERAGE: Npl
SOURCE: EPA
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: Not available

EXPLANATION:
The Superfund National Priority List sites is a collection of points signifying Superfund sites.

COVERAGE: Nsi
SOURCE: EPA
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: Not applicable

EXPLANATION:
The National Sediment Inventory database is a compilation of readily available data that could be used to evaluate the extent of sediment contamination throughout the United States.

COVERAGE: Pcs
SOURCE: EPA
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: Not applicable

EXPLANATION:
The Permit Compliance System Sites and Computer Loading is a national computerized management system that automates entry, updating, and retrieval of NPDES data and tracks permit issuance, permit limits and monitoring data, and other data pertaining to facilities regulated under NPDES. NPDES permit-holding facility information contains parameter-specific loadings to surface waters computed using the EPA Effluent Decision Support System (EDSS).

COVERAGE: Ppl
SOURCE: USGS
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:24,000 - 1:100,000

EXPLANATION:
Populated place locations are a collection of populated place names derived from USGS Geographic Names Information System II (GNISII) topographic names data.

COVERAGE: Q_100k
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:

The 1:100,000 Topographic Quadrangle Series Index layer contains the outlines of the U.S. Geological Survey 1:100,000-scale topographic maps (30- by 60-minute quadrangles). Quadrangle name, USGS reference code, publication date, and map coverage by state are given for each quadrangle.

COVERAGE: Q_24k
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:

The 1:24,000 Topographic Quadrangle Series Index layer contains the outlines of the U.S. Geological Survey 1:24,000-scale topographic maps (7.5-minute quadrangles). Quadrangle name, USGS reference code, publication date, and map coverage by state are given for each quadrangle.

COVERAGE: Q_250k
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:

The 1:250,000 Topographic Quadrangle Series Index layer contains the outlines of the U.S. Geological Survey 1:250,000-scale topographic maps. Quadrangle name, USGS reference code, publication date, and map coverage by state are given for each quadrangle.

COVERAGE: Railroad
SOURCE: Digital Chart of the World
TYPE: line
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:1,000,000

EXPLANATION:

Railroad contains lines describing railroad line types and line status.

COVERAGE: Rf1
SOURCE: USGS / EPA
TYPE: line
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:500,000

EXPLANATION:

Environmental Protection Agency Reach File Version 1 contains two type of reaches, shoreline and transport. Shoreline depicts US continental coasts and perimeters of lakes, reservoirs, estuaries, the shore lines of some wide rivers and islands. Transport reaches depict segments of the hydraulic transport pathes through streams and inland open waters including lakes and estuaries.

COVERAGE: Riv1m
SOURCE: Digital Chart of the World
TYPE: line
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:1,000,000

EXPLANATION:

Riv1m contains single line streams not included in the Lak1m coverage.

COVERAGE: Riv2m
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:

The Rivers and Streams layer contains perennial and intermittent rivers, braided rivers, canals, ditches, and stream centerlines. These features are part of the USGS DLG data set.

COVERAGE: Road
SOURCE: USGS
TYPE: line
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:

The Roads information from the Digital Line Graph includes major transportation systems collected in three separate subcategories: (1) Roads and Trails, (2) Railroads, and (3) Cultural Features.

COVERAGE: Sat_bnd
SOURCE: EOSAT nominal scene algorithm, 1992.
TYPE: line
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:

The Landsat Nominal Scene Index layer contains an index to the coverage area for more that 700 nominal satellite scenes. The scene outlines

apply to both Thematic Mapper and Multispectral Scanner data acquired by Landsats 4 and 5. The index is composed of two coverages, one containing the scene center points, and the other containing scene footprints.

COVERAGE: State
SOURCE: USGS
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:2,000,000

EXPLANATION:
State boundaries are from the USGS Digital Line Graphs data.

COVERAGE: Tri92
SOURCE: EPA
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: Not applicable

EXPLANATION:
The Toxic Release Inventory data contains information about the facilities, as well as flags for each facility indicating whether the particular facility released a particular media during 1992.

COVERAGE: Urban
SOURCE: U.S. Bureau of Census
TYPE: polygon
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:24,000

EXPLANATION:
The Urbanized areas contains boundaries of Census defined urbanized areas.

COVERAGE: Utility
SOURCE: Digital Chart of the World
TYPE: line
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:1,000.000

EXPLANATION:
Utility contains line features depicting utility line types.

COVERAGE: Wq_stat
SOURCE: EPA
TYPE: point
PROJECTION: Transverse Mercator
SOURCE SCALE: 1:24,000 - 1:100,000 (depending on map availability)

EXPLANATION:
Water Quality and Monitoring and Data Summaries contains statistical summaries of water quality monitoring for 50 physical and chemical-related parameters. Parameter-specific statistics computed by station for 5 year intervals from 1970-1994.

MAP PROJECTIONS

CTP Transverse Mercator
Projection - TRANSVERSE MERCATOR
Map units - UNITS METERS

Scale factor - 0.9996
Central Meridan - -85.0
Reference latitude - 0.0
False easting - 500000.0
False northing - -4200000.

Appendix E. Site Assessment Worksheets and Guidelines for Aquatic and Terrestrial Sites

Sample Terrestrial Site Assessment Form

STATE		NCT_SITE	SITE_CODE	IRREPLAC	URGENCY	OPPORTUN	MAJ_STR1	MAJ_STR2	MAJ_STR3	MAJ_SRC1	MAJ_SRC2	MAJ_SRC3	STRATEGY1	STRATEGY2	STRATEGY3	FEASIBLE	PROBABLE	PARTNER1	PARTNER2	PARTNER3	TNCLEAD	PORTSITE	LANDSITE	PROTLEVL	Comments
MI	Alma Cedar Swamp		51																			P			
MI	Baker Sanctuary		348																			Y			
MI	Baudette Park		90																			P			
MI	Beulow Road Prairie		136																			P			
MI	Binder Park Zoo		113																			P			
MI	Cary Lake Meadow		141																			P			
MI	Concord Fen		114																			P			
MI	County Line Bog		79																			P			
MI	Davis Creek		101																			P			
MI	Dexter-Huron Metropark		106																			Y			
MI	Dodge #4 State Park		93																			P			
MI	Drayton Plains		87																			P			
MI	Elizabeth Lake		89																			P			
MI	Gidding's Lake Bog		55																			P			
MI	Goose Creek Grasslands		124																			Y			
MI	Gowen Woods		58																			P			
MI	Grand River Corridor		329																			P			
MI	Grand River-Thornapple		68																			Y			
MI	Island Lake State Recreation Area		99																			Y			

Guidelines for assessing potential portfolio sites in the North Central Tillplain Ecoregion

These guidelines are to accompany the Excel spreadsheet and to assist in assessing the sites that are proposed for the portfolio of the North Central Tillplain ecoregion. On the spreadsheet, you should see a list of proposed sites for your state. To facilitate the portfolio design process, please review the list of site names, the site boundaries on the map of sites for your state, and answer the site assessment questions. If there is a more appropriate site name, please enter it in the appropriate column. The site boundaries that appear on the map were generated in one of two ways: 1) someone knowlegeable about the site drew the boundaries on a map and they were subsequently digitized. This could have occurred through one of the technical teams (birds or vertebrates [Indiana bat sites were drawn in]), or through review of the preliminary EOs at some stage of the process. In cases where more than one boundary was drawn for a site, boundaries were merged under the assumption that the particular target at a site that required the most area for its conservation would determine the ultimate site boundary. 2) Arcview was used to draw a buffer around EOs (using a radius of 1 mile) that were selected, either with "no regrets" or "provisionally". It is fairly easy to distinguish these sites; the boundaries look like circles that were merged. Please indicate whether the boundaries (in any case) are OK for the purposes of ecoregional planning. If they are not and you have time to sketch in a new rough boundary, please do so on the map provided.

Site Assessment Guidelines:

1. Irreplaceability: Is the site irreplaceable due to its biological contribution to the portfolio? Choose one of the following responses:
    A. Yes; it is the only site in the ecoregion where a landscape of representative communities and species of the ecoregion can be conserved. If this site is not conserved, many elements would need to be conserved piecemeal at many sites, and at considerable expense with a lower probability of long term viability.
    B. Yes; it contains an extraordinary concentration of elements (where replacement of the site in the portfolio would require many sites). If this site is not conserved, many targets would need to be conserved piecemeal at many different sites, and at considerable expense with a lower probability of long term viability.
    C. Yes; it is the only known site in the ecoregion for a conservation target.
    D. Yes; it is by far the best known site for a conservation target across its range.
    E. No.

2. Urgency: How soon could the threats or existing situation at a site lead to destruction of the target elements that brought us there to begin with? Or, given the immediacy and severity of the threats, what is the urgency of protection at the site? Fit response into one of the following categories:
    A. 1-2 years
    B. 3-5 years
    C. 6-10 years
    D. 10+ years
    E. Currently stable, but situation could change
    F. Fully protected over the long term

3. Opportunity: is there currently or in the very near future an opportunity to implement a strategy that would result in significant protection or leverage of other strategies, and will that opportunity vanish in the near future? (H, M, L)

4. Major stresses: Using the following list of major stresses, identify the top 3 stresses at this site:

A. Habitat destruction or conversion
B. Habitat fragmentation
C. Habitat disturbance
D. Alteration of natural fire regimes
E. Nutrient loading
F. Sedimentation
G. Toxins/contaminants
H. Extraordinary predation/parasitism/disease
I. Modification of water levels; changes in natural flow patterns
J. Thermal alteration
K. Groundwater depletion
L. Resource depletion
M. Extraordinary competition for resources
N. Excessive herbivory
O. Altered composition/structure

6. Major sources of stress: Using the following list of major sources of stress, identify the top 3 sources of stress at this site:
   A. **Agricultural and Forestry** (Incompatible crop production practices, Incompatible livestock production practices, Incompatible grazing practices, Incompatible forestry practices)
   B. **Land Development** (Incompatible primary home development, Incompatible second home/resort development, Incompatible commercial/industrial development, Incompatible development of roads or utilities, Conversion to agriculture or silviculture)
   C. **Water Management** (Dam construction, Construction of ditches, dikes, drainage or diversion systems, Channelization of rivers or streams, Incompatible operation of dams or reservoirs, Incompatible operation of drainage or diversion systems, Excessive groundwater withdrawal, Shoreline stabilization)
   D. **Point Source Pollution** (Industrial discharge, Livestock feedlot, Incompatible wastewater treatment, Marina development, Landfill construction or operation)
   E. **Resource Extraction** (Incompatible mining practices, Incompatible oil or gas drilling, Overfishing or overhunting, Poaching or commercial collecting)
   F. **Recreation** (Incompatible recreational use, Recreational vehicles)
   G. **Land/Resource Management** (Fire suppression, Incompatible management of/for certain species)
   H. **Biological** (Parasites/pathogens, Invasive/alien species)

7. General strategies: Using the following categories, identify the top 3 strategies likely to be used at this site: the following categories:
   A. No action
   B. Implement low-cost holding action
   C. Implement community program
   D. Implement acquisition
   E. Implement management strategy
   F. Implement landowner strategy
   G. Implement policy strategy
   H. Implement compatible development strategyHigher level strategies (multi-site, ecoregional, multi-state, or national strategies)

8. Feasibility of conservation: Given the cost of implementing conservation and the political/cultural setting, what is the feasibility of implementing conservation? (H, M, L)

9. Probability of conservation success: Given the threats, feasibility and opportunities, what is the probability of successful conservation activities at the site?
   A. Very High. Implementing the overall site conservation strategy is very straightforward; this appraoch has often been used successfully.

B. High. Implementing the site conservation strategy is relatively straightforward, but not certain; this approach has been used successfully.
C. Medium. Implementing the site conservation strategy involves a fair number of complexities, hurdles and/or uncertainties; this approach has rarely been used before.
D. Low. Implementing the site conservation strategy involves many complexities, hurdles and/or uncertainties; this approach has never been used before.

10. Types of partners: Record the three major types of partners that would be involved in implementation, using the following categories:
    A. Federal regulatory agency
    B. Federal land management agency
    C. State regulatory agency
    D. State land management agency
    E. Regional or local government
    F. Private conservation groups
    G. Private land owners
    H. Other

11. Will TNC play a major role (lead or major partner)? (Y or N)

12. Given threats, probability of success, urgency and everything else discussed, should this site be included in the portfolio? ("Y" for Yes - no regrets!; "P" for Provisional Yes, given our current level of knowledge; "N" for No)

13. Is this a "landscape" site? Choose from the following selections.
    A. Yes; it is a **functional landscape**. (e.g., Poiani and Richter). These landscape-scale sites hold greatest promise for long-term sustainability by retaining as much as possible of their original ecosystem integrity, including key ecosystem patterns and processes (fire, hydrology, predator/prey interactions, etc.) These sites encompass both terrestrial and aquatic communities. They typically are large (e.g., 50,000 acres or larger) and may include both public and private lands.)
    B. Yes; it is a **large functional site**. (Some large landscape-scale sites may be selected for conserving important conservation targets, but do not meet the criteria of a functional landscape. As explained by Poiani and Richter: "A functional site may be as large as a functional landscape. However, size alone does not ensure protection of the full biodiversity continuum." For example, a site targeting aquatic mussels may require conservation on a watershed scale, but for various reasons [ecological significance, feasibility] may not necessarily seek to conserve terrestrial communities and species in the watershed.)
    C. Yes; it is an **aggregation of smaller sites clustered within a geographic landscape**. (Smaller sites that lie close to each other may be treated as a landscape-scale project for the purpose of implementing conservation strategies. Ecological processes outside of smaller site boundaries may be substantially impaired.)
    D. No.

14. What is the level of protection already in place at the site? Estimate the percentage of the site that is already in some conservation ownership or that is protected through regulatory means using the following categories:
    A. 0-15%
    B. 15-50%
    C. 50-85%
    D. 85-100%

Michigan's Upper Peninsula
Evaluating Threats and Prioritizing Action

February, 2000

During the site selection workshop, we will consider a range of relevant information that may impact our or our partners' ability to successfully work at a site to protect the biodiversity targets. This information will enable us to: 1) confirm that a site should be selected; 2) identify threats that occur at multiple sites so that we can develop more efficient conservation strategies; and 3) determine which portfolio sites are in most urgent need of conservation attention.

Site information that will be compiled and discussed includes:

1. Biological contribution of the site to the portfolio
2. Irreplaceability
3. Threats to *targets* at the site
4. Strategies
5. The Nature Conservancy's role
6. Public/Private ownership
7. Conservation partners
8. Probability of successful conservation activities at the site
9. Urgency of action required
10. Opportunity
11. Site selection

Further guidance on these items follows!

1. Biological contribution of the site to the portfolio

Considering the number and diversity of targets at a site; *and* the viability or condition of these targets, determine the site's biological contribution to the portfolio. Some guidelines:

High: Large number of targets relative to other sites; physical and biological targets captured. Targets have *very good* viability, based on their size, condition, and landscape context.

Moderate: Moderate number of targets relative to other sites; physical and biological targets could still be captured. Targets have *good* viability.

Low: Low number of targets. Targets have *fair or poor* viability.

2. Irreplaceability

Indicate whether or not this site is irreplaceable due to its biological contribution to the portfolio. In other words, if this site is *not* included in the portfolio, are there other opportunities to capture the same targets? Reasons that a site might be considered irreplaceable include:

1. This site is the only known site for a target.
2. This site is by far the best known site for a given target across its range.
3. This site contains an extraordinary concentration of targets (where replacement of the site in the portfolio would require many sites). If this site is not conserved, many elements would need to be conserved piecemeal at many different sites, and at considerable expense with a lower probability of long term viability.

3. Threats to *Targets* at the Site

A. Identify the *most* significant threats to the targets at this site (up to 3). Choose from the lists below, answering at the level of detail you are comfortable with.

1) Aquatic/Hydrologic Alterations
   a) dredging
   b) diversion (dams, dikes, ditches, etc.)
   c) ground water withdrawal
   d) channelization
   e) creation of impervious surfaces (e.g. paving)
   f) jetties & seawalls
   g) riprap and other shoreline stabilizations

2) Development
   a) urban & residential development due to increase in local population
   b) urban & residential development without population growth
   c) second home development
   d) roads

3) Agriculture
   a) increased nutrient input due to livestock
   b) increased nutrient input due to agricultural practices
   c) sedimentation due to agricultural practices
   d) loss of vegetative cover
   e) other agriculture source

4) Industry
   a) power generation
   b) right of way
   c) other industrial source

5) Pollution
   a) non-point source pollution
   b) point source pollution
   c) solid waste disposal
   d) air deposition

6) Resource Extraction
   a) mining
   b) oil drilling
   c) natural gas extraction
   d) forestry
   e) fishing
   f) hunting
   g) commercial flora or fauna collecting
   h) poaching

7) Climatic Alteration
   a) microclimate alteration
   b) thermal shadow
   c) global warming

8) Recreation
   a) Boating
   b) recreational vehicles
   c) general purpose recreational use (includes hiking, biking, skiing, camping, etc.)

9) Biological Sources
   a) exotic species
   b) deer browsing
   c) parasites
   d) infectious diseases

10) Management
   a) managed for target, but needs support
   b) managed for incompatible species/community
   c) vertebrate animal control
   d) vandalism

11) UNKNOWN
12) ADD CHOICE

B. Rank the threat, based on its severity. In other words, what is the projected impact of this threat to conservation targets and/or supporting processes and patterns at the site, given the existing situation?

VERY HIGH: the projected impact would cause destruction or elimination of a conservation target and/or supporting processes.

HIGH: the projected impact would cause serious degradation of a conservation target and/or supporting processes.

MEDIUM: the projected impact would cause some or uncertain degradation of a conservation target and/or supporting processes.

LOW: the projected impact would cause slight deterioration of a conservation target and/or supporting processes.

5. Strategies

General strategies: Using the following categories, identify the top 3 strategies likely to be used at this site: the following categories:

I. No action
J. Implement low-cost holding action
K. Implement community program
L. Implement acquisition
M. Implement management strategy
N. Implement landowner strategy
O. Implement policy strategy
P. Implement compatible development strategy
Q. Higher level strategies (multi-site, ecoregional, multi-state, or national strategies)

6. The Nature Conservancy's Role

A. How is The Nature Conservancy ***currently*** involved at the site?

B. How should The Nature Conservancy be involved at the site ***in the future***?

Choose one or more of the following categories:

1. Conservation lead
2. Land owner
3. Landowner contact program
4. Holder of conservation easement
5. Assist in acquisition
6. Manager
7. Management consultant
8. Manager of lease agreement
9. Advise local planning efforts
10. Broad scale planning with multiple partners or jurisdictions
11. Community based conservation
12. Compatible development project
13. Policy development
14. Anchor site*
15. On-the-ground local staff
16. Supported only by staff at the TNC state office
17. Joint effort among multiple TNC offices
18. Eventually phase out involvement
19. No involvement

* Anchor sites are high priority sites (as defined by biological criteria in *Conservation by Design* and *Geography of Hope*) where the Conservancy develops cutting edge solutions that could have an impact beyond that site. They are envisioned as encompassing larger geographic scales, addressing larger threats to an ecoregion, and offering opportunities for testing new conservation tools and techniques.

7. Ownership

Estimate the percentage of the site that is publicly and privately owned.

9. Conservation partners

List the three major types of partners that would be involved in implementation, using the following categories. Indicate whether they are an owner/manager, decision-maker, or stakeholder.

1. National Government
2. State/Provincial Government
3. Multi-jurisdictional Government/Commission
4. Local Government (includes municipal & county)
5. Tribal Government
6. NGO
7. Foundations
8. Individuals (who? how many?)
9. Local Association
10. Educators/Academia
11. Industry
12. Commerce
13. Agriculture
14. Mining
15. Residential Developers
16. Recreation

10.Probability of Success

Given the threats, level of complexity and obstacles, what is the probability of successful conservation activities at the site? Guidelines to consider:

High: TNC and its partners have the potential capacity to implement strategies to abate critical threats; we are reasonably confident that we can be successful; and strategies can be implemented with reasonable expenditure of resources.

Moderate: TNC and its partners have *uncertain* capacity to implement strategies to abate critical threats; we are moderately confident that we can be successful; and the cost to implement strategies will likely be high.

Low: The capacity to implement strategies to abate critical threats is unlikely to exist in the near future; we are not confident that we can be successful; and the cost to implement strategies will be extremely high.

11.Urgency of Action Required

How soon could the threats or existing situation at a site lead to destruction of the target elements that brought us there to begin with? Or, given the immediacy and severity of the threats, level of complexity and obstacles, what is the urgency of conservation action at the site?

- 1-2 years
- 3-5 years
- 6-10 years
- 10+ years
- Currently stable, but situation could change
- Fully protected over the long term

12. Opportunity

Is there currently or in the very near future an opportunity to implement a strategy that would result in significant protection or leverage of other strategies, and will that opportunity vanish in the near future? Rate this opportunity H, M or L.

13. Site Selection

Given the threats, probability of success, urgency and everything else discussed, should this site be included in the portfolio? ("Y" for Yes- no regrets!; "N" for No; or "P" for Provisional Yes)

Appendix F. Conservation Areas in the North Central Tillplain Ecoregion July, 2003

State	Site Name	Site Code	Portfolio Status
IL-IN			
	Vermillion River	239	Final
IN			
	Atterbury Upland Site	40	Final
	Ball Wetlands/Pisgah Marsh	342	Final
	Big Blue River/Montgomery	321	Provisional
	Big Chapman Lake Nature Preserve	341	Final
	Big Walnut	37	Final
	Binkly Bog/ Jimmerson Lake	7	Final
	Black Rock/Ross Biological Reserve	352	Final
	Burket Bog	22	Final
	Cabin Creek Bog	31	Final
	Chain O' Lakes State Park	195	Provisional
	Chamberlain Lake	11	Final
	Christlieb Bog	21	Final
	Coal Creek Seeps	353	Final
	Deer Creek	373	Final
	Delhi Swamp Site	225	Provisional
	Douglas Woods	12	Final
	Eagle Lake	355	Final
	Eagles Crest Nature Preserve	35	Final
	Elkhart Bog	3	Final
	Fall Creek Gorge	28	Final
	Ft Harrison State Park/Woolen' s Garden	34	Final
	Ginn Woods	29	Final
	Grass lake - Steuben Co. Complex	9	Final
	Hammer Wetlands	14	Final
	Indian Village Bog	19	Final
	Kickapoo Falls	30	Final
	Kingsbury	338	Final
	Lake Wawasee	191	Provisional
	Laketon Bog Nature Preserve	210	Provisional
	Lindenwood Environmental Study Area	204	Provisional
	Little Blue River	294	Provisional
	Lonidaw Nature Preserve	17	Final
	Mainstem Middle Wabash	381	Final
	Mallard Roost Wetland Conservation Area	16	Final
	Manitou Islands State Nature Preserve	23	Final
	Marsh Lake Complex	6	Final
	Merry Lea Nature Preserve	20	Final
	Mill Creek/Fish Creek Fens (La Porte)	339	Final
	Morgan County Snake	301	Provisional
	Morgan County Snake 2	302	Provisional
	Mounds State Park	32	Final
	Newport Army Ammunition Plant Central	358	Final
	Newport Army Ammunition Plant East	359	Final
	Newport Army Ammunition Plant West	360	Final
	Olin Lake	175	Final
	Pipewort Pond Nature Preserve	4	Final
	Portland Arch Nature Preserve	361	Final
	Rainsville Bridge	25	Final
	Rattle Snake Canyon Site	363	Final
	Rock Island	24	Final
	Ropchan Wildlife Refuge	8	Final
	Sedge Bluff	159	Final
	Shrader - Weaver Nature Preserve	38	Final
	Smith Cemetery Site	364	Final
	Spicer Lake Nature Preserve	1	Final
	Spring Creek Seeps Nature Preserve (Montgomery)	33	Final
	Spring Pond Nature Preserve	36	Final
	Spurgeon Nature Preserve	15	Final

State	Site Name	Site Code	Portfolio Status
	Sugar Creek of the Blue	267	Provisional
	Sugar River	395	Final
	Swamp Angel	13	Final
	Tippecanoe River	205	Final
	Turkey Run, Sugar Creek, and Shades State Park	350	Final
	Wabash Brecks Point Gravel Hill Prairie	26	Final
	Wabash County False Hop Sedge	213	Provisional
	Wea Creek Gravel Hill Prairie	27	Final
	Woodland Bog	10	Final
	Yost Pond	5	Final
IN-MI			
	Big Swamp-Lake Anne	157	Final
	Lime Lake Fen (Steuben)	2	Final
	Pigeon River and Wetlands	337	Final
IN-MI-O			
	Upper St. Joseph River	400	Final
IN-OH			
	Fish Creek	188	Final
	Mainstem Upper Wabash	382	Final
	State Line Woods/Mud Lake Bog	168	Final
MI			
	Baker Sanctuary	348	Final
	Bakertown Fen	150	Final
	Barry Wetlands	347	Final
	Cass County Forests	415	Provisional
	Concord Fen	114	Provisional
	Cook Lake-Rudy Road Fens	130	Final
	Dayton Wet Prairie	153	Provisional
	Dowagiac Woods	131	Provisional
	Flat River Barrens	60	Final
	Fort Custer	331	Final
	Gidding' s Lake Bog	55	Final
	Gourdneck	119	Final
	Grand River Corridor	329	Final
	Holly Fen	405	Final
	Huron River Headwater Lakes	376	Final
	Kalamazoo River Headwaters	399	Final
	Knickerbocker Lake	123	Final
	Lake Diane	163	Final
	Liberty Fen	122	Final
	Lime Lake (Van Buren County)	357	Final
	Mainstem Grand River	380	Final
	Maple River (Tillplain)	383	Final
	Mill Creek Wetlands (St. Joseph)	336	Final
	Paw Paw Lake-Lawton Prairie	117	Final
	Paw Paw River	406	Final
	Pinckney-Waterloo	325	Final
	Quimby Road Fen	362	Final
	River Raisin Headwaters	387	Final
	Rogue River	388	Final
	Rose Lake	76	Final
	Russ Forest	128	Provisional
	Saul Lake Bog	64	Final
	Shiawassee River and Shiawassee Flats	391	Final
	Skiff Lake	409	Provisional
	Spring Brook-Kalamazoo Nature Center	392	Final
	St. Joseph River (Calhoun)	333	Final
	Stony Creek	84	Final
	Tamarack Swamp	129	Final
	Thompson Lake	145	Final
	Union Lake-Blossom Road Swamp	127	Provisional
	Upper Clinton River	89	Final
	Upper Huron River	408	Final
	Upper Kalamazoo Tributaries	414	Final
	Vermontville/Thornapple	349	Provisional

State	Site Name	Site Code	Portfolio Status
	Wolf Lake	108	Final
	Zeigenfuss Lake/Greenville	59	Final
OH			
	Beavercreek Wetlands	289	Final
	Betsch Fen	303	Final
	Blakeslee Virginia Mallow	181	Final
	Blanchard River	212	Final
	Brown County Flatwoods	316	Provisional
	Caldwell Woods	313	Final
	Clermont County Flatwoods	315	Provisional
	Clermont County Flatwoods 2	317	Provisional
	Clifton Gorge	281	Final
	Crabill Fen	264	Provisional
	Darby Creek	372	Final
	Dean Culbertson Woods	305	Final
	Dietrich Woods	216	Final
	East Fork Lake	46	Final
	East Fork Little Miami River	402	Final
	Fort Hill Woods	314	Final
	Gahanna Woods	261	Provisional
	Germantown Woods	297	Final
	Great Seal Woods	304	Final
	Hazel Daughmer Savanna	220	Provisional
	Hoge Woods	228	Provisional
	Hueston Woods	43	Final
	Huron River	375	Final
	Killdeer Plains	44	Final
	Lawrence Woods	356	Final
	Lewisburg Mine	279	Final
	Little Miami River Mainstem	47	Final
	Lower Vermillion River	378	Final
	Macochee Creek/Mad River Headwaters	413	Final
	Mad River Plains	412	Final
	Middle Scioto River	390	Final
	Ohio Brush Creek	411	Final
	Old Woman Creek	385	Final
	Paint Creek	410	Final
	Paint Creek Escarpment	48	Final
	Pott' s Post Oak Woods	318	Final
	Richardson Forest	307	Provisional
	Sandusky River	45	Final
	Sears-Carmean Woods	217	Final
	Shallenberger Woods	292	Provisional
	Spring Valley Fens/Caesar Creek	42	Final
	Springville Marsh	208	Provisional
	St. Mary' s River Wetlands	324	Final
	Stillwater River	393	Final
	Stonelick Lake	312	Provisional
	Twin Creek	404	Final
	Upper Auglaize River	398	Final

Appendix G. Results of Site Assessments for Portfolio Conservation Areas in the North Central Tillplain Ecoregion

State **IL-IN**

Site Name **Vermillion River**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Habitat disturbance
Nutrient loading

Sources of Stress: Biological
Water management
Agriculture and forestry

Strategies: Implement landowner strategy
Implement management strategy
Implement compatible development strategy

Partners: State land management agency
Regional or local government
Private land owners

Irreplaceable? Yes; exclusive representative landscape

Amount Protected: 0-15%

Urgency: Currently stable but could change

Feasibility: Medium

Opportunity: High

State **IN**

Site Name **Atterbury Upland Site**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat disturbance
Alteration of natural fire regimes

Sources of Stress: Land/resource management

Strategies: Implement policy strategy
No action

Partners: Federal land management agency

Irreplaceable? No

Amount Protected: 85-100%

Urgency: Currently stable but could change

Feasibility: Medium

Opportunity: Low

State **IN**

Site Name **Ball Wetlands/Pisgah Marsh**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat disturbance

Sources of Stress: Land development
Agriculture and forestry

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency
Private conservation group

Irreplaceable? No

Urgency: 10+ years

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Big Blue River/Montgomery**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: No action

Partners:

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Low

State **IN**

Site Name **Big Chapman Lake Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Sedimentation

Sources of Stress: Land development

Agriculture and forestry

Strategies: Implement acquisition

Implement landowner strategy

Partners: Federal land management agency

Private land owners

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: High

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Big Walnut**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: LRA

Stresses: Habitat fragmentation

Habitat destruction or conversion

Habitat disturbance

Sources of Stress: Land development

Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Implement compatible development strategy

Partners: State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 1 - 2 years

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Binkly Bog/ Jimmerson Lake**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Land development
Agriculture and forestry

Strategies: Implement acquisition

Partners: State land management agency

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Low

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Black Rock/Ross Biological Reserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation
Habitat destruction or conversion

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency
Private conservation group

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: High

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Burket Bog**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat disturbance

Habitat destruction or conversion

Sources of Stress:

Land development

Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners:

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Cabin Creek Bog**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Alteration of natural fire regimes

Sources of Stress: Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 1 - 2 years

Opportunity: High

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Chain O' Lakes State Park**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat disturbance

Sources of Stress: Land/resource management

Strategies: Implement low-cost holding action

Partners: State land management agency

Irreplaceable? No

Urgency: Fully protected over the long term

Opportunity: High

Amount Protected: 85-100%

Feasibility: Medium

State **IN**

Site Name **Chamberlain Lake**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Habitat fragmentation

Sources of Stress: Land development

Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 1 - 2 years

Opportunity: Low

Amount Protected: 50-85%

Feasibility: Medium

State **IN**

Site Name **Christlieb Bog**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Sources of Stress: Land development

Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Coal Creek Seeps**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Habitat fragmentation

Sources of Stress: Agriculture and forestry

Land development

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: High

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Deer Creek**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Nutrient loading

Modification of water levels; changes in natural flow patterns

Sources of Stress: Agriculture and forestry

Water management

Strategies: Implement landowner strategy

Implement management strategy

Partners: Federal regulatory agency

Private land owners

Irreplaceable? Yes; best site for species or community

Urgency: Currently stable but could change

Opportunity: High

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Delhi Swamp Site**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency:

Opportunity:

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Douglas Woods**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy

Partners:

Irreplaceable? No

Urgency: 10+ years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Eagle Lake**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: High

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Eagles Crest Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Sources of Stress: Water management

Strategies: Implement management strategy

Partners: Regional or local government

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity:

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Elkhart Bog**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Modification of water levels; changes in natural flow patterns

Nutrient loading

Sources of Stress: Land development

Land/resource management

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 1 - 2 years

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Fall Creek Gorge**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Alteration of natural fire regimes

Sources of Stress: Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners: Private conservation group

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Ft Harrison State Park/Woolen' s**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Altered composition/structure

Sources of Stress: Land development

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Ginn Woods**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Habitat fragmentation

Sources of Stress: Land/resource management

Strategies: Implement management strategy

Partners: Other

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity:

Amount Protected: 85-100%

Feasibility: Medium

State **IN**

Site Name **Grass lake - Steuben Co. Complex**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Nutrient loading
Habitat disturbance

Sources of Stress: Agriculture and forestry
Land development
Water management

Strategies: Implement acquisition
Implement management strategy
Implement landowner strategy

Partners: State land management agency
Private conservation group
Private land owners

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Hammer Wetlands**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation
Habitat destruction or conversion

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 15-50%

Feasibility: Medium

State **IN**

Site Name **Indian Village Bog**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Land development
Agriculture and forestry

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 10+ years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Kickapoo Falls**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Land development
Agriculture and forestry

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Kingsbury**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Lake Wawasee**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Habitat fragmentation

Sources of Stress: Land development

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 15-50%

Feasibility: Medium

State **IN**

Site Name **Laketon Bog Nature Preserve**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Sources of Stress: Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Lindenwood Environmental Study**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement management strategy

Partners: Private conservation group

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Little Blue River**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Sedimentation
Nutrient loading

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement landowner strategy
Implement policy strategy

Partners: Federal regulatory agency
State regulatory agency
Private land owners

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Low

State **IN**

Site Name **Lonidaw Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation

Sources of Stress: Agriculture and forestry

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity:

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Mainstem Middle Wabash**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Nutrient loading
Habitat disturbance
Habitat destruction or conversion

Sources of Stress: Agriculture and forestry
Resource extraction
Land development

Strategies: Implement policy strategy
Higher level strategies

Partners: Federal regulatory agency
Federal land management agency
Other

Irreplaceable? Yes; best site for species or community

Urgency: 3 - 5 years

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Low

State **IN**

Site Name **Mallard Roost Wetland Conservation**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation
Habitat destruction or conversion

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: High

Amount Protected: 15-50%

Feasibility: Medium

State **IN**

Site Name **Manitou Islands State Nature**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Marsh Lake Complex**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses: Habitat fragmentation
Habitat destruction or conversion
Habitat disturbance

Sources of Stress: Land development
Agriculture and forestry

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency
Regional or local government
Private conservation group

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 1 - 2 years

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Merry Lea Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation
Habitat destruction or conversion

Sources of Stress: Land development
Agriculture and forestry

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency
Regional or local government
Private conservation group

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Mill Creek/Fish Creek Fens (La**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Habitat destruction or conversion
Alteration of natural fire regimes

Sources of Stress: Biological
Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency
Regional or local government
Federal regulatory agency

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 1 - 2 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Morgan County Snake**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable? No

Urgency:

Opportunity:

Amount Protected: 0-15%

Feasibility:

State **IN**

Site Name **Morgan County Snake 2**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable? No

Amount Protected: 0-15%

Urgency:

Feasibility:

Opportunity:

State **IN**

Site Name **Mounds State Park**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Alteration of natural fire regimes

Sources of Stress: Land/resource management

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? No

Amount Protected: 85-100%

Urgency: Fully protected over the long term

Feasibility: High

Opportunity:

State **IN**

Site Name **Newport Army Ammunition Plant**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement landowner strategy

Partners: Federal land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: High

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Newport Army Ammunition Plant East**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement landowner strategy

Partners: Federal land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: High

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Newport Army Ammunition Plant**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement landowner strategy

Partners: Federal land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: High

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Olin Lake**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Habitat fragmentation

Sources of Stress: Agriculture and forestry

Land development

Strategies: Implement acquisition

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Pipewort Pond Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Land development
Agriculture and forestry

Strategies: Implement acquisition

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Portland Arch Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation
Habitat disturbance

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy
Implement landowner strategy

Partners: State land management agency
Private conservation group
Private land owners

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Rainsville Bridge**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation
Habitat disturbance

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy
Implement landowner strategy

Partners: State land management agency
Private conservation group
Private land owners

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Rattle Snake Canyon Site**

Portfolio Status Final

Action Site 1: N

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation
Habitat disturbance

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy
Implement landowner strategy

Partners: State land management agency
Private conservation group
Private land owners

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Rock Island**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Sources of Stress: Land development

Strategies: Implement acquisition

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Ropchan Wildlife Refuge**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Habitat destruction or conversion

Sources of Stress: Biological

Agriculture and forestry

Strategies: Implement management strategy

Implement acquisition

Partners: Private conservation group

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: High

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Sedge Bluff**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Biological
Agriculture and forestry

Strategies: Implement management strategy

Partners:

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: High

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Shrader - Weaver Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Land development
Agriculture and forestry

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Smith Cemetery Site**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? Yes; unique species or community

Urgency: Fully protected over the long term

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Spicer Lake Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Habitat fragmentation

Sources of Stress: Land development

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Regional or local government

Irreplaceable? No

Urgency: 1 - 2 years

Opportunity: Medium

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Spring Creek Seeps Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency
Regional or local government

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State **IN**

Site Name **Spring Pond Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Sources of Stress: Land/resource management

Strategies: Implement management strategy

Partners: Regional or local government

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity:

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Spurgeon Nature Preserve**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Habitat fragmentation

Sources of Stress: Land development

Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Sugar Creek of the Blue**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Sedimentation

Habitat destruction or conversion

Sources of Stress: Agriculture and forestry

Strategies: Implement landowner strategy

Implement compatible development strategy

Partners: Federal regulatory agency

Regional or local government

Private conservation group

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Sugar River**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Nutrient loading

Modification of water levels; changes in natural flow patterns

Sources of Stress: Agriculture and forestry

Water management

Strategies: Implement community program

Partners: State regulatory agency

Federal regulatory agency

Other

Irreplaceable? Yes; best site for species or community

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Swamp Angel**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation

Sources of Stress: Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners:

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Tippecanoe River**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: Y

Landscape Scale Restoration Area: N

Stresses: Sedimentation

Nutrient loading

Sources of Stress: Agriculture and forestry

Strategies: Implement landowner strategy

Implement compatible development strategy

Partners: Federal regulatory agency

Regional or local government

Private conservation group

Irreplaceable? Yes; exclusive representative landscape

Urgency: 1 - 2 years

Opportunity: High

Amount Protected: 0-15%

Feasibility: High

State **IN**

Site Name **Turkey Run, Sugar Creek, and Shades**

Portfolio Status Final

Action Site 1: N

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses: Habitat destruction or conversion

Habitat fragmentation

Sources of Stress: Land development

Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Implement compatible development strategy

Partners: State land management agency

Regional or local government

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 6 - 10 years

Opportunity: High

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Wabash Brecks Point Gravel Hill**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Alteration of natural fire regimes

Sources of Stress: Biological

Strategies: Implement management strategy

Partners:

Irreplaceable? No

Urgency: Fully protected over the long term

Opportunity: High

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Wabash County False Hop Sedge**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **IN**

Site Name **Wea Creek Gravel Hill Prairie**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Alteration of natural fire regimes

Sources of Stress: Biological

Strategies: Implement management strategy

Partners:

Irreplaceable? No

Urgency: Fully protected over the long term

Opportunity: High

Amount Protected: 85-100%

Feasibility: High

State **IN**

Site Name **Woodland Bog**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Sources of Stress: Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners: Private conservation group

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: High

Amount Protected: 15-50%

Feasibility: High

State **IN**

Site Name **Yost Pond**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Sources of Stress: Agriculture and forestry

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: High

Amount Protected: 15-50%

Feasibility: High

State **IN-MI**

Site Name **Big Swamp-Lake Anne**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Habitat fragmentation

Sources of Stress: Agriculture and forestry

Land development

Strategies: Implement acquisition

Partners: State land management agency

Irreplaceable? No

Urgency: 10+ years

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Medium

State **IN-MI**

Site Name **Lime Lake Fen (Steuben)**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat disturbance

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: High

State **IN-MI**

Site Name **Pigeon River and Wetlands**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: Y

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat fragmentation
Altered composition/structure

Sources of Stress: Land development
Agriculture and forestry
Water management

Strategies: Implement landowner strategy
Implement community program
Implement acquisition

Partners: Private land owners
State regulatory agency
Private conservation group

Irreplaceable? Yes; exclusive representative landscape

Urgency: 3 - 5 years

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Medium

State **IN-MI-O**

Site Name **Upper St. Joseph River**

Portfolio Status Final

Action Site 1: Y

Action Site 2: N

Landscape-Scale Action Site: Y

Landscape Scale Restoration Area: N

Stresses: Sedimentation
Nutrient loading
Habitat destruction or conversion

Sources of Stress: Agriculture and forestry
Land development
Land/resource management

Strategies: Implement community program
Implement landowner strategy
Implement compatible development strategy

Partners: Federal regulatory agency
Private land owners
State land management agency

Irreplaceable? Yes; exclusive representative landscape

Amount Protected: 0-15%

Urgency: 3 - 5 years

Feasibility: Medium

Opportunity: High

State **IN-OH**

Site Name **Fish Creek**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Sedimentation

Sources of Stress: Agriculture and forestry

Strategies: Implement landowner strategy

Partners: State land management agency
Private land owners

Irreplaceable? Yes; exclusive representative landscape

Amount Protected: 15-50%

Urgency: 1 - 2 years

Feasibility: Medium

Opportunity: Medium

State **IN-OH**

Site Name Mainstem Upper Wabash

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Sedimentation
Nutrient loading

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement landowner strategy
Implement compatible development strategy

Partners: Federal regulatory agency
Regional or local government
Private conservation group

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 0-15%

Urgency: 6 - 10 years

Feasibility: Medium

Opportunity: Medium

State IN-OH

Site Name State Line Woods/Mud Lake Bog

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat disturbance
Altered composition/structure
Habitat fragmentation

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement acquisition
Implement landowner strategy
Implement management strategy

Partners: Private land owners
State land management agency

Irreplaceable? No

Amount Protected: 0-15%

Urgency: 3 - 5 years

Feasibility: Medium

Opportunity: Low

State MI

Site Name **Baker Sanctuary**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Urgency: 3 - 5 years

Opportunity:

Amount Protected: 15-50%

Feasibility:

State **MI**

Site Name **Bakertown Fen**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Alteration of natural fire regimes

Altered composition/structure

Modification of water levels; changes in natural flow patterns

Sources of Stress: Agriculture and forestry

Biological

Water management

Strategies: Implement acquisition

Implement management strategy

Partners: Regional or local government

Private conservation group

Private land owners

Irreplaceable? No

Urgency: 1 - 2 years

Opportunity: Medium

Amount Protected: 15-50%

Feasibility: Medium

State **MI**

Site Name Barry Wetlands

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Stresses: Habitat disturbance
Altered composition/structure
Habitat destruction or conversion

Strategies: Implement management strategy
Implement acquisition
Implement policy strategy

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 6 - 10 years

Opportunity: Medium

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Sources of Stress: Land/resource management
Biological
Land development

Partners: State land management agency
Regional or local government
Private land owners

Amount Protected: 50-85%

Feasibility: Medium

State MI

Site Name Cass County Forests

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Stresses:

Strategies:

Irreplaceable?

Urgency: 1 - 2 years

Opportunity:

Landscape-Scale Action Site: N

Landscape Scale Restoration Area:

Sources of Stress:

Partners:

Amount Protected:

Feasibility:

State MI

Site Name Concord Fen

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Urgency: 6 - 10 years

Opportunity:

Amount Protected: 0-15%

Feasibility:

State MI

Site Name Cook Lake-Rudy Road Fens

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation
Habitat destruction or conversion
Altered composition/structure

Sources of Stress: Land development
Land/resource management
Water management

Strategies: Implement acquisition
Implement management strategy
Implement landowner strategy

Partners: Federal regulatory agency
Regional or local government
Private conservation group

Irreplaceable? No

Urgency: 1 - 2 years

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Medium

State MI

Site Name **Dayton Wet Prairie**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Altered composition/structure
Alteration of natural fire regimes

Sources of Stress: Agriculture and forestry
Biological
Land/resource management

Strategies: Implement management strategy
Implement landowner strategy
Implement policy strategy

Partners: Private conservation group
Private land owners
State regulatory agency

Irreplaceable? No

Amount Protected: 0-15%

Urgency: 1 - 2 years

Feasibility: High

Opportunity: Low

State **MI**

Site Name **Dowagiac Woods**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Modification of water levels; changes in natural flow patterns
Habitat fragmentation

Sources of Stress: Land development
Water management

Strategies: Implement acquisition
Implement landowner strategy
Implement management strategy

Partners: Private conservation group
Regional or local government
Private land owners

Irreplaceable? No

Amount Protected: 50-85%

Urgency: 3 - 5 years

Feasibility: High

Opportunity: High

State **MI**

Site Name **Flat River Barrens**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses: Alteration of natural fire regimes
Habitat disturbance
Habitat destruction or conversion

Sources of Stress: Land/resource management
Biological
Land development

Strategies: Implement management strategy
Implement acquisition

Partners: State land management agency
Federal regulatory agency
Private land owners

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 50-85%

Urgency: Currently stable but could change

Feasibility: High

Opportunity: High

State **MI**

Site Name **Fort Custer**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses: Habitat fragmentation
Alteration of natural fire regimes
Habitat destruction or conversion

Sources of Stress: Agriculture and forestry
Land/resource management
Land development

Strategies: Implement management strategy
Implement acquisition
Implement community program

Partners: Federal land management agency
State land management agency
Regional or local government

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 15-50%

Urgency: 6 - 10 years

Feasibility: Medium

Opportunity: High

State **MI**

Site Name **Gidding' s Lake Bog**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Urgency: 6 - 10 years

Opportunity:

Amount Protected: 0-15%

Feasibility:

State **MI**

Site Name **Gourdneck**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Resource depletion

Modification of water levels; changes in natural flow patterns

Sources of Stress: Resource extraction

Water management

Land/resource management

Strategies: No action

Implement low-cost holding action

Implement management strategy

Partners: State land management agency

Private land owners

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: High

State **MI**

Site Name **Grand River Corridor**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Urgency: 3 - 5 years

Opportunity:

Amount Protected: 0-15%

Feasibility:

State **MI**

Site Name **Holly Fen**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Urgency: 3 - 5 years

Opportunity:

Amount Protected:

Feasibility:

State **MI**

Site Name Huron River Headwater Lakes

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Toxins/contaminants
Groundwater depletion
Thermal alteration

Sources of Stress: Point source pollution
Agriculture and forestry
Recreation

Strategies: Implement community program
Implement acquisition
Implement landowner strategy

Partners: Regional or local government
State land management agency
Private conservation group

Irreplaceable? No

Amount Protected: 15-50%

Urgency: 1 - 2 years

Feasibility: Medium

Opportunity: High

State MI

Site Name Kalamazoo River Headwaters

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Nutrient loading
Toxins/contaminants

Sources of Stress: Land development
Agriculture and forestry
Point source pollution

Strategies: Implement community program
Implement landowner strategy
Implement compatible development strategy

Partners: State regulatory agency
Regional or local government
Other

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 0-15%

Urgency: 3 - 5 years

Feasibility: Medium

Opportunity: Medium

State MI

Site Name Knickerbocker Lake

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion

Alteration of natural fire regimes

Modification of water levels; changes in natural flow patterns

Sources of Stress: Land development

Point source pollution

Recreation

Strategies: Implement acquisition

Implement low-cost holding action

Implement management strategy

Partners: Private land owners

Private conservation group

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 0-15%

Urgency: 1 - 2 years

Feasibility: High

Opportunity: Medium

State MI

Site Name Lake Diane

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Amount Protected: 0-15%

Urgency: 3 - 5 years

Feasibility:

Opportunity:

State MI

Site Name Liberty Fen

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Altered composition/structure
Groundwater depletion

Sources of Stress: Land development
Biological
Water management

Strategies: Implement acquisition
Implement management strategy
Implement landowner strategy

Partners: Federal regulatory agency
Regional or local government
Private land owners

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 15-50%

Urgency: 3 - 5 years

Feasibility: High

Opportunity: Medium

State MI
Site Name Lime Lake (Van Buren County)

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Alteration of natural fire regimes
Habitat destruction or conversion

Sources of Stress: Biological
Land/resource management
Land development

Strategies: Implement management strategy
Implement acquisition
Implement landowner strategy

Partners: Federal regulatory agency
Private land owners
State regulatory agency

Irreplaceable? No

Amount Protected: 0-15%

Urgency: 1 - 2 years

Feasibility: Medium

Opportunity: Medium

State MI
Site Name Mainstem Grand River

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Toxins/contaminants
Nutrient loading
Sedimentation

Sources of Stress: Point source pollution
Agriculture and forestry
Land development

Strategies: Implement community program
Implement landowner strategy

Partners: Regional or local government
Private conservation group
State land management agency

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State MI
Site Name Maple River (Tillplain)

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Urgency: 3 - 5 years

Opportunity:

Amount Protected: 0-15%

Feasibility:

State MI
Site Name Mill Creek Wetlands (St. Joseph)

Portfolio Status Final

Action Site 1: Y
Action Site 2: Y
Landscape-Scale Action Site: N
Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Habitat destruction or conversion
Habitat disturbance

Sources of Stress: Land/resource management
Land development
Biological

Strategies: Implement management strategy
Implement acquisition
Implement landowner strategy

Partners: State land management agency
Private land owners
Federal regulatory agency

Irreplaceable? Yes; extraordinary concentration of targets
Amount Protected: 50-85%
Urgency: 6 - 10 years
Feasibility: Medium
Opportunity: Medium

State MI
Site Name Paw Paw Lake-Lawton Prairie

Portfolio Status Final

Action Site 1: N
Action Site 2: N
Landscape-Scale Action Site: N
Landscape Scale Restoration Area: LRA

Stresses: Habitat destruction or conversion
Habitat disturbance
Habitat fragmentation

Sources of Stress: Land development
Water management
Biological

Strategies: Implement acquisition
Implement landowner strategy
Implement management strategy

Partners: Federal regulatory agency
Private conservation group
Private land owners

Irreplaceable? No
Amount Protected: 0-15%
Urgency: 1 - 2 years
Feasibility: Medium
Opportunity: Medium

State MI
Site Name Paw Paw River

Portfolio Status Final

Action Site 1: Y
Landscape-Scale Action Site: N

Action Site 2: Y

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Amount Protected:

Urgency: 1 - 2 years

Feasibility:

Opportunity:

State **MI**

Site Name **Pinckney-Waterloo**

Portfolio Status Final

Action Site 1: Y

Landscape-Scale Action Site: Y

Action Site 2: Y

Landscape Scale Restoration Area: PRA

Stresses:	Habitat destruction or conversion	**Sources of Stress:**	Land development
	Habitat fragmentation		Biological
	Habitat disturbance		Land/resource management
Strategies:	Implement community program	**Partners:**	State land management agency
	Implement acquisition		Private land owners
	Implement management strategy		Private conservation group

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 50-85%

Urgency: 3 - 5 years

Feasibility: Medium

Opportunity: High

State **MI**

Site Name **Quimby Road Fen**

Portfolio Status Final

Action Site 1: N

Landscape-Scale Action Site: N

Action Site 2: N

Landscape Scale Restoration Area: N

Stresses:	Habitat disturbance	**Sources of Stress:**	Agriculture and forestry
	Altered composition/structure		Biological
	Alteration of natural fire regimes		Land development
Strategies:	Implement landowner strategy	**Partners:**	Private land owners
	Implement acquisition		State regulatory agency
	Implement management strategy		Federal regulatory agency
Irreplaceable?	No	**Amount Protected:**	
Urgency:	1 - 2 years	**Feasibility:**	Medium
Opportunity:	Medium		

State **MI**

Site Name **River Raisin Headwaters**

Portfolio Status Final

Action Site 1:	Y	**Landscape-Scale Action Site:**	Y
Action Site 2:	Y	**Landscape Scale Restoration Area:**	LRA
Stresses:	Habitat destruction or conversion	**Sources of Stress:**	Land development
	Nutrient loading		Agriculture and forestry
	Sedimentation		Water management
Strategies:	Implement acquisition	**Partners:**	State land management agency
	Implement landowner strategy		Regional or local government
	Implement policy strategy		Private conservation group
Irreplaceable?	Yes; extraordinary concentration of targets	**Amount Protected:**	0-15%
Urgency:	3 - 5 years	**Feasibility:**	High
Opportunity:	High		

State **MI**

Site Name **Rogue River**

Portfolio Status Final

Action Site 1:	N	**Landscape-Scale Action Site:**	N
Action Site 2:	N	**Landscape Scale Restoration Area:**	N
Stresses:	Habitat destruction or conversion	**Sources of Stress:**	Land development

	Nutrient loading		Agriculture and forestry
	Toxins/contaminants		Point source pollution
Strategies:	Implement community program	**Partners:**	State land management agency
	Implement landowner strategy		Regional or local government
	Implement compatible development strategy		Private land owners
Irreplaceable?	No	**Amount Protected:**	15-50%
Urgency:	3 - 5 years	**Feasibility:**	Medium
Opportunity:	Medium		

State **MI**

Site Name **Rose Lake**

Portfolio Status Final

Action Site 1:	N	**Landscape-Scale Action Site:**	N
Action Site 2:	N	**Landscape Scale Restoration Area:**	N
Stresses:	Alteration of natural fire regimes	**Sources of Stress:**	Recreation
	Habitat destruction or conversion		Biological
	Altered composition/structure		Land development
Strategies:	Implement management strategy	**Partners:**	State land management agency
	Implement landowner strategy		Private land owners
	Implement community program		Private conservation group
Irreplaceable?	No	**Amount Protected:**	85-100%
Urgency:	10+ years	**Feasibility:**	Medium
Opportunity:	Medium		

State **MI**

Site Name **Russ Forest**

Portfolio Status Provisional

Action Site 1:	N	**Landscape-Scale Action Site:**	N
Action Site 2:	N	**Landscape Scale Restoration Area:**	N
Stresses:	Habitat fragmentation	**Sources of Stress:**	Agriculture and forestry

	Excessive herbivory		Land/resource management
	Altered composition/structure		Biological
Strategies:	Implement management strategy	**Partners:**	State land management agency

Irreplaceable? No **Amount Protected:** 85-100%
Urgency: Currently stable but could change **Feasibility:** Medium
Opportunity: High

State **MI**
Site Name **Saul Lake Bog**
Portfolio Status Final
Action Site 1: N **Landscape-Scale Action Site:** N
Action Site 2: N **Landscape Scale Restoration Area:** N
Stresses: **Sources of Stress:**

Strategies: **Partners:**

Irreplaceable? **Amount Protected:** 0-15%
Urgency: 6 - 10 years **Feasibility:**
Opportunity:

State **MI**
Site Name **Shiawassee River and Shiawassee**
Portfolio Status Final
Action Site 1: Y **Landscape-Scale Action Site:** Y
Action Site 2: Y **Landscape Scale Restoration Area:** N

Stresses:	Habitat disturbance	**Sources of Stress:**	Land development
	Nutrient loading		Agriculture and forestry

	Modification of water levels; changes in natural flow patterns		
Strategies:	Implement community program	**Partners:**	Private conservation group
	Higher level strategies		Regional or local government
	Implement acquisition		Private land owners

Irreplaceable? No **Amount Protected:** 0-15%

Urgency: 1 - 2 years **Feasibility:** Medium

Opportunity: High

State **MI**

Site Name **Skiff Lake**

Portfolio Status Provisional

Action Site 1: N **Landscape-Scale Action Site:** N

Action Site 2: N **Landscape Scale Restoration Area:**

Stresses: **Sources of Stress:**

Strategies: **Partners:**

Irreplaceable? **Amount Protected:**

Urgency: 1 - 2 years **Feasibility:**

Opportunity:

State **MI**

Site Name **Spring Brook-Kalamazoo Nature**

Portfolio Status Final

Action Site 1: N **Landscape-Scale Action Site:** N

Action Site 2: N **Landscape Scale Restoration Area:** N

Stresses:	Habitat destruction or conversion	**Sources of Stress:**	Land development
	Modification of water levels; changes in natural flow patterns		Water management
	Toxins/contaminants		Point source pollution

Strategies: Implement community program
Implement acquisition
Implement landowner strategy

Partners: Regional or local government
Private land owners

Irreplaceable? Yes; best site for species or community
Amount Protected: 0-15%
Urgency: 3 - 5 years
Feasibility: High
Opportunity: High

State **MI**
Site Name **St. Joseph River (Calhoun)**
Portfolio Status Final
Action Site 1: N
Landscape-Scale Action Site: N
Action Site 2: N
Landscape Scale Restoration Area: N
Stresses:
Sources of Stress:

Strategies:

Partners:

Irreplaceable?
Amount Protected: 0-15%
Urgency: 6 - 10 years
Feasibility:
Opportunity:

State **MI**
Site Name **Stony Creek**
Portfolio Status Final
Action Site 1: N
Landscape-Scale Action Site: N
Action Site 2: N
Landscape Scale Restoration Area: N
Stresses: Habitat destruction or conversion
Habitat fragmentation
Habitat disturbance
Sources of Stress: Land development
Recreation
Land/resource management
Strategies: Implement landowner strategy
Partners: Regional or local government

	Implement management strategy		Private land owners
	Implement policy strategy		Other

Irreplaceable? No
Amount Protected: 15-50%
Urgency: 3 - 5 years
Feasibility: High
Opportunity: High

State MI
Site Name Tamarack Swamp

Portfolio Status Final

Action Site 1: N
Landscape-Scale Action Site: N
Action Site 2: N
Landscape Scale Restoration Area: N

Stresses:	Habitat destruction or conversion	**Sources of Stress:**	Agriculture and forestry
	Altered composition/structure		Land development
	Modification of water levels; changes in natural flow patterns		Biological
Strategies:	Implement acquisition	**Partners:**	Private land owners
	Implement management strategy		Federal regulatory agency
	Implement landowner strategy		

Irreplaceable? No
Amount Protected: 15-50%
Urgency: 1 - 2 years
Feasibility: High
Opportunity: Low

State MI
Site Name Thompson Lake

Portfolio Status Final

Action Site 1: N
Landscape-Scale Action Site: N
Action Site 2: N
Landscape Scale Restoration Area: N

Stresses:	Altered composition/structure	**Sources of Stress:**	Land development
	Nutrient loading		Land/resource management
	Habitat fragmentation		Biological
Strategies:	Implement landowner strategy	**Partners:**	Private land owners

Implement management strategy

Implement acquisition

Federal regulatory agency

Private conservation group

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: High

State **MI**

Site Name **Union Lake-Blossom Road Swamp**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Urgency: 3 - 5 years

Opportunity:

Amount Protected: 0-15%

Feasibility:

State **MI**

Site Name **Upper Clinton River**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?
Amount Protected: 15-50%
Urgency: 1 - 2 years
Feasibility:
Opportunity:

State **MI**
Site Name **Upper Huron River**
Portfolio Status Final
Action Site 1: Y
Landscape-Scale Action Site: N
Action Site 2: Y
Landscape Scale Restoration Area: N
Stresses:
Sources of Stress:

Strategies:
Partners:

Irreplaceable?
Amount Protected:
Urgency: 1 - 2 years
Feasibility:
Opportunity:

State **MI**
Site Name **Upper Kalamazoo Tributaries**
Portfolio Status Final
Action Site 1: N
Landscape-Scale Action Site: N
Action Site 2: N
Landscape Scale Restoration Area:
Stresses:
Sources of Stress:

Strategies:
Partners:

Irreplaceable?
Amount Protected:
Urgency: 3 - 5 years
Feasibility:
Opportunity:

State **MI**
Site Name **Vermontville/Thornapple**
Portfolio Status Provisional
Action Site 1: N
Landscape-Scale Action Site: N
Action Site 2: N
Landscape Scale Restoration Area: N
Stresses:
Sources of Stress:

Strategies:
Partners:

Irreplaceable?
Amount Protected: 0-15%
Urgency: 6 - 10 years
Feasibility:
Opportunity:

State **MI**
Site Name **Wolf Lake**
Portfolio Status Final
Action Site 1: N
Landscape-Scale Action Site: N
Action Site 2: N
Landscape Scale Restoration Area: N
Stresses:
Sources of Stress:

Strategies:
Partners:

Irreplaceable?
Urgency: 6 - 10 years
Opportunity:
Amount Protected:
Feasibility:

State MI
Site Name Zeigenfuss Lake/Greenville

Portfolio Status Final

Action Site 1: Y
Action Site 2: Y
Landscape-Scale Action Site: N
Landscape Scale Restoration Area: N

Stresses: Alteration of natural fire regimes
Habitat destruction or conversion
Habitat fragmentation

Sources of Stress: Land development
Recreation

Strategies: Implement landowner strategy
Implement acquisition

Partners: Private land owners
Other

Irreplaceable? Yes; unique species or community
Urgency: 3 - 5 years
Opportunity: Low
Amount Protected: 0-15%
Feasibility: Low

State OH
Site Name Beavercreek Wetlands

Portfolio Status Final

Action Site 1: N
Action Site 2: N
Landscape-Scale Action Site: N
Landscape Scale Restoration Area: N

Stresses: Groundwater depletion
Modification of water levels; changes in natural flow patterns
Altered composition/structure

Sources of Stress: Land development
Water management
Biological

Strategies: Implement acquisition
Implement management strategy

Partners: State land management agency
Regional or local government
Private conservation group

Irreplaceable? No
Amount Protected: 15-50%

Urgency: 3 - 5 years **Feasibility:** High

Opportunity: High

State OH

Site Name Betsch Fen

Portfolio Status Final

Action Site 1: N **Landscape-Scale Action Site:** N

Action Site 2: N **Landscape Scale Restoration Area:** N

Stresses:	Groundwater depletion	**Sources of Stress:**	Water management
	Altered composition/structure		Point source pollution
	Modification of water levels; changes in natural flow patterns		
Strategies:	Implement management strategy	**Partners:**	State land management agency
	Implement acquisition		Private conservation group

Irreplaceable? No **Amount Protected:** 85-100%

Urgency: Currently stable but could change **Feasibility:** Medium

Opportunity: Low

State OH

Site Name Blakeslee Virginia Mallow

Portfolio Status Final

Action Site 1: N **Landscape-Scale Action Site:** N

Action Site 2: N **Landscape Scale Restoration Area:** N

Stresses:	Habitat destruction or conversion	**Sources of Stress:**	Land development
Strategies:	Implement landowner strategy	**Partners:**	Private land owners
	Implement acquisition		

Irreplaceable? No **Amount Protected:** 0-15%

Urgency: 6 - 10 years **Feasibility:** Medium

Opportunity: Low

State OH
Site Name Blanchard River

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Sedimentation

Sources of Stress: Agriculture and forestry

Strategies: Implement landowner strategy
Implement policy strategy

Partners: State regulatory agency
State land management agency
Private land owners

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 0-15%

Urgency: 1 - 2 years

Feasibility: Medium

Opportunity: Low

State OH
Site Name Brown County Flatwoods

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Habitat disturbance
Habitat destruction or conversion

Sources of Stress: Agriculture and forestry
Land development
Biological

Strategies: Implement landowner strategy
Implement acquisition

Partners: Private land owners

Irreplaceable? No

Amount Protected: 0-15%

Urgency: 10+ years

Feasibility: Medium

Opportunity: Low

State **OH**

Site Name **Caldwell Woods**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Extraordinary competition for resources
Excessive herbivory

Sources of Stress: Biological
Recreation

Strategies: Implement management strategy

Partners: Regional or local government

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: Medium

State **OH**

Site Name **Clermont County Flatwoods**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Altered composition/structure
Habitat disturbance

Sources of Stress: Land development
Agriculture and forestry
Biological

Strategies: Implement landowner strategy
Implement acquisition

Partners: Private land owners
State land management agency

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Low

Amount Protected: 85-100%

Feasibility: Medium

State **OH**

Site Name **Clermont County Flatwoods 2**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Altered composition/structure
Habitat disturbance

Sources of Stress: Land development
Agriculture and forestry
Biological

Strategies: Implement landowner strategy
Implement acquisition

Partners: Private land owners

Irreplaceable? No

Urgency: 10+ years

Opportunity: Low

Amount Protected: 85-100%

Feasibility: Medium

State **OH**

Site Name **Clifton Gorge**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure
Habitat disturbance

Sources of Stress: Biological

Strategies: Implement management strategy
Implement acquisition

Partners: State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: Fully protected over the long term

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: High

State **OH**

Site Name **Crabill Fen**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Groundwater depletion

Modification of water levels; changes in natural flow patterns

Sources of Stress: Biological

Water management

Strategies: Implement management strategy

Partners: Federal land management agency

State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 85-100%

Urgency: Fully protected over the long term

Feasibility: Medium

Opportunity: Low

State **OH**

Site Name **Darby Creek**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: Y

Landscape Scale Restoration Area: LRA

Stresses: Nutrient loading

Sedimentation

Modification of water levels; changes in natural flow patterns

Sources of Stress: Agriculture and forestry

Land development

Strategies: Implement landowner strategy

Implement policy strategy

Implement acquisition

Partners: Federal land management agency

Private conservation group

Regional or local government

Irreplaceable? Yes; exclusive representative landscape

Amount Protected: 15-50%

Urgency: 1 - 2 years

Feasibility: Medium

Opportunity: High

State **OH**

Site Name **Dean Culbertson Woods**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Groundwater depletion

Modification of water levels; changes in natural flow patterns

Sources of Stress: Water management

Strategies: Implement acquisition

Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: Medium

State **OH**

Site Name **Dietrich Woods**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Habitat fragmentation

Habitat destruction or conversion

Sources of Stress: Agriculture and forestry

Land development

Biological

Strategies: Implement landowner strategy

Implement acquisition

Partners: Private land owners

Irreplaceable? No

Urgency: 6 - 10 years

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Low

State **OH**

Site Name **East Fork Lake**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses: Altered composition/structure

Sources of Stress: Biological
Recreation
Land/resource management

Strategies: Implement management strategy
Implement acquisition

Partners: State land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: Medium

State **OH**

Site Name **East Fork Little Miami River**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Nutrient loading
Sedimentation

Sources of Stress: Agriculture and forestry
Point source pollution

Strategies: Implement landowner strategy
Implement policy strategy

Partners: State regulatory agency
Regional or local government
Private conservation group

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: Currently stable but could change

Opportunity: High

Amount Protected: 0-15%

Feasibility: High

State **OH**

Site Name **Fort Hill Woods**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Sources of Stress: Biological

Land/resource management

Strategies: Implement management strategy

Implement landowner strategy

Partners:

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: High

State **OH**

Site Name **Gahanna Woods**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Extraordinary competition for resources

Excessive herbivory

Altered composition/structure

Sources of Stress: Biological

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: Fully protected over the long term

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: High

State **OH**

Site Name **Germantown Woods**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Excessive herbivory

Sources of Stress: Recreation

Biological

Strategies: Implement management strategy

Partners: Regional or local government

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: Medium

State **OH**

Site Name **Great Seal Woods**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Sources of Stress: Biological

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: Medium

State **OH**

Site Name **Hazel Daughmer Savanna**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:	Excessive herbivory	**Sources of Stress:**	Agriculture and forestry
	Groundwater depletion		Water management
	Alteration of natural fire regimes		Biological
Strategies:	Implement acquisition	**Partners:**	State land management agency
	Implement management strategy		Regional or local government

Irreplaceable? Yes; exclusive representative landscape

Amount Protected: 0-15%

Urgency: 1 - 2 years

Feasibility: High

Opportunity: Low

State **OH**

Site Name **Hoge Woods**

Portfolio Status Provisional

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:	Altered composition/structure	**Sources of Stress:**	Agriculture and forestry
	Habitat disturbance		Biological
Strategies:	Implement landowner strategy	**Partners:**	Private land owners
	Implement acquisition		State land management agency

Irreplaceable? No

Amount Protected: 0-15%

Urgency: 10+ years

Feasibility: Medium

Opportunity: Low

State **OH**

Site Name **Hueston Woods**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses: Altered composition/structure

Sources of Stress: Biological

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: Fully protected over the long term

Opportunity: High

Amount Protected: 85-100%

Feasibility: High

State **OH**

Site Name **Huron River**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Sedimentation

Modification of water levels; changes in natural flow patterns

Nutrient loading

Sources of Stress: Agriculture and forestry

Water management

Land development

Strategies: Implement landowner strategy

Partners: Private conservation group

Federal regulatory agency

State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: Currently stable but could change

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Medium

State **OH**

Site Name **Killdeer Plains**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses: Modification of water levels; changes in natural flow patterns
Toxins/contaminants
Habitat fragmentation

Sources of Stress: Water management
Land/resource management
Point source pollution

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: Medium

Amount Protected: 50-85%

Feasibility: Medium

State **OH**

Site Name **Lawrence Woods**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Sources of Stress: Biological

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: Fully protected over the long term

Opportunity: High

Amount Protected: 85-100%

Feasibility: High

State **OH**

Site Name **Lewisburg Mine**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Habitat destruction or conversion
Habitat disturbance

Sources of Stress: Resource extraction
Recreation
Land development

Strategies: Implement landowner strategy
Implement acquisition
Implement management strategy

Partners: Private land owners

Irreplaceable? No

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 0-15%

Feasibility: Medium

State **OH**

Site Name **Little Miami River Mainstem**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Modification of water levels; changes in natural flow patterns
Nutrient loading
Sedimentation

Sources of Stress: Agriculture and forestry
Point source pollution

Strategies: Implement landowner strategy
Implement policy strategy

Partners: State land management agency
Regional or local government
Private land owners

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 3 - 5 years

Opportunity: High

Amount Protected: 15-50%

Feasibility: Medium

State **OH**

Site Name **Lower Vermillion River**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Nutrient loading

Sedimentation

Sources of Stress: Agriculture and forestry

Strategies: Implement landowner strategy

Partners: Regional or local government

Federal regulatory agency

Irreplaceable? No

Urgency: Currently stable but could change

Opportunity: Low

Amount Protected: 0-15%

Feasibility: Medium

State **OH**

Site Name **Macochee Creek/Mad River**

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area:

Stresses: Nutrient loading

Sedimentation

Modification of water levels; changes in natural flow patterns

Sources of Stress: Agriculture and forestry

Water management

Strategies: Implement landowner strategy

Implement policy strategy

Implement acquisition

Partners:

Irreplaceable?

Urgency:

Opportunity: High

Amount Protected: 0-15%

Feasibility: High

State **OH**

Site Name Mad River Plains

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area:

Stresses: Groundwater depletion

Altered composition/structure

Modification of water levels; changes in natural flow patterns

Sources of Stress: Water management

Resource extraction

Strategies: Implement management strategy

Implement acquisition

Partners: State land management agency

Federal land management agency

Regional or local government

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 6 - 10 years

Opportunity: Medium

Amount Protected: 85-100%

Feasibility: Medium

State OH

Site Name Middle Scioto River

Portfolio Status Final

Action Site 1: Y

Action Site 2: Y

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses:

Sources of Stress:

Strategies:

Partners:

Irreplaceable?

Urgency:

Opportunity:

Amount Protected: 0-15%

Feasibility:

State OH

Site Name **Ohio Brush Creek**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area:

Stresses: Nutrient loading
Sedimentation
Modification of water levels; changes in natural flow patterns

Sources of Stress: Agriculture and forestry

Strategies: Implement landowner strategy
Implement policy strategy
Implement acquisition

Partners:

Irreplaceable?

Urgency:

Opportunity:

Amount Protected: 0-15%

Feasibility: Medium

State **OH**

Site Name **Old Woman Creek**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: N

Stresses: Nutrient loading
Sedimentation
Altered composition/structure

Sources of Stress: Agriculture and forestry
Biological
Land development

Strategies:

Partners: State land management agency
Other

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 3 - 5 years

Opportunity: Medium

Amount Protected: 15-50%

Feasibility: High

State **OH**

Site Name **Paint Creek**

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area:

Stresses:

Sources of Stress:

Strategies: Implement landowner strategy

Implement policy strategy

Implement acquisition

Partners:

Irreplaceable?

Urgency:

Opportunity: High

Amount Protected:

Feasibility: High

State OH

Site Name Paint Creek Escarpment

Portfolio Status Final

Action Site 1: N

Action Site 2: N

Landscape-Scale Action Site: N

Landscape Scale Restoration Area: PRA

Stresses: Habitat fragmentation

Habitat destruction or conversion

Excessive herbivory

Sources of Stress: Land development

Agriculture and forestry

Recreation

Strategies: Implement landowner strategy

Implement management strategy

Implement acquisition

Partners: Private conservation group

Private land owners

State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Urgency: 3 - 5 years

Opportunity: High

Amount Protected: 50-85%

Feasibility: High

State OH

Site Name Pott' s Post Oak Woods

Portfolio Status Final

Action Site 1: N
Action Site 2: N
Landscape-Scale Action Site: N
Landscape Scale Restoration Area: N
Stresses: Alteration of natural fire regimes
Altered composition/structure
Sources of Stress: Land/resource management
Strategies: Implement landowner strategy
Implement acquisition
Partners: Private land owners
Irreplaceable? Yes; extraordinary concentration of targets
Urgency: 6 - 10 years
Opportunity: Medium
Amount Protected: 0-15%
Feasibility: Medium

State **OH**
Site Name **Richardson Forest**
Portfolio Status Provisional
Action Site 1: N
Action Site 2: N
Landscape-Scale Action Site: N
Landscape Scale Restoration Area: N
Stresses: Groundwater depletion
Altered composition/structure
Sources of Stress: Biological
Water management
Strategies: Implement management strategy
Partners: Regional or local government
Irreplaceable? No
Urgency: 6 - 10 years
Opportunity: Medium
Amount Protected: 85-100%
Feasibility: Medium

State **OH**
Site Name **Sandusky River**
Portfolio Status Final

Action Site 1: Y
Action Site 2: Y
Landscape-Scale Action Site: N
Landscape Scale Restoration Area: N

Stresses: Habitat fragmentation
Habitat destruction or conversion
Sedimentation

Sources of Stress: Agriculture and forestry
Point source pollution

Strategies: Implement landowner strategy
Implement policy strategy

Partners: State regulatory agency
State land management agency
Regional or local government

Irreplaceable? Yes; extraordinary concentration of targets
Amount Protected: 0-15%
Urgency: 3 - 5 years
Feasibility: Low
Opportunity: High

State **OH**
Site Name **Sears-Carmean Woods**
Portfolio Status Final

Action Site 1: N
Action Site 2: N
Landscape-Scale Action Site: N
Landscape Scale Restoration Area: N

Stresses: Extraordinary competition for resources

Sources of Stress: Biological

Strategies: Implement management strategy

Partners: State land management agency
Regional or local government

Irreplaceable? No
Amount Protected: 85-100%
Urgency: Currently stable but could change
Feasibility: Medium
Opportunity: Medium

State **OH**
Site Name **Shallenberger Woods**
Portfolio Status Provisional

Action Site 1: N
Landscape-Scale Action Site: N

Action Site 2: N
Landscape Scale Restoration Area: N
Stresses: Altered composition/structure
Sources of Stress: Land development

Strategies: Implement management strategy
Partners: State land management agency

Irreplaceable? No
Amount Protected: 85-100%
Urgency: Currently stable but could change
Feasibility: High
Opportunity: Medium

State **OH**
Site Name **Spring Valley Fens/Caesar Creek**
Portfolio Status Final
Action Site 1: N
Landscape-Scale Action Site: N
Action Site 2: N
Landscape Scale Restoration Area: N
Stresses: Altered composition/structure
Sources of Stress: Biological
Recreation

Strategies: Implement management strategy
Partners: State land management agency

Irreplaceable? Yes; extraordinary concentration of targets
Amount Protected: 15-50%
Urgency: Fully protected over the long term
Feasibility: Medium
Opportunity: High

State **OH**
Site Name **Springville Marsh**
Portfolio Status Provisional
Action Site 1: N
Landscape-Scale Action Site: N

Action Site 2: N

Landscape Scale Restoration Area: N

Stresses:	Modification of water levels; changes in natural flow patterns	**Sources of Stress:**	Point source pollution
	Groundwater depletion		Water management
	Toxins/contaminants		Biological
Strategies:	Implement acquisition	**Partners:**	State land management agency
	Implement management strategy		

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 85-100%

Urgency: 6 - 10 years

Feasibility: Medium

Opportunity: Medium

State OH

Site Name St. Mary' s River Wetlands

Portfolio Status Final

Action Site 1: Y

Landscape-Scale Action Site: N

Action Site 2: Y

Landscape Scale Restoration Area: N

Stresses:	Altered composition/structure	**Sources of Stress:**	Agriculture and forestry
	Modification of water levels; changes in natural flow patterns		Water management
	Sedimentation		Point source pollution
Strategies:	Implement management strategy	**Partners:**	Private land owners
	Implement landowner strategy		State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 0-15%

Urgency: 6 - 10 years

Feasibility: Medium

Opportunity: High

State OH

Site Name Stillwater River

Portfolio Status Final

Action Site 1: Y

Landscape-Scale Action Site: N

Action Site 2: Y

Landscape Scale Restoration Area: N

Stresses: Nutrient loading
Sedimentation

Sources of Stress: Agriculture and forestry
Land development

Strategies: Implement landowner strategy
Implement policy strategy
Implement acquisition

Partners: Private conservation group
Federal land management agency
State land management agency

Irreplaceable? Yes; extraordinary concentration of targets

Amount Protected: 0-15%

Urgency: Currently stable but could change

Feasibility: Medium

Opportunity: High

State OH
Site Name Stonelick Lake

Portfolio Status Provisional

Action Site 1: N

Landscape-Scale Action Site: N

Action Site 2: N

Landscape Scale Restoration Area: N

Stresses: Altered composition/structure

Sources of Stress: Land/resource management
Biological

Strategies: Implement management strategy

Partners: State land management agency

Irreplaceable? No

Amount Protected: 85-100%

Urgency: 10+ years

Feasibility: Medium

Opportunity: Medium

State OH
Site Name Twin Creek

Portfolio Status Final

Action Site 1: Y

Landscape-Scale Action Site: N

Action Site 2: Y

Landscape Scale Restoration Area: N

Stresses: Nutrient loading

Modification of water levels; changes in natural flow patterns

Sources of Stress: Agriculture and forestry

Point source pollution

Land development

Strategies: Implement landowner strategy

Implement policy strategy

Implement acquisition

Partners: Private conservation group

Private land owners

Other

Irreplaceable? No

Amount Protected: 0-15%

Urgency: 3 - 5 years

Feasibility: Medium

Opportunity: High

State OH

Site Name Upper Auglaize River

Portfolio Status Final

Action Site 1: N

Landscape-Scale Action Site: N

Action Site 2: N

Landscape Scale Restoration Area: N

Stresses: Modification of water levels; changes in natural flow patterns

Nutrient loading

Sedimentation

Sources of Stress: Water management

Agriculture and forestry

Strategies: Implement landowner strategy

Implement policy strategy

Partners: Federal regulatory agency

Regional or local government

Irreplaceable? No

Amount Protected: 0-15%

Urgency: Currently stable but could change

Feasibility: Low

Opportunity: Low

Appendix H. Conservation Targets Found in Portfolio Sites in the North Central Tillplain Ecoregion

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
IL-IN					
	Vermillion River		Final		
		Blanchard' s Cricket Frog		Y	AAABC01011
		Butternut		Y	PDJUG02030
		Central Bur Oak Openings		Y	CEGL002159
		Clubshell		Y	IMBIV35060
		Eastern Sand Darter		Y	AFCQC01060
		Glade Mallow		Y	PDMAL0X010
		Henslow' s sparrow		Y	ABPBXA0030
		Indiana Bat		Y	AMACC01100
		large mid to mainstem streams/rivers?		Y	CEAS007003
		medium headwater to mainstem streams		Y	CEAS007002
		Midwest Glacial Drift Hill Prairie		Y	CEGL005183
		North-Central Maple - Basswood Forest		Y	CEGL002062
		Purple lilliput		Y	IMBIV43030
		Rabbitsfoot		Y	IMBIV39041
		Skunk Cabbage Seepage Meadow		Y	CEGL002385
		Small Eroding Cliffs		Y	CEGL002315
		Rabbitsfoot		P	IMBIV39040
IN					
	Atterbury Upland Site		Final		
		Dickcissel		Y	ABPBX65010
		Henslow' s sparrow		Y	ABPBXA0030
		Grasshopper Sparrow		P	ABPBXA0020
		Prairie Warbler		P	ABPBX03190
		Rayed Bean		P	IMBIV47050
	Ball Wetlands/Pisgah Marsh		Final		
		Blanding' s Turtle		Y	ARAAD04010
		Eastern massasauga		Y	ARADE03011
		Kirtland' s snake		Y	ARADB06010
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
		Purple lilliput		Y	IMBIV43030
		Tussock Sedge Wet Meadow		Y	CEGL002258
		Copperbelly Water Snake		P	ARADB22023
		Spotted Turtle		P	ARAAD02010
	Big Blue River/Montgomery		Provisional		
		headwater-mainstem into large river		Y	CEAS003005
		headwater-mainstem into large river		Y	CEAS003006

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		headwaters into headwaters - mainstem		Y	CEAS003001
		headwaters into headwaters - mainstem		Y	CEAS003002
		headwaters into medium river		Y	CEAS003007
		Indiana Bat		Y	AMACC01100
		medium mainstem into large river		Y	CEAS003004
		Unique to EDU		Y	CEAS003003
		Indiana Bat		P	AMACC01100
	Big Walnut		Final		
		Central Green Ash - Elm - Hackberry Forest		Y	CEGL002014
		Eastern Hemlock - Beech Hardwood Forest		Y	CEGL005043
		Indiana Bat		Y	AMACC01100
		White Oak - Red Oak Dry-Mesic Forest		Y	CEGL002068
	Binkly Bog/ Jimmerson Lake		Final		
		Bulrush - Cattail - Burreed Shallow Marsh		Y	CEGL002026
		Central Tamarack - Red Maple Rich Swamp		Y	CEGL005232
		Dogwood - Willow - Poison Sumac Shrub Fen		Y	CEGL005087
	Burket Bog		Final		
		Leatherleaf Relict Bog		Y	CEGL005092
	Cabin Creek Bog		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
	Chain O' Lakes State Park		Provisional		
		Blanding' s Turtle		Y	ARAAD04010
	Chamberlain Lake		Final		
		Inland Coastal Plain Marsh		Y	CEGL005108
	Christlieb Bog		Final		
		Leatherleaf Relict Bog		Y	CEGL005092
	Coal Creek Seeps		Final		
		Skunk Cabbage Seepage Meadow		Y	CEGL002385
	Deer Creek		Final		
		headwater-mainstem into large river		Y	CEAS003005
		headwater-mainstem into large river		Y	CEAS003006
		headwaters into headwaters - mainstem		Y	CEAS003002
		headwaters into headwaters - mainstem		Y	CEAS003001
		headwaters into medium river		Y	CEAS003007
		medium mainstem into large river		Y	CEAS003004
		Unique to EDU		Y	CEAS003003
	Eagle Lake		Final		
		Twigrush Meadow Marsh		Y	CEGL005104
	Eagles Crest Nature Preserve		Final		
		Beech - Maple Glaciated Forest		Y	CEGL005013
	Elkhart Bog		Final		

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		Dogwood - Willow - Poison Sumac Shrub Fen		Y	CEGL005087
		Spotted Turtle		P	ARAAD02010
	Fall Creek Gorge		Final		
		Forked aster		Y	PDAST0T170
		Sandstone Moist Bluff - Cliff		Y	CEGL002287
	Ft Harrison State Park/Woolen' s Garden		Final		
		Beech - Maple Glaciated Forest		Y	CEGL005013
		Central Indiana Till Plain Flatwoods		Y	CEGL005173
		Rose Turtlehead		Y	PDSCR0F043
	Ginn Woods		Final		
		Central Indiana Till Plain Flatwoods		Y	CEGL005173
	Grass lake - Steuben Co. Complex		Final		
		Black Oak - White Oak / Blueberry Forest		Y	CEGL005030
		Inland Coastal Plain Marsh		Y	CEGL005108
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
		Northern Buttonbush Swamp		Y	CEGL002190
	Hammer Wetlands		Final		
		Great Lakes Swamp White Oak-Pin Oak Flatwoods		Y	CEGL005037
		Eastern massasauga		P	ARADE03011
	Indian Village Bog		Final		
		Highbush Blueberry Bog		Y	CEGL005085
	Kingsbury		Final		
		Willow Flycatcher		Y	ABPAE33040
	Lake Wawasee		Provisional		
		Lake sturgeon		P	AFCAA01020
	Laketon Bog Nature Preserve		Provisional		
		Central Green Ash - Elm - Hackberry Forest		P	CEGL002014
	Lindenwood Environmental Study Area		Provisional		
		Kirtland' s snake		P	ARADB06010
	Little Blue River		Provisional		
		headwater-mainstem into large river		Y	CEAS003006
		headwater-mainstem into large river		Y	CEAS003005
		headwaters into headwaters - mainstem		Y	CEAS003002
		headwaters into headwaters - mainstem		Y	CEAS003001
		headwaters into medium river		Y	CEAS003007
		medium mainstem into large river		Y	CEAS003004
		Unique to EDU		Y	CEAS003003
		Purple lilliput		P	IMBIV43030
	Lonidaw Nature Preserve		Final		
		Northern Buttonbush Swamp		Y	CEGL002190

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
	Mainstem Middle Wabash		Final		
		Beech - Oak - Maple Mesic Floodplain Forest		Y	CEGL005014
		Black Oak - White Oak - Hickory Forest		Y	CEGL002076
		Bog bluegrass		Y	PMPOA4Z1W0
		Central Shale Glade		Y	CEGL002428
		extra large mid to mainstem streams/rivers?		Y	CEAS006005
		Glade Mallow		Y	PDMAL0X010
		Indiana Bat		Y	AMACC01100
		Kitten Tails		Y	PDSCR09030
		medium headwater to mainstem streams/rivers?		Y	CEAS006003
		medium interlobate headwater streams		Y	CEAS006002
		medium interlobate mid to mainstem streams/rivers?		Y	CEAS006004
		Midwest Dry Gravel Prairie		Y	CEGL002215
		Prothonotary Warbler		Y	ABPBX07010
		Rabbitsfoot		Y	IMBIV39041
		Ring Pink		Y	IMBIV31030
		Royal Catchfly		Y	PDCAR0U1G0
		Sandstone Moist Bluff - Cliff		Y	CEGL002287
		Skunk Cabbage Seepage Meadow		Y	CEGL002385
		small interlobate headwater streams		Y	CEAS006001
		White Oak - Red Oak Dry-Mesic Forest		Y	CEGL002068
		Eastern massasauga		P	ARADE03011
		Midwest Dry-Mesic Prairie		P	CEGL002214
	Mallard Roost Wetland Conservation Area		Final		
		Bulrush - Cattail - Burreed Shallow Marsh		P	CEGL002026
		Eastern massasauga		P	ARADE03011
		Midwest Mixed Emergent Deep Marsh		P	CEGL002229
	Manitou Islands State Nature Preserve		Final		
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
	Marsh Lake Complex		Final		
		Blanding' s Turtle		Y	ARAAD04010
		Central Tamarack - Red Maple Rich Swamp		Y	CEGL005232
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Duke' s skipper		Y	IILEP77050
		Eastern massasauga		Y	ARADE03011
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
		Spotted Turtle		Y	ARAAD02010
	Merry Lea Nature Preserve		Final		
		Leatherleaf Relict Bog		Y	CEGL005092
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
		Northern Buttonbush Swamp		Y	CEGL002190

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
	Mill Creek/Fish Creek Fens (La Porte)		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Mitchell' s satyr		Y	IILEPN3021
	Morgan County Snake		Provisional		
		Kirtland' s snake		Y	ARADB06010
	Morgan County Snake 2		Provisional		
		Kirtland' s snake		Y	ARADB06010
	Mounds State Park		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		White Oak - Red Oak Dry-Mesic Forest		Y	CEGL002068
	Newport Army Ammunition Plant Central		Final		
		Beech - Oak - Maple Mesic Floodplain Forest		Y	CEGL005014
		Indiana Bat		Y	AMACC01100
	Olin Lake		Final		
		Blanding' s Turtle		Y	ARAAD04010
	Pipewort Pond Nature Preserve		Final		
		Inland Coastal Plain Marsh		Y	CEGL005108
		Spotted Turtle		P	ARAAD02010
	Rainsville Bridge		Final		
		Midwest Dry-Mesic Prairie		Y	CEGL002214
		Sandstone Moist Bluff - Cliff		Y	CEGL002287
	Ropchan Wildlife Refuge		Final		
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
	Sedge Bluff		Final		
		Kitten Tails		P	PDSCR09030
	Shrader - Weaver Nature Preserve		Final		
		Beech - Maple Glaciated Forest		Y	CEGL005013
		Bog bluegrass		Y	PMPOA4Z1W0
	Spicer Lake Nature Preserve		Final		
		Northern Buttonbush Swamp		Y	CEGL002190
		Red Maple - Ash - (elm) Swamp Forest		Y	CEGL005038
	Spring Pond Nature Preserve		Final		
		Central Indiana Till Plain Flatwoods		Y	CEGL005173
	Spurgeon Nature Preserve		Final		
		Beech - Maple Glaciated Forest		Y	CEGL005013
		White Oak - Red Oak Dry-Mesic Forest		Y	CEGL002068
	Sugar Creek of the Blue		Provisional		
		headwater-mainstem into large river		Y	CEAS003006
		headwater-mainstem into large river		Y	CEAS003005
		headwaters into headwaters - mainstem		Y	CEAS003002

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		headwaters into headwaters - mainstem		Y	CEAS003001
		headwaters into medium river		Y	CEAS003007
		medium mainstem into large river		Y	CEAS003004
		Unique to EDU		Y	CEAS003003
		Purple lilliput		P	IMBIV43030
		Snuffbox		P	IMBIV16190
	Sugar River		Final		
		Alkaline Dry Bluff - Cliff		Y	CEGL002291
		Beech - Maple Glaciated Forest		Y	CEGL005013
		Beech - Oak - Maple Mesic Floodplain Forest		Y	CEGL005014
		Bog bluegrass		Y	PMPOA4Z1W0
		Central Green Ash - Elm - Hackberry Forest		Y	CEGL002014
		Eastern Hemlock - Beech Hardwood Forest		Y	CEGL005043
		Eastern Sand Darter		Y	AFCQC01060
		extra large mid to mainstem streams/rivers?		Y	CEAS006005
		Indiana Bat		Y	AMACC01100
		Longsolid		Y	IMBIV17120
		medium headwater to mainstem streams/rivers?		Y	CEAS006003
		medium interlobate headwater streams		Y	CEAS006002
		medium interlobate mid to mainstem streams/rivers?		Y	CEAS006004
		Salamander mussel		Y	IMBIV41010
		Sandstone Moist Bluff - Cliff		Y	CEGL002287
		Silver Maple - Elm - (Cottonwood) Forest		Y	CEGL002586
		Skunk Cabbage Seepage Meadow		Y	CEGL002385
		Small Eroding Cliffs		Y	CEGL002315
		small interlobate headwater streams		Y	CEAS006001
		White Oak - Red Oak Dry-Mesic Forest		Y	CEGL002068
	Swamp Angel		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Eastern massasauga		Y	ARADE03011
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
		Spotted Turtle		Y	ARAAD02010
	Tippecanoe River		Final		
		Blanding' s Turtle		Y	ARAAD04010
		Clubshell		Y	IMBIV35060
		Eastern Sand Darter		Y	AFCQC01060
		extra large mid to mainstem streams/rivers?		Y	CEAS006005
		Fanshell		Y	IMBIV10020
		Indiana Bat		Y	AMACC01100
		medium headwater to mainstem streams/rivers?		Y	CEAS006003
		medium interlobate headwater streams		Y	CEAS006002

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		medium interlobate mid to mainstem streams/rivers?		Y	CEAS006004
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
		Ohio Lamprey		Y	AFBAA01010
		Purple lilliput		Y	IMBIV43030
		Rabbitsfoot		Y	IMBIV39041
		Rayed Bean		Y	IMBIV47050
		Salamander mussel		Y	IMBIV41010
		Sheepnose		Y	IMBIV34030
		small interlobate headwater streams		Y	CEAS006001
		Spotted Darter		Y	AFCQC02420
		Tippecanoe Darter		Y	AFCQC02800
		Tussock Sedge Wet Meadow		Y	CEGL002258
		Twigrush Meadow Marsh		Y	CEGL005104
	Woodland Bog		Final		
		Red Maple - Ash - (elm) Swamp Forest		Y	CEGL005038
IN-MI					
	Big Swamp-Lake Anne		Final		
		Blanding' s Turtle		Y	ARAAD04010
		Bog bluegrass		Y	PMPOA4Z1W0
		Central Tamarack - Red Maple Rich Swamp		Y	CEGL005232
		Copperbelly Water Snake		P	ARADB22023
	Lime Lake Fen (Steuben)		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
	Pigeon River and Wetlands		Final		
		Black Oak / Lupine Barrens		Y	CEGL002492
		Blanding' s Turtle		Y	ARAAD04010
		Bog bluegrass		Y	PMPOA4Z1W0
		Central Tamarack - Red Maple Rich Swamp		Y	CEGL005232
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Eastern massasauga		Y	ARADE03011
		Indiana Bat		Y	AMACC01100
		Leatherleaf Relict Bog		Y	CEGL005092
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
		Mitchell' s satyr		Y	IILEPN3021
		Red Maple - Ash - (elm) Swamp Forest		Y	CEGL005038
		southern tributaries to St. Joseph River (Lake Michigan drainage)		Y	CEAS013004
		Spotted Turtle		Y	ARAAD02010
		Tussock Sedge Wet Meadow		Y	CEGL002258
		Willow Flycatcher		Y	ABPAE33040
		Ellipse		P	IMBIVA4010
		Greater redhorse		P	AFCJC10170

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		Inland Coastal Plain Marsh		P	CEGL005108
		Kitten Tails		P	PDSCR09030
		Red Maple - Ash - (elm) Swamp Forest		P	CEGL005038
		Twigrush Meadow Marsh		P	CEGL005104
IN-MI-OH					
	Upper St. Joseph River		Final		
		Blanding' s Turtle		Y	ARAAD04010
		Bulrush - Cattail - Burreed Shallow Marsh		Y	CEGL002026
		Clubshell		Y	IMBIV35060
		Copperbelly Water Snake		Y	ARADB22023
		headwater tributaries to Maumee River		Y	CEAS012001
		interlobate headwater streams (Maumee River drainage)		Y	CEAS012002
		medium-sized till plain mainstems-- local groundwater inputs present eastern Bluffton till plain headwater streams		Y	CEAS012005
		Northern Buttonbush Swamp		Y	CEGL002190
		St. Joseph River mainstem (Maumee drainage)		Y	CEAS012003
		Virginia mallow		Y	PDMAL100C0
		Blanding' s Turtle		P	ARAAD04010
		Central Green Ash - Elm - Hackberry Forest		P	CEGL002014
		Copperbelly Water Snake		P	ARADB22023
		Indiana Bat		P	AMACC01100
		Pugnose shiner		P	AFCJB28080
IN-OH					
	Fish Creek		Final		
		Clubshell		Y	IMBIV35060
		Salamander mussel		Y	IMBIV41010
		White Catspaw		Y	IMBIV16112
	Mainstem Upper Wabash		Final		
		Alkaline Moist Bluff - Cliff		Y	CEGL002292
		Eastern massasauga		Y	ARADE03011
		Fanshell		Y	IMBIV10020
		Forked aster		Y	PDAST0T170
		Glade Mallow		Y	PDMAL0X010
		Kirtland' s snake		Y	ARADB06010
		large headwater to mainstem streams/rivers?		Y	CEAS004005
		large mainstem rivers		Y	CEAS004006
		large mid to mainstem streams/rivers?		Y	CEAS004007
		medium interlobate headwater to mainstem streams		Y	CEAS004004
		medium mid to mainstem streams/rivers?		Y	CEAS004003
		small headwater to mainstem streams		Y	CEAS004001
		small headwater to mainstem streams		Y	CEAS004002

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		Spotted Turtle		Y	ARAAD02010
MI					
	Baker Sanctuary		Final		
		Blanchard' s Cricket Frog		Y	AAABC01011
		Copperbelly Water Snake		Y	ARADB22023
		Waterfowl Stopover		Y	OBIRDSTOP4
	Bakertown Fen		Final		
		Blazing Star Stem Borer		Y	IILEYC0450
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
	Barry Wetlands		Final		
		Angular Spittlebug		Y	IIHOM09020
		Blanchard' s Cricket Frog		Y	AAABC01011
		Eastern massasauga		Y	ARADE03011
		Inland Coastal Plain Marsh		Y	CEGL005108
		Kitten Tails		Y	PDSCR09030
		Laricis Tree Cricket		Y	IIORT19010
		Mitchell' s satyr		Y	IILEPN3021
		Spotted Turtle		Y	ARAAD02010
		Willow Flycatcher		Y	ABPAE33040
		Bur Oak - White Oak Openings		P	CEGL005121
		Central Wet-Mesic Tallgrass Prairie		P	CEGL002024
		Spotted Turtle		P	ARAAD02010
		Watercress Snail		P	IMGASG5040
	Cass County Forests		Provisional		
		Highbush Blueberry Bog		Y	CEGL005085
		Tussock Sedge Wet Meadow		Y	CEGL002258
		White Oak - Red Oak / Early Meadow-Rue Forest		Y	CEGL005016
		Black Oak - White Oak - Hickory Forest		P	CEGL002076
		Blanchard' s Cricket Frog		P	AAABC01011
		Central Tamarack - Red Maple Rich Swamp		P	CEGL005232
		White Cedar - Black Ash Swamp		P	CEGL005165
		White Oak - Red Oak / Early Meadow-Rue Forest		P	CEGL005016
	Cook Lake-Rudy Road Fens		Final		
		Mitchell' s satyr		Y	IILEPN3021
	Dayton Wet Prairie		Provisional		
		Eastern massasauga		Y	ARADE03011
		Cinquefoil - Sedge Prairie Fen		P	CEGL005139
		Spotted Turtle		P	ARAAD02010
	Dowagiac Woods		Provisional		
		Bog bluegrass		Y	PMPOA4Z1W0
	Flat River Barrens		Final		

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		Karner Blue		Y	IILEPG5021
		White Oak - Red Oak / Early Meadow-Rue Forest		Y	CEGL005016
		Midwest Mixed Emergent Deep Marsh		P	CEGL002229
	Fort Custer		Final		
		Blanchard' s Cricket Frog		Y	AAABC01011
		Blanding' s Turtle		Y	ARAAD04010
		Central Mesic Tallgrass Prairie		Y	CEGL002203
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Eastern massasauga		Y	ARADE03011
		large, deep, stream-connected lakes		Y	CEAL013010
		Red Maple - Ash - (elm) Swamp Forest		Y	CEGL005038
		Silver Maple - Elm - (Cottonwood) Forest		Y	CEGL002586
		White Oak - Red Oak / Early Meadow-Rue Forest		Y	CEGL005016
		White Oak - Red Oak Dry-Mesic Forest		Y	CEGL002068
		Indiana Bat		P	AMACC01100
		Pugnose shiner		P	AFCJB28080
		Spotted Turtle		P	ARAAD02010
		Watercress Snail		P	IMGASG5040
	Gidding' s Lake Bog		Final		
		Highbush Blueberry Bog		Y	CEGL005085
	Gourdneck		Final		
		Blanchard' s Cricket Frog		Y	AAABC01011
		Kirtland' s snake		Y	ARADB06010
		Eastern massasauga		P	ARADE03011
	Grand River Corridor		Final		
		Greater redhorse		P	AFCJC10170
		Indiana Bat		P	AMACC01100
	Holly Fen		Final		
		A Leafhopper		Y	IIHOM03030
		Blazing Star Stem Borer		P	IILEYC0450
		Powesheik Skipperling		P	IILEP57010
	Huron River Headwater Lakes		Final		
		Black Spruce / Alder Rich Swamp		Y	CEGL002452
		Blazing Star Stem Borer		Y	IILEYC0450
		cisco lakes		Y	CEAL020007
		Eastern massasauga		Y	ARADE03011
		interlobate headwater streams (Lake Erie drainage)		Y	CEAS020002
		kettle moraine lakes		Y	CEAL020004
		Leatherleaf Bog		Y	CEGL002498
		marl lakes		Y	CEAL020005
		Central Wet-Mesic Tallgrass Prairie		P	CEGL002024

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
	Kalamazoo River Headwaters		Final		
		interlobate headwater streams (Lake Michigan drainage)		Y	CEAS013005
		kettle moraine lakes		Y	CEAL013009
		large rivers in southwest Michigan till plains (not coastal reach)		Y	CEAS013001
		Leatherleaf Bog		Y	CEGL002498
		tributary streams in medium textured moraines (southern Iona moraines)		Y	CEAS013007
		Central Cordgrass Wet Prairie		P	CEGL002224
		Mitchell' s satyr		P	IILEPN3021
	Knickerbocker Lake		Final		
		Inland Coastal Plain Marsh		Y	CEGL005108
		Reticulated Nutrush		Y	PMCYP0R0K0
	Lake Diane		Final		
		Copperbelly Water Snake		Y	ARADB22023
	Liberty Fen		Final		
		Angular Spittlebug		Y	IIHOM09020
		Blazing Star Stem Borer		Y	IILEYC0450
		Bog bluegrass		Y	PMPOA4Z1W0
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Laricis Tree Cricket		Y	IIORT19010
		Mitchell' s satyr		Y	IILEPN3021
		Powesheik Skipperling		Y	IILEP57010
	Lime Lake (Van Buren County)		Final		
		Mitchell' s satyr		Y	IILEPN3021
	Mainstem Grand River		Final		
		Black Oak / Lupine Barrens		Y	CEGL002492
		large rivers in southwest Michigan till plains (not coastal reach)		Y	CEAS013001
		Red Oak-Sugar Maple-Elm Forest		Y	CEGL005017
		White Pine - White Oak Barrens		Y	CEGL005127
		Central Cordgrass Wet Prairie		P	CEGL002224
		Greater redhorse		P	AFCJC10170
	Maple River (Tillplain)		Final		
		Inland Saline Marsh		Y	CEGL005111
		medium-sized, lowland rivers with extensive riparian wetlands		Y	CEAS013006
		Waterfowl Stopover		Y	OBIRDSTOP4
	Mill Creek Wetlands (St. Joseph)		Final		
		Blanding' s Turtle		Y	ARAAD04010
		Copperbelly Water Snake		Y	ARADB22023
		Eastern massasauga		Y	ARADE03011
		Indiana Bat		Y	AMACC01100

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		Mitchell' s satyr		Y	IILEPN3021
		Spotted Turtle		Y	ARAAD02010
	Paw Paw Lake-Lawton Prairie		Final		
		Black Oak / Lupine Barrens		Y	CEGL002492
		Mitchell' s satyr		Y	IILEPN3021
		Cinquefoil - Sedge Prairie Fen		P	CEGL005139
	Pinckney-Waterloo		Final		
		Black Oak - White Oak - Hickory Forest		Y	CEGL002076
		Black Oak / Lupine Barrens		Y	CEGL002492
		Black Spruce / Alder Rich Swamp		Y	CEGL002452
		Blanding' s Turtle		Y	ARAAD04010
		Bog bluegrass		Y	PMPOA4Z1W0
		Central Wet-Mesic Tallgrass Prairie		Y	CEGL002024
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Eastern massasauga		Y	ARADE03011
		Laricis Tree Cricket		Y	IIORT19010
		Leatherleaf Bog		Y	CEGL002498
		Mesic Sand Tallgrass Prairie		Y	CEGL005096
		Powesheik Skipperling		Y	IILEP57010
		Tussock Sedge Wet Meadow		Y	CEGL002258
		Waterfowl Stopover		Y	OBIRDSTOP4
		White Oak - Red Oak / Early Meadow-Rue Forest		Y	CEGL005016
		Willow Flycatcher		Y	ABPAE33040
		Black Spruce / Alder Rich Swamp		P	CEGL002452
		Blanchard' s Cricket Frog		P	AAABC01011
		Blanding' s Turtle		P	ARAAD04010
		Blazing Star Stem Borer		P	IILEYC0450
		Central Mesic Tallgrass Prairie		P	CEGL002203
		Central Tamarack Poor Fen		P	CEGL002472
		Cinquefoil - Sedge Prairie Fen		P	CEGL005139
		Eastern massasauga		P	ARADE03011
		Eastern Prairie White-fringed Orchid		P	PMORC1Y0F0
		Inland Coastal Plain Marsh		P	CEGL005108
		Spotted Turtle		P	ARAAD02010
	River Raisin Headwaters		Final		
		Angular Spittlebug		Y	IIHOM09020
		Beech - Maple Glaciated Forest		Y	CEGL005013
		Blanchard' s Cricket Frog		Y	AAABC01011
		Central Green Ash - Elm - Hackberry Forest		Y	CEGL002014
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Eastern massasauga		Y	ARADE03011
		Indiana Bat		Y	AMACC01100

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		interlobate headwater streams (Lake Erie drainage)		Y	CEAS020002
		kettle moraine lakes		Y	CEAL020004
		Kitten Tails		Y	PDSCR09030
		Powesheik Skipperling		Y	IILEP57010
		Silver Maple - Elm - (Cottonwood) Forest		Y	CEGL002586
		Spotted Turtle		Y	ARAAD02010
		Indiana Bat		P	AMACC01100
	Rogue River		Final		
		small to medium-sized tributary streams in end moraine and outwash		Y	CEAS013002
		White Oak - Red Oak / Early Meadow-Rue Forest		Y	CEGL005016
		Kitten Tails		P	PDSCR09030
	Rose Lake		Final		
		Blanding' s Turtle		Y	ARAAD04010
		Eastern massasauga		P	ARADE03011
	Russ Forest		Provisional		
		Beech - Maple Glaciated Forest		Y	CEGL005013
		Quiet Underwing		Y	IILEY89A40
	Saul Lake Bog		Final		
		Leatherleaf Bog		Y	CEGL002498
	Shiawassee River and Shiawassee Flats		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Eastern massasauga		Y	ARADE03011
		Indiana Bat		Y	AMACC01100
		interlobate headwater streams (Saginaw Bay drainage)		Y	CEAS014001
		kettle moraine lakes stream- and wetland-connected headwater and in-line lakes;		Y	CEAL014002
		Laricis Tree Cricket		Y	IIORT19010
		Powesheik Skipperling		Y	IILEP57010
		Tussock Sedge Wet Meadow		Y	CEGL002258
		Black Spruce / Alder Rich Swamp		P	CEGL002452
		Blanchard' s Cricket Frog		P	AAABC01011
		Central Wet-Mesic Tallgrass Prairie		P	CEGL002024
		Leatherleaf Bog		P	CEGL002498
	Skiff Lake		Provisional		
		Kitten Tails		Y	PDSCR09030
	Spring Brook-Kalamazoo Nature Center		Final		
		Mitchell' s satyr		Y	IILEPN3021
		small to medium-sized tributary streams in outwash and ice contact		Y	CEAS013003
		Eastern massasauga		P	ARADE03011
		Spotted Turtle		P	ARAAD02010

State	Site Name Common Name	Site Portfolio Status*	Target Status*	GELCODE
	St. Joseph River (Calhoun)	Final		
	Indiana Bat		P	AMACC01100
	Stony Creek	Final		
	Inland Coastal Plain Marsh		Y	CEGL005108
	Lake Sedge Wet Meadow		Y	CEGL002256
	Red Maple - Ash - (elm) Swamp Forest		Y	CEGL005038
	White Oak - Red Oak / Early Meadow-Rue Forest		Y	CEGL005016
	White Oak - Red Oak / Early Meadow-Rue Forest		Y	CEGL005016
	Beech - Maple Glaciated Forest		P	CEGL005013
	Central Tamarack Poor Fen		P	CEGL002472
	Red Maple - Ash - Birch Swamp Forest		P	CEGL002071
	White Cedar - Black Ash Swamp		P	CEGL005165
	White Pine - Red Oak Forest		P	CEGL002480
	Tamarack Swamp	Final		
	Mitchell' s satyr		Y	IILEPN3021
	Thompson Lake	Final		
	Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
	cisco lakes		Y	CEAL013011
	Mitchell' s satyr		Y	IILEPN3021
	southern tributaries to St. Joseph River (Lake Michigan drainage)		Y	CEAS013004
	Eastern Prairie White-fringed Orchid		P	PMORC1Y0F0
	Kitten Tails		P	PDSCR09030
	Union Lake-Blossom Road Swamp	Provisional		
	Central Green Ash - Elm - Hackberry Forest		Y	CEGL002014
	Copperbelly Water Snake		P	ARADB22023
	Upper Clinton River	Final		
	Bluejoint Eastern Marsh		Y	CEGL005174
	Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
	Eastern massasauga		Y	ARADE03011
	Laricis Tree Cricket		Y	IIORT19010
	Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
	Red Oak-Sugar Maple-Elm Forest		Y	CEGL005017
	White Cedar - Black Ash Swamp		Y	CEGL005165
	Central Tamarack Poor Fen		P	CEGL002472
	Purple lilliput		P	IMBIV43030
	Rayed Bean		P	IMBIV47050
	Snuffbox		P	IMBIV16190
	Upper Huron River	Final		
	Central Tamarack - Red Maple Rich Swamp		Y	CEGL005232
	Eastern massasauga		Y	ARADE03011
	Red Maple - Ash - Birch Swamp Forest		Y	CEGL002071

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		Red Oak-Sugar Maple-Elm Forest		Y	CEGL005017
		Twigrush Meadow Marsh		Y	CEGL005104
		White Cedar - Black Ash Swamp		Y	CEGL005165
		White Oak - Red Oak Dry-Mesic Forest		Y	CEGL002068
		Black Oak - White Oak - Hickory Forest		P	CEGL002076
		Copperbelly Water Snake		P	ARADB22023
		Mesic Sand Tallgrass Prairie		P	CEGL005096
	Vermontville/Thornapple		Provisional		
		Indiana Bat		Y	AMACC01100
	Wolf Lake		Final		
		Eastern massasauga		P	ARADE03011
	Zeigenfuss Lake/Greenville		Final		
		White Pine - White Oak Forest		Y	CEGL002481
		Eastern massasauga		P	ARADE03011
		White Cedar - Black Ash Swamp		P	CEGL005165
OH					
	Beavercreek Wetlands		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
	Blanchard River		Final		
		headwater tributaries to Maumee River		Y	CEAS012001
		Purple lilliput		P	IMBIV43030
	Brown County Flatwoods		Provisional		
		Beech - Oak - Red Maple Flatwoods		Y	CEGL005015
	Caldwell Woods		Final		
		Sugar Maple - Chinquapin Oak Forest		Y	CEGL005010
	Clermont County Flatwoods 2		Provisional		
		Beech - Oak - Red Maple Flatwoods		Y	CEGL005015
	Crabill Fen		Provisional		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
	Darby Creek		Final		
		Central Mesic Tallgrass Prairie		Y	CEGL002203
		medium headwater to mainstem streams		Y	CEAS001004
		medium headwater to mainstem streams		Y	CEAS001003
		Royal Catchfly		Y	PDCAR0U1G0
		Tall Larkspur		Y	PDRAN0B0J0
		Drooping Bluegrass		P	PMPOA4Z1C0
		Snuffbox		P	IMBIV16190
	Dean Culbertson Woods		Final		
		Beech - Oak - Red Maple Flatwoods		Y	CEGL005015
	Dietrich Woods		Final		
		Sugar Maple - Chinquapin Oak Forest		Y	CEGL005010

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		White Oak - Red Oak Dry-Mesic Forest		Y	CEGL002068
	East Fork Lake		Final		
		Red-headed Woodpecker		Y	ABNYF04040
		Prairie Warbler		P	ABPBX03190
	East Fork Little Miami River		Final		
		Beech - Oak - Red Maple Flatwoods		Y	CEGL005015
		headwater streams		Y	CEAS002001
		medium headwater streams		Y	CEAS002006
		small headwater streams		Y	CEAS002005
		small headwater streams		Y	CEAS002004
	Fort Hill Woods		Final		
		Canby' s Mountain-lover		Y	PDCEL0A010
	Gahanna Woods		Provisional		
		Beech - Maple Glaciated Forest		Y	CEGL005013
		Cypress-knee Sedge		Y	PMCYP033K0
	Great Seal Woods		Final		
		Sugar Maple - Chinquapin Oak Forest		Y	CEGL005010
	Hoge Woods		Provisional		
		Sugar Maple - Chinquapin Oak Forest		Y	CEGL005010
	Huron River		Final		
		Black Oak - White Oak - Hickory Forest		Y	CEGL002076
		eastern Maumee lake plain coastal mainstems		Y	CEAS012009
	Killdeer Plains		Final		
		Blazing Star Stem Borer		Y	IILEYC0450
		Central Cordgrass Wet Prairie		Y	CEGL002224
		Central Mesic Tallgrass Prairie		Y	CEGL002203
		Dickcissel		Y	ABPBX65010
		Grasshopper Sparrow		Y	ABPBXA0020
		Kirtland' s snake		Y	ARADB06010
		Red-headed Woodpecker		Y	ABNYF04040
		Massasauga		P	ARADE03010
	Little Miami River Mainstem		Final		
		Appalachian Bluff White Cedar Woodland		Y	CEGL002596
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		extra large mid to mainstem rivers?		Y	CEAS002014
		Kirtland' s snake		Y	ARADB06010
		Purple lilliput		Y	IMBIV43030
		Silver Maple - Elm - (Cottonwood) Forest		Y	CEGL002586
		Sugar Maple - Chinquapin Oak Forest		Y	CEGL005010
		Massasauga		P	ARADE03010
		Rayed Bean		P	IMBIV47050

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
	Lower Vermillion River		Final		
		small, coastal streams on Maumee lake plain		Y	CEAS012006
		Beech - Maple Glaciated Forest		P	CEGL005013
	Macochee Creek/Mad River Headwaters		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		interlobate headwater streams		Y	CEAS002003
	Mad River Plains		Final		
		Beech - Maple Glaciated Forest		Y	CEGL005013
		Bulrush - Cattail - Burreed Shallow Marsh		Y	CEGL002026
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		Eastern Prairie White-fringed Orchid		Y	PMORC1Y0F0
		Spotted Turtle		Y	ARAAD02010
		Willow Flycatcher		Y	ABPAE33040
		Kirtland' s snake		P	ARADB06010
		Massasauga		P	ARADE03010
		Spotted Turtle		P	ARAAD02010
	Middle Scioto River		Final		
		Cinquefoil - Sedge Prairie Fen		Y	CEGL005139
		large mainstem rivers		Y	CEAS001008
		large mid to mainstem streams/rivers?		Y	CEAS001006
		Spotted Turtle		P	ARAAD02010
	Old Woman Creek		Final		
		small, coastal streams on Maumee lake plain		Y	CEAS012006
	Paint Creek		Final		
		large mid to mainstem streams/rivers?		Y	CEAS001007
		Frost Cave Isopod		P	ICMAL01340
	Pott' s Post Oak Woods		Final		
		Post Oak Chert Barrens		Y	CEGL005134
	Richardson Forest		Provisional		
		Bulrush - Cattail - Burreed Shallow Marsh		Y	CEGL002026
	Sandusky River		Final		
		Beech - Maple Glaciated Forest		Y	CEGL005013
		Central Cordgrass Wet Prairie		Y	CEGL002224
		Great Lakes Swamp White Oak-Pin Oak Flatwoods		Y	CEGL005037
		Land Bird Stopover		Y	OBIRDSTOP1
		Raptor Stopover		Y	OBIRDSTOP2
		Red-headed Woodpecker		Y	ABNYF04040
		Sandusky River headwater streams		Y	CEAS012004
		Wood Thrush		Y	ABPBJ19010
	Shallenberger Woods		Provisional		
		Appalachian Oak - (chestnut) Forest		Y	CEGL005023

State	Site Name	Common Name	Site Portfolio Status*	Target Status*	GELCODE
		White Oak - Chestnut Oak - Maple Acid Forest		Y	CEGL002059
	Spring Valley Fens/Caesar Creek		Final		
		Kirtland' s snake		Y	ARADB06010
		Prothonotary Warbler		Y	ABPBX07010
		Willow Flycatcher		Y	ABPAE33040
	Springville Marsh		Provisional		
		Spotted Turtle		P	ARAAD02010
	St. Mary' s River Wetlands		Final		
		Beech - Oak - Maple Mesic Floodplain Forest		Y	CEGL005014
		Bulrush - Cattail - Burreed Shallow Marsh		Y	CEGL002026
		Great Lakes Swamp White Oak-Pin Oak Flatwoods		Y	CEGL005037
		Midwest Mixed Emergent Deep Marsh		Y	CEGL002229
		Northern Buttonbush Swamp		Y	CEGL002190
	Stillwater River		Final		
		medium headwater streams		Y	CEAS002006
		small headwater streams		Y	CEAS002004
		Rayed Bean		P	IMBIV47050
	Stonelick Lake		Provisional		
		Beech - Oak - Red Maple Flatwoods		Y	CEGL005015
	Twin Creek		Final		
		Beech - Maple Glaciated Forest		Y	CEGL005013
		headwater streams		Y	CEAS002002
		Indiana Bat		Y	AMACC01100
		medium headwater streams		Y	CEAS002006
		Silver Maple - Elm - (Cottonwood) Forest		Y	CEGL002586
	Upper Auglaize River		Final		
		headwater tributaries to Maumee River		Y	CEAS012001
		medium-sized till plain mainstems-- local groundwater inputs present eastern Bluffton till plain headwater streams		Y	CEAS012005

*Y = recommended with "no regrets"; P = recommended "provisionally"

Appendix I. Preparation of Data for the Action Sites Excel Workbook

The Microsoft Excel "Action Sites" workbook incorporates the new Geography Of Hope criteria for selecting TNC action sites. These criteria are: complementarity, conservation value, threat, feasibility and leverage. The worksheet was used twice in selecting Action Sites, once for the May, 2000 version of the plan and again, with newer information, for the 2003 version of the plan. Though preparation of data differed slightly for sites in different states, the workbood was used to rank the entire set of sites to come up with the subset of "Action Sites 2". Some results from the initial process were used as data in the 2003 analysis, hence the methods for the 2000 selection process are listed below. New element occurrence information was incorporated into the calculation of the conservation value criteria (biodiversity health and number/diversity of targets), and complementarity was reassessed for Michigan sites based on additional consideration of aquatic system targets. For all sites, evaluation of feasibility and urgency were drawn from the site assessments (described in Chapter 4).

The ratings of conservation value (a composite of "number/diversity of targets" and "biodiversity health") for Indiana and Illinois sites followed this procedure:

Number/Diversity of Targets

Create a lookup table that matches each NCT SITECODE with the ELCODEs of the conservation drivers at that site. This table will have one record for each site/element combination.
Create a summary table (each site is a record) in ACCESS to hold the results of the calculations that follow.
Assign each target to a spatial scale following the categories in Poiani & Richter. Regional scale species are categorized at the level they will be conserved at the site (e.g. a neotropical migrant that breeds in small, isolated wetlands would get categorized as a small scale species).
Run a cross-tabulation of ELCODEs by site by spatial scale to determine which sites support targets at coarse, intermediate, and small scales. The sites that do get a "1" in the scales column of the summary table.
This table also provides the number of drivers at the site. Determine the 80th percentile number of targets at a site. Those sites with at least this many targets support a large number of targets and get a "1" in the "large number" column of the summary table. (Note, since the number of site drivers at each site is small, using the 75th percentile would have included all sites with at least 2 targets in the list of sites with a large number of targets. A more restrictive criterion would have allowed very few sites to make it into this group.)
Assign each target (species and community) to the aquatic or terrestrial realm. Categorize organisms (e.g. dragonflies) that cross this line based on where they spend most of their lives.
Run a cross-tabulation of ELCODEs by site by aquatic/terrestrial to determine which sites support targets in both realms. Sites that do get a "1" in aquatic/terrestrial column.
Sum the values in the scales, large number, and aquatic/terrestrial column and store this value in the "Diversity" column of the summary table.
Sites with a Diversity value of 3 get a "High" in the Excel tool, those with a 2 get a Medium, and the rest get a Low. Note that most of the sites (ca. 240 of 310) got a total score of zero, they are denoted by LOW (all caps) in this field.

Biodiversity Health

Create a new field (Rounded EORANK) in EOALL.
Copy EO Ranks of A, B, C, D, or X to the new field
Round EO Ranks that include ranges or qualifiers "up" to create a single digit rank (e.g. "AB" becomes A, "B?" becomes B)
Translate numeric ranks from Ohio directly: 1 -> A, 2 -> B, 3 -> C, and 4 -> D.
Assign a Rounded EORANK of B to all aquatic community targets.

Convert EO Ranks that are missing or lower than D (e.g. Extant, Failed to find, Historic, eXtirpated) to C if the occurrence was selected for the portfolio by the experts.
Convert EO Ranks that are missing or lower than D (other than X) to D if the occurrence was NOT selected for the portfolio by the experts.
Run a cross-tabulation on the Rounded EORANK field to get a count of the occurrences of each rank at each site. Include ALL EOs (drivers and non-drivers) at each potential portfolio site.
Use the methods from the Measures of Success workbook to calculate an average viability score for each site: (#A *4.0 + #B*3.5 + #C*2.5 + #D*1 + #X*0)/# EOs
Convert this to a Biodiversity Health Score using the following ranges (also taken from the measures of Success workbook): High >= 3.75; Medium = 3.0 to 3.74 =; Low <3.0
Copy the Biodiversity Health Score to the Excel tool.

In Ohio, complementarity for each site was provided by the first draft of the North Central Tillplain Ecoregional Plan. Number/diversity of targets was determined for each site by determining the number of different target EOs in each site, ranking the sites by number of EOs, and creating thresholds for High, Medium and Low based on natural breaks in the distribution of data. Biodiversity health was determined for each terrestrial site by examining the data provided by the viability filters (see above) and creating conditions for High, Medium and Low ranking. Any site with provisional viability automatically received a biodiversity health score of "Low." Sites that passed all the viability filters were assigned a biodiversity score of "High." Sites that were provisional based on the landscape context filter but were viable for the size filter were assigned a biodiversity health score of Medium. For aquatic sites, biodiversity health was determined by averaging aquatic use attainment scores determined by Ohio EPA for relevant HUC 11 watersheds for each site. Thresholds for scores of High, Medium and Low were assigned based on natural breaks in the distribution of the data. Degree of threat was determined by using the Ohio EPA attainment scores, landscape context variables and expert opinion in a qualitative manner. For example, sites within a largely urbanized or agricultural landscape were given higher threat scores. Sites with compromised water quality or areas of rapid urban growth were given higher threat scores. The feasibility score was based on expert opinion, including knowledge of partners and watershed coordinators working in each area.

Methods used to prepare data for the Action Sites Excel Workbook in the 2000 version of this plan

Biological Value[2]

Number/Diversity of Targets

Create a lookup table that matches each NCT SITECODE with the ELCODEs of the conservation drivers at that site. This table will have one record for each site/element combination.
Create a summary table (each site is a record) in ACCESS to hold the results of the calculations that follow.
Assign each target to a spatial scale following the categories in Poiani & Richter. Regional scale species are categorized at the level they will be conserved at the site (e.g. a neotropical migrant that breeds in small, isolated wetlands would get categorized as a small scale species).

[2] Note that some portfolio sites were nested within others, and that EOs that were contained in more than one site had to be counted in each site for this selection process. Hence, each crosstabulation used to prepare data for the Biological Value criterion was run twice, once for BIGSITE (the encompassing sites) and once for NCT_SITE (the smaller, nested sites). The results of the former analysis were printed and entered by hand (as needed) in the output table of the latter crosstabulation before further analysis.

Run a cross-tabulation of ELCODEs by site by spatial scale to determine which sites support targets at coarse, intermediate, and small scales. The sites that do get a "1" in the scales column of the summary table.
This table also provides the number of drivers at the site. Determine the 80th percentile number of targets at a site. Those sites with at least this many targets support a large number of targets and get a "1" in the "large number" column of the summary table. (Note, since the number of site drivers at each site is small, using the 75th percentile would have included all sites with at least 2 targets in the list of sites with a large number of targets. A more restrictive criterion would have allowed very few sites to make it into this group.)
Assign each target (species and community) to the aquatic or terrestrial realm. Categorize organisms (e.g. dragonflies) that cross this line based on where they spend most of their lives.
Run a cross-tabulation of ELCODEs by site by aquatic/terrestrial to determine which sites support targets in both realms. Sites that do get a "1" in aquatic/terrestrial column.
Sum the values in the scales, large number, and aquatic/terrestrial column and store this value in the "Diversity" column of the summary table.
Sites with a Diversity value of 3 get a "High" in the Excel tool, those with a 2 get a Medium, and the rest get a Low. Note that most of the sites (ca. 240 of 310) got a total score of zero, they are denoted by LOW (all caps) in this field.

Biodiversity Health

Create a new field (Rounded EORANK) in EOALL.
Copy EO Ranks of A, B, C, D, or X to the new field
Round EO Ranks that include ranges or qualifiers "up" to create a single digit rank (e.g. "AB" becomes A, "B?" becomes B)
Translate numeric ranks from Ohio directly: 1 -> A, 2 -> B, 3 -> C, and 4 -> D.
Assign a Rounded EORANK of B to all aquatic community targets.
Convert EO Ranks that are missing or lower than D (e.g. Extant, Failed to find, Historic, eXtirpated) to C if the occurrence was selected for the portfolio by the experts.
Convert EO Ranks that are missing or lower than D (other than X) to D if the occurrence was NOT selected for the portfolio by the experts.
Run a cross-tabulation on the Rounded EORANK field to get a count of the occurrences of each rank at each site. Include ALL EOs (drivers and non-drivers) at each potential portfolio site.
Use the methods from the Measures of Success workbook to calculate an average viability score for each site: (#A *4.0 + #B*3.5 + #C*2.5 + #D*1 + #X*0)/# EOs
Convert this to a Biodiversity Health Score using the following ranges (also taken from the measures of Success workbook): High >= 3.75; Medium = 3.0 to 3.74 =; Low <3.0
Copy the Biodiversity Health Score to the Excel tool.

Appendix J. Targets With Unmet Goals in the North Central Tillplain

Taxonomic Group	GNAME	GCOMNAME	Goal	Viable EOs
Birds				
	Ammodramus henslowii	Henslow' s sparrow	10	2
	Ammodramus savannarum	Grasshopper Sparrow	10	2
	Dendroica discolor	Prairie Warbler	10	2
	Empidonax traillii	Willow Flycatcher	10	6
	Hylocichla mustelina	Wood Thrush	10	2
	Melanerpes erythrocephalus	Red-headed Woodpecker	10	3
	Protonotaria citrea	Prothonotary Warbler	10	3
	Spiza americana	Dickcissel	10	2
Crustaceans				
	Caecidotea rotunda	Frost Cave Isopod	10	1
Fish				
	Acipenser fulvescens	Lake sturgeon	10	1
	Ammocrypta pellucida	Eastern Sand Darter	10	7
	Etheostoma maculatum	Spotted Darter	10	1
	Etheostoma tippecanoe	Tippecanoe Darter	10	3
	Ichthyomyzon bdellium	Ohio Lamprey	10	2
	Moxostoma valenciennesi	Greater redhorse	10	5
	Notropis anogenus	Pugnose shiner	10	3
Insects				
	Catocala dulciola	Quiet Underwing	5	1
	Euphyes dukesi	Duke' s skipper	5	1

Taxonomic Group	GNAME	GCOMNAME	Goal	Viable EOs
	Hemileuca sp 3	Midwestern Fen Buckmoth	10	4
	Lepyronia angulifera	Angular Spittlebug	5	4
	Lycaeides melissa samuelis	Karner Blue	10	8
	Oecanthus laricis	Laricis Tree Cricket	10	9
	Papaipema silphii	Silphium borer moth	10	4
	Pygarctia spraguei	Sprague' s pygarctic	10	1
Mollusks				
	Cyprogenia stegaria	Fanshell	10	2
	Epioblasma obliquata perobliqua	White Catspaw	10	1
	Fontigens nickliniana	Watercress Snail	10	5
	Fusconaia subrotunda	Longsolid	10	1
	Obovaria retusa	Ring Pink	10	1
	Plethobasus cyphyus	Sheepnose	10	8
	Quadrula cylindrica	Rabbitsfoot	10	2
	Quadrula cylindrica cylindrica	Rabbitsfoot	10	7
	Simpsonaias ambigua	Salamander mussel	10	5
	Venustaconcha ellipsiformis	Ellipse	10	3
	Villosa fabalis	Rayed Bean	10	9
Reptiles				
	Sistrurus catenatus	Massasauga	10	8
Terrestrial Communities				
	Acer (rubrum, saccharinum) - Fraxinus spp. - Ulmus americana Forest	Red Maple - Ash - (elm) Swamp Forest	10	8
	Acer rubrum - Fraxinus spp. - Betula papyrifera / Cornus canadensis Forest	Red Maple - Ash - Birch Swamp Forest	10	3
	Acer saccharum - Tilia americana / Ostrya virginiana - Carpinus	North-Central Maple - Basswood Forest	10	1

Taxonomic Group	GNAME	GCOMNAME	Goal	Viable EOs
	caroliniana Forest			
	Alkaline Dry Bluff - Cliff Sparse Vegetation	Alkaline Dry Bluff - Cliff	10	3
	Alkaline Moist Bluff - Cliff Sparse Vegetation	Alkaline Moist Bluff - Cliff	10	3
	Andropogon gerardii - Calamagrostis canadensis - Helianthus grosseserratus Herbaceous Vegetation	Central Wet-Mesic Tallgrass Prairie	10	5
	Andropogon gerardii - Sorghastrum nutans - (Sporobolus heterolepis) - Liatris spp. - Ratibida pinnata Herbaceous Vegetation	Central Mesic Tallgrass Prairie	10	9
	Andropogon gerardii - Sorghastrum nutans - Schizachyrium scoparium - Aletris farinosa Herbaceous Vegetation	Mesic Sand Tallgrass Prairie	10	2
	Calamagrostis canadensis Eastern Herbaceous Vegetation [Provisional]	Bluejoint Eastern Marsh	10	1
	Carex lacustris Herbaceous Vegetation	Lake Sedge Wet Meadow	10	1
	Carex spp. - Cladium mariscoides - Rhynchospora capillacea - Tofieldia glutinosa Herbaceous Vegetation	Midwest Calcareous Seep	10	1
	Carex stricta - Carex spp. Herbaceous Vegetation	Tussock Sedge Wet Meadow	10	8
	Chamaedaphne calyculata Relict Bog Dwarf-shrubland	Leatherleaf Relict Bog	5	4
	Cladium mariscoides - (Carex lasiocarpa, Hypericum kalmianum, Solidago riddellii, Eleocharis elliptica) Herbaceous Vegetation	Twigrush Meadow Marsh	10	4
	Cornus amomum - Salix spp. - Rhus vernix - Rhamnus lanceolata Fen Shrubland	Dogwood - Willow - Poison Sumac Shrub Fen	10	3
	Eroding Cliffs Sparse Vegetation	Small Eroding Cliffs	10	2
	Fagus grandifolia - Acer saccharum - Quercus bicolor - Acer rubrum Flatwoods Forest	Central Indiana Till Plain Flatwoods	10	5
	Fagus grandifolia - Quercus alba - (Quercus michauxii) - Acer rubrum Flatwoods Forest	Beech - Oak - Red Maple Flatwoods	10	6
	Larix laricina - Acer rubrum / (Rhamnus alnifolia, Vaccinium corymbosum) Forest	Central Tamarack - Red Maple Rich Swamp	10	9
	Larix laricina / Alnus incana Forest	Tamarack Minerotrophic Swamp	10	1
	Larix laricina / Aronia melanocarpa / Sphagnum spp. Forest	Central Tamarack Poor Fen	10	5
	Nuphar lutea ssp. advena - Nymphaea odorata Herbaceous Vegetation	Central Water Lily Aquatic Wetland	10	3
	Picea mariana / Alnus incana / Sphagnum spp. Forest	Black Spruce / Alder Rich Swamp	10	5
	Pinus strobus - (Pinus resinosa) - Quercus rubra Forest	White Pine - Red Oak Forest	10	1
	Pinus strobus - Quercus alba - (Quercus ellipsoidalis) / Carex pensylvanica Wooded Herbaceous Vegetation	White Pine - White Oak Barrens	10	1
	Pinus strobus - Quercus alba - Mixed Hardwoods Forest	White Pine - White Oak Forest	10	1

Taxonomic Group	GNAME	GCOMNAME	Goal	Viable EOs
	Platanus occidentalis - Acer saccharinum - Juglans nigra - Ulmus rubra Forest	Sycamore-silver Maple Floodplain Forest	10	1
	Polygonum spp. - Mixed Forbs Herbaceous Vegetation [Provisional]	Temporary Herbaceous Pond	10	1
	Potamogeton spp. - Ceratophyllum spp. Midwest Herbaceous Vegetation	Midwest Pondweed Submerged Aquatic Wetland	10	4
	Quercus alba - Quercus macrocarpa / Andropogon gerardii Wooded Herbaceous Vegetation	Bur Oak - White Oak Openings	10	4
	Quercus alba - Quercus rubra - Quercus prinus - Acer saccharum / Lindera benzoin Forest	White Oak - Chestnut Oak - Maple Acid Forest	10	1
	Quercus macrocarpa - (Quercus alba - Quercus stellata) / Andropogon gerardii Wooded Herbaceous Vegetation	Central Bur Oak Openings	10	2
	Quercus marilandica - (Juniperus virginiana) / Schizachyrium scoparium - Danthonia spicata Wooded Herbaceous Vegetation	Central Shale Glade	10	1
	Quercus palustris - Quercus bicolor - Acer rubrum Flatwoods Forest	Great Lakes Swamp White Oak-Pin Oak Flatwoods	10	6
	Quercus prinus - Quercus coccinea - (Castanea dentata) - Carya glabra Forest	Appalachian Oak - (chestnut) Forest	10	1
	Quercus rubra - Acer saccharum - Quercus alba - Ulmus americana / Prunus virginiana Forest	Red Oak-Sugar Maple-Elm Forest	10	3
	Quercus stellata - Quercus marilandica / Schizachyrium scoparium - Silphium terebinthinaceum Wooded Herbaceous Vegetation	Post Oak Chert Barrens	10	1
	Quercus velutina - (Quercus alba) - Quercus ellipsoidalis / Schizachyrium scoparium - Lupinus perennis Wooded Herbaceous Vegetation	Black Oak / Lupine Barrens	10	7
	Quercus velutina - Quercus alba - Carya (glabra, ovata) Forest	Black Oak - White Oak - Hickory Forest	10	5
	Quercus velutina - Quercus alba / Vaccinium (angustifolium, pallidum) / Carex pensylvanica Forest	Black Oak - White Oak / Blueberry Forest	10	1
	Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula Dry - Mesic Herbaceous Vegetation	Midwest Dry-Mesic Prairie	10	3
	Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula Dry Gravel Herbaceous Vegetation	Midwest Dry Gravel Prairie	10	3
	Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula Glacial Drift Herbaceous Vegetation	Midwest Glacial Drift Hill Prairie	10	1
	Scirpus maritimus - Atriplex patula - Eleocharis parvula Herbaceous Vegetation	Inland Saline Marsh	10	2
	Spartina pectinata - Carex spp. - Calamagrostis canadensis - Lythrum alatum - (Oxypolis rigidior) Herbaceous Vegetation	Central Cordgrass Wet Prairie	10	7
	Thuja occidentalis - Fraxinus nigra Forest	White Cedar - Black Ash Swamp	10	9
	Thuja occidentalis / Carex eburnea Woodland	Appalachian Bluff White Cedar Woodland	10	1
	Tsuga canadensis - Fagus grandifolia - Acer saccharum / Kalmia latifolia - Ericaceae Forest	Eastern Hemlock - Beech Hardwood Forest	10	7

Taxonomic Group	GNAME	GCOMNAME	Goal	Viable EOs
	Typha spp. Midwest Herbaceous Vegetation	Midwest Cattail Deep Marsh	10	1
	Vaccinium corymbosum - Gaylussacia baccata - Aronia melanocarpa / Calla palustris Shrubland	Highbush Blueberry Bog	10	3
Vascular Plants				
	Aster furcatus	Forked aster	10	2
	Besseya bullii	Kitten Tails	10	9
	Carex decomposita	Cypress-knee Sedge	5	2
	Chelone obliqua var speciosa	Rose Turtlehead	10	3
	Delphinium exaltatum	Tall Larkspur	10	3
	Juglans Cinerea	Butternut	10	1
	Napaea dioica	Glade Mallow	10	7
	Paxistima canbyi	Canby' s Mountain-lover	10	1
	Platanthera leucophaea	Eastern Prairie White-fringed Orchid	10	4
	Poa Languida	Drooping Bluegrass	10	2
	Scleria reticularis	Reticulated Nutrush	10	1
	Sida hermaphrodita	Virginia mallow	10	2
	Silene regia	Royal Catchfly	10	7