

# Foundation for Planning DRAFT

## General Rationale for Establishing Natural Areas

People, especially children, must develop a sense of connection to the natural environment and be made aware of its susceptibilities to degrading influences, if communities are to be healthy, prosperous, and sustainable in the future. To create this connection and to build a foundation for understanding, people's lives need to be infused with opportunities to explore and experience the natural world by gaining access to surrounding natural areas.

Also, inasmuch as all natural areas are truly unique to all others and local natural areas are truly unique to the world, their stewardship and understanding can lead local residents to a deep appreciation of their natural assets and afford them an authentic sense of place. The people of Tippecanoe County are blessed with a relatively large number of remnant natural areas of very high quality. There are many counties in the Midwest that have no natural remnants at all, the prevailing vegetative mantle being commodity-scale agriculture, which provides no genuine link to a land of aboriginal and irreplaceable natural beauty.

A rationale for the identification and stewardship of the natural remnants of Tippecanoe County is supported by four principle considerations, which include environmental, educational, recreational, and cultural programs. Consideration of prospective natural areas represents the richness and health of the region in all four programs in terms of both ecological and cultural assets. Several examples of existing high-quality natural areas or preserves will serve as noteworthy opportunities toward the identification of potential remnant natural areas and provide aspiration for the recognition and stewardship of ecologically rich public and private lands.

Because these natural landscapes developed much of their essential character in harmony with aboriginal cultures throughout the Holocene, cultural disengagement from them in the post-settlement era has led to their degradation, though not complete annihilation. All have suffered from over-grazing, fire suppression, changes in harvesting, and hydrologic perturbations. As the people of the county come better to understand these landscapes and see that their re-engagement and loving attention will draw from them great beauty and diversity, both the places and the people will prosper from the healing effort.

Currently, these natural areas are under the ownership of several entities, which include private, local, county, and state governments, local and regional non-profit preservation groups, and national non-profits such, as The Nature Conservancy. In most cases, these landscapes have neither stewardship plans nor funds for their overt management. Very few of the residents of Tippecanoe County are aware of the quality and fragility of these priceless remnants.

Our effort has tried to discover and identify many of the remnant natural lands through a combination of remote sensing, interviews with resource practitioners, and direct field observation. While a number of such areas were surveyed, it is clear that many others, mostly on private land, would present themselves as beautiful, unique entities if their owners were to become aware of them and be enabled to manage them. The evaluation and assessment method that we used is described by Swink & Wilhelm (1994), in their book, *Plants of the Chicago Region*, published by the Indiana Academy of Sciences. Individual coefficients of Conservatism are those produced by Indiana Botanist's under the leadership of Dr. Paul Rothrock.

Although the individual Indiana C-values differ from those of the Chicago Region for some species, the general philosophy and evaluation perspective is the same. According to Swink and Wilhelm:

*"Mean C values in the preponderance of our open land range from 0-2. In light of the fact that 89% of our native flora has a C value of 4 or greater, and has a Mean C value of 7.3, it is evident that the principal elements of our native systems are virtually uninvolved in the Chicago region landscape today.*

*"The vast majority of land in the region registers Floristic Quality Index values less than 20 and essentially has no significance from a natural area perspective. Areas with I values higher than 35 possess sufficient conservatism and richness to be of profound importance from a regional perspective. Areas registering in the 50's and higher are extremely rare and of paramount importance; they represent less than 0.5% of the land area in the Chicago region."*

While we have not such actuarial information on Tippecanoe County, a quick observation of aerial photographs show very little of the county left, most of it along the Wabash River and its immediate tributaries. The natural area remnants that do remain owe their uniqueness to vagaries of geology, slope exposure, the general phenomenology of landscape variability, land-use history, and current landscape management approaches.

There is a general belief that, if one were simple to let a landscape alone, that somehow, perhaps through succession, it would just grow back. Those who make this claim seem to rely on the idea that so long as the "structure" of a system is present, the "system" is present, or perhaps base the belief on the idea that all the original genetic components of the system are still "around," and need only to be "dispersed" back to the area. The last quarter of a century has disabused us of this idea. We have seen little hard evidence that this is the case in the contemporary, highly fragmented landscape. Rather, it seems that our remnant natural areas are less like the segments of worms, and more like the nerves of human beings—once they are severely damaged they rarely grow back. If too much nervous tissue is damaged, the corporal structure degrades catastrophically; once too many conservative species have been eroded, or scraped away, or dissipated through fire suppression, or diminished by other changes in ecological processes, the natural area degrades irretrievably to a much more simplified system, very often one that cannot sustain.

We have found, however, that relatively high-quality remnants of the caliber described above are stewarded to the advantage of their aboriginal biodiversity, the healing response can be impressive, beautiful, and inspiring to human souls involved.

### **Environmental Rationale**

As one might already infer, native remnant landscapes are of significance when they possess a sufficient richness to represent a regional character found nowhere else in the world. As cultures disengage, become unaware of the native species and the warp and weft of life that support them, the system degrades—even as their erstwhile stewards focus on more secular, usually man-made interests. This lessening of richness and accrued deficiencies in indigenous habitat represent a disconnected relationship between the land and people. Such cultural disengagement usually results in ecosystem instability and can lead to a more difficult or even impossible course in ecosystem recovery and health. An example of this would be the floodplains along the river and its tributaries that have been virtually obliterated by increased stormwater runoff from built impervious surfaces and past agricultural practices. These once beautiful bottomlands and prairies, crippled by watershed-scale hydrological changes, have become much less biodiverse, less beautiful, and less efficient even in the handling of water.

Conservation and stewardship of these rich natural areas, in perpetuity, can reveal outstanding examples of the Wabash River's indigenous biological diversity and a gauge of the region's health. All inhabitants, including people, can and will benefit from an exquisite landscape fed by cool clean

water, self-replenishing rich organic soils, and clean air. Remnant natural areas can teach us about how to live sustainably where we are. Our ignorance of sustainable live and the attendant consequences will burgeon as if we allow the passing of our natural areas to become inexorable.

The recognition and stewardship of the remnants of Tippecanoe County must receive first-principle consideration in any plan for the present or the future. Conservation, restoration, and stewardship efforts within the Wabash River corridor include, but are not limited to:

- Exemplary or representative ecological communities (terrestrial and aquatic) maintained under existing natural conditions.
- Formations or features of the natural landscape significantly illustrating geological processes.
- Ecological communities that illustrate significantly the processes maintained or perpetuated through natural or cultural influences, such as fire and harvesting.
- Habitats that support rare or constrained species of native plants and animals.
- Seasonal refuge for concentration of native animals, such as migratory birds or breeding grounds.
- Areas of aesthetic quality that illustrate the scenic grandeur of the Wabash River Valley.
- Unique or unusual natural features.
- Preserve and protect areas of ecological or educational value;
- Restore historic hydrological processes;
- Areas needed to widen the riparian buffer between agriculture and river/stream systems.
- Increase the acreage of wetlands and sloughs along the Wabash River and its tributaries.

The existing natural areas under both public and private ownership are scattered throughout the corridor area but form important linkages, which if broken would degrade to whole.

### **Education Rationale**

If children can play in natural areas they can learn to empathize with living things. As they get older they will learn to advocate for the health and prosperity of remnant lands. As adults they can develop and implement strategies for remnant stewardship and even de novo restorations that can knit fragments together. To paraphrase Rachel Carson, a people focused on caring for the land and each other are a people less focused on destroying the land, air, and water and each other. The identification, stewardship, and efforts to understand natural remnants can have much to contribute to the re-engagement of a people with their place and themselves.

Pedagogic approaches that include the great mysteries and beauties of nature can further the understanding and functions of natural areas to increased public awareness and support. Correspondingly, a lack of knowledge and uninformed perceptions will weaken support for natural areas within the corridor and will limit the opportunity to establish vital management and stewardship practices in current and future areas. If the remnant areas pass, generations of the future will be condemned to find solace and beauty only in the soon-to-be passé artifacts of people.

It is critical to inform and involve private land owners in their own understanding of their remnant assets, and up to them to come to appreciate and decide how best to bequeath them to generations yet unborn. Community leaders, practitioners, and educators must receive consistent, high-quality nature and environmental education training, and have access to materials, resources, and exceptional sites to promote support for and the protection of remnant natural areas.

### **Recreational**

Natural areas can provide opportunities for passive and leisure activities in an outdoor setting that is enjoyable by all age groups. Such activities could include hiking, biking, picnicking, birding watching, and plant identification. These activities can be combined with interpretative and environmental education such as the learning of plants and animals, their life histories, and of the history of a place, along with its geological and natural features.

### **Cultural**

In today's surrounding river corridor, one sees clearly the cultural landscape expressed in the physical patterns of farming, grazing, and urban settlements. Yet the quintessential Wabash River cultural landscape character had its own pattern, which is most at risk. There is an extensive and diverse human history in the Wabash River corridor. But, there is little relevance placed on a multidisciplinary approach to assessing the significance of a region's cultural values in remnant natural areas, because most professional disciplines undertake only one facet, such as soil erosion, plant community succession, or indigenous archaeology, or the ecology of "plant community" or a specific plant or animal species, or recorded history. It is frequent that Native American cultural values are considered separately from the natural values when evaluating natural areas, even though these past cultural values are evident in the few remaining high quality natural areas.

Therefore, recognizing past cultural values as integral to working with and managing the remnant native landscapes, can be passed to present land stewards. Native American cultural values expressed in physical evidence in a place offer a benchmark from which to measure ecological change over an identified period. Also, visiting natural areas and interpreting the cultural values in the region's landscape is a way of broadening the appreciation and enjoyment of the past, even as a sublime hope can grow that includes a sustainable future where children are imbedded in beauty, vitality, and fecundity.

### **Summary of Floristic Quality Assessments of Remnant Natural Landscapes alongg the Wabash River and its Major Tributaries**

For thousands of years prior to settlement the Wabash River, its bluffs, springs, and prairies, was home to Native Peoples, prevailingy Ouiatanons, Piankashahs, Miamis, Muscotens, Kickapoos, and others. They, of course pulled all of their critical resources from the river and its attendant woods, bluffs, and prairies—all from within walking distance of where they lived along the Wabash.

Contemporary English speakers are inevitably charmed when they learn that "Wabssh" is an abbreviated form of the Miami word, *Ouapacheikki*, that alluded to the pure white stone over which the clear river flowed in its northern reaches. Other variants of the name have included the French rendering of the Illinois word, *Ouabouskigou*, which probably alluded the abundance of the "plant that smells like a skunk" that grew on the wooded bluffs all along its length, which we believe to be the wild leek, *Allium tricoccum*, still so prevalent today in remnant woodlands of Tippecanoe County.

George Croghan, one of the first of the European travelers and traders to arrive here came by canoe along the Wabash, itself. He was among the first to describe the Wabash, particularly insofar as it was a principle transportation route:

*“The Head of the Cuabache is about forty Miles from this Place [the portage at Kekionga, Fort Wayne] and after a Course of about 760 Miles from its head Spring thro one of the Finest Countrys in the World it empties itself into the Ohio. The Navagation from hence to Ouiatanon is very difficult in low water on account of the many rapids and rifts, but in Freshes which generally happen [in] Spring and fall Batteaux or Cannoes will pass without difficulty from here to Ouiatanon in three Days which is about 240 miles and by land about 210 miles. . . . throughout the Whole Course of the Pubache [sic!] the banks are pretty, and in the River are a great many Islands: many Shrubs and Trees are found here not Known to us. . . .”*

One-half century later, in 1815, Caleb Lownes described the river this way:

“The Wabash rises in a level Country, consequently is not subject to those sudden floods and rapid streams, so prevalent on the Western Waters. Its rising is slow and regular, taking several Weeks to get up to full beds---and as long & slow in falling. . . . It is a beautiful and valuable stream---the water generally perfectly clear & transparent---exhibiting a clean gravelly bottom. It abounds with Fish of various kinds: Bass, Pickerel, Pike, Perch, Catfish, &. The inhabitants in the season easily supply their families.

This beautiful river, owes much of its comeliness to the bluff and lateral ravines and tributaries that attend it flows southwest across Tippecanoe County. Nowhere, however, is there any sameness. The valley was carved through the morainic silts and clays by the torrential outwash currents that debauched from the ancient glacial Lake Maumi. A most curious and complex glacial geology has rendered the river corridor with great outwash plains of sands and gravel, the morainic uplands everywhere dissected by ravine complexes traversed by streams with evocative names such as:

Wea Creek, after the Wea, or Ouiatenon Indians;  
Sugar Creek, probably after pure white sands of its outwash valley;  
Indian Creek, Flint Creek, Wildcat Creek, no doubt for obvious reasons;  
Burnett, Jordan, and Harrison Creeks, after local historic Europeans;  
and where did Lost Creek and Happy Hollow get their names?

And the beautiful Tippecanoe River braids into the Wabash from north.

As is true of nearly all of the more level or gently rolling uplands of the Midwest, most of those of Tippecanoe County are either devoted to commodity-scale agriculture or urban and suburban development, much connected and interlaced with roads. The river bottom flats of the Wabash have are also in agriculture on those terraces that do not suffer too frequent floods. The lower flats are overwhelmed by relatively recent sediments and bedeviled by great floods.

Inasmuch as very few of the native plants and animals are adapted to these post settlement land uses, the remnants of biodiversity peculiar to the Wabash Valley are found mostly on the bluffs and ravines too steep for agriculture and situated above the frequent

flood zones. It is a blessing to the people of Tippecanoe County and their posterity, however, that significant tracts of aboriginal vegetation still survive along the bluffs of the Wabash. Prevaingly wooded, a passerby in a canoe can float nearly the entire reach of the river through the metropolitan district of LaFayette and West LaFayette and scarcely notice a building.

If not attentive to the plants and geology, the canoeist might conclude that the wooded bluffs are fairly uniform in composition, because the depauperate wooded bottom lands are, in fact, much alike, with Hackberry's, Silver Maples, Cottonwoods, and Stinging Nettles. But, as for the bluffs, nothing could be further from the truth. The bluffs of the Wabash and lower flowages of the Tippecanoe River are gravelly outwash, where springs flow each day of the year.

While most of the wet prairies and aboriginal marshes have perished, one of the more interesting and high-quality spring-run fens of Indiana occurs along the rills of Harrison Creek at Prophet's Town State Park, and several outwash springs occur along the bluffs at Battleground and near the Indiana Mounds.

The river narrows dramatically upstream from the confluence with Wea Creek, then widens out farther west, lined along the right morainic bluff with some of the finer woodlands in Indiana, at the bases of which curious seeps and discharge wetlands with their own peculiar mix of species. Just before leaving the county, Flint Creek flows into the Wabash. Just a few hundred yards upstream is an altogether different kind of fen.

The tributary creeks and rivers that flow into the Wabash all along the way are lined with remnant morainic woodlands, some of the yet very high in quality. There are even a few small remnants of the Wea Plains, which can be visited with a certain amount of persistence.

One would be hard pressed to find a great metropolitan region of the United States so embedded in the beauty of aboriginal landscapes. More interesting yet, as the residents discover the singular nature of each of the remnants and understand their contemporary condition, the need to steward them will become progressively evident. Where such opportunities pertain, particularly in the Midwest, they have shown themselves to have healing quality not only to the land and its plants and animals, but the people involved in the stewardship.

In the evaluation of most these areas, during the fall of 2009, only one visit was possible. In the areas on the grounds of the new Prophet's Town State Park, we were able to include information taken during the Spring of 1999, which means that these areas floristic inventories that approximate about 90% of what is likely to reside in them. In order to equilibrate the Floristic Quality Index metric among all the sites, we assumed that our fall inventory overlooked no less than 40% of the plants likely to be there. The Index for these areas is calculated by multiplying the observed species richness by 1.4, so all the sites may be compared among themselves insofar as their measured floristic quality.

All of these areas are in need of and should receive a controlled burn as often as their fuel load will carry a fire in the autumn, after October 15<sup>th</sup> or the first suitable day after

the first hard frost. Most of the wooded areas need to be selectively thinned. Most of the areas are at least thinly infested with introduced shrubs, the most notable of which is *Lonicera maackii*, the Amur Honeysuckle; these must be removed and their stumps or leafy re-growth herbicided. In some areas, there is evidence of chronic deer browse, which problem can be alleviated only through deer enclosure or a program of targeted culling. The restoration and management programs that are underway at Prophet's Town State Park are exemplary and there are other restoration initiatives going on in the area, so there is a lot of experience in the area.

In remnant systems where management is planned, it is strongly recommended that disciplined monitoring protocols be implemented to evaluate the extent to which all guild of native organisms are responding to the stewardship program. The practitioner must understand, however, that even with proper management, the Mean C metric is unlikely to increase much more than a few tenths of a point over time. Once a living system has been damaged fundamentally, just like the tissues affected by a stroke, its recovery is painfully slow.

The result of initial burning, thinning, and shrub removal might even result in a small decrease, as certain weedy native species are released, but the original numbers will recur as the system stabilizes with regular management. The Floristic Quality Index will increase for several years because of the observed increase in species richness. Native species much suppressed or very anemic in abundance will surge with management, but this newly discovered guild of species tends to have a similar Mean C to the one registered by initial inventories.

Discouraging as it might seem insofar as the Mean C metric, management is not an optional program if the remnant landscape is to sustain. These remnants, in their contemporary condition are not in stable circumstance. Their current trend is the slow but inexorable loss of species, exaggerated loss of soil and water on sloped systems, and net losses of soil organic matter in all systems. A no-management program will allow this trend to continue. As this biodiversity bleeds away, so also does the potential for next generations to connect to great natural beauty and the interminable mysteries of creation. If beauty and mystery are allowed to be supplanted by man-made infrastructure, with all its gaudy branding and soullessness, our posterity may not even realize that we have deprived them, as they wander for ever in a world of passé styles, unavoidable hubris, and whatever consequences such a cultural consciousness will yield.

It is not possible to emphasize how fortunate the people of the middle Wabash Valley are to have yet among them these remnant systems, which line the bluffs of the river and many of its tributaries. We found more than thirty-five significant remnants, mostly on public land. A casual assessment assures us that there are probably at least that many areas surviving on private land. Very few areas in the Midwest are so blessed. In addition to the implementation of management on public lands, just as important is the implementation of a program to help private land owners appreciate what they have.

## Cultural and Restoration Areas

Most of the land that is not paved over or in agriculture is bereft of native vegetation. Examples include parks and lawns. As can be seen in the table below parks and lawns reflect negligible quality, have no genetic memory of sustained relationships with people, and are very replaceable. In a number of areas in Tippecanoe County, there are attempts to restore natural vegetation. Although restorations rarely approximate aboriginal systems, some have been quite successful, given the natural limitations. One such example is the decade-old attempt at Museum's of Prophet's Town. Note that no fewer than 42 native species have been recruited and are sustaining in the system and support a Mean C of 3.6 and a Floristic Quality Index of 22. More intensive research might show it to register as high as 28. Not that an old field, left to "succeed" on its own has much lower metric values. Battle Ground Park, although lawn, is on original soil that once supported an upland outwash woodland, of which there are very few remaining today.

Cultural and Restoration Areas	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Museum of Prophet's Town Restoration	35	42	3.6	3	22	20	28
Battleground Park	16	29	1.2	0.7	5	4	8
Old Field, Lafayette	16	40	0.9	0.4	4	2	7
Lawn	0	6	0	0	0	0	0

### Remnant Natural Areas Sandy Districts of the Outwash Plains

In the sand districts of Prophet's Town State Park, we noted only two **Sand Savannas** that approached remnant quality. Although of marginal remnant quality, these are the only sand savannas recorded.

Sand Savannas	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
*Sand Savanna, Prophet's Town	111	131	3.4	2.8	35	33	35
Mesic Sand Savanna, Prophet's Town	72	77	3.3	2.1	28	27	28
*Thinned Sandy Woods, Prophet's Town State Park	77	82	3	2.9	27	26	27

Although extremely degraded, the Grandville **Sand Barrens** is all we have left of the Wea Plains, other than the two quite different Hill Prairies. It contains a few species that are known nowhere else in the area.

Sand Barrens	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Granville Sand Barrens	55	74	2.8	2.1	21	18	28

### Hill Prairies of the Outwash Plains

We were able to discover only two remnant **Hill Prairies** in the Wea Plains. Lookout Point is protected and stewarded by The Nature Conservancy. Wea Prairie is an Indiana Nature Preserve, but it is not being stewarded.

Hill Prairies	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Lookout Point TNC	93	97	4.1	4	41	40	48
Wea Prairie INP	45	56	3.7	3.3	26	24	33

### Wooded Outwash Bluffs

These are remnant wooded outwash bluffs that line districts with ground watersheds too small to provide the water flow for significant and steady springs. All of these woods are in need of stewardship, but the Tippecanoe County Amphitheater Woods remains very high in floristic quality.

Outwash Bluffs	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Tippecanoe County Amphitheater Woods	116	125	3.8	3.5	40	39	50
*Gravelly Bluff Woods, Prophet's Town State Park	96	103	3.6	3.3	35	34	35
Wabash Heritage Trail, Battleground	39	44	3.5	3.1	22	21	27

### Wooded Outwash Bluffs and Springs

These areas are flanked by a large outwash plain, into which sufficient waters can infiltrate and provide the steady flow of discharge water. Just 1 gallon per minute discharging from a permanent spring in about 520,000 gallons per year, nearly half the annual rainfall on 1 acre if it were all to infiltrate. Although degraded and in need of stewardship, these two unique areas include the best of the systems that we have seen in Tippecanoe County.

Outwash Bluffs and Springs	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
*Gravelly Bluffs and Springs at Battleground	179	228	3.6	2.8	48	43	48
*Indian Mounds Bluffs and Springs	125	135	4.1	3.8	46	44	46

### Outwash Spring Run

Although much of the ambient landscape is quite degraded, this is the only large spring run that emerges from a seam in the outwash bluffs. It is flanked by wooded outwash bluffs and their numerous springs and perched fens, but none of these springs show the steady, year-round volume of this spring run. It originates from a point about midway up the bluff, the waters issuing from a large, multi-headed discharge fan, which itself is quite large and quite unique.

Outwash Spring Run	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
*Spring Run at Prophet's Town	128	150	3.3	2.8	37	34	37

## Outwash Tributary Woods and Prairie

This is the only timbered ravine on an outwash tributary to the Wabash River that we inventoried. It is also unique in that there is a remnant tall-grass prairie on a steep south-facing slope. This prairie is unlike anything in the Wea Plains.

Outwash Woods and Prairie	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Clegg Gardens	77	85	4.2	3.9	37	35	46

## Outwash Fens

Fens are peculiar to the glaciated districts of the Midwest, particularly common in areas of Wisconsinan glaciation. Within that till plain, fens are confined to outwash areas, where significant flows of minerotrophic water can be sustained indefinitely. Most of these areas have been grazed out, flooded out, dewatered, or dried up due to collapse of the infiltration hinterland that supplied them. The two fens that we know of that remain in Tippecanoe County are magnificent. They provide the refuge habitat for many of the rarest plants and animals in Indiana. The Flint Creek Fen is small, but very high in quality. Mean C values of 5.3 are exceptionally rare. It is however in need of stewardship. The fen along the declivity of Harrison Creek that runs between the gravelly bluff and outwash island north of Battle Ground is one of the Midwest's more magnificent systems. In addition, its quality has much improved over the last decade due to the careful stewardship afforded it by the staff of Prophet's Town State Park. Note that the Floristic Quality Indices of both areas exceed 50!

Outwash Fens	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Flint Creek Fen	83	83	5.3	5.3	49	49	57
*Prophet's Town Fen	169	196	4.2	3.6	55	51	55

## Outwash Marshes

Marshes were once abundant along the Wabash and the bottoms or its larger tributaries. There are still a few relative high-quality ones intercalated inseparably with portions of the Prophet's Town Fen. Most Marshes, however, have been subject to the doctrine that they are the "natural" repositories for our polluted fluxing stormwater discharges. There being very few native species with a genetic memory for such habitat, most such low lands have taken on the depauperate quality exhibited by the marsh at Prophet's Rock. Many other marshes have been smothered by agricultural sediments and are now in corn or bean. Others, higher on the terraces, have suffered from dewatering, fire suppression, over-grazing, and other land uses uncongenial to their health.

Sadly, the marsh at Battleground, on either side of Route 225, is the best remnant that we could find. If stormwater can be kept out of it and annual fire, along with some other stewardship activities were to be applied, it might well be able to recover somewhat. This, it seems to us would be a particularly important effort, given that it was through this marshy prairie that the allied warriors under Tenskwetawa crept, covered by the dark of night on November 6, 1811, toward the sleeping but battle-ready soldiers of General Harrison's army. They did not creep through the Eurasian weeds that now dominate this marsh. Just as the Battleground itself would be far more congenial to history and cultural context if it were to be restored to its natural vegetation, so also would history and understanding be enhanced if the marsh were restored, along with the outwash woods on the western bluff, as well as the morainic woods ambient to Prophet's Rock.

Outwash Marshes	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
*Battleground Marsh	63	82	2.9	2.2	23	20	23
Rt. 25 Wetland at Americus	29	34	2.3	2	13	12	16
Prophet's Rock Marsh	11	12	1.7	1.6	6	6	7

## Floodplains

It reasonably can be said that the bottomlands of the Wabash were embedded in outwash sediments. Many of these bottomlands were invested by prairie, but some, on the higher terraces, would have been clothed with some form of timber, probably including Sycamores, Green Ashes, Hackberries, Cottonwoods, and Silver Maples, certainly along with a rich ground plain, probably consisting of as many as 12-15 or more native species per quarter-meter square. All is lost to antiquity, however, because the extreme sediments of post-settlement agriculture have given no quarter. Just as with the outwash marshes, these bottoms and their once rich flora are all but gone. The one of highest quality that has come to our attention lies along the right bank of the Wabash, on a terrace at the toe of the bluff south of the Museums of Prophet's Town.

The post-settlement transformation of the bottoms of the Wabash is well known. It is most dramatically revealed when one compares to today the descriptions of the Wabash and Little Wabash rivers provided by George Rogers Clark during the trek of his little but formidable Army of the Illinois from Kaskaskia to Vincennes, in January and February of 1779. The restoration of the Wabash River bottoms necessarily will require a cultural and economic consilience with ourselves and the watershed of the Wabash River, a reexamination of our relationship with land and water, food, economy, as well as the security and happiness of our posterity.

Wabash Bottomland	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
*Flood Plain Woods, Prophet's Town	51	58	2.9	2.6	21	20	21
Tapawingo Park	54	81	1.6	1.1	12	10	17

## Outwash Swamp and Morainic Ravine

Just a hint of what some of the swamps may have been along the Wabash is preserved at what once was the Hoffman property along Sugar Creek. Fortunately, this unutterably unique and high-quality remnant is now owned by the people of Tippecanoe County. The dissection through the moraine by Sugar Creek is bottomed by outwash. The Hoffman tract includes an outwash terrace, well watered with groundwater discharge, and surrounded on three sides by beautiful morainic ravine woodland, including outcroppings of a curious aggregate bedrock sufficiently rich in carbonates to support Walking Fern! Most of the rest of the Sugar Creek bottom has been obliterated either by growing-season floodwaters or agriculture, or other cultural land uses. We know of nowhere else in the Midwest where this magnificent combination of floristic development and geology remains this well intact. Its Floristic Quality Index of 65 is among the higher of any area of Indiana outside of the Indiana Dunes. Such a gift!

Remnant Natural Area	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Hoffman Mesophytic Swamp	130	135	4.7	4.6	54	53	65

## Wooded Morainic Bluffs and Marshes

Abutting the Hoffman tract on its east side is a unique remnant complex of morainic wooded ravines and marshes. Privately owned by a visionary physician and naturalist, it includes remnants of the bluffs and ravines along the left bank of the glacial drainage that has become Sugar Creek. During our single sojourn with Dr. Arvin, we recorded 180 native species, which species richness is quite rare outside of the Indiana Dunes. The marshes that lie along the toe of the bluff are yet elevated above routine flood waters. They are probably the result of some ice-contact activity during the glacial retreat. Marshy in character, their principle hydrology is driven significantly it would seem, by groundwater discharge. Whatever the true nature, we saw nothing else like them in the valley. Their inhabitancy by an improbable diversity of rare amphibians must be unique to Indiana. To have two such areas as the Arvin and Hoffman tracts preserved together certainly sets this complex of remnants among the more important in the Midwest. The Arvin tract, alone registered a Floristic Quality Index of 60, but is likely to stand at 70 or so!

Morainic Woods and Marshes	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Arvin Woods and Marshes	180	187	4.4	4.3	60	59	71

## Wooded Morainic Bluffs and Seeps

Along the right bluff of the Wabash River, south of Battle Ground, the outwash is overlain by morainic till, the soils much more silty and clayey than the gravelly ones that characterize the outwash plains. These bluffs are characterized by wooded ravines, remnants from glacial streams that lead from the till plain to the river. Once much more open than we see today, many of them still bear wooded remnants of high quality, as seen in

the table below. All along the toe are seeps and small springs evocative of but geologically and floristically quite different from fens. While the northern bluffs on the right bank of the Wabash River are borne of a great outwash plain, this same outwash flow pick up south of the narrows on the left bank, leaving the right bank having been cut through moraine. All four of these areas bluff remnants are impressive, but none more so than the Ross Preserve, owned by Purdue University. Although suffering from fire suppression and some overgrazing by deer, they all retain a great deal of remnant diversity, less degraded than their outwash bluffs farther north. If properly cared for and stewarded, this entire system would present an area so beautiful as to scarcely credit description by contemporary imaginations.

Wooded Morainic Bluffs and Seeps	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Ross Preserve	160	165	4.3	4.1	54	53	65
Ross Hills Camp	118	120	4.2	4.2	46	46	54
Ross Hills Park	118	122	3.9	3.8	42	42	51
Wabash Valley Hospital Bluffs	108	112	4	3.8	42	41	50

### Wooded Morainic Bluffs and Prairie

Similar in their morainic character to those described above, but evidently without the strong association with outwash terraces along the toe and probably even more open with regard to tree growth and characteristics. The also differ in that many of the nose slopes of the ridges along the ravines have remnant prairies. Both the prairies and the wooded areas are in severe need of stewardship, many of the native species having their populations becoming more anemic with each passing growing season. Although in serious decline, an inspection of the data in the table below, show them still to retain very high quality and natural area significance.

Wooded Morainic Bluffs and Prairie	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Veteran's Woods	128	135	4.4	4.2	50	48	60
Wright Wildlife Corridor Woods	111	115	4.3	4.1	45	44	55

### Wooded Morainic Ravines

These are wooded ravines of the till plain, wholly disassociate from the outwash districts. Much of the till plain in this area was in prairie, largely because of the strong tendency of the clayey soils to hold moisture and accumulate organic carbon. These ravines are ancient glacial flowages to the tributaries that flowed to the Wabash. Fairly well drained, they could support a fairly substantial timbered community, but along the ridge and noses slopes there was significant intercalation of prairie vegetation, which is quite evident from an examination of the species composition. Most of these tracts have been much degraded by overgrazing, fire suppression, and some have been much abused by desultory visitation by demand paths and trails. For all that, the Martel Forest, owned by Purdue University, and the Happy Hollow ravines have exceptionally high remnant quality. If properly stewarded, these areas would provide generations yet local residents with a sublimity of natural wonder

and beauty unavailable, sadly, to many Midwesterners today, much less tomorrow. Happy Hollow is enmeshed in a residential neighborhood and the park at the bottom is much visited by children. Martel Forest is available to students at Purdue. The Indiana Nature Preserve is at the gateway to West Lafayette. Murdock Woods is part of a well used downtown park. Prophet's Rock Woods is an historic site. As with most of the natural remnants along the corridor, these areas are at once neglected and at once so potentially able to enlarge the quality of education and sense of place and pride locally, as well as provide a deep natural beauty that would be attractive to people from all over the world who are seeking something authentic---if only they were cared for and their presence made known.

Wooded Morainic Ravines	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Happy Hollow	173	183	4.5	4.2	59	57	72
Martell Forest, Ravines	141	146	4.2	4.1	50	49	60
I-65/43 Woods Nature Preserve	83	88	4.2	3.8	38	37	47
Murdock Woods	79	94	3.4	2.9	30	28	39
Prophet's Rock Woods	74	79	3.5	3.2	30	29	37

### Wooded Upland Moraines

These are wooded upland moraines, disassociated with outwash, and gently rolling, not part of the dissected tributary system of ravine and bluff that were part of the ancient glacial drainage. These were portions of groves that once were found on better-drained soils throughout the eastern verges of the prairie biome. As with other woodlands, they are fire-suppressed, and in many areas infested heavily with Amur Honeysuckle and other weeds. As with most such upland moraines, there are depressional areas where a perched water table is at, or near, the surface. Prior to settlement, these depressions had no outlet and were sustained through the slow but inexorable infiltration of rainwater in ambient upland woods. With secession of fire and overgrazing, much of the ground plain vegetation has collapsed. The diminished organic carbon content of the soil now leads to surface sheet runoff during rain events, which send too much water too sediment-rich to the depressions. In many instances the surcharge of water has overtopped the low divide and allowed the down-cutting energy to dewater them. In other cases, particularly in response to mosquito abatement activities, outlet ditches have been contrived. Most of these woodlands are significant islands of verdure in an otherwise quite urban or suburban context, and have the same potential as many of the other areas to enliven an interest in nature and become focal points of local pride and singular beauty.

Wooded Upland Moraines	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
McCormick Woods	89	92	4.4	4.3	42	41	50
Right Bluff and Bottom of Barnett Creek, at Rt. 225	90	99	3.4	3.1	32	31	40
Michaud-Sinninger Nature Preserve	95	104	3.2	2.9	31	30	39
Horticulture Park	48	52	3.7	3.4	26	25	32

### Morainic Lowlands

At one time these morainic lowlands were peaty depressional areas in the prairie, sometimes associated with ice contact during the melting and recession of the last glacial episode. As with most of our wetlands, these bogs and low prairies have been encumbered by agricultural sediments, stormwater, dewatering activities, or otherwise had their aboriginal hydrology altered to the point where relatively few native species can tolerate contemporary conditions. The low flats and shallow "lake" at Celery Bog may be the best of what little remains.

Morainic Lowlands	Species		Mean C		Floristic Quality Index		
	Native	Total	Native	Total	Native	Total	Potential
Celery Bog Lowlands	106	117	2.4	2.2	25	24	31

The casual eye might conclude that there are a lot of trees along the Wabash and in tucked away areas of Lafayette and West Lafayette, which is true. In some areas the trees are merely planted or have sprung up in agricultural sediments or old field. In some other areas, however, these trees are the first evidence of a beautiful land that once was and yet could be again. The residents of the middle Wabash Valley are custodians of some of the more unique and impressive natural areas of Indiana, which if cared for could be their gift to generations for time beyond mind.

Now, virtually hidden on the ravine slopes, in and along the springs and seeps, faintly expressed in minute but priceless prairies, secreted away in splendid marshes and swamps, is a substantial remnant of the native biodiversity of Indiana. Once in consilience with Human culture, these forests and wetlands lie along a great flyway, where many of the birds of the rain forests of South America come to breed and live for half their lives---the other half of their world. It is the whole real world for children of Tippecanoe County, born and yet unborn, if nurtured and reintegrated into their lives, in consilience with Human Culture. What a blessing!

# Happy Hollow Woods

August 26, 2009  
Gerould Wilhelm  
Conservation Research Institute

FLORISTIC QUALITY DATA		Native		Adventive	
173	NATIVE SPECIES	Tree	36	Tree	2
183	Total Species	Shrub	15	Shrub	5
4.5	NATIVE MEAN C	W-Vine	7	W-Vine	0
4.2	W/Adventives	H-Vine	2	H-Vine	0
58.5	NATIVE FQI	P-Forb	80	P-Forb	0
56.9	W/Adventives	B-Forb	2	B-Forb	1
2.4	NATIVE MEAN W	A-Forb	6	A-Forb	1
2.4	W/Adventives	P-Grass	13	P-Grass	1
AVG: Fac. Upland (+)		A-Grass	0	A-Grass	0
		P-Sedge	7	P-Sedge	0
		A-Sedge	0	A-Sedge	0
		Fern	5	Fern	0

ACRONYM	C SCIENTIFIC NAME	W WETNESS	PHYSIOGNOMY	COMMON NAME
ACARHO	0 Acalypha rhomboidea	3 FACU	Nt A-Forb	THREE-SEEDED MERCURY
ACESAS	4 Acer saccharum s. saccharum	3 FACU	Nt Tree	SUGAR MAPLE
ACTPAC	7 Actaea pachypoda	5 UPL	Nt P-Forb	DOLL'S-EYES
AESGLA	5 Aesculus glabra	-1 FAC+	Nt Tree	OHIO BUCKEYE
AGAGAT	7 Agalinis gattingeri	5 UPL	Nt A-Forb	ROUND-STEMMED FALSE FOXGLOVE
AGEALT	2 Ageratina altissima	3 FACU	Nt P-Forb	WHITE SNAKEROOT
AGRPUB	5 Agrimonia pubescens	5 UPL	Nt P-Forb	SOFT AGRIMONY
AGRPER	2 Agrostis perennans	1 FAC-	Nt P-Grass	AUTUMN BENT GRASS
ALLPET	0 ALLIARIA PETIOLATA	0 FAC	Ad B-Forb	GARLIC MUSTARD
AMEARB	6 Amelanchier arborea	3 FACU	Nt Tree	JUNE BERRY
ANEACU	8 Anemone acutiloba	5 UPL	Nt P-Forb	SHARP-LOBED HEPATICA
ANEVIR	4 Anemone virginiana	5 UPL	Nt P-Forb	TALL ANEMONE
ANTPLA	3 Antennaria plantaginifolia	5 UPL	Nt P-Forb	COMMON PUSSY TOES
APOAND	6 Apocynum androsaemifolium	5 UPL	Nt P-Forb	SPREADING DOGBANE
ARACAN	6 Arabis canadensis	5 UPL	Nt B-Forb	STICKLEPOD
ARARAC	8 Aralia racemosa	5 UPL	Nt P-Forb	AMERICAN SPIKENARD
ARITRI	4 Arisaema triphyllum	-2 FACW-	Nt P-Forb	INDIAN TURNIP
ARISER	8 Aristolochia serpentaria	5 UPL	Nt P-Forb	BIRTHWORT
ASACAN	5 Asarum canadense	5 UPL	Nt P-Forb	CANADA WILD GINGER
ASCEXA	8 Asclepias exaltata	5 UPL	Nt P-Forb	POKE MILKWEED
ASITRI	6 Asimina triloba	0 FAC	Nt Tree	PAPAW
AURFLA	7 Aureolaria flava	5 UPL	Nt P-Forb	SMOOTH FALSE FOXGLOVE
BOTVIR	4 Botrychium virginianum	3 FACU	Nt Fern	RATTLESNAKE FERN
BRAERE	6 Brachyelytrum erectum	5 UPL	Nt P-Grass	LONG-AWNED WOOD GRASS
BROPUB	4 Bromus pubescens	2 FACU+	Nt P-Grass	WOODLAND BROME
CAMAME	4 Campanulastrum americanum	0 FAC	Nt A-Forb	AMERICAN BELLFLOWER
CXALBU	7 Carex albursina	5 UPL	Nt P-Sedge	BLUNT-SCALED WOOD SEDGE
CXBLAN	1 Carex blanda	0 FAC	Nt P-Sedge	COMMON WOOD SEDGE
CXCEPP	3 Carex cephalophora	3 FACU	Nt P-Sedge	SHORT-HEADED BRACTED SEDGE
CXGRIS	3 Carex grisea	5 UPL	Nt P-Sedge	WOOD GRAY SEDGE
CXHIRS	3 Carex hirsutella	4 FACU-	Nt P-Sedge	HAIRY GREEN SEDGE
CXJAME	4 Carex jamesii	5 UPL	Nt P-Sedge	GRASS SEDGE
CXPENP	5 Carex pensylvanica	5 UPL	Nt P-Sedge	PENNSYLVANIA OAK SEDGE
CARPCA	5 Carpinus caroliniana s. virginiana	0 FAC	Nt Tree	BLUE BEECH
CARCOR	5 Carya cordiformis	0 FAC	Nt Tree	BITTERNUT HICKORY
CARGLA	4 Carya glabra	3 FACU	Nt Tree	PIG NUT HICKORY
CAROVA	4 Carya ovata	3 FACU	Nt Tree	SHAGBARK HICKORY
CELOCC	3 Celtis occidentalis	1 FAC-	Nt Tree	HACKBERRY
CERCAN	3 Cercis canadensis	3 FACU	Nt Tree	EASTERN REDBUD
COEVIR	7 Coeloglossum viride	0 FAC	Nt P-Forb	BRACTED GREEN ORCHID
COMUMB	7 Comandra umbellata	3 FACU	Nt P-Forb	BASTARD TOADFLAX
COMCOM	0 COMMELINA COMMUNIS	0 FAC	Ad A-Forb	COMMON DAY FLOWER
CONAME	8 Conopholis americana	5 UPL	Nt P-Forb	CANCER ROOT
CORTRP	8 Coreopsis tripteris	0 FAC	Nt P-Forb	TALL COREOPSIS
CORALT	8 Cornus alternifolia	5 UPL	Nt Tree	PAGODA DOGWOOD
CORFLO	4 Cornus florida	4 FACU-	Nt Tree	FLOWERING DOGWOOD
COROBL	5 Cornus obliqua	-5 OBL	Nt Shrub	PALE DOGWOOD
CRAMAC	5 Crataegus macrosperma	5 UPL	Nt Tree	BIG-FRUITED HAWTHORN
CRYCAN	3 Cryptotaenia canadensis	0 FAC	Nt P-Forb	HONEYSUCK
CYPPFP	8 Cypridium parviflorum v. pubescens	-1 FAC+	Nt P-Forb	LARGE YELLOW LADY'S SLIPPER
DANSPI	3 Danthonia spicata	5 UPL	Nt P-Grass	POVERTY OAT GRASS
DICBOS	4 Dichanthelium boscii	5 UPL	Nt P-Grass	BEARDED PANIC GRASS
DICDIM	4 Dichanthelium dichotomum s. microcarpon	5 UPL	Nt P-Grass	SMALL-FRUITED PANIC GRASS
DICLAT	6 Dichanthelium latifolium	3 FACU	Nt P-Grass	BROAD-LEAVED PANIC GRASS

DIOVIL	4	Dioscorea villosa	1	FAC-	Nt	H-Vine	COMMON WILD YAM
DIRPAL	8	Dirca palustris	0	FAC	Nt	Shrub	LEATHERWOOD
DODMEA	7	Dodecatheon meadia	3	FACU	Nt	P-Forb	SHOOTING STAR
ELAUMB	0	ELAEAGNUS UMBELLATA	3	FACU	Ad	Shrub	AUTUMN OLIVE
ELYHYS	5	Elymus hystrix	5	UPL	Nt	P-Grass	BOTTLEBRUSH GRASS
ELYVIR	3	Elymus virginicus	-2	FACW-	Nt	P-Grass	VIRGINIA WILD RYE
EQUARV	1	Equisetum arvense	0	FAC	Nt	Fern	COMMON HORSETAIL
EQUHYA	2	Equisetum hyemale s. affine	-2	FACW-	Nt	Fern	TALL SCOURING RUSH
EQUFER	2	Equisetum x ferrissii	-3	FACW	Nt	Fern	JOLIET HORSETAIL
ERIPUL	8	Erigeron pulchellus	3	FACU	Nt	P-Forb	ROBIN'S PLANTAIN
EUOALA	0	EUONYMUS ALATA	5	UPL	Ad	Shrub	WINGED EUONYMUS
EUOOBO	7	Euonymus obovata	5	UPL	Nt	Shrub	RUNNING STRAWBERRY BUSH
EUPPUR	5	Eupatoriadelphus purpureus	0	FAC	Nt	P-Forb	PURPLE JOE PYE WEED
EUPCOR	4	Euphorbia corollata	5	UPL	Nt	P-Forb	FLOWERING SPURGE
FAGGRA	8	Fagus grandifolia	3	FACU	Nt	Tree	AMERICAN BEECH
FRAAME	4	Fraxinus americana	3	FACU	Nt	Tree	WHITE ASH
FRANIG	7	Fraxinus nigra	-4	FACW+	Nt	Tree	BLACK ASH
FRAPEL	1	Fraxinus pennsylvanica v. lanceolata	0	FAC	Nt	Tree	GREEN ASH
GALCIH	5	Galium circaeans v. hypomalacum	5	UPL	Nt	P-Forb	HAIRY WILD LICORICE
GALCON	5	Galium concinnum	3	FACU	Nt	P-Forb	SHINING BEDSTRAW
GENQUO	5	Gentianella quinquefolia s. occidentalis	0	FAC	Nt	A-Forb	STIFF GENTIAN
GEUCAN	1	Geum canadense	0	FAC	Nt	P-Forb	WHITE AVENS
HACVIR	0	Hackelia virginiana	1	FAC-	Nt	P-Forb	STICKSEED
HAMVIR	5	Hamamelis virginiana	3	FACU	Nt	Shrub	WITCH HAZEL
HELDEC	5	Helianthus decapetalus	5	UPL	Nt	P-Forb	PALE SUNFLOWER
HELDIV	5	Helianthus divaricatus	5	UPL	Nt	P-Forb	WOODLAND SUNFLOWER
HELSTR	5	Helianthus strumosus	5	UPL	Nt	P-Forb	PALE-LEAVED SUNFLOWER
HELTUB	2	Helianthus tuberosus	0	FAC	Nt	P-Forb	JERUSALEM ARTICHOKE
HOULON	7	Houstonia longifolia	5	UPL	Nt	P-Forb	LONG-LEAVED BLUEETS
HYBCON	6	Hybanthus concolor	2	FACU+	Nt	P-Forb	GREEN VIOLET
HYDARB	7	Hydrangea arborescens	4	FACU-	Nt	Shrub	WILD HYDRANGEA
IMPCAP	2	Impatiens capensis	-3	FACW	Nt	A-Forb	SPOTTED TOUCH-ME-NOT
IPOPAN	3	Ipomoea pandurata	3	FACU	Nt	P-Forb	WILD SWEET POTATO
JUGNIG	2	Juglans nigra	3	FACU	Nt	Tree	BLACK WALNUT
JUNTEN	0	Juncus tenuis	0	FAC	Nt	P-Forb	PATH RUSH
JUNVIR	2	Juniperus virginiana	3	FACU	Nt	Tree	EASTERN RED CEDAR
LEEVIR	4	Leersia virginica	-3	FACW	Nt	P-Grass	WHITE GRASS
LIGVUL	0	LIGUSTRUM VULGARE	5	UPL	Ad	Shrub	COMMON PRIVET
LINBEN	5	Lindera benzoin	-5	OBL	Nt	Shrub	HAIRY SPICEBUSH
LIRTUL	4	Liriodendron tulipifera	2	FACU+	Nt	Tree	TULIP POPLAR
LOBSIP	3	Lobelia siphilitica	-4	FACW+	Nt	P-Forb	GREAT BLUE LOBELIA
LONMAA	0	LONICERA MAACKII	5	UPL	Ad	Shrub	AMUR HONEYSUCKLE
LONRET	8	Lonicera reticulata	5	UPL	Nt	W-Vine	GRAPE HONEYSUCKLE
MAIRAC	4	Maianthemum racemosum	3	FACU	Nt	P-Forb	FEATHERY FALSE SOLOMON SEAL
MALIOE	3	Malus ioensis	5	UPL	Nt	Tree	IOWA CRAB
MELWOO	7	Melanthium woodii	5	UPL	Nt	P-Forb	FALSE HELLEBORE
MENCAN	3	Menispermum canadense	-1	FAC+	Nt	W-Vine	MOONSEED
MORALB	0	MORUS ALBA	0	FAC	Ad	Tree	WHITE MULBERRY
MORRUB	4	Morus rubra	1	FAC-	Nt	Tree	RED MULBERRY
MUHSCH	0	Muhlenbergia schreberi	0	FAC	Nt	P-Grass	NIMBLEWILL
MUHTEN	7	Muhlenbergia tenuiflora	5	UPL	Nt	P-Grass	SLENDER SATIN GRASS
OSMCLI	3	Osmorhiza claytonii	4	FACU-	Nt	P-Forb	HAIRY SWEET CICELY
OSTVIR	5	Ostrya virginiana	4	FACU-	Nt	Tree	HOP HORNBAM
PARQUI	2	Parthenocissus quinquefolia	1	FAC-	Nt	W-Vine	VIRGINIA CREEPER
PASLUT	7	Passiflora lutea	5	UPL	Nt	H-Vine	SMALL PASSION FLOWER
PEDCAN	6	Pedicularis canadensis	2	FACU+	Nt	P-Forb	WOOD BETONY
PHLDIV	5	Phlox divaricata	3	FACU	Nt	P-Forb	BLUE PHLOX
PHRLEP	4	Phryma leptostachya	5	UPL	Nt	P-Forb	LOPSEED
PHYVIA	5	Physostegia virginiana v. arenaria	-3	FACW	Nt	P-Forb	PRAIRIE OBEDIENT PLANT
PHYAME	0	Phytolacca americana	1	FAC-	Nt	P-Forb	POKEWEED
PINSTR	5	Pinus strobus	0	FAC	Nt	Tree	WHITE PINE
PLAOCC	3	Platanus occidentalis	-3	FACW	Nt	Tree	SYCAMORE
POACOM	0	POA COMPRESSA	2	FACU+	Ad	P-Grass	CANADIAN BLUE GRASS
POLCAN	3	Polymnia canadensis	5	UPL	Nt	P-Forb	PALE LEAF CUP
POLACR	5	Polystichum acrostichoides	5	UPL	Nt	Fern	CHRISTMAS FERN
POTSIM	2	Potentilla simplex	4	FACU-	Nt	P-Forb	COMMON CINQUEFOIL
PREALB	5	Prenanthes alba	3	FACU	Nt	P-Forb	LION'S FOOT
PRUVLA	1	Prunella vulgaris s. lanceolata	0	FAC	Nt	P-Forb	SELFHEAL
PRUSER	1	Prunus serotina	3	FACU	Nt	Tree	WILD BLACK CHERRY
PTETRT	4	Ptelea trifoliata v. trifoliata	2	FACU+	Nt	Shrub	SMOOTH WAFER ASH
QUEALB	5	Quercus alba	3	FACU	Nt	Tree	WHITE OAK
QUEBIC	7	Quercus bicolor	-4	FACW+	Nt	Tree	SWAMP WHITE OAK
QUEMUH	4	Quercus muhlenbergii	5	UPL	Nt	Tree	CHINKAPIN OAK
QUERUB	4	Quercus rubra	3	FACU	Nt	Tree	NORTHERN RED OAK
QUEVEL	4	Quercus velutina	5	UPL	Nt	Tree	BLACK OAK
ROBPSE	1	Robinia pseudoacacia	4	FACU-	Nt	Tree	BLACK LOCUST
ROSBLA	4	Rosa blanda	3	FACU	Nt	Shrub	EARLY WILD ROSE
ROSCAR	4	Rosa carolina	4	FACU-	Nt	Shrub	PASTURE ROSE
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad	Shrub	JAPANESE ROSE
RUBFLA	2	Rubus flagellaris	4	FACU-	Nt	Shrub	COMMON DEWBERRY
RUBREC	5	Rubus recurvans	3	FACU	Nt	Shrub	RECURVED BLACKBERRY

RUDHIP	2	Rudbeckia hirta v. pulcherrima	3	FACU	Nt P-Forb	BLACK-EYED SUSAN
RUDLAC	3	Rudbeckia laciniata	-4	FACW+	Nt P-Forb	WILD GOLDEN GLOW
RUDTRI	3	Rudbeckia triloba	1	FAC-	Nt A-Forb	BROWN-EYED SUSAN
RUESTR	4	Ruellia strepens	-1	FAC+	Nt P-Forb	SMOOTH RUELLIA
SANCAD	5	Sanguinaria canadensis	4	FACU-	Nt P-Forb	BLOODROOT
SANCAC	2	Sanicula canadensis	2	FACU+	Nt B-Forb	CANADIAN BLACK SNAKEROOT
SANODO	2	Sanicula odorata	-1	FAC+	Nt P-Forb	CLUSTERED BLACK SNAKEROOT
SASALB	1	Sassafras albidum	3	FACU	Nt Tree	SASSAFRAS
SCHSCO	4	Schizachyrium scoparium	4	FACU-	Nt P-Grass	LITTLE BLUESTEM GRASS
SCRMAR	5	Scrophularia marilandica	4	FACU-	Nt P-Forb	LATE FIGWORT
SCUOVA	7	Scutellaria ovata	3	FACU	Nt P-Forb	HEART-LEAVED SKULLCAP
SILSTE	5	Silene stellata	5	UPL	Nt P-Forb	STARRY CAMPION
SILTET	6	Silphium terebinthi...v. terebinthinaceum	1	FAC-	Nt P-Forb	PRAIRIE DOCK
SMIECI	5	Smilax ecirrhata	5	UPL	Nt P-Forb	UPRIGHT CARRION FLOWER
SMHTS	3	Smilax hispida	0	FAC	Nt W-Vine	BRISTLY GREEN BRIER
SMILL	6	Smilax illinoensis	5	UPL	Nt P-Forb	ILLINOIS CARRION FLOWER
SOLCAE	7	Solidago caesia	3	FACU	Nt P-Forb	BLUESTEM GOLDENROD
SOLFLE	6	Solidago flexicaulis	3	FACU	Nt P-Forb	BROAD-LEAVED GOLDENROD
SOLGIG	4	Solidago gigantea	-3	FACW	Nt P-Forb	LATE GOLDENROD
SOLJUN	3	Solidago juncea	5	UPL	Nt P-Forb	EARLY GOLDENROD
SOLNEM	3	Solidago nemoralis	5	UPL	Nt P-Forb	OLD-FIELD GOLDENROD
SOLSPE	7	Solidago speciosa	5	UPL	Nt P-Forb	SHOWY GOLDENROD
STATRI	5	Staphylea trifolia	0	FAC	Nt Shrub	BLADDERNUT
SYMCOR	5	Symphyotrichum cordifolium	5	UPL	Nt P-Forb	HEART-LEAVED ASTER
SYMDRU	4	Symphyotrichum drummondii	3	FACU	Nt P-Forb	DRUMMOND'S ASTER
SYMLAT	3	Symphyotrichum lateriflorum	-2	FACW-	Nt P-Forb	SIDE-FLOWERING ASTER
SYMSHO	6	Symphyotrichum shortii	5	UPL	Nt P-Forb	SHORT'S ASTER
SYMURO	4	Symphyotrichum urophyllum	5	UPL	Nt P-Forb	ARROW-LEAVED ASTER
TAEINT	7	Taenidia integerrima	5	UPL	Nt P-Forb	YELLOW PIMPERNEL
THADIO	7	Thalictrum dioicum	2	FACU+	Nt P-Forb	EARLY MEADOW RUE
THAEAR	7	Thaspium barbinode	5	UPL	Nt P-Forb	HAIRY MEADOW PARSNIP
TILAMA	5	Tilia americana v. americana	3	FACU	Nt Tree	AMERICAN LINDEN
TOXRAR	1	Toxicodendron radicans s. radicans	3	FACU	Nt W-Vine	POISON IVY
TRASUB	4	Tradescantia subaspera	5	UPL	Nt P-Forb	BROAD-LEAVED SPIDERWORT
TRIAUA	5	Triosteum aurantiacum	5	UPL	Nt P-Forb	EARLY HORSE GENTIAN
ULMAME	3	Ulmus americana	-2	FACW-	Nt Tree	AMERICAN ELM
ULMPUM	0	ULMUS PUMILA	5	UPL	Ad Tree	SIBERIAN ELM
ULMRUB	3	Ulmus rubra	0	FAC	Nt Tree	SLIPPERY ELM
UVUGRA	7	Uvularia grandiflora	5	UPL	Nt P-Forb	LARGE-FLOWER BELLWORT
VERALT	3	Verbesina alternifolia	-3	FACW	Nt P-Forb	WINGSTEM
VIBACE	8	Viburnum acerifolium	5	UPL	Nt Shrub	MAPLE-LEAVED ARROWWOOD
VIBLEN	5	Viburnum lentago	-1	FAC+	Nt Shrub	NANNYBERRY
VIBPRU	4	Viburnum prunifolium	3	FACU	Nt Shrub	BLACK HAW
VIOPAA	5	Viola palmata	5	UPL	Nt P-Forb	CLEFT VIOLET
VIOSOR	1	Viola sororia	1	FAC-	Nt P-Forb	WOOLLY BLUE VIOLET
VITAES	4	Vitis aestivalis	3	FACU	Nt W-Vine	SUMMER GRAPE
VITRIP	1	Vitis riparia	-2	FACW-	Nt W-Vine	RIVERBANK GRAPE
ZIZAPT	10	Zizia aptera	3	FACU	Nt P-Forb	HEART-LEAVED MEADOW PARSNIP

	Species		Mean C		Index		Potential	
	Native	Total	Native	Total	Native	Total		
Veteran's Woods	128	135	4.4	4.2	50	48	60	Morainic Bluff and Prairie
Wright Wildlife Corridor Woods	111	115	4.3	4.1	45	44	55	Morainic Bluff and Prairie
Happy Hollow	173	183	4.5	4.2	59	57	72	Tributary Ravines and Marshes
Arvin Woods and Marshes	180	187	4.4	4.3	60	59	71	Tributary Ravines
Martell Forest, Ravines	141	146	4.2	4.1	50	49	60	Tributary Ravines
I-65/43 Woods Nature Preserve	83	88	4.2	3.8	38	37	47	Tributary Ravines
Clegg Gardens	77	85	4.2	3.9	37	35	46	Tributary Ravine and Prairie
Murdock Woods	79	94	3.4	2.9	30	28	39	Tributary Bluff and Bottom
Prophet's Rock Woods	74	79	3.5	3.2	30	29	37	Tributary Bluff
*Spring Run at Prophet's town	128	150	3.3	2.8	37	34	37	Spring Run
*Sand Savanna, Prophet's Town	111	131	3.4	2.8	35	33	35	Sand Savanna
*Thinned Sandy Woods, Prophet's Town State Park	77	82	3	2.9	27	26	27	Sand Savanna
Granville Sand Barrens	55	74	2.8	2.1	21	18	28	Sand Prairie
Museum of Prophet's Town Restoration	35	42	3.6	3	22	20	28	Prairie Restoration
Battleground Park	16	29	1.2	0.7	5	4	8	Park
*Indian Mounds Bluffs and Springs	125	135	4.1	3.8	46	44	46	Outwash Bluffs and Springs
*Gravelly Bluffs and Seeps at Battleground	179	228	3.6	2.8	48	43	48	Outwash Bluffs and Springs
Tippecanoe County Amphitheater Woods	116	125	3.8	3.5	40	39	50	Outwash Bluffs
*Gravelly Bluff Woods, Prophet's Town State Park	96	103	3.6	3.3	35	34	35	Outwash Bluffs
Wabash Heritage Trail, Battleground	39	44	3.5	3.1	22	21	27	Outwash Bluffs
Right Bluff and Bottom of Barnett Creek, at Rt. 225	90	99	3.4	3.1	32	31	40	Morainic Upland Woods with depressions
McCormick Woods	89	92	4.4	4.3	42	41	50	Morainic Upland Woods
Horticulture Park	48	52	3.7	3.4	26	25	32	Morainic Upland Woods
Michaud-Sinninger Nature Preserve	95	104	3.2	2.9	31	30	39	Morainic Upland Woods
Celery Bog Lowlands	106	117	2.4	2.2	25	24	31	Morainic Lowland
Ross Preserve	160	165	4.3	4.1	54	53	65	Morainic Bluffs and Seeps
Ross Hills Camp	118	120	4.2	4.2	46	46	54	Morainic Bluffs and Seeps
Wabash Valley Hospital Bluffs	108	112	4	3.8	42	41	50	Morainic Bluffs and Seeps
Ross Hills Park	118	122	3.9	3.8	42	42	51	Morainic Bluffs and Seeps
Flint Creek Fen	83	83	5.3	5.3	49	49	57	Minerotrophic Fen
*Prophet's Town Fen	169	196	4.2	3.6	55	51	55	Minerotrophic Fen
Hoffman Mesophytic Swamp	130	135	4.7	4.6	54	53	65	Mesophytic Swamp and Forest
*Battleground Marsh	63	82	2.9	2.2	23	20	23	Marsh
Rt. 25 Wetland at Americus	29	34	2.3	2	13	12	16	Marsh
Prophet's Rock Marsh	11	12	1.7	1.6	6	6	7	Marsh
Lookout Point TNC	93	97	4.1	4	41	40	48	Hill Prairie
Wea Prairie INP	45	56	3.7	3.3	26	24	33	Hill Prairie
*Flood Plain Woods, Prophet's Town	51	58	2.9	2.6	21	20	21	Floodplain Woods
Tapawingo Park	54	81	1.6	1.1	12	10	17	Floodplain Woods
Old Field, Lafayette	16	40	0.9	0.4	4	2	7	
Lawn	0	6	0	0	0	0	0	

**Summary of Floristic Quality Assessments of Key Areas Along the Wabash**  
**Rational follows Swink & Wilhelm (1994), with Indiana Coefficients of Conservatism**