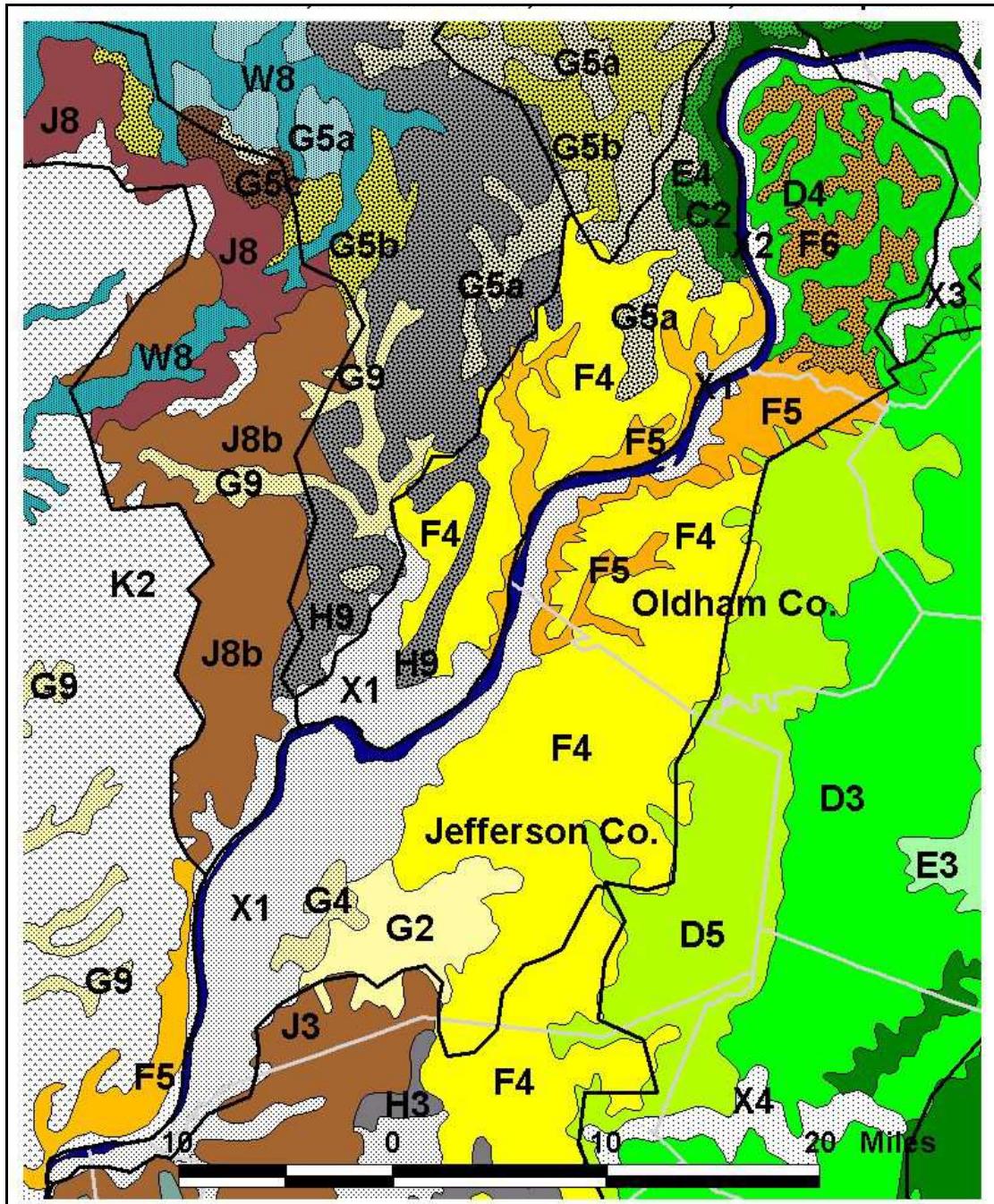


# The Falls-of-Ohio Region

Natural History and Prospects for Conservation

Notes by Julian Campbell ([bluegrasswoodland.com](http://bluegrasswoodland.com))





## Map of the Falls-of-Ohio Region

This is a provisional map based on the soil associations of STATSGO (USDA 2006). The Falls region is shown here with black line, centered on the dolomitic geology (F: yellow or orange) plus broader lowlands of the Ohio River (X,G).

- C = Eden Shale Hills (deep green) [middle Ordovician geology]
- D = Western Bluegrass [upper Ordovician geology]
- E = Illinoian Till Plain
- F = Dolomitic Plains and Hills [mostly Silurian geology]
- G = Louisville Lowlands etc. [also varied transitions to the Knobs and high terraces draining from glacial till]
- H = Black Shale Knobs [mostly Devonian geology]
- J = Mixed Knobs [Miss./Dev.]
- K = Karst Plain [Mississippian]
- X = Floodplains [Quaternary]

# **The Falls-of-Ohio Region**

## **Natural History and Prospects for Conservation**

**Core counties**

**Kentucky: Jefferson, Oldham and Trimble**

**Indiana: Floyd, Clark and Jefferson**

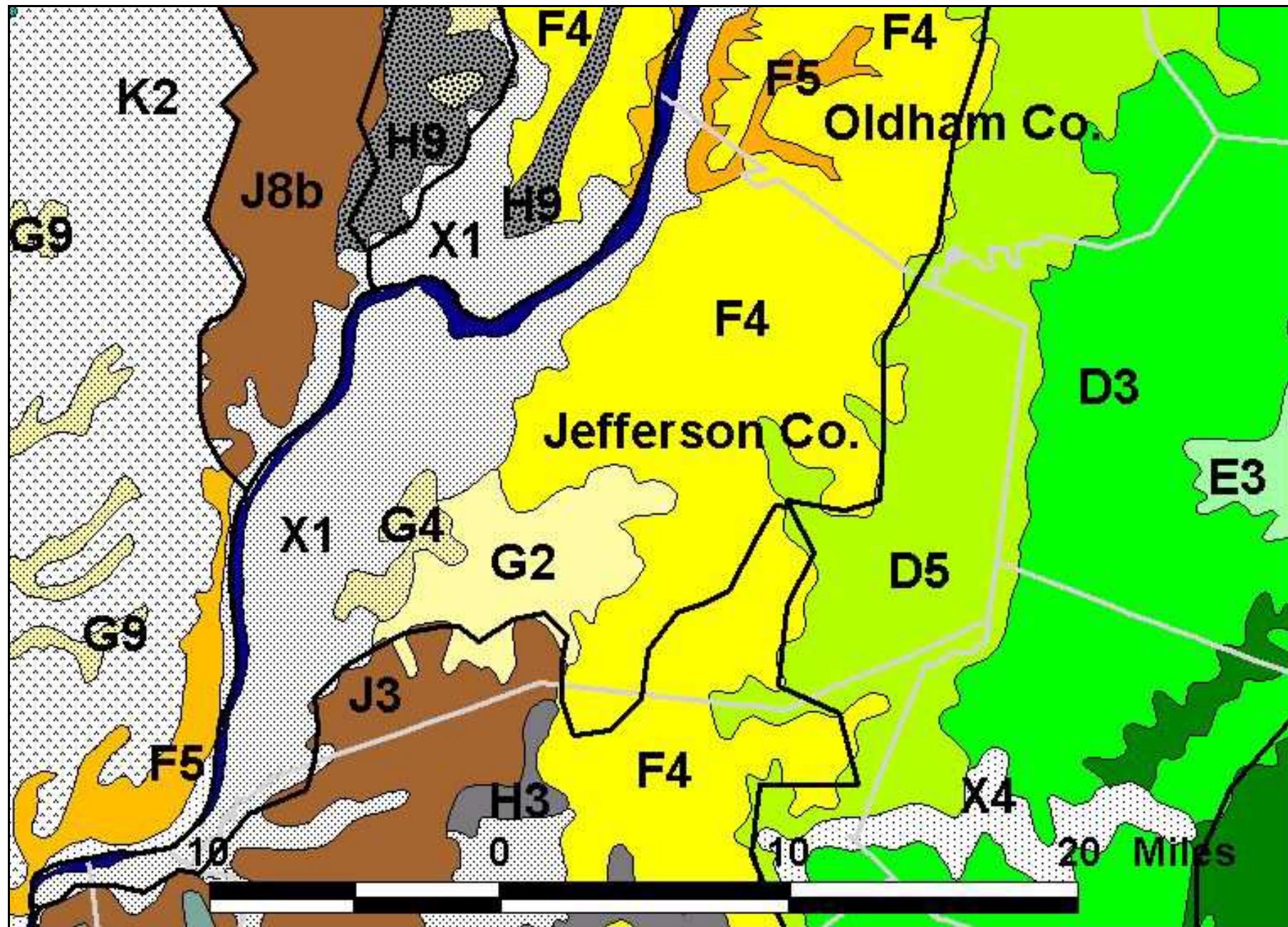
**Initial notes on Jefferson County assembled by Julian Campbell,  
Sep. 2013, in preparation for a local team to advance the concept.**

Bluegrass Woodland Restoration Center

3525 Willowood Road, Lexington, KY 40517

[www.bluegrasswoodland.com](http://www.bluegrasswoodland.com); go to “Bluegrass+” page.

Email [julian.campbell@twc.com](mailto:julian.campbell@twc.com); telephone 859-229-7711



Falls-of-Ohio Region: close-up of Jefferson Co., where the region includes most X1, G2 & F4.

## **PROPOSAL: Flora, Vegetation, and Wilderness Remnants in Jefferson Co., Kentucky: Inventory, Teaching, Conservation and Restoration for the Twenty-first Century.**

**Rationale.** Before its settlement during 1770-1800, the Louisville area included a complex mosaic of native vegetation that reflected varied geology, accumulated influences of the Ohio River and glaciers to the north, plus more recent effects of animals and Native American populations. Virtually all of this mosaic has now been removed or radically altered, except in some of the peripheral hills. Much information about the original landscape can be gleaned from historical sources, museum collections and modern remnants, but there has been little previous effort to bring data together for a complete picture. It is critical for good conservation in this challenging environment that we gain a better concept of the original vegetation. Conservation and future restoration should be measured, in part, against this natural history.

**Goal.** This project will provide an account of the original landscape that can be easily understood and applied for public information, for planning conservation of the better remnants, and for a technical baseline to be used in future research and assessment. The presentation will be usable by the lay person, and especially schools or colleges, but thoroughly supported by technical appendices that include species lists, vegetation maps, environmental data, and bibliographic references.

**Projects.** (1) A local herbarium (DHL) will be re-established in Jefferson Co., Kentucky, to work in partnership with Indiana University Southeast (JEF). (2) An educational program will be initiated for regular field work in the region. (3) A booklet will be assembled, together with associated slide-presentations, maps, and databases; it will have the following sections.

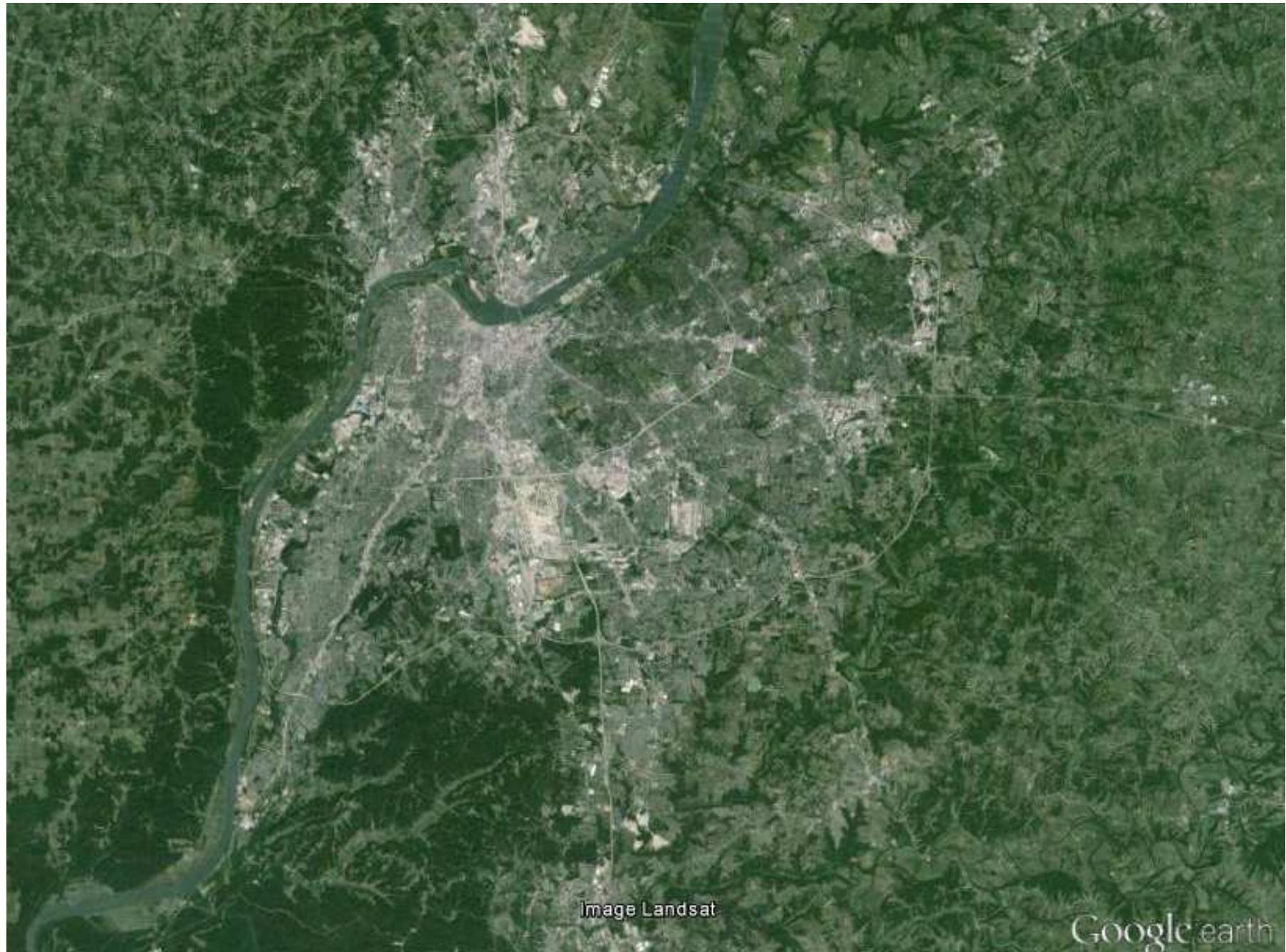


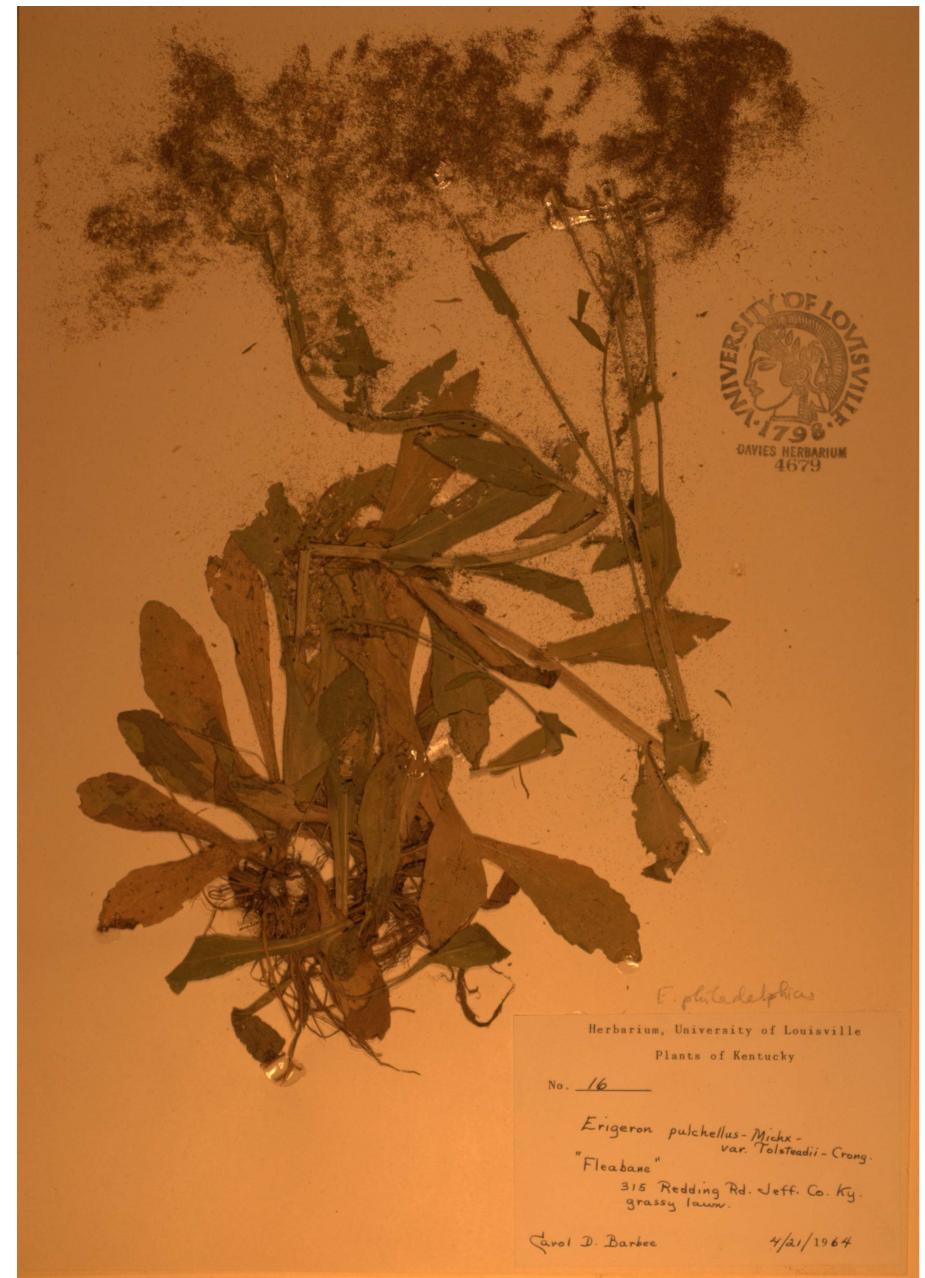
Image Landsat

Google earth

- **Summary.** This will present the overall documented botanical patterns for the region, together with recommendations for education, research, conservation and restoration.
- **Text.** This will present a description of the original landscape, based on information about the original native flora, vegetation, soils, geology and other natural environmental patterns in the area. It will be illustrated with numerous figures, photographs, diagrams and tables. The sequence of topics will allow easy application for educational use at the high school level or above. Technical information will be worked into conclusions about the original natural features, and into recommendations for planning, implementing and assessing conservation or restoration in the future. The significant past and future role of natural areas, parks and greenways will be emphasized.
- **Maps.** These will include locations for selected species of interest, historical features of the original vegetation, details of current remnants, an estimated reconstruction of the original vegetation, overlays of hydrology, topography, soils and geology, plus summarized effects of settlement and development. Material will be printed and supplied in electronic (GIS) format.
- **Technical Appendices.** These will include lists of native and alien plant species, with notes on their distribution, special notes on rare, endangered and locally extinct species, technical details of the vegetation types, historical and archaeological information, analysis of relationships between vegetation and environment, and various applications for conservation planning.
- **Bibliography.** This will be comprehensive, drawing on all available biological sources in the academic and popular literature, plus significant historical sources, making special use of the Filson Club's library.



**Schedule and Requested Funding.** This project can be accomplished within 12-24 months during 2014-2016, for \$10,000 to \$100,000, depending on the level of detail and presentation. I am interested to discuss the various options with potential supporters. Subsequent pages outline some modular components to complete and extend the basic interests outlined above.



Examples of specimens destroyed by cigar beetles at the University of Louisville's herbarium.

## **Project 1. Herbarium Recovery: re-establishment of the botanical base for Jefferson Co.**

This proposal is being developed in partnership with Patricia Haragan and Jeff Masters.

**Goal.** To continue salvage of the University of Louisville's herbarium and re-establish a well-maintained collection for botanical research, education, outreach, and identification services in the flora and vegetation of Jefferson County.

**Rationale.** Herbaria are organized 'libraries' of dried plant specimens, mounted and filed within compartmentalized metal cases. They are essential for botanists to identify species (or do other taxonomic work), to preserve data on flora and vegetation in various localities (including historical data on species now extinct from the region), and for many aspects of botanical teaching and research.

Although the University built up a herbarium during 1930-1980, maintenance became difficult due to shifting institutional priorities in research at local and national levels. After 1990, the herbarium was located next to the Archaeological Collection in the Transportation complex on Floyd Street. Salvage began with volunteered work of JC during Jan to Apr of 2007, dealing with problems of climate control, insect damage (mostly from 'cigar beetles'), refiling old loans and teaching materials. Most specimens—including a complete set of records from Jefferson County—have been transferred to Western Kentucky University (WKU), where a large, secure, regional facility is being developed to serve western Kentucky. However, a largely duplicated set of local collections from Jefferson County (or, in some cases, adjacent counties) has been transferred to the basement at University of Louisville's Department of Biology.

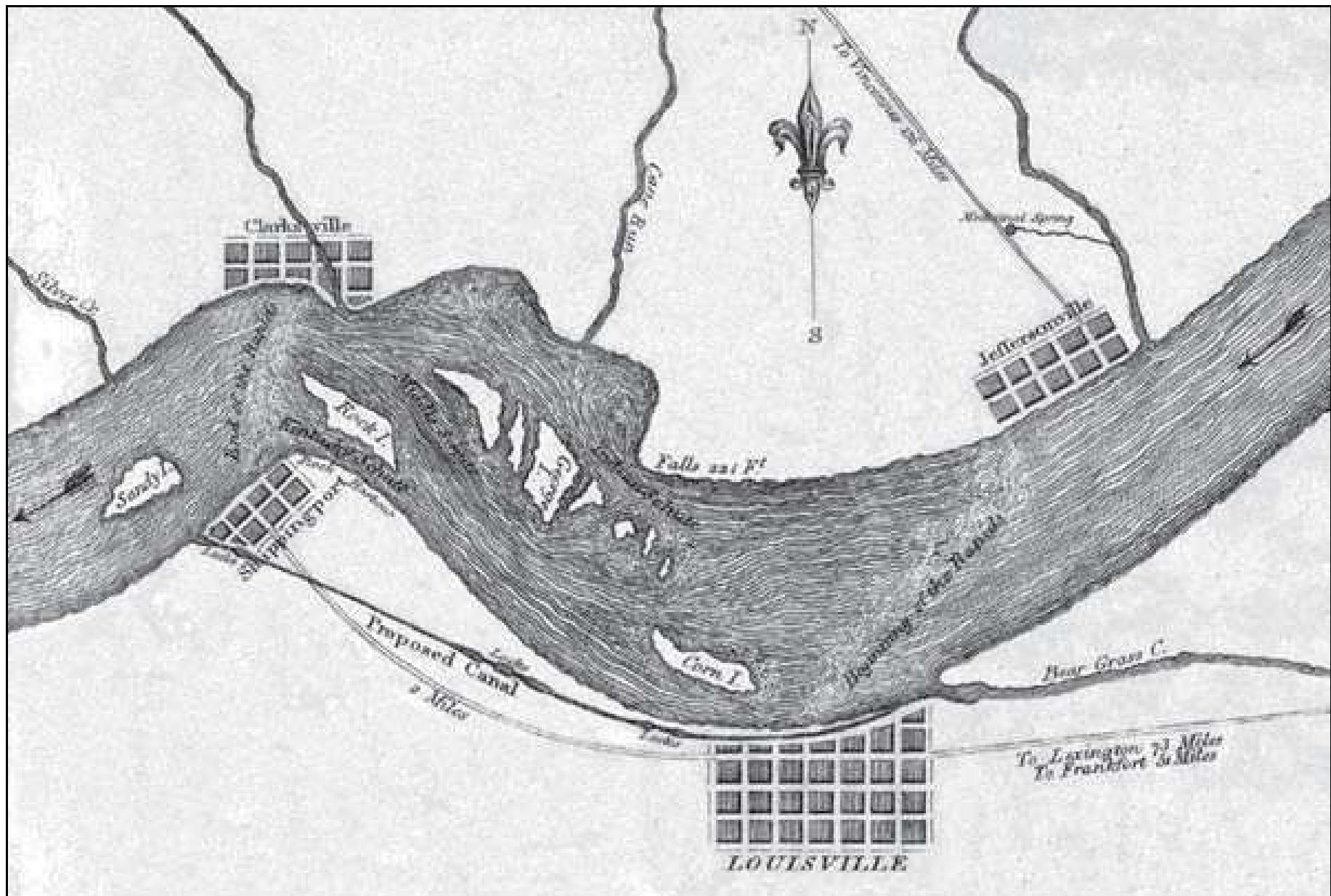


Left: specimen of *Psoralea stipulatum* [= *Orbexilum s.*] at Kew, England; now globally extinct. Right: stigmas of *Tripsacum dactyloides* [= gamagrass or beargrass?]; now locally extinct.

It is now essential that this local collection be well-curated, with complete elimination of further insect damage, accurate filing, and provision of access for users to study the material. *Otherwise the community of Louisville will continue to lose what remains of its heritage in botanical science!*

## Products.

1. **Curation.** The remaining collection of ca. 5000 specimens will be rechecked for insect damage, identifications, and correct filing. All collections will be refrozen to kill insects and eggs. New folders will be provided where necessary. Obvious corrections to identifications will be made.
2. **Species list.** In order to begin databasing the collection, a spread sheet will be established with species names and recorded counties. In future work, all reasonably useful data will be entered.
3. **Taxonomic notes.** Genera or species with difficult taxonomic problems will be highlighted for further work. In some cases, experts in certain taxonomic groups will be asked to provide identifications.
4. **Development of long-term plan.** Matters to be considered include the following items.
  - (a) Best eventual home for the herbarium—does U of L intend to maintain it, or should it be transferred to a dedicated non-profit organization elsewhere in the community?
  - (b) Guidelines for usage—should material be sent on loan?—what rules are appropriate for users, in order to prevent further damage?—what oversight should exist?
  - (c) Securing long-term funding for curation—what grants or income can be generated?



Falls-of-the-Ohio, map ca. 1812 by John Melish (1771–1822). *Psoralea* grew on Rock Island. The mouth of Bear Grass Creek , resting place above the Falls, may have had much *Tripsacum*.

## **Project 2. Development of Field Botany Course for Jefferson Co. and adjacent counties.**

**Rationale.** Although Jefferson County has had a diverse natural heritage of flora and vegetation, the great development of the landscape, plus dwindling institutional interest in research and training in botany, has led to a sorry state of affairs. Within the past 20 years, there has been rather little consistent teaching of local botany at the university or college level, and schools have largely abandoned such work or struggled with only sporadic examples of excellence (e.g., Richard Guetig at Atherton High School). While the usefulness of botanical education is often unclear to students, parents and educational administrators (especially if the discussion is restricted to job-seeking criteria), there is a revival of general environmental interest within the population (especially those older and wiser). Many people would support offering at least some minimal education about the diversity of the plant kingdom that surrounds us. It is reasonable to test these waters by initial trial-runs, inviting teachers, environmental organizations, garden clubs and other sectors of the public who may want to help reconnect our post-modern urban and suburban populations with some fundamental aspects of what plants used to be here, and what could still be conserved, restored, and used for the good of the community.

**Goal.** To offer a series of field trips to examples of different vegetation types in Jefferson County or nearby, where basic training will be offered in identifying plants and understanding their ecology. This program will be highly flexible in the timing of field trips, and in the degree to which they are integrated with deeper education and research. Such extensions would involve classroom instruction, readings, and independent work by the participants.

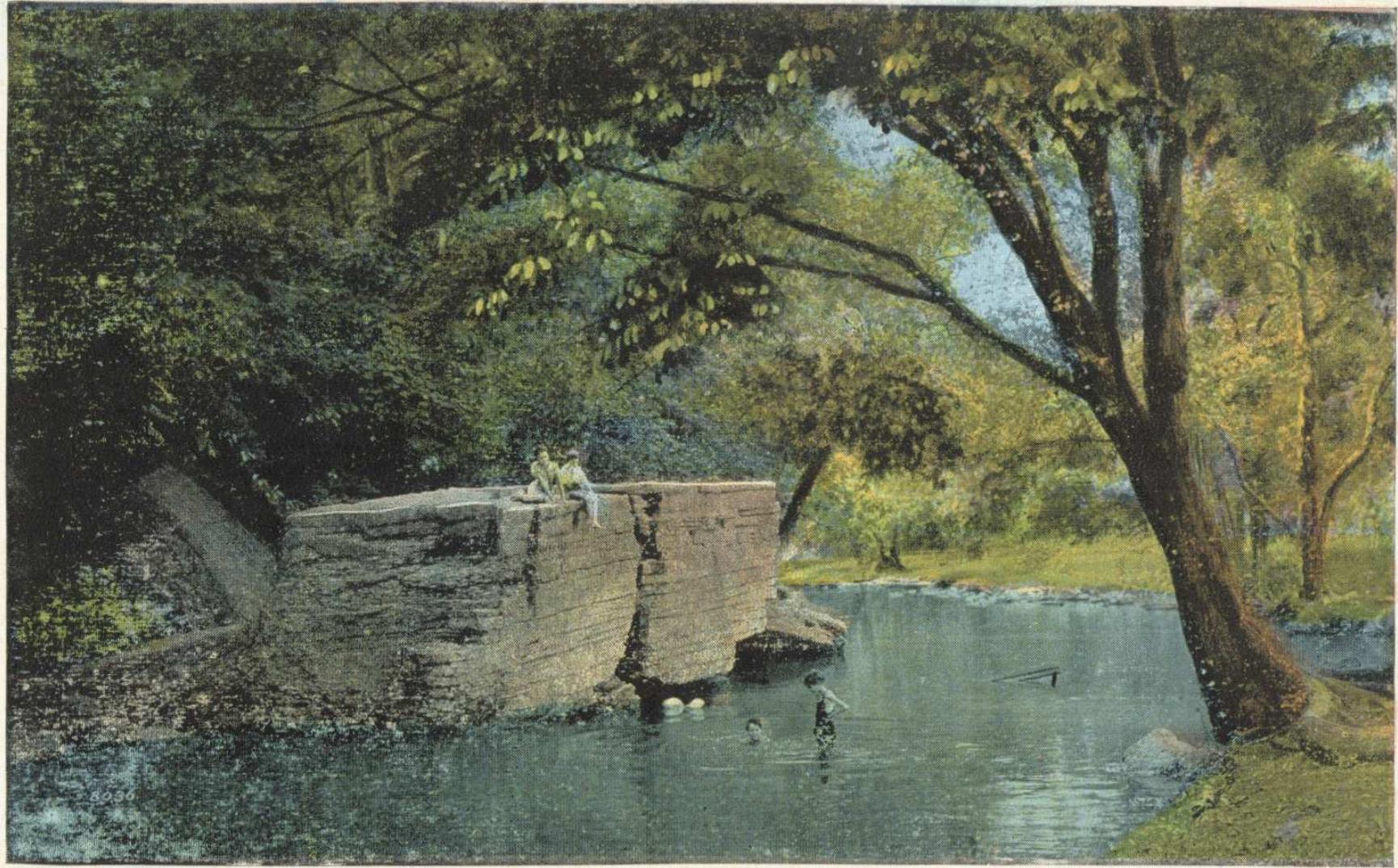


*Phlox pilosa* (prairie phlox): formerly frequent in dry open grassy areas of Jefferson County. It was collected several times for the herbarium during 1947-64, but has now disappeared.

## **Products.**

- 1. Series of field trips in different seasons.** These will be offered through appropriate institutional partners and public media, with a reasonable fee required per participant, contingent on a minimum number signing up (ca. 10 per trip). Primary audiences would include teachers (especially in June-July), selected classes at high school or college level, appropriate professional or amateur associations, societies and clubs, and retired people with interest in continuing education. Four seasonal groups of trips would be offered: spring, summer, fall and winter. Each group would include a wide variety of habitats, and if appropriate they would be organized in cooperation with the local land managers. The basic objectives would be introduce participants to various types of vegetation—with native and alien species; to initiate training in identification of common species and preparation of collections; to develop lists of species for each site and other notes (with potential for independent study); to discuss management issues; and to encourage deeper interest in sites with special scientific or environmental interest.
- 2. Development of supporting written material.** In addition to recommending common reference books (e.g., Ron Jones's 2005 Guide to Plant Life of Kentucky), basic material will be made available for explaining botanical terms, how plants are classified (including evolutionary concepts), distributions of plants within the region, ecological differences between plants, and what can be done for conservation and utilization of various species, vegetation types and potential natural areas.
- 3. Further support for serious students and interested public.** Participants who wish to develop their interests further for educational credit, research projects, or community values (especially those related to conservation), will be able to secure assistance through the following means.

Big Rock, Cherokee Park, Louisville, Ky.



Cherokee Park: combining features of the Westport Hills and Dolomitic Plains. It was established in 1891, to become an essential reminder of the natural world for the city. Several patches of original forest, with some rare species, became incorporated into it.

- (a) A simple plant identification service will be offered, providing information about the species of interest, and, if desired, more information about how to identify the species and how to understand its habits (e.g. weed problems, horticultural uses, conservation needs).
- (b) Special sessions may be scheduled for training and supervised research at herbarium (see Module 1), e.g. for more detailed identification of species and compilation of species lists for particular sites.
- (c) Special trips may be scheduled at particular sites for particular purposes, e.g., rapid assessment by the community of a threatened area, recommendations for native plantings, alien reduction, or other restoration.

**Schedule and requested funding.** During 2014-2015, an initial series of exploratory field trips will be offered, with special attention to institutional partners and discussion of the details for this program. During 2014-2016, the program will be fully established in conjunction with development of materials outlined in ‘Module 3’ below. The leading teacher (or teachers) would be paid at least \$250 per day (or \$30 per hour), from participatory fees or institutional grants.



The Louisville Nature Center at Beargrass Creek, like several other facilities in the county, offers regular instruction on Natural History for the public. More integration would be useful.

## **Project 3. Flora and Vegetation of Jefferson County: baseline for education, conservation and research.**

**Rationale.** During the past 5-10 years, there has been increasing interest by the community in conservation around Louisville and Jefferson County. Much interest has focused on the Floyd's Fork watershed, with its relatively unimpaired water quality, extensive wooded corridors, and potential for a growing parks system in Jefferson County ([floydsfork.org](http://floydsfork.org)). More than a thousand acres of protected land have already been added, and an ambitious plan is in place to secure much more. Many details in this effort remain to be determined, especially as regards the management of vegetation on the protected lands, and their various uses for recreation, education, resource management, ongoing monitoring and research. A comprehensive survey of the flora and vegetation of this area and elsewhere in the county, especially the wooded stream corridors, will be essential for further planning, for public education, and for enhancing the scientific basis of the protected areas. Currently available materials (including various websites) can be greatly improved with more complete technical information, with deeper educational components, and with more interactive utility for long-term research projects in the watershed.

**Goal.** Based on the literature and fresh field work at selected sites, to conduct a survey of flora and vegetation in the county. There will be special attention to wooded stream corridors and protected areas, such as the Floyd's Fork watershed. This information will be presented in accessible formats for planners, educators and scientists working with the project.



Shawnee Park (or nearby): smaller intensively used parks still have potential for native plants.

## **Products.**

- 1. A report will be provided**, together with associated slide-presentation, maps, and databases, including the following sections: summary, text, maps, technical appendices and bibliography. Details will parallel the outline of the ‘umbrella’ proposal for the county (see page one above), and this report would become integrated that overall set of materials for the county. The presentation will be organized primarily according to subsections of the watershed and wooded corridors on different soil associations; then by vegetation type, with species lists appended. Special features such as more mature woodland areas, including older growth, and rare or endangered species will be accurately mapped with GIS. Data will be synthesized in vegetation maps for current remnants, with a projection back to estimated vegetation at the time of settlement.
- 2. A continuing series of monthly field trips** to varied sites in different seasons will be offered for teachers, associated professionals and interested members of the public, in order to discuss concepts for appropriate management and educational use of the more natural areas in the watershed. These trips, together with associated materials provided by the leader, will lay the ground work for a regular program of botanical and ecological education in the watershed. Trials runs can be conducted with selected groups of students, as outlined above ('Module 2').
- 3. Activities will be developed for students and ‘citizen scientists’** from the community to participate in more detailed assessment and monitoring of selected areas within the watershed. Special attention will be given to further botanical survey, forest succession, rare and endangered species, and invasive alien species. Simple databases and GIS will be developed to allow long-term accumulation of information for guiding future plans, public education, and management. Materials will be integrated with the developing local websites.



Floyd's Fork Corridor: generally located between the city and more farmed land to the east

**4. Recommendations will be developed for management** of vegetation on protected areas, ideally in cooperation with agencies of local or state government, foundations or other non-profits, and other land owners committed to conservation and restoration of natural features. Special attention will be given to areas where restoration of native vegetation and recovery of rare or endangered species is desired. Also, the difficult issues involving invasive species will be addressed with an assessment of possible options for control. In selected areas, management with burning or browsing may be suitable and site-specific plans can be developed.

### **Schedule and requested funding.**

A reasonable budget could include the following items.

1. Survey leading to baseline report on flora and vegetation (as above): 2014-2016; \$20K.
2. Series of 12 field trips in 2016, with associated educational materials: \$20K.
3. Development of activities for ‘citizen scientists’: ca. \$5-10K, depending on interests.
4. Cooperative management planning: ca \$5-10K, depending on mutual interests.

**Total:** \$40-50,000; mostly for time of contractor/director, plus minor amounts for travel, computing and printing.



View of Louisville from Iroquois Park, on an outlying knob at the south side of the region

## **PROVISIONAL APPENDED MATERIALS**

These materials include a outline of the eventual report on flora and vegetation of the region, plus varied notes on land type associations (subsections of the region), vegetation types and species lists.

Although much of this document focuses on Jefferson County, the larger “Falls-of-Ohio Region” should become a broader focus in the future. It will be important to develop partnerships with plants-people in Indiana so that we can together study and improve conservation of natural resources in this complex little region.

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## INTRODUCTION

### **From Primaeval Crossing to Urban Wilderness—Does Louisville have Room for Botany?**

In the early scramble for settlement of what became Jefferson County, during 1773-1784, not much was written about the land—nor much survives—other than hurried notes related to hunts, fights, surveys, claims, sales, and the so-called “improvements” of those who came from the east. We do know that the Falls of the Ohio River was a primary cause for the location of this city, which came to play a pivotal role in taming of the Ohio Valley—the “Western Territory” at that time. The Falls had been an important crossing for “buffaloes” (bison), and it lies in a geologically varied region that connects with several lines of hills and with various valleys or plains, to the north, south, east and west. With the evidence of Natural History that remains today, we can inquire into that past environment, and ask: what does remain in a viable condition; what should we restore for the future; and can we provide more room for native species in the current push to increase parkland for the region?

While good reasons for conservation of nature have been widely discussed among educated people in this community, we have neglected an important means towards that end: *botany*. I have been visiting Louisville regularly for 30 years, primarily to visit Max Medley, who worked for 15 years at the University, getting his doctorate in 1993 and amassing the largest collection of Kentucky plants ever—almost 20,000 dried specimens for incorporating into the botanical museums that we call “herbaria.” During a small “golden age” during 1950-1970, the University of Louisville led botanical programs in the central Ohio Valley. Unfortunately, the study of local botany—in Jefferson County or indeed elsewhere in the

region—dwindled at the University after 1970-90. Several other graduate students came and went, sometimes making significant collections as well; Harry Woodward, now deceased, has also left many unprocessed boxes.

Currently, I am now working with a few people in Louisville and Bowling Green to secure the bulk of these important collections, transferring them to a safer environment at Western Kentucky University. Unfortunately, there was insufficient care for the collections at Louisville; insect-pests moved into the herbarium or associated storage during the 1990s and much was damaged. Also, for many years there had been little or no refiling of collections taken out for teaching or loans—can you imagine a library maintained like that? However, enough duplicated material remains to retain a good small collection in Louisville, if we can get secure institutional support. We are now actively looking for the best way to reestablish some minimal ability in local botany, with a good new little herbarium as the hub, for identifying and documenting species in the county or nearby.

Why is this important? Botany offers an essential avenue towards understanding variation in our natural world. The many hundred species of native vascular species recorded from Jefferson County (about 1200 in total) are distributed across a wide range of terrestrial and aquatic habitats. These plants indicate ecological conditions around them, and they provide deeper insight to biological processes, at least for those of us obsessed with floristic functions and virtues. Many species are rare or endangered, at least within this region. The current tendency for society to be disconnected from nature is particularly evident in botanical terms. Basic knowledge of plants, gardening, weeds, uses for food, medicine and diverse structural

purposes, has been radically reduced. The pioneers advanced into a paradise of natural perfection, which we have gradually lost.

So we are searching for ways to support botany in the community. We are still looking for appropriate institutional support—there has to be a well-maintained herbarium for reference in the identification of species. As well as space, which the University can still offer, there needs to be a staff person for maintaining the collection and for connecting it to applications in education, research and service across the community. While grants and endowments would be appropriate for this effort, we also want to explore the potential for income from the community for botanical services. Such services could include educational programs at various levels in the system, support for diverse types of research, botanical surveys of particular areas, and integration of botanical knowledge into overall planning for development of conservation or restoration.

It is somewhat tragic that we have come to this point—to recognize that Louisville has almost lost its botanical heritage. But we feel that a revival is possible. Please contact me if you want to become part of this effort. The attached pages provide more detail for several modular components that need to be developed.



## **Appendices**

**Provisional notes on ecological regions, natural history,  
conservation and restoration in Jefferson County  
and similar parts of adjacent counties**

## Appendix One

# Selected Historical Quotes on Vegetation in the Louisville Area

**Lewis Evans. 1755 [1766, 1776].** General Map of the Middle British Colonies, in America. Engraved by James Turner, Philadelphia. Other editions include: Lewis Evans and Thomas Pownall. 1776. Map of the Middle British Colonies in North America, with Pownall's 1776 Addition. Printed by Act of Parliament for J. Almon, London, England. Reproduced [at least 1766 version] in: L.A. Brown. 1958. Early Maps of the Ohio Valley [check details].

The 1755 edition shows “Rotten Cr. or Bear Grass C.” for what is now called Beargrass Creek, just above the Falls of the Ohio River. This is the first written record of the creek. Rothert (1927) proposed that *Yucca filamentosa* was the origin of Bear Grass. However, that species is not native here, and the most likely plant was probably gama-grass (*Tripsacum dactyloides*) or some other large graminoid by the river, located at the harbor for canoes that was formed by the mouth of the creek.

**Fincastle Survey Book. 1773-74.** [Earliest surveys in Kentucky, as recorded for “Fincastle County” of Virginia.] Virginia Court House, Washington County, Virginia. Official copies are filed with the Land Office of Kentucky; see also bound photocopies at the Museum of Kentucky History, Frankfort.

Only a few selected quotations are provided here; complete analysis will eventually be undertaken in a separate project.

Page 167 [in original book; see also printing in Filson Quarterly, January 1973, p. 17]: 1773 survey of 2000 acres for John Connolly above the Falls of the Ohio River; thanks are due to Neal Hammon (pers. comm.) for this reference, who notes that six years later this land was escheated by Virginia and used to form the newly chartered town of Louisville; NH indicates that this was the first survey ever recorded by Virginia west of the Appalachian and Allegheny Mountains.

“...on the south side of the Ohio River opposite to the Falls, Beginning at a Box Elder & Hickory on the River Bank & runnith thence down the River S 83 W 35 poles to the mouth of Bear Grass Creek...”

Page 58: survey of John Floyd, June 7<sup>th</sup>, 1774; to check... (thanks for Neal Hammon for reference).

Two 1000 acre tracts on Middle or Sinking fork of Beargrass Creek with one corner “on a hillside near the creek by a Buffalo Ford.”

**Thomas Hanson. 1774.** Journal, April 7-August 9. Copied in 1855 for Lyman C. Draper’s manuscripts: 24CC. Printed as pages 110-133 in: R.G. Thwaites & L.P. Kellogg. 1905. Documentary History of Dunmore’s War. Wisconsin Historical Society. Democrat Printring Co., Madison, Wisconsin.

p. 123 [in 1905 printing]: May 24<sup>th</sup>, along the Ohio River two days below the Kentucky River, probably in what became Oldham Co.

“Mr. Floyd went to the top of the hill from the River & surveyed a tract of land which is good and well timbered & watered.”

p. 126: June 12<sup>th</sup>, towards Bullitt's Lick, near what became Shepherdsville, from the northeast, perhaps starting near what became Fern Creek (on US 31E), in southern Jefferson and northern Bullitt Cos.

"We packd up our alls & marched for Salt Lick near Salt River, 12 miles bearing to the south west. We passed a large body of good land well watered & well timbered."

p. 127: June 16<sup>th</sup>, along the north fork of Salt River, probably in what became western or central Spencer Co.

"We travelled 25 miles, the land good for nothing."

p. 128: June 22<sup>nd</sup>, in the northern part of the Salt River drainage, probably in what became southern Shelby Co.

"The land is good & well watered & timbered."

**Court Records. 1779-80.** Commissioners certificates and other materials filed with the Fayette County Court. Selected material transcribed and printed in: Samuel M. Wilson. 1923. The First Land Court of Kentucky, 1779-1780. Proceedings of the 22<sup>nd</sup> Annual Meeting of the Kentucky State Bar Association. Reprinted in the Register of the Kentucky State Historical Society, Frankfort. Vol. 21, 164 pages.

These include many references to features of tracts surveyed during about 1774-1779; they be searched more thoroughly in further work. See especially, Wilson's (1923) transcriptions, notes on place names and other matters. Some of Wilson's notes on selected **place names** (p. 69-86)

have special interest, and are repeated here with his numbers and parenthetic cross-references. Those included here provide some insight to vegetation, if it is presumed that these place names represented unusual features on the landscape. They do seem to emphasize features of more open or younger woodland. Note the virtual absence of many common trees in place names of the central Bluegrass: ash, elm, hickory, oak, sugar-tree.

“46. “The Vineyard,” on one of the South Forks of Brashears Creek, the waters of Salt River. (P. 98.) (Property of the heirs of Daniel Goodman.)”

Interpretation. This was west of Taylorsville (Spencer Co.).

“117. “A Large Meadow,” about six or seven miles, near a southwest course, from the Falls of Ohio. (P. 248.) (Property of Benjamin Roberts, Junior.)”

Interpretation. Presumably, this was the large bottom west of US 60 & 31W, between Shively and Valley Station; much further investigation into the botanical history here is needed. Was this meadow maintained by flooding, beaver, browsing or burning or all of the above? Was it similar to the “meadows” further up the Ohio River, noted by several people (Ohio, West Virginia and Pennsylvania)?

“129. “A Large Cane Bottom.” on the south side of the Rolling Fork of Salt River, about five miles below the mouth of Pottenger’s Creek. (P. 324.) (Property of the heirs of Eli Garrard.)”

Interpretation. Pottinger’s Creek joins the river at New Haven (on US 31E). One of the largest bottoms anywhere along the river lies about 5-10 air miles northwest of New Haven. Alternatively, this bottom was the smaller one to the northeast of Lyon (on Ky. Route 52), about 2-3 air miles or 4-5 river miles from New Haven.

**Colonel William Fleming. 1779-83.** Journals. In N.D. Mereness (ed). 1916. Travels in the American Colonies. The MacMillan Co., New York.

p. 618-655: Journal in Kentucky from Nov. 10, 1779, to May 27<sup>th</sup>, 1780.

1779, Nov. 10<sup>th</sup>: from Harrodsburg to Brashear's Station [Shepherdsville]

"We kild the buffaloes... we marked [marched] about three miles over short broken hills and then fell into a buffalos path thit run on a ridge dividing the waters of the Town [fork] from Chaplains fork [West Fork of Salt River]—we went through some very good upland with water but too beachy [with beech trees]. Our march this day [was] 10 miles."

1779, Nov. 11<sup>th</sup>

"set out early [and] in 4 miles fell on the Town Fork [East Fork of Salt River]—went through beach bottoms, on the river each side, kild a buffalo, crossed by the mouth of Bucheers Creek [Brashears Creek or perhaps 12 miles lower]—shot an elk a three year old 4 feet high, so poor we could not use any of it. Kild a buffalo cow very fat, but so old her horns wrinkled from the top down. Our march about 8 miles went along a buffalo path crossed the river several times—went through some rich bottoms... we came on to Bullet's Creek 4 miles further [from Brashear's Station] over very flat oak land—our march 16 miles..."

1779, Nov. 13<sup>th</sup>: from "Flat Lick" [also known as Bullitt's Lick, by modern Sheperdsville] to Falls of the Ohio.

“on the road to the Flat Lick we went up some rising hills that had earth rich in saltpeter. Pine trees grew on the top of them—the first pine I met with in this country—we went through some fine level oak land but scarce of water met with—none but at the Fish Pool 8 miles from the Lick...”

1779, Nov. 14<sup>th</sup>: at Louisville or nearby.

“the land round the town is not near so rich as about Harrodsburg and upwards, there is little cane and that small about this place...”

1779, Nov. 25<sup>th</sup>-29<sup>th</sup>: returning from Brashear’s Station [Sheperdsville] to Harrodsburg.

“we went up the Salt River for two miles on a buffalo path... fell on a creek that emptied into Chaplains Fork of Salt River over bad beach [beech] knobs... We lost three of our company. One went after a buffalo... Our journey after we left Chaplains Fork was over steep short bush hills and short knobs and very brushy... we kild numbers of deer, buffalo, raccoons and turkeys on our way from Falls and saw bears...”

1780, May 27<sup>th</sup>: surveying on Beargrass Creek near Louisville.

(1) “Warrant for 1000 acres on the waters of Goose, Beargrass Creeks beginning at a sugar tree, ash, elm and buckeye on the side of a hill corner to Wm Christians land, thence N. 53° E. 400 poles crossing the creek to a sugar tree, thence So. 37° E. 400 poles crossing the creek to two sugar trees on Col. Christians land, and along the same crossing the creek twice N. 37° W. 400 poles to the beginning.”

(2) "Settlement and preemption Assigt of Jas. Ross on the head waters of a smaller branch that empties into the Ohio near the upper end of the 3 Iland [perhaps Three-mile Island], thence with Griffins East line to the branches of Harrods Creek for quantity."

"The buffalo lick in No 2 is a water lick on the So. side of the lick..." [This reference is unclear; other surveys are noted in the journal here.]

p. 661-674: Journal in Kentucky from Jan 4<sup>th</sup> to April 22<sup>nd</sup>, 1783.

1783, Jan. 8<sup>th</sup>: at Louisville.

"...we found the place almost deserted of inhabitants, the few left depending chiefly on the garrison, neither being provided with corn or forriage or other necessities, nor cane near the place."

1783, Jan. 16<sup>th</sup>: at Louisville.

"We rode down to the lower end of the Falls, rode into Rock Island and several others, where we picked up many petrified substances. Walnut in different degrees of petrefaction, buffalo dung turned to a perfect stone, goose dung turned to stone, some partly petrified whilst some of the same remaining in its natural state, petrified roots of trees and a petrified buffalo horn which unfortunately broke in three pieces separating it from the rock [with further details supplied, some of these items were probably true Devonian fossils not recent deposits]... I was informed the Oionn [pecan] or Illinois nut grows near the Falls and above Beargrass—it is a species of the hickory [or] the cotton tree [cottonwood], neither of which I saw..."

1783, Jan. 17<sup>th</sup>: at Louisville.

“The inhabitants tan leather with beach [beech], they likewise find sugar tree bark will answer.—Blue ash, a species of the white ash and called so from the bark tinging water of that colour, grows to be a large tree as does the prickly ash [probably *Zanthoxylum americanum*], the white ash and the cotton tree [cottonwood].—The soil after crossing Salt River alters much from what is in Lincoln and Fayette, in general being mixed with sand and of a lighter colour, and more inclined to beach [beech]...”

**John Floyd. 1780.** Letters. Included in Draper Manuscripts (see below under Draper, 1843-1851): 17CC, p. 120-187 [?].

p. 120 [in Draper 17CC]: written from Beargrass Creek, in what became eastern Jefferson Co.  
“19<sup>th</sup> Jan 1780... it is certainly an uncommon winter as the cane seems to be all dead by the hard frosts.”

**Anonymous. 1780.** Letter from “Harrardsburgh, January ye 30<sup>th</sup>, 1780” [sources to be checked]. Printed in The Filson Club History Quarterly 50: 370-371.

Describing settlement on Bear Grass Creek near Louisville at that time.

“I have made considerable purchases of land which I am induced to do from the grate value those lands must shortly be. I am now owner of 2800 acres of land on Bear Grass with in four miles of the Falls of Ohio which is as rich land can be & perfectly level on which I have several never failing springs & the most butyfull places to build on, with the gratest quantity of fine timber, the greater part of which is popular, which grow there in grate plenty & to a most innormous size. The other groath is chiefly buck eye with walnut & cherry. I think it is rich

enough & I am confident will be worth more money than any lands in this country. (Colo. Todd offered me two acres of the best Elk Horn land for one on Bear Grass.) I have another tract on Mulbury which was my choice of all the land within 20 miles of the Falls (some were excepted.) This contains 1400 As. level & rich situate 8 miles from good navigation on Salt River & Twelve from near the mouth of Kentucky.—This is extremely valuable. I have now Sir discribed you the lands—shall proceede to inform you of the prises I have given for them— Beargrass cost me 6200£ pounds 3800£ pounds to be payd next Ocr. & 1400 in Ocr. 1781.—& Mulbury I am to give a negro wench & child & a warrant for 400 acres..."

Interpretation. The Bear Grass lands may have been around the northwest end of Poplar Level Road (Ky. Route 864), which leads to Beargrass Creek State Nature Preserve and the Louisville Zoo. Mulberry Creek is in Shelby Co., on the northeast side of Shelbyville. Neal Hammon (pers. comm.) suggests that the author of this letter may have been Culbertson Bullitt, son of Col. Bullitt, or an associate of his.

**William Peyton. 1781.** Surveys for Boone family transcribed in: W.R. Jillson. 1942. Squire Boone, 1744-1815. The Filson Club History Quarterly Vol. 16 (p. 159 etc.). Details will be checked in relation to general assembly and mapping of original surveys with Neal Hammon.

Mar. 8<sup>th</sup>: witness-trees extracted from surveys on Clear Creek, about 2.5 miles northeast of Shelbyville.

(1) large white oak, buckeye and hickory—honey locust, small walnut, wht. thorn, ironwood and small hickory—two sugar-trees, mulberry and hickory—two small sugartrees and a mulberry.

- (2) large white oak, buckeye and hickory—elm, ironwood, hickory and white oak—hickory, elm and ironwood; white oak and buckeye—sugartree and ash and white oak.
- (3) honey locust, small walnut and white thorn, ironwood and small hickory—hoopwood and sugar tree growing from one root and two buckeye—honey locust, walnut and buckeye—hickory, elm and ironwood—elm, ironwood, hickory and white oak—large white oak, buckeye and hickory.

**Nicholas Meriwether's surveyors. 1783-85.** [Surveys for N.M. on Bear Grass Creek.] Papers in the Filson Historical Society, Louisville, Kentucky. Filed under MSS C M.

Two original surveys are for land on “Beargrass Creek” with notes on trees extracted as follows.

- (1) 1783, December 15<sup>th</sup>: “on the head of the South fork of Beargrass... honey locust, buckeye & sugartree... dogwood, poplar & elm... ash & two beeches... three beeches...”
- (2) 1785, August 29<sup>th</sup>: “on South Fork of Bear Grass Creek... large forked ash... beech, elm & ash... walnut and beeches... two poplars and cherry tree and elm...”

**Kentucky Gazette. 1787-1800.** [Selected material from its earliest years.] Published by John Bradford, Lexington, Kentucky. Material of historical interest was also reworked into: Bradford (1826-29); see below.

This was the first newspaper in Kentucky. Although virtually no information about timber, vegetation or other associated subjects is presented, the following selection of notices provides some picture of the decreasing interactions with Indians as settlement became solidified.

Evidently, these were among the last of the raids by Shawnee or others in the central Bluegrass; in other regions, raids by the Cherokee, especially, may have continued some for some years longer.

1793, April 6<sup>th</sup>: short reports about Indians attacking near Hazel Patch (probably Laurel Co.), Slate Creek (probably Montgomery Co.), Beech Fork (probably Nelson Co.), Man's Lick (Bullitt Co.), and Eastin's mill (Jefferson Co.); to be transcribed...

1793, April 20<sup>th</sup>: reports of fighting with Indians on the waters of Paint Creek (tributary of Scioto River in southeast Ohio), Rolling Fork (probably Nelson Co.), Hardin's Settlement (Hardin Co.), and the Ohio River between Louisville and Salt River; to be transcribed...

**Needham Parry. 1794.** Diary of trip westward in 1794. Copied by John D. Shane. Filed under 14CC (p. 1-9) with the Draper Manuscripts at the Archives of the Wisconsin Historical Society, Madison. Printed in: L. Beckner (ed). 1948. John D. Shane's copy of Needham Parry's Diary of Trip Westward in 1794. The Filson Club History Quarterly 22: 227-247.

p. 235 [in the 1948 printing]: June 14<sup>th</sup>, at Benjamin Hewes [Hughes] station, between Shelbyville and Beargrass Creek.

“At this place I called to feed my horse, and was informed that on this place, about one-fourth of a mile of his house, there was a family murdered by the Indians just before sun-down, the 23<sup>rd</sup> day of the 5<sup>th</sup> month 1794. And this man where I now am, has militia draughted to guard him.”

p. 245 [footnote]: June 15<sup>th</sup>, at Shelbyville.

“...I was dissuaded very much from going this trip, [as] it was counted very dangerous. I met some bacon lying in the road—2 pieces—just as if it might have been dropped there. I made a sort of halt, but when I thought of what I had heard of the Indian [de]coys, I turned and went on...”

p. 235: June 15<sup>th</sup>, at Beargrass Creek, west of Louisville in Jefferson Co.

“The land here is very fine on this Creek, and the water good, but on some of the most pleasant situations the timber is chiefly beech with scarcely as much of other timber as will fence it. Yet six poplars, growing among the beach, have been known to make 2400 rails.”

p. 235, June 16<sup>th</sup>: from the Shelbyville area to Bardstown and beyond.

“Started early, and crossed Floyd’s fork lower down than I did before, and then crossed Salt River into Nelson County, and rode 8 miles to Coxes Creek [now US 31E & 150]. The land for some distance about Floyd’s fork is not more than third rate, and a good deal hilly, and continued so for a number of miles. Then came to rather better land, timbered with oak and poplar [still on US31E]. Came to Bardstown, County town for Nelson County, and after I passed Bardstown, I came to the heaviest timbered land I had seen in Kentucky, which last[ed] almost to the Beach-fork [low knobs along US 150]. The timber on this land was poplar, oak, and hickory, and very large chestnut; which was the whole chestnut I saw in Kentucky, except for a little on the knobs [perhaps later near Bourbon Furnace].”

p. 236: June 17<sup>th</sup>, from Springfield (Washington Co.) to Danville (now Boyle Co.).

“About 5 miles from this town [Springfield], I crossed the waters of the Beach-fork of Salt River again, and then crossed a ridge of excellent land, and was told that all along the waters of this stream, the land was good [now southeast Washington Co. and northeast Marion Co.]. The timber is beach, mixed with poplars, ash, walnut, and cherry tree. And then I went through some second rate land, again, for a few miles, then came to excellent land, which lasted to Danville.”

**Ben Cassedy. 1852.** Casseday’s History of Louisville. The History of Louisville from its Earliest Settlement till the Year 1852. Hull and Brother, Louisville, Kentucky.

p. 33: quoting “Marshall, Doddridge, others...” about the early settlement of Louisville during 1775-85; sources to be checked.

“The food was of the most wholesome and nutritive kind. The richest milk, the finest butter, and best meat that ever delighted man’s palate, were here eaten with relish which health and labor only know. These were shared by friend and stranger in every cabin with profuse hospitality. Hats were made of the native fur; and the buffalo wool [was] employed in the composition of cloth, as was also the bark of the wild nettle [perhaps *Urtica gracilis*]. There was some paper money in the country, which had not depreciated one half nor even a fourth as much as it had at the seat of government. If there was any gold or silver its circulation was suppressed. The price of a beaver was five hundred dollars.”

**Henry M[c]’Murtrie. 1819.** Sketches of Louisville and Its Environs, including, among a great variety of miscellaneous matter, a Florula Louisvillensis... S. Penn, Louisville, Kentucky.

[There is evidence that Rafinesque contributed the list of flora; see notes in Mabel Slack's (1941) thesis, citing Western Review and Miscellaneous Magazine, Vol. 2, p. 90.]

p. 2-3: general notes on the Ohio Valley but with some focus on the Louisville area.

"The whole of this tract, with few exceptions, is extremely similar in its general appearance whether it be viewed, with the inquisitive and searching eye of the Geognost or the more superficial glance of the common traveller. The one [the Geognost], every where, beholds the same formation characterized by the nature and position of the Rock, the paucity of its metallic productions, the abundance of its saline ones, and the existence of those alluvial deposits, the *debris* of former ages, which together, with other circumstances, carry the most inestable conviction to his mind, that he is now treading on a spot once occupied by the deep and placid waters of a Lake bounded by the Knobs [in Kentucky] and Silver Creek Hills [in Indiana], then doubtless much higher than at present."

"The other [the common traveller] gazes with delight upon the number of beautiful streams, which interrupting his passage, are every where seen rolling their tribute to the Ocean, bearing on their foaming bosoms, the products of the lovely country through which they pass. If accident or design should lead him into the surrounding high country, how is he struck with admiration at the sight of meadows containing from five, to a hundred thousand acres lying on one uninterrupted level, covered with a profusion of Flora's most favorite gifts, and composed of the richest soil that any people under the canopy of Heaven can boast of! He sees that nothing more is requisite to prepare the Prairie\* for the reception of that seed which it is sure to return him a thousand fold, than to burn up the grass and set in his plow... [M'Murtrie's footnote as follows:] \*The name by which these extensive natural meadows are generally

known in the Western Country. In the state of Kentucky alone it is calculated there are upwards of half a million acres of this description, which are now rapidly settling.”

p. 8: on the Kentucky River.

“...it runs in a northwesterly direction to the Ohio, through a country remarkable for the fertility of its soil, and the sublimity of the scenery exhibited on the banks of its water courses, some of which are from four to five hundred feet in height, crowned with groves of red Cedar, which furnish ample supplies of that valuable timber to the Louisville market.”

p. 10: on Bear-Grass [Creek].

“It enters the Ohio, (to which for the last half mile it runs nearly parallel) opposite Louisville, leaving between it and the river, an elevated slip of land, covered with large trees, that affords a delightful and shady promenade to the citizens during the heats of summer.”

p. 53-54: under the heading “Soil”.

“Perhaps no city in the universe is supported by a more fertile and productive soil than Louisville. The lands throughout the country generally are well timbered, the first rate, being covered with walnut, mulberry, locust, beech, sugar-tree, cherry, papaw, buckeye, elm, poplar and grape-vines, the two latter of which attain a most enormous size. I have frequently met with grape-vines, in the Beargrass settlement, measuring 36 inches in circumference, and as to the poplar it is proverbially gigantic. From 6 to 10 feet is the usual diameter of these trees, and of the sycamore, one individual of which is said to be still standing in the interior, into whose hollow, a gentleman assured me, he had stepped with a measured rod twenty feet long, which, grasping by its middle he could turn in every direction. If in addition to this we consider the

thickness of sound wood on each side of the tree, necessary to sustain its tremendous and superincumbent weight, we may have some idea of this monarch of the western forest.”

“The second rate lands produce dogwood, oak, hickory and some sugar-trees; the third rate, nothing but blackjack oak and fir [probably scrub pine, *Pinus virginiana*]; red cedar is found on the banks of the rivers and creeks, and white pine only in the mountains.” [Subsequent notes on crop production has interest for agricultural history.]

p. 58-61: notes on animals.

“The elk, deer, bear, buffaloe, beaver, and otter, together with the various species of squirrel, and other smaller animals common to the American forest, were found in great plenty near this place, by the early settlers, particularly buffaloes, which have often been seen at the licks, to which they resorted in search of salt, in droves of from seven to eight thousand. The roads opened by these animals, in their progress through the woods, may be reckoned among the natural curiosities of the state, being generally wide enough for a carriage or waggon way, in which the trees, shrubs, &c. are all trampled down, and destroyed by the irresistible impetus of the mighty phalanx. Of the vast numbers of these animals, that once covered the prairies of Kentucky, not one is to be found at the present hour—an enemy to civilized man, they retire before his approaches, and continue to preserve their independence in the heart of the wilderness.”

“The same remark may be partially applied to the elk and beaver; the latter of which abounded within a few miles of the town, and, were we permitted to judge from the remains of their *fortifications*, we should pronounce them to have been in innumerable possessors of the soil

from time immemorial. Every pond, creek, and river, exhibits some traces of them, but their metropolis appears to have been situated about four miles east of Louisville, where, among a variety of extensive dams, I measured one whose length is fifteen hundred feet, heighth eight, thickness at the base fourteen, with a talus equal to  $45^{\circ}$ . extending to the top... I have been informed by a respectable old gentleman who was among the earlier settlers, that, when he first arrived here, the beaver was sometimes to be seen in the neighbourhood, and that at that time the great dam spoken of, was at least fourteen feet high,—a prodigious monument of the industry and skill of this social little animal..."

"Deer inhabit the barrens, and are sometimes seen within a few miles of the town, while bears keep themselves buried in the woods at a distance. Foxes occasionally disturb the farmer's hen roosts, and wolves now and then pick up a stray sheep, they are however neither very numerous nor fierce."

**James R. Robertson. 1836.** Letter from Madison County, Indiana, to Messrs. Ross and Alexander Carsons, Washington County, Tennessee. Papers in Filson Historical Society, Louisville, Kentucky. Filed under MSS C R.

General description of north-central Kentucky, based on travels to Lexington and Louisville areas.

"I have seen many strange and interesting things since I left the "Cloud capt hills and barren vales of Lick Creek" [perhaps Tennessee]. After passing the Cumberland mountains, I arrived in old Kentucky which is the most wealthy, and highly cultivated country I ever saw. A great portion of this country is reserved for pastureing. It is no uncommon thing to see from 50 to

100 miles in one pasture; the whole country is fenced in. I have rode for 50 miles without being out of a lane... This country is mostly a perfect level, just rolling enough to relieve the prospect from dull monotony. There are numerous towns and villages here; it is nothing uncommon to be in sight of two towns at the same time. This is a fine grazing country, grass springs up spontaneously. Horses and cows keep very fast in the forests. The growth is sugartree, buckeye, beech, hickory, elms, poplar, walnut, cherry, oak, ash, hackberry, spicewood, &c. Cows and hogs are numerous, and that interesting little creature the Goat is very common..." [Details of livestock follow.]

**Lyman C. Draper (ed.) and John D. Shane. 1842-51.** Draper Manuscripts in the Archives of the Wisconsin Historical Society, Madison, Wisconsin. [Shane conducted many interviews for Draper during the 1840s but it is not always clear if Shane or Draper was the source of the writing, and the exact dates are sometimes obscure; to be checked further in some cases.]

11CC, p. 226...[?]: **Stephen Shelton**, perhaps interviewed in the 1840s [check details]. Transcribed in N.E. Hammon. 1978. Early Louisville and the Beargrass Stations. The Filson Club History Quarterly 52:147-165.

p. 226: describing Louisville in 1779.

"At Louisville was the greatest world of cane I ever saw. Some I know [was] full 30 feet high. All the level places were covered with this cane. Someone had cleared a little place and planted corn and pumpkins when we got there, but I now do not know who it was. It was on the hill, right back of the fort. They've got it all level now. There was a pond right back of the fort. It is all filled up now... After we got back from the campaign we cleared all around the fort that open flat below town, except on a little quad of cane."

**Otto A. Rothert. 1927.** Origin of the names Beargrass Creek, the Point and Thruston Square. The Filson Club History Quarterly 2: 19-21.

Interpretation. Rothert claims that Beargrass refers to *Yucca filamentosa*, which he states “was plentiful in the Virginia colonies.” However, there is no evidence of such association of local history. Moreover, current botanical information indicates that this species is not native to Kentucky. Other reasonable interpretations of “bear grass” must be sought, perhaps gama-grass (*Tripsacum dactyloides*) or big blue stem (*Andropogon gerardii*); see also notes above under Walker (1749-50, April 12th). According to several sources, cane was certainly abundant in some parts of the Beargrass Creek area at the time of settlement. It is possible that big blue stem occurred locally along scoured banks of the river and even some drier uplands disturbed by burning and browsing. Rothbert dismisses the idea that beargrass was a corruption of the French “La Barre Grosse Crique” for “The Big Bar Creek”; this has been suggested since the creek’s mouth is just above the Falls of the Ohio River. There appears to be no documentary evidence for this French origin, but neither is there for the *Yucca* theory.

**Ben Cassedy. 1852.** Casseday’s History of Louisville. The History of Louisville from its Earliest Settlement till the Year 1852. Hull and Brother, Louisville, Kentucky.

p. 33: quoting “Marshall, Doddridge, others...” about the early settlement of Louisville during 1775-85; sources to be checked.

“The food was of the most wholesome and nutritive kind. The richest milk, the finest butter, and best meat that ever delighted man’s palate, were here eaten with relish which health and

labor only know. These were shared by friend and stranger in every cabin with profuse hospitality. Hats were made of the native fur; and the buffalo wool [was] employed in the composition of cloth, as was also the bark of the wild nettle [perhaps *Urtica gracilis*]. There was some paper money in the country, which had not depreciated one half nor even a fourth as much as it had at the seat of government. If there was any gold or silver its circulation was suppressed. The price of a beaver was five hundred dollars."

Interpretation. The price of \$500 for a beaver pelt needs to be checked; was it a tenth that?

**George R. Wilson and Gayle Thornbrough. 1940.** The Buffalo Trace. Indiana Historical Society, Indianapolis.

p. 249-261: based on the original surveys during 1805-07, these authors have mapped this major buffalo trace across southern Indiana. This trace crossed the Ohio River at the Falls and connected with traces from the Louisville area east to the Frankfort area then across the Blue Licks, etc., and also south to the Shepherdsville area (especially Bullitt's Lick) and beyond. Further historical work is still needed across east-central states, in order to improve our understanding of these animals' migration patterns.

[This book needs further study; also potential ideas about dispersal of *Solidago shortii*, found only along this trace or nearby—Blue Licks—Falls of Ohio—Blue River.]

**Robert E. McDowell. 1956.** Bullitt's Lick. The related saltworks and settlements. Filson Club History Quarterly 30: 241-267.

This paper provides a very useful map of the area around Bullitt's Lick and Mann's Lick, with topographic and historical features of 1773-1830. Both of these licks became important for producing salt in the pioneer era. McDowell has provided copious footnotes for original sources to be checked.

McDowell (p. 244): "Bullitt's Lick was the hub of a great system of buffalo roads leading into it from all directions like the spokes of a wheel." It was one of a cluster of licks around what became Shepherdsville, in Bullitt Co. These included Blue Lick, Iron's Lick, Dry Lick, Long Lick and Parakeet Lick (or McGee's Lick). Downstream from Bullitt's Lick Run, "Fort Nonsense" was by the crossing of "a great buffalo road" that led from the Salt River here to Long Lick and what became Ky. Route 245. "Brashear's Fort" was at the mouth of Floyd's Fork by a "buffalo ford" across Floyd's Fork (leading along Ky. Route 44).

The route mapped by Filson (1784) from the Falls to Bardstown crossed Town Fork of Salt River, with a ferry, near "Bashare's" then ran near what are now called Cedar Creek (and "Pine Creek Barrens"), to Cedar Grove, to Ky. Route 1604, joining Ky. Route 245 at Deatsville. However, McDowell notes another popular route after 1781, when the ferry was installed: "Now they could ferry across at Dowdall's [Station] and take another buffalo path that went up the south side of Salt River, ford Cox's Creek at the mouth of Rocky Run, and go up the east fork of Cox's Creek to Harrodsburg" [along Ky. Routes 480 to 48, etc.]. This "other buffalo path" from Bullitt's Lick probably crossed the Salt River near what became the "Shepherdsville Ford" and then up "Buffalo Run" (a small tributary still called this on modern maps) into what became Ky. Route 480.

McDowell (p. 260): “About a half mile above Shepherdsville was a pretty little lick on the north bank of Salt River known variously as McGree’s Lick or the Parakeet Lick from the flocks of these colorful birds that frequented the place... [this became] the famous Paroquette Springs, one of the most fashionable spas of the old south.”

Mann’s Lick was on the south side of “Oldham’s Pond”—the larger of the “Fish Ponds” marked on Filson’s (1784) map. “Ash Pond” was adjacent to the east. Remnants of the two largest ponds, now swampy woods and fields, are located in Jefferson Co. along the L&N Railroad south of the airport (Standiford Field) and north of the Gene Snyder Freeway. Several other smaller “ponds” or “pools” are marked in this watershed: called “Pond Creek” by Filson (1784), but now known as “Mill Creek” downstream (with much artificial modification), with upstream branches, Fern Creek and Fish Pool Creek.

McDowell (p. 254): “From Mann’s Lick on the north to Long Lick on the south, the forest was falling before the wood choppers. The furnaces devoured wood at a fearsome rate. The sound of ax strokes filled the air... Bullitt’s Lick must have taken on something of the nature of a boom town—a startling, unbelievable sight to the hunters in from the deep woods, to the settlers from their lonely clearings... As wood grew scarce about the licks, the furnaces were moved further and further off. The water was conveyed to them through wooden pipes made from gum or sassafras logs... Some of these strings of pipes went on for miles... Poor Benjamin Stansberry, who owned 500 acres close to Bullitt’s Lick, testified that the saltmakers had broken his arm when he had tried to stop them from cutting and carrying off his wood. Moreover, they added insult to injury, reviling and abusing him whenever he was forced to go into the lick on business...”

## **Appendix Two: Ecological Regions and Soil Associations**

### **1. WESTERN BLUEGRASS REGION (part of the Bluegrass Region).**

**Subsections:** loosely defined as follows.

- (a) Western Bluegrass Plains [mostly E3 on map]; further east, especially in Shelby Co.
- (b) Western Bluegrass Hills [mostly D3 on map]; just to the east of Jefferson Co.
- (c) Western Bluegrass Ravines [mostly D4 on map]; to the north along the Ohio River; merges with Bedford Hills.
- (d) Western Bluegrass-Dolomitic transition [mostly D5 on map]; mostly in eastern Jefferson and Oldham Cos.

Details are not elaborated here; (d) is the only subsection in Jefferson Co.

**Counties:** Washington, Bullitt, Spencer, Shelby, Jefferson, Oldham (and some fringes of Trimble).

**Geology:** Upper Ordovician limestones and calcareous shales, with some dolomitic rocks to the west; also, widespread loess deposit on uplands (forming at least 30-50% of upper soil horizons on gentler slopes).

**Topography:** rolling to moderately dissected plain, the uplands mostly at 800-900 ft a.s.l. and broader stream bottoms mostly at 500-600 ft a.s.l.

**Typical Soils:** mostly hapludalfs (Faywood, Lowell, Beasley) on slopes and rolling uplands; locally fragiudalfs (Nicholson, Lawrence) on upland depressions.

**Original Forests:** compared to Eastern Bluegrass, mesic sites had more beech/tulip tree; much less cane.

**Original Openings:** perhaps locally some areas with ash-elm/walnut-buckeye woodland, bur oak and cane were relatively thin in the canopy; some large buffalo trails crossed this region.

**Notable Plants:** none known.

**Significant Sites:** much of Floyd's Fork Corridor; Fisherman's Park.

## **2. FALLS-OF-THE-OHIO REGION (part of the Knobs Region, with adjacent plains).**

**Subsections:** treated here as follows, but not clearly demarcated in some areas.

(a) Bedford Hills; (b) Westport Bluffs; (c) Louisville-LaGrange Plain; (d) Louisville Lowlands.

### **2a. BEDFORD HILLS** [mostly mixture of D4 and F6 on map].

Mostly in Trimble County; characterized by uplands with remnants of Illinoian Glacial Till on top of dolomitic paleosols [F6 on map], plus side slopes similar to the Western Bluegrass Ravines [D4 on map]; not detailed further here.

### **2b. WESTPORT HILLS** [mostly mixture of F5 and F4 on map].

**Geology:** (Upper Ordovician), Silurian and Devonian; limestone, dolomite, calcareous shale and non-calcareous shale, with much loess on flatter ground; Quaternary alluvium on Ohio River bottomland.

**Topography:** slightly to highly dissected area between Lagrange Plain and Ohio River, including lower Harrods Creek; relatively narrow strip of Ohio River bottomland.

**Typical Soils:** hapludalfs (Caneyville, Beasley) on slopes [F5 on map]; paleudalf (Crider) and fragiudalf (Nicholson) on less dissected uplands [F4 on map]; locally perhaps dystrochrepts (Colyer, Rockcastle) on non-calcareous uplands; Elk-Weinback-Melvin on Ohio River bottom.

**Original Forest:** slopes with much sugar maple/northern red oak, beech/tulip on mesic sites, or locally chinquapin oak-blue ash (red cedar) on drier sites; uplands with white oak-hickory on drier sites, or locally swampy flatwoods (with pin oak, swamp white oak) on wetter sites; locally chestnut oak/chestnut on drier Devonian shale.

**Original Openings:** no natural sites known, except for depauperate patches of rocky glades on upper transitions to (c).

**Notable Plants:** in mesic forest, *Allium burdickii*, ?*Arabis shortii*, *Dryopteris goldiana*, *D. intermedia*, *Stachys cordata*, *Trifolium stoloniferum* (check field notes); *Oxalis illinoensis* (at Cherokee Park), *Veratrum woodii*; along calcareous outcrops, ?*Carex eburnea*, *Hexalectris spicata* (Cherokee Park), *Perideridia americana* (Cherokee Park), *Pellaea glabella*, ?*Sedum telephioides* (Cherokee Park), ?*Ulmus thomasii*; on non-calcareous uplands, ?*Castanea pumila*.

**Significant Sites:** Harrods Creek Corridor; Little Goose Creek; Goose Creek; Cherokee Park (marginal).

## 2c. LOUISVILLE-LAGRANGE PLAIN [F4 on map].

**Counties:** Oldham, Jefferson (fringes of Bullitt).

**Geology:** Silurian (mostly upper) and Devonian; limestones, calcareous shales and dolomites, locally non-calcareous shale; plus much loess on flatter ground.

**Topography:** mostly a rolling plain; dissected with short rocky slopes and thin outcrops along larger streams.

**Typical Soils:** paleudalf (Crider) and fragiudalf (Nicholson) on less dissected plain; hapludalf (Caneyville) on slopes.

**Original Forest:** probably much beech/tulip tree and sugar maple/northern red oak on mesic sites; locally ash/elm and walnut/buckeye (and perhaps shumard oak/shellbark hickory) on

submesic sites; locally perhaps pin oak/swamp chestnut oak/sweetgum or swamp white oak/green ash on hydric sites.

**Original Openings:** large beaver ponds were present; probably canebrakes in some areas, especially near buffalo traces; possibly small Silurian outcrops with grassy vegetation; occasional thin soil sites are known along roads and on eroded slopes that have native grassy vegetation.

**Notable Plants:**

**Significant Sites and Parks:** Jefferson Freeway Woods; Seneca Park; Beargrass Creek (Louisville Nature Center); Blackacre Preserve; Chenoweth Park (= Charlie Vettiner Park); Algonquin Park.

**2d. LOUISVILLE LOWLANDS [X1 and G2 on map; marginally G4].**

**Subsections:** (a) narrow riparian corridor of current river; (b) general high terrace of river (X1 on map); (c) Scottsburg Lowlands (G2 on map).

**Counties:** Jefferson

**Geology:** Quaternary (and perhaps Pliocene) alluvium [X1]; on the upper terraces, locally enveloping or mixing with Devonian-Mississippian residuum from various shales or other rocks [especially G4], and with loess [especially G2].

**Topography:** Ohio River bottomland and upper terraces, with little dissection.

**Typical Soils:** Elk-Weinback-Melvin association along Ohio River; Belknap-Karnack association on Scottsburg Lowland.

**Original Forest:** more mesic areas probably with much beech/tulip and sugar maple/northern red oak; more active floodplains and wetlands probably with cottonwood/willow, silver

maple/boxelder and ash/elm (locally pecan); swamp oaks/red maple/sweetgum/blackgum on poorly drained areas of backwaters/headwaters.

**Original Openings:** since there was a large buffalo trail crossing the Ohio at the Falls, then fanning into north-central Kentucky, it is likely that extensive grassland and open woodland occurred here due to the animals themselves, and associated human effects.

(1) At the Falls of the Ohio, there was unique vegetation on rocky banks, today perhaps indicated by patches of *Andropogon gerardii*, *Panicum virgatum* (locally abundant) and *Tripsacum dactyloides* (perhaps the “beargrass” of Beargrass Creek); rare species formerly included ?*Carex vesicaria*, *Orbexilum stipulatum* (extinct globally), *Solidago shortii* (extinct locally), etc.; other notes of Max Medley to be incorporated here.

(2) There were large ponds and marshes, covering 1000s of acres, especially on the upper terraces; the botanical features of these openings were never documented properly, but check Kellerman (

(3) On relatively fertile, mesic to subhydric sites, there were probably extensive open woodlands or “meadows” maintained by large ungulates and perhaps fire; these included a “large meadow” of the bottomland near the river 6-7 miles downstream from the Falls (perhaps with *Andropogon*, *Panicum* and *Tripsacum*). Canebrakes probably occurred in some areas transitional to woodland.

(4) Based on a few roadside records of rare grassland species, there may also have been naturally open, grassy areas on subxeric (perhaps sandy to gravelly) soils more prone to fire; rare species included *Elymus canadensis*, *Silphium integrifolium*, etc.

**Notable plants:** old records from grassland remnants include *Elymus canadensis*, *Silphium integrifolium*; from wetlands, *Caltha palustris*, *Hottonia inflata*, *Glyceria pallida*. The Falls of the Ohio was a unique area before settlement, with ?*Carex vesicaria*, *Orbexilum stipulatum* and

*Solidago shortii* on open rocky shores of the river. Note: all of these species appear to have become extinct in this area; the *Orbexilum* appears to be globally extinct.

**Significant Sites and Parks:** (a) Twelve Mile Island, Six Mile Island, Falls-of-Ohio, Shawnee Park, Chickasaw Park; (b) Miles Park, Cane Run Lowlands; (c) Egypt Lane Flatwoods and other remnants to west.

### **3. WESTERN KNOBS & VALLEYS REGION (a part of the Knobs Region).**

**Subsections:** more or less divisible into the following.

(a) Bardstown Plain; (b) Lower Rolling Fork Knobs; (c) Lower Salt River Hills (or northern Muldraugh's Hill).

These all have a minor presence in Jefferson County; the taller southwestern hills in this county belong mostly with (c), based on geology and soils, but their northern and eastern fringes belong with (b).

#### **3a. BARDSTOWN PLAIN [mostly F4 on map].**

**Counties:** Jefferson, Bullitt, Nelson

**Geology:** Upper Ordovician and Silurian; limestone, mostly dolomitic, and dolomitic; some non-calcareous shales at upper levels.

**Topography:** slightly to moderately dissected plain; minor karst development.

**Typical Soils:** paleudalfs (Pembroke/Crider) and fragiudalf (Nicholson) on less dissected plain; hapludalf (Beasley/Shrouds) on slopes; argiudoll (Corydon) on shallow soils.

**Original Forest:** general deep soil plains may have had much tulip tree, southern red oak before settlement; locally mesic ravines with beech/tulip tree, sugar maple/northern red oak; drier, rocky sites with chinquapin oak-shumard oak-ashes, post oak-blackjack oak, and grassy

"dolomite glades" now filled in with much red cedar; locally chestnut oak, Virginia pine on non-calcareous hilltops.

**Original Openings:**

- (1) On deeper/damper upland soils, there are a few remnants of taller grassland with *Andropogon gerardii*, *Desmanthus illinoensis*, *Orbexilum onobrychis*, *Sorghastrum nutans*, *Silphium terebinthinaceum* var. *brauniae*, etc.; rare species include the *Silphium*, ?*Carex crawei*, ?*Lythrum alatum*. Some of these sites are deep soil fringes to the more xeric sites (see below), but the best example is largely separate (Gethsemani Monastery).
- (2) On shallower, subxeric-xeric sites, there are several sites with native grassland and rock outcrops; rare species include *Carex meadii/tetanica*, *Juncus filipendulus*, *Leavenworthia exigua* var. *laciniata* (endemic to this area), *Liatris squarrulosa*, *Spiranthes magnicamporum*, *Sporobolus heterolepis*, *Viola egglestonii*, etc.
- (3) There were some large ungulate licks before settlement (especially Mann's Lick, Bullitt's Lick; check locations; perhaps in transitions to the Devonian bedrock).

**Notable Plants:** in or near dolomitic glades and outcrops, *Aster sericeus*, *Carex crawei*, *C. meadii/tetanica*, ?*C. umbellata*, ?*Cheilanthes feei*, *Dalea* spp., ?*Isoetes melanopoda*, *Juncus filipendulus*, *Leavenworthia exigua* var. *laciniata* (endemic to this area), *Lythrum alatum*, *Nothoscordum bivalve*, *Pellaea glabella*, *Scutellaria leonardii*, *Spiranthes magnicamporum*, *Viola egglestonii*, *V. cf. fimbriatula*.

**Significant Sites:** Lower Floyd's Fork Corridor (including Leavenworthia sites); McNeeley Park.

**2Bb. LOWER ROLLING FORK KNOBS [mostly H3 and I2; some J3].**

**Counties:** Jefferson, Bullitt, Nelson, Washington, Marion.

**Geology:** (Silurian), Devonian, (Lower Mississippian); acid, gray (clay) or black (oil) shales.

**Topography:** broad dissected escarpment with knobby hills.

**Typical Soils:** dystrochrepts (Rockcastle, Colyer) on steeper slopes; hapludult (Trappist/Muse) on gentler slopes.

**Original Forest:** chestnut oak/former oak-chestnut and white oak/oak-hickory on drier slopes; beech/tulip on moister slopes.

**Original Openings:**

(1) There may several small (0.1-10 acre) grassy/rocky openings along black shale slopes (and also overlying siltstone), but these are not well documented; characteristic species include *Silene caroliniana*.

(2) Whether there was also bottomland grasslands, licks, etc., needs to be addressed.

**Significant Sites:** eastern parts of Jefferson Memorial Forest; check Bernheim Forest periphery, etc.

**2Bc. LOWER SALT RIVER HILLS (with northern Muldraugh's Hill)** [mostly J4 and K1; some J3; marginally G4].

**Counties:** (Jefferson) Bullitt, Hardin, Larue, Marion.

**Geology:** (Devonian), Lower (to middle) Mississippian, including Borden Formation (mostly non-calcareous shales and siltstones) and Salem (and perhaps Harrodsburg) Limestone at upper levels; Pliocene and Quaternary terraces along rivers, much probably laid down in glacial lakes.

**Topography:** escarpment (Muldraugh's Hill) and outlying hills (including Jefferson Hill); broad floodplains and terraces along lower Salt River and its lower Rolling Fork; transition to Northern Karst plain at upper levels.

**Typical Soils:** mostly eutrochrept (Garmon) on steep slopes; hapludalf (Caneyville) on moderate slopes; paleudalf (Crider) or paleudult (Frederick) on gentler slopes; Belknap-Karnak (?=McGary-Markland), ?Wheeling-Huntingdon, etc., on bottomland terraces.

**Original Forest:** mostly oak-hickory and oak-chestnut forest, with sugar maple/northern red oak and beech/tulip tree on mesic sites.

**Original Openings:**

- (1) Grassy open woods and "glades" on subxeric-xeric slopes with outcrops of siltstone; rare/conservative species include *Liatris aspera*, *Silphium terebinthinaceum* var. *brauniae*; <search for *Calamagrostis porteri* ssp. *insperata* in woods> <check Eftspan Prairie--or was this Salem Limestone?>
- (2) Grassy open woods and "glades" on subxeric-xeric slopes with shaley Salem Limestone; rare species include *Cypripedium candidum*, *Dalea* spp., *Psoralea tenuifolia* (disappeared?), *Spiranthes magnicamporum* (?), *Viola egglestonii*, etc.

**Notable Plants:** calcareous outcrops and grassland remnants with *Aster sericeus*, *Carex crawei*, ?*C. umbellata*, *Cypripedium candidum* (glades on Salem Limestone), *Dalea* spp., *Nothoscordum bivalve*, *Pellaea glabella*, *Scutellaria leonardii*, *Spiranthes magnicamporum*, *Viola egglestonii*.

**Significant Sites:** northern outliers (G4 on map) are Iroquois Park, Culler Woods, Waverly Hills, Waverly Park; more extensive areas are in Jefferson memorial Forest (J3 on map).

## Appendix Three: Notes on Vegetation Types

These habitat classes are loosely defined in terms of hydrology and overall development of vegetation, from open (stressed or disturbed) to closed (relatively mesic) conditions. Ecologists have employed several descriptive adjectives for habitats based on Greek roots. These words do not have broad consistency in scientific usage, but for Kentucky they can be defined in simple terms as follows.

Aquatic	With soil submerged for most of the year
Hydric	With soil wet and anaerobic for much of the year
Mesic	With neither hydric nor xeric tendencies; oak local or absent
Pyric	With frequent fires greatly influencing the vegetation
Rheic	With force of floods greatly influencing the vegetation
Seral	Changing to more mature or mesic forest unless redisturbed
Subhydric	Intermediate between hydric and mesic
Submesic	Somewhat mesic but modified by stresses or disturbances
Subxeric	Intermediate between xeric and mesic; oak potentially abundant
Xeric	Dry enough to maintain much red cedar or pine or rocky glades
Xerohydric	Usually wet in winter, dry in summer; opposite of mesic

More popular terms closer to traditional usage in floristic manuals are provided in quotation marks below.

Classes 2 and 3 contain hydrophytic vegetation mostly composed of ‘obligate’ wetland species. Classes 1 and 9 contain mixtures or zonations of species from ‘obligate’ to ‘facultative wetland’ to ‘facultative’ species. Classes 4 and 6 contain mostly ‘facultative wetland’ or ‘facultative’ species. Classes 7 and 10 are generally not at all hydric, but can include swales or damp flats with patches of ‘facultative wetland’ or ‘facultative’ species.

Class 12 contains the most xerophytic vegetation. Classes 11 and 10 contain moderately xerophytic vegetation. Classes 1, 7, 8 and 9 contain various mixtures or zonations that can include some moderately xerophytic vegetation. Classes 2, 3, 4, 5 and 6 contain virtually no xerophytic vegetation, except for included microhabitats such as exposed shorelines, occasional rocky ledges, and epiphytic situations.

**Examples:** those provided below come from EcoTech in Louisville Olsmsted Parks Conservancy (1994), and other sources; all are from Jefferson Co. unless coded B (Bullitt Co.); O (Oldham Co.); S (Shelby Co.); W (Washington Co.).

## **1. Rivers and streams, including shrubby/grassy streambanks.**

**Typical sites.** This class of habitat is defined to include the whole non-forested zone along flowing watercourses, but it is usually much changed due to human developments.

**Typical species.** Aquatic plants (*Podostemon*, *Potamogeton*, *Vallisneria*) formerly occurred within relatively unpolluted free-flowing streams, and water-willow (*Justicia americana*) was often abundant in riffles. The banks are temporarily flooded, but often violently so, which tends to prevent complete tree cover. Also, seasonal drought can be severe in sections with coarse sandy, gravelly or rocky substrate, which hinders forest further. Various species of willows (*Salix*) are typically abundant at lower levels, often with much silky dogwood (*Cornus obliqua*). Other examples of characteristic shrubs, locally, include alder (*Alnus serrulata*) in more swampy transitions, and indigo-bush (*Amorpha fruticosa*) along the Ohio River.

**Variants and changes.** Some streams, especially the Ohio River, formerly had complex zonations, from shoals with partly submerged plants, to low lagoons with sedges (e.g., *Carex emoryi*), to exposed substrates with abundant annuals (e.g., *Bidens*, *Persicaria*, *Xanthium*), to more stable shrubby levees, to higher rocky banks and ledges with grasses (especially *Panicum virgatum* & *Andropogon gerardii*, locally *Tripsacum dactyloides* & *Spartina pectinata*) and characteristic forbs (e.g., *Hypericum sphaerocarpon*, *Desmanthus illinoensis*, *Physostegia virginiana*, *Solidago* spp., *Zizia aurea*). Also, wood oats (*Chasmanthium latifolium*), wild ryes (*Elymus*) and other species are characteristic of more shady transitions to adjacent riparian forest. Many rare, uncommon or disjunct species occur in some variants of this class. In general, the vegetation along banks of larger streams is moderately secure from human interferences, but

some variants have been much reduced by impoundment. Aquatic vegetation is probably much reduced in most larger streams and rivers due to pollution and impoundment.

**Status in Jefferson County:** largely destroyed or highly modified; remnants near the falls and perhaps elsewhere along the river.

### **Examples of River Banks**

Falls-of-Ohio: remnants of native vegetation with much *Panicum virgatum*, *Salix* spp., *Amorpha*; old records of *Heteranthera dubia*, *Podostemum ceratophyllum*, *Orbexilum stipulatum*/X, *Sagittaria graminea*, *Solidago shortii*/C=\$ (replanted); recent records of *Vallisneria americana*; Shawnee Park: “riverbank willows”; *Salix nigra*, *S. exigua*; *Polygonum lapathifolium*, *Artemisia annua*, *Chenopodium ambrosioides*, *Solanum* cf. *ptycanthum*.

### **Examples of Smaller Streams**

Cherokee Park: Beargrass Creek; famous for the endemic “Louisville Crayfish” (*Orconectes jeffersoni*); but “the stream suffers from a lack of in-stream habitat diversity—there are few riffles, only very shallow ponds and an inhospitable silt-laden substrate that inhibits insect reproduction in the stream.”

## **2. Lakes and ponds, with associated shrubby/grassy marshes.**

**Typical sites.** This class is defined to include the whole non-forested zone around stagnant water-bodies, but most of this vegetation has been removed. Banks were seasonally or semipermanently flooded, and rarely rocky (except for some artificial impoundments).

**Typical species.** There were probably complex zonations with increasing water depth or flooding frequency. Buttonbush (*Cephalanthus occidentalis*) is typically dominant in the woody fringe around these sites; other shrubby species would include alder (*Alnus serrulata*), black willow (*Salix nigra*), swamp dogwood (*Cornus foemina*). Wetter zones can include locally abundant cattails (*Typha*), grasses (especially *Phragmites*, *Phalaris arundinacea*, *Leersia oryzoides*), sedges and their allies (*Carex*, *Cyperus*, *Scirpus*), knotweeds (especially *Persicaria hydropiperoides*), swamp-loosestrife (*Decodon verticillatus*), and others, grading into duckweeds (Lemnaceae), pondweeds (Naijadaceae, Potamogetonaceae), water-lilies (Nymphaeaceae) and other floating or submerged aquatic vegetation in open water. Mudflats and other exposed shorelines during the drier seasons can become colonized by many annual species (e.g., *Bidens*, *Cyperus*, *Fimbristylis*, *Ipomoea*, *Iva*, *Persicaria*, *Xanthium*).

**Variants and changes.** Many variants probably existed before settlement, and several may have virtually disappeared in some regions, e.g., smaller oxbows, beaver-ponds, seasonally ponded swales, and associated boggy openings. Although there are many artificial or semi-natural areas with this kind of vegetation, there are few good natural examples, except in the lowlands of western regions.

**Status in Jefferson County:** largely destroyed or highly modified; small remnants may remain in wet meadows and woods along the river or in the wetlands south of town; good artificial ponds can start to accumulate considerable diversity after some decades.

## Examples

Cherokee Park: “willow pond” (or “Cherokee Lake”); *Salix nigra* [?]; Slack (1941) listed *Bidens* spp., *Eleocharis obtusa*, *Scirpus lineatus*, *Juncus acuminatus*, *Carex frankii*, *Cyperus strigosus*, *C. ferox* [check syn.], *C. rivularis*, *Spirodela polyrhiza*, *Naias flexilis*, *Potamogeton foliosus*, *Elodea densa*.

Iroquois Park: “Park Road Snail Pond” (or “Iroquois Pond”); *Typha latifolia*, *Elodea cf. densa*, *Myriophyllum cf. spicatum*; large diverse group of aquatic mollusks.

Old Fish Ponds: need to research old floristic records; see McMurtrie (1819), Gunn (1956), Kellerman (1959); check wetland data with Evans, Bryan, Libby, Hartowisz.

### **[3. Cypress/tupelo or other deep swamp forest, with associated open woodland.]**

[These seasonally or semi-permanently flooded sites are concentrated in southwestern regions and probably did not extend up to the Louisville area. But note old obscure references to *Carya illinoensis*, *Gledistia aquatica*.]

### **4. Riparian (“streamside”) forest.**

**Typical sites.** These sites have temporary flooding, scouring and siltation that significantly influence the canopy composition, but with rapid recovery from disturbance.

**Typical species.** Trees are mostly boxelder (*Acer negundo*), silver maple (*A. saccharinum*), sycamore (*Platanus occidentalis*) and cottonwood (*Populus deltoides*, especially on the first river terrace); locally river birch (*Betula nigra*) or more acid/infertile alluvium. Other common trees, including swampy transitions, are sweetgum (*Liquidambar styraciflua*), green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*) and white elm (*Ulmus americana*).

**Variants and changes.** To be described, in terms of soil base-statusd, substrate, flooding history and other disturbance.

**Status in Jefferson County:** this class of forest is still widespread, though often confined to narrow strips.

### **Examples**

Six-Mile Island: 81 acres of undisturbed riparian forest; check with KSNPC for data.

Falls-of-Ohio: check data from Shippingport Island; riparian woods with most diverse heron rookery in KY.

Shawnee Park: “first [river] terrace—cottonwood forest”; *Populus deltoides*, *Platanus*, *Celtis occidentalis*, *Acer negundo*, *A. saccharinum*, *Morus alba*; *Eupatorium rugosum*, *Elymus* sp., *Laportea*, *Verbesina alternifolia*, *Solidago* cf. *altissima*, *Vernonia gigantea*, *Artemesia vulgaris*.

Shawnee Park: “[tributary] ravine forest—silver maple, box elder, sycamore”; *Acer saccharinum*, *A. negundo*, *Platanus*, *Celtis occidentalis*; *Glechoma*, *Elymus*, *Impatiens capensis*, *Geum canadense*, *Aster* cf. *lanceolatus*.

Shawnee Park: “terrace forest—black locust, elms, hackberry, cottonwood” (a transition); *Populus deltoides*, *Ulmus americana*, *U. rubra*, *Robinia*, *Celtis occidentalis*; *Impatiens capensis*, *Viola papilionacea*, *Eupatorium rugosum*, *Elymus* sp., *Polygonum virginianum*.

Cherokee Park: “even-aged bottomland forest—box elder, sycamore, hackberry, elms”; *Acer negundo*, *Platanus*, *Celtis*, *Ulmus rubra*, *U. americana*, (*Salix exigua*), (*Fraxinus pennsylvanica*); *Lonicera maackii*, *Ligustrum* cf. *vulgare* (native shrubs very rare); *Eupatorium rugosum*, *Geum canadense*, *Aster* spp., *Glechoma*.

Cherokee Park: “streambank forest—sycamore, elms, box elder, black walnut” (just a row of trees); *Platanus*, *Ulmus* spp., *Acer negundo*, *Juglans nigra*, *Celtis occidentalis*, *Salix nigra*.

Cherokee Park: Slack (1941) noted possible “virgin timber” in the *Platanus*.

## 5. Mesic forest (“moist woods”).

**Typical sites.** This class can occur on well-drained, temporarily flooded alluvial terraces, on various types of toe slope and upland swale, on some relatively undisturbed uplands with residual soils, and—especially in the modern landscape with restricted woodland—on steeper colluvial slopes, especially slopes with NE-facing aspects. Such sites have little or no hydric, xeric or pyric influence. The forest is fairly continuous, except for streamsides and temporary gaps after trees die.

**Typical species.** Among the most typical trees are sugar maples (*Acer saccharum* and its relatives), basswoods (*Tilia*), buckeyes (*Aesculus*), bitternut hickory (*Carya cordiformis*), beech (*Fagus grandifolia*), and tulip poplar (*Liriodendron tulipifera*). More locally, on acid soils, there are characteristic magnolias (*Magnolia*), birches (especially *Betula lenta*) and hemlock (*Tsuga canadensis*). More stressed or disturbed transitions can also have locally abundant white ash (*Fraxinus americana*), slippery elm (*Ulmus rubra*), northern red oak (*Quercus rubra*), and white pine (*Pinus strobus*). Also, chestnut (*Castanea dentata*) was formerly frequent in subxeric transitions on sandy soils.

**Variants and changes.** These forests are still widespread in hilly regions, but variants on fertile floodplains and on calcareous uplands have become very rare or virtually eradicated.

### Examples

Shawnee Park: “ravine forest—American beech, sugar maple, sycamore”; Fagus, Acer saccharum, Platanus, Fraxinus sp., Celtis occidentalis, Carya laciniosa; Lonicera japonica, Asarum, Hydrophyllum appendiculatum.

Iroquois Park: “sugar maple forest”; Acer saccharum, Quercus rubra, Q. alba, Fagus, Liriodendron; Asimina.

Iroquois Park: “mixed forest—oak, yellow poplar, sugar maple, beech” [transitional to subxeric or submesic]; Quercus rubra, Q. alba, Liriodendron, Acer saccharum, Fagus, Liquidambar, Carya spp.; Asimina, Ulmus rubra, Acer rubrum.

Iroquois Park: “beech-yellow poplar forest”; Fagus, (36-48 inches with many dead but also frequent saplings), Liriodendron, Quercus alba, Q. rubra, Liquidambar, Platanus, Populus deltoides, Acer saccharum (mostly saplings); Asimina, Lindera; Hydrastis (patches with 100s), Claytonia, Trillium flexipes, Podophyllum, Corallorrhiza wisteriana, Epifagus, Laportea; JC—perhaps some eutrophication is under way with decadent Fagus, locally increasing Acer saccharum and rich ground vegetation, but Fagus is regenerating.

Cherokee Park: “lower slopes mesophytic forest—sugar maple, beech, yellow poplar, sycamore, hackberry”; Acer saccharum, Fagus, Platanus, Liriodendron, Celtis occidentalis, Ulmus spp., Juglans nigra; Lonicera maackii, Ligustrum cf. vulgare, Asimina (small patches only); Hydrophyllum cf. appendiculatum, other native herbs.

Cherokee Park: Slack (1941) noted “open beech woods” with spring wildflowers; Claytonia, Corydalis, Dentaria laciniata, Erigenia, Polemonium, Anemonella, Enemion, Erythronium americanum; also two rare species in the park, Spiranthes “cernua” and Botrychium dissectum var. obliquum; Hydrastis was collected here in 1935, but not relocated; noted possible “virgin timber” in the Fagus, also large Liriodendron; she noted that hickories in the park were “scarce, the commonest one being Carya cordiformis.

Pond Creek (Willigs Woods): base-rich variants; check notes.

Morris Branch: base-rich variants; check notes.

Wolf Pen Branch & nearby (Bingham Tracts): base-rich variants; check with G. Libby.

Goose Creek Corridor; esp. 35 acres at Surrey Hills (?); trees common up to 6 dm dbh, *Acer saccharum*, *Carya cordiformis*, *Fagus*, *Liriodendron*; also *Aesculus glabra*, *Celtis* [cf. *occidentalis*], *Carya laciniosa*, *Juglans nigra*, *Prunus serotina*, *Populus deltoides*, *Platanus*, *Quercus muhlenbergii*, *Q. rubra*, *Q. shumardii*, *Tilia*, *Ulmus americana*, *U. rubra*.

## **6. Subhydric forest (“damp” or “wet woods”) and associated open woodland.**

**Typical sites.** This class occurs on lower floodplain terraces or swampy upland swales and seeps, with temporary to seasonal flooding or saturation, and high water tables. Although soils are generally damp or wet, there can be occasional droughts and even fires. There can be scattered small openings, especially along streams.

**Typical species.** Common trees include swamp red maple (*Acer rubrum* var. *trilobum*), blackgum (*Nyssa sylvatica*), sweetgum (*Liquidambar styraciflua*), sugarberry (*Celtis laevigata*), green ash (*Fraxinus pennsylvanica*), white elm (*Ulmus americana*); and locally hickories—notably shellbark (*Carya laciniosa*), and pecan (*C. illinoiensis*), and oaks—notably swamp chestnut oak (*Quercus michauxii*), bur oak (*Q. macrocarpa*), cherrybark oak (*Q. pagoda*) and shumard oak (*Q. shumardii*). There is much intergradation with the more oak-dominated forest of Class 9. Sedges, grasses, cane and other shrubs are often abundant in the understory, especially in more open woods close to streams and seeps.

**Variants and changes.** These forests are widespread in the state, but good examples are mostly small and threatened by human disturbances. Variants on more fertile soils have been largely

cleared or intensively grazed. Variants on less fertile soils, especially small acid seeps, have often been degraded by pollution of surface or ground water.

**Examples:** to be developed...

Old Fish Ponds area: the “ash pond” by Mann’s Lick was presumably dominated by green ash (*Fraxinus pennsylvanica*); MSD has much data from the wet woods in this part of the county; to be accumulated; check wetland data with Evans, Bryan, Libby, Hartowisz.

Prewitt’s Lake area: ash/elm, gum/maple; check JC data from Hardin Co.

## **7. Submesic forest (average “upland woods”) and associated open woodland.**

**Typical sites.** This widespread class is often a broad transition between mesic forest (Class 5) and more frequently disturbed thickets (Class 8) or open woodland (Class 10). It can occur on a wide range of topographic sites, but is most extensive on gentle slopes and flats with residual or alluvial soils that have some dry or damp season. These sites include moister zones in rolling plains, seasonally damp swales on uplands, and terraces with temporary flooding. Though somewhat mesic, the forests experience stresses from occasional dry or wet conditions, and they have often been disturbed by burning, grazing or farming.

**Typical species.** The highly varied tree composition can include locally abundant red maple (*Acer rubrum*), blackgum (*Nyssa sylvatica*), holly (*Ilex opaca*), tulip poplar (*Liriodendron tulipifera*), hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), buckeyes (especially *Aesculus glabra*), mulberry (*Morus rubra*), coffee tree (*Gymnocladus dioicus*), and various ashes, elms, hickories and oaks. Sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*)

are locally abundant in transitions to mesic forest. On more fertile soils, the forest can be more distinctive, with locally dominant walnut, hackberry or buckeye, and the understory is often dense with tall herbs (e.g. *Ageratina altissima*), grasses (e.g. *Elymus* spp.), vines (e.g. *Vitis vulpina*), or thickets of cane, pawpaw, coralberry or other shrubby species.

**Variants and changes.** Much disturbed forest of diverse type belongs in this class, but probably few areas are similar to presettlement conditions, because of general conversion to farmland, frequent wood-cutting, and overgrazing or mowing in the remnants.

## Examples

Pond Creek (O): Willigs Woods; base-rich variants with much cane; check notes.

Wolf Pen Branch & nearby (Bingham Tracts): base-rich variants; *Trifolium stoloniferum*; check with G. Libby.

Goose Creek Corridor; see under class 5; probably grades into class 7.

Cherokee Park: “midslope mesophytic forest—hackberry, sugar maple, chinquapin oak, blue ash, beech”; *Celtis occidentalis*, *Acer saccharum*, *Quercus muhlenbergii*, *Fraxinus quadrangulata*, *Fagus*, *Prunus serotina*, *F. americana*, *Ulmus rubra*, *U. americana*; *Lonicera maackii*, *Ligustrum cf. vulgare*, *Euonymus alatus* (natives very rare, *Cornus*, *Viburnum*, *Prunus*, *Cercis*); *Lonicera japonica*, *Celastrus orbiculatus*, *Vinca minor*, *Hedera helix*, *Akebia quinata* (native herbs dominate in only two woodlots).

Cherokee Park: “even-aged upland forest—black cherry, black locust, yellow poplar, box elder”; Liriodendron, Robinia, Prunus serotina, Acer negundo; Lonicera maackii, Celastrus orbiculatus, Vinca minor, L. japonica, Hedera helix, Ligustrum cf. vulgare.

Cherokee Park: “tree clump community” (patches mowed around in meadows); Celtis, Acer saccharum, Fraxinus spp. [?], Ulmus spp., Quercus muhlenbergii, Fagus; Lonicera maackii, Ligustrum cf. vulgare, Celtis, Acer saccharum (saplings), Rubus cf. pensylvanicus.

Cherokee Park (O): Slack (1941) noted possible “virgin timber” in Prunus serotina and Gleditsia triacanthos, also large Juglans and Celtis.

Seneca Park: unusual grove of Aesculus glabra, ca. 5 dm dbh; some wildflowers along limestone ledges (Aquilegia, Heuchera); but much Lonicera maackii, etc. (P. Haragan, pers. comm.).

Shawnee Park: “second terrace—hickory, hackberry slope forest”; Celtis occidentalis, Carya laciniosa, Prunus serotina, Robinia, Acer negundo, A. saccharum, Cornus florida; Symporicarpos, Lonicera japonica, Glechoma; Associated is a small patch with Gymnocladus, Morus alba; Lonicera japonica, Symporicarpos; this had been an old flower garden.

Shawnee Park: “park-like remnant upland forest—red oaks, bur oak, hickory; Quercus rubra, Q. shumardii, Q. macrocarpa, ?Carya laciniosa, Liriodendron, Acer saccharum, Fraxinus americana; mowed grasses, etc.

## **8. Deciduous seral thickets, maintained by repeated disturbance.**

**Typical sites.** Ecological distinction of this varied habitat class, typified by several thorny or root-sprouting species, is often bypassed by biologists. It occurs on a wide range of soils, but usually not hydric or xeric enough for permanent openings without disturbance. Much is in forest-edges, brushy grasslands, and old fields with frequent fire or grazing.

**Typical species.** While many species can occur, some of the most characteristic larger trees include persimmon (*Diospyros virginiana*), sassafras (*Sassafras albidum*), honey locust (*Gleditsia triacanthos*), black locust (*Robinia pseudoacacia*), black cherry (*Prunus serotina*) and osage orange (*Maclura pomifera*). Characteristic smaller trees and shrubs include devil's walking-stick (*Aralia spinosa*), cane (*Arundinaria gigantea*), pawpaw (*Asimina triloba*), redbud (*Cercis canadensis*), dogwoods (*Cornus*), black haws (*Viburnum*), hawthorns (*Crataegus*), crabapples (*Malus*), plums (*Prunus*), sumacs (*Rhus*), roses (*Rosa*), dwarf willows (*Salix*), coralberry (*Symphoricarpos orbiculatus*) and prickly-ash (*Zanthoxylum americanum*).

**Variants and changes.** As a class, such vegetation is extensive in today's disturbed landscape, often beginning in old-field succession with abundant briars (*Rubus*). However, it is probably much changed from presettlement conditions, and it is likely that some variants have now virtually disappeared. For example, canebrakes and plum thickets were probably widespread at grassland margins, along animal trails, and around regular human (Native American) encampments, but have now become highly reduced in the modern landscape. Also, pines and cedars have tended to displace many of these species in succession to submesic forest (Class 7) or other classes, especially on drier sites where regular burning has declined.

**Examples** (mostly miscellaneous mixes of trees, brush and grass)

Iroquois Park: “roadside and trailside plants” (broadly defined to include grassy verges for Class 10); *Albizzia*, *Ailanthus*, *Robinia*, *Celtis*, *Sassafras*, *Pinus taeda*, *Morus albra*, *Prunus serotina*, *Cercis*, *Ulmus pumila*; *Rubus cf. pensylvanica*, *Dioscorea oppositifolia*, *Lonicera maackii*, *Rhus glabra*, *R. typhina*, *Rosa multiflora*, *Lonicera japonica*, *Ligustrum cf. vulgare*, *Celastrus scandens*; *Cichorium*, *Duschesnia*, *Artemisia vulgaris*, *Andropogon virginicus*, *Setaria sp.*, *Festuca arundinacea*, *Physalis sp.*, *Achillea*, *Daucus*, *Vinca*, *Melilotus sp.*, *Trifolium pratense*, *T. repens*, *Cassia fasciculata*, *Solidago altissima*, *S. nemoralis*, *Misanthus sinensis*, *Glechoma*.

Cherokee Park: “unmowed meadow and brushland”; *Solidago altissima*, *Daucus*, *Rhus glabra*, *Rubus*.

## **9. Hydric-tending flats with oak woodland or grassland (“swampy woods and openings”).**

**Typical sites.** This class occurs on seasonally to temporarily flooded or saturated soils, but in some cases there is also frequent drought stress and even occasional fire in late summer or fall. Ungulates probably had local influence before settlement, especially near seeps, licks and wallows.

**Typical species.** Oaks are common in wooded remnants—including characteristic swamp white (*Q. bicolor*) and pin (*Q. palustris*); more locally swamp chestnut (*Q. michauxii*), overcup (*Q. lyrata*), or shumard (*Q. shumardii*). There can also be frequent red maple (*Acer rubrum* var. *trilobum*), blackgum (*Nyssa sylvatica*), sweetgum (*Liquidambar styraciflua*), green ash (*Fraxinus pennsylvanica*), or shellbark hickory (*Carya laciniosa*), especially in transitions to subhydric forest (Class 6) or submesic forest (Class 7). Openings with native vegetation include rushes (*Juncus*), sedges (*Carex*), beak-sedges (*Rhynchospora*), bulrushes (*Scirpus*), umbrella-sedges (*Cyperus*), spike-rushes (*Eleocharis*), and many grasses.

**Variants and changes.** Wetter openings often grade into marshy vegetation transitional to Class 2 or 3. There are also ephemeral ponds of various types that can be included within the definition of this class. Although small remnants of such vegetation are widely scattered in much of the state, the few good extensive examples are concentrated in western regions. Most land has been converted to farmland, especially with artificial drainage after 1950. More open, grassy variants with a history of burning—and perhaps licking, stamping and wallowing by megafauna—have virtually all disappeared.

## Examples

Miller's Flatwoods: small 5-10 acres patch with *Quercus palustris*, *Fagus*, etc. (?*Q. bicolor*); check.

Shawnee Park: "park-like remnant lowland forest—swamp chestnut oak, pin oak, sycamore"; *Quercus michauxii*, *Q. palustris*, *Platanus*, *Carya laciniosa*, *Diospyros*; mowed grasses, *Trifolium repens*, *Duschiesnia*, *Glechoma*.

Iroquois Park: on Burnt Knob, several large pin oaks along margins of the mowed fields indicate perched water table.

Old Fish Ponds area: and Mann's Lick area; formerly much of this vegetation occurred here; to be researched further; *Quercus michauxii*, *Q. palustris*, etc., are locally frequent in this area (E. Hartowicz).

?Prewitt's Lake area (Hardin Co., West Point Qd.); 100s-1000 acres of young swampy woods and restorable wetlands; see JC Hardin Co. notes for oaks (?)...

## **10. Submesic (or xeric-tending) plains with oak woodland or grassland (“open oak woods and barrens”).**

**Typical sites.** Native vegetation of this class was formerly widespread on gentle slopes, rolling plains and upland flats with a history of much burning and grazing. Although soils are deep and often somewhat mesic, they are subject to occasional intense droughts. The land is not typically flooded or saturated, but some soils are relatively impermeable or poorly drained in winter or spring.

**Typical species.** Characteristic trees in wooded areas include oaks—especially blackjack (*Q. marilandica*), post (*Q. stellata*), southern red (*Q. falcata*), shingle (*Q. imbricaria*), shumard (*Q. shumardii*), and bur oak (*Q. macrocarpa*), hickories, locally ashes and elms. Pines (at least *Pinus virginiana* in adjacent Bullitt Co.) and red cedars (*Juniperus virginiana*) can be locally abundant, depending on disturbance regime. Many native grasses and wildflowers are typical of the more open variants.

**Variants and changes.** This vegetation has been virtually all converted to farmland, and the woodland remnants, without burning or browsing, tend to become denser and shadier in various ways. Without disturbance, there can be increases of pine or cedar (seral extensions of Class 12), development of shrubby thickets (Class 8), gradual invasion of more mesic trees such as maples (Class 7), or various mixtures of these components. Much farmland can be considered artificially analogous to this class, though with much more soil disturbance and with a more weedy, ruderal component in the vegetation. The clearance of trees, erosion of topsoil, soil-compaction, and more flashy hydrology in farmland has allowed expansion of this broadly defined habitat class.

onto formerly more mesic sites. However, it may be reasonable in future to segregate a distinct class for the more ruderal vegetation that is typical of farmland.

## Examples

Iroquois Park: “blackjack oak-post oak forest”; Quercus marilandica, Q. stellata, Q. montana, Q. alba, Pinus virginiana, Juniperus; Antennaria plantaginifolia, Potentilla cf. canadensis (“simplex”), Aster cf. undulatus (“shortii”).

Iroquois Park: “white oak savanna” on Burnt Knob (perhaps with fire history but also adjacent to the mowed meadow); very few understory trees; Solidago bicolor.

Shawnee Park: see notes under Class 07; perhaps some bur oak (Quercus macrocarpa) was originally associated with thin woodland or edges, such as along buffalo traces; however, this long-lived tree may not need frequent openings for regeneration.

## **11. Subxeric oak forests (“dry or rocky woods”).**

**Typical sites.** This class is on moderate to steep slopes and ridges, with well-drained soils that are generally rocky with outcrops or colluvium. Disturbance from burning or browsing may have occurred before settlement but less intensively than in Class 10, and not enough to thin out the tree canopy and maintain grassy openings.

**Typical species.** Typical trees included chestnut (*Castanea dentata*, before the blight), chestnut oak (*Quercus montana*), scarlet oak (*Q. coccinea*), white oak (*Q. alba*), black oak (*Q. velutina*), southern red oak (*Q. falcata*), chinquapin oak (*Q. muhlenbergii*), shumard oak (*Q. shumardii*), pignut hickory (*Carya glabra*), mockernut hickory (*C. tomentosa*), shagbark hickory (*C. ovata*), white ash (*Fraxinus americana*), and blue ash (*F. quadrangulata*). Without disturbance, the understory often shifts to include more mesic or submesic species such as red maple (*Acer rubrum*), sugar maple (*A. saccharum*), blackgum (*Nyssa sylvatica*), red elm (*Ulmus rubra*), and white pine (*Pinus strobus*).

**Variants and changes.** There is a clear gradient from base-rich soils (*Q. muhlenbergii*, *Q. shumardii*, etc.) to acid infertile soils (*Q. montana*, *Q. coccinea*, etc.). This vegetation is still extensive, because much of the land is not suitable for farming, but there are very few examples of old-growth.

## Examples

Iroquois Park: “chestnut oak forest”; Quercus montana, Q. alba, Pinus virginiana, Juniperus, Robinia (locally on eroded area with Miscanthus); Cunila, Sericocarpus asteroides, Solidago bicolor, S. nemoralis, Tephrosia virginiana, Asplenium platyneuron; mosses (mostly Leucobryum), lichens.

Iroquois Park: “oak-hickory forest”; Quercus alba, Q. rubra, Q. montana, Carya ovata, C. glabra; Cornus florida, Smilax spp., Cercis, Aralia spinosa; Polystichum, Eupatorium cf. rugosum [?].

Cherokee Park: “oak-dominated forest”; Quercus muhlenbergii, Q. rubra, Q. imbricaria, Q. shumardii, Ulmus rubra, Prunus serotina; Acer saccharum (saplings common), Quercus spp. (saplings present); Lonicera maackii, Cornus florida (only veg. in park where significant).

## **12. Xeric coniferous forest/glades and transitions to oak (“dry pine- or red cedar-oak woods and glades”).**

**Typical sites.** These habitats typically occur on thin rocky soils where droughts maintain relatively open conditions and reduce the rate of succession to oaks or other forest trees. Such vegetation was formerly concentrated on or near rocky slopes (especially with SW-facing aspect), narrow ridges, clifftops, flatrocks, other outcrops, and eroded areas. Included also are various kinds of transition to oak or successional forests on deeper soils, often influenced by disturbance history as well as dry soils. There is exposure to fires but fuels are often thin and interrupted by outcrops. Ungulate use was presumably varied before settlement, ranging from insignificant along clifftops to highly intense at mineral licks.

**Typical species.** With changes in disturbance-regime, red cedar (*Juniperus virginiana*) and scrub pine (*Pinus virginiana*) have now become much more extensive, especially in young woods and thickets transitional to Classes 10, 8 and 7. Other locally abundant trees include pitch pine (*P. rigida*), short-leaf pine (*P. echinata*), and various oaks, hickories, ashes and elms.

**Variants and changes.** Some xeric variants have stable grassy openings, and these have generally survived fairly well since settlement. However, most subxeric variants have become highly modified or reduced in extent, due to clearance for farmland, reduction in fire-frequency, and other environmental changes.

### **Examples: to be developed.**

Check outcrops in knobs, eroded areas; especially dolomitic glade-remnants along Floyds Fork.

## **13. Xeric grassland or outcrops (rocky, eroded or compacted)**

**Typical sites.** These areas can be segregated from Class 12, but often occur in complex mixtures and transitions. Dry soil conditions generally prevent succession to shrubs or trees, or slow it down to a large extent, but various types of disturbance can interact with soil to maintain the vegetation. Before Virginian settlement, this vegetation was generally limited to rocky outcrops in the hills, but it was probably expanded much in some regions due to burning or browsing, especially in association with grassland on deeper damper soils in Class 14.

**Typical species.** These include poverty grasses (*Danthonia* spp.), three-awn grasses (*Aristida* spp.), little bluestem (*Schizachyrium scoparius*), dropseeds (*Sporobolus* spp.). Annuals are often common, especially on base-rich soils.

**Examples:** to be developed.

## **14. Maintained grassland or fields (submesic to xerohydric)**

**Typical sites.** This is a broad grassland class that can be used for any vegetation that is maintained in a largely open, non-woody condition by frequent burning, browsing, mowing or other disturbance, rather than by dry or wet conditions. However, there is usually much gradation into woodland of various types (especially Classes 10, 8 and 7). Before Virginian settlement in Kentucky, this class of vegetation was extensive on some western plains, especially the Pennyrhile Karst Plain. Further east, it also occurred in relatively narrow strips, bands or zones in areas browsed by buffaloes or burned by native people, especially along the foothills and valleys of the Knobs region, broadly defined to include the Falls-of-Ohio region. In the farmed landscape, various types of old fields or pastures can also be classified here, but they tend to have much lower diversity of native species.

**Typical species.** Native species include bluestems and broomsedges (*Andropogon* spp.), Indian grass (*Sorghastrum nutans*), greasegrass (*Tridens flavus*), panic grasses (*Panicum* spp.), ironweeds (*Vernonia* spp.), goldenrods (*Solidago* spp. or allies), asters (*Aster* spp. or allies), wingstems (*Verbesina* spp.), sunflowers (*Helianthus* spp.) and allies, milkweeds (*Asclepias* spp.) and allies, nightshades and allies (*Solanum*, *Physalis*), ladies-tresses (*Spiranthes* spp.) and many others. Modern old fields can be grouped here, but often with uncomfortable biogeographic mixtures.

**Examples:** to be developed.

Shawnee Park: “unmowed old fields”; *Daucus carota*, *Solidago* cf. *altissima*, *Aster* spp., *Trifolium pratense*, *Vernonia gigantea*, *Verbesina alternifolia*, *Festuca* cf. *arundinacea*.

Cherokee Park: “mowed meadows”; little interest botanically, but *Trifolium stoloniferum* patch found [near trees].

## **15. Hydric grassland or marshes (hydric to hydroxeric)**

**Typical sites.** These areas can be segregated from wet woodlands of Class 9, but they often occur in complex mixtures and transitions. Wet soil conditions generally prevent succession to woodland, or slow it down to a large extent, but there can be interactions with browsing, burning or other disturbances to maintain the open character. Before Virginian settlement, this vegetation may have been limited in some regions to relatively narrow zones around ponds and along meandering rivers. However, it probably extended further into otherwise wooded sites where browsing or burning was increased, especially in association with the grassland of better drained land in Class 14.

**Typical species.** Native species include sedges and allies (*Carex*, *Scirpus*, *Eleocharis*, *Cyperus*, *Rhynchospora*, etc.), a few grasses (e.g. *Andropogon glomeratus*, *Phalaris arundinacea*), rushes (*Juncus*), cattails (*Typha*) and a wide variety of dicots.

**Examples:** to be developed.

Iroquois Park: small wetland area near riding stable, one maintained by mowing; restoration potential

Mann's Lick area: formerly much of this vegetation occurred here; to be researched further.

## **Appendix Four: Notes on the Flora.**

**[Also needed: notes on selected fauna].**

[To be developed.]

A complete floristic list with historical annotations; this will have three reference points through time.

- (1) *Florula Louisvilliensis* of McMurtrie (1819), attributed to Rafinesque (Slack 1941); plus other observations from 1810-1850, especially by C.W. Short.
- (2) Gunn's (1968) list for the seven-county area and a review of the University of Louisville's "golden age" of botany ca. 1950-1970.
- (3) Modern records derived largely from Medley (1993) and associated field work, plus recent work of Patricia Dalton Haragan.

Notes on ecological and taxonomic groups.

## **Notes on globally or regionally rare species.**

This is a provisional list of rare and unusual species known or expected in the Falls-of-the-Ohio region or nearby. Included here are all species considered to have S3S4 rank ("watch list"), S3, S2 or S1. Notes on habitats and ranking of each species will be added in the near future. Abbreviations at left margin have been used to show species locations on maps; in general the first two letters of genus and species name have been used, but in several genera with the same first two letters, a subsequent letter has been picked to distinguish these genera.

### Codes at left margin

- \* Species apparently concentrated in or near remnants of native grassland or open grassy woodland; many of these species survive mostly along ROWs.
- (\*) Species more persistent in woodland, and less concentrated in openings, but still clearly benefitting from occasional disturbance or rocky openings.
- < Species known from within a few miles of the Falls-of-the-Ohio region, and perhaps expected in the region with further research and restoration.
- << Species known from adjacent regions, but perhaps unlikely in the Falls-of-the-Ohio region.

### Codes with species names

ABC      Upper case species names are globally rare: G1/G2/G3 in TNC-State Heritage system.

  Underlined species are officially listed or should be: S1/S2/S3 in TNC-State Heritage system.

{ } Species that are uncommon to rare in the region, but, with few exceptions, are not officially listed; these species typically belong in the "S3S4" rank of abundance in the state.

[ ] Species that are more common in parts of the state (S4 mostly) but which have notable disjunct populations in the region.

Broad moisture-related vegetation classes; see Appendix Two: Part 2 for descriptions of following vegetation types.

- 1 = Typical of stream corridors and associated "shrubby or graminoid streambank" vegetation.
- 2 = Typical of ponds and associated "shrubby or graminoid swamp" vegetation;  
including h = aquatic openings (too wet for shrubs).  
A wide range of hydrology is included here, from permanent ponds on bottomlands, to ephemeral ponds on uplands (with very different transitional vegetation around them).
- 3 = Typical of "deep swamp forest" vegetation.
- 4 = Typical of "streamside forest" vegetation
- 5 = Typical of "mesic forest" vegetation;  
including h = floodplain mostly; c = under cliffs.
- 6 = Typical of "subhydric forest" vegetation;  
including h = subhydric variants; s = ground-water seeps.
- 7 = Typical of “submesic forest” vegetation;
- 8 = Typical of "deciduous seral thickets" vegetation

9 = Typical of "hydric oak flats" vegetation;  
including: x = hydroxeric-tending; h = deep-swamp tending

10 = Typical of "submesic-xeric tending oak woods" vegetation;  
including: h = xerohydric-tending; x = xeric-tending

11 = Typical of "subxeric oak forest" vegetation.

12 = Typical of "xeric-subxeric conifer-oak" vegetation;  
including: x = clifftops; h = flatrocks (often puddled).

13 = Typical of "xeric" grassland or other open land

14 = Typical of "maintained" grassland (with disturbance)

15 = Typical of "hydric" grassland or marsh (with sedges, rushes, etc.)

#### Soil-related subdivisions

A = Typical of extremely acid, infertile soils.

B = Typical of transition from A to C (or both).

C = Typical of moderate base-status and fertility.

D = Typical of transition from C to E (or both).

E = Typical of high base-status and fertility.

Annotated list of rare plants.

Acde      *{Acalypha deamii}*  
4(7) D

\* Agfa      *Agalinis fasciculata*}  
9D: scattered widely in western Ky.

(\*) Arra      *Aristida ramosissima*: branched three-awn grass  
12C? (historical @DHL)

(\*) Asex      *{Asclepias exaltata}*  
11-6 B

\* Bple      *{Baptisia leucantha (alba var. macrophylla)}*  
10-9 C

Caca      *Cabomba caroliniana*: Carolina fanwort  
2D? (historical, apparently extinct in region)

(\*) Cmgl      *Calamintha glabella*  
12/10/7 E

Cade      *CASTANEA DENTATA*

11/5/7 (devastated by disease)

\* Capu    *Castanea pumila*: chinkapin (dwarf chestnut)  
10-12 B (historical)

\* Dilo    {*Dichanthelium longiligulatum*}  
9 C

Drca    *Dryopteris carthusiana*: spinulose wood-fern  
7-5-6 D?

Elca    *Elodea canadensis*  
2/1 D

\* Elca    *Elymus canadensis*  
10/2 D (historical)

\* Eryu    {*Eryngium yuccifolium*}  
10-12 C

(\*) Etma    *Eutrochium maculatum* (=*Eupatorium m.*)  
9/7/10? D? (historical)

(\*) Hedu    *Heteranthera dubia*: grassleaf mud-plantain

2 D? (historical)

- \* Hegr      *{Helianthus grosserratus}*  
10 D: typical of better barrens remnants; but perhaps adventive also.
  - \* Hemo      *{Helianthus mollis}*  
10 D: typical of better barrens remnants in western Ky.; perhaps adventive also.
  - (\*) Hxsp      *{Hexalectris spicata}*  
12-11 D?: scattered across Ky. in brushy woodland and grassy edges; generally < 10 plants.
- Hoin      *{Hottonia inflata}*  
2 C? (historical)
- Hdca      *[Hydrastis canadensis]*  
5/11 D (was much harvested)
- (\*) Jgci      *JUGLANS CINEREA*; has been federal candidate  
6-5C: formerly common in KY, but greatly declined due to disease.
- Lapa      *Lathyrus palustris*  
1,2 C (historical)

- \* Lwel     *LEAVENWORTHIA EXIGUA VAR. LACINIATA*: Kentucky glade-cress  
12 D (known only on the Bardstown Plain)
  - \* Ltsp     {*Liatris spicata*}  
10-9C: typical of damper barrens remnants in scattered sections of KY, and locally abundant, but apparently very sensitive to agricultural development.
  - \* Ltsq     [*Liatris squarrosa*]  
12-10xC; fairly widespread in KY, generally in native grassland remnants, but still not "weedy" or spreading in farmland.
  - \* Ltsl     {*Liatris squarrulosa*} (= *L. scariosa*)  
10C: similar ecological distribution to *L. aspera* but perhaps more concentrated on calcareous soils.
- (\*) Lyhy     *Lysimachia hydrida*  
7,6,4 D? (uncertain record)
- (\*) Ltal     {*Lythrum alatum*}  
9,10 E
- (\*) Mose     {*Monarda “serotina”*} (*fistulosa-clinopodia* intermediate)  
7,4 D (check records)

\* Oron *Orbexilum onobrychis* (= *Psoralea o.*)  
10,8,7 D

\*? Orst *ORBEXILUM STIPULATUM* (= *Psoralea s.*)  
1 D? (perhaps globally extinct)

Oxil *Oxalis illinoensis*  
5,7,11 E?

Pxqu {*Panax quinquefolius*}  
5 C: widespread in KY, but much reduced due to collecting for medicinal use.

\* Pnvi {*Panicum virgatum*}  
1/10h-9 D

\* Phpi {*Phlox pilosa*}  
10x-12 D; scattered disjunct native grassland remnants on calcareous soils.

Pdce *Podostemum ceratophyllum*: threadfoot  
1 C (historical)

Podo *Polanisia dodecandra*  
1 C

Pnco      *Pontederia cordata*: pickerel-weed  
2 D (historical)

Ptbe      *Potamogeton berchtoldii* (= *P. pusillus* var. *b.*)  
2 D?

Ptil      *Potamogeton illinoensis*: Illinois pondweed  
1E (historical)

(\*) Prcr      *PRENANTHES CREPIDINEA*

6-5D: scattered KY records, including historical data, suggest formerly widespread, but now may be restricted to remnants of open woodland on moist, base-rich soils; hypothetically associated with biotic disturbances before settlement; only flowering in sunny places.

\* Prlo      *Proboscidea louisianica*  
10,9 E? (perhaps adventive)

Prvi      *Prunus virginiana*  
11,8,12 D (uncertain historical record)

\* Rapi      [*Ratibida pinnata*]  
10x D: good native grassland remnants and open rocky woods in calcareous regions of KY.

\* Rbwh *RUBUS WHARTONIAE* (taxonomy debated; may be more or less endemic to Knobs)

10,12 B

Sagr *Sagittaria graminea*: grassleaf arrowhead  
2 D? (historical)

Sxer *Salix eriocephala*  
2 E? (historical)

Shpu {*Schoenoplectus pungens*} (= *Scirpus americanus*)  
9,2,1 C

\* Scle {*Scutellaria leonardii*}  
12hE: fairly frequent in xeric calcareous glades of s. KY; this habitat type very restricted.

\* Siin *Silphium integrifolium*  
10,8 C (historical)

\* Sila *Silphium laciniatum*  
10,12 C (historical)

- \* Somi      *{Solidago missouriensis}*  
10,9 C? (check taxonomy, records)
  
- \* Soru      *{Solidago rupestris}*  
1 E: restricted to calcareous rocky banks of rivers.
  
- \* Sosh      *SOLIDAGO SHORTII*: Short's goldenrod  
1/12-10 E (historical)
  
- Sppe      *{Spartina pectinata}*  
9,1,2 D
  
- \* Spoc      *Spiranthes ochroleuca*  
10,8,7,12 C
  
- \* Spcl      *{Sporobolus clandestinus}*  
12,10,8 D
  
- (\*) Stlo      *Stellaria longifolia*: longleaf stitchwort  
9/6/2 D? (needs confirmation)
  
- Syfo      *Symplocarpus foetidus* (KY records uncertain)  
6,9 C (historical)

Syhi      *{Synandra hispidula}*  
5h E: typical of mesic forest on base-rich soils in central KY.

Thpa      *Thelypteris palustris* var. *pubescens*  
9,6 B (historical)

Topa      *Torreyochloa pallida* (= *Puccinellia* or “*Glyceria*” *pallida*)  
2,3 D (historical)

(\*) Troh      *{Tradescantia ohiensis}*  
1,4 C

(\*) Trco      *Tragia cordata*  
11,7,10 E (?): scattered in subxeric thickets across western KY, this species is rarely recorded.

(\*) Trst      *TRIFOLIUM STOLONIFERUM*: running buffalo clover  
7,8,10 D

Vaam      *Vallisneria americana*: eelgrass  
1 D (historical)

Vewo      *Veratrum woodii* (= *Melanthium* w.): Wood’s bunchflower

5-6D (historical); scattered in mesic calcareous forests across w. KY, but with few records.

Veam      *Veronica americana* ? (taxonomy uncertain)

1,2,4,6 E (historical uncertain record)

\*      Vieg      *VIOLA EGGLESTONII*: Eggleston's violet

12h E: typical of xeric calcareous glades, especially on flat-rocks.

(\*)      Vtla      *Vitis labrusca*: northern fox-grape

8/10 C? (historical)

Wima      {*Wisteria macrostachya*} (= *W. frutescens* var. *m.*)

1,2 D

# City of Parks

**Bridge Access for Bikes and Pedestrians**  
Connections to Southern Indiana

The City of Parks initiative – unveiled by Mayor Jerry Abramson in February 2005 – includes:

- Acquisition and development of new park land in the Floyds Fork watershed, Jefferson Memorial Forest and Southwest Louisville Metro.
- A paved multi-use loop trail of more than 100 miles.
- A record level of capital investment to improve existing parks.

This multi-million dollar, multi-year initiative to add thousands of acres of park land and protected green space to Louisville Metro's "greenprint" builds upon the groundwork laid by famed landscape architect Frederick Law Olmsted over a century ago, and will complete Louisville's transformation into a City of Parks.

**City of Parks Partners**  
Louisville Metro Government  
Metro Parks  
Future Fund  
Olmsted Parks Conservancy  
Trust for Public Land  
21st Century Parks

2/09

**Louisville Loop**  
RiverWalk 7 miles

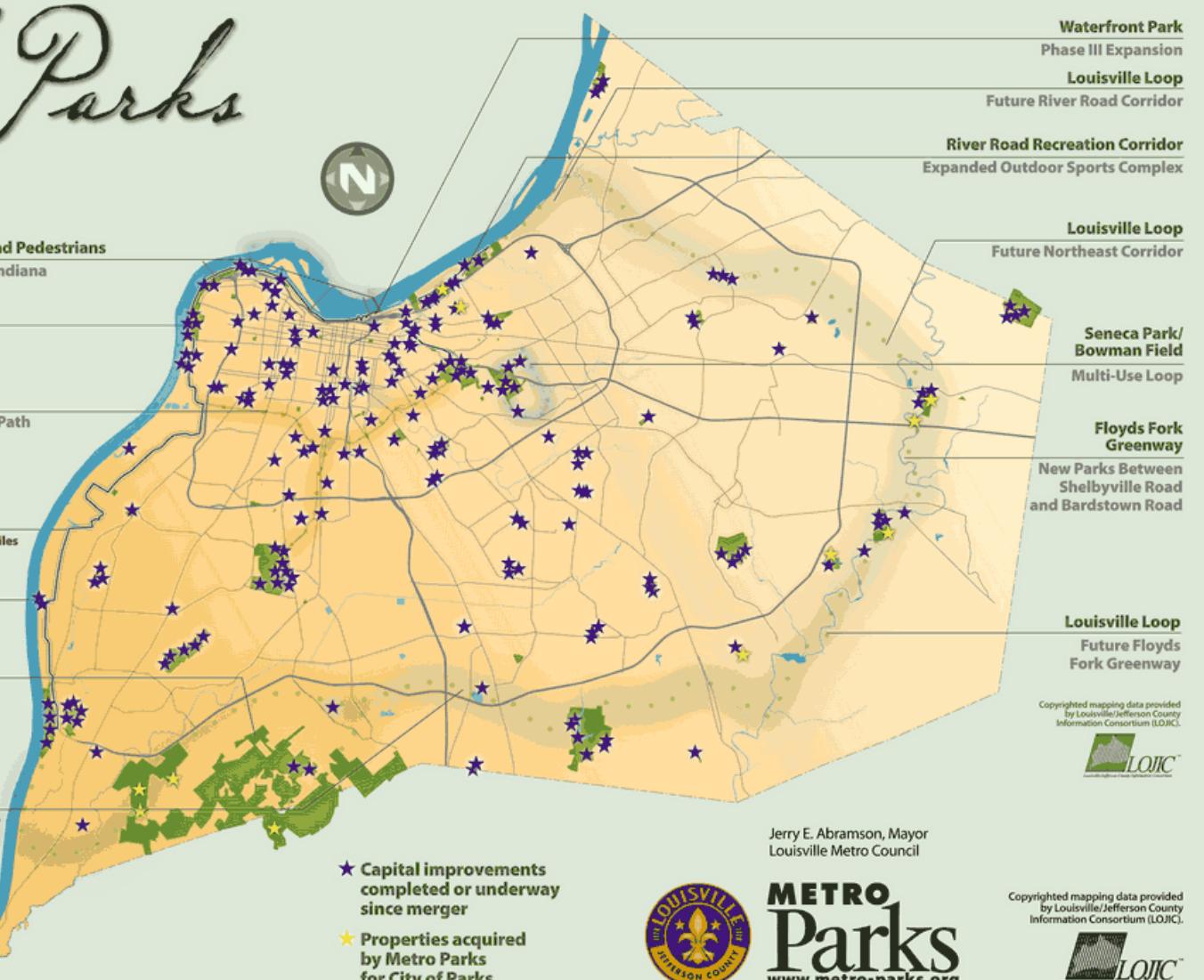
**Louisville Loop**  
Future Olmsted Parkways Path

**Louisville Loop**  
Ohio River Levee Trail 16 miles

**Riverview Park**  
Expansion

**Jefferson Memorial Forest**  
Continued Expansion

**Louisville Loop**  
Future Southwest Corridor



Poster produced by Louisville Metro Parks, with depiction of the planned Floyd's Fork corridor  
[http://insiderlouisville.com/wp-content/uploads/2013/04/city\\_of\\_parks\\_map.gif](http://insiderlouisville.com/wp-content/uploads/2013/04/city_of_parks_map.gif)

# **Appendix Five: Prioritized Sites for Conservation and Restoration.**

These notes refer to specific sites in Jefferson Co., or overlapping into adjacent counties, that have particular interest for natural history, conservation or restoration. They are organized generally in accord with the ecological regions (see Part 1). Asterisks indicate degree of importance for conservation or natural history in general:

- \*\*\*\*\* high global significance;
- \*\*\*\* moderate global significance or high regional significance;
- \*\*\* moderate regional significance;
- \*\* some regional significance;
- \* no special significance other than local greenspace with potential for native species.

Other codes are from previous classification ca. 1990 and will be converted.

## **1. WESTERN BLUEGRASS: SIGNIFICANT SITES**

\*\*\* **Floyds Fork Corridor macrosite** (Bullitt, Jefferson, Oldham, Shelby Cos.); data will be produced from current parks program. Much of this corridor lies in transitions to the Louisville-LaGrange Plain; the lower section is in the Bardstown Plain, where details are provided below.

## **2b. WESTPORT HILLS: SIGNIFICANT SITES**

\*\*\* **Westport Bluffs macrosite** (Oldham Co.)

\*\* [Twelve Mile Island &] Dunbar Hollow (Oldham Co.); Laura Lee Brown & Steve Wilson's place with penned buffalo herd above; nice wildflowers and woods; much *Aquilegia*, *Collinsia*, *Mertensia*, etc.

\*\* Morris Branch (Oldham Co., Owen Qd.); [5Acx(6237\*,6017\*)].

\*\* Bull Creek (Oldham Co., Owen Qd.)

\*\*\* Pond Creek (including Willigs Woods) (Oldham Co., Owen Qd.); much cane; [5Acx(6237\*,6017\*); 7Am(...)/BC=\$?].

\*\*\*\* Harrods Creek Corridor macrosite (Oldham & Jefferson Cos.); KSNPC "Harrods Creek Corridor"; this is the only extensive continuous forested area within the Westport Hills; locally there are problems with *Lonicera maackii*, etc.; *Allium burdickii*, *Synandra hispidula*; [5Acx(6237\*,6017\*)/C3; 1000+ acres C/CD forest?=\$?]

\*\* Horner Wildlife Santurary (Oldham Co., Anchorage Qd.); need more data.

\*\* Hardin Falls State Natural Area (Oldham Co., Anchorage Qd.); need more data...

\*\*\*\* Wolf Pen Branch (Jefferson Co., Anchorage Qd.); land of Sallie Bingham managed by River Fields; *Trifolium stoloniferum*/A=\$\$ (1000 plants); *Trillium grandiflorum*; check with Gary Libby.

\*\* Goose Creek Corridor (Jefferson Co., Jeffersonville & Anchorage Qds.); KSNPC "Goose Creek" and "Little Goose Creek"; needs further assessment; includes connected Little Goose Creek; although within the city of Louisville, this has fair natural quality with trees common up to 6 dm dbh (classes 5, 7; calc. meso. B; see above); gray bat/E.

**\*\* Surrey Hills Farm State Natural Area** (Jefferson Co., Anchorage Qd.); land from Palmer-Ball family; 35 acres of "mature mesic forest" under management agreement with KSNPC; ?*Allium burdickii*; [calc meso/C].

IN: Selda Creek Sullivantia Site: Big Saluda Creek; drains down from Chelsea Flatwoods

IN: Clifty Canyon

## **2c. LOUISVILLE-LAGRANGE PLAIN: SIGNIFICANT SITES**

\*\* **Miller Flatwoods** (Oldham Co., Roland Miller): small 5-10 acres patch with *Quercus palustris*, *Fagus*, etc.; large grassland project adjacent; check for more remnants in area [here/nearby flatwoods w/*Q. bicolor*; 6Bs (2432~)/C1-?]

\*? **Tom Sawyer State Park and Flatwoods to east** (Jefferson Co.); generally not significant but flatwoods a mile east of the park deserves further investigation; may be potential for local restoration or native plantings..

\*\*\* **Beargrass Creek macrosite** (Jefferson Co., Louisville East Qd.); perhaps only an urban restoration project but has endemic crayfish, *Orconectes jeffersonii* (?G1G2) [check: may also occur in Knob Creek near mouth of Salt River; JRM says only in Beargrass Creek globally]

\* **Cherokee Park**: better woods being restored, locally some potential; *Hexalectris spicata*, *Oxalis illinoensis*, *Perideridia americana*; *Sedum telephiooides* (?); formerly *Trifolium stoloniferum*.

\* **Seneca Park**: unusual grove of *Aesculus glabra*, ca. 5 dm dbh; some wildflowers along limestone ledges (*Aquilegia*, *Heuchera*); but much *Lonicera maackii*, etc.

\*\* **Beargrass Creek State Nature Preserve**; 41 acres near Louisville Zoo (with potential rookery of yellow-crowned night herons) and Audubon Hospital ground.

\*? **Beargrass Creek addition**; adjacent to preceding site; check details.

\*\* **Blackacre State Nature Preserve** (Jefferson Co., Jeffersontown Qd.); 170 acres, mostly fields; on dolomitic Silurian and upper Ordovician bedrock; drains to Floyd's Fork but mostly flat interfluve with rather poor drainage.

## 2d. LOUISVILLE LOWLANDS: SIGNIFICANT SITES

\*? **Twelve-mile Island** (Jefferson and Oldham Cos., Jeffersonville Qd. etc.); needs assessment.

\*\* **Six-mile Island State Nature Preserve** (Jefferson Co., Jeffersonville Qd.); 81 acres; rare molluscs present or locally extinct, *Lithasia verrucosa/C*, *Nycticorax nyct/X*, *Riparia riparia/X*; *Vallisneria americana/C*; need more data.

\*\*\* **Falls of the Ohio Area** (Jefferson Co. KY; Floyd Co. IN, New Albany Qd.): includes 1215 acre USACE land in National Wildlife Conservation Area and Shippingport Island SNA (KY); most diverse heron rookery in KY is on Shippingport Island; extinct mussels, also *Plethobasus cyphyus* (G3)/B; *Leptoxis praerosa* (G1G3)/B; *Acipensens fulvescens* (G3, sturgeon)/B; old records of *Heteranthera dubia*, *Podostemum ceratophyllum*, *Orbexilum stipulatum/X*, *Sagittaria graminea*, *Solidago shortii/C=\$* (replanted); recent records of *Vallisneria americana*; [1Agx(4739\*)/C2?; 1Asx(3899\*)/C2?=\$?; 4Ax(2018)/C2].

\* **Cane Run Lowlands** (Jefferson Co., Louisville West Qd.); very small area, no notable timber.

\*\* **Everett Culler Woods** (Jefferson Co., Louisville West Qd.); checked by T. Littlefield; nice woods with some big trees.

\*\* **Waverly Hills** (Jefferson Co., Louisville West Qd.); nice woods adjacent to Waverly Park.

\*\*\* **Old Fish Ponds (Mill Creek) macrosite**; restorable mitigated wetland complex with Kirtland's Watersnake (*Clonophis kirtlandii*) (?G2G3, here at edge of its upper Mississippi-Shawnee Hills range); check other sites with *Clonophis kirtlandii*; check wetland data with Evans, Bryan, Libby, Hartowisz, MSD.

\*\* **Northern Ditch Marsh**: small marshy area with native species (H. Bryan et al., pers. comm.).

\*\* **Egypt Lane Flatwoods** (Jefferson Co., Louisville East Qd.); small tract of remnant wet flatwoods (M. Evans, pers. comm.); needs further checking.

\* **Prewitt's Lake area** (Hardin Co., West Point Qd.); 100s-1000 acres of young swampy woods and restorable wetlands; see JC Hardin Co. notes.

## **INDIANA: Nine Penny Run Woods**

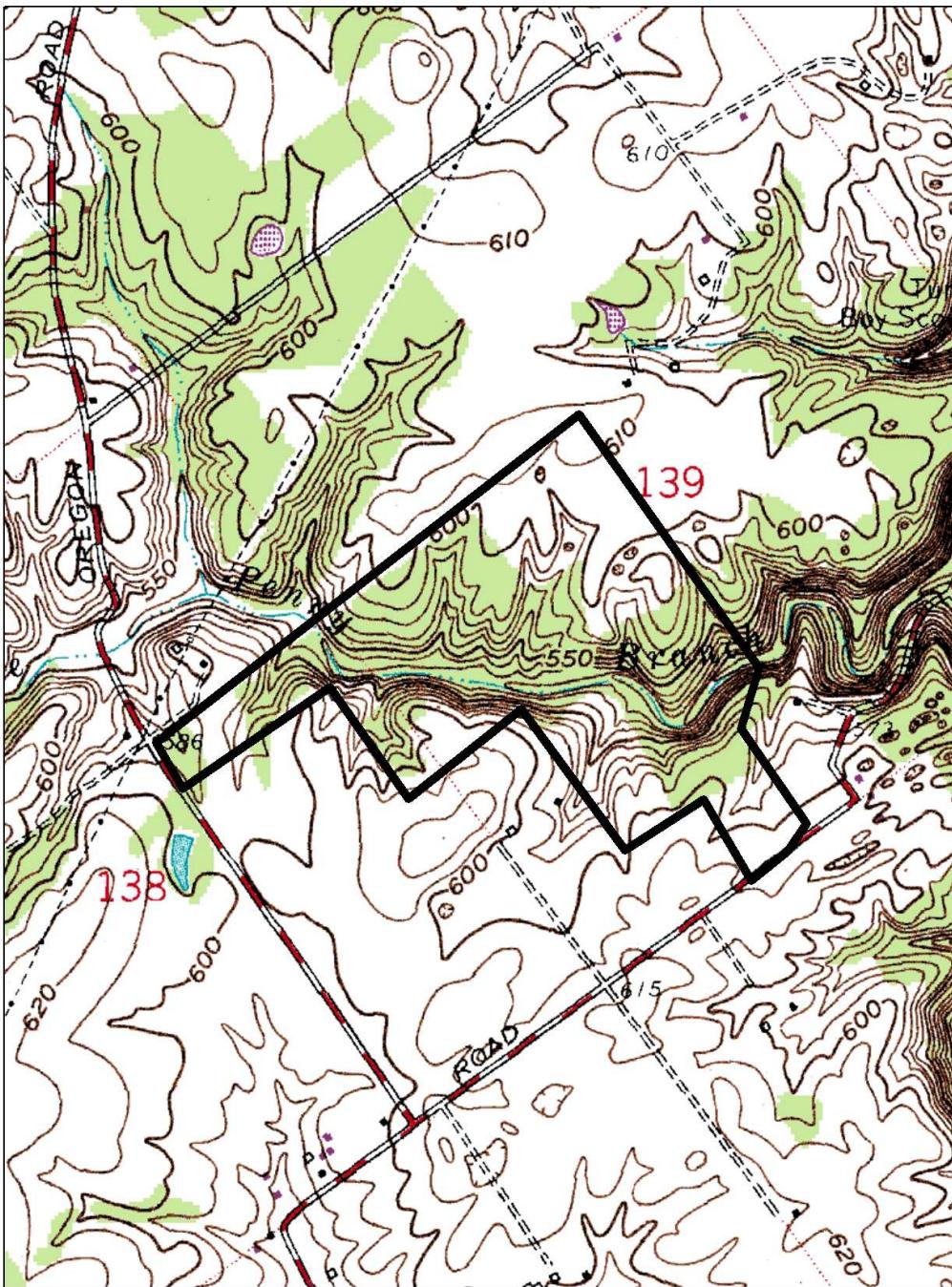
<http://dcwi.com/~eric/goot/nine.htm>: as follows

Location: From Charlestown (east of New Albany) and the intersection of SR 62 and SR 3, take 62 northeast to Monroe Street and turn left. Take the second right, Tunnel Mill Road and go a mile and a half. The preserve is on the left and extends to the northwest. You can also turn on New Market Road, in which case the preserve is on your right and extending to the northeast. Now connected to Charlestown State Park, which might be the better approach.

Description: Here's my original description: Woods, a creek, waterfalls, limestone outcrops; an old field turning back to woodland. 119 acres. Sounds nice; it's a pity that there is no real way to stop and visit without parking in a ditch or trespassing on private property. The Indiana DNR is in charge of this. I don't expect neat little trails, and I don't mind climbing the occasional fence, but a pull-off should be provided. Who exactly is this being preserved for? This after driving down to visit the place and finding no way to get in. I got a letter in response from some conservation-minded individual telling me off for complaining about this, and responded that I thought the best way to help preserve nature was to let people see it. Well, I'm back to eat crow. By preserving this place, it was left available for eventual connection, via another land purchase, to Charlestown State Park, which is now accomplished. So I was wrong.

Nearby Points of Interest: Charlestown State Park, Clark State Forest, Falls of the Ohio State Park

Ownership: Indiana DNR





## **Charlestown State Park**

Location: About 10 miles northeast of New Albany (the Indiana side of Louisville) on SR 62.

Description: Charlestown is Indiana's newest state park, and facilities are still an ongoing project. The campground has been put in now, but no visitor center. It's located on grounds formerly part of the military-industrial complex, but apparently contains no unexploded ordnance (!). The place is large, though, and shows a great deal of potential if not overdeveloped. It is bordered by the Ohio River on the south, and the rather pretty Fourteen Mile Creek flows through the center. In 1997 there were only two marked trails; Trail 2 was very woodsy and a good workout as well; the ascent from Fourteen Mile Creek seems to go up forever. On a hill on the other side of the creek right where it enters the Ohio, a stone fort or watchtower was discovered in the early 1800's; no one knew who built it (it was not a Native American structure) and one of the stones had a date of 1187 carved on it. The state geologist of the time even visited it and confirmed its existence. Whether or not this has any connection with the legends of Welsh presence in Indiana (noted in the Visitor's Center at Falls of the Ohio State Park ) is not known or likely to be figured out; but it is interesting to speculate if you're not irretrievably wedded to the notion that our ancestors were too stupid to get across the ocean until Columbus came along. There has never been any archaeological exploration at the site.

Nearby Points of Interest: Falls of the Ohio State Park, Clifty Falls State Park

Cautions: Nothing much.

Ownership: Indiana DNR

Fourteenmile Creek Nature Preserve

County: Clark Size: 858.63 acres

Ownership: State Parks & Reservoirs - IDNR

Location and Access: 03se

Parking lot and trail. This nature preserve is part of Charlestown State Park. Take I-65 south to Henryville and SR 160 (exit 19). Take SR 160 through town, and follow this to Charlestown (about 9 mi). Where SR 160 intersects with SR 403 and SR 3, take SR 3 south through town to SR 62. Turn left onto SR 62 and go about 1 mi. The park entrance will be on the right. (continued...)

USGS Quad map: Charlestown, Owen; Charlestown Q SR 3/62 q q o

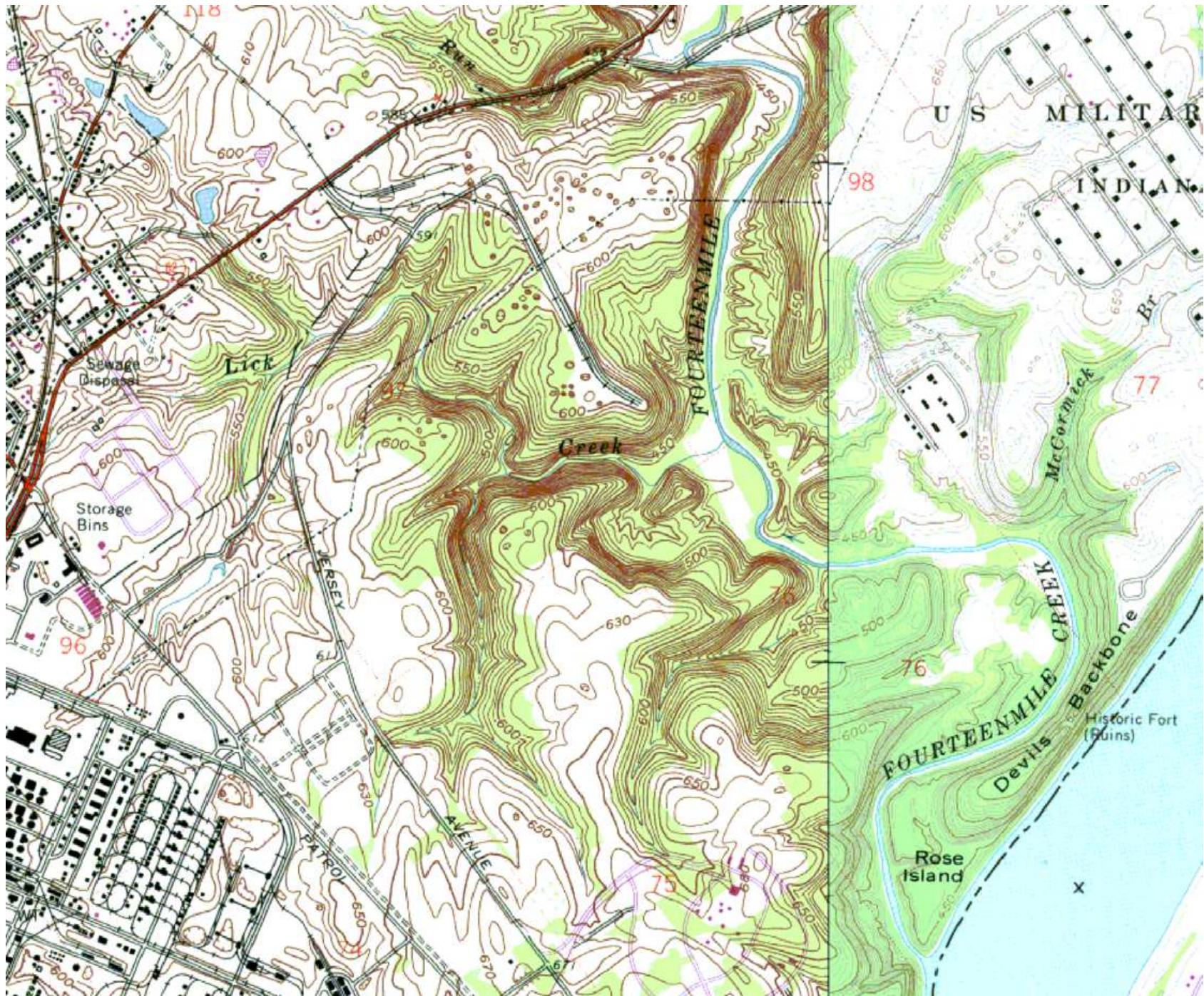
Further Information:

Charlestown State Park. 12500 St Rd 62. Charlestown, IN 47111. 812-256-5600.

[www.in.gov/dnr/parklake/parks/charlestown.html](http://www.in.gov/dnr/parklake/parks/charlestown.html)

Division of Nature Preserves. 402 W Washington St, Rm W267. Indianapolis IN 46204-2739.  
317-232-0209. [www.in.gov/dnr/naturepr](http://www.in.gov/dnr/naturepr)

Description: This preserve contains high-quality limestone cliffs, and a range of dry upland to floodplain forests. The dry upland areas support species that can grow in well-drained soils, such as Eastern red cedar, chinquapin oak, prickly pear cactus, shooting star, pucooon, nodding onion, and the adder's tongue fern. The area known as the Devil's Backbone, at the south end of the preserve, is has more moist habitat, with sugar maple, tulip tree; red, white, black, and chinquapin oaks, American beech, and a variety of flowers such as mayapple, columbine, twinleaf, Jack-in-the-pulpit, sessile trillium; and the walking fern found there.





## **Clark State Forest**

Location: From I-65 in southeastern Indiana, take the SR 160 exit to Henryville, then go one mile north of Henryville on US 31 to the forest entrance. The main part of the forest is actually on the other (west) side of I-65.

Description: Not Visited. Clark covers 23,979 acres, apparently all contiguous, and has several good hiking trails, including a big part of the Knobstone Trail, Indiana's longest. There is also a 20-mile loop trail through the forest, and a couple of short hikes, including one through the 143 acre White Oak Nature Preserve. The 20-mile Clark State Forest Trail is noted as rugged; estimates range from 7 to 10 hours for the whole trail. I'm looking forward to first-hand accounts of this forest; the hiking sounds great.

Nearby Points of Interest: From Clark you could easily visit Charlestown State Park, Falls of the Ohio State Park, and Jackson-Washington State Forest (the other terminus of the Knobstone Trail).

Cautions: Hunting seasons for deer, squirrel, turkey, quail and rabbit.

Facilities: Primitive campground; 2000 acre backpack camping area.

White Oak Nature Preserve

County: Clark Size: 143 acres

Ownership: Forestry - IDNR

Location and Access

Further Information:

Clark State Forest. PO Box 119. Henryville, IN 47126. 812-294-4306. [clarksf@dnr.state.in.us](mailto:clarksf@dnr.state.in.us).

Division of Nature Preserves. 402 W Washington St, Rm W267. Indianapolis IN 46204-2739.

317-232-0209.

[www.in.gov/dnr/naturepr](http://www.in.gov/dnr/naturepr)

03sw USGS Quad map: Henryville

Parking lot and trail. White Oak Nature Preserve is located in Clark State Forest.

From Henryville go north 0.9 mi on US 31, then turn left at the Forest entrance.

Cross over I-65 and park in the picnic grounds on the right. The preserve is across the road. A trail guide can be obtained at the Forest Office building at the entrance.

Description:

White Oak is the most important tree within this fine example of an oakhickory forest. It also supports red, black, scarlet, post and chestnut oaks, along with pignut, shagbark and bitternut hickories. There are also scattered native Virginia pines.

Understory trees and shrubs include flowering dogwood, Juneberry, roundleaf greenbriar, Virginia creeper, and pasture rose. Dryland blueberry clumps indicate acid soil conditions.

The wildflower display varies with exposure and soil moisture. Dry sites have pussytoes, spring beauty, shooting star, orange hawkweed, phlox, firepink, bluets, and goats' rue. Mesic (moist) sites have Jack-in-the-pulpit, wild ginger, wild geranium, mayapple, and jewelweed. Mesic sites are also rich in ferns.

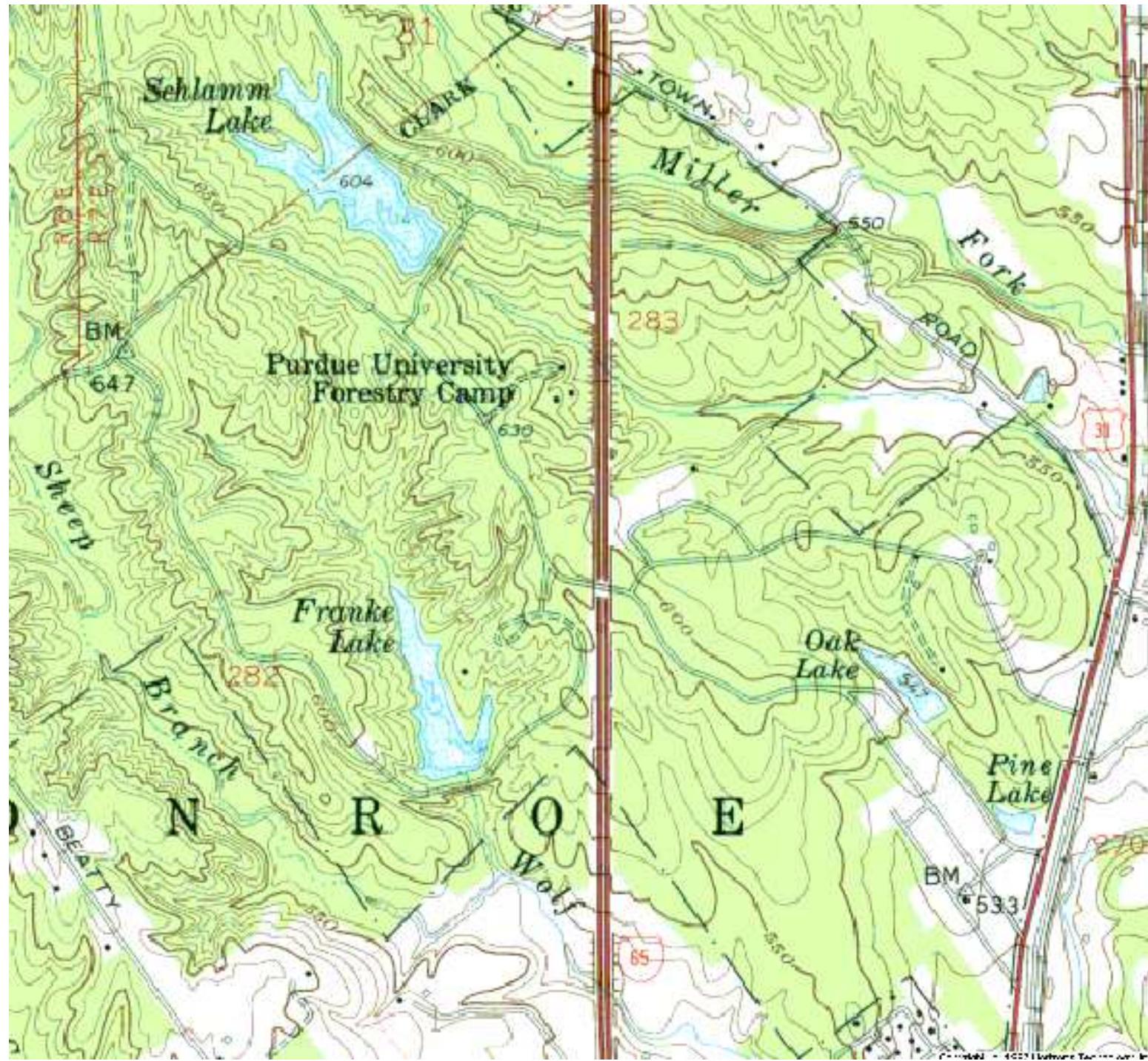
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## Falls of the Ohio State Park

Location: Take exit 0 (zero) west from I-65 just before it leaves our fair state and ventures into the bizarre kinship structures of Kentucky. Falls of the Ohio is right in the city area.

Description: This would be easy to confuse with a city park. There is no charge to enter the park itself, only the Interpretive Center. The Center is worth the admission, because to understand why this riverbank (and series of islands in low water) is significant enough to be a state park, you have to know something about the prehistory and history of the area. The Riverbed here is rich in fossils; one of the premiere fossil beds in the world. You can't collect, but virtually every stone you look at will be full of interest. Wander around and check out the news from 35 million years ago. While you're here, check out the rumors of Welsh occupation pre-Columbus. It's interesting, though probably impossible to verify.

Nearby Points of Interest: Charlestown State Park; Brock-Sampson Ridge Nature Preserve; Clark State Forest

Cautions: During the spring and other high-water times, most of the interesting features of the park may be underwater. During the floods in 1997, the Interpretive Center was nearly underwater. Visit in late summer or fall.

Ownership: Indiana DNR

## **Clifty Falls State Park**

Location: Right on the west side of Madison on either SR 62 or 56. Madison is on the Ohio River about halfway between Cincinnati and Louisville.

Description: This park boasts one of the highest waterfalls in Indiana, and certainly one of the most impressive. The best trail in the park, #2, leads along the canyon floor from the falls on down to the southern edge of the park; you will see a lot of fossils in the rock left over from Indiana's sojourn as a sea floor. There are several other falls along the canyon and all are worth seeing. Trails tend to have steep descents to start with and steep climbs to end with. The woods are pretty, too; lots of wildflowers in spring. I like the Clifty Inn, so I don't know what the campgrounds are like.

Nearby Points of Interest: SR 56-156-56 between here and Cincinnati is a great drive winding along over the Ohio through some of the nicest hill country in the state, all of which, thanks to the public-spirited residents of Switzerland County, is in private hands. Come on, folks, let's share the love a little! Check Crosley F&W and Brush Creek F&W to the north.

Cautions: Climbs are not for the weak of heart. Don't try going over the falls in a canoe.

Ownership: Indiana DNR

## **Clifty Canyon Nature Preserve**

County: Jefferson Size: 179 acres

Ownership: State Parks & Reservoirs - IDNR

Location and Access: Parking & trail. This preserve is located in Clifty Falls State Park, on the outskirts of Madison, Indiana. The preserve encompasses the majority of the valley which forms the primary natural feature of the park. Trails 2 through 8 lead through the preserve. Information is available at the park office, gate house or nature center.

Description: This preserve is of geological as well as ecological interest. Small streams have cut deep gorges into ancient Ordovician rock beds. These rock exposures contain numerous fossils.

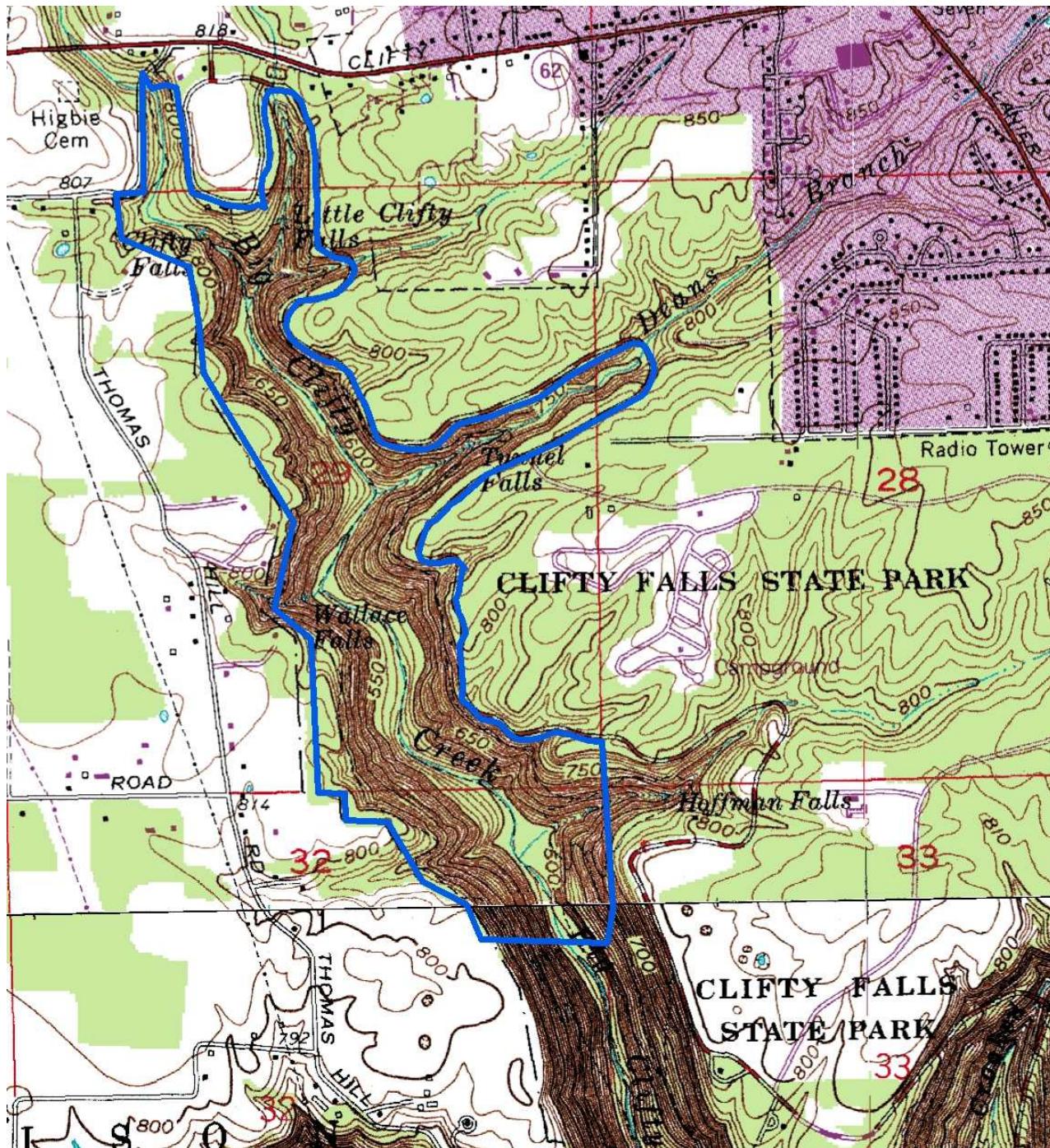
Spectacular waterfalls on the streams which flow through the preserve are a major attraction. There are mesic forests on the lower slopes and ravine bottoms, and dry oak hickory forests on the

upper slopes and ridge tops. In places steep ravines support undisturbed cliff communities of mosses, lichens, and ferns. Several rare plants are known to occur on these undisturbed rock communities. Common wildflowers are widespread throughout the preserve.

03se USGS Quad map: Clifty Falls & Madison West 2 maps

Further Information: Clifty Falls State Park. 1501 Green Rd. Madison, IN 47250. 812-265-1331.

[www.in.gov/dnr/parklake/parks/index.html](http://www.in.gov/dnr/parklake/parks/index.html). Division of Nature Preserves. 402 W. Washington St., Room W267. Indianapolis, IN 46204 317-232-0209. [www.in.gov/dnr/naturepr](http://www.in.gov/dnr/naturepr)





## **Crosley Fish and Wildlife Area**

Location: From the intersection of SR 7 and US 50 (the loneliest road in America) in North Vernon, head south on SR 7. Turn right at the junction with SR 3, in Vernon, and follow SR 3 about two miles to the road to the property office which goes off to the left. I know, but it's better than the directions to Brush Creek, isn't it?

Description: Not Visited. This place sounds good. 4600 acres, formerly a game preserve and hunting lodge for some rich troll. Mostly forested, including some pine plantations, but also including ponds, marshes, meadows and a good length of the Muscatatuck River. There are several limestone caves along this river, too, which are little visited. Got to try this one soon!

Nearby Points of Interest: Brush Creek F&W, Muscatatuck National Wildlife Refuge, Clifty Falls State Park, Selmier State Forest

Cautions: Hunting. Caves may be dangerous, I don't know how big they are (one of them is actually a man-made tunnel, apparently).

Facilities: No camping, although camping is available at Clifty Falls State Park about 20 miles south. No trails, just overgrown roads; put-ins on the river and one of the lakes.

## **Brush Creek Fish and Wildlife Area**

Location: It would be best to check in at Crosley, which is nearby, and get a map; the directions I can find are unclear. Generally speaking, it is west of North Vernon on US 50 (the loneliest road in America) and north of Butlerville.

Description: Not Visited. Apparently not as interesting as Crosley, McPherson gives it one paragraph. Mostly wooded, except for a big lake popular with fishers. 1,860 acres.

Nearby Points of Interest: Crosley Fish and Wildlife Area, Muscatatuck National Wildlife Refuge, Selmier State Forest, Clifty Falls State Park

Cautions: Not readily perceptible. Be aware of hunting seasons.

Facilities: Nope.

## **Muscatatuck National Wildlife Refuge**

Location: The office is just to the south of US 50 a couple of miles east from I-65.

Description: I had only a little time here, but it looked very nice; it encompasses some wetlands and some open fields as well as forest. River otter have been released on the Muscatatuck River here, and the birdwatching is good. The little trail around the area near the information center is nice, although not spectacular. There are 8 other very short trails, mostly for bird and wildlife viewing rather than serious hiking. Lots of ducks and sandhill cranes during migration. This place is worth more time than I spent; I'll be back.

Nearby Points of Interest: Jackson Washington State Forest; Selmier State Forest; Clifty Falls State Park, Brush Creek F&W, Crosley F&W

Cautions: Mostly harmless.

Ownership: US Fish and Wildlife Service (not connected with UN plans to take over the USA).

## **Thomastown Bottoms Nature Preserve**

County: Scott Size: 889 acres Ownership: DNR Nature Preserves/Fish & Wildlife

### **Location and Access:**

The nature preserve is located near the town of Austin. From I-65 take exit 34, going west on SR 256. After traveling about 0.5 mile, turn left (South) onto CR 300W. Take a right followed by a quick left to stay on CR 300W at about 0.5 mile from SR 256. CR 300W will change to Thomastown Rd. portions of the nature preserve are on both sides of the road (see map). Continue South and West on Thomastown Rd, turn right (North) at the stop sign onto Finley Firehouse Rd/CR 400W. Portions of another part of the preserve are on the left and right of the road near Stucker Ditch. There is no designated parking area. Please park in a

safe place off the side of the road, being careful to avoid parking on private property. Visitors should

be aware that hunting is allowed in season. Additionally, after heavy rains ditches may not be crossable and the ground can be very soggy.

### **Description:**

This nature preserve is a part of a larger 1428 acre property jointly acquired by the DNR Divisions of Fish

and Wildlife and Nature Preserves. It protects an extensive hardwood bottomland forest situated on the

floodplain of the Muscatatuck River. Dominant trees include swamp white oak, pin oak, red maple, and

green ash. The wet forest harbors plants such as cardinal flower, monkey flower, sweet Indian plantain,

and many sedges. Occasional sloughs are dominated by buttonbush along with swamp milkweed, rice cutgrass, and featherfoil.

Further Information:

Division of Nature Preserves Southeast Regional Ecologist, Jason Larson: [jlarson@dnr.in.gov](mailto:jlarson@dnr.in.gov)  
0 220 440 880

Meters

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Legend

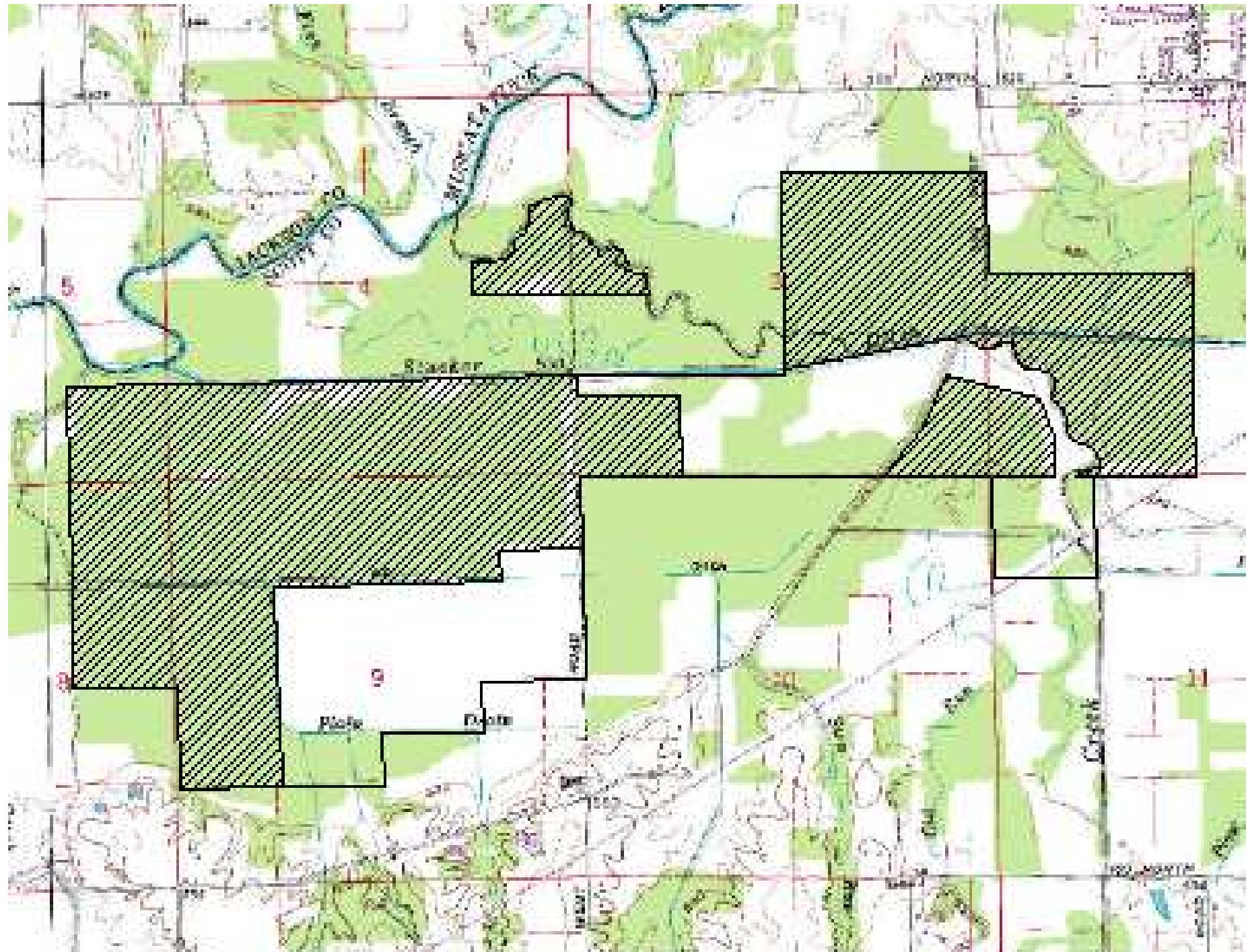
USGS Quad map: Scottsburg

DeLorme © page: 58

No Access

Nature Preserve

Stucker FWA





## **Selmier State Forest**

Location: From I-65, east to North Vernon on US 50; north on Main St. /CR20W two miles to CR 350N, and east on 350 about 1 mile.

Description: Not Visited. REALLY tiny for a state forest at 355 acres; hiking via fire lanes.  
Best walks are along the Muscatatuck River.

Nearby Points of Interest: Muscatatuck National Wildlife Refuge; Clifty Falls State Park,  
Crosley F&W, Brush Creek F&W

Cautions: Hunting seasons for deer, squirrel, rabbit, turkey, crow and dove!

Facilities: None. No camping, nothing. Nada.

## Jackson-Washington State Forest

Location: West of I-65 at the Seymour (US 50) exit. Take US 50 to Brownstown, then south on SR 39; the Forest Information Center is on the left.

Description: Not Visited. 15,329 acres, possibly in two disconnected parcels. The northern end of the Knobstone Trail is located here at Spurgeon Hollow; the area around the hollow is also the backcountry area of the forest and open to backpackers. The landscape centers around the "knobs", or rugged hills that the glaciers that steamrolled northern Indiana never touched. Heavily forested and little visited much of the year. There are several lakes in the park. The Indian Bitters Nature Preserve is located in the southern, Washington County part of the forest, but there are no trails to it; aside from the Knobstone, there are no trails at all in the Washington County portion. To get to the nature preserve, look for information signs going north from Salem on SR 135, or use the State Forest Map to track it down. (Hopefully I'll be able to get a better description of this after visiting). There is a "skyline drive" through the northern portion (which is more developed, with trails as well as campground, shelters, etc.) that is supposed to be very pretty but on a rather tricky road climbing up and down through the knobs.

Nearby Points of Interest: Spring Mill State Park to the west; Hoosier National Forest to the north; Muscatatuck National Wildlife Refuge to the east; Clark State Forest to the South.

Cautions: Sounds pretty rugged. Take them hiking boots. Hunting seasons for deer, squirrel, grouse and, in Jackson County only, turkey.

Facilities: Primitive camping, 2,544 acre backcountry area, backpacking trail.

## **Sherman Minton Nature Preserve**

### **Location and Access:**

This nature preserve is located 4 miles southwest of downtown New Albany. From New Albany,

take SR 111 south to Five Mile Road and turn right (west), there will be a 90 degree bend where

Five Mile becomes Budd Rd. Continue north on Budd for 1/3 mile, pass Blunk Knob Rd.

Pull off on left side of road just before the fenced pumping station (on right). Please park

### **Further Information:**

Division of Nature Preserves Southeast Regional Ecologist, Jason Larson: [jlarson@dnr.in.gov](mailto:jlarson@dnr.in.gov)

### **Description:**

This nature preserve protects a significant portion of Indiana's Knobstone Hills landscape, a landscape which is a

dramatically dissected complex of steep, forested hills and mesic ravines. Natural communities found here include

dry, dry-mesic, and mesic upland forest as well as several siltstone glades, the latter is exceedingly rare worldwide.

This preserve is named in honor of Dr. Sherman A. Minton, a noted herpetologist and author of "The Reptiles and

Amphibians of Indiana".

on on the left side of pull-off and allow access room for service vehicles to enter through the gate.

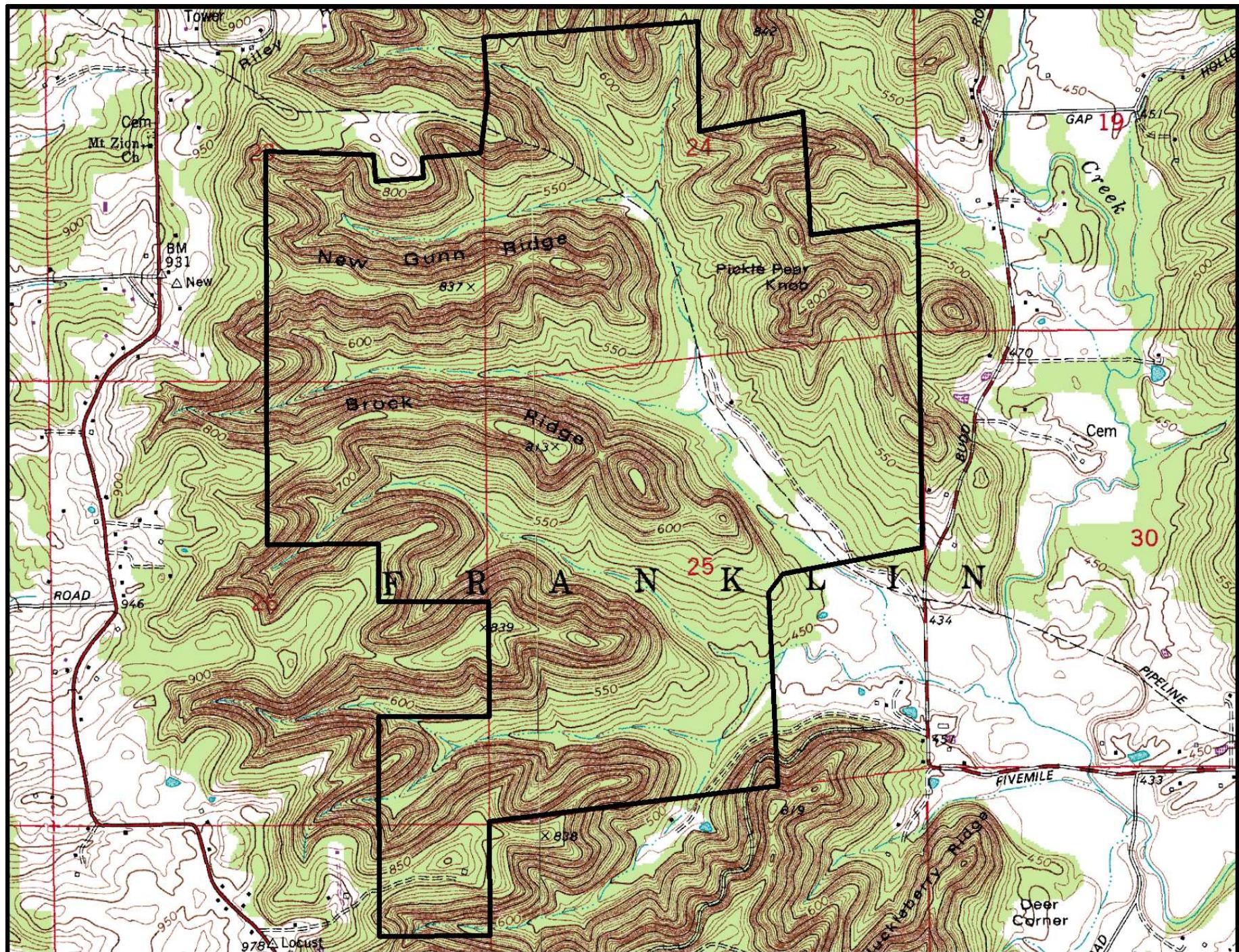
Follow the gravel lane into the preserve on foot. There are no trails and the terrain is very

rugged. Visitors should be aware that hunting is allowed in season.

USGS Quad map: Lanesville

DeLorme ® page: 58

County: Floyd Size: 1301 Acres Ownership: DNR Fish & Wildlife and Nature Preserves





## **Chelsea Flatwoods**

Journey With Nature Photo TNC Open to the Public: Yes

Things To Do: [View All](#)

Plan Your Visit: [View All](#)

Get Directions [Why You Should Visit :](#) One of the largest, wettest and most diverse examples of the Bluegrass Tillplain flatwoods in Indiana, Chelsea Flatwoods is a forest offering various wildflowers, ferns and an interesting mix of trees. American beech, sweet gum, sugar maple and a variety of oaks dominate the woods while a number of ferns cover the forest floor.

Location: Jefferson County

Ecoregion: Interior Low Plateau

Size: 388 Acres

Owned & Managed By The Nature Conservancy

Partners : Indiana Heritage Trust

What The Nature Conservancy is Doing/has Done: Stewardship activities include invasive removal - including garlic mustard and bush honeysuckle - and reforestation of the adjacent agricultural fields. Cool prescribed burns have also been applied to ensure the enhancement of rare plant species. The Conservancy plans to secure the last remaining flatwoods in the area to provide a small buffer zone around the preserve core.

Things To Do

**What to See: Plants and Animals.** The preserve homes uncommon wildflowers like the whorled pogonia orchid and the Virginia meadow-beauty which is best seen in the late summer. Numerous sedges - such as the rare Wolf spikerush - and fern species make a pretty understory for an array of mix of trees including American beech, sugar maple, pin oak, sweet gum, swamp chestnut oak, white oak and southern red oak (which is unusual as it is the most northern limit of its range at this preserve).

### Plan Your Visit

In the springtime, it would be best to bring some boots as the flatwoods are at its wettest. The forest is extensive, and with the seemingly unchanging terrain, it is easy to get turned around. As there is so established trail on the preserve, a compass is strongly recommended.

### Directions

From Scottsburg, travel east on S.R. 56 approximately 15 miles to S.R. 62 and turn right (south). Travel 3 miles to West Reardon Road (C.R. 500 S) and turn left (east). Continue to the end of the woods on the right side until you reach a gated driveway next to a barn. Please park in the driveway and make sure to not block the gate.

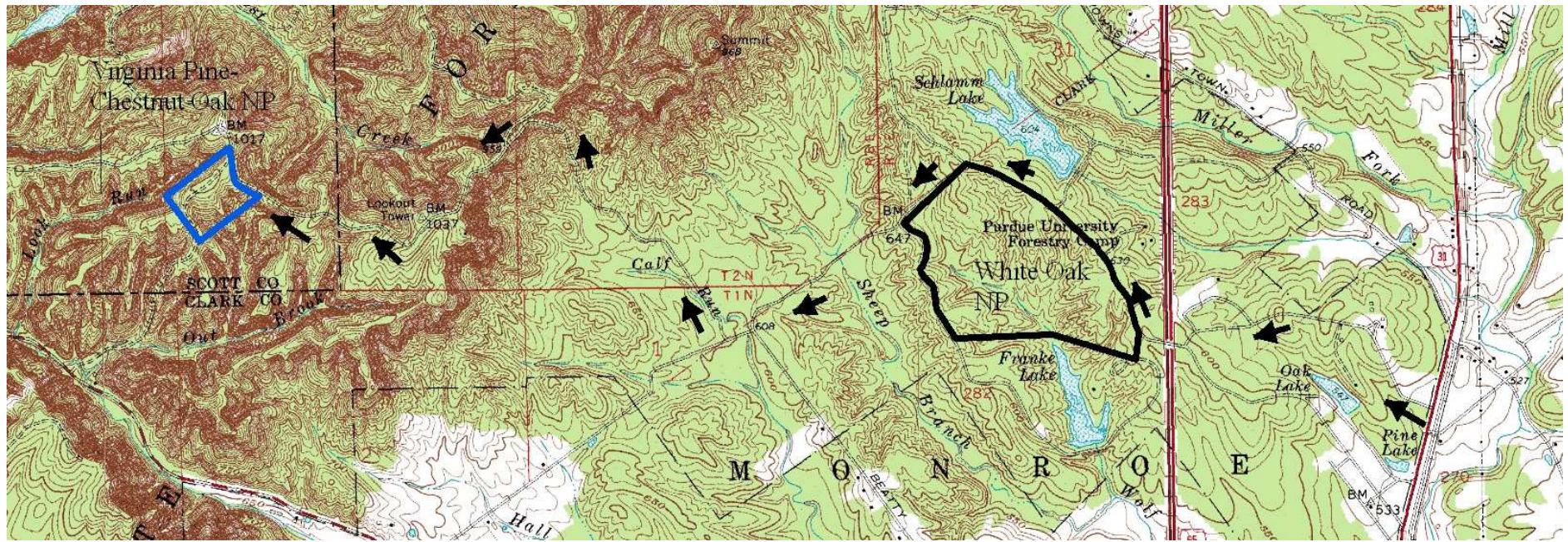
## **Virginia Pine-Chestnut Oak Nature Preserve**

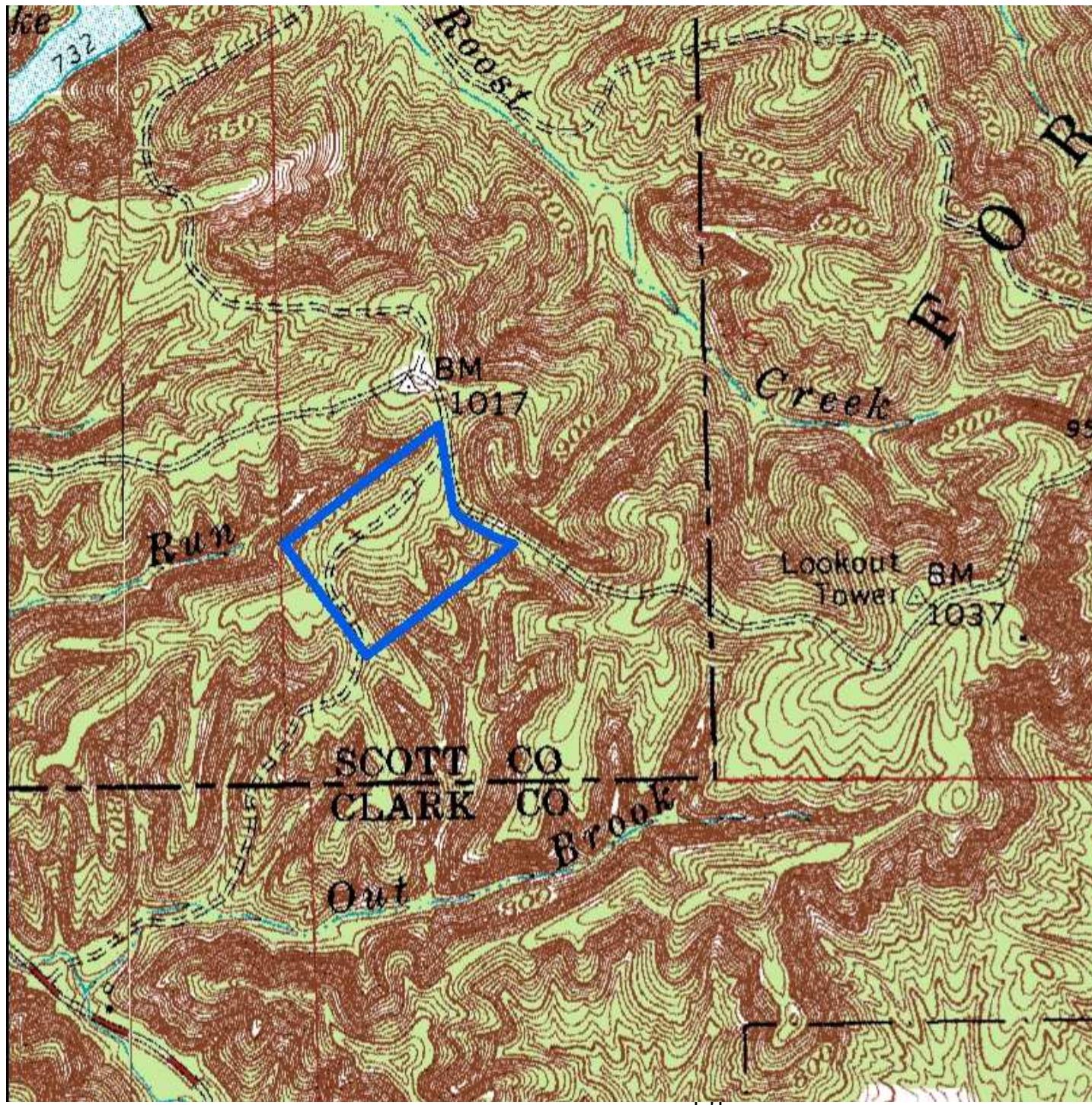
County: Scott Size: 24 acres; Ownership: Forestry – IDNR; No parking. Trail.

The forest road may be difficult to follow, so stopping at the forest headquarters for directions is advised. From Henryville go north 0.9 mi. on US 31 and turn left on the main forest road. Follow this road to the preserve, which is about 0.5 mi. west of the lookout tower. You will pass White Oak Nature Preserve on your way to Virginia Pine-Chesnut Oak. Park along the roadside. The Knobstone Trail runs southwest through the preserve. Description: This extremely hilly area is formed upon lower Mississippian sandstones, shales, and limestones. The preserve includes a

ridge top and surrounding slopes. The forest is predominantly Virginia pine on the upper slopes and chestnut oak on the lower. Midway down the slope there is a transition zone between the two dominant trees; white and scarlet oaks mingle with the Virginia pine and chestnut oak. The understory in the preserve is quite sparse. Much of it is greenbrier, poison ivy, dogwood, and sassafras. Native stands of Virginia pine are not common in Indiana and are confined to the Knobstone Region in Floyd, Clark, and Scott Counties.

Further Information: Clark State Forest. PO Box 119. Henryville, IN 47126. 812-294-4306  
[www.in.gov/dnr/forestry](http://www.in.gov/dnr/forestry); Division of Nature Preserves. 402 W. Washington St., Rm. W267.  
Indianapolis, IN 46204. 317-232-0209. [www.in.gov/dnr/naturepr](http://www.in.gov/dnr/naturepr)  
03sw USGS Quad map: Henryville





## **Still to check from DNR website: Jennings County**

- [Calli Nature Preserve](#)
- [Guthrie Memorial Woods Nature Preserve](#)
- [Tribbett's Woods Nature Preserve](#)
- [Wells Woods Nature Preserve](#)

### **3a. BARDSTOWN PLAIN: SIGNIFICANT SITES**

[Following is lower end of the macrosite; see also under Western Bluegrass above.]

\*\*\* **Floyds Fork Corridor macrosite** (Oldham, Jefferson & Bullitt Cos., Crestwood, Fisherville, Jeffersontown, Mount Washington, Brooks, etc., Qds.); possible long-term planning unit for careful integration of residential, rural and natural areas in a highly developed part of the state; challenges to water quality and terrestrial habitats have not yet been thoroughly dealt with; includes bluffs and bottoms along Floyds Fork and major tributaries; some rare aquatics (*Pleurobema cava/O*); several occurrences of *Leavenworthia exigua* var. *laciniata* (=§; but few are easily protected), *Viola egglestonii*, etc.

\*\*\* **Wells Run Glade** (Bullitt Co., Mount Washington Qd.): Leav exig/B?

\*\* Other sites probably should be defined for glade remnants...

\*\* Other sites probably should be defined for better woods on slopes and bottoms....

[Other sites occur in Bullitt, Nelson Co., etc.]

### **3b. LOWER ROLLING FORK KNOBS: SIGNIFICANT SITES**

Distinction from Lower Salt River Hills is unclear; Jefferson Co. lands are provisionally included with the Hills, as follows.

### **3c. LOWER (ROLLING FORK) SALT RIVER HILLS: SIGNIFICANT SITES**

Includes Cecil Ridge and Muldraugh's Hill to the south; a loosely defined megasite of great regional significance could include siltstone and limestone glade clusters in Harrison Co., Indiana, plus Fort Knox, plus Jefferson Memorial Forest plus Bernheim Forest.

**\*\* Waverly Hills** (Jefferson Co., Louisville West Qd.); includes city park and adjacent forest to N and S which seem to have good quality (M. Evans, pers. comm.).

**\*\*\* Jefferson County Memorial Forest** (Jefferson & Bullitt Cos., Valley Station & Brooks Qd.): 1000s of acres of forests [C/CD quality =\$?]; can combine with Knob Creek corridor, which has *Orconectes jeffersonii* reported (G1G2).

INDIANA SITES nearby:

KNOBS:

Brock-Sampson Ridge (south near river)

Floyd/Clark Siltstone (edge)

Virginia Pine-Chestnut Oak knobs (headwaters of Blue River)

FLATWOOD etc

Chelsea Flatwoods

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# END

## **INVOICE**

**Date:** Feb. 20<sup>th</sup>, 2008.

**To:** Dr. Ronald Fell  
Dept. of Biology,  
University of Louisville  
Louisville, KY 40292

**From:** Julian Campbell  
3525 Willowood Road

Lexington, KY 40517

Social Security: 402 04 8651

For: half of the preparatory work to separate University of Louisville's herbarium into a reference collection to retain in the Dept. and the remainder for transferring to Western Kentucky University. All of the basic refiling has been accomplished (old loans and teaching material), cabinets rearranged for the reference collection and the actual separation has been initiated. This current invoice covers 10 days of my time, mostly during last fall. Another 10 days or so will be needed to complete the separation.

Note: I am interested to write grants for expanding on this basic work, which covers only item 1 in the plan below plus minor amounts under items 2 and 3.

TOTAL: \$1500.00

Please remit to above address.

Thank you.

Signed:

Julian Campbell



To: Dr. Ronald Fell, Director, Dept. of Biology, Univ. of Louisville.

cc: Dr. Margeret Carriero (UofL), Dr. Albert Meijer (WKU), Dr. Lawrence Alice (WKU), Robert Neidlinger (WKU), Patricia Haragan (Olmstead Conservancy).

Attached below is the final plan for the herbarium, developed by myself and Pat in consultation with you all. This would lead to separation of the reference collection for Jefferson County (to retain at Univ of Louisville) and transfer of remaining specimens to Western Kentucky University. Can we get the ball rolling as follows?

A. Let's agree to start the general process and try to secure a truck rental as soon as possible; Pat and I will look into this again and check with Ryder. WKU (Meier et al.) tell us that early May would be a good time to deliver at Bowling Green, but it will also take a good week or two to pack in the material and to freeze it in the truck. We are currently checking to see if Ryder can park a truck at the Louisville herbarium for up to a month, starting in early April.

B. Meanwhile, I can continue this winter to work on separation of the reference collection for retaining in Louisville; based on our initial effort, we have increased this estimated task to at least 20 person-days. It would be good to receive some payment for this, at least \$3000, as indicated under item 1 in the process outlined below. I would be glad to help write more detailed grants or funding requests for this and other items, if appropriate—do you have suggestions?

C. When we can secure a truck for the bulk transfer, let's go ahead and jump into the whole move, with whatever volunteer/paid help is available at either end (UofL/WKU). Any remaining separation of the collections can be done at WKU by myself and Robert, ideally dovetailing into anticipated grants that they will secure.

I am attaching an invoice to the University of Louisville for 50% of the basic payment to me for work as a private contractor. If further paperwork or discussion is needed, please let me know as soon as possible. I already volunteered 10 days in Jan-Mar 2007 to begin refiling old loans and teaching materials. Thanks for your help in approving this effort.

To: Dr. Ronald Fell, Director, Dept. of Biology, Univ. of Louisville.

cc: Dr. Albert Meijer (WKU), Dr. Lawrence Alice (WKU), Robert Neidlinger (WKU), Patricia Haragan (Olmstead Conservancy).

Attached and copied below is the final proposal that myself and Pat have put together for work at the Louisville end. (I already volunteered 10 days in Jan-Mar 2007 to refile old loans and teaching materials.) With help from Dr. Meier and Dr. Alice, Robert Neidlinger—the curator of the WKU collection—is writing a proposal to NSF this week for their collection development, including accession of material from Louisville. It is my understanding that they will seek a statement from your Dept. agreeing to the partial transfer of the collection, as suggested below. I think their deadline is this Friday, and they will be contacting you about this soon.

I have also drafted a personal letter supporting this project, based on researches using the Louisville and Western collections, especially my forthcoming book—the Atlas of Kentucky Flora—coauthored with Max Medley, who received his Ph.D. from U of L after 12 years working at the herbarium there. This letter is also attached for your interest—Robert, I will send/fax you hard copy in next day or two; let me know if you want different content/format. I suggest you contact KSNPC and perhaps Ron Jones/others at EKU for letters if you need more.

Thanks for your interest in salvaging this important collection.

To: National Science Foundation

Re: Proposal for Herbarium Development at Western Kentucky University

Date: July 27<sup>th</sup>, 2007

From: Julian Campbell, Ph.D.  
3525 Willowood Road  
Lexington, KY 40517  
[julian.campbell@insightbb.com](mailto:julian.campbell@insightbb.com)

I wish to lend my strongest support for the reestablishment of the University of Louisville Herbarium, to be divided between Western Kentucky University (for general floristic research on the Kentucky Flora) and a smaller herbarium to be established in Louisville, focussing for the local flora. The herbarium at Western is the largest within the western half of Kentucky, and with clearly demonstrated support from administration and faculty, plus much student use. It is becoming a major regional resource for botanical sciences within the lower Ohio Valley.

I have been involved in research on the Kentucky Flora for 30 years, and I have spent many, many days and nights laboring over identification of collections at both institutions. The recent culmination of this work has been the preparation of the first distributional Atlas of the Kentucky Flora. This is being reviewed currently by the University Press of Kentucky, and it will probably be published in 1-2 years. My coauthor is Max Medley, who completed his Ph.D. on the Kentucky Flora at the University of Lousiville in 1993. I have incorporated his material

into the book. Earlier, I acquired the ca. 20,000 collections of Max Medley and donated them to Western.

In addition to this general work on the flora, many papers have been published by ourselves and other Kentucky botanists, using collections at both institutions. Among the highlights are descriptions of species new to science, such as *Aster saxicastellii* J.J. N. Campb. & Medley, *Elymus macgregorii* R. Brooks & J.J.N. Campb. and *Silpium wasiotense* M. Medley. Also, many collections in the Louisville herbarium provide unique evidence about the flora of that metropolitan area before development and expansion during the past 50 years. Several of these species now appear to be locally extinct—they cannot be found anymore within Jefferson or adjacent counties.

I will continue to offer assistance whenever possible to secure good curation for these scientifically valuable collections.

Sincerely,

Julian Campbell

Courier Journal, 2013 Sep 1st

Bob Hill | Planting the seeds for Louisville's Waterfront Botanical Gardens

Efforts to create Louisville's Waterfront Botanical Gardens are stepping up as interest, eagerness and fundraising increase among area's gardeners and others

[Former Courier-Journal columnist Bob Hill is a member of the Botanica board and owner of Hidden Hill Nursery & Sculpture Garden in Utica, Ind.]

Climbing up the slope to the top of the 23-acre mound that will become Louisville's Waterfront Botanical Gardens, the bright yellow patch of goldenrod in the flat sea of weedy green was a sign of things to come.

So was the music of the birds, the flutter of butterflies, the broad patchy-blue sky and the small seedlings pushing up through the soil whether you wanted them or not.

The site, both isolated and urban, is filled with all such resolute offerings of Mother Nature — and, OK, airplanes overhead, utility lines and highways at its edges and some piles of slowly decaying wood chips and brush that will only, in time, add nurturing compost to the land.

That's both the challenge and the great promise of the place; land rehabilitation meets urban ecosystem meets community recreation as Louisville's long overdue Waterfront Botanical Gardens rises at the corner of Frankfort Avenue and River Road.

From there it will continue along River Road to the bike path along Beargrass Creek, a cooler, shaded area where monstrous cottonwood trees rise into the sky and hikers and bikers already make their way toward downtown Louisville — and the Big Four Bridge — only a few minutes away.

A botanical garden for Louisville has been discussed, promoted, planned, designed and even partly financed in various forms for almost 30 years — with little success.

This past June, Botanica, the revitalized, nonprofit organization working on the gardens, signed a land-use agreement with Louisville as an initial step to finalize its use of the 23-acre site on the former Ohio Street Landfill, which has been vacant since the 1960s.

In 2001, longtime Louisville gardener Helen Harrigan left Botanica \$1.5 million in trust to foster her desire to see a botanical garden and conservatory built in Louisville, with only the interest and dividends from the gift available each year.

This summer, Emil and Nancy Graeser of Louisville — two longtime garden supporters — pledged a \$225,000 gift to Botanica over a three-year period that will be matched by other donations in a forthcoming fundraising campaign.

“My wife and I visit botanical gardens whenever we are in other parts of the country,” he said, “and I’ve had a longtime interest in seeing a garden in this city.

“I have several reasons for that. A botanical garden will be educational for children, it will be good for the community, and I think it would be a wonderful tourist attraction.”

Graeser said that, in discussing his gift with friends and family, he’s found a lot of interest for a Louisville botanical garden, an idea whose time has come. It’s just been a matter of getting it moving with solid planning, commitment, resources and good public information.

“As far as I’m concerned, this is just a beginning. ... I can’t read the future, but I could well do more than this.”

Graeser’s vision of downtown botanical gardens easily accessible to all sections of Louisville and Southern Indiana is shared by Louisville Mayor Greg Fischer. He also sees the garden as a great tourist attraction, adding to the energy already being created with the new restaurants, shops and bourbon distilleries in the downtown area to welcome tourists.

“It’s just an example of good city planning,” Graeser said. “It’s close enough to town people could walk out there.

“We’re happy to be part of it, and we want to see it become successful. Some folks have stepped up with a lead gift and that, hopefully, portends good things to come.

“I think it will be great. We need things like this in the city.”

Certainly the area around the site presents industrial-sized challenges —the steady invasion of noise from nearby interstate highways, the heavy truck traffic along Frankfort Avenue, the commuters making their way up and down River Road, and the current and proposed addition of almost 330 RiverPark Place apartments across the way, many of whose occupants could easily become gardens users, if not volunteers.

Its designers will have to take all that in mind, creating an oasis in an urban community as was done in the development of the very successful Waterfront Park — which will be the botanical garden's neighbor.

There are also many other parks and botanical gardens in the United States thriving in an urban environment while also carefully reclaiming land — and landfills — that have been fallow too long.

The Cincinnati Zoo & Botanical Garden has done a great job of melding both features into one urban area, as has the White River Gardens in downtown Indianapolis, which connects with the Indianapolis Zoo and the White River pathway.

The 87-acre South Coast Botanic Garden near Los Angeles was built on a reclaimed landfill, as was part of the very popular 100-acre Lauritzen Gardens — which serve as the Omaha (Neb.) Botanical Center near downtown.

Botanica took a first step in creating botanical gardens this spring with an initial planting of flowers, shrubs and trees at the Heigold Façade at the corner of Frankfort Avenue and River Road — the façade itself a Louisville reclamation project with a history lesson.

The house was built in the 1850s by immigrant stone mason Christopher Heigold near a wealthy River Road area called “The Point.” Between the moving of Beargrass Creek from downtown Louisville to its present location, the 1937 Flood and the construction of Interstate 64, the area was devastated and bulldozed — with much of it becoming the beginning of the Ohio Street Landfill.

The façade — 26 feet tall, 35 feet wide and weighing about 70,000 pounds — was originally saved in 1955 and moved to Thruston Park across from Towhead Island.

In 2007, it was moved to its present location — serving as a doorway to Butchertown, and the Waterfront Botanical Gardens, where it’s already a magnet for visitors, tourists and photo opportunities.

Botanica has already initiated a comprehensive environmental analysis of the landfill property and is in the early stages of selecting a design team for the project.

No decisions have been made, but that final design could include tree, shrub and flower plantings; water features; walking paths; a conservatory; a botanical library; several specialty gardens, including a children's garden and a bonsai exhibit; and meeting and rental space.

Those areas, along with year-round access to Beargrass Creek, will allow Botanica to serve as a central, year-round umbrella organization and educational center for the Louisville and Southern Indiana gardening area. It is now seeking community input and suggestions for other ideas for its gardens, facilities and programs.

Botanica also will host guest speaker Peter Raven, botanist, environmentalist and president emeritus of the Missouri Botanical Garden in St. Louis — one of the great botanical gardens in the nation — at its annual member meeting at Locust Grove from 5:30 to 8 p.m. Oct. 23.

The Waterfront Botanical Gardens will become another link in the very diverse, 100-mile park loop being created around Louisville that already encompasses many of the city's parks and forests

Its urban mission will be to complement but not duplicate the work of larger, well-established facilities such as the Bernheim Arboretum and Research Forest near Shepherdsville and Yew Dell Botanical Gardens near Crestwood in Oldham County — and to work with Metro Parks, The Parklands of Floyds Fork and the many historic-home gardens, garden clubs and Master Gardener programs on both sides of the Ohio River.

That mission became clearer while walking on top of the old landfill on a summer evening — with Beargrass Creek hidden down below the far edge.

There would be a handicapped-accessible path down to the creek, great groupings of native trees, specialty and seasonal gardens, an organically designed conservatory with a restaurant tucked inside, an artistic roof observatory with a view of the sun setting over downtown Louisville and the Big Four Bridge.

My historical hope for the gardens would be something of a grand, tumbling, watery entrance reminiscent of the original Falls of the Ohio. Along with that might be an a re-creation of the original flora and fauna found on the now vanished Corn Island — the roughly 40-acre Ohio

River site where George Rogers Clark and his 60 militia and settlers landed in 1778 before moving to the Kentucky shore.

The Botanica board is both optimistic and realistic; these things will take years and millions of dollars — but given Louisville’s history of waterfront development success along the Ohio River, the optimism is warranted.

“Waterfront Park has raised our community’s expectation for land use,” said Mike Kimmel, vice president of Botanica and the Louisville Waterfront Development Committee. “Nearby vacant warehouses are now fashionable apartments and restaurants.

“Underutilized properties, with and without buildings, are being reborn as successful residential centers. The waterfront district is now being recognized by both developers and the public as an incredibly desirable place.

“Once again, this challenging vision has united the city, Botanica, the Waterfront Development Corporation, and a growing army of donors, to take a former landfill and turn it into a botanical center of education and excellence.”

David Karem, longtime president and executive director of the Waterfront Development Corp., added, “We see the relationship of Waterfront Park and the Waterfront Botanical Gardens to be mutually beneficial. The educational opportunities of such a partnership are boundless.”

## old transfer notes

**Products:** the following activities will occur, to some extent concurrently, during the operation.

1. A set of specimens for each species from Jefferson Co. or adjacent counties will be selected to remain at the Dept. of Biology. For most species, 2-3 specimens per species will be selected; these will number ca. 3000-5000 and be housed in about five or six cases. If there is only one specimen from Jefferson Co., this will be kept for WKU, but a photocopy will be retained in Louisville, or a specimen from an adjacent county substituted.
2. A total of ca. 10 cases will be retained, allowing room to expand and store other research material. These cases will be stored, maintained and used within a space of ca. 500-1000 sq. ft., including room for processing (freezing, mounting), research and teaching. This facility will be essential for research and education about the local flora; it will serve the community, and it will be available for reasonable use and loans by other botanists. It could become an accredited herbarium for international exchange, research or housing type specimens.
3. Unnecessary duplicates, or specimens that have significant damage, will be pulled out (and labeled in batches), for future reference, transcription of data, repair or eventual disposal. They will be stored in 5-10 secure cases at a storage facility (probably remaining with the Archaeology Collection provisionally).
4. All remaining specimens of reasonable quality and value will be packed up for transfer to Western Kentucky University. These will include at least one or two specimens of each species from Jefferson County, as far as possible, to ensure a backup for records retained at the local Louisville herbarium.

5. A refrigerated truck will be located in the gated parking lot next to the herbarium for a week or more while collections are loaded for transfer. All specimens will be frozen at -20°C for 3-5 days, in order to ensure killing of all possible insect pests.
6. An updated and annotated list of the flora in Jefferson and adjacent counties will be generated as we go through this process. This list will be developed in conjunction with the database for the distributional Atlas of the Kentucky Flora that has been put together by J. Campbell, M. Medley and others.

**Schedule and requested funding:** for above products; activities will be spread out during Jan-Jun, 2008.

NOTE: University of Louisville could logically be responsible for most of these items, except items 4 and 5.

1. Extraction of reference specimens to remain at Dept. of Biology: ca. 20 person days; cost, ca. \$4000 (labor).
2. Re-establishment of the proposed herbarium within the Dept. of Biology: ca. 10 person-days; cost, ca. \$4000 (for skilled labor, haulage/repair of cases, purchase of in-house freezer, boxes, other materials).
3. Archiving of duplicate/damaged specimens: ca. 10 person-days; cost, ca. \$2500 (for labor, perhaps boxes).
4. Packing for transfer to WKU: ca. 5 person-days; cost, ca. \$1000 (mostly for unskilled labor, perhaps boxes).
5. Freezing: ca. 30 days during Jan-Apr, 2008; cost, ca. \$3000 (mostly for refrigeration truck); truck rental may be donated by Ryder Truck Inc., through agreement with Univ. of Louisville.

6. Provision of updated floristic list: ca. 10 days by end of 2008; cost, ca. \$2500 (mostly for skilled labor).

**Total:** \$17,000; see note on potential donation under item 5; a more detailed budget can be prepared on request.



**TODO**

## NOTES TO SELF

vistas article

cigar beetle

freezer temp

Phyllis Croce—MSD 5 part talk series riparian uses, engineering apps at Beargrass Nat Pre (60 acres)

Paul Capiello; Alan Bush;

Max—check with Phil DeBlaze about old map with witness trees, “ash pond” etc.

check Nat Geo Bhutan (Engleberg)

check Life in Conservation by A. Roberts (Painting the Cows and other tales)

KY: **JEFF OLDH TRIM**; BULL SPEN SHEL HENR

IN: **FLOY CLAR JEFF**; HARR WASH SCOT JENN

people:

Jeff Masters

## **JEFF grassland sites**

Alan Nations roadside

McNeely Park with *Leavenworthia exigua*

Iroquois Park: summit with *Liatris squarrosa*; also planted  
*Asc ver*; *Bap leu* planted ; *Des ill* planted; *Ech pur* planted; *Lia spi* planted; *Rat pin* planted

Blackacre SNP

Beargrass Creek: Illinois Av-Poplar Level Rd area

**Asclepias exaltata:** check data

**Asclepias verticillata:** check data

**Baptisia leucantha:** JEFF (LO): PADavies 1524b 26 Jun 1947: shaded hillside Red Stone Hill

**Dalea purpurea:** JEFF: Pat Haragan says loc fre at Iroquois Park but might have been planted; she is checking; JC--no clear record in planting lists from 1990s; PD has a coll. (?)

**Desmanthus illinoensis:** check data.

**Desmodium obtusum:** JEFF: JC 2010 coll at Alan Nation's place; prairie remnant!!!

**Echinacea simulata:** check data

**Helianthus cf. rigidus:** LO: JEFF PADavies #777; dry hillside Indian Hills Rd Aug 27 1943; "pauciflorus".

also from atlas: Helianthus grosseserratus; H. strumosus; H. hirsutus; H. mollis (GET DATA)—Hm planted at Cherokee Pk by Beargrass

**Liatris spicata:** check data

**Liatris squarrosa:** check data

**Liatris squarrulosa:** check data

?Lysimachia hybrida: source of MM to research...

**Lysimachia quadriflora:** JEFF (PH) based on Short coll: "slate bluff below Louisville."

**Ratibida pinnata:** check data

**Phlox pilosa sites:** JEFF: (LO): PADavies-1397 11May1947 dry hillside near crest, near stream, Indian Hills; HKoufunge-52 7May1948 damp rich soil, Goose Cr; PADavies 8May1948 South Park; DRColes-15 8 May1948 pine knobs, South Park Rd; TThrelkeld-63 2Jun1948 yard, Hycliff Avenue; WHPowers-11 18May1950 dry soil top of hill, Bear Camp Rd; Thriqe-67 28May1950 dry open sandy ground, Jefferson Hills; Sanford-46 1Apr1953 dry soil in Jefferson Hills [var. virens]; FBell-60 14Apr1953 dry soil along Goose Neck Cr;

Whitney-50 14May1954 open woods, rich neutral, Mitchell Hill; MQuin-57 22May1954 meadowside, Iroquois area; GEllis 23Apr1964 South Park Country Club, hillsides, stream margins, 700 ft and below; CDBarbee-23 5May1964 south side Finley Hill, woody area; KRosenbaum-114 16May1964 South Park Country Club;

**Rudbeckia grandiflora:** This taxon occurs mostly on the Gulf Coastal Plain, west of the Mississippi Rv. Var. *grandiflora* is largely Ozarkian (FNA 21), but may be native in some disjunct prairies and glades as far as nw. Ga. (W). Var. *alismifolia* is known from two old colls. in JEFF (DHL), which could have been native or adventive: P.A. Davies #743/748, 2/4 Aug 1943, uncultivated field/dry hillside, Illinois Avenue. There are no other records of this species from the state.

**Silphium laciniatum var rob:** JEFF (GH): P.A. Davies & H. Bishop #374 dry hillside Poplar Level Road, Louisville; see also Gunn 1968b; where is this coll at LO now???

**Silphium integrifolium:** JEFF (LO); PADavies & HBishop #373 dry hiliside Poplar Level Road 5 Jul 1940; and PA Davies #737 Camp Taylor 30 Aug 1943; see also *laciniatum*; the Davies #373 collection is duped at GH where ided as "astericus var. *aspernum*" by Clevenger.

?**Solidago missouriensis:** MM coll check data

**Sorghastrum nutans:** JEFF (LO): PADavies-73 17Sep1943 Beargrass Cr dry ground; -74 28Aug1943 Beargrass Cr dry hillside; -75 2Sep1943 Jefferson Hills.

**Tripsacum:** JEFF (LO): PADavies-129 18Aug1943 off Poplar Level Rd, Illinois Av, roadside field.

**Typical species.** Native species include bluestems and broomsedges (*Andropogon* spp.), Indian grass (*Sorghastrum nutans*), greasegrass (*Tridens flavus*), panic grasses (*Panicum* spp.), ironweeds (*Vernonia* spp.), goldenrods (*Solidago* spp. or allies), asters (*Aster* spp. or allies), wingstems (*Verbesina* spp.), sunflowers (*Helianthus* spp.) and allies, milkweeds (*Asclepias* spp.) and allies, nightshades and allies (*Solanum*, *Physalis*), ladies-tresses (*Spiranthes* spp.) and many others. Modern old fields can be grouped here, but often with uncomfortable biogeographic mixtures.

**Examples:** to be developed.

Shawnee Park: “unmowed old fields”; *Daucus carota*, *Solidago* cf. *altissima*, *Aster* spp., *Trifolium pratense*, *Vernonia gigantea*, *Verbesina alternifolia*, *Festuca* cf. *arundinacea*.

Cherokee Park: “mowed meadows”; little interest botanically, but *Trifolium stoloniferum* patch found [near trees].





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Area of  
Interest  
(AOI)

Soil  
Map

Soil  
Data  
Explorer

Shopping  
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## Add to Shopping Cart Options

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oil Map

**Basic Search**

Enter  
keywords

## Advanced Search

- All the keywords
- At least one of the keywords
- The exact phrase

 Clear Search

Map Unit Legend

X

**Jefferson County, Kentucky  
(KY111)**

## Calibrate map scale to your monitor's screen resolution

Current value: 70 pixels per inch. (default)



If you calibrate your screen resolution, the application will:

- indicate the current map scale in the scale dropdown, and
- allow you to select a particular map scale using the scale dropdown.

If you don't need these features, just click the **Cancel** button.

To calculate map scale, the application needs to know your screen resolution (pixels per inch).

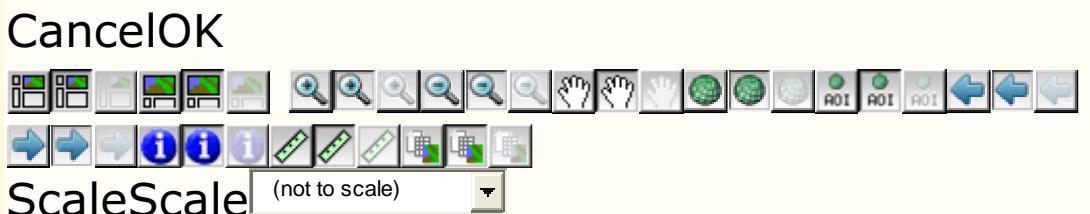
To set pixels per inch, make the black line segment exactly one inch long:

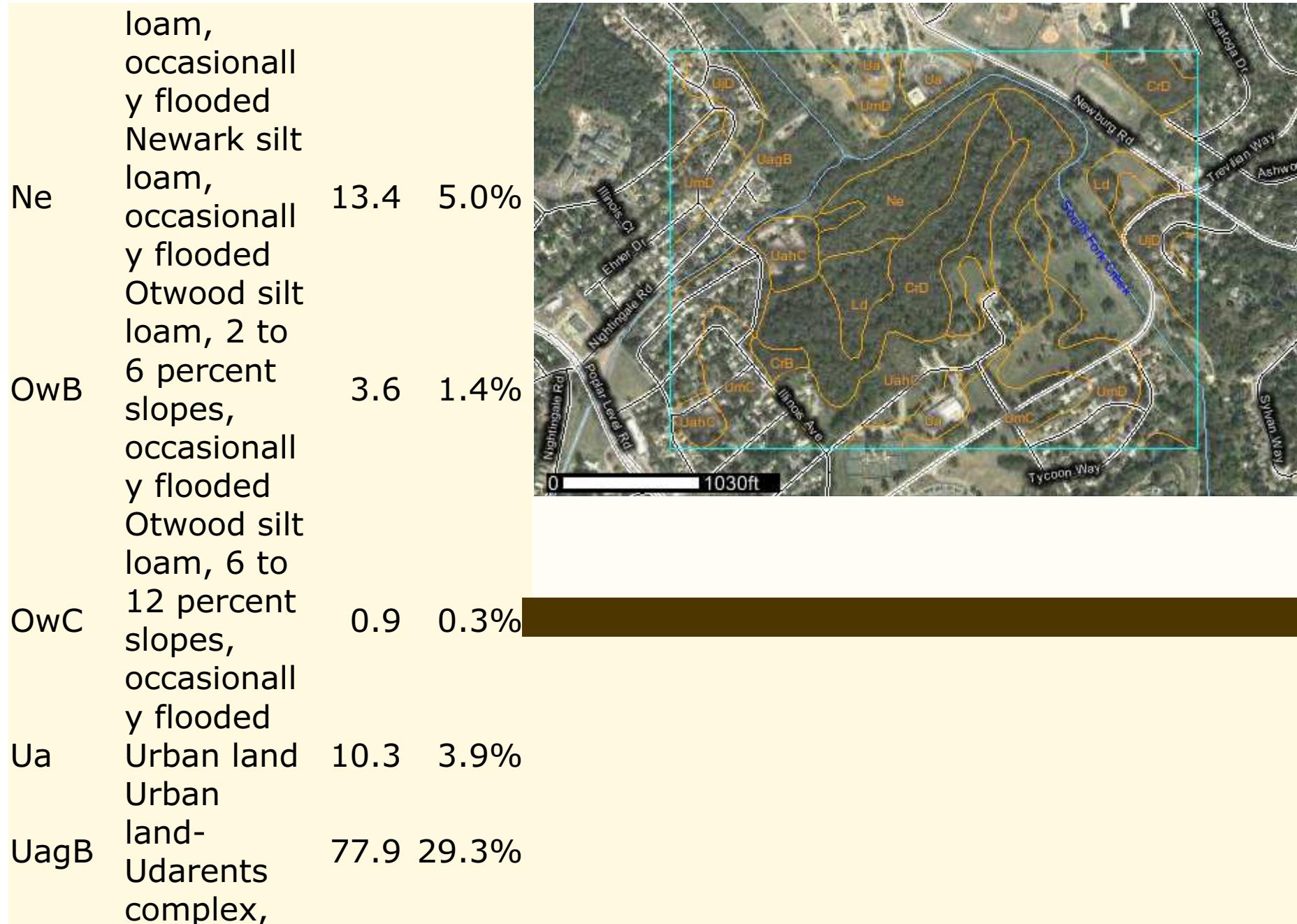
1. Hold a ruler (in inches) up to your screen so that the zero point is aligned with the left edge of the black line segment (inside

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
I	Caneyville silt loam, 12 to 25 percent slopes, eroded, very rocky	11.9	4.5%
CaD2	Crider silt loam, 2 to 6 percent slopes	3.0	1.1%
CrB	Crider silt loam, 6 to 12 percent slopes	5.8	2.2%
CrC	Crider silt loam, 12 to 20 percent slopes	29.1	10.9%
Ld	Linside silt	9.0	3.4%

- the end bar).
- Click in the gray space where your ruler measures one inch, or drag the line segment to resize it.
  - When the black line segment is exactly one inch long, between the end bars, press **OK**.

When you change your screen resolution, the application resets the calibration to "(not to scale)", but it remembers the previous value of pixels per inch until you explicitly change it, because it will still be valid if you return to the previous screen resolution.





	wet substratum , 0 to 6 percent slopes, rarely flooded Urban land- Udorthents			
UahC	complex, 0 to 12 percent slopes Urban land-Alfic	24.5	9.2%	
UjC	Udarents complex, clayey substratum -over hard bedrock, 0 to 12 percent	3.0	1.1%	

	slopes
	Urban
	land-Alfic
	Udarents
	complex,
	clayey
UjD	substratum 13.0 4.9%
	-over hard
	bedrock,
	12 to 25
	percent
	slopes
	Urban
	land-Alfic
	Udarents-
UmC	Crider 23.7 8.9%
	complex, 0
	to 12
	percent
	slopes
	Urban
	land-Alfic
	Udarents-
UmD	Crider 36.8 13.9%

complex,  
12 to 25  
percent  
slopes

Totals for Area of    265. 100.0  
Interest                9        %

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